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Appendix K

Report on Contamination Investigation

State Significant Development,
Development Application (SSD DA)

Cockle Bay Park Redevelopment
241-249 Wheat Road, Sydney

Prepared for
DPT Operator Pty Ltd and DPPT Operator Pty Ltd

Project 202546.00
October 2021



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

	Signature	Date
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Executive Summary

Douglas Partners Pty Ltd (DP) has been engaged by DPT Operator Pty Ltd and DPPT Operator Pty Ltd to complete this contamination investigation for the Cockle Bay Park redevelopment at 241-249 Wheat Road, Sydney (the site). The site is shown on Drawing 1, Appendix A.

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

This investigation was undertaken concurrently with a geotechnical investigation, DP report 202546.00.R.001 which has been reported separately.

The investigation comprised the drilling of boreholes, analysis of soil samples for the contaminants of concern, groundwater testing, soil gas screening, acid sulfate soil testing and preliminary waste classifications.

The detailed findings of the investigation are presented and discussed in Sections 9 and 10. Based on the results of the investigation it is considered that the site can be made suitable for the proposed open space and commercial development subject to implementation of the recommendations below.

- Further detailed investigations should be undertaken within the proposed commercial tower and fire tank footprints following demolition of the overlying structures to confirm the contamination status of these materials;
- Further waste classification assessment should be undertaken. In particular the focus should be on areas where excavation is proposed (the commercial tower and fire water tank). Further ex situ waste classification is also recommended during development to confirm preliminary *in situ* classifications. As noted previously, based on the presence of building wastes in the fill the potential for asbestos contamination in the fill is considered to be high;
- Additional high resolution acid sulfate soil investigations are recommended to be undertaken within the proposed excavation zones following demolition of the overlying structures (the commercial tower and proposed fire water tank) with a high density (vertically and horizontally) of laboratory tests to assess the lateral and vertical extent and nature of acid sulfate soils. Alternatively further testing can be undertaken *ex situ* as materials are excavated;
- Outside of the proposed excavation zones, following the demolition of any structures at the site a asbestos clearance should be undertaken by a licenced asbestos assessor and further contamination assessment (soil and groundwater) be undertaken within those footprints which were inaccessible during the current preliminary investigation;
- A destructive hazardous building material (hazmat) assessment should be undertaken prior to demolition on all structures proposed for demolition;
- Preparation of a soil management plan including an unexpected finds protocol to provide procedures to limit the impacts of disturbing soils around the harbour foreshore and manage unexpected contaminant finds such as asbestos;
- Preparation of an environmental management plan to manage lead impacted soils below the concrete pavement in the vicinity of borehole CP1;

- An acid sulfate soil management plan should be prepared. The ASSMP should provide the proposed scope of the recommended high resolution acid sulfate soil assessment and the methodology to manage acid sulfate soils present at the site;
- Groundwater will be encountered during the excavation works for the proposed tower and fire tank. Therefore, a dewatering management plan should be prepared. Based on the results of the preliminary groundwater assessment the primary contaminants identified in groundwater were heavy metals and TSS. There are a number of treatment methods for heavy metals and TSS, most commonly the use of filtration and flocculant based systems. A supplementary round of groundwater testing should be conducted to confirm the presence (or otherwise) of TRH in some locations (and potential impact on dewatering management) and potential tidal influence variability in groundwater condition;
- It is recommended that if materials are disturbed and excavated from the vicinity ofW1, W5 and / or CP1 that additional ex situ waste classification be undertaken to confirm the classification of this material which was provisionally classified as hazardous waste or restricted waste following excavation; and
- If building structures are proposed in the vicinity of CW6 or CP2 where elevated PID readings were detected during gas screening than further soil vapour assessment may be warranted. It would be considered prudent to collect a soil gas grab sample from CW6 for VOC and TRH analysis. If hydrocarbon contaminated soils and / or groundwater are encountered during further investigations or if elevated VOC or TRH are detected in the recommended grab sample from CW6 additional soil vapour assessment may be warranted.

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Report on Contamination Investigation
Cockle Bay Park Redevelopment
241-249 Wheat Road, Sydney

1. Introduction

Douglas Partners Pty Ltd (DP) has been engaged by DPT Operator Pty Ltd and DPPT Operator Pty Ltd to complete this contamination investigation for the Cockle Bay Park redevelopment at 241-249 Wheat Road, Sydney (the site). The site is shown on Drawing 1, Appendix A.

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

This 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).

This investigation was undertaken concurrently with a geotechnical investigation, DP report 202546.00.R.001 which has been reported separately.

2. Proposed Development

The proposed scope of works includes the demolition of the existing Cockle Bay Wharf building and pedestrian bridge for the progression of a new proposed development. The existing Cockle Bay Wharf deck structure along the Harbour foreshore will be retained and used as a platform for the construction of the proposed podium structure. The proposed development includes several major components with proposed foundations as summarised below:

- Podium structure on Cockle Bay Wharf:
  - Low rise retail podium structure on Cockle Bay Wharf. It is assumed that the podium structure will include some public open space and recreational areas;
  - Reinforced concrete columns with an estimated column working load of 5 MN; and
  - Superstructure proposed to be transferred at ground level onto a regular pile foundation grid.
- Tower structure:
  - 43 storey high rise commercial office tower located on the east side of the podium;
  - Reinforced concrete columns with an estimated column working load of 130 MN;

  - Columns proposed to be founded on pile groups of large diameter socketed in high strength rock with tower core to be founded on a piled 1.5 m deep raft; and
  - Raking piles proposed to be used to support lateral tower forces.
- Land bridge spanning across the existing Western Distributor:
  - Deck structure connecting the new podium structure on Cockle Bay Wharf with the existing Darling Park towers;
  - The deck structure will cover the area of Western Distributor between the new development and the Darling Park towers;
  - Reinforced concrete columns with an estimated column working load of 35 MN and ultimate horizontal impact load of 2.7 MN; and
  - Proposed to be founded on pile or pad foundations.

Excavations are required adjacent to existing Harbour Street for the construction of core rafts, lift pits, large ground floor set-downs and loading docks.

It is understood that a bulk excavation to approximately 6 m depth will also be required towards the southern end of the proposed development to accommodate a large in-ground fire water tank. The broad elements of the proposed development are presented in Figure 1.

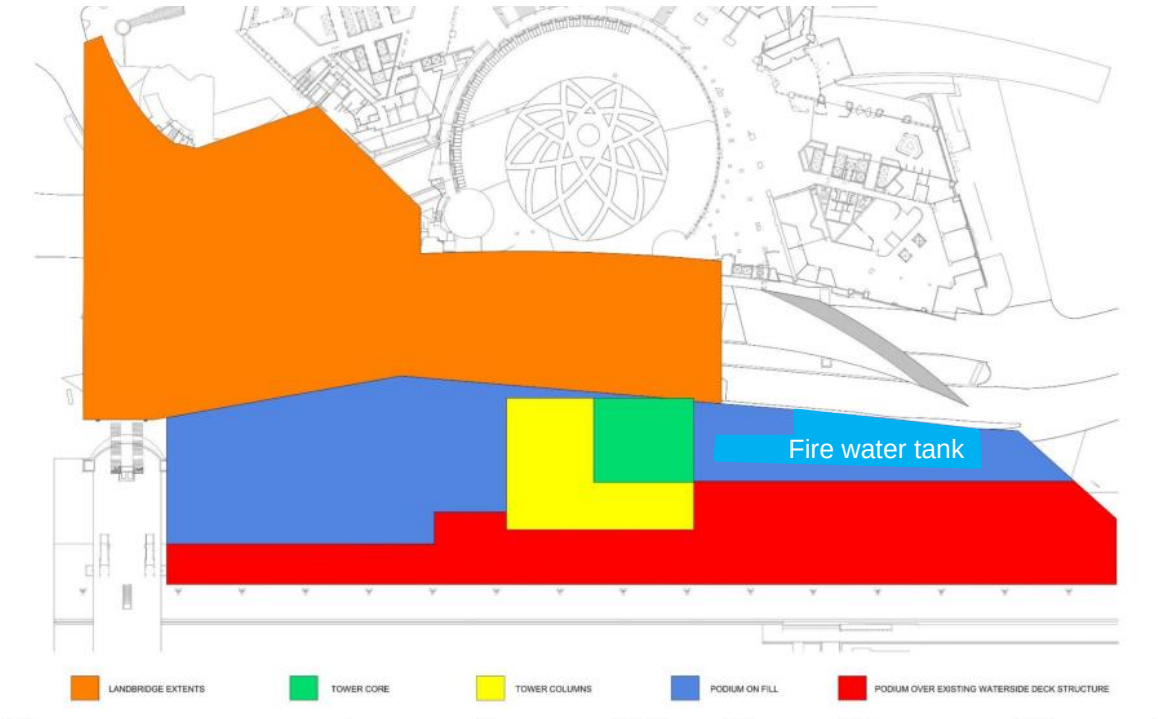


Figure 1: Proposed Development

3. Scope of Work

The scope of work completed to date includes:

- Review of the previous contamination and archaeological reports (provided by client);
- A site inspection to assess potential sources of contamination, contaminant pathways and potential receptors;
- Prior to drilling, on-site electronic scanning was completed to identify buried services during set-out of each proposed borehole location. For borehole locations situated on the existing suspended deck, the underside of the deck was inspected for structural components and under-slung utilities;
- Diatube coring methods were used to drill through the hardstand surface at each borehole location. The over-land holes were then advanced using non-destructive drilling techniques to check for the presence of underground utilities and services;
- Drilling of fifteen boreholes (W1-W5, CW1-CW7, SS1-SS2, CP1 - CP2 and WD1-WD3) using a combination of track and bobcat mounted drilling rigs. The boreholes were drilled to, or close to, the top of rock using a combination of solid flight auger and rotary wash boring methods. Once weathered rock was encountered, the holes were advanced to depths of between 17.7 m and 45 m, using NMLC (52 mm diameter) diamond core drilling techniques to obtain continuous core samples of the rock;
- Six boreholes (CW2, CW3, CW5, CW6, CP2 and SS2) were converted into groundwater monitoring wells at the completion of drilling;
- Collection of soil samples from the geotechnical boreholes for contamination testing at regular intervals, upon signs of contamination and at the observed water table;
- Screening of soil samples using a photoionisation detector (PID);
- Development of the six groundwater wells and collection of groundwater samples using low flow sampling methods. Standard field parameters were recorded;
- Gas screening from the groundwater wells using a PID and landfill gas analyser;
- Dispatch and analysis of selected soil samples at a NATA accredited laboratory for the following potential contaminants identified in the PSI and nominated quantities (in the client brief) in brackets;
    - Heavy metals, polycyclic aromatic hydrocarbons (PAH), total recoverable hydrocarbons (TRH), volatile organic compounds (VOC), organochlorine pesticides (OCP), organophosphate pesticides (OPP), polychlorinated biphynels (PCB) soil pH and asbestos presence / absence ;
    - Total organic carbon (TOC);
    - Total Characteristic Leaching Procedure (TCLP) analysis (metals and PAH) for waste classification purposes; and
    - Industry standard QA / QC testing including replicates, trip spikes and trip blanks.
- Dispatch and analysis of six groundwater samples at a NATA accredited laboratory for the following potential contaminants:
    - Heavy metals, PAH, TRH, phenols and VOC; and
    - Industry standard QA / QC testing including replicates, trip spikes, trip blanks and rinsate samples.

- Based on the PSI, additional potential contaminants of concern were identified in soil and groundwater that DP recommended testing as listed below:
  - Soil (phenols, tin and tributyl tin (TBT)); and
  - Groundwater (OCP, OPP, PCB, TBT, iron (total, ferric and ferrous), total suspended solids and oil and grease).
- Preliminary acid sulfate soil investigation including:
  - Collection of additional soil samples from selected boreholes drilled as part of the geotechnical investigation;
  - Screening of selected soil samples for field pH and oxidised pH;
  - Analysis of selected soil samples for chromium reducible sulphur suite testing; and
  - Inclusion of the results of the acid sulfate soil assessment in the contamination assessment report.
- Preparation of a contamination assessment report including the following:
  - Summaries of the previous reports;
  - Site assessment criteria (SAC);
  - Comments on the suitability of the site (from a contamination standpoint) for the proposed development;
  - Comments on whether remediation is required;
  - Comments on groundwater contamination and options for groundwater treatment (if required) during dewatering;
  - Preliminary in situ waste classification; and
  - Recommendations for further works (if warranted).

4. Site Information

Site Address	241-249 Wheat Road, Sydney
Legal Description	Lots 12 and 17, DP801770, Lots 60 and 65, DP1009964 and Part Lot 42, DP864696
Area	Approximately 21,000 m^2 as defined by the development outline on Drawing 1, Appendix A
Zoning	Darling Harbour Development Plan No 1
	Zone SP2 Infrastructure (Classified Road)
Local Council Area	City of Sydney Council
Current Use	Commercial and Open Space

Surrounding Uses	North - Pyrmont Bridge, a two storey bar and café and Sydney Aquarium. East - Western Distributor and commercial office towers. South - Western Distributor and site of former IMAX West - A marina and Darling Harbour

The site features (from Coffey 2017, the PSI)[1] and Boundary is shown on Figure 1.



Figure 2: Site Location

[1] Preliminary Site Investigation Report, DPT and DPPT Operator Pty Ltd c/- Enstruct, Group Pty Ltd Proposed Development at Cockle Bay Park, Preliminary Site Investigation dated 25 August 2017.

Cockle Bay Park is located at 241-249 Wheat Road, Darling Harbour, currently occupied by the existing Cockle Bay Wharf precinct. The site comprises an irregular shaped area of about 21,000 m^2, the general layout of which is shown on Drawing 1 in Appendix A. The site is bound by Darling Harbour to the west, Pyrmont Bridge to the north and The W Hotel to the south. The northern end of the site extends out to the east, across the Western Distributor, to the existing Darling Park Towers. The areas north, south, and west of the existing building are typically paved public walkways. Loading docks and back-of-house facilities are located on the eastern side of the building.

The existing Cockle Bay Wharf building is generally used for retail purposes. The existing developments surrounding the site are a combination of retail and commercial office spaces.

An existing sheet pile sea wall is located beneath the site, running roughly north south, with the western portion of the site supported on a suspended deck which extends out over Darling Harbour, the surface of which is at about RL 2.2 m AHD. The approximate location of the existing sheet pile wall is shown on Drawings 4, 5 and 6.

The following features were noted during the PSI (Coffey 2017):

- Cockle Bay Wharf, which is part of the Darling Harbour Entertainment Precinct, is located on the site;
- The site consists of two buildings (referred to as the northern and southern building herein) which are occupied by cafes and restaurants on both the ground floor and the first floor. The two buildings are connected through an aboveground walkover in the middle. Two spiral staircases are also noted on either sides of the site;
- Both buildings appear to be concrete structures with tiles used in part of the buildings as decoration;
- The site surface is either paved with brick or concrete. A water feature is located in the open area between the two buildings;
- No major cracks were observed on the concrete floor within the site at the time of the site walkover. The general housekeeping practices appeared reasonable;
- Amenities facilities were located in the eastern portion of the buildings. Each building contains its own locking dock, air conditioning plant room, fire control room, electrical sub-station and switch room;
- The cleaner office was located within the air conditioning plant room in the northern building. Storage of general commercial cleaning products were noted during the site walkover;
- Recycling facilities were located with the loading docks. Potable gas cylinders were noted to be stored with the docking docks. No major cracking or staining was observed in the two loading docks at the time of site visit;
- There were two storage areas within the site: the first one located in the open area between the building which was used to store potable gas cylinders and restaurant furniture. The second storage area was located under the southern building where waste bins and potable gas cylinders were noted;
- The telecommunication room was located on the first floor of the northern building;
- Two chillers were located on the balcony level; and

- No underground storage tanks were identified at the site. No aboveground storage tanks, other than portable liquefied petroleum gas (LPG) cylinders, were noted during site visit. No fill points or vent pipes that may associated with underground storage tanks were noted during the site walkover.

The condition of the site has not changed substantially since 2017.

5. Environmental Setting

5.1 Topography

The ground surface is relatively level to the east of the existing Cockle Bay Wharf precinct, with surface levels at or about reduced level (RL) 3 m relative to Australian Height Datum (AHD). The ground surface falls away into the harbour to the west of the existing precinct, with the bottom of the harbour at about RL -5 m AHD. The foreshore deck continues over the water to the west of the precinct, at about RL 2.2 m AHD.

5.2 Site Geology

The Sydney 1:100 000 Geological Series Sheet indicates the site spans across the boundary between Hawkesbury Sandstone (medium to coarse-grained sandstone with minor shale and laminate lenses) on the eastern side of the Western Distributor and Quaternary-aged alluvial and estuarine sediment (silty/peaty sand, silt, clay, common shell layers) on the western side of the Western Distributor. The area south of Darling Harbour is mapped as having man-made fill placed over the Quaternary-aged sediments, resulting from historical land reclamation works. A review of mapping suggests that no geological structures such as major fault zones or dykes cross the site.

5.3 Soil Landscape

The Sydney 1:100 000 Soils Landscape Sheet indicates the site spans across the boundary between 'Disturbed Terrain' on the western side of the Western Distributor and erosional sandy soils on the eastern side of the Western Distributor. 'Disturbed Terrain' is considered to have been extensively altered by anthropogenic influences, likely by placement of land fill material (soil, rock, building and waste materials). Based on the previous reports (refer to Section 6), it is understood that fill has been placed to raise surface elevations allowing the expansion of the foreshore as part of land reclamation works carried out mainly between the 1820s to 1890s, with minor infilling and straightening undertaken in the 1900s to 1910s.

5.4 Acid Sulfate Soils

Acid Sulfate Soils (ASS) Risk Mapping by the NSW Department of Planning Industry and Environment identifies the site to span across the boundary between a 'High Probability of Occurrence' along the eastern shoreline and Class 2 zone over the majority of the site. There is a high probability of encountering potential or actual ASS if the Darling Harbour bed is disturbed.

5.5 Surface Water and Groundwater

Darling Harbour is located to the west of the site, which joins Sydney Harbour to the north. It is anticipated that the inferred groundwater flow is in a general to the west into Cockle Bay.

Based on information provided in Coffey (2017), there are no groundwater monitoring bores located within a 500 m radius of the site. A search of the publicly available registered groundwater bore database on 25 August 2021 also indicated that there are no groundwater monitoring bores within 500 m of the site.

Given the proximity of the site to Darling Harbour, it is expected that the groundwater table beneath the site is relatively shallow and is influenced by tidal movement.

The ground is generally level across the site. It is likely that drains and gutters in the buildings are connected to the stormwater system or directly into Darling Harbour. The entire site is covered with pavers and the building and as such there are no areas for infiltration of precipitation or stormwater runoff.

6. Previous Reports and Site History

The following previous reports are relevant to the current investigation:

- Preliminary Site Investigation Report, DPT and DPPT Operator Pty Ltd c/- Enstruct, Group Pty Ltd Proposed Development at Cockle Bay Park, Preliminary Site Investigation dated 25 August 2017. Prepared by Coffey (Coffey 2017); and
- Cockle Bay Park Historical Archaelogical Assessment, report prepared for DPT and DPPT, August 2017. Prepared by GML Heritage (GML 2017).

6.1 Coffey (2017)

Coffey (2017) was a preliminary contamination assessment comprising a site history investigation, a site walkover and report. Coffey (2017) provided the following summary of the site history.

The earliest historical records indicate that the site was used as for heavy industrial uses and a working dock from the late 1880s to the 1960s, including shipyard, timber yard, warehouse, engineering workshop and garage. Heavy industrial activities ceased in the 1960s when most of the buildings were demolished. Between the 1960s to the early 1980s the site was still used as a shipping dock but it

appears that most of the heavy industries had moved out of the CBD area during this period. The western portion of the site was progressively reclaimed between the late 1880s to the 1980s. The finger wharves that were historical located on this part of the Darling Harbour foreshore were demolished by the early 1990s.

The foreshore layout was in its current form since 1991, with the Cockle Bay Wharf constructed between 1991 and 2000. No significant changes to the use of the site and surrounding area since 2000.

Anecdotal information provided by the Facility Manager, in relation to dangerous goods storage, is consistent with the dangerous goods record obtained from SafeWork NSW.

The observations made by Coffey showed that site conditions were generally consistent with the documented records discussed above. The site and the surrounding area was mostly covered with hardstand therefore signs of contamination could not be observed during the site walkover. No dangerous goods, other than small LPG cylinders, were noted to be used on-site by the restaurant operators.

The surrounding area was predominately used for heavy industrial purposes to support the working dock until around the early 1980s. The area to the east of the site has been developed for office and retail uses since the 1980s. A automotive garage was identified in the northern portion of the site.

The site has been occupied by cafes and restaurants since the early 1990s. Based on information provided to Coffey and site observations, the amount of chemicals that are currently stored on-site are restricted to general cleaning products and cooking oils. The site surface is paved therefore top down impacts associated with spills are unlikely.

The site features described in Coffey (2017) are summarised in Section 4.

Coffey (2017) identified several potential sources of contamination which are summarised in Section 7 in the conceptual site model (CSM).

6.2 GML (2017)

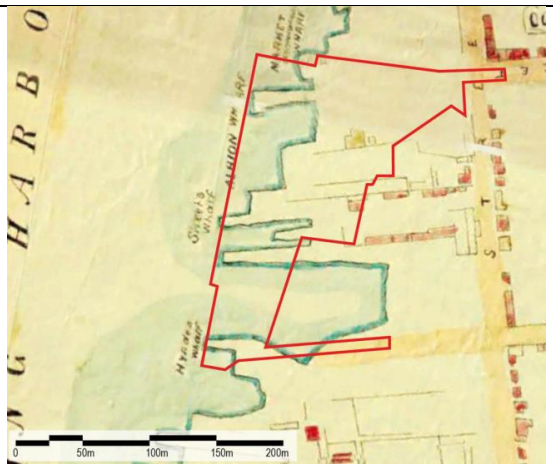
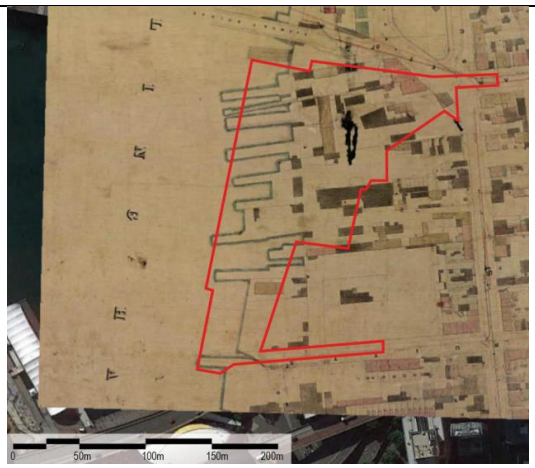
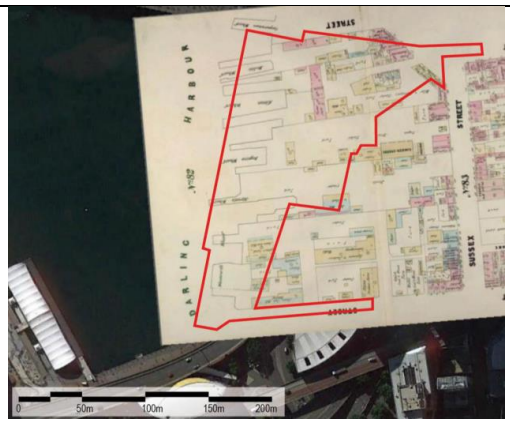
GML (2017) details the aboriginal and European heritage and archaeology of the site. The key findings of this report as it relates to this assessment include:

- Prior to European settlement the site formed part of the lands of the Cadigal clan of the Darug;
- The first European settlement was established in 1804 and by 1811 Market Wharf had been commissioned;
- The first industry was established in the Darling Harbour area in the 1820s;
- The Pyrmont Bridge was erected in 1857;
- The area continued to operate as working shipyard and dock from the late 1800s to 1960s. Industries included a timber yard, warehousing, shipping, engineering, vehicle and ship maintenance;
- The wharves underwent several periods of redevelopment and land reclamation. The changing character of the wharves is demonstrated in the maps presented in Table 1; and

- The site was redeveloped for primarily office, restaurant and retail use in the 1980s and 1990s.

The figures presented below in Figure 1 from GML (2017) do not reflect the current project boundary. The figures are included to show the changing nature of the site and in particular the shoreline. It is understood that new heritage reports have been prepared subsequent to GML (2017) which have not been reviewed for the contamination report as the information provided in the GML (2017) report was considered sufficient for the purposes of the contamination assessment to determine previous land uses and site history.

Table 1: Historical Maps and Figures

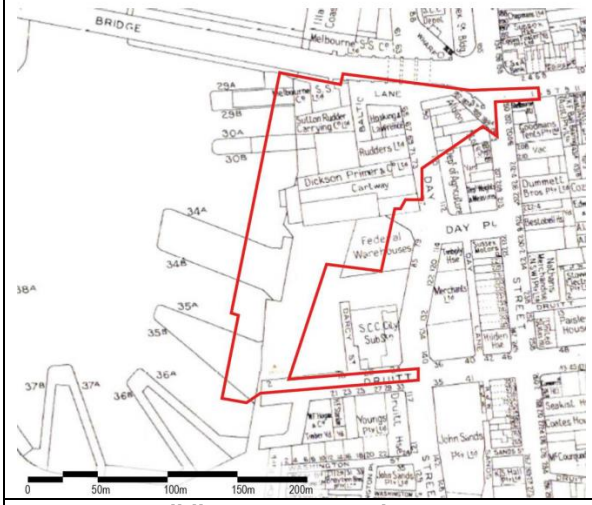
	
Francis Webb Shields Map of Sydney 1844	**Trigonometry Survey of Sydney 1855-65**
	
Doves Plan of Sydney 1880	**Daring Harbour Resumption 1900**



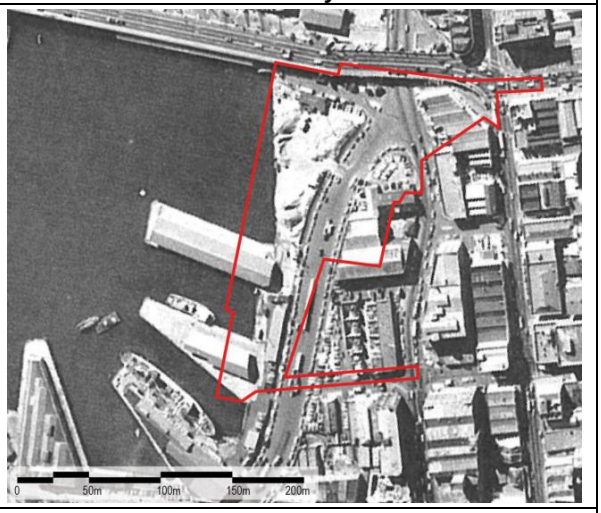
Fire Underwriters Survey 1923



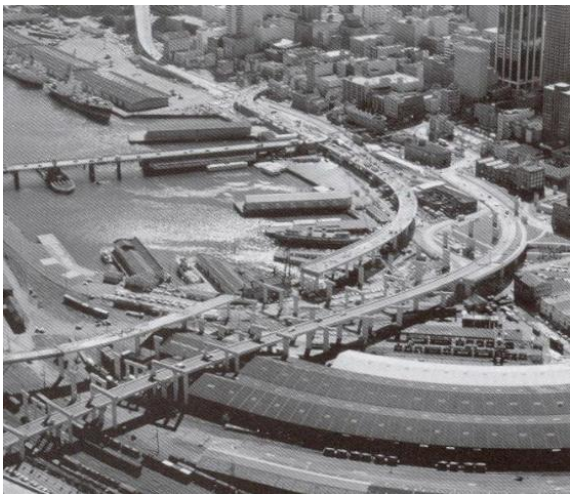
Civic Survey 1948



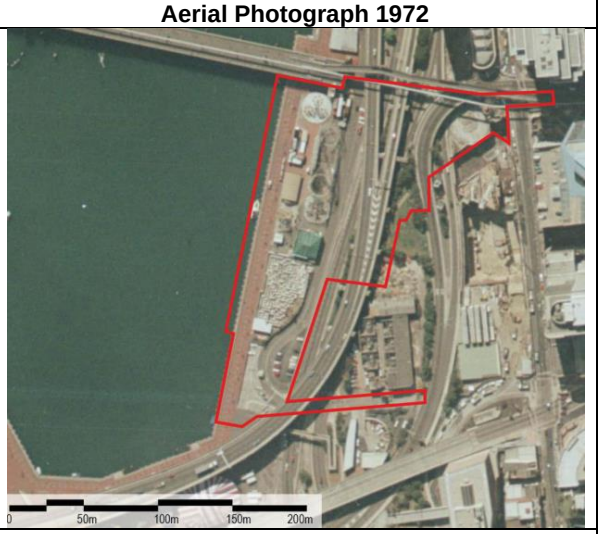
Building Surveyors Plan 1956



Aerial Photograph 1972



Construction of Western Distributor 1980



Site 1994

Source: GML 2017

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).

Potential Sources

The areas of environmental concern and contaminants of potential concern presented in Table 2 are taken from Coffey (2017).

Table 2: Areas of Environmental Concern and Contaminants of Potential Concern

Potential Contaminating Activity / AEC	COPC	Likelihood of Impact	Comments
S1: Fill material of unknown origin used as part of site development and land reclamation process	PAH, TRH, heavy metals, and asbestos	Moderate to high	Fill material of unknown origin may have been used as part of site development and land reclamation process. Fill material could contain dredged materials, waste material generated from the site and nearby areas and ash from coal burning. Fill material is expected to be present up to several metres down above the underlying natural soils.
S2: Former shipyard operation	BTEX, PAH, TRH, heavy metals, PCB and asbestos	Low to moderate	Ship repairs were likely to be undertaken in the former shipyards operating along Darling Harbour. Fuels, engine oils and other lubricants were likely to be used and stored on-site at the time. Waste generated from shipyard operation may also be present on-site. The shipyard generally operated between the late 1800s to 1960s Coal was likely to be used as a fuel on-site until installation of town electricity supply. Ash resulting from burning of coal could be present within the fill material. Potential impacts are likely to be present a greater risk to the fill than underlying natural soil. Trialkyltins were not discovered as an antifouling agent until the 1950s, and became commonly used in antifouling paints in the 1960s and 1970s. Therefore, it is considered that organotin such as tributyl tin (TBT) may not have been used at the shipyard (although may be a contaminant of concern related to ship docking, see S5).

Potential Contaminating Activity / AEC	COPC	Likelihood of Impact	Comments
S3: Former timber yard operation	BTEX, PAH, TRH, heavy metals, OCP and creosols	Low to moderate	Chemicals associated with timber preservation activities may be present beneath the site. Waste products might have been disposed on-site which was considered to be an acceptable practice in the early 1900s. Coal was likely to be used as a fuel on-site until installation of town electricity supply. Ash is likely to be present within the fill material. Potential impacts are likely to be present a greater risk to the fill than underlying natural soil.
S4: Former automobile garage and engineer's workshop	BTEX, PAH, TRH, metals, VOC	Low to moderate	Chemicals associated with the use of lubricants and solvents may be present at the site. Waste oil and fuel might have been disposed on-site which was considered to be an acceptable practice in the early 1900s. Historical information reviewed as part of Coffey (2017) did not indicate the exact type of engineer's workshop and what was undertaken on-site, but it is anticipated that it would mostly likely involve metal works to support the site operations at the time. Coal was likely to be used as a fuel on-site until installation of town electricity supply. Ash is likely to be present within the fill material. Potential impacts are likely to be present a greater risk to the fill than underlying natural soil
S5: Former shipping dock	TBT	Low to moderate	Anti-fouling paint containing TBT might have come off vessels during docking. Potential impacts are likely to be present a greater risk to the fill than underlying natural soil.

Potential Receptors

The following potential human receptors have been identified:

- R1: Current users [commercial, recreational open space];
- R2: Construction and maintenance workers;

- R3: End users [commercial and recreational open space]; and
- R4: Adjacent site users [commercial and recreational open space].

The following potential environmental receptors have been identified:

- R5: Surface water [Cockle Bay, Saline];
- R6: Groundwater; and
- R7: Terrestrial ecosystems.

Potential Pathways

The following potential pathways have been identified:

- P1: Ingestion and dermal contact;
- P2: Inhalation of dust and / or vapours;
- P3: Surface water run-off;
- P4: Leaching of contaminants and vertical migration into groundwater;
- P5: Lateral migration of groundwater providing base flow to water bodies; and
- P6: Inhalation, ingestion and absorption.

Summary of Potentially Complete Exposure Pathways

A 'source - pathway - receptor' approach has been used to assess the potential risks of harm being caused to human or environmental receptors from contamination sources on or in the vicinity of the site, via exposure pathways (potential complete pathways). The possible pathways between the above sources (S1 to S5) and receptors (R1 to R7) are provided in below Table 3.

Table 3: Summary of Potentially Complete Exposure Pathways

Source and COPC	Transport Pathway	Receptor	Risk Management Action
S1: Fill material of unknown origin used as part of site development and land reclamation process PAH, TRH, heavy metals, and asbestos S2: Former shipyard operation BTEX, PAH, TRH, heavy metals, PCB and asbestos	P1: Ingestion and dermal contact P2: Inhalation of dust and/or vapours	R1: Current users [commercial, recreational open space]; R2: Construction and maintenance workers; R3: End users [commercial and recreational open space].	An intrusive investigation is recommended to assess possible contamination. Based on results of investigation a remediation action plan (RAP) and acid sulfate soil management plan
	P2: Inhalation of dust and/or vapours	R4: Adjacent site users [commercial and recreational open space].	

Source and COPC	Transport Pathway	Receptor	Risk Management Action
S3: Former timber yard Operation BTEX, PAH, TRH, heavy metals, OCP and creosols S4: Former automobile garage and engineer's workshop BTEX, PAH, TRH, metals, VOC S5: Former shipping dock TBT	P3: Surface water run-off P5: Lateral migration of groundwater providing base flow to water bodies	R5: Surface water	(ASSMP) may be required. Further detailed investigations required within footprint of proposed excavations
	P4: Leaching of contaminants and vertical migration into groundwater	R6: Groundwater	
	P6: Inhalation. Ingestion and absorption	R7: Terrestrial ecosystems	

8. Sampling and Analysis Quality Plan

8.1 Data Quality Objectives

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

8.2 Soil Sampling Rationale

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

Borehole locations were primarily determined on the basis of site accessibility and geotechnical considerations. Soil samples were collected opportunistically from the geotechnical boreholes. Borehole locations are shown on Drawing 1, in Appendix A.

	Proposed Land bridge over Western Distributor
SS1 and SS2	Slip Street boreholes
CW4. CW6	Cockle Bay Wharf boreholes
CP1, CP2	Car park boreholes
WD1, WD2, WD3	Western distributor boreholes
	Site investigation and waste classicisation for soils which may be disturbed by works for foundations related to proposed land bridge.

	Proposed Commercial Tower
CW1, CW2, CW3	Boreholes within vicinity of proposed tower. Site investigation and waste classification within footprint of proposed tower
	Podium
CW5, CW7 W1, W2, W3, W4, W5	Cockle Bay Wharf boreholes Wharf (over water) boreholes CW5 within footprint of proposed in-ground fire water tank Site investigation and waste classification within footprint of proposed water tank Site investigation and waste classification within footprint of proposed fire tank and podium. Boreholes over the water were drilled primarily for waste classification and acid sulfate soil assessment purposes related to potential foundations. Assessment of sediment and potential remediation of the sediments within Cockle Bay was beyond the scope of this investigation (and would require a broader investigation of Cockle Bay beyond to the project boundaries).

Soil samples were collected from each borehole at regular intervals where sample recovery was achievable in conjunction with geotechnical sampling. It is noted that the ground conditions and sampling methods limited sample recovery in some instances.

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

8.3 Groundwater Sampling Rationale

In order to assess the current groundwater contamination status at the site and evaluate whether historical / current / off site land uses have impacted on groundwater, sampling from six monitoring wells was undertaken.

The locations were selected based on the following rationale:

- CW2 is located in the central portion of the site and will provide information of the groundwater conditions near the proposed Tower;
- CW3 is located in the central portion of the site and will provide information of the groundwater conditions near the proposed Tower;

- CW5 is located in the southern portion of the site and will provide information on the groundwater conditions at the southern end of the site and at the location of the proposed fire tank;
- CW6 is location in the northern portion of the site in the vicinity of the former auto mechanic and will provide information on the general water quality and potential contamination associated with the former mechanic;
- CP2 is located on the eastern site boundary and will provide information on the general water quality and groundwater quality near the upgradient site boundary; and
- SS2 is located in the north-eastern corner of the site and will provide information on the groundwater quality near the upgradient site boundary.

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

It is noted that no groundwater wells were installed in the W series boreholes as these are located over water and it was not practical to install groundwater wells in these locations. Moreover, groundwater well locations were limited to those that could be easily accessed for groundwater monitoring (i.e., did not require road closures, WD1 to WD3, etc.).

8.4 Gas Screening Rationale

In order to determine if a detailed ground gas assessment was required a preliminary ground gas assessment was undertaken from the groundwater wells installed at the site. Gas screening of VOC was undertaken using a PID and for landfill gases using and GA5000.

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

8.5 Acid Sulfate Soil Testing Rationale

Soil samples were selected from eleven boreholes for acid sulfate soil screening tests. Selected samples were submitted for chromium reducible sulphur suite based on the field observations and results of the field screening.

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 recreational / commercial land use scenario. The derivation of the SAC is included in Appendix E and the adopted SAC are listed on the summary analytical results tables in Appendix G.

10. Results

10.1 Field Work Results

10.1.1 Soils

The borehole logs for this assessment are included in Appendix F. Cross-sections showing the typical profile are presented on Drawings 2 to 5, Appendix A. The logs recorded the following general sub-surface profile:

FILL: Variably compacted road base, sands, gravelly sands, silty sands, clayey sands, sandy gravels, and sandy clay fill with building rubble (bricks, concrete fragments, timber, metal), sandstone gravel and cobbles.. In over-land borehole locations fill was typically encountered down to elevations between RL 1.3 m and RL -6.5 m AHD. In boreholes CW1 and W1, which were drilled through the suspended deck, fill was encountered from the 'seabed' to elevations of between RL -7 and RL -7.2 m AHD.

All locations had a hardstand at the surface, comprising pavers, asphalt or concrete. The suspended deck was typically 0.39 m thick.

ALLUVIAL / ESTUARINE SEDIMENTS: Generally comprising very soft to firm clays, silty clays and sandy clays interbedded with very loose to loose sands, silty sands and clayey sands, with some apparently discontinuous firm to stiff and medium dense to dense bands. Typically encountered down to elevations between RL -6.5 m and RL -18.2 m AHD. No natural soils were encountered in SS1 or SS2.

A thin layer of possible residual soil was encountered immediately above the sandstone bedrock in several locations, although the consistency of these soils was not dissimilar to the overlying sediments.

SANDSTONE BEDROCK: The top of sandstone bedrock was encountered between RL 1.3 m (near SS1 and SS2) and RL -18.2 m AHD (over the harbour). A relatively thin weathered profile, comprised of pale grey, brown and red-brown, very low to low strength and low to medium strength sandstone, up to a maximum thickness of about 4.8 m, was present at the top of the bedrock profile in boreholes W3, CW1, CW2, CW3, CW4 and CW5. Pale grey medium to high strength sandstone was encountered in all boreholes, at elevations ranging between RL 1.3 m and RL-20.9 m AHD.

In boreholes CW1 and CW2, a low to medium strength, predominantly siltstone band, about 0.6 m thick, was encountered at RL -27.6 m and RL -28.3 m respectively. In CW3, a similar low to medium and medium strength interbedded siltstone and sandstone band presented between about RL -25.9 m and RL -30 m, with another 0.2 m thick medium to high strength siltstone band at about RL -36.6 m.

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. Hydrogen sulphide odours were noted in the alluvial soils in some locations, particularly those where the boreholes were drilled over the harbour, which may be indicative of acid sulfate soil conditions.

Building demolition materials as described above were observed sporadically through the fill. Charcoal was observed in a number of locations. Trace ash was noted in borehole CW4.

The PID screening indicated that the sub-surface conditions were generally absent of VOC with all recorded values less than 5 ppm.

10.1.2 Groundwater

Groundwater levels were gauged on 2 or 3 September prior to sampling using an electronic oil / water interface meter. The measured water levels prior to sampling are shown in Table 4.

Table 4: Summary of Groundwater Level Measurements on 9 October 2021

Well ID	Location of Monitoring Well	Ground Level * m (AHD)	SWL m (bgl)	SWL m (AHD)
CW2	Centre of site	2.9	2.97	-0.07
CW3	Centre of Site	3.1	2.81	0.29
CW5	Southern Side	2.8	2.98	-0.18
CW6	Northern Side	3.0	2.89	0.11
CP2	Eastern (up-gradient)	2.5	4.39	-1.89
SS2	North-eastern (up-gradient)	3.5	3.55	-0.55

Notes:
*Surveyed by dGPS
AHD - Australian Height Datum
SWL - standing water level
bgl - below ground level

Based on the site location and level measurements, groundwater is generally expected to flow to the west towards Cockle Bay. The measured groundwater levels were typically at or close to sea level and are expected to be tidally influenced. In this regard the direction of groundwater may fluctuate with the tides, particularly in close proximity to the shoreline.

It is noted that groundwater levels are transient and may fluctuate over time in response to climatic variations, tides, and anthropogenic influences. It is expected that the groundwater level at this site will be closely related to the tidal water level in Darling Harbour.

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

Physical parameters were measured whilst sampling (where possible) and are summarised in Table 5.

Table 5: Summary of Field Parameters (Groundwater and Surface Water)

Well / Sample ID	Temp. (ºC)	DO (ppm)	Turbidity (ntu)	EC* (mS/cm)	pH	Redox (mV)
CW2	17.6	2.64	35	44.8	7.01	110
CW3	20.2	0.26	817	26.2	7.23	-170.9
CW5	17.9	0.77	2140	40.3	7.12	-47.7
CW6	19.3	0.68	3963	2.9	7.3	-133
CP2	19.7	1.04	680	22.0	6.51	-92.6
SS2	19.7	1.27	490	1.7	4.2	362

Notes:
*Calculated from TDS result

The dissolved oxygen levels indicated generally aerobic to anoxic conditions. The pH was slightly acidic. The electrical conductivity values are generally typical of brackish to saline water as would be expected of a tidally influence waters where mixing of sea water is occurring. Redox potential (Eh) generally indicates slightly reducing conditions.

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

A sulphuric odour was noted in CW3 and CP2

An unknown odour was noted in CW6 which corresponded to the slightly elevated PID reading (refer to Section 10.1.3). As mild hydrocarbon odour was noted in SS2.

10.1.3 Gas Screening

The results of the gas screening are presented in Table 6. The field records are presented in Appendix F. The results of the gas screening are discussed in Section 11.3.

Table 6: Gas Screening Results - Stabilised

Well ID	Date	Methane CH_4 %	Carbon Dioxide CO_2 %	Oxygen O_2 %	Hydrogen Sulphide H_2S ppm	Carbon Monoxide CO ppm	Flow (l/hr)	PID ppm
CW2	2/9/21	0	0.1	20.9	10	9	0.4	1.2
CW3	2/9/21	0	0.1	19.1	24	8	3.2	1.6
CW5	2/9/21	0	0.1	20.9	0	0	0.1	1.6
CW6	2/9/21	0	0.4	1.3	0	1	0.1	43.7
CP2	3/9/21	0	1.4	18.3	0	8	0	5.3
SS2	3/9/21	0	6.8	15.2	0	0	0.1	1.2

10.2 Laboratory Analytical Results

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

- Table 1: Summary of Results of Soil Analysis - Open Space Land Use;
- Table 2: Summary of Results of Soil Analysis - Commercial Land Use;
- Table 3: Summary of Results of Soil Analysis - Waste Classification;
- Table 4: Summary of Results of Acid Sulfate Soils; and
- Table 5: Summary of Results - Groundwater.

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

11. Discussion

11.1 Soils

The proposed development includes a combination of public open space and commercial properties. Therefore, the results have been compared to both the open space and commercial / industrial land use criteria.

BTEX, OCP, OPP, PCB VOC, and phenols were below the laboratory limits of reporting in all samples tested.

No asbestos was observed or reported by the laboratory analysis. However, given the presence of building demolition materials in the fill, such as concrete and bricks, it is considered that the risk of asbestos being present is high and consideration for the risk of asbestos should be adopted during planning and proposed soil management.

The majority of heavy metals, PAH and TRH were below the adopted SAC for both open space and commercial / industrial land use with the exception of those listed in Table 7.

Table 7: Soil Exceedance

Analyte	SAC	Sample ID	Concentration (mg/kg)	Comments
Open Space				
Copper	EIL 240 mg/kg	W3/10.75-11.2 W5/8.8-9.23 CW4/2.5-2.95 CW6/3.8-4.25	310 410 440 320	With the exception of copper and lead EIL exceedances at CW4, CW6, CP1 and WD1 all heavy metal and TRH exceedances were from boreholes drilled through the suspended decking of the wharf over the water. The proposed project may include new or reinforced foundations for the proposed podium structure that will sit over the water. With respect to the project area there is no direct exposure pathway to the alluvial soils below the suspended structure and therefore are not considered to warrant remediation in respect of the proposed development. Furthermore, remediation of the alluvial materials below the harbour is beyond the scope of the project and would be of little benefit in isolation to the rest of the harbour. The EIL exceedances at CW4 and CW6 are not considered significant due to the depth > 2m. With regards to HIL and EIL lead exceedances at CP1 these test locations are located below the proposed land bridge and were drilled primarily for geotechnical and waste classification purposes. Soil exceedances at the surface will not impact upon the proposed land bridge as there will be no direct exposure pathway from the surface soils to the land bridge. However, it
Lead	HIL 600 mg/kg and EIL 1100 mg/kg	W4/10 W1/8-8.45 CP1/1-1.1 CP1/2-2.1 WD1/1.9-2.0	1200 1600 3900 2500 1500	
Lead	HIL only 600 mg/kg	W3/10.75-11.2 W5/8.8-9.23	810 880	
Zinc	EIL 820 mg/kg	W3/10.75-11.2 W4/10 W5/11.5-11.95	1100 1000 1400	
TRH C6-C10	ESL 120 mg/kg	W3/10.75-11.2 W5/8.8-9.23	180 200	
TRH C16-C34	ESL 300 mg/kg	W4/10 W3/10.75-11.2 W5/8.8-9.23	310 3000 4900	
TRH C16-C34	ESL 300 mg/kg Management Limit 2500 mg/kg	W3/10.75-11.2 W5/8.8-9.23 WD1/0.4-0.5	3000 4900 4000	

Analyte	SAC	Sample ID	Concentration (mg/kg)	Comments
				would be recommended that the presence of elevated lead be noted in an environmental management plan. With regards to the lead exceedance at WD1, WD1 is part of the road reserve for the western distributor and therefore not considered a recreational open space. Therefore, the exceedance of the Open Space criteria is not considered significant. The ESL exceedance of TRH C16-C34 at WD1/0.4-0.5 is not considered significant as this test location is adjacent to the Western Distributor and exposure to ecological receptors would be limited.
Benzo (a) pyrene	ESL 0.7 mg/kg	CW4/0.9-1.0 CW6/0.5-0.6 BD1/20210633* W4/10 CW5/2.0 W1/10-10.43 W1/8.0-8.45 W3/10.75-11.2 W5/8.8-9.23	0.75 1.6 1.9 0.96 2.3 0.71 0.95 6.4 26.0	Not considered significant, see below
Benzo (a) pyrene TeQ	HIL 3 mg/kg	CW5/2.0 W3/10.75-11.2 W5/8.8-9.23	3.2 8.9 35	Material at CW5/2.0 will be excavated for the proposed fire tank. Moreover, the land use at CW5 would be considered commercial and therefore an exceedance of the open space criteria is not considered relevant W3 and W5 were collected from boreholes drilled through the wharf which is suspended over the water and the samples collected from the underlying harbour floor

Analyte	SAC	Sample ID	Concentration (mg/kg)	Comments
				Exposure to contaminants below the suspended deck of the wharf are not considered significant with regards to the proposed development and remediation of the harbour floor is outside the scope of the project

Analyte	SAC	Sample ID	Concentration (mg/kg)	Comments
Commercial / Industrial				
Copper	EIL 330 mg/kg	W5/8.8-9.23 CW4/2.5-2.95	410 440	With the exception of CW4 and CP1 all these samples were collected from boreholes drilled through the wharf which is suspended over the water and the samples collected from the underlying harbour floor. Given the depth from the surface (>2 m with the exception of CP1/1-1.1) or below the harbour exceedances of the EILs are not considered significant. Given the scope of the project and depth of the sample at W1 the risk to human health related to the lead HIL exceedance is considered insignificant to the proposed overland use. Remediation of the sediments and Cockle Bay is considered to be beyond the scope of the project. With regards to lead exceedances at CP1 this test location is located below a concrete slab and the proposed land bridge/western distributor and was drilled primarily for geotechnical and waste classification purposes. Soil exceedances at the surface will not impact upon the proposed land bridge as there will be no direct exposure pathway from the surface soils to the land bridge. However, it would be recommended that the presence of elevated lead be
Lead	HIL 1500 mg/kg	W1/8-8.45	1600	
Lead	HIL 1500 mg/kg & EIL 1800 mg/kg	CP1/1-1.1 CP1/2-2.1	3900 2500	
Zinc	EIL 1200 mg/kg	W5/8.8-9.23	1400	
TRH C6-C10	ESL 170 mg/kg	W3/10.75-11.2 W5/8.8-9.23	180 200	
TRH C16-C34	ESL 1700 mg/kg	W3/10.75-11.2 W5/8.8-9.23	3000 4900	
TRH C16-C34	ESL 1700 mg/kg Management Limit 3500 mg/kg	W5/8.8-9.23 WD1/0.4-0.5	4900 4000	

Analyte	SAC	Sample ID	Concentration (mg/kg)	Comments
Commercial / Industrial				
				noted in an environmental management plan. The ESL exceedance of TRH C16-C34 at WD1/0.4-0.5 is not considered significant as this test location is adjacent to the Western Distributor and exposure to ecological receptors would be limited.
Benzo(a)pyrene	ESL 1.4 mg/kg	CW6/0.5-0.6 BD1/20210633* CW5/2.0 W3/10.75-11.2 W5/8.8-9.23	1.6 1.9 2.3 6.4 26.0	Not considered significant, see below

* replicate of above sample

In the current investigation, nine samples had a concentration of B(a)P that exceeded the open space ESL of 0.7 mg/kg. It is noted that the B(a)P ESL is a low reliability value. Higher reliability screening levels have been published in CRC CARE *Risk-based Management and Remediation Guidance for Benzo(a)pyrene* (CRC CARE, 2017). The high reliability value of 33 mg/kg (or ranging from 21 mg/kg to 135 mg/kg) for fresh B(a)P suggests that the concentrations of B(a)P detected at the site are unlikely to pose an unacceptable risk to terrestrial ecology and therefore the exceedance(s) are not considered to be of concern. In regard to W5/8.8-9.23, which had a B(a)P concentration of 26 mg/kg the sample was collected from borehole through the deck of the wharf and was 8.8 m below the "surface level" of the decking and 2.05 m below the surface of the harbour floor. Therefore, the ESL are not considered applicable and as noted previously remediation of the harbour sediments is beyond the scope of the project.

Tributyl tin (TBT) was detected in boreholes drilled over the harbour (W1/8-8.45 - 3 µg/kg, W3/10.75-11.2 - 83 µg/kg and W5/11.5-11.95 - 85 µg/kg). It is likely that TBT is present sporadically within alluvial and fill materials along the shoreline. TBT was not detected in other locations in limited testing (eight samples collected from CW1, CW2, CW4, CW5, CP2, WD1 and WD3) and therefore it is considered likely that TBT impacts are limited to the near shore, however the extent of TBT impacts cannot be confirmed based on the limited analysis. Materials containing TBT must be handled in accordance with the Environmentally Hazardous Chemical Act 1985, Chemical Control Order in Relation to Organotin Waste. Further testing on materials during excavation or following demolition would be required to confirm if TBT is present.

Organic carbon was tested in five samples with results ranging from 6500 mg/kg to 61,000 mg/kg as follows:

- CW4/5.5-5.95 - 57,000 mg/kg;
- CW5/0.5-0.6 - 6500 mg/kg;
- CW5/5.45-5.5 - 33,000 mg/kg;
- W5/11.5-11.95 - 61,000 mg/kg; and
- CP2/2.4-2.5 - 10,000 mg/kg.

While remediation and preparation of a RAP in respect to soil contamination is not considered to warranted. It is recommended that as a minimum a soil management plan including an unexpected finds protocol be prepared to appropriately manage potential risk associated with the excavation and disturbance of soils at the site, particularly those below the suspended wharf. It is also noted that given the limited access within the centre of the proposed podium section (on fill) increases the uncertainty. It is also recommended that an environmental management plan be prepared to address the elevated lead in the vicinity of CP1.

Furthermore, given the preliminary nature of the investigation and limited number of boreholes it is recommended that further investigations be undertaken, particularly in the footprint of the proposed commercial tower and fire tank.

11.2 Groundwater

The results of VOC, BTEX, PAH, OPP, OCP, speciated phenols (including cresols) were all below the laboratory limits of reporting and SAC with the exception of:

- Chloroform in SS2 at a concentration of 2 µg/L. Within the SAC of 370 µg/L but above the limit of reporting; and
- Dieldrin (OCP) in SS2 at a concentration of 0.04 µg/L exceeding the 0.01 µg/L SAC (which is derived from the fresh water unknown reliability guideline.

It is noted that SS2 is located in the north-eastern corner of the site below the proposed land bridge and given its location on the upgradient site boundary may be derived from an up-gradient source. It is noted that chloroform and dieldrin were not detected in CW4 or CW6 suggesting the extent of such impacts are limited and do not extend to the proposed excavation zones and in that regard are unlikely to impact the dewatering of these features. Therefore, no action is required in regards to these detections.

TRH was detected in two locations CW5 and CW6 as follows:

- C_{10}-C_{16} (77 µg/L and 52 µg/L respectively);
- C_{16}-C_{34} (350 µg/L in CW6);
- F2-napthalene (77 µg/L and 52 µg/L respectively); and
- C_{15}-C_{28} (140 µg/L and 370 µg/L).

It is noted there is no SAC for the above TRH fractions and organic carbon was noted in soil and in the absence of volatile hydrocarbons or PAH in groundwater the above TRH detections are not considered likely to be related to petroleum hydrocarbons and therefore don't warrant remediation, however, may require consideration for dewatering and groundwater disposal.

Oil and grease was below the laboratory limits of reporting in all samples. Total suspended solids ranged from 0.41 mg/L to 44 mg/L.
The results of heavy metals testing were within the SAC with the exception of:

- Copper at 12 µg/L in SS2 which exceeded the 95% ANZG (2018) marine water guideline (MWG) 1.3 µg/L;
- Lead at 38 g/L in SS2 which exceeded the 95% ANZG (2018) marine water guideline (MWG) 4.4 µg/L;
- Nickel at 9 µg/L in CP2 (and 8 µg/L in its replicate BD1), 9 µg/L in CW3 and 33 µg/L in SS2 which exceeded the 99% ANZG (2018) marine water guideline (MWG) 7 µg/L. However, nickel is not considered a high risk bioaccumulation and therefore exceedance of the 99% MWG is not considered significant. Nickel was within the 95% MWG of 70 µg/L;
- Zinc at 13 µg/L and 15 µg/L at CW2 and 77 µg/L at SS2 which exceeded the 99% ANZG (2018) marine water guideline (MWG) 7 µg/L and the 95% MWG (15 µg/L) in SS2. Zinc is not considered a high risk for bioaccumulation and therefore exceedances of the 99% MWG are not considered significant; and
- Total iron at 38 mg/L at CP2, 5.6 mg/L at CW3, 3.5 mg/L at CW5, 5.8 mg/L at CW6 and 0.4 mg/L at SS2 exceeded the recreational water quality guideline (which has also been suggested in ANZG as an interim groundwater quality guideline in the absence of an alternative) of 0.3 mg/L. Iron is typically naturally present at similar concentrations in groundwaters of Hawkesbury Sandstone.

Based on our experience in the area, the concentrations of metals in groundwater are considered likely to be attributed to the background concentrations that would be associated uncontrolled fill within the harbour foreshore area and urban runoff. As stated above elevated iron levels are considered likely naturally occurring. Therefore, remediation of heavy metals in groundwater is not considered to be warranted, however will require consideration for dewatering and discharge purposes

Tributyl tin was below the limit of reporting in all samples indicating that groundwater is not impacted by TBT and indicating that the impacts of TBT in soil are likely limited to the near shore areas (as indicated in Section 11.1).

The two proposed excavation zones for the tower and fire tank will encounter groundwater and therefore a dewatering management plan will be required. The primary contaminants of concern in relation to the dewatering and disposal of groundwaters in these areas are heavy metals, TSS and low levels of TRH. There are a number of groundwater treatment methodologies suitable for these types of contaminants, typically a combination of filtration and settlement tanks and flocculants.

A supplementary round of groundwater monitoring could be undertaken to confirm or otherwise the presence of trace TRH in groundwater to determine if TRH contamination is present and requires consideration for dewatering management.

It is also noted that given the tidal nature of the area the groundwater conditions may be subject to change.

11.3 Gas Screening

Gas screening was performed using a PID and GA5000 gas meter at the six groundwater monitoring wells CW2, CW3, CW5, CW6, SS2 and CP2.

No methane was detected during the gas screening. Therefore, it is considered that further assessment of bulk gases (landfill gases) is not warranted at this stage. It is noted that carbon monoxide was detected at a maximum concentration 8 ppm and carbon dioxide at a maximum concentration of 6.8% however this is not uncommon where biological activity is occurring in alluvial soils and organic carbon is present. Hydrogen sulphide was detected in CW2 and CW3 which is considered likely related to potential acid sulfate soils. Oxygen was depleted at CW6 which may be the result of biological activity (respiration of aerobic organisms)

The PID results were less than 2 ppm at CW2 and CW3 were low which indicates a low risk of vapour intrusion into the proposed commercial building. Similarly, the PID at CW5 was less than 2 ppm indicating a low risk of vapour intrusion for the proposed fire tank. SS2 in the north-eastern corner of the site was also less than 2 ppm.

Slightly elevated PID readings were detected at CW6 (43.7 ppm) and CP2 (5.3 ppm). These results indicate a potential source of volatile contaminants such as petroleum hydrocarbons in these two locations. An unknown “nasal burning odour” was noted during groundwater and gas screening at CW6 which may contributed to the elevated PID reading.

As noted in Section 11.2 volatile contaminants were not detected in groundwater in these two locations although TRH hydrocarbons greater than C_{10} were detected in CW6 (and CW5) groundwater samples, however heavy end TRH fractions are not typically associated with vapour intrusion risks. Therefore, it is considered unlikely that the elevated PID readings are the result of the presence of volatile contaminants in these locations that represent a vapour intrusion risk.

It is also noted that CP2 is located on the eastern site boundary and CW6 is located in the northern portion of the site adjacent to the Western Distributor and both were drilled primarily for the purpose of designing the proposed land bridge. The proposed development does not include any new building structures in these locations. As the land bridge will be suspended over the western distributor vapour intrusion risks to this element of the project are not considered to be relevant. If new buildings are proposed in the vicinity of these boreholes, then further vapour assessment may be warranted.

Therefore, at this stage, it is considered, that further detailed soil gas investigations are not warranted however it may be prudent to conduct a grab sample Suma Canister to be tested for VOC and TRH to attempt to better identify the unknown odour at CW6 and rule out the presence of VOC and TRH. If hydrocarbon impacted materials are encountered during recommended additional investigations, then targeted soil investigations may be warranted.

11.4 Acid Sulfate Soils

The preliminary acid sulfate soil investigation including performing field screening for field and oxidised pH which are presented in Table 4, Appendix G. The field screening results generally did not indicate a high probability of potential acid sulfate soils (PASS) however it is considered possible that the presence of concrete in the fill, and shells in the fill and alluvial soils may have resulted in false negative results in the field screening.

Therefore, nine samples (two fill and seven from the alluvial soils) were subject to laboratory analysis for the chromium reducible suite. The results were compared to the action criteria in Sullivan et al (2018). An action criteria of 0.03% S was adopted on the basis that that material included coarse material and greater than 1000 tonnes of material is expected to be disturbed.

The net acidity of all seven samples tested exceeded the action criteria of 0.03% S as below:

- CP2/1.9-2.0 (fill soil) - 0.09 % S;
- CP2/2.9-3.0 (alluvial) - 0.05 % S;
- CW1/13-13.45 (alluvial) - 0.12 % S;
- CW2/9-9.15 (alluvial) - 2.1 % S;
- CW5/5.5-9.5 (alluvial) - 1.4 % S;
- W3/11.5-11.95 (alluvial) - 0.74% S;
- W3/14.5-14.95 (alluvial) - 0.04 % S; and
- WD1/1.9-2.0 (fill) - .0.074 % S.

Based on the results a preliminary liming rate was provided in the laboratory certificate ranged between 1 kg and 100 kg aglime per tonne.

Therefore, it is considered that both the fill material and the alluvial soils are potential acid sulfate soils (PASS) and require management and the preparation of an acid sulfate soil management plan (ASSMP). It is considered possible that some of the fill materials above the water table are potentially not PASS, however at this stage it should be assumed that all the fill is PASS.

It is recommended that, post demolition, additional high resolution investigations be undertaken within the proposed excavation zones (the commercial tower and proposed fire water tank) with a high density of laboratory tests (vertically and horizontally) to assess the lateral and vertical extent and nature of acid sulfate soils. Alternatively further testing can be undertaken ex situ as materials are excavated. The recommended scope of this testing should form part of the ASSMP.

11.5 Preliminary In Situ Waste Classification

The following Table 8 presents the results of the six step procedure outlined in NSW EPA (2014) for determining the type of waste and the waste classification. This process applies to the fill (including surface soils) at the site, which do not meet the definition of VENM.

Table 8: Six Step Classification Procedure

Step	Comments	Rationale
1. Is the waste special waste?	No	No asbestos-containing materials (ACM), clinical or related waste, or waste tyres were observed in the boreholes; and Asbestos was not detected by the analytical laboratory.
2. Is the waste liquid waste?	No	The fill comprised a soil matrix.
3. Is the waste "pre-classified"?	No	The fill is not pre-classified with reference to NSW EPA (2014). The natural material, if classified as VENM, is pre-classified as General Solid Waste (non-putrescible).
4. Does the waste possess hazardous waste characteristics?	No	The fill was not observed to contain or considered at risk to contain explosives, gases, flammable solids, oxidising agents, organic peroxides, toxic substances, corrosive substances, coal tar, batteries, lead paint or dangerous goods containers.
5. Determining a wastes classification using chemical assessment	Conducted	Refer to Table 3, Appendix G (attached).
6. Is the waste putrescible or non-putrescible?	Putrescible / Non-putrescible	The fill does not contain materials considered to be putrescible [a].

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

As shown in the attached Table 3, Appendix G, all contaminant concentrations were within the criteria for General Solid Waste as defined in NSW EPA (2014) with exception of:

- Sample W1/8-8.45 which had a total lead concentration of 1600 mg/kg exceeding the SCC1 criterion for general solid waste;
- Sample W5 / 8.8-9.23 which was logged as natural clay and had a benzo(a)pyrene concentration of 26 mg/kg and total PAH concentration of 240 mg/kg which exceeds the SCC2 criterion for restricted solid waste; and
- Sample CP1/1-1.1 which had a total lead concentration of 3900 mg/kg and TCLP concentration of 11 mg/L exceeding SCC1 and TCLP1 criteria for general solid waste lead respectively and CP1/2-2.1 which had a total lead concentration of 2500 mg/kg exceeding the SCC1 criterion for general solid waste.

Table 9: Waste Classification Summary

Item	Description
Based on the observations at the time of sampling and the reported analytical results, the fill described as:	Refer to Section 10.1.1
Within the area subject to classification, **excluding materials below the waterline in the vicinity of W1 and W5 and fill material in the vicinity of CP1** as shown on Drawing 1, is classified as:	General Solid Waste (non-putrescible), PASS
Within the vicinity of W1 and CP1 as shown on Drawing 1, is classified as:	Restricted Solid Waste, PASS
Within the vicinity of W5, **excluding materials above the concrete wharf decking** as shown on Drawing 1, is classified as:	Hazardous Waste, PASS
Subject to appropriate management and neutralisation acid sulfate soils in accordance with an approved acid sulfate soil management plan.	

It is recommended that if materials are disturbed and excavated from the vicinity of W1 or W5 that additional ex situ waste classification be undertaken to confirm the classification of this material. Similarly, it is recommended that further waste classification be undertaken in the vicinity of borehole CP1 if materials are excavated from this location for disposal.

It is noted that asbestos was not detected or observed during the investigation. However, given the presence of building demolition materials such as concrete and bricks it is considered that the risk of asbestos being present is high and consideration for the risk of asbestos should be adopted during planning of the proposed soil management.

The following Table 10 presents the results of the assessment of natural alluvial soils at the site with reference to the VENM definition in the POEO Act and the EPA[2] website. The assessment does not extend to the underlying bedrock.

Table 10: VENM Classification Procedure

Item	Comments	Rationale
1. Is the material natural?	Yes	Natural materials logged in the boreholes as alluvial soils, refer to Section 10.1.1 and the attached borehole logs. These materials underlie the fill at the site.
2. Is the material impacted by manufactured chemicals or process residues?	Yes	Tributyl tin was detected in boreholes drilled over the harbour (W1/8-8.45 - 3 µg/kg, W3/10.75-11.2 p 83 µg/kg and W5/11.5-11.95 - 85 µg/kg). PAH were detected in the natural material in a number of locations. Sample W5 / 8.8-9.23 which was logged as natural clay and had a benzo(a)pyrene concentration of 26 mg/kg and total PAH concentration of 240 mg/kg.

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

Item	Comments	Rationale
3. Are the materials acid sulfate soils?	Yes	Refer to Section 11.4
4. Are there current or previous land uses that have (or may have) contaminated the materials?	No	Previous land uses may have impacted on surface soils overlying the materials.

Table 11: Waste Classification Summary

Item	Description
Based on the outcomes presented in Table 6, the natural soils described as:	Refer to Section 10.1.1
Within the area subject to classification, **excluding materials below the waterline in the vicinity of W5** as shown on Drawing 1, is classified as:	General Solid Waste (non-putrescible), PASS
Within the vicinity of W5, **excluding materials above the concrete wharf decking** as shown on Drawing 1, is classified as:	Hazardous Waste, PASS
Materials containing tributyl tin must be handled in accordance with the Environmentally Hazardous Chemical Act 1985, Chemical Control Order in Relation to Organotin Waste. Previous correspondence with the NSW EPA has indicated the chemical control order is intended for application for highly contaminated organotin waste scrapings from ships and similar and is not typically applied to low levels in contaminated soils. However further testing of the material upon excavation would be required and, specific advice obtained from the NSW EPA upon receipt of the results to determine if the order need apply.	
Subject to appropriate management and naturalisation acid sulfate soils in accordance with an approved acid sulfate soil management plan.	

It is possible that bedrock, if properly segregated from the overlying alluvial material and fill could be assessed separately ex situ to determine if the material can be classified as VENM.

It is possible that the alluvial soils could be classified as VENM, PASS. However further assessment, particularly to confirm that the alluvial soil was not impacted by TBT, heavy metals and PAH from the overlying fill would be required either via additional boreholes and / or via validation testing during excavation. Segregation of materials during bulk excavation for the tower and / or fire tank may be possible, although is unlikely where materials are excavated for foundations (piles).

This classification is preliminary in nature based on a limited dataset and is not intended for off-site disposal. Further *ex situ* classification will be required to confirm the classification during excavation of the material.

11.6 Data Quality Assurance and Quality Control

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

12. Conclusions and Recommendations

Based on the results of the investigation it is considered that the site can be made suitable for the proposed open space and commercial development subject to implementation of the recommendations below:

- Further detailed investigations should be undertaken within the proposed commercial tower and fire tank footprints following demolition of the overlying structures to confirm the contamination status of these materials;
- Further waste classification assessment should be undertaken. In particular the focus should be on areas where excavation is proposed (the commercial tower and fire water tank). Further ex situ waste classification is also recommended during development to confirm preliminary *in situ* classifications. As noted previously, based on the presence of building wastes in the fill the potential for asbestos contamination in the fill is considered to be high;
- Additional high resolution acid sulfate soil investigations are recommended to be undertaken within the proposed excavation zones following demolition of the overlying structures (the commercial tower and proposed fire water tank) with a high density (vertically and horizontally) of laboratory tests to assess the lateral and vertical extent and nature of acid sulfate soils. Alternatively further testing can be undertaken *ex situ* as materials are excavated;
- Outside of the proposed excavation zones, following the demolition of any structures at the site a asbestos clearance should be undertaken by a licenced asbestos assessor and further contamination assessment (soil and groundwater) be undertaken within those footprints which were inaccessible during the current preliminary investigation;
- A destructive hazardous building material (hazmat) assessment should be undertaken prior to demolition on all structures proposed for demolition;
- Preparation of a soil management plan including an unexpected finds protocol to provide procedures to limit the impacts of disturbing soils around the harbour foreshore and manage unexpected contaminant finds such as asbestos;
- Preparation of an environmental management plan to manage lead impacted soils below the concrete pavement in the vicinity of borehole CP1;
- An acid sulfate soil management plan should be prepared. The ASSMP should provide the proposed scope of the recommended high resolution acid sulfate soil assessment and the methodology to manage acid sulfate soils present at the site;

- Groundwater will be encountered during the excavation works for the proposed tower and fire tank. Therefore, a dewatering management plan should be prepared. Based on the results of the preliminary groundwater assessment the primary contaminants identified in groundwater were heavy metals and TSS. There are a number of treatment methods for heavy metals and TSS, most commonly the use of filtration and flocculant based systems. A supplementary round of groundwater testing should be conducted to confirm the presence (or otherwise) of TRH in some locations (and potential impact on dewatering management) and potential tidal influence variability in groundwater condition;
- It is recommended that if materials are disturbed and excavated from the vicinity of W1, W5 and / or CP1 that additional ex situ waste classification be undertaken to confirm the classification of this material which was provisionally classified as hazardous waste or restricted waste following excavation; and
- If building structures are proposed in the vicinity of CW6 or CP2 where elevated PID readings were detected during gas screening than further soil vapour assessment may be warranted. It would be considered prudent to collect a soil gas grab sample from CW6 for VOC and TRH analysis. If hydrocarbon contaminated soils and / or groundwater are encountered during further investigations or if elevated VOC or TRH are detected in the recommended grab sample from CW6 additional soil vapour assessment may be warranted.

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.

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

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

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

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

14. Limitations

Douglas Partners (DP) has prepared this report for this project at 241-249 Wheat Road, Sydney in accordance with DP's proposal 200099.P.001.Rev1 dated 11 November 2020 and acceptance received from DPT Operator Pty Ltd. The work was carried out under the CBP Professional Services Agreement (513963472.3). This report is provided for the exclusive use of DPT Operator 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 this investigation. The accuracy of the advice provided by DP in this report may be affected by undetected variations in ground conditions across the site between and beyond the sampling and/or testing locations. The advice may also be limited by budget constraints imposed by others or by site accessibility.

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

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

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

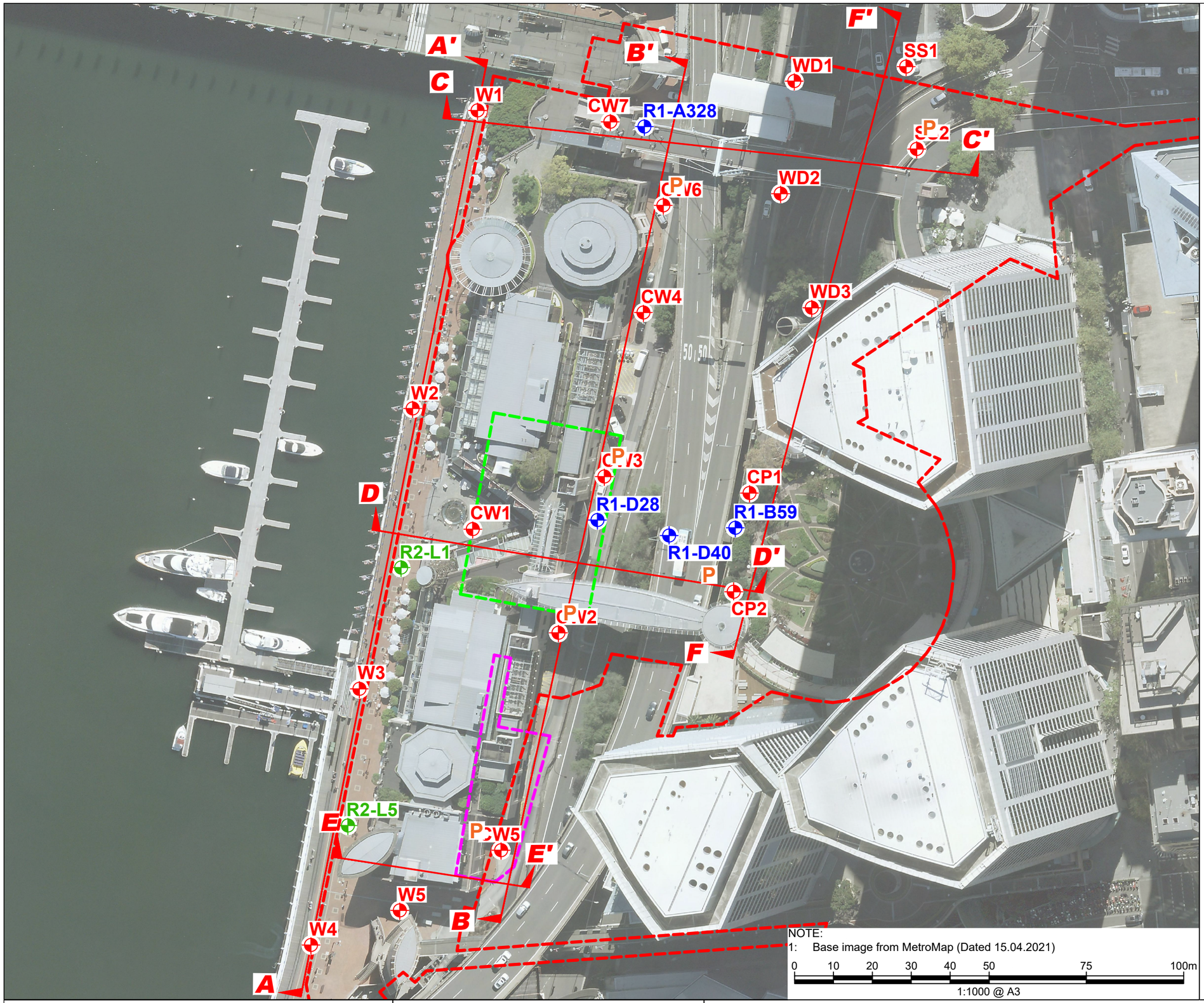
Asbestos has not been detected by observation or by laboratory analysis, either on the surface of the site, or in filling materials at the test locations sampled and analysed. Building demolition materials, such as concrete, brick, tile were, however, located in filling and these are considered as indicative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

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

Douglas Partners Pty Ltd

Appendix A

Drawings





Locality Plan

NOTE:
1: Base image from MetroMap (Dated 15.04.2021)

0 10 20 30 40 50 75 100m
1:1000 @ A3

LEGEND

- Approximate Proposed Development Outline
- Approximate Tower Outline
- Approximate Proposed Bulk Excavation Outline
- Borehole Location, Current Investigation
- Borehole Location, Coffey, 1971
- Borehole Location, Coffey, 1985
- P Standpipe Piezometer
- Geological Cross Section

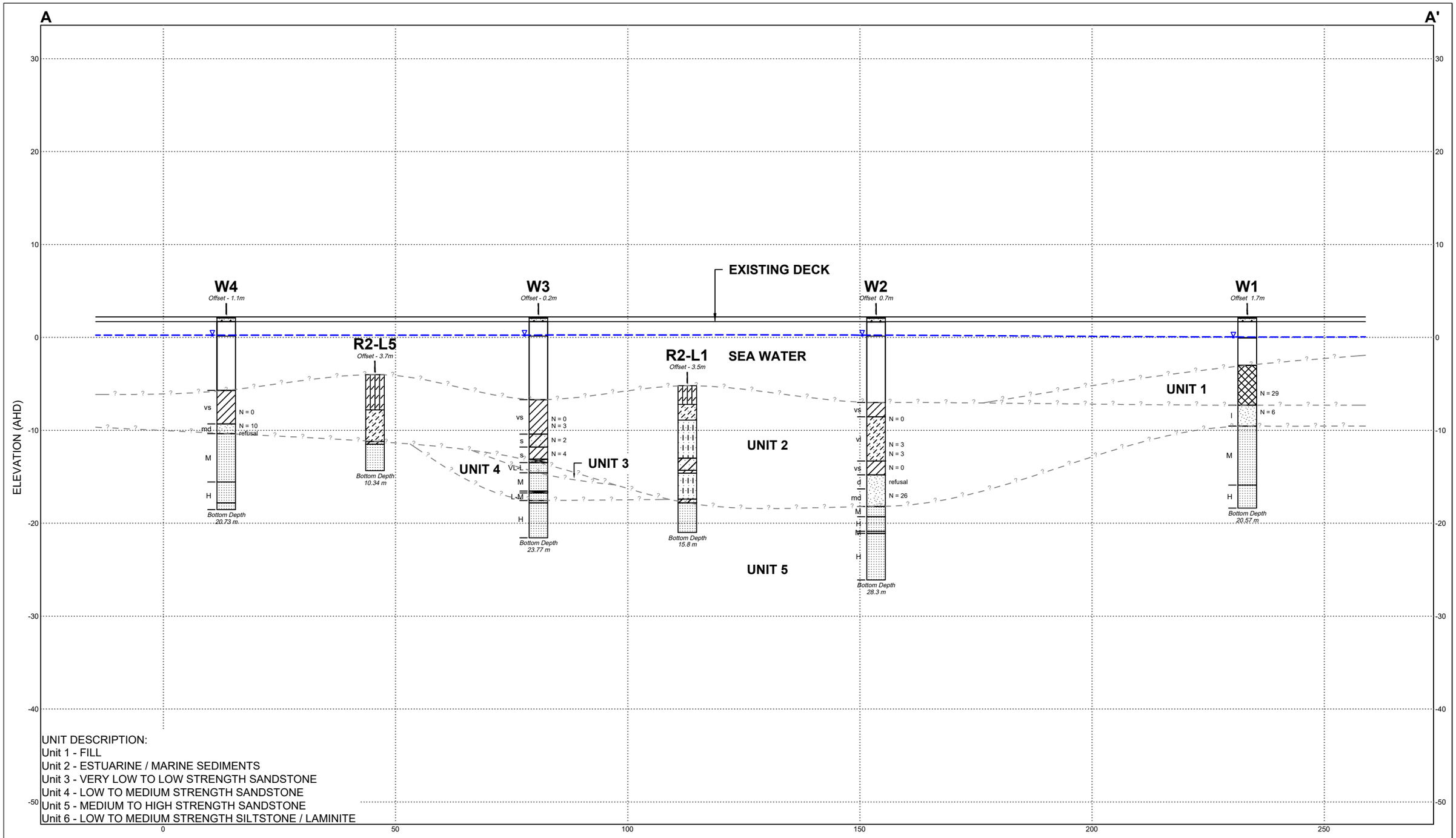
Douglas Partners
Geotechnics / Environment / Groundwater

CLIENT: DPT Operator Pty Ltd	
OFFICE: Sydney	DRAWN BY: MG
SCALE: 1:1000 @ A3	DATE: 12.10.2021

TITLE: **Test Location Plan**
Cockle Bay Park Redevelopment
241-249 Wheat Road, Sydney

N

PROJECT No:	202546.00
DRAWING No:	1
REVISION:	2



UNIT DESCRIPTION:
Unit 1 - FILL
Unit 2 - ESTUARINE / MARINE SEDIMENTS
Unit 3 - VERY LOW TO LOW STRENGTH SANDSTONE
Unit 4 - LOW TO MEDIUM STRENGTH SANDSTONE
Unit 5 - MEDIUM TO HIGH STRENGTH SANDSTONE
Unit 6 - LOW TO MEDIUM STRENGTH SILTSTONE / LAMINITE

LEGEND

Core Loss	Concrete	Sand
Clay	Blank Lithology (with border)	Sandstone
Clayey Sand	Filling	Sandy Clay
Clayey Silt	Pavers	Silty Sand

NOTES:
1. Subsurface conditions are accurate at the borehole locations only. Variations in subsurface conditions may occur between borehole locations. Interpreted strata boundaries are approximate and should be used as a guide only.
2. Summary logs only and should be read in conjunction with detailed logs.
3. Horizontal and vertical scales are not equal.

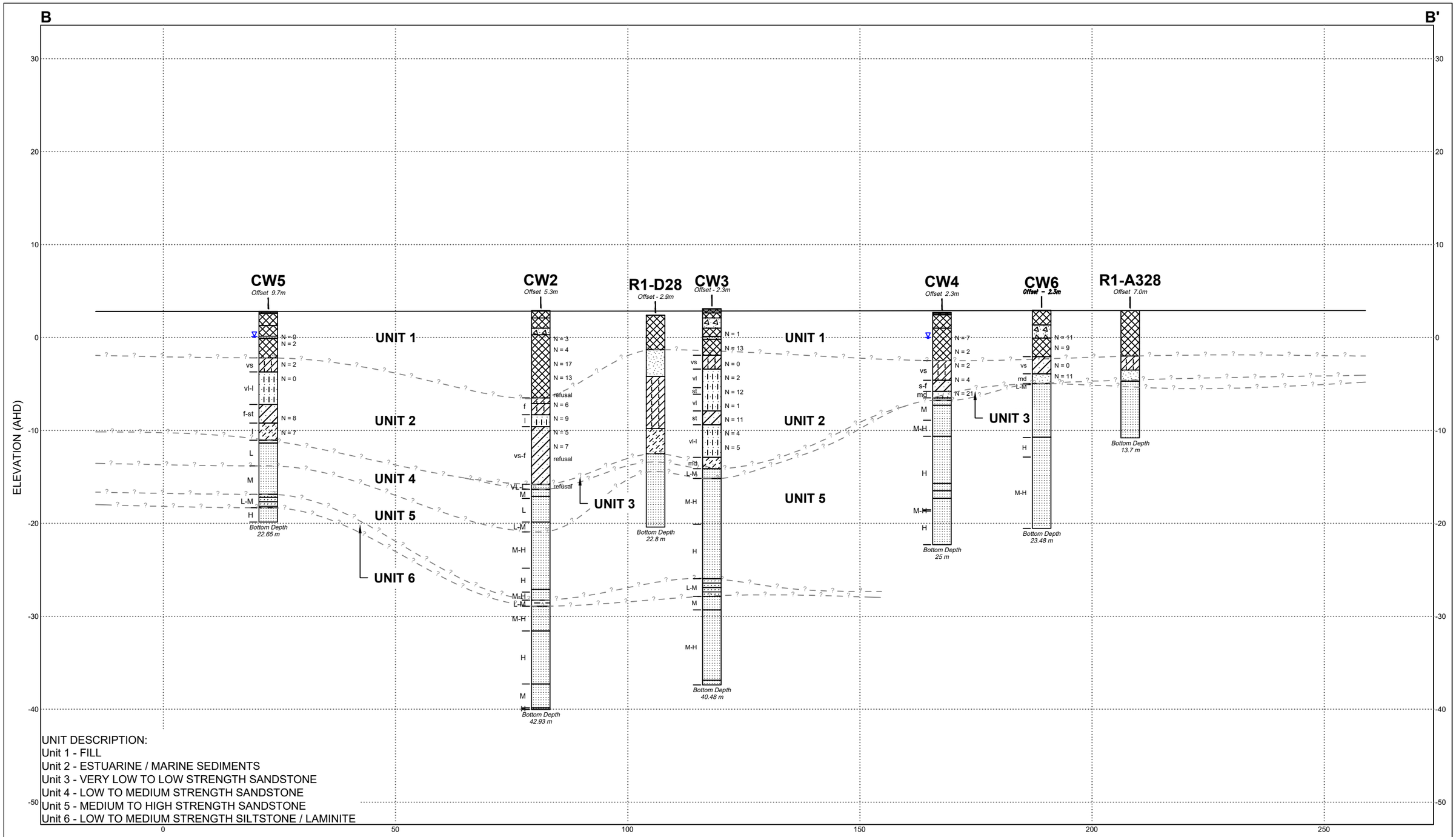
ROCK STRENGTH	SOIL CONSISTENCY	SOIL DENSITY
EL - Extremely Low	vs - Very Soft	vl - Very Loose
VL - Very Low	s - Soft	l - Loose
L - Low	f - Firm	md - Medium Dense
M - Medium	st - Stiff	d - Dense
H - High	vst - Very Stiff	vd - Very Dense
VH - Very High	h - Hard	

TESTS / OTHER
N - Standard penetration test value
— ? — — - Interpreted geotechnical boundary
▽ - Water level

0 16
Horizontal Scale (metres)
Vertical Exaggeration = 2.0

Douglas Partners
Geotechnics / Environment / Groundwater

CLIENT: DPT Operator Pty Ltd		TITLE: **Cross-Section A-A'**	PROJECT No: 202546.00
OFFICE: Sydney	DRAWN BY: MG	**Cockle Bay Park Redevelopment**	DRAWING No: 2
SCALE: 1:800 (H) 1:400 (V) @ A3	DATE: 03.08.2021	**241-249 Wheat Road, Sydney**	REVISION: 0



UNIT DESCRIPTION:
Unit 1 - FILL
Unit 2 - ESTUARINE / MARINE SEDIMENTS
Unit 3 - VERY LOW TO LOW STRENGTH SANDSTONE
Unit 4 - LOW TO MEDIUM STRENGTH SANDSTONE
Unit 5 - MEDIUM TO HIGH STRENGTH SANDSTONE
Unit 6 - LOW TO MEDIUM STRENGTH SILTSTONE / LAMINITE

LEGEND

- Asphaltic Concrete
- Filling
- Concrete
- Silty Clay
- Silty Sand
- Sandy Clay
- Sandstone
- Siltstone
- Blank Lithology (with border)
- Clayey Sand
- Laminite
- Sand

NOTES:
1. Subsurface conditions are accurate at the borehole locations only. Variations in subsurface conditions may occur between borehole locations. Interpreted strata boundaries are approximate and should be used as a guide only.
2. Summary logs only and should be read in conjunction with detailed logs.
3. Horizontal and vertical scales are not equal.

ROCK STRENGTH		SOIL CONSISTENCY		SOIL DENSITY	
EL -	Extremely Low	vs -	Very Soft	vl -	Very Loose
VL -	Very Low	s -	Soft	l -	Loose
L -	Low	f -	Firm	md -	Medium Dense
M -	Medium	st -	Stiff	d -	Dense
H -	High	vst -	Very Stiff	vd -	Very Dense
VH -	Very High	h -	Hard		

TESTS / OTHER
- N - Standard penetration test value
- Interpreted geotechnical boundary
- Water level

0 16
Horizontal Scale (metres)
Vertical Exaggeration = 2.0

Douglas Partners
Geotechnics / Environment / Groundwater

CLIENT: DPT Operator Pty Ltd		PROJECT No: 202546.00
OFFICE: Sydney	DRAWN BY: MG	DRAWING No: 3
SCALE: 1:800 (H) 1:400 (V) @ A3	DATE: 09.09.2021	REVISION: 1

TITLE: **Cross-Section B-B'**
Cockle Bay Park Redevelopment
241-249 Wheat Road, Sydney

C

C'

EXISTING DECK

APPROXIMATE LOCATION OF EXISTING SHEET PILE WALL - TOE DEPTH UNKNOWN

SEA WATER

UNIT 1

UNIT 2

UNIT 3

UNIT 5

W1
Offset 4.3m
N = 29
N = 6
M
H
Bottom Depth 20.57 m

CW7
Offset 3.9m
N = 4
N = 4
N = 0
vs
L-M
M
M-H
Bottom Depth 16.79 m

R1-A328
Offset 3.9m
refusal
Bottom Depth 13.7 m

SS2
Offset 9.6m
M
VL
H
M-H
H
refusal
Bottom Depth 17.8 m

ELEVATION (AHD)

30 20 10 0 -10 -20 -30 -40 -50

-50 0 50 100 150 200

DISTANCE ALONG PROFILE (m)

UNIT DESCRIPTION:
Unit 1 - FILL
Unit 2 - ESTUARINE / MARINE SEDIMENTS
Unit 3 - VERY LOW TO LOW STRENGTH SANDSTONE
Unit 4 - LOW TO MEDIUM STRENGTH SANDSTONE
Unit 5 - MEDIUM TO HIGH STRENGTH SANDSTONE
Unit 6 - LOW TO MEDIUM STRENGTH SILTSTONE / LAMINITE

LEGEND

- Filling
- Silty Clay
- Sand
- Sandstone
- Pavers
- Concrete
- Blank Lithology (with border)

NOTES:
1. Subsurface conditions are accurate at the borehole locations only. Variations in subsurface conditions may occur between borehole locations. Interpreted strata boundaries are approximate and should be used as a guide only.
2. Summary logs only and should be read in conjunction with detailed logs.
3. Horizontal and vertical scales are not equal.

ROCK STRENGTH		SOIL CONSISTENCY		SOIL DENSITY	
EL	Extremely Low	vs	Very Soft	vl	Very Loose
VL	Very Low	s	Soft	l	Loose
L	Low	f	Firm	md	Medium Dense
M	Medium	st	Stiff	d	Dense
H	High	vst	Very Stiff	vd	Very Dense
VH	Very High	h	Hard		

TESTS / OTHER
- N - Standard penetration test value
- — ? — — - Interpreted geotechnical boundary
- ▽ - Water level

0 16
Horizontal Scale (metres)

Vertical Exaggeration = 2.0

Douglas Partners
Geotechnics / Environment / Groundwater

CLIENT: DPT Operator Pty Ltd		TITLE: **Cross-Section C-C'**	PROJECT No: 202546.00
OFFICE: Sydney	DRAWN BY: MG	**Cockle Bay Park Redevelopment**	DRAWING No: 4
SCALE: 1:800 (H) 1:400 (V) @ A3	DATE: 09.09.2021	**241-249 Wheat Road, Sydney**	REVISION: 1

D

D'

ELEVATION (AHD)

EXISTING DECK

APPROXIMATE LOCATION OF EXISTING SHEET PILE WALL - TOE DEPTH UNKNOWN

SEA WATER

UNIT 1

UNIT 2

UNIT 3

UNIT 4

UNIT 5

UNIT 6

CW1 Offset 7.2m

CW2 Offset - 13.0m

R1-D28 Offset 11.2m

R1-D40 Offset 10.2m

CP2 Offset - 1.0m

R2-L1 Offset - 8.7m

Bottom Depth 15.8 m

Bottom Depth 22.8 m

Bottom Depth 20.7 m

Bottom Depth 18.55 m

Bottom Depth 42.93 m

Bottom Depth 45 m

DISTANCE ALONG PROFILE (m)

UNIT DESCRIPTION:
Unit 1 - FILL
Unit 2 - ESTUARINE / MARINE SEDIMENTS
Unit 3 - VERY LOW TO LOW STRENGTH SANDSTONE
Unit 4 - LOW TO MEDIUM STRENGTH SANDSTONE
Unit 5 - MEDIUM TO HIGH STRENGTH SANDSTONE
Unit 6 - LOW TO MEDIUM STRENGTH SILTSTONE / LAMINITE

LEGEND

Core Loss
Asphaltic Concrete
Clay
Clayey Sand
Clayey Silt
Concrete
Blank Lithology (with border)
Filling
Sand
Sandstone
Sandy Clay
Siltstone
Silty Clay
Silty Sand

NOTES:
1. Subsurface conditions are accurate at the borehole locations only. Variations in subsurface conditions may occur between borehole locations. Interpreted strata boundaries are approximate and should be used as a guide only.
2. Summary logs only and should be read in conjunction with detailed logs.
3. Horizontal and vertical scales are not equal.

ROCK STRENGTH
EL - Extremely Low
VL - Very Low
L - Low
M - Medium
H - High
VH - Very High

SOIL CONSISTENCY
vs - Very Soft
s - Soft
f - Firm
st - Stiff
vst - Very Stiff
h - Hard

SOIL DENSITY
vl - Very Loose
l - Loose
md - Medium Dense
d - Dense
vd - Very Dense

TESTS / OTHER
N - Standard penetration test value
- Interpreted geotechnical boundary
- Water level

Horizontal Scale (metres) 0 16

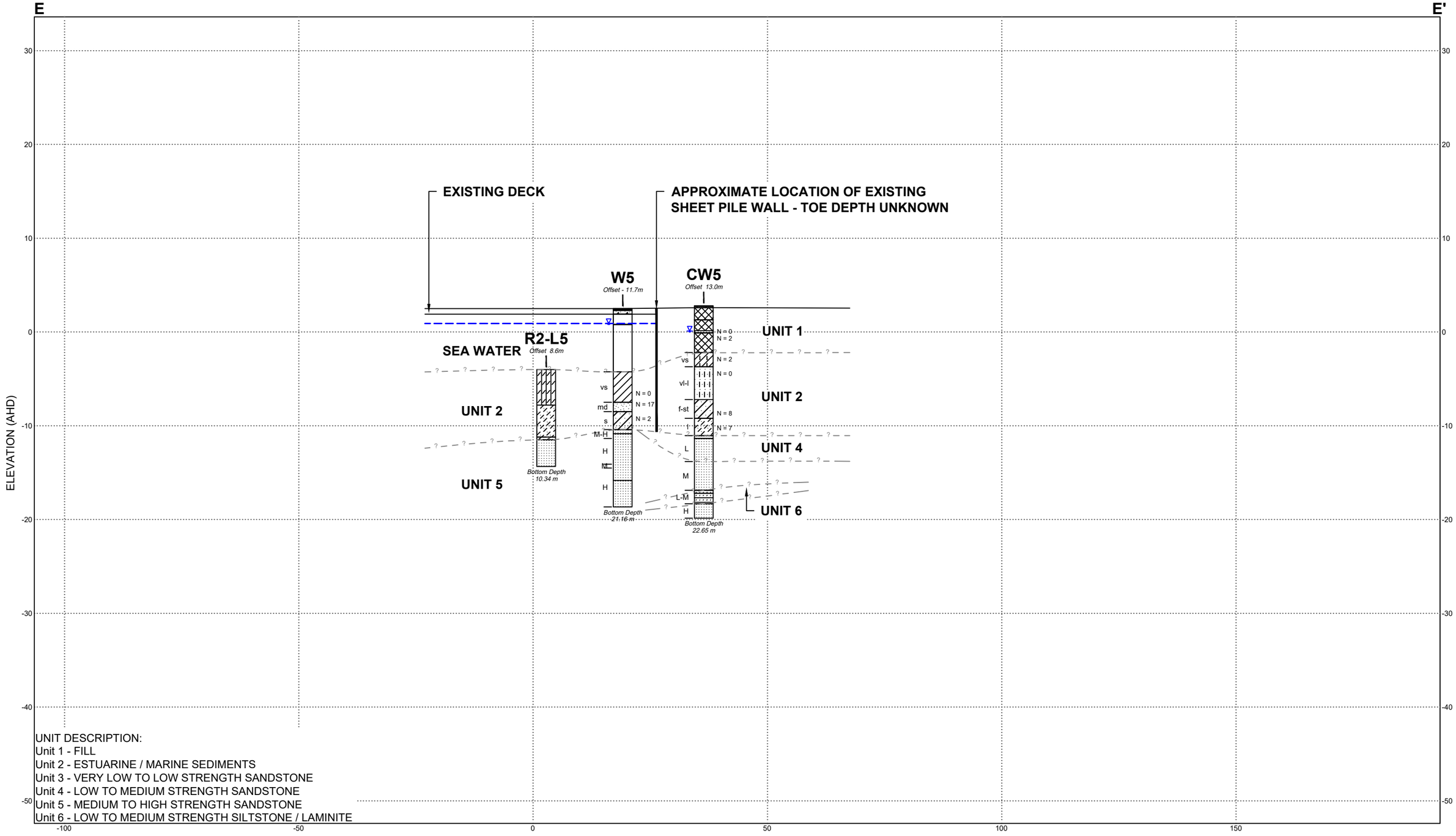
Vertical Exaggeration = 2.0

Douglas Partners
Geotechnics / Environment / Groundwater

CLIENT: DPT Operator Pty Ltd		TITLE: **Cross-Section D-D'**	PROJECT No: 202546.00
OFFICE: Sydney	DRAWN BY: MG	**Cockle Bay Park Redevelopment**	DRAWING No: 5
SCALE: 1:800 (H) 1:400 (V) @ A3	DATE: 09.09.2021	**241-249 Wheat Road, Sydney**	REVISION: 1

E

E'



UNIT DESCRIPTION:
Unit 1 - FILL
Unit 2 - ESTUARINE / MARINE SEDIMENTS
Unit 3 - VERY LOW TO LOW STRENGTH SANDSTONE
Unit 4 - LOW TO MEDIUM STRENGTH SANDSTONE
Unit 5 - MEDIUM TO HIGH STRENGTH SANDSTONE
Unit 6 - LOW TO MEDIUM STRENGTH SILTSTONE / LAMINITE

DISTANCE ALONG PROFILE (m)

LEGEND

- Asphaltic Concrete
- Concrete
- Filling
- Blank Lithology (with border)
- Silty Clay
- Silty Sand
- Sandy Clay
- Clayey Sand
- Sandstone
- Laminite
- Clayey Silt
- Pavers
- Clay
- Sand

NOTES:
1. Subsurface conditions are accurate at the borehole locations only. Variations in subsurface conditions may occur between borehole locations. Interpreted strata boundaries are approximate and should be used as a guide only.
2. Summary logs only and should be read in conjunction with detailed logs.
3. Horizontal and vertical scales are not equal.

ROCK STRENGTH
EL - Extremely Low
VL - Very Low
L - Low
M - Medium
H - High
VH - Very High

SOIL CONSISTENCY
vs - Very Soft
s - Soft
f - Firm
st - Stiff
vst - Very Stiff
h - Hard

SOIL DENSITY
vl - Very Loose
l - Loose
md - Medium Dense
d - Dense
vd - Very Dense

TESTS / OTHER
N - Standard penetration test value
— ? — — - Interpreted geotechnical boundary
▽ - Water level

Horizontal Scale (metres) 0 16
Vertical Exaggeration = 2.0

Douglas Partners
Geotechnics / Environment / Groundwater

CLIENT: DPT Operator Pty Ltd		TITLE: **Cross-Section E-E'**	PROJECT No: 202546.00
OFFICE: Sydney	DRAWN BY: MG	**Cockle Bay Park Redevelopment**	DRAWING No: 6
SCALE: 1:800 (H) 1:400 (V) @ A3	DATE: 03.08.2021	**241-249 Wheat Road, Sydney**	REVISION: 0

Appendix B

Notes 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

This report is the property of Douglas Partners Pty Ltd. The report may only be used for the purpose for which it was commissioned and in accordance with the Conditions of Engagement for the commission supplied at the time of proposal. Unauthorised use of this report in any form whatsoever is prohibited.

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

DQO

Appendix C
DQO
241-249 Wheat Road, Sydney

C1.0 Data Quality Objectives

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

Step	Summary
1: State the problem	The objective of the investigation is to confirm the contamination status of the site with respect to the proposed land use. The report is being undertaken as the land is to be redeveloped. 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. Provide a comment on any budget or community concerns that were factors in designing the assessment.
2: Identify the decisions / goal of the study	The site history has identified possible contaminating previous uses which are identified in the CSM (Section 7). The CSM identifies the associated contaminants of potential concern (COPC) and the likely impacted media. The site assessment criteria (SAC) for each of the COPC are detailed in Appendix E. The decision is to establish whether or not the results fall below the SAC. On this basis, an assessment of the site's suitability from a contamination perspective and whether (or not) further assessment and / or remediation will be derived.
3: Identify the information inputs	Inputs to the investigation will be the results of analysis of samples to measure the concentration 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) will be used on-site to screen soils for VOC. PID readings will be used to inform sample selection for laboratory analysis.
4: Define the study boundaries	The lateral boundaries of the investigation area are shown on Drawing 1, Appendix A. The vertical boundaries are to the extent of contamination impact as determined from the site history assessment and site observations. The assessment is limited to the timeframe over which the field investigation was undertaken.

Step	Summary
5: Develop the analytical approach (or decision rule)	The decision rule is to compare all analytical results with SAC (Section 9, based on NEPC (2013)). Where guideline values are absent, other sources of guideline values accepted by NEPC (2013) shall be adopted where possible. Where a sample result exceeds the adopted criterion, a further site-specific assessment will be made as to the risk posed by the presence of that contaminant(s). Initial comparisons will be with individual results then, where required, summary statistics (including mean, standard deviation and 95% upper confidence limit (UCL) of the arithmetic mean (95% UCL) to assess potential risks posed by the site contamination. Quality control results are to be assessed according to their relative percent difference (RPD) values. For field duplicates, triplicates and laboratory results, RPDs should generally be below 30%; for field blanks 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 exceed human health and environmental SAC and poses a potentially unacceptable risk to receptors (null hypothesis). Alternative condition: Contaminants at the site complies with human health and environmental SAC and as such, does 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.

C2.0 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.

Appendix D

Fieldwork Methods

Appendix D
Fieldwork Methods
Cockle Bay

D1.0 Guidelines

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

- NEPC *National Environment Protection (Assessment of Site Contamination) Measure 1999 (as amended 2013) [NEPM]* (NEPC, 2013).
- NSW EPA *Assessment and Management of Hazardous Ground Gases* (NSW EPA, 2020).
- Sullivan, L., Ward, N., Toppler, N., & Lancaster, G. (2018). *National Acid Sulfate Soils Guidance: National Acid Sulfate Soils Sampling and Identification Methods Manual.* Canberra ACT CC BY 4.0: Department of Agriculture and Water Resources (Sullivan, et al., 2018).

D2.0 Soil Sampling

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

- Collect soil samples directly from SPT sample tube / solid flight auger;
- Collect near surface samples using hand tools where potholing was required;
- 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 ~40 g to 50 g samples in zip-lock bags for asbestos (presence / absence) analysis where sufficient sample recovery was achieved;
- Collect 300 g samples in zip-locked bags, removal of air, placement in a freezer as soon as practical for acid sulfate soil testing;
- 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.

D2.1 Field Testing

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

PID Field Test

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

D3.0 Groundwater Sampling

D3.1 Monitoring Well Installation

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

D3.2 Monitoring Well Development

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

D3.3 Groundwater Sampling

Bladder Pump

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

- Measure the static water level using an electronic interface probe and record the thickness of any LNAPL (if encountered);
- Decontaminate the interface probe and cable between monitoring wells by rinsing in a diluted Decon-90 solution and then rinsing in demineralised water;

- Fit the pump with a well-dedicated bladder and tubing. Lower the pump into the well then clamp at a level estimated to be 1 m below the top of the water column (provided the depth of the pump is within the screened section) or to the approximate mid-point of the well screen;
- Set the pump at the lowest rate possible that could produce laminar flow to minimise drawdown of the water column;
- Measure physical parameters by continuously passing the purged water through a flow cell; and
- Following stabilisation of the field parameters, collect samples in laboratory-prepared bottles minimising headspace within the sample bottle and cap immediately.

Decontaminate the interface probe, pump and cable between monitoring wells by rinsing in a diluted Decon-90 solution and then rinsing in demineralised water.

Sample Handling, All Methods

The general groundwater sample handling and management procedures comprise:

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

D4.0 Acid Sulfate Soil Screening

The ASS screening tests were performed by an experienced DP Environmental Scientist in accordance with the methods in Sullivan et al (2018).

The procedure for the pHF is outlined below:

- Calibrate battery powered field pH meter according to manufacturer's instructions;
- Prepare test tubes in a tube rack;
- For each sample place approximately half a teaspoon of soil into each of the pHF and pHFOX tubes;
- Place enough deionised (DI) water in the pHF test tube to make a paste similar to 'grout mix' or 'white sauce'; stir the soil:water paste to ensure all soil 'lumps' are removed (demineralised water can be substituted; never use tap water). Water must be added to the soil samples within 10 min of sampling to reduce the risk of reduced organic sulfur (RIS) oxidation; monosulfidic material may start to oxidise in less than 5 min, substantially affecting pHF results;
- Immediately place the pH spear point electrode into the soil:water paste, ensuring the spear point is completely submerged;
- Measure the pHF with the calibrated pH meter;

- Wait for the reading to stabilise and record the pH measurement; and
- All measurements should be recorded on a data sheet.

The procedure for the field pH peroxide test (pHFOX) is outlined below:

- Adjust the pH of the H_2O_2 to between 4.5 and 5.5 before going into the field. While stirring, add a few drops of dilute NaOH and regularly check the pH with a calibrated electrode until the correct range is reached. Allow the peroxide to stand for 15 min and then recheck the pH. As H_2O_2 degrades over time, only buffer small quantities at a time and refrigerate when not in use;
- Calibrate field pH meter according to manufacturer's instructions;
- Prepare heat-resistant tubes in a tube rack;
- To the pHFOX tube, prepared while sampling for pHF, add sufficient 30% H_2O_2 (at room temperature) to cover the soil, then stir the mixture;
- Rate the reaction of soil and peroxide using the reaction scale in Table D1;
- Allow approximately 15 min for any reactions to occur. The reaction may be rapid and vigorous if substantial RIS is present. If the reaction is violent and the soil:peroxide mix may overtop the tube, use a wash bottle to add small amounts of deionised or demineralised water to cool and calm the reaction. Do not add too much water as this may dilute the mixture and affect the pH value;
- Add a further 1-2 mL of H2O2, mix, allow to react for 15 min and rate the reaction. Continue this process until the soil:peroxide mixture reaction has slowed. This will ensure most of the RIS have reacted;
- If there is no initial reaction, individual tubes containing the soil:peroxide mixture can be placed in direct sunlight. This may encourage the initial reaction to occur;
- Wait for the soil:peroxide mixture to cool. This may take up to 10 min as the reaction can exceed 90 °C. Check the temperature rating of the pH meter and probe as high temperatures can damage the electrode and result in inaccurate readings. A more accurate pH is recorded if a temperature probe is used, however, this may be impractical in some field situations;
- Place the spear point pH electrode into the soil:peroxide mixture, ensuring the spear point is completely submerged. Never stir the paste with the electrode as this may damage the semipermeable glass membrane;
- Measure the pHFOX with the calibrated pH meter; and
- Wait for the reading to stabilise and record the pHFOX measurement.

Table D1: Soil Reaction Rating Scale for pH_{fox} Test

Reaction Scale	Rate of Reaction
L / 1	Low reaction
M / 2	Medium reaction
H / 3	High reaction
X / 4	Extreme reaction
V / 5	Volcanic reaction

D5.0 Gas Screening

D5.1 Gas Monitoring

Landfill gas monitoring is carried out in accordance with DP standard operating procedures and NSW EPA (2020). The monitoring method is described as follows:

- Record the barometric pressure;
- Connect the tube on the calibrated landfill gas analyser to the quick connect gas fitting on the well cap;
- Set the analyser pump on and record concentrations of methane, carbon dioxide, oxygen, carbon monoxide and hydrogen sulphide, generally at 30 second intervals, for a minimum of ten minutes and until concentrations have generally stabilised;
- Return to the well following at least one hour and re-connect the landfill gas analyser and record the gas flow rate;
- Connect the tube on the calibrated PID to the quick connect gas fitting on the well cap; and
- Set the PID concentrations of VOC at 30 second intervals, for a minimum of ten minutes and until concentrations have generally stabilised.

Note the general weather conditions and record the atmospheric pressure during the monitoring event. The conditions were generally consistent with the Bureau of Meteorology (BOM) data from the weather station at Observation Hill, the closest monitoring location, which records atmospheric pressure was at generally between 1025 and 1030 hPa at during the monitoring period.

D6.0 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.

NSW EPA. (2020). *Assessment and Management of Hazardous Ground Gases.* NSW Environment Protection Authority.

Sullivan, L., Ward, N., Toppler, N., & Lancaster, G. (2018). *National Acid Sulfate Soils Guidance: National Acid Sulfate Soils Sampling and Identification Methods Manual.* Canberra ACT CC BY 4.0: Department of Agriculture and Water Resources.

Douglas Partners Pty Ltd

Appendix E

Site Acceptance Criteria

Appendix E
Site Acceptance Criteria
241-249 Wheat Road, Sydney

1.0 Introduction

1.1 Guidelines

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

- NEPC *National Environment Protection (Assessment of Site Contamination) Measure 1999 (as amended 2013) [NEPM]* (NEPC, 2013);
- CRC CARE *Health screening levels for petroleum hydrocarbons in soil and groundwater* (CRC CARE, 2011);
- ANZG *Australian and New Zealand Guidelines for Fresh and Marine Water Quality* (ANZG, 2018);
- NHMRC *Guidelines for Managing Risks In Recreational Water* (NHMRC, 2008);
- ANZECC *Australian and New Zealand Guidelines for Fresh and Marine Water Quality* (ANZECC, 2000);
- Sullivan, L., Ward, N., Toppler, N., & Lancaster, G. (2018). *National Acid Sulfate Soils Guidance: National Acid Sulfate Soils Sampling and Identification Methods Manual.* Canberra ACT CC BY 4.0: Department of Agriculture and Water Resources. (Sullivan, et al., 2018);
- NSW EPA. (2016). Addendum to the Waste Classification Guidelines (2014) - Part 1: Classifying Waste. NSW Environment Protection Authority. (NSW EPA, 2016); and
- NSW EPA. (2020). Assessment and Management of Hazardous Ground Gases. NSW Environment Protection Authority. (NSW EPA, 2020).

1.2 General

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

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

- Land use: recreational and commercial / industrial.
  - Corresponding to land use category ‘C‘, public open space such as parks, playgrounds, playing fields (e.g., ovals), secondary schools and footpaths.

- Corresponding to land use category 'D', commercial / industrial such as shops, offices, factories and industrial sites.
- Soil type: sand.

2.0 Soils

2.1 Health Investigation and Screening Levels

The generic health investigation levels (HIL) and health screening levels (HSL) are considered to be appropriate for the assessment of human health risk via all relevant pathways of exposure associated with contamination at the site. The adopted soil HIL and HSL for the contaminants of concern are in Table 1, Table 2 and Table 3.

Table 1: Health Investigation Levels (mg/kg)

Contaminant	HIL-C	HIL-D
Metals		
Arsenic	300	3000
Cadmium	90	900
Chromium (VI)	300	3600
Copper	17 000	240 000
Lead	600	1500
Mercury (inorganic)	80	730
Nickel	1200	6000
Zinc	30 000	400 000
TBT		
Tin		
PAH		
B(a)P TEQ	3	40
Total PAH	300	4000
Phenols		
Phenol	40 000	240 000
Pentachlorophenol	120	660
Cresols	4000	25 000
OCP		
DDT+DDE+DDD	400	3600

Contaminant	HIL-C	HIL-D
Aldrin and dieldrin	10	45
Chlordane	70	530
Endosulfan	340	2000
Endrin	20	100
Heptachlor	10	50
HCB	10	80
Methoxychlor	400	2500
OPP		
Chlorpyrifos	250	2000
PCB		
PCB	1	7
VOC (various analytes)	-	-

Table 2: Health Screening Levels (mg/kg)

Contaminant	HSL-C	HSL-C	HSL-C	HSL-C
SAND	**0 m to <1 m**	**1 m to <2 m**	**2 m to <4 m**	**4 m+**
Benzene	NL	NL	NL	NL
Toluene	NL	NL	NL	NL
Ethylbenzene	NL	NL	NL	NL
Xylenes	NL	NL	NL	NL
Naphthalene	NL	NL	NL	NL
TRH F1	NL	NL	NL	NL
TRH F2	NL	NL	NL	NL

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

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

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

Table 3: Health Screening Levels (mg/kg)

Contaminant	HSL-D	HSL-D	HSL-D	HSL-D
SAND	**0 m to <1 m**	**1 m to <2 m**	**2 m to <4 m**	**4 m+**
Benzene	3	3	3	3
Toluene	NL	NL	NL	NL
Ethylbenzene	NL	NL	NL	NL
Xylenes	230	NL	NL	NL
Naphthalene	NL	NL	NL	NL
TRH F1	260	370	630	NL
TRH F2	NL	NL	NL	NL

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

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

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

The HSL for direct contact derived from CRC CARE (2011) are in Table 4.

Table 4: Health Screening Levels for Direct Contact (mg/kg)

Contaminant			DC HSL-C	DC HSL-D	DC HSL-IMW
Benzene			120	430	1100
Toluene			18 000	99 000	120 000
Ethylbenzene			5300	27 000	85 000
Xylenes			15 000	81 000	130 000
Naphthalene			1900	11 000	29 000
TRH F1			5100	26 000	82 000
TRH F2			3800	20 000	62 000
TRH F3			5300	27 000	85 000
TRH F4			7400	38 000	12 000

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

2.2 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.

2.3 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 7, 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)	Historic contamination / fill
pH	8.5	Site average, refer to Table 6
CEC	20.0 $cmol_c/kg$	Site average, refer to Table 6
Clay content	5%	assumed
Traffic volumes	high	
State / Territory	NSW	

Table 6: pH and CEC Results

Bore ID	Depth	pH Units	Cation Exchange Capacity				
							meq/100g
CP2	0.4-0.5	8.9					
CP2	2.4-2.5	8.3					
CW1	12-12.45	3.6					
CW1	14.5-14.95	6.5					
CW2	0.4-0.5	10.1					17
CW2	2.8-3.2	10.4					
CW2	7-7.45	9					
CW3	0.5	9.7					
CW4	0.9-1	8.6					

Bore ID	Depth	pH Units	Cation Exchange Capacity				
							meq/100g
CW5	2	9.2					28
CW5	0.5-0.6	9.1					
CW5	5.5-5.45	8.6					
CW6	0.5-0.6	8.9					
CW7	0.5	9.4					
CW7	2-2.1	8.9					15
W1	10-10.43	9.4					
W3	14-14.45	5.3					
W4	10	8.5					
W5	11.5-11.95	8.8					
Average		8.5					20.0

Table 7: Ecological Investigation Levels (mg/kg)

Contaminant	EIL-A-B-C	EIL-D
Metals		
Arsenic	100	160
Copper	240	330
Nickel	270	460
Chromium III	330	540
Lead	1100	1800
Zinc	820	1200
PAH		
Naphthalene	170	370
OCP		
DDT	180	640

Notes: EIL-AES area of ecological significance

2.4 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 8.

Table 8: Ecological Screening Levels (mg/kg)

Contaminant	Soil Type	EIL-A-B-C	EIL-D
Benzene	Coarse	50	75
Toluene	Coarse	85	135
Ethylbenzene	Coarse	70	165
Xylenes	Coarse	105	180
TRH F1	Coarse/ Fine	180*	215*
TRH F2	Coarse/ Fine	120*	170*
TRH F3	Coarse	300	1700
TRH F4	Coarse	2800	3300
B(a)P	Coarse	0.7	1.4

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

2.5 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 9.

Table 9: Management Limits (mg/kg)

Contaminant	Soil Type	ML-A-B-C	ML-D
TRH F1	Coarse	700	700
TRH F2	Coarse	1000	1000
TRH F3	Coarse	2500	3500
TRH F4	Coarse	10 000	10 000

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

3.0 Waste Classification

The waste classification was conducted with reference to the NSW EPA Waste Classification Guidelines, Part 1: Classifying Waste (NSW EPA, 2014). In assessing materials as virgin excavated natural materials (VENM) the POEO Act and NSW EPA website were also referenced.

4.0 Acid Sulfate Soils

The following section provides the action criteria to determine if the soil is classified as PASS / ASS and therefore if acid sulfate soil management is required.

4.1 Field Screening

Field screening indicators do not form part of the assessment criteria as such but can be used to provide an indication of the ASS status and to assist in selecting samples for laboratory testing.

Field screening is indicative only and can give false positive and false negative indications of the presence of ASS. False positives can be caused by organic matter, which often “froths” during oxidation. False negatives can be caused by shells in the soil. Indicators of ASS from field screening comprise:

- Field pH is less than or equal to pH 4;
- pHfox is less than 3.5;
- A decrease of more than 1 pH unit from the field pH to the pHfox;
- Bubbling, production of heat or release of sulphur odours during pHfox testing; and
- Change in colour from grey to brown tones during oxidation.

4.2 Laboratory Analysis

The action criteria trigger are the basis for determining if a ASSMP is required. They are based on Net Acidity. As clay content tends to influence a soil's natural buffering capacity, the action criteria are grouped by three broad texture categories - coarse, medium and fine. If the Net Acidity of any individual soil tested is equal to or greater than the action criterion a detailed ASS management will need to be prepared.

The test results can be used to evaluate the presence / absence of ASS in accordance. If the results indicate the absence of ASS treatment is not required. The following Table 10 provides the action criteria.

Table 10: Action Criteria

Type of Material		Net Acidity#			
		1-1000 t materials disturbed		>1000 t materials disturbed	
Texture Range (NCST 2009)*	Approximate Clay Content %)	% S-equiv (oven dried basis)	Mol H+/t (oven dried basis)	% S-equiv (oven dried basis)	Mol H+/t (oven dried basis)
Coarse and Peats: sands to loamy sands	<5	≥ 0.03	≥ 18	≥ 0.03	≥ 18

* If bulk density values are not available for the conversion of cubic meters to tonnes of soil, then the default bulk densities based on the soil texture in Table 11, may be used.

Net Acidity can only include a soil material's measured Acid Neutralising Capacity where this measure has been corroborated by other data (for example slab incubation data) that demonstrates the soil material does not experience acidification during complete oxidation under field conditions (Equation C1). Where the Acid Neutralising Capacity has not been corroborated, the Net Acidity must be determined using Equation C2.

Table 11: Default Bulk Densities Based on Soil Texture

Texture	Bulk Density (t/m^3)
Sand	1.8
Loamy Sand	1.8
Sandy Loam	1.7
Loam	1.6
Silty Loam	1.5
Clay Loam	1.5
Clay	1.4
Peat	1.0

4.2.1 Net Acidity

Net Acidity is the quantitative measure of the acidity hazard of ASS. It is determined from an Acid Base Accounting (ABA) approach using one of the equations below. Equations E1 and E2 are used to determine the net acidity prior to treatment of ASS / PASS and therefore if acid sulfate soil treatment and / or management plan is required. Equation E3 is used to determine the neutralisation treatment has been successful.

- Equation E1 - when the effectiveness of a soil's measured Acid Neutralising Capacity has been corroborated by other data demonstrating the soil does not experience acidification during complete oxidation under field conditions, or
- Equation E2 - when the effectiveness of a soil's measured Acid Neutralising Capacity has not been corroborated by other data, or
- Equation E3 - when the effectiveness of a management approach involving the addition of liming materials is being verified post treatment via calculation of the Verification Net Acidity.

Equation E1 Net Acidity whereby acid neutralising capacity (ANC) has been corroborated by other data.

Net Acidity = potential sulfidic acidity + actual acidity + retained acidity - Acid Neutralising Capacity

Net Acidity = Scr + S-TAA at pH 6.5 + SNAS - s-ANCBT

Equation E2 Net Acidity whereby ANC has not been corroborated by other data.

Net Acidity = potential sulfidic acidity + actual acidity + retained acidity

Net Acidity = Scr + S-TAA at pH 6.5 + SNAS

Equation E3 Verification Net Acidity.

Verification Net Acidity = potential sulfidic acidity + actual acidity + retained acidity - (post neutralised Acid Neutralising Capacity - pre neutralised Acid Neutralising Capacity)

Verification Net Acidity = Scr + S-TAA at pH 6.5 + SNAS - (ANCBT of treated material - ANCBT of untreated material)

4.3 Liming Rates

The required liming rate can be calculated from one of the following formulas.

Equation E4:
Neutralising Material Required (kg $CaCO_3$/tonne soil) = (Net acidity (mol H+/t) / 19.98) x FOS x 100/ENV

Equation E5:
Neutralising Material Required (kg $CaCO_3/m^3$ soil) = D (tonne/m^3) x (Net acidity (mol H+/t) / 19.98) x FOS x 100/ENV

Where:

net acidity (mol H+/t) is derived using the 95% UCL of the Net Acidity (%S) using the methods in 4.2.1;

19.98 converts to kg $CaCO_3$/tonne;

FOS (factor of safety) = a minimum value of 1.5 needs to be adopted, although values of up to 2 can be suitable;

ENV = Effective Neutralising Value (e.g., Approx. 98% for fine (0.3 mm grain size) ag lime with an NV of 98%).

D = bulk density, site specific results can be used, or the bulk densities in Table 11 should be used

Notes:

- The ENV is calculated based on the molecular weight, particle size and purity of the neutralising agent and should be assessed for proposed materials in accordance with ASSMAC (1998).
- Natural net acidity must not be used.

An initial liming rate based on the laboratory result calculation (excluding ANC) is considered appropriate based on it including a safety factor of 1.5 and the use of ag lime with an NV of at least 98% and a grain size of less than 0.5 mm.

5.0 Groundwater

5.1 Introduction

The groundwater investigation levels (GIL) used for interpretation of the groundwater data (as a Tier 1 assessment) have been selected based on the potential risks posed from contamination sourced from the site to receptors at or down-gradient of the site, as identified by the conceptual site model (CSM). The receptors, exposure points and pathways are summarised in Table 12.

Table 12: Summary of Potential Receptors and Potential Risks

Receptor	Location	Exposure Point	Exposure Pathway
Surface water aquatic ecosystem	Down-gradient from site.	Receiving surface water body at the groundwater discharge point.	Exposure to contaminants.
Occupants of buildings	On site and down-gradient from site.	Enclosed buildings (existing or proposed).	Inhalation of VOC (including TRH and BTEX) overlying VOC impacted groundwater via the vapour intrusion pathway.
Human recreation (e.g., swimming)	Down-gradient from site.	Receiving surface water body at the groundwater discharge point.	Ingestion / dermal absorption of contaminants during recreational activities (e.g.,swimming).

The rationale for the selection of GIL is in Table 13.

Table 13: Groundwater Investigation Level Rationale

Receptor / Beneficial Use	GIL	Source	Comments / Rationale
Aquatic ecosystem	DGV	ANZG (2018)	Marine water 99% LOP for bioaccumulative contaminants 95% LOP for non-bioaccumulative contaminants
Building occupants (vapour intrusion)	HSL	NEPC (2013)	2 m to <4 m Sand, HSLC & HSLD
Recreational waters	GV	NHMRC (2008)	Based on the NHMRC (2018) values x10 to account for ingestion of water whilst undertaking recreational activities.

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

Based on the highly saline and tidal nature of the groundwater, the groundwater is not considered a possible drinking water aquifer and therefore the drinking water guidelines have not been adopted.

5.2 Groundwater Investigation Levels for Aquatic Ecosystems

The DGV for the protection of aquatic ecosystems derived from ANZG (2018) are in Table 14. Analytes not listed in Table 14 (which are included in the analyte list of Table 5 in Appendix G) do not have a marine water 95%, 99% on unknown reliability DGV.

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

Group	Analyte	ANZG (2018) Marine water (unknown reliability) toxicant DGVs	ANZG (2018) Marine water 95% toxicant DGVs	ANZG (2018) Marine water 99% toxicant DGVs
Metals	Arsenic (Filtered)			
	Cadmium (Filtered)		0.0055	0.0007
	Chromium (III+VI) (Filtered)			
	Copper (Filtered)		0.0013	0.0003
	Iron (Filtered)			
	Lead (Filtered)		0.0044	0.0022
	Mercury (Filtered)		0.0004	0.0001
	Nickel (Filtered)		0.07	0.007
	Tin (Filtered)			
	Tributyltin as SN		0.000006	0.0000004
	Zinc (Filtered)		0.015	0.007
BTEX	Benzene		0.7	0.5
	Ethylbenzene	0.005		
	Toluene	0.18		
	Xylene (o)	0.35		
MAH	Isopropylbenzene	0.03		
Chlorinated hydrocarbons	1,1,1-trichloroethane	0.27		
	1,1,2-trichloroethane	0.33	1.9	0.14
	1,1-dichloroethene	0.7		
	1,2-dichloroethane	1.9		
	1,2-dichloropropane	0.9		
	1,3-dichloropropane	1.1		
	Carbon tetrachloride	0.24		

Group	Analyte	ANZG (2018) Marine water (unknown reliability) toxicant DGVs	ANZG (2018) Marine water 95% toxicant DGVs	ANZG (2018) Marine water 99% toxicant DGVs
	Chloroform	0.37		
	Trichloroethene		0.33	0.2
	Tetrachloroethene	0.07		
	Vinyl chloride	0.1		
Halogenated Benzenes	1,2,3-trichlorobenzene	0.003		
	1,2,4-trichlorobenzene		0.08	0.02
	1,2-dichlorobenzene	0.16		
	1,3-dichlorobenzene	0.26		
	1,4-dichlorobenzene	0.06		
	Chlorobenzene	0.055		
	Hexachlorobenzene	0.00005		
PAH/Phenols	2,4-dimethylphenol	0.002		
	2,4-dinitrophenol	0.045		
	2-nitrophenol	0.002		
	4-nitrophenol	0.058		
	Anthracene	0.0001		
	Benzo(a) pyrene	0.0001		
	Fluoranthene	0.001		
	Naphthalene		0.07	0.05
	Phenanthrene	0.0006		
	Phenol		0.4	0.27
Halogenated Phenols	2,3,4,6-tetrachlorophenol	0.01		
	2,4,5-trichlorophenol	0.004		
	2,4,6-trichlorophenol	0.003		
	2,4-dichlorophenol	0.12		
	2,6-dichlorophenol	0.034		
	2-chlorophenol	0.34		

Group	Analyte	ANZG (2018) Marine water (unknown reliability) toxicant DGVs	ANZG (2018) Marine water 95% toxicant DGVs	ANZG (2018) Marine water 99% toxicant DGVs
	3/4-Methylphenol (m/p-cresol)			
	Pentachlorophenol		0.022	0.011
Polychlorinated Biphynels	Arochlor 1242	0.0003		
	Arochlor 1254	0.00001		
Organochlorine Pesticides	4,4-DDE	0.0000005		
	Aldrin	0.000003		
	DDT	0.0000004		
	Dieldrin	0.00001		
	Endrin		0.000008	0.000004
	g-BHC (Lindane)	0.000007		
	Heptachlor	0.0000004		
	Methoxychlor	0.000004		
Organophosphorous Pesticides	Azinophos methyl	0.00001		
	Chlorpyrifos		0.000009	0.0000005
	Diazinon	0.00001		
	Dimethoate	0.00015		
	Fenitrothion	0.000001		
	Malathion	0.00005		
	Parathion	0.000004		

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

5.3 Health Screening Levels for Vapour Intrusion

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

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

Contaminant	HSL-C	HSL-C	HSL-C	Solubility Limit
SAND	**2 m to <4 m**	**4 m to <8 m**	**8 m+**	**-**
Benzene	NL	NL	NL	59 000
Toluene	NL	NL	NL	61 000
Ethylbenzene	NL	NL	NL	3900
Xylenes	NL	NL	NL	21 000
Naphthalene	NL	NL	NL	170
TRH F1	NL	NL	NL	9000
TRH F2	NL	NL	NL	3000

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

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

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

Table 16: Groundwater Health Screening Levels for Vapour Intrusion (µg/L)

Contaminant	HSL-D	HSL-D	HSL-D	Solubility Limit
SAND	**2 m to <4 m**	**4 m to <8 m**	**8 m+**	**-**
Benzene	5000	5000	5000	59 000
Toluene	NL	NL	NL	61 000
Ethylbenzene	NL	NL	NL	3900
Xylenes	NL	NL	NL	21 000
Naphthalene	NL	NL	NL	170
TRH F1	6000	6000	7000	9000
TRH F2	NL	NL	NL	3000

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

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

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

5.4 Groundwater Investigation Levels for Recreational Water

The GV for recreational water derived from NHMRC (2008) are in Table 17.

Table 17: Groundwater Investigation Levels for Protection of Recreational Waters (mg/L)

Chemical Group	Analyte	Recreational water quality and aesthetics
Metals	Arsenic (Filtered)	0.05
	Cadmium (Filtered)	0.005
	Chromium (III+VI) (Filtered)	0.05
	Copper (Filtered)	1
	Iron (Filtered)	0.3
	Lead (Filtered)	0.05
	Mercury (Filtered)	0.001
	Nickel (Filtered)	0.1
	Zinc (Filtered)	5
BTEX	Benzene	0.01
Chlorinated Hydrocarbons	1,1-dichloroethene	0.0003
	1,2-dichloroethane	0.01
	Carbon tetrachloride	0.003
	Trichloroethene	0.03
	Tetrachloroethene	0.01
PAH	Benzo(a) pyrene	0.00001
Halogenated Phenols	2,3,4,6-tetrachlorophenol	0.001
	2,4,5-trichlorophenol	0.001
	2,4,6-trichlorophenol	0.01
	Pentachlorophenol	0.01
Organochlorine Pesticides	Aldrin	0.001
	DDT	0.003
	Dieldrin	0.001
	Endrin	0.001
	g-BHC (Lindane)	0.01
	Heptachlor	0.003

Chemical Group	Analyte	Recreational water quality and aesthetics
Organophosphorus Pesticides	Azinophos methyl	0.01
	Bromophos-ethyl	0.02
	Chlorpyrifos	0.002
	Diazinon	0.01
	Dichlorvos	0.02
	Dimethoate	0.1
	Ethion	0.006
	Fenitrothion	0.02
	Malathion	0.1
	Methyl parathion	0.006
	Ronnel	0.06
Pesticides	Parathion	0.03

6.0 References

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Douglas Partners Pty Ltd

Appendix F

Borehole Logs and Field Records

BOREHOLE LOG

CLIENT: DPT Operator Pty Ltd
PROJECT: Cockle Bay Park Redevelopment
LOCATION: 241-249 Wheat Road, Sydney

SURFACE LEVEL: 2.5 AHD
EASTING: 333784
NORTHING: 6250591
DIP/AZIMUTH: 90°/--

BORE No: CP1
PROJECT No: 202546.00
DATE: 18 - 19/9/2021
SHEET 1 OF 3

RL	Depth (m)	Description of Strata	Degree of Weathering (EW HW MW SW FS FR)	Graphic Log	Rock Strength (Ex Low / Very Low / Low / Medium / High / Very High / Ex High)	Water	Fracture Spacing (m) (0.01 / 0.05 / 0.10 / 0.50 / 1.00)	Discontinuities (B - Bedding J - Joint S - Shear F - Fault)	Sampling & In Situ Testing: Type	Core Rec. %	RQD %	Test Results & Comments
2	0.24	CONCRETE: grey, igneous aggregate of 12mm nominal diameter, 18mm steel reinforcement							A			
	0.4	FILL/Sandy GRAVEL: fine to medium igneous gravel, dark grey, fine to coarse sand, with silt, moist, appears medium dense							A			
1	1	FILL/Silty SAND: fine to coarse, brown, trace fine sandstone gravel and concrete cobbles, moist, appears in a medium dense condition							A*			
	1.5	FILL/Sandy SILT: low plasticity, grey, fine to coarse sand, trace fine sandstone gravel, W<PL, appears in a firm condition							A			
0	2	Sandy CLAY CL: low plasticity, grey-brown, fine to medium sand, W<PL, appears soft, estuarine							A			
	2.2								A			
-1	2.9	Clayey SAND SC: fine to medium, grey, trace shells, sulphurous odour, w>PL, appears medium dense, estuarine							A			
	3								U_{50}			
-2	4	Sandy CLAY CL: low plasticity, orange-brown mottled grey, fine to medium sand, w>PL, stiff, estuarine										
	4.0											
	5											
-3									U_{50}			pp = 180
	6											
-4		Below 6.5m: grading to grey										
	7											
-5												
	8											
	8.0	Clayey SAND SC: fine to medium, red-brown, wet, appears medium dense to dense, estuarine										
-6		Below 8.7m: grading to grey										
	9											
-7		Below 9.4m: grading to orange-brown										

RIG: XC rig **DRILLER:** Terratest **LOGGED:** LHS **CASING:** HW to 3.5m; HQ to 12.66m

TYPE OF BORING: Diacore to 0.24m, Hand auger to 0.5m, Solid flight auger to 3.0m; Rotary wash bore to 12.66m; NMLC Coring to 27.88m

WATER OBSERVATIONS: Free groundwater observed at 3.0m depth whilst augering

REMARKS: Location coordinates are in MGA94 Zone 56. *Field replicate BD01/180921 taken at 1.0-1.1m depth

SAMPLING & IN SITU TESTING LEGEND

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

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Geotechnics / Environment / Groundwater

BOREHOLE LOG

CLIENT: DPT Operator Pty Ltd
PROJECT: Cockle Bay Park Redevelopment
LOCATION: 241-249 Wheat Road, Sydney

SURFACE LEVEL: 2.5 AHD
EASTING: 333784
NORTHING: 6250591
DIP/AZIMUTH: 90°/--

BORE No: CP1
PROJECT No: 202546.00
DATE: 18 - 19/9/2021
SHEET 2 OF 3

RL	Depth (m)	Description of Strata	Degree of Weathering (EW HW MW SW FS FR)	Graphic Log	Rock Strength (Ex Low, Very Low, Low, Medium, High, Very High, Ex High)	Water	Fracture Spacing (m) (0.01, 0.05, 0.10, 0.50, 1.00)	Discontinuities (B - Bedding J - Joint S - Shear F - Fault)	Sampling & In Situ Testing: Type	Core Rec. %	RQD %	Test Results & Comments
-8	11	Clayey SAND SC: fine to medium, red-brown, wet, appears medium dense to dense, estuarine *(continued)*										
-9	12							Unless otherwise stated, rock is fractured along rough, planar bedding dipping 0-10°				
-10	12.66	SANDSTONE: medium to coarse grained, orange-brown, distinctly and indistinctly bedded at 0-10°, with siltstone specks, medium to high strength, moderately weathered, slightly fractured, Hawkesbury sandstone							C	100	100	PL(A) = 0.5
-11	13											PL(A) = 1.1
-12	14	Below 14.07m: becoming pale grey, fresh						13.8m: B5°, pl, ro, fe stn 14.07m: B10°, un, cbs 1mm	C	100	99	PL(A) = 0.9
-13	15	Between 15.27-15.28m: siltstone clasts Below 15.74m: siltstone clasts and lenses						15.28m: Cs, 10mm				PL(A) = 1.1
-14	15.98 16 16.18	SILTSTONE: dark grey, with 5% pale grey, fine grained sandstone laminations and beds, low to medium strength, fresh, slightly fractured, Hawkesbury sandstone						15.84m: B10°, un, ro, cln 16.17m: B20°, pl, cly vnr 16.37m: B0°, pl, cly vnr 16.4m: B5°, pl, cly 2mm	C	100	98	PL(A) = 0.3 PL(A) = 0.7
-15	17	SANDSTONE: medium to coarse grained, pale grey, distinctly and indistinctly bedded at 0-10°, medium to high strength, fresh, slightly fractured, Hawkesbury sandstone Below 17.00m: high strength, unbroken										PL(A) = 1
-16	18								C	100	100	PL(A) = 1.1 PL(A) = 1.3
-17	19								C	100	100	PL(A) = 1.1
	20.0											

RIG: XC rig **DRILLER:** Terratest **LOGGED:** LHS **CASING:** HW to 3.5m; HQ to 12.66m

TYPE OF BORING: Diacore to 0.24m, Hand auger to 0.5m, Solid flight auger to 3.0m; Rotary wash bore to 12.66m; NMLC Coring to 27.88m

WATER OBSERVATIONS: Free groundwater observed at 3.0m depth whilst augering

REMARKS: Location coordinates are in MGA94 Zone 56. *Field replicate BD01/180921 taken at 1.0-1.1m depth

SAMPLING & IN SITU TESTING LEGEND

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

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Geotechnics / Environment / Groundwater

BOREHOLE LOG

CLIENT: DPT Operator Pty Ltd
PROJECT: Cockle Bay Park Redevelopment
LOCATION: 241-249 Wheat Road, Sydney

SURFACE LEVEL: 2.5 AHD
EASTING: 333784
NORTHING: 6250591
DIP/AZIMUTH: 90°/--

BORE No: CP1
PROJECT No: 202546.00
DATE: 18 - 19/9/2021
SHEET 3 OF 3

RL	Depth (m)	Description of Strata	Degree of Weathering (EW HW MW SW FS FR)	Graphic Log	Rock Strength (Ex Low / Very Low / Low / Medium / High / Very High / Ex High)	Water	Fracture Spacing (m) (0.01 / 0.05 / 0.10 / 0.50 / 1.00)	Discontinuities (B - Bedding J - Joint S - Shear F - Fault)	Sampling & In Situ Testing: Type	Core Rec. %	RQD %	Test Results & Comments
-18	21	SANDSTONE: medium to coarse grained, pale grey, distinctly and indistinctly bedded at 0-10°, high strength, fresh, unbroken, Hawkesbury sandstone							C	100	100	PL(A) = 1
-19									C	100	100	PL(A) = 1.4
-20	22								C	100	100	PL(A) = 1.1
-21	23								C	100	100	PL(A) = 1.5
-22	24											PL(A) = 1.2
-23	25	Below 25.4m: 5% siltstone clasts and specks						25.02-25.03m: B0°, pl, cly vnr	C	100	96	PL(A) = 1.2
-24	26							26m: B10°, un, cly 5mm				PL(A) = 1.8
-25	27	Below 26.6m: massive							C	100	100	PL(A) = 1.5
	27.88											
-26	28	Bore discontinued at 27.88m - Limit of investigation										
-27	29											

RIG: XC rig **DRILLER:** Terratest **LOGGED:** LHS **CASING:** HW to 3.5m; HQ to 12.66m

TYPE OF BORING: Diacore to 0.24m, Hand auger to 0.5m, Solid flight auger to 3.0m; Rotary wash bore to 12.66m; NMLC Coring to 27.88m

WATER OBSERVATIONS: Free groundwater observed at 3.0m depth whilst augering

REMARKS: Location coordinates are in MGA94 Zone 56. *Field replicate BD01/180921 taken at 1.0-1.1m depth

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: DPT Operator Pty Ltd
PROJECT: Cockle Bay Park Redevelopment
LOCATION: 241-249 Wheat Road, Sydney

SURFACE LEVEL: 2.5 AHD
EASTING: 333780
NORTHING: 6250566
DIP/AZIMUTH: 90°/--

BORE No: CP2
PROJECT No: 202546.00
DATE: 20 - 21/8/2021
SHEET 1 OF 2

RL	Depth (m)	Description of Strata	Degree of Weathering (EW HW MW SW FS FR)	Graphic Log	Rock Strength (Ex Low, Very Low, Low, Medium, High, Very High, Ex High)	Water	Fracture Spacing (m) (0.01, 0.05, 0.10, 0.50, 1.00)	Discontinuities (B - Bedding, J - Joint, S - Shear, F - Fault)	Sampling & In Situ Testing: Type	Core Rec. %	RQD %	Test Results & Comments
2.5	0.26	CONCRETE: two rows of reo (approximately 10mm diameter)										
2	0.5	FILL/Clayey GRAVEL: medium to coarse gravel, dark grey, low plasticity clay, moist							A/E			
1	1	FILL/Gravelly SAND: fine to medium sand, medium to coarse gravel, dark grey, moist							A/E			
0.5	1.5	FILL/Silty CLAY: medium plasticity, dark grey, with medium to coarse gravel, w~PL							A/E			
0	2.0	Silty CLAY: medium plasticity, pale brown, w>PL, estuarine							A/E			
-0.5	3								A/E			
-1	3.5	Sandy CLAY: low plasticity, dark grey, medium sand, with shell fragments, w>PL, estuarine				20-08-21			A/E			
-1.5	4								A/E			
-2	4.5	Sandy CLAY: low to medium plasticity, pale brown mottled orange, medium sand, w~PL, estuarine							A/E			
-2.5	5								A/E			
-3	6											
-4	7											
-5	8											
-6	9											
-7												

RIG: Underpinner **DRILLER:** Ground Test **LOGGED:** JY **CASING:** 90mm PVC to 6.0m

TYPE OF BORING: Diacore to 0.26m, hand auger to 0.50m, Spiral flight auger (TC Bit) to 5.0m, Rotary drilling to 14.0m, NMLC to 18.55m

WATER OBSERVATIONS: Free groundwater observed at 3.9m depth whilst augering

REMARKS: Location coordinates are in MGA94 Zone 56. Groundwater well constructed: blank PVC 0.0 to 3.0m, Slotted PVC pipe 3.0 to 18.55m, backfill 0.0 to 2m, bentonite 2 to 2.5m, gravel 2.5 to 18.55m, gatic at surface

SAMPLING & IN SITU TESTING LEGEND

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

Douglas Partners
Geotechnics / Environment / Groundwater

BOREHOLE LOG

CLIENT: DPT Operator Pty Ltd
PROJECT: Cockle Bay Park Redevelopment
LOCATION: 241-249 Wheat Road, Sydney

SURFACE LEVEL: 2.5 AHD
EASTING: 333780
NORTHING: 6250566
DIP/AZIMUTH: 90°/--

BORE No: CP2
PROJECT No: 202546.00
DATE: 20 - 21/8/2021
SHEET 2 OF 2

RL	Depth (m)	Description of Strata	Degree of Weathering (EW HW MW SW FS FR)	Graphic Log	Rock Strength (Ex Low, Very Low, Low, Medium, High, Very High, Ex High)	Water	Fracture Spacing (m) (0.01, 0.05, 0.10, 0.50, 1.00)	Discontinuities (B - Bedding J - Joint S - Shear F - Fault)	Type	Core Rec. %	RQD %	Test Results & Comments
-8		Sandy CLAY: low to medium plasticity, pale brown mottled orange, medium sand, w~PL, estuarine *(continued)*										
-9	11											
-10	12											
-11	13							Unless otherwise stated, rock is fractured along planar, rough and clean bedding plane defects dipping 0-10°				
-12	14 14.0	SANDSTONE: medium to coarse grained, red brown and pale brown, thinly bedded, medium to high strength, moderately weathered, slightly fractured, Hawkesbury Sandstone						14.22m: B 20°, pl, ro, cln 14.4m: B 20°, pl, ro, cly 10mm 14.59m: B 20°, pl, ro, cln	C	100	87	PL(A) = 0.5
-13	15							14.92m: B 20°, pl, ro, fe 15.05m, 15.06m: Bx2 0°, pl, ro, fe 15.14m: B 20°, pl, ro, cln 15.18m, 15.20m: Bx2 0°, pl, ro, fe 15.2m: B 0°, pl, ro, fe, cly 25mm 15.3m: Jx2 20°, cu, ro, fe 15.65m, 15.69m: B 0°, un, ro, cbs				PL(A) = 1.2
	15.65	SANDSTONE: fine to medium grained, pale grey, thinly bedded, high strength, slightly weathered to fresh, unbroken, Hawkesbury Sandstone Below 16.7m: with siltstone clasts							C	100	100	
-14	16											PL(A) = 1.5
-15	17								C	100	100	PL(A) = 1.7
-16	18	Below 18m: medium to coarse grained										PL(A) = 1.5
	18.55	Bore discontinued at 18.55m - Limit of investigation (equipment limitation)										
-17	19											

RIG: Underpinner **DRILLER:** Ground Test **LOGGED:** JY **CASING:** 90mm PVC to 6.0m

TYPE OF BORING: Diacore to 0.26m, hand auger to 0.50m, Spiral flight auger (TC Bit) to 5.0m, Rotary drilling to 14.0m, NMLC to 18.55m

WATER OBSERVATIONS: Free groundwater observed at 3.9m depth whilst augering

REMARKS: Location coordinates are in MGA94 Zone 56. Groundwater well constructed: blank PVC 0.0 to 3.0m, Slotted PVC pipe 3.0 to 18.55m, backfill 0.0 to 2m, bentonite 2 to 2.5m, gravel 2.5 to 18.55m, gatic at surface

SAMPLING & IN SITU TESTING LEGEND

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

Douglas Partners
Geotechnics / Environment / Groundwater

BOREHOLE LOG

CLIENT: DPT Operator Pty Ltd
PROJECT: Cockle Bay Park Redevelopment
LOCATION: 241-249 Wheat Road, Sydney

SURFACE LEVEL: 3.3 AHD
EASTING: 333717
NORTHING: 6250585
DIP/AZIMUTH: 90°/--

BORE No: CW1
PROJECT No: 202546.00
DATE: 12 - 14/7/2021
SHEET 1 OF 5

RL	Depth (m)	Description of Strata	Degree of Weathering (EW HW MW SW FS FR)	Graphic Log	Rock Strength (Ex Low, Very Low, Low, Medium, High, Very High, Ex High)	Water	Fracture Spacing (m) (0.01, 0.05, 0.10, 0.50, 1.00)	Discontinuities (B - Bedding, J - Joint, S - Shear, F - Fault)	Sampling & In Situ Testing: Type	Core Rec. %	RQD %	Test Results & Comments
	0.2	CONCRETE: igneous gravel of 20mm nominal diameter										
		VOID										
	0.93	CONCRETE: igneous gravel of 20mm nominal diameter										
	1.31	VOID										
	3.4	SEAWATER				12-07-21						
	6.8	FILL/SAND: fine to coarse, brown, with sandstone gravel, cobbles and brick fragments, wet, appears generally in a loose condition							S^			25/140 refusal
									S^			9,25/100 refusal

RIG: Comacchio 205 **DRILLER:** Ground Test **LOGGED:** LHS **CASING:** HW to 10.0m; HQ to 21.0m

TYPE OF BORING: Diacore to 0.2m, NDD to 0.93m, Diacore to 1.31m; Rotary wash bore 6.8m to 20.8m, NMLC Coring to 45.0m

WATER OBSERVATIONS: Water observed at 3.40m at 2:00pm on 12 July 2021

REMARKS: Location coordinates are in MGA94 Zone 56. ^SPT at 8.15m and 8.75m undertaken in HW casing; *Field replicate BD07/120721 taken at 12.0-12.45m depth and field replicate BD08/130721 taken at 20.5-20.95m depth

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: DPT Operator Pty Ltd
PROJECT: Cockle Bay Park Redevelopment
LOCATION: 241-249 Wheat Road, Sydney

SURFACE LEVEL: 3.3 AHD
EASTING: 333717
NORTHING: 6250585
DIP/AZIMUTH: 90°/--

BORE No: CW1
PROJECT No: 202546.00
DATE: 12 - 14/7/2021
SHEET 2 OF 5

RL	Depth (m)	Description of Strata	Degree of Weathering (EW HW MW SW FS FR)	Graphic Log	Rock Strength (Ex Low / Very Low / Low / Medium / High / Very High / Ex High)	Water	Fracture Spacing (m) (0.01 / 0.05 / 0.10 / 0.50 / 1.00)	Discontinuities (B - Bedding J - Joint S - Shear F - Fault)	Sampling & In Situ Testing: Type	Core Rec. %	RQD %	Test Results & Comments
-7									S			12,13,8 N = 21
	10.5	Sandy CLAY CL: low plasticity, grey, medium to coarse sand, w>PL, stiff, estuarine										
-8	11											
									U_{75}			pp = 190
-9	12								S/E*			4,8,8 N = 16
	12.7	Clayey SILT MH: high plasticity, grey, with medium to coarse sand, w>PL, firm, estuarine										
-10	13								S/E			1,2,4 N = 6
-11	14											
									S/E			13,11,6 N = 17
-12	15											
		Below 15.5m: grading to grey mottled orange-brown, trace medium to coarse sand, soft										
-13	16								S/E			0,0,3 N = 3
	17 17.0	SAND SP: medium to coarse, grey mottled orange-brown, trace clay, wet, dense, estuarine										
-14		Below 17.5m: grading to pale brown, without clay							S/E			25/140 refusal
	18											
-15												
	19	Below 19m: grading to medium dense							S/E			2,1,10 N = 11
-16												

RIG: Comacchio 205 **DRILLER:** Ground Test **LOGGED:** LHS **CASING:** HW to 10.0m; HQ to 21.0m

TYPE OF BORING: Diacore to 0.2m, NDD to 0.93m, Diacore to 1.31m; Rotary wash bore 6.8m to 20.8m, NMLC Coring to 45.0m

WATER OBSERVATIONS: Water observed at 3.40m at 2:00pm on 12 July 2021

REMARKS: Location coordinates are in MGA94 Zone 56. ^SPT at 8.15m and 8.75m undertaken in HW casing; *Field replicate BD07/120721 taken at 12.0-12.45m depth and field replicate BD08/130721 taken at 20.5-20.95m depth

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: DPT Operator Pty Ltd
PROJECT: Cockle Bay Park Redevelopment
LOCATION: 241-249 Wheat Road, Sydney

SURFACE LEVEL: 3.3 AHD
EASTING: 333717
NORTHING: 6250585
DIP/AZIMUTH: 90°/--

BORE No: CW1
PROJECT No: 202546.00
DATE: 12 - 14/7/2021
SHEET 3 OF 5

RL	Depth (m)	Description of Strata	Degree of Weathering (EW HW MW SW FS FR)	Graphic Log	Rock Strength (Ex Low / Very Low / Low / Medium / High / Very High / Ex High)	Water	Fracture Spacing (m) (0.01 / 0.05 / 0.10 / 0.50 / 1.00)	Discontinuities (B - Bedding J - Joint S - Shear F - Fault)	Type	Core Rec. %	RQD %	Test Results & Comments
-17		SAND SP: medium to coarse, grey mottled orange-brown, trace clay, wet, dense, estuarine *(continued)*						Unless otherwise stated, rock is fractured along rough, planar bedding, dipping 0-10°				
		Below 20.4m: grading to pale brown mottled yellow-brown, possibly residual							S/E*			12,23,27 N = 50
	20.8											
	21	SANDSTONE: medium to coarse grained, red and orange-brown, very low to low strength, highly										PL(A) = 0.08 PL(A) = 0.2
-18								21.15m: Ds, 60mm				PL(A) = 0.2 PL(A) = 0.5
	21.45	weathered to moderately weathered, slightly fractured, Hawkesbury Sandstone										
								21.79m: B10°, pl, cly 3mm				PL(A) = 0.5
	22	SANDSTONE: medium to coarse grained, pale grey and orange-brown, distinctly and indistinctly bedded at 5-10°, medium strength, slightly weathered, Hawkesbury Sandstone						22.11-22.23m: J70°, pl, ro, fe stn	C	100	89	
-19								22.32m: B20°, un, ro, cln				
		Below 22.23m: becoming pale grey, fresh						22.79-22.95m: B20° (x2), pl, cly vn				PL(A) = 0.4
	23	Between 22.79-22.81m: carbonaceous laminations						23m: B0°, pl, cly 5mm				PL(A) = 0.7
-20	23.3											PL(A) = 1.3
		SANDSTONE: medium to coarse grained, pale grey, distinctly and indistinctly bedded at 5-20°, high strength, fresh, slightly fractured, Hawkesbury Sandstone										PL(A) = 1.1
	24							23.9m: B10°, pl, cly vn				
-21								24.4-24.47m: B10° (x2), pl, cly vn				PL(A) = 1.4
	25								C	100	98	
-22								25.33m: B5°, pl, cly vn				
												PL(A) = 1.2
	26											
-23												PL(A) = 1.5
	27											
-24								27.63m: B10°, pl, cly vn				PL(A) = 1.5
	28							27.84m: B0°, pl, cly vn	C	100	98	
-25		Between 28.4-29.3m: with siltstone specks and clasts										PL(A) = 1.7
	29											
-26								29.12m: B5°, un, ro, cln 29.19m: B0°, pl, cly vn				PL(A) = 2.2
								29.75m: B10°, pl, cly	C	100	94	

RIG: Comacchio 205 **DRILLER:** Ground Test **LOGGED:** LHS **CASING:** HW to 10.0m; HQ to 21.0m

TYPE OF BORING: Diacore to 0.2m, NDD to 0.93m, Diacore to 1.31m; Rotary wash bore 6.8m to 20.8m, NMLC Coring to 45.0m

WATER OBSERVATIONS: Water observed at 3.40m at 2:00pm on 12 July 2021

REMARKS: Location coordinates are in MGA94 Zone 56. ^SPT at 8.15m and 8.75m undertaken in HW casing; *Field replicate BD07/120721 taken at 12.0-12.45m depth and field replicate BD08/130721 taken at 20.5-20.95m depth

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: DPT Operator Pty Ltd
PROJECT: Cockle Bay Park Redevelopment
LOCATION: 241-249 Wheat Road, Sydney

SURFACE LEVEL: 3.3 AHD
EASTING: 333717
NORTHING: 6250585
DIP/AZIMUTH: 90°/--

BORE No: CW1
PROJECT No: 202546.00
DATE: 12 - 14/7/2021
SHEET 4 OF 5

RL	Depth (m)	Description of Strata	Degree of Weathering (EW HW MW SW FS FR)	Graphic Log	Rock Strength (Ex Low, Very Low, Low, Medium, High, Very High, Ex High)	Water	Fracture Spacing (m) (0.01, 0.05, 0.10, 0.50, 1.00)	Discontinuities (B - Bedding J - Joint S - Shear F - Fault)	Type	Core Rec. %	RQD %	Test Results & Comments
-27		SANDSTONE: medium to coarse grained, pale grey, distinctly and indistinctly bedded at 5-20°, high strength, fresh, slightly fractured, Hawkesbury Sandstone *(continued)*						2mm	C	100	94	PL(A) = 1.3
	30.92											PL(A) = 0.2
-28	31	SILTSTONE: dark grey, low strength with 40% clay bands, highly weathered, slightly fractured, Hawkesbury Sandstone						31.18m: Cs, 100mm				
	31.48	Between 31.28-31.36: medium grained sandstone bed						31.37m: Cs, 110mm				
	32	SANDSTONE: medium to coarse grained, pale grey, distinctly and indistinctly bedded 5-20°, high strength, fresh, unbroken, Hawkesbury Sandstone										PL(A) = 1.2
-29		Between 32.67-32.74m: with carbonaceous laminations, low strength							C	100	96	PL(A) = 1.4
	33	Between 32.99-34.44m: slightly fractured						32.99m: Cs, 15mm				
-30		Between 33.43-34.5m: with siltstone specks and clasts						33.37m: B5°, pl, cly 3mm				PL(A) = 2
	34							33.59m: B10°, un, ro, cln				
-31								34.44m: B0°, un, ro, cln				PL(A) = 1.4
	35	Between 34.79-34.81m: carbonaceous laminations										
		Between 34.85-36.4m: massive							C	100	100	PL(A) = 1.5
-32	36											
-33												PL(A) = 1.8
	37											
-34												PL(A) = 1.5
	38											
-35		Between 38.3-39.75m: massive							C	100	100	PL(A) = 1.4
	39							>>				
-36												PL(A) = 1.6

RIG: Comacchio 205 **DRILLER:** Ground Test **LOGGED:** LHS **CASING:** HW to 10.0m; HQ to 21.0m

TYPE OF BORING: Diacore to 0.2m, NDD to 0.93m, Diacore to 1.31m; Rotary wash bore 6.8m to 20.8m, NMLC Coring to 45.0m

WATER OBSERVATIONS: Water observed at 3.40m at 2:00pm on 12 July 2021

REMARKS: Location coordinates are in MGA94 Zone 56. ^SPT at 8.15m and 8.75m undertaken in HW casing; *Field replicate BD07/120721 taken at 12.0-12.45m depth and field replicate BD08/130721 taken at 20.5-20.95m depth

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: DPT Operator Pty Ltd
PROJECT: Cockle Bay Park Redevelopment
LOCATION: 241-249 Wheat Road, Sydney

SURFACE LEVEL: 3.3 AHD
EASTING: 333717
NORTHING: 6250585
DIP/AZIMUTH: 90°/--

BORE No: CW1
PROJECT No: 202546.00
DATE: 12 - 14/7/2021
SHEET 5 OF 5

RL	Depth (m)	Description of Strata	Degree of Weathering (EW HW MW SW FS FR)	Graphic Log	Rock Strength (Ex Low / Very Low / Low / Medium / High / Very High / Ex High)	Water	Fracture Spacing (m) (0.01 / 0.05 / 0.10 / 0.50 / 1.00)	Discontinuities (B - Bedding J - Joint S - Shear F - Fault)	Sampling & In Situ Testing: Type	Core Rec. %	RQD %	Test Results & Comments
-37		SANDSTONE: medium to coarse grained, pale grey, distinctly and indistinctly bedded 5-20°, high strength, fresh, unbroken, Hawkesbury Sandstone *(continued)*							C	100	100	PL(A) = 1.4
	41											
-38		Between 41.3-41.5m: siltstone breccia										
		Between 41.5-42.1m: with siltstone specks							C	100	100	PL(A) = 1.5
	42											
-39												PL(A) = 1.5
	43											
-40								43.3m: B10°, un, cly vn				PL(A) = 1.4
	44								C	100	100	
-41								44.16m: B10°, pl, cly vn				PL(A) = 1
	45 45.0	Bore discontinued at 45.0m - Limit of investigation										
-42												
	46											
-43												
	47											
-44												
	48											
-45												
	49											
-46												

RIG: Comacchio 205 **DRILLER:** Ground Test **LOGGED:** LHS **CASING:** HW to 10.0m; HQ to 21.0m

TYPE OF BORING: Diacore to 0.2m, NDD to 0.93m, Diacore to 1.31m; Rotary wash bore 6.8m to 20.8m, NMLC Coring to 45.0m

WATER OBSERVATIONS: Water observed at 3.40m at 2:00pm on 12 July 2021

REMARKS: Location coordinates are in MGA94 Zone 56. ^SPT at 8.15m and 8.75m undertaken in HW casing; *Field replicate BD07/120721 taken at 12.0-12.45m depth and field replicate BD08/130721 taken at 20.5-20.95m depth

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: DPT Operator Pty Ltd
PROJECT: Cockle Bay Park Redevelopment
LOCATION: 241-249 Wheat Road, Sydney

SURFACE LEVEL: 2.9 AHD
EASTING: 333732
NORTHING: 6250562
DIP/AZIMUTH: 90°/--

BORE No: CW2
PROJECT No: 202546.00
DATE: 9 - 13/7/2021
SHEET 1 OF 5

RL	Depth (m)	Description of Strata	Degree of Weathering (EW HW MW SW FS FR)	Graphic Log	Rock Strength (Ex Low / Very Low / Low / Medium / High / Very High / Ex High)	Water	Fracture Spacing (m) (0.01 / 0.05 / 0.10 / 0.50 / 1.00)	Discontinuities (B - Bedding J - Joint S - Shear F - Fault)	Sampling & In Situ Testing: Type	Core Rec. %	RQD %	Test Results & Comments
	0.06	ASPHALTIC CONCRETE							E			
		FILL/Sandy GRAVEL: fine to coarse igneous gravel, grey, fine to coarse sand, moist, appears moderately compacted							E			
	0.8	Below 0.2m: grading to fine to coarse sandstone gravel, brown, with bricks, trace steel bars, concrete rubble, glass fragments and possible charcoal, appears generally in a loose condition							E*			
	1.9	FILL/Gravelly SAND: fine to coarse sand, brown, with fine to coarse sandstone gravel, trace sandstone cobbles, moist, appears generally in a loose condition							E			
	2.6	FILL/CONCRETE										
		FILL/Clayey SAND: medium to coarse, brown and pale grey, silty clay, sandstone gravel, cobbles, boulders and brick fragments, wet, appears generally in a very loose to loose condition							S/E			3,2,1 N = 3
									S/E			1,2,2 N = 4
		Below 5.5m: appears generally in a medium dense condition							S/E			9,9,8 N = 17
									S/E			5,6,7 N = 13
		Between 7.6-8.3m: likely concrete rubble										
									S			10 refusal bouncing, no sample recovered
	9.4	Between 9.15-9.4m: piece of timber (possible sleeper)										
		Silty CLAY CL-CI: (continued on next page)										
	10.0											

RIG: Bobcat **DRILLER:** Ground Test **LOGGED:** JS **CASING:** HW to 2.35m; HQ to 20.6m

TYPE OF BORING: Diacore to 0.06m, NDD to 1.9m, Solid flight auger (TC Bit) to 2.35m, Rotary wash boring to 19.24m, NMLC Coring to 42.93m

WATER OBSERVATIONS: No free groundwater observed whilst augering

REMARKS: Location coordinates are in MGA94 Zone 56. *Field replicate BD02/20210630 taken at 0.9-1.0m; Groundwater well constructed: blank PVC 0.0 to 3.1m, Slotted PVC pipe 3.1 to 12.6m, backfill 0.0 to 0.6m, bentonite 0.6 to 2.6m, gravel 2.6 to 12.6m; gatic at surface

SAMPLING & IN SITU TESTING LEGEND

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

Douglas Partners
Geotechnics / Environment / Groundwater

BOREHOLE LOG

CLIENT: DPT Operator Pty Ltd
PROJECT: Cockle Bay Park Redevelopment
LOCATION: 241-249 Wheat Road, Sydney

SURFACE LEVEL: 2.9 AHD
EASTING: 333732
NORTHING: 6250562
DIP/AZIMUTH: 90°/--

BORE No: CW2
PROJECT No: 202546.00
DATE: 9 - 13/7/2021
SHEET 2 OF 5

RL	Depth (m)	Description of Strata	Degree of Weathering (EW HW MW SW FS FR)	Graphic Log	Rock Strength (Ex Low, Very Low, Low, Medium, High, Very High, Ex High)	Water	Fracture Spacing (m) (0.01, 0.05, 0.10, 0.50, 1.00)	Discontinuities (B - Bedding J - Joint S - Shear F - Fault)	Sampling & In Situ Testing: Type	Core Rec. %	RQD %	Test Results & Comments
-8	11	Silty CLAY CL-CI: low to medium plasticity, dark grey, with roots and rootlets, trace charcoal, w>PL, firm, estuarine							S/E S/E U_{50}			2,3,3 N = 6
-9	11.2 12	Silty SAND SM: medium to coarse, pale grey, with sandy clay beds, trace seashells, wet, loose, estuarine							S			3,4,5 N = 9
-10	12.5 13	Sandy CLAY CL-CI: low to medium plasticity, pale grey, brown and red-brown, with silt, clayey sand and silty clay beds, trace ironstone gravel, w>PL, firm with very soft to soft beds, estuarine							S			2,2,3 N = 5
-11	14											
-12	15								S			5,4,3 N = 7
-13	16								S			25/100 refusal bouncing, no sample recovered
-14	17											
-15	18							Unless otherwise stated, rock is fractured along rough, planar bedding dipping 0-10°, with ironstaining or clay coating				
-16	18.7 19	SANDSTONE: brown, pale grey and red-brown, apparently very low to low strength							S			10/50 refusal bouncing, no sample recovered
-17	19.24 20.0	SANDSTONE: (continued on next page)							C	100	97	PL(A) = 0.5

RIG: Bobcat **DRILLER:** Ground Test **LOGGED:** JS **CASING:** HW to 2.35m; HQ to 20.6m

TYPE OF BORING: Diacore to 0.06m, NDD to 1.9m, Solid flight auger (TC Bit) to 2.35m, Rotary wash boring to 19.24m, NMLC Coring to 42.93m

WATER OBSERVATIONS: No free groundwater observed whilst augering

REMARKS: Location coordinates are in MGA94 Zone 56. *Field replicate BD02/20210630 taken at 0.9-1.0m; Groundwater well constructed: blank PVC 0.0 to 3.1m, Slotted PVC pipe 3.1 to 12.6m, backfill 0.0 to 0.6m, bentonite 0.6 to 2.6m, gravel 2.6 to 12.6m; gatic at surface

SAMPLING & IN SITU TESTING LEGEND

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

Douglas Partners
Geotechnics / Environment / Groundwater

BOREHOLE LOG

CLIENT: DPT Operator Pty Ltd
PROJECT: Cockle Bay Park Redevelopment
LOCATION: 241-249 Wheat Road, Sydney

SURFACE LEVEL: 2.9 AHD
EASTING: 333732
NORTHING: 6250562
DIP/AZIMUTH: 90°/--

BORE No: CW2
PROJECT No: 202546.00
DATE: 9 - 13/7/2021
SHEET 3 OF 5

RL	Depth (m)	Description of Strata	Degree of Weathering (EW HW MW SW FS FR)	Graphic Log	Rock Strength (Ex Low, Very Low, Low, Medium, High, Very High, Ex High)	Water	Fracture Spacing (m) (0.01, 0.05, 0.10, 0.50, 1.00)	Discontinuities (B - Bedding J - Joint S - Shear F - Fault)	Type	Core Rec. %	RQD %	Test Results & Comments
-18	21	SANDSTONE: medium to coarse grained, brown, pale grey and red-brown, distinctly and indistinctly bedded at 0-10°, low to medium strength with very low strength bands, highly weathered to slightly weathered, fractured and slightly fractured, Hawkesbury Sandstone						20.54m: J60°, ir, ro, cln (healed) 20.57m: J40°, ir, ro, cly vn 20.64m: Ds, 30mm 21.05m: J50°, ir, ro, cly vn 21.15m: Ds, 10mm 21.32m: Ds, 10mm 21.44-21.46m: J50°(x2), pl, ro, cly co 21.52m: B0-10°, un, ro, cly co 5mm 21.62-21.76m: J70°, ir, ro, cly co 21.96-22.05m: J50°, pl, ro, cly vn 22.07-22.12m: J80°, ir, ro, cln 22.10-22.17m: J50°, pl, ro, cly vn 22.38m: J50°, pl, ro, cly vn 23.61m: Ds, 10mm 23.83m: J20°, pl ro, cly co 24.15m: J20°, pl, ro, cly vn 25.11m: B10°, pl, ro, cly co 5mm	C	100	97	PL(A) = 0.2
-19	22								C	100	25	PL(A) = 0.2
-20	22.75 23	SANDSTONE: medium to coarse grained, pale grey, distinctly and indistinctly bedded at 0-10°, 1-5% siltstone and carbonaceous laminations, low to medium strength, slightly weathered, slightly fractured, Hawkesbury Sandstone										PL(A) = 0.4
-21	24	Below 23.83m: medium to high strength, fresh										PL(A) = 0.6
-22	25								C	100	88	PL(A) = 1.1
-23	26											PL(A) = 0.9
-24	27											PL(A) = 1
-25	28								C	100	100	PL(A) = 1.3
-26	29											PL(A) = 1.2
-27	30.0	Between 29.45-29.51m: 25% siltstone clasts							C	100	98	PL(A) = 1.5

RIG: Bobcat **DRILLER:** Ground Test **LOGGED:** JS **CASING:** HW to 2.35m; HQ to 20.6m

TYPE OF BORING: Diacore to 0.06m, NDD to 1.9m, Solid flight auger (TC Bit) to 2.35m, Rotary wash boring to 19.24m, NMLC Coring to 42.93m

WATER OBSERVATIONS: No free groundwater observed whilst augering

REMARKS: Location coordinates are in MGA94 Zone 56. *Field replicate BD02/20210630 taken at 0.9-1.0m; Groundwater well constructed: blank PVC 0.0 to 3.1m, Slotted PVC pipe 3.1 to 12.6m, backfill 0.0 to 0.6m, bentonite 0.6 to 2.6m, gravel 2.6 to 12.6m; gatic at surface

SAMPLING & IN SITU TESTING LEGEND

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

Douglas Partners
Geotechnics / Environment / Groundwater

BOREHOLE LOG

CLIENT: DPT Operator Pty Ltd
PROJECT: Cockle Bay Park Redevelopment
LOCATION: 241-249 Wheat Road, Sydney

SURFACE LEVEL: 2.9 AHD
EASTING: 333732
NORTHING: 6250562
DIP/AZIMUTH: 90°/--

BORE No: CW2
PROJECT No: 202546.00
DATE: 9 - 13/7/2021
SHEET 4 OF 5

RL	Depth (m)	Description of Strata	Degree of Weathering (EW HW MW SW FS FR)	Graphic Log	Rock Strength (Ex Low / Very Low / Low / Medium / High / Very High / Ex High)	Water	Fracture Spacing (m) (0.01 / 0.05 / 0.10 / 0.50 / 1.00)	Discontinuities (B - Bedding J - Joint S - Shear F - Fault)	Type	Core Rec. %	RQD %	Test Results & Comments
-28		SANDSTONE: (continued)							C	100	98	
	31											PL(A) = 0.9
	31.15	SILTSTONE: dark grey, thinly laminated at 0-10°, low strength, fresh, slightly fractured, Hawkesbury Sandstone										PL(A) = 0.2
-29	31.82	Between 31.59-31.69m: sandstone bed, pale grey, medium strength						31.45m: J40°, pl, ro, cly vn 31.81m: Ds, 10mm				PL(A) = 0.6
	32	SANDSTONE: medium to coarse grained, pale grey, distinctly and indistinctly bedded at 0-10°, 1-5% siltstone laminations and clasts, medium to high strength, fresh, slightly fractured, Hawkesbury Sandstone										PL(A) = 1
-30									C	100	99	
	33											
		Between 33.45-33.47m: siltstone clasts										PL(A) = 0.8
-31	34							33.99-34.06m: B0-5°(x5), pl, ro, cly co				
	34.47	Between 34.43-34.47m: siltstone clasts										
-32		SANDSTONE: medium to coarse grained, pale grey, indistinctly bedded, 5% siltstone flecks, high strength, fresh, unbroken, Hawkesbury Sandstone										PL(A) = 1.3
	35								C	100	97	(UCS Sample 35.61-35.95m)
-33												PL(A) = 1.3
	36											
-34								>>				PL(A) = 1.3
	37											
-35												PL(A) = 1.2
	38								C	100	100	
-36												PL(A) = 1.3
	39											
-37												

RIG: Bobcat **DRILLER:** Ground Test **LOGGED:** JS **CASING:** HW to 2.35m; HQ to 20.6m

TYPE OF BORING: Diacore to 0.06m, NDD to 1.9m, Solid flight auger (TC Bit) to 2.35m, Rotary wash boring to 19.24m, NMLC Coring to 42.93m

WATER OBSERVATIONS: No free groundwater observed whilst augering

REMARKS: Location coordinates are in MGA94 Zone 56. *Field replicate BD02/20210630 taken at 0.9-1.0m; Groundwater well constructed: blank PVC 0.0 to 3.1m, Slotted PVC pipe 3.1 to 12.6m, backfill 0.0 to 0.6m, bentonite 0.6 to 2.6m, gravel 2.6 to 12.6m; gatic at surface

SAMPLING & IN SITU TESTING LEGEND

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

Douglas Partners
Geotechnics / Environment / Groundwater

BOREHOLE LOG

CLIENT: DPT Operator Pty Ltd
PROJECT: Cockle Bay Park Redevelopment
LOCATION: 241-249 Wheat Road, Sydney

SURFACE LEVEL: 2.9 AHD
EASTING: 333732
NORTHING: 6250562
DIP/AZIMUTH: 90°/--

BORE No: CW2
PROJECT No: 202546.00
DATE: 9 - 13/7/2021
SHEET 5 OF 5

RL	Depth (m)	Description of Strata	Degree of Weathering (EW HW MW SW FS FR)	Graphic Log	Rock Strength (Ex Low / Very Low / Low / Medium / High / Very High / Ex High)	Water	Fracture Spacing (m) (0.01 / 0.05 / 0.10 / 0.50 / 1.00)	Discontinuities (B - Bedding J - Joint S - Shear F - Fault)	Sampling & In Situ Testing: Type	Core Rec. %	RQD %	Test Results & Comments
-38	40.19	SANDSTONE: medium to coarse grained, pale grey, distinctly and indistinctly bedded at 0-10°, 5-10% dark grey siltstone laminations, medium strength, fresh, slightly fractured, Hawkesbury Sandstone						40.21m: Ds, 10mm	C	100	99	PL(A) = 1.4
	41	Between 40.99-41.33m: 20% siltstone clasts, up to 30mm										PL(A) = 0.7
-39	42								C	100	99	PL(A) = 0.6
		Between 42.33-42.38m: 10% siltstone clasts										
-40	42.76											PL(A) = 1.5
	42.93	SANDSTONE: fine to medium grained, grey, 10% dark grey siltstone laminations, high strength, fresh, slightly fractured, Hawkesbury Sandstone										
	43	Bore discontinued at 42.93m - Limit of investigation										
-41	44											
-42	45											
-43	46											
-44	47											
-45	48											
-46	49											
-47												

RIG: Bobcat **DRILLER:** Ground Test **LOGGED:** JS **CASING:** HW to 2.35m; HQ to 20.6m

TYPE OF BORING: Diacore to 0.06m, NDD to 1.9m, Solid flight auger (TC Bit) to 2.35m, Rotary wash boring to 19.24m, NMLC Coring to 42.93m

WATER OBSERVATIONS: No free groundwater observed whilst augering

REMARKS: Location coordinates are in MGA94 Zone 56. *Field replicate BD02/20210630 taken at 0.9-1.0m; Groundwater well constructed: blank PVC 0.0 to 3.1m, Slotted PVC pipe 3.1 to 12.6m, backfill 0.0 to 0.6m, bentonite 0.6 to 2.6m, gravel 2.6 to 12.6m; gatic at surface

SAMPLING & IN SITU TESTING LEGEND

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

Douglas Partners
Geotechnics / Environment / Groundwater

BOREHOLE LOG

CLIENT: DPT Operator Pty Ltd
PROJECT: Cockle Bay Park Redevelopment
LOCATION: 241-249 Wheat Road, Sydney

SURFACE LEVEL: 3.1 AHD
EASTING: 333747
NORTHING: 6250596
DIP/AZIMUTH: 90°/--

BORE No: CW3
PROJECT No: 202546.00
DATE: 8/7 - 11/8/2021
SHEET 1 OF 5

RL	Depth (m)	Description of Strata	Degree of Weathering (EW HW MW SW FS FR)	Graphic Log	Rock Strength (Ex Low / Very Low / Low / Medium / High / Very High / Ex High)	Water	Fracture Spacing (m) (0.01 / 0.05 / 0.10 / 0.50 / 1.00)	Discontinuities (B - Bedding J - Joint S - Shear F - Fault)	Sampling & In Situ Testing: Type	Core Rec. %	RQD %	Test Results & Comments
3	0.05	ASPHALTIC CONCRETE							E			
	0.45	FILL/Sandy GRAVEL: fine to coarse igneous gravel, dark grey, fine to coarse sand, possibly cement stablised, moist							E			
2	1.0	FILL/Silty Sandy GRAVEL: fine to coarse igneous and sandstone gravel, brown, fine to coarse sand, with sandstone cobbles, asphalt and concrete fragments, moist, appears loose							E			
		CONCRETE										
1	2.1	FILL/SAND: fine to medium, brown and pale grey, with fine gravel and shell fragments, generally very loose							S			1,0,1 N = 1 No sample recovered
0	3.0	CONCRETE										
	3.3	FILL/SAND: fine to coarse, brown and grey, with sandy clay, fine to medium gravel, concrete rubble, generally medium dense							S/E			6,5,8 N = 13
-1	5.0	Silty CLAY CL-CI: low to medium plasticity, grey, with fine sand, shell fragments, rootlets, w>PL, very soft, estuarine							S/E*			0,0,0 N = 0
-2	6.5	Silty SAND SW: fine to coarse, grey and brown, with pale grey sandy clay and shell fragments, wet, very loose, estuarine							U_{75}			No sample recovered
-3									S			2,2,0 N = 2
-4		Between 8.5-9.2m: sandy clay bed, pale grey, w>PL, stiff							S			3,6,6 N = 12
-5												
-6												

RIG: Bobcat **DRILLER:** Ground Test **LOGGED:** JS **CASING:** HW to 1.0m, HQ to 17.8m

TYPE OF BORING: NDD to 1.0m, Rotary wash boring to 17.22m, NMLC Coring to 40.48m

WATER OBSERVATIONS: No free ground water observed whilst augering

REMARKS: Location coordinates are in MGA94 Zone 56. *BD1/09.08.21 and PFAS taken at 5.7-6.15m depth
Standpipe installed to 15.0m, bentonite seal 0.5-2.5m, gravel pack 2.5-15.0m, screen length 3.0-15.0m

SAMPLING & IN SITU TESTING LEGEND

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

Douglas Partners
Geotechnics / Environment / Groundwater

BOREHOLE LOG

CLIENT: DPT Operator Pty Ltd
PROJECT: Cockle Bay Park Redevelopment
LOCATION: 241-249 Wheat Road, Sydney

SURFACE LEVEL: 3.1 AHD
EASTING: 333747
NORTHING: 6250596
DIP/AZIMUTH: 90°/--

BORE No: CW3
PROJECT No: 202546.00
DATE: 8/7 - 11/8/2021
SHEET 2 OF 5

RL	Depth (m)	Description of Strata	Degree of Weathering (EW HW MW SW FS FR)	Graphic Log	Rock Strength (Ex Low, Very Low, Low, Medium, High, Very High, Ex High)	Water	Fracture Spacing (m) (0.01, 0.05, 0.10, 0.50, 1.00)	Discontinuities (B - Bedding J - Joint S - Shear F - Fault)	Sampling & In Situ Testing: Type	Core Rec. %	RQD %	Test Results & Comments
-7		Silty SAND SW: fine to coarse, grey and brown, with pale grey sandy clay and shell fragments, wet, very loose, estuarine *(continued)*										
									S			3,1,0 N = 1 No sample recovered
-8	11 11.0	Sandy CLAY CL: low plasticity, pale grey, brown and red-brown, w>PL, stiff, estuarine										
-9	12								S			3,6,5 N = 11
	12.5	Silty SAND SW: fine to coarse, brown and pale grey, wet, very loose to loose, estuarine										
-10	13											
									S			4,2,2 N = 4
-11	14											
-12	15								S			7,4,1 N = 5
-13	16 16.0	Clayey SAND SW: medium to coarse, brown and red-brown, with very low strength sandstone bands, medium dense, residual						Unless otherwise stated, rock is fractured along rough planar bedding dipping at 0-10° with ironstaining or clay coating				
-14	17											
	17.22	SANDSTONE: medium to coarse grained, brown and red-brown, low then medium strength, moderately weathered, slightly fractured, Hawkesbury Sandstone						17.71m: Ds, 20mm	C	100	65	PL(A) = 0.1 PL(A) = 0.6
-15	18											
	18.26	SANDSTONE: medium to coarse grained, pale grey, distinctly and indistinctly bedded at 0-10°, medium to high then high strength, fresh, slightly fractured, Hawkesbury Sandstone							C	100	99	PL(A) = 0.9
-16	19											PL(A) = 1

RIG: Bobcat **DRILLER:** Ground Test **LOGGED:** JS **CASING:** HW to 1.0m, HQ to 17.8m

TYPE OF BORING: NDD to 1.0m, Rotary wash boring to 17.22m, NMLC Coring to 40.48m

WATER OBSERVATIONS: No free ground water observed whilst augering

REMARKS: Location coordinates are in MGA94 Zone 56. *BD1/09.08.21 and PFAS taken at 5.7-6.15m depth
Standpipe installed to 15.0m, bentonite seal 0.5-2.5m, gravel pack 2.5-15.0m, screen length 3.0-15.0m

SAMPLING & IN SITU TESTING LEGEND

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

Douglas Partners
Geotechnics / Environment / Groundwater

BOREHOLE LOG

CLIENT: DPT Operator Pty Ltd
PROJECT: Cockle Bay Park Redevelopment
LOCATION: 241-249 Wheat Road, Sydney

SURFACE LEVEL: 3.1 AHD
EASTING: 333747
NORTHING: 6250596
DIP/AZIMUTH: 90°/--

BORE No: CW3
PROJECT No: 202546.00
DATE: 8/7 - 11/8/2021
SHEET 3 OF 5

RL	Depth (m)	Description of Strata	Degree of Weathering (EW HW MW SW FS FR)	Graphic Log	Rock Strength (Ex Low / Very Low / Low / Medium / High / Very High / Ex High)	Water	Fracture Spacing (m) (0.01 / 0.05 / 0.10 / 0.50 / 1.00)	Discontinuities (B - Bedding J - Joint S - Shear F - Fault)	Sampling & In Situ Testing: Type	Core Rec. %	RQD %	Test Results & Comments
-17		SANDSTONE: medium to coarse grained, pale grey, distinctly and indistinctly bedded at 0-10°, medium to high then high strength, fresh, slightly fractured, Hawkesbury Sandstone *(continued)*							C	100	99	
-18	21								C	100	100	PL(A) = 0.9
		Between 21.80-22.00m: fine to medium grained										PL(A) = 1.1
-19	22							22.12m: Ds, 5mm				
-20	23								C	100	99	PL(A) = 0.9
-21	24											PL(A) = 1.3
-22	25											PL(A) = 1.7
-23	26								C	100	100	PL(A) = 1.1
		Between 26.30-26.36m: 20% siltstone clasts, up to 15mm										PL(A) = 1.4
-24	27											
-25	28							27.87m: B15°, ir, ro, cly co				PL(A) = 1.8
-26	29	29.05 INTERBEDDED SANDSTONE AND SILTSTONE: *refer to following page*							C	100	65	PL(A) = 1.3
								29.31-29.41m: J30°-50°(x3), pl, ro, cly vn				PL(A) = 0.4
	30.0											

RIG: Bobcat **DRILLER:** Ground Test **LOGGED:** JS **CASING:** HW to 1.0m, HQ to 17.8m

TYPE OF BORING: NDD to 1.0m, Rotary wash boring to 17.22m, NMLC Coring to 40.48m

WATER OBSERVATIONS: No free ground water observed whilst augering

REMARKS: Location coordinates are in MGA94 Zone 56. *BD1/09.08.21 and PFAS taken at 5.7-6.15m depth
Standpipe installed to 15.0m, bentonite seal 0.5-2.5m, gravel pack 2.5-15.0m, screen length 3.0-15.0m

SAMPLING & IN SITU TESTING LEGEND

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

Douglas Partners
Geotechnics / Environment / Groundwater

BOREHOLE LOG

CLIENT: DPT Operator Pty Ltd
PROJECT: Cockle Bay Park Redevelopment
LOCATION: 241-249 Wheat Road, Sydney

SURFACE LEVEL: 3.1 AHD
EASTING: 333747
NORTHING: 6250596
DIP/AZIMUTH: 90°/--

BORE No: CW3
PROJECT No: 202546.00
DATE: 8/7 - 11/8/2021
SHEET 4 OF 5

RL	Depth (m)	Description of Strata	Degree of Weathering (EW HW MW SW FS FR)	Graphic Log	Rock Strength (Ex Low / Very Low / Low / Medium / High / Very High / Ex High)	Water	Fracture Spacing (m) (0.01 0.05 0.10 0.50 1.00)	Discontinuities (B - Bedding J - Joint S - Shear F - Fault)	Sampling & In Situ Testing: Type	Core Rec. %	RQD %	Test Results & Comments
-27		INTERBEDDED SANDSTONE AND SILTSTONE: medium to coarse grained, pale grey sandstone, interbedded with 30-40% dark grey siltstone beds up to 200mm thick, medium strength, fresh, fractured to slightly fractured, Hawkesbury Sandstone						29.95m: Ds, 10mm 30.01-30.30m: J70°-80°, pl, ro, cln 30.09m: Ds, 10mm 30.12m: J70°-80°(x2), ir, ro, cln 30.33m: Ds, 5mm 30.36m: Ds, 80mm	C	100	65	
-28	31 30.95											PL(A) = 0.7
		SANDSTONE: medium to coarse grained, pale grey, distinctly and indistinctly bedded at 0-10°, 10% fine grained beds up to 80mm thick, medium to high strength, fresh, slightly fractured, Hawkesbury Sandstone										
-29	32											PL(A) = 0.9
	32.4	SANDSTONE: medium to coarse grained, pale grey, distinctly and indistinctly bedded at 0-10°, medium to high and high strength, fresh, slightly fractured to unbroken, Hawkesbury Sandstone						32.03-32.08m: B5°-10°(x3), pl, ro, cly co	C	100	94	
-30	33											PL(A) = 1.3
												PL(A) = 1
-31	34	Between 33.79-34.80m: 20% siltstone clasts up to 20mm						33.83m: Ds, 5mm				
-32	35											PL(A) = 1.3
									C	100	100	
-33	36											PL(A) = 1.1
-34	37								C	100	100	PL(A) = 1.2
									C	100	100	
-35	38											PL(A) = 1.1
-36	39	Between 39.60-39.65m: 50% siltstone clasts							C	100	100	PL(A) = 0.9
	39.98	39.7-39.98m: interbedded siltstone and sandstone										PL(A) = 0.9

RIG: Bobcat **DRILLER:** Ground Test **LOGGED:** JS **CASING:** HW to 1.0m, HQ to 17.8m

TYPE OF BORING: NDD to 1.0m, Rotary wash boring to 17.22m, NMLC Coring to 40.48m

WATER OBSERVATIONS: No free ground water observed whilst augering

REMARKS: Location coordinates are in MGA94 Zone 56. *BD1/09.08.21 and PFAS taken at 5.7-6.15m depth
Standpipe installed to 15.0m, bentonite seal 0.5-2.5m, gravel pack 2.5-15.0m, screen length 3.0-15.0m

SAMPLING & IN SITU TESTING LEGEND

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

Douglas Partners
Geotechnics / Environment / Groundwater

BOREHOLE LOG

CLIENT: DPT Operator Pty Ltd
PROJECT: Cockle Bay Park Redevelopment
LOCATION: 241-249 Wheat Road, Sydney

SURFACE LEVEL: 3.1 AHD
EASTING: 333747
NORTHING: 6250596
DIP/AZIMUTH: 90°/--

BORE No: CW3
PROJECT No: 202546.00
DATE: 8/7 - 11/8/2021
SHEET 5 OF 5

RL	Depth (m)	Description of Strata	Degree of Weathering (EW HW MW SW FS FR)	Graphic Log	Rock Strength (Ex Low / Very Low / Low / Medium / High / Very High / Ex High)	Water	Fracture Spacing (m) (0.01 / 0.05 / 0.10 / 0.50 / 1.00)	Discontinuities (B - Bedding J - Joint S - Shear F - Fault)	Sampling & In Situ Testing: Type	Core Rec. %	RQD %	Test Results & Comments
-37		SANDSTONE: medium grained, pale grey, indistinctly bedded, 10% siltstone flecks, high strength, fresh, slightly fractred to unbroken, Hawkesbury Sandstone *(continued)*							C	100	100	PL(A) = 1.3
	40.48	Bore discontinued at 40.48m - Limit of investigation										
-38	41											
-39	42											
-40	43											
-41	44											
-42	45											
-43	46											
-44	47											
-45	48											
-46	49											

RIG: Bobcat **DRILLER:** Ground Test **LOGGED:** JS **CASING:** HW to 1.0m, HQ to 17.8m

TYPE OF BORING: NDD to 1.0m, Rotary wash boring to 17.22m, NMLC Coring to 40.48m

WATER OBSERVATIONS: No free ground water observed whilst augering

REMARKS: Location coordinates are in MGA94 Zone 56. *BD1/09.08.21 and PFAS taken at 5.7-6.15m depth
Standpipe installed to 15.0m, bentonite seal 0.5-2.5m, gravel pack 2.5-15.0m, screen length 3.0-15.0m

SAMPLING & IN SITU TESTING LEGEND

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

Douglas Partners
Geotechnics / Environment / Groundwater

BOREHOLE LOG

CLIENT: DPT Operator Pty Ltd
PROJECT: Cockle Bay Park Redevelopment
LOCATION: 241-249 Wheat Road, Sydney

SURFACE LEVEL: 2.7 AHD
EASTING: 333753
NORTHING: 6250645
DIP/AZIMUTH: 90°/--

BORE No: CW4
PROJECT No: 202546.00
DATE: 14 - 15/7/2021
SHEET 1 OF 3

RL	Depth (m)	Description of Strata	Degree of Weathering (EW HW MW SW FS FR)	Graphic Log	Rock Strength (Ex Low, Very Low, Low, Medium, High, Very High, Ex High)	Water	Fracture Spacing (m) (0.01, 0.05, 0.10, 0.50, 1.00)	Discontinuities (B - Bedding J - Joint S - Shear F - Fault)	Sampling & In Situ Testing: Type	Core Rec. %	RQD %	Test Results & Comments
	0.06	ASPHALTIC CONCRETE							E			
	0.2	FILL/Sandy GRAVEL: fine to coarse igneous gravel, grey, fine to coarse sand, dry, appears moderately compacted							E			
	0.25	CONCRETE										
	1	FILL/Gravelly SAND: fine to coarse sand, brown, fine to coarse igneous and sandstone gravel, cobbles and brick fragments, moist, appears generally in a loose condition							E			
	1.7	Below 1.0m: with ceramic fragments, trace ash and charcoal							E			
	2	FILL/Clayey SAND: medium to coarse, grey and brown, with sandstone and igneous gravel and cobbles, building rubble (concrete and brick), moist, appears generally in a loose condition							A/E*			
						14-07-21			S/E			3,4,3 N = 7
	4	Between 4.4-5.8m: likely concrete rubble							S/E			0,1,1 N = 2 no sample recovered
	5	Between 5.0-5.2m: piece of timber (possible sleeper)										
	5.2	Silty CLAY CL-CI: low to medium plasticity, grey, with fine to medium sand, fine seashells, w>PL, very soft, estuarine							S/E			0,1,1 N = 2
	6								U_{75}			no sample recovered
	7								S			2,2,2 N = 4
	7.3	Sandy CLAY CL-CI: low to medium plasticity, brown, pale grey and red-brown, w>PL, soft to firm, estuarine										
	8											
	8.5	Silty SAND SM: medium to coarse, pale grey and brown, with clayey sand, wet, medium dense, alluvial						Unless otherwise stated, rock is fractured along rough, planar bedding dipping 0-10°, with ironstaining or clay coating	S			4,9,12 N = 21
	9											
	9.2	SANDSTONE: brown, apparently low to medium strength										
	9.46	SANDSTONE: (continued on next page)							C	100	96	PL(A) = 0.7
	10.0											

RIG: Bobcat **DRILLER:** Ground Test **LOGGED:** JS **CASING:** HW to 4.5m; HQ to 9.46m

TYPE OF BORING: Diacore to 0.06m, NDD to 1.5m, Solid flight auger (TC Bit) to 4.5m, Rotary wash boring to 9.46m, NMLC Coring to 25.0m

WATER OBSERVATIONS: Free groundwater observed at 2.8m depth whilst augering

REMARKS: Location coordinates are in MGA94 Zone 56. *Field replicate BD1/14.07.21 taken at 1.9-2.0m depth

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: DPT Operator Pty Ltd
PROJECT: Cockle Bay Park Redevelopment
LOCATION: 241-249 Wheat Road, Sydney

SURFACE LEVEL: 2.7 AHD
EASTING: 333753
NORTHING: 6250645
DIP/AZIMUTH: 90°/--

BORE No: CW4
PROJECT No: 202546.00
DATE: 14 - 15/7/2021
SHEET 2 OF 3

RL	Depth (m)	Description of Strata	Degree of Weathering (EW HW MW SW FS FR)	Graphic Log	Rock Strength (Ex Low, Very Low, Low, Medium, High, Very High, Ex High)	Water	Fracture Spacing (m) (0.01, 0.05, 0.10, 0.50, 1.00)	Discontinuities (B - Bedding J - Joint S - Shear F - Fault)	Sampling & In Situ Testing: Type	Core Rec. %	RQD %	Test Results & Comments
-8	11	SANDSTONE: medium to coarse grained, brown, pale grey and red-brown, distinctly and indistinctly bedded at 0-10°, medium then medium to high strength, moderately weathered, slightly fractured, Hawkesbury Sandstone							C	100	96	PL(A) = 0.8
-9	12											PL(A) = 1
-10	13								C	100	100	PL(A) = 1.1
-11	13.33	SANDSTONE: medium to coarse grained, pale grey, distinctly and indistinctly bedded at 0-10°, 1-5% carbonaceous laminations up to 3mm thick, high strength, fresh, slightly fractured then unbroken, Hawkesbury Sandstone										PL(A) = 1.7
-12	14											
-13	15											PL(A) = 1.2
-14	16								C	100	99	PL(A) = 1.2
-15	17											PL(A) = 1.1
-16	18											PL(A) = 1.4
-17	18.41	SANDSTONE: fine to medium grained, pale grey, distinctly bedded at 0-5°, high strength, fresh, slightly fractured, Hawkesbury Sandstone							C	100	97	
	19											PL(A) = 1.5
	19.19	Below 19.08m: 30-40% siltstone clasts and beds, up to 30mm thick						19.16m: Ds, 30mm				
		SANDSTONE: (continued next page)										
	20.0											PL(A) = 1.1

RIG: Bobcat **DRILLER:** Ground Test **LOGGED:** JS **CASING:** HW to 4.5m; HQ to 9.46m

TYPE OF BORING: Diacore to 0.06m, NDD to 1.5m, Solid flight auger (TC Bit) to 4.5m, Rotary wash boring to 9.46m, NMLC Coring to 25.0m

WATER OBSERVATIONS: Free groundwater observed at 2.8m depth whilst augering

REMARKS: Location coordinates are in MGA94 Zone 56. *Field replicate BD1/14.07.21 taken at 1.9-2.0m depth

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: DPT Operator Pty Ltd
PROJECT: Cockle Bay Park Redevelopment
LOCATION: 241-249 Wheat Road, Sydney

SURFACE LEVEL: 2.7 AHD
EASTING: 333753
NORTHING: 6250645
DIP/AZIMUTH: 90°/--

BORE No: CW4
PROJECT No: 202546.00
DATE: 14 - 15/7/2021
SHEET 3 OF 3

RL	Depth (m)	Description of Strata	Degree of Weathering (EW HW MW SW FS FR)	Graphic Log	Rock Strength (Ex Low / Very Low / Low / Medium / High / Very High / Ex High)	Water	Fracture Spacing (m) (0.01 / 0.05 / 0.10 / 0.50 / 1.00)	Discontinuities (B - Bedding J - Joint S - Shear F - Fault)	Sampling & In Situ Testing: Type	Core Rec. %	RQD %	Test Results & Comments
-18	21	SANDSTONE: medium to coarse grained, distinctly and indistinctly bedded at 0-10°, high strength, fresh, slightly fractured to unbroken, Hawkesbury Sandstone							C	100	97	
												PL(A) = 1.2
-19		Between 21.24-21.37m: fine to medium grained bed, medium to high strength						21.37m: Ds, 5mm				PL(A) = 0.9
	22								C	100	100	
-20		Between 22.62-24.16m: slightly weathered										
	23											PL(A) = 1.7
-21												
	24								C	100	100	PL(A) = 2.3 (UCS Sample 23.48-23.79m) PL(A) = 1.5
-22	25 25.0	Bore discontinued at 25.0m - Limit of investigation										
-23												
	26											
-24												
	27											
-25												
	28											
-26												
	29											
-27												

RIG: Bobcat **DRILLER:** Ground Test **LOGGED:** JS **CASING:** HW to 4.5m; HQ to 9.46m

TYPE OF BORING: Diacore to 0.06m, NDD to 1.5m, Solid flight auger (TC Bit) to 4.5m, Rotary wash boring to 9.46m, NMLC Coring to 25.0m

WATER OBSERVATIONS: Free groundwater observed at 2.8m depth whilst augering

REMARKS: Location coordinates are in MGA94 Zone 56. *Field replicate BD1/14.07.21 taken at 1.9-2.0m depth

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: DPT Operator Pty Ltd
PROJECT: Cockle Bay Park Redevelopment
LOCATION: 241-249 Wheat Road, Sydney

SURFACE LEVEL: 2.8 AHD
EASTING: 333715
NORTHING: 6250505
DIP/AZIMUTH: 90°/--

BORE No: CW5
PROJECT No: 202546.00
DATE: 7 - 8/7/2021
SHEET 1 OF 3

RL	Depth (m)	Description of Strata	Degree of Weathering (EW HW MW SW FS FR)	Graphic Log	Rock Strength (Ex Low / Very Low / Low / Medium / High / Very High / Ex High)	Water	Fracture Spacing (m) (0.01 / 0.05 / 0.10 / 0.50 / 1.00)	Discontinuities (B - Bedding J - Joint S - Shear F - Fault)	Sampling & In Situ Testing: Type	Core Rec. %	RQD %	Test Results & Comments
	0.06	ASPHALTIC CONCRETE										
	0.21	CONCRETE										
		FILL/Sandy GRAVEL: fine to coarse igneous gravel, grey, fine to coarse sand, with concrete rubble, dry, appears moderately compacted							E			
		Below 0.4m: grading to fine to coarse igneous and sandstone gravel, brown, with bricks and clay, trace siltstone, moist, appears generally in a loose condition							E			
	1.5	Below 1.1m: grading to sandstone cobbles							E			
		FILL/Sandy CLAY: low to medium plasticity, grey, with building rubble (concrete and brick), sandstone and igneous gravel and cobbles, w>PL,							A/E			
	2.65	appears generally in a soft condition							S			5,0,0 N = 0 no sample recovered
	2.9	VOID				07-07-21						
		FILL/Silty SAND: fine to medium, dark grey, with clay and fine to medium gravel, with seashells, wet, appears generally in a very loose condition							S			1,1,1 N = 2 no sample recovered
	5.0	Silty CLAY CH: high plasticity, dark grey, with rootlets, trace shells, w>PL, very soft, estuarine							A			
									S/E			0,1,1 N = 2
	6.5	Silty SAND SM: fine to medium, grey, with shells, wet, very loose, estuarine										
									S			1,0,0 N = 0
		Between 8.7m and 9.2m: apparently loose										
									U_{75}			no sample recovered
	10.0											

RIG: Bobcat **DRILLER:** Ground Test **LOGGED:** JS **CASING:** HW to 2.2m; HQ to 11.25m

TYPE OF BORING: Diacore to 0.06m, NDD to 1.5m, Solid flight auger (TC Bit) to 7.0m, Rotary wash boring to 14.15m, NMLC Coring to 22.65m

WATER OBSERVATIONS: Free groundwater observed at 2.8m depth whilst augering

REMARKS: Location coordinates are in MGA94 Zone 56. Groundwater well constructed: blank PVC 0.0 to 1.0m, Slotted PVC pipe 1.0 to 5.0m, backfill 0.0 to 0.3m, bentonite 0.3 to 1.0m, gravel 1.0 to 5.0m, bentonite 5.0 to 22.65m, gatic at surface

SAMPLING & IN SITU TESTING LEGEND

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

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Geotechnics / Environment / Groundwater

BOREHOLE LOG

CLIENT: DPT Operator Pty Ltd
PROJECT: Cockle Bay Park Redevelopment
LOCATION: 241-249 Wheat Road, Sydney

SURFACE LEVEL: 2.8 AHD
EASTING: 333715
NORTHING: 6250505
DIP/AZIMUTH: 90°/--

BORE No: CW5
PROJECT No: 202546.00
DATE: 7 - 8/7/2021
SHEET 2 OF 3

RL	Depth (m)	Description of Strata	Degree of Weathering (EW HW MW SW FS FR)	Graphic Log	Rock Strength (Ex Low, Very Low, Low, Medium, High, Very High, Ex High)	Water	Fracture Spacing (m) (0.01, 0.05, 0.10, 0.50, 1.00)	Discontinuities (B - Bedding J - Joint S - Shear F - Fault)	Sampling & In Situ Testing: Type	Core Rec. %	RQD %	Test Results & Comments
-8	11	Sandy CLAY CL: low plasticity, pale grey mottled brown and red-brown, w~PL, firm to stiff, estuarine										
									S			3,4,4 N = 8
-9	12											
	12.0	Clayey SAND SC: medium to coarse, pale grey, brown and red-brown, wet, loose, residual										
-10	13							Unless otherwise stated, rock is fractured along rough, planar bedding dipping 0-10°, with ironstaining or clay coating	S			4,2,5 N = 7
-11	13.85	SANDSTONE: brown, pale grey and red-brown, apparently low strength										
	14											
	14.15	SANDSTONE: medium to coarse grained, brown, pale grey and red-brown, distinctly and indistinctly bedded at 0-10°, low then medium strength, moderately weathered, slightly fractured, Hawkesbury Sandstone										
-12	15								C	100	88	PL(A) = 0.2
-13	16							15.84m: Ds, 70mm 16.30m: Ds, 120mm 16.50m: Ds, 120mm				PL(A) = 0.2
-14	17											PL(A) = 0.7
-15		Between 17.6-18.4m: slightly weathered										
	18								C	100	98	PL(A) = 0.6
-16	19											PL(A) = 0.8
		Below 19.08m: 5% carbonaceous laminations						19.08m: B10-50°, ir, ro, cbs co 19.47m: B10-30°, ir, ro, cbs vn				
-17	19.68							19.68m: Ds, 220mm				
	20.0	INTERBEDDED SILTSTONE AND SANDSTONE: (continued page 3)							C	100	86	PL(A) = 0.2

RIG: Bobcat **DRILLER:** Ground Test **LOGGED:** JS **CASING:** HW to 2.2m; HQ to 11.25m

TYPE OF BORING: Diacore to 0.06m, NDD to 1.5m, Solid flight auger (TC Bit) to 7.0m, Rotary wash boring to 14.15m, NMLC Coring to 22.65m

WATER OBSERVATIONS: Free groundwater observed at 2.8m depth whilst augering

REMARKS: Location coordinates are in MGA94 Zone 56. Groundwater well constructed: blank PVC 0.0 to 1.0m, Slotted PVC pipe 1.0 to 5.0m, backfill 0.0 to 0.3m, bentonite 0.3 to 1.0m, gravel 1.0 to 5.0m, bentonite 5.0 to 22.65m, gatic at surface

SAMPLING & IN SITU TESTING LEGEND

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

Douglas Partners
Geotechnics / Environment / Groundwater

BOREHOLE LOG

CLIENT: DPT Operator Pty Ltd
PROJECT: Cockle Bay Park Redevelopment
LOCATION: 241-249 Wheat Road, Sydney

SURFACE LEVEL: 2.8 AHD
EASTING: 333715
NORTHING: 6250505
DIP/AZIMUTH: 90°/--

BORE No: CW5
PROJECT No: 202546.00
DATE: 7 - 8/7/2021
SHEET 3 OF 3

RL	Depth (m)	Description of Strata	Degree of Weathering (EW HW MW SW FS FR)	Graphic Log	Rock Strength (Ex Low, Very Low, Low, Medium, High, Very High, Ex High)	Water	Fracture Spacing (m) (0.01, 0.05, 0.10, 0.50, 1.00)	Discontinuities (B - Bedding J - Joint S - Shear F - Fault)	Sampling & In Situ Testing: Type	Core Rec. %	RQD %	Test Results & Comments
-18	21	INTERBEDDED SILTSTONE AND SANDSTONE: dark grey, interbedded with 20-30% medium to coarse grained, pale grey sandstone with siltstone clasts up to 50mm, distinctly bedded at 0-20°, low then medium strength, fresh, slightly fractured, Hawkesbury Sandstone										PL(A) = 0.6
	21.12	SANDSTONE: medium to coarse grained, pale grey, distinctly and indistinctly bedded at 0-10°, 1-5% siltstone clasts and flecks, high strength, fresh, slightly fractured, Hawkesbury Sandstone						21.05m: Ds, 70mm	C	100	86	
-19	22	Between 21.90 and 22.05m: fine to medium grained bed						21.49m: J20°, pl, ro, cly vn				PL(A) = 1.7
	22.65	Bore discontinued at 22.65m - Limit of investigation										PL(A) = 1.5
-20	23											
-21	24											
-22	25											
-23	26											
-24	27											
-25	28											
-26	29											
-27												

RIG: Bobcat **DRILLER:** Ground Test **LOGGED:** JS **CASING:** HW to 2.2m; HQ to 11.25m

TYPE OF BORING: Diacore to 0.06m, NDD to 1.5m, Solid flight auger (TC Bit) to 7.0m, Rotary wash boring to 14.15m, NMLC Coring to 22.65m

WATER OBSERVATIONS: Free groundwater observed at 2.8m depth whilst augering

REMARKS: Location coordinates are in MGA94 Zone 56. Groundwater well constructed: blank PVC 0.0 to 1.0m, Slotted PVC pipe 1.0 to 5.0m, backfill 0.0 to 0.3m, bentonite 0.3 to 1.0m, gravel 1.0 to 5.0m, bentonite 5.0 to 22.65m, gatic at surface

SAMPLING & IN SITU TESTING LEGEND

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

Douglas Partners
Geotechnics / Environment / Groundwater

BOREHOLE LOG

CLIENT: DPT Operator Pty Ltd
PROJECT: Cockle Bay Park Redevelopment
LOCATION: 241-249 Wheat Road, Sydney

SURFACE LEVEL: 3.0 AHD
EASTING: 333762
NORTHING: 6250665
DIP/AZIMUTH: 90°/--

BORE No: CW6
PROJECT No: 202546.00
DATE: 16/7 - 3/8/2021
SHEET 1 OF 3

RL	Depth (m)	Description of Strata	Degree of Weathering (EW HW MW SW FS FR)	Graphic Log	Rock Strength (Ex Low, Very Low, Low, Medium, High, Very High, Ex High)	Water	Fracture Spacing (m) (0.01, 0.05, 0.10, 0.50, 1.00)	Discontinuities (B - Bedding J - Joint S - Shear F - Fault)	Sampling & In Situ Testing: Type	Core Rec. %	RQD %	Test Results & Comments
	0.06	ASPHALTIC CONCRETE							E			
		FILL/Sandy GRAVEL: fine to coarse igneous gravel, grey, fine to coarse sand, moist, appears moderately compacted							E*			
2	1	Below 0.3m: grading to fine to coarse sandstone gravel, brown, with bricks, with clay, trace siltstone, moist, appears loose							E			
		Below 1.0m: trace igneous gravel, trace glass										
	1.6	1.3m to 1.9m: with sandstone cobbles										
1	2	CONCRETE										
									S/E			4,4,7 N = 11
0	3	FILL/Clayey SAND: medium to coarse, brown, wet, generally in a loose condition										
	3.0											
-1	4								S/E			2,2,7 N = 9
-2	5	Sandy CLAY CL-CI: low to medium plasticity, dark grey, fine to medium sand, trace shell fragments, w>PL, very soft, estuarine							U_{75}			no recovery
	5.0											
-3	6								S/E			0,0,0 N = 0
	6.85											
-4	7	SAND SW: fine to medium, grey and brown, trace silty clay, trace shell fragments, medium dense, estuarine							S			2,5,6 N = 11
	7.9											
-5	8	SANDSTONE: medium to coarse grained, yellow-brown and pale pink-grey, distinctly and indistinctly bedded at 0-10°, medium strength, moderately and slightly weathered, slightly fractured, Hawkesbury Sandstone						Unless otherwise stated, rock is fractured along rough planar bedding dipping at 0-10° with ironstaining or clay veneer	C	100	100	PL(A) = 0.3
									C	100	100	
-6	9								C	100	100	PL(A) = 0.8
									C	100	100	
									C	100	96	
		Between 9.65-10.70m: becoming purple-brown, high strength						9.71-9.73m: J20°(x2), pl, ro, cly vn	C	100	100	PL(A) = 1

RIG: Bobcat **DRILLER:** Ground Test **LOGGED:** TM **CASING:** HW to 2.7m; HQ to 7.9m

TYPE OF BORING: NDD to 1.6m, Solid flight auger (TC Bit) to 1.7m, Rotary wash boring to 7.9m, NMLC Coring to 23.48m

WATER OBSERVATIONS: No free groundwater observed whilst augering

REMARKS: Location coordinates are in MGA94 Zone 56. *Blind duplicate BD01/20210630 taken at 0.5-0.6m depth; Groundwater well constructed: blank PVC 0.0 to 1.2m, Slotted PVC pipe 1.2 to 7.0m, backfill 0.0 to 0.2m, bentonite 0.2 to 0.7m, gravel 0.7 to 7.0m, bentonite 7.0 to 23.48m, gatic at surface

SAMPLING & IN SITU TESTING LEGEND

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

Douglas Partners
Geotechnics / Environment / Groundwater

BOREHOLE LOG

CLIENT: DPT Operator Pty Ltd
PROJECT: Cockle Bay Park Redevelopment
LOCATION: 241-249 Wheat Road, Sydney

SURFACE LEVEL: 3.0 AHD
EASTING: 333762
NORTHING: 6250665
DIP/AZIMUTH: 90°/--

BORE No: CW6
PROJECT No: 202546.00
DATE: 16/7 - 3/8/2021
SHEET 2 OF 3

RL	Depth (m)	Description of Strata	Degree of Weathering (EW HW MW SW FS FR)	Graphic Log	Rock Strength (Ex Low, Very Low, Low, Medium, High, Very High, Ex High)	Water	Fracture Spacing (m) (0.01, 0.05, 0.10, 0.50, 1.00)	Discontinuities (B - Bedding J - Joint S - Shear F - Fault)	Type	Core Rec. %	RQD %	Test Results & Comments
-7		SANDSTONE: medium to coarse grained, yellow-brown and pale pink-grey, distinctly and indistinctly bedded at 0-10°, medium strength, moderately and slightly weathered, slightly fractured, Hawkesbury Sandstone *(continued)*						9.92m: B0-5°, pl, ro, cly inf 5mm				
-8	11											PL(A) = 0.9
								11.12m: B0-5°, pl, he, cly inf 5mm	C	100	100	
-9	12											PL(A) = 0.8
								12.13m: B0-5°, pl, ro, fe stn, cly inf 5mm				
-10	13											PL(A) = 0.9
	13.67	SANDSTONE: medium to coarse grained, pale grey, distinctly and indistinctly bedded at 0-10°, medium to high strength, fresh, slightly fractured and unbroken, Hawkesbury Sandstone						13.68m: B0°, pl, ro, cbs stn				PL(A) = 1.6
-11	14								C	100	99	
-12	15											PL(A) = 1.6
								15.57m: B0°, pl, ro, cbs vn				
-13	16							15.85m: B0°, pl, ro, cbs/cly vn				PL(A) = 0.9
												PL(A) = 0.9
-14	17	Between 16.88-16.93m: siltstone clast						16.83m: B0-5°, pl, ro, cbs vn				PL(A) = 1
-15	18											PL(A) = 0.9
								18.13m: B5-10°, pl, ro, cbs vn				
-16	19								C	100	100	PL(A) = 0.8
									C	100	100	

RIG: Bobcat **DRILLER:** Ground Test **LOGGED:** TM **CASING:** HW to 2.7m; HQ to 7.9m

TYPE OF BORING: NDD to 1.6m, Solid flight auger (TC Bit) to 1.7m, Rotary wash boring to 7.9m, NMLC Coring to 23.48m

WATER OBSERVATIONS: No free groundwater observed whilst augering

REMARKS: Location coordinates are in MGA94 Zone 56. *Blind duplicate BD01/20210630 taken at 0.5-0.6m depth; Groundwater well constructed: blank PVC 0.0 to 1.2m, Slotted PVC pipe 1.2 to 7.0m, backfill 0.0 to 0.2m, bentonite 0.2 to 0.7m, gravel 0.7 to 7.0m, bentonite 7.0 to 23.48m, gatic at surface

SAMPLING & IN SITU TESTING LEGEND

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

Douglas Partners
Geotechnics / Environment / Groundwater

BOREHOLE LOG

CLIENT: DPT Operator Pty Ltd
PROJECT: Cockle Bay Park Redevelopment
LOCATION: 241-249 Wheat Road, Sydney

SURFACE LEVEL: 3.0 AHD
EASTING: 333762
NORTHING: 6250665
DIP/AZIMUTH: 90°/--

BORE No: CW6
PROJECT No: 202546.00
DATE: 16/7 - 3/8/2021
SHEET 3 OF 3

RL	Depth (m)	Description of Strata	Degree of Weathering (EW HW MW SW FS FR)	Graphic Log	Rock Strength (Ex Low / Very Low / Low / Medium / High / Very High / Ex High)	Water	Fracture Spacing (m) (0.01 / 0.05 / 0.10 / 0.50 / 1.00)	Discontinuities (B - Bedding J - Joint S - Shear F - Fault)	Sampling & In Situ Testing: Type	Core Rec. %	RQD %	Test Results & Comments
-17		SANDSTONE: medium to coarse grained, pale grey, distinctly and indistinctly bedded at 0-10°, medium to high strength, fresh, slightly fractured and unbroken, Hawkesbury Sandstone *(continued)*										PL(A) = 0.8
-18	21								C	100	100	PL(A) = 1
-19	22											PL(A) = 1.1
									C	100	100	
-20	23											PL(A) = 1.1
	23.48	Bore discontinued at 23.48m - Limit of investigation										PL(A) = 1.1
-21	24											
-22	25											
-23	26											
-24	27											
-25	28											
-26	29											

RIG: Bobcat **DRILLER:** Ground Test **LOGGED:** TM **CASING:** HW to 2.7m; HQ to 7.9m

TYPE OF BORING: NDD to 1.6m, Solid flight auger (TC Bit) to 1.7m, Rotary wash boring to 7.9m, NMLC Coring to 23.48m

WATER OBSERVATIONS: No free groundwater observed whilst augering

REMARKS: Location coordinates are in MGA94 Zone 56. *Blind duplicate BD01/20210630 taken at 0.5-0.6m depth; Groundwater well constructed: blank PVC 0.0 to 1.2m, Slotted PVC pipe 1.2 to 7.0m, backfill 0.0 to 0.2m, bentonite 0.2 to 0.7m, gravel 0.7 to 7.0m, bentonite 7.0 to 23.48m, gatic at surface.

SAMPLING & IN SITU TESTING LEGEND

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

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Geotechnics / Environment / Groundwater

BOREHOLE LOG

CLIENT: DPT Operator Pty Ltd
PROJECT: Cockle Bay Park Redevelopment
LOCATION: 241-249 Wheat Road, Sydney

SURFACE LEVEL: 2.8 AHD
EASTING: 333748
NORTHING: 6250687
DIP/AZIMUTH: 90°/--

BORE No: CW7
PROJECT No: 202546.00
DATE: 6/7 - 5/8/2021
SHEET 1 OF 2

RL	Depth (m)	Description of Strata	Degree of Weathering (EW HW MW SW FS FR)	Graphic Log	Rock Strength (Ex Low / Very Low / Low / Medium / High / Very High / Ex High)	Water	Fracture Spacing (m) (0.01 / 0.05 / 0.10 / 0.50 / 1.00)	Discontinuities (B - Bedding J - Joint S - Shear F - Fault)	Type	Core Rec. %	RQD %	Test Results & Comments
	0.07	PAVER										
	0.1	FILL/SAND: medium to coarse, brown, moist							E*			
									B			
	0.8	FILL/Sandy GRAVEL: medium to coarse igneous gravel, brown, fine to coarse sand, trace silt, moist, appears moderately compacted							E			
		Below 0.4m: appears poorly compacted							B			
		FILL/SAND: fine to coarse, brown, trace coarse sandstone gravel, moist, appears poorly compacted										
	2.0	1.3-2.0m: with brick and ceramic fragments							A			
		FILL/SAND: fine to coarse, dark brown and brown, trace clay, fine to coarse sandstone gravel, moist, very loose							S			0,2,2 N = 4
		3.5m: becoming dark grey and grey							S			1,2,2 N = 4
		4.8-4.9m: possible concrete rubble										
	5.3	Sandy CLAY CL-CI: low to medium plasticity, dark grey, medium to coarse, with silt, trace rootlets and shell fragments, w>PL, very soft, estuarine						Unless otherwise stated, rock is fractured along rough, planar bedding dipping at 0-10° with clay veneer	S			0,0,0 N = 0
									U			
	7.3	SANDSTONE: brown, apparently low to medium strength							S			0,0,25/100 refusal
	7.5	SANDSTONE: medium to coarse grained, red-brown and pale brown, cross bedded at 0-10°, medium strength, moderately weathered, slightly fractured, Hawkesbury Sandstone						8.35m: B0-10°, un, he, fe stn 8.45m: B0-10°, un, he, fe stn 8.55m: B0-5°, pl, he, fe stn 8.61m: B0-5°, pl, he, fe stn	C	100	97	PL(A) = 0.7 PL(A) = 0.9
									C	100	100	PL(A) = 0.7

RIG: Bobcat **DRILLER:** Ground Test **LOGGED:** LHS/YB **CASING:** HW to 7.5m; HQ to 8.0m

TYPE OF BORING: NDD to 2.0m,Solid flight auger (TC bit) to 4.0m, Rotary wash boring to 7.5m, NMLC Coring to 16.79m

WATER OBSERVATIONS: No free groundwater observed whilst augering

REMARKS: Location coordinates are in MGA94 Zone 56. *Blind duplicate BD03/060721 taken at 0.4-0.5m depth

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: DPT Operator Pty Ltd
PROJECT: Cockle Bay Park Redevelopment
LOCATION: 241-249 Wheat Road, Sydney

SURFACE LEVEL: 2.8 AHD
EASTING: 333748
NORTHING: 6250687
DIP/AZIMUTH: 90°/--

BORE No: CW7
PROJECT No: 202546.00
DATE: 6/7 - 5/8/2021
SHEET 2 OF 2

RL	Depth (m)	Description of Strata	Degree of Weathering (EW HW MW SW FS FR)	Graphic Log	Rock Strength (Ex Low, Very Low, Low, Medium, High, Very High, Ex High)	Water	Fracture Spacing (m) (0.01, 0.05, 0.10, 0.50, 1.00)	Discontinuities (B - Bedding J - Joint S - Shear F - Fault)	Sampling & In Situ Testing: Type	Core Rec. %	RQD %	Test Results & Comments
-8	11	SANDSTONE: medium to coarse grained, red-brown and pale brown, cross bedded at 0-10°, medium strength, moderately weathered, slightly fractured, Hawkesbury Sandstone *(continued)*						10.57m: B0°, pl, ro, fe stn, cly vn	C	100	100	PL(A) = 0.8
-9	12							11.89m: B0-5°, pl, ro, fe stn, cly vn	C	100	100	PL(A) = 0.8 PL(A) = 0.8
-10	13							13.03m: B0°, pl, ro, cbs/cly vn				PL(A) = 1.3
-11	13.42	SANDSTONE: medium to coarse grained, pale grey, distinctly and indistinctly bedded at 0-10°, medium to high strength, fresh, slightly fractured, Hawkesbury Sandstone										
-12	14							14.18m: B0°, pl, ro, cbs vn 14.5m: B0°, pl, ro, cbs stn				PL(A) = 0.7
-13	15								C	100	100	PL(A) = 1.1
-14	16							15.76m: B0°, pl, ro, cly inf 5mm 15.87m: Cs 20mm				PL(A) = 0.8
-15	16.79	Bore discontinued at 16.79m - Limit of investigation										PL(A) = 0.7
-16	17											
-17	18											
	19											

RIG: Bobcat **DRILLER:** Ground Test **LOGGED:** LHS/YB **CASING:** HW to 7.5m; HQ to 8.0m

TYPE OF BORING: NDD to 2.0m,Solid flight auger (TC bit) to 4.0m, Rotary wash boring to 7.5m, NMLC Coring to 16.79m

WATER OBSERVATIONS: No free groundwater observed whilst augering

REMARKS: Location coordinates are in MGA94 Zone 56. *Blind duplicate BD03/060721 taken at 0.4-0.5m depth

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: DPT Operator Pty Ltd
PROJECT: Cockle Bay Park Redevelopment
LOCATION: 241-249 Wheat Road, Sydney

SURFACE LEVEL: 2.9 AHD
EASTING: 333757
NORTHING: 6250686
DIP/AZIMUTH: 90°/--

BORE No: R1-A328
PROJECT No: 202546.00
DATE:
SHEET 1 OF 2

RL	Depth (m)	Description of Strata	Degree of Weathering (EW HW MW SW FS FR)	Graphic Log	Rock Strength (Ex Low, Very Low, Low, Medium, High, Very High, Ex High)	Water	Fracture Spacing (m) (0.01, 0.05, 0.10, 0.50, 1.00)	Discontinuities (B - Bedding, J - Joint, S - Shear, F - Fault)	Sampling & In Situ Testing: Type	Core Rec. %	RQD %	Test Results & Comments
2												
1												
0												
-1												
-2	4.9											
-3	6.4											
-4	7.6											
-5												
-6												
-7												

RIG: **DRILLER:** **LOGGED:** **CASING:**

TYPE OF BORING:

WATER OBSERVATIONS:

REMARKS: Location coordinates are in MGA94 Zone 56.

SAMPLING & IN SITU TESTING LEGEND

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

Douglas Partners
Geotechnics / Environment / Groundwater

BOREHOLE LOG

CLIENT: DPT Operator Pty Ltd
PROJECT: Cockle Bay Park Redevelopment
LOCATION: 241-249 Wheat Road, Sydney

SURFACE LEVEL: 2.9 AHD
EASTING: 333757
NORTHING: 6250686
DIP/AZIMUTH: 90°/--

BORE No: R1-A328
PROJECT No: 202546.00
DATE:
SHEET 2 OF 2

RL	Depth (m)	Description of Strata	Degree of Weathering (EW HW MW SW FS FR)	Graphic Log	Rock Strength (Ex Low, Very Low, Low, Medium, High, Very High, Ex High)	Water	Fracture Spacing (m) (0.01, 0.05, 0.10, 0.50, 1.00)	Discontinuities (B - Bedding, J - Joint, S - Shear, F - Fault)	Sampling & In Situ Testing: Type	Core Rec. %	RQD %	Test Results & Comments
-8	11											
-9	12											
-10	13											
	13.7											
-11	14											
-12	15											
-13	16											
-14	17											
-15	18											
-16	19											
-17												

RIG: **DRILLER:** **LOGGED:** **CASING:**

TYPE OF BORING:

WATER OBSERVATIONS:

REMARKS: Location coordinates are in MGA94 Zone 56.

SAMPLING & IN SITU TESTING LEGEND

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

Douglas Partners
Geotechnics / Environment / Groundwater

BOREHOLE LOG

CLIENT: DPT Operator Pty Ltd
PROJECT: Cockle Bay Park Redevelopment
LOCATION: 241-249 Wheat Road, Sydney

SURFACE LEVEL: 3.1 AHD
EASTING: 333780
NORTHING: 6250582
DIP/AZIMUTH: 90°/--

BORE No: R1-B59
PROJECT No: 202546.00
DATE:
SHEET 1 OF 2

RL	Depth (m)	Description of Strata	Degree of Weathering (EW HW MW SW FS FR)	Graphic Log	Rock Strength (Ex Low, Very Low, Low, Medium, High, Very High, Ex High)	Water	Fracture Spacing (m) (0.01, 0.05, 0.10, 0.50, 1.00)	Discontinuities (B - Bedding J - Joint S - Shear F - Fault)	Sampling & In Situ Testing: Type	Core Rec. %	RQD %	Test Results & Comments
3												
2	1											
1	2											
0	3											
	3.8							3.8m: CORE LOSS: 6900mm				
-1	4											
-2	5											
-3	6											
-4	7											
-5	8											
-6	9											

RIG: **DRILLER:** **LOGGED:** **CASING:**

TYPE OF BORING:

WATER OBSERVATIONS:

REMARKS: Location coordinates are in MGA94 Zone 56.

SAMPLING & IN SITU TESTING LEGEND

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

Douglas Partners
Geotechnics / Environment / Groundwater

BOREHOLE LOG

CLIENT: DPT Operator Pty Ltd
PROJECT: Cockle Bay Park Redevelopment
LOCATION: 241-249 Wheat Road, Sydney

SURFACE LEVEL: 3.1 AHD
EASTING: 333780
NORTHING: 6250582
DIP/AZIMUTH: 90°/--

BORE No: R1-B59
PROJECT No: 202546.00
DATE:
SHEET 2 OF 2

RL	Depth (m)	Description of Strata	Degree of Weathering (EW HW MW SW FS FR)	Graphic Log	Rock Strength (Ex Low, Very Low, Low, Medium, High, Very High, Ex High)	Water	Fracture Spacing (m) (0.01, 0.05, 0.10, 0.50, 1.00)	Discontinuities (B - Bedding, J - Joint, S - Shear, F - Fault)	Sampling & In Situ Testing: Type	Core Rec. %	RQD %	Test Results & Comments
-7												
	10.7											
-8	11											
-9	12											
-10	13											
-11	14											
-12	15											
-13	16											
	16.6											
-14	17											
-15	18											
-16	19											

RIG: **DRILLER:** **LOGGED:** **CASING:**

TYPE OF BORING:

WATER OBSERVATIONS:

REMARKS: Location coordinates are in MGA94 Zone 56.

SAMPLING & IN SITU TESTING LEGEND

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

Douglas Partners
Geotechnics / Environment / Groundwater

BOREHOLE LOG

CLIENT: DPT Operator Pty Ltd
PROJECT: Cockle Bay Park Redevelopment
LOCATION: 241-249 Wheat Road, Sydney

SURFACE LEVEL: 2.4 AHD
EASTING: 333745
NORTHING: 6250584
DIP/AZIMUTH: 90°/--

BORE No: R1-D28
PROJECT No: 202546.00
DATE:
SHEET 1 OF 3

RL	Depth (m)	Description of Strata	Degree of Weathering (EW HW MW SW FS FR)	Graphic Log	Rock Strength (Ex Low, Very Low, Low, Medium, High, Very High, Ex High)	Water	Fracture Spacing (m) (0.01, 0.05, 0.10, 0.50, 1.00)	Discontinuities (B - Bedding, J - Joint, S - Shear, F - Fault)	Sampling & In Situ Testing: Type	Core Rec. %	RQD %	Test Results & Comments
2.4	0											
	3.7											
	6.6											

RIG: **DRILLER:** **LOGGED:** **CASING:**

TYPE OF BORING:

WATER OBSERVATIONS:

REMARKS: Location coordinates are in MGA94 Zone 56.

SAMPLING & IN SITU TESTING LEGEND

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

Douglas Partners
Geotechnics / Environment / Groundwater

BOREHOLE LOG

CLIENT: DPT Operator Pty Ltd
PROJECT: Cockle Bay Park Redevelopment
LOCATION: 241-249 Wheat Road, Sydney

SURFACE LEVEL: 2.4 AHD
EASTING: 333745
NORTHING: 6250584
DIP/AZIMUTH: 90°/--

BORE No: R1-D28
PROJECT No: 202546.00
DATE:
SHEET 2 OF 3

RL	Depth (m)	Description of Strata	Degree of Weathering (EW HW MW SW FS FR)	Graphic Log	Rock Strength (Ex Low, Very Low, Low, Medium, High, Very High, Ex High)	Water	Fracture Spacing (m) (0.01, 0.05, 0.10, 0.50, 1.00)	Discontinuities (B - Bedding, J - Joint, S - Shear, F - Fault)	Sampling & In Situ Testing: Type	Core Rec. %	RQD %	Test Results & Comments
-8	11											
-9	12											
-10	12.2											
	13											
-11												
	14											
-12	14.9											
	15											
-13												
	16											
-14												
	17											
-15												
	18											
-16												
	19											
-17												

RIG: **DRILLER:** **LOGGED:** **CASING:**

TYPE OF BORING:

WATER OBSERVATIONS:

REMARKS: Location coordinates are in MGA94 Zone 56.

SAMPLING & IN SITU TESTING LEGEND

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

Douglas Partners
Geotechnics / Environment / Groundwater

BOREHOLE LOG

CLIENT: DPT Operator Pty Ltd
PROJECT: Cockle Bay Park Redevelopment
LOCATION: 241-249 Wheat Road, Sydney

SURFACE LEVEL: 2.4 AHD
EASTING: 333745
NORTHING: 6250584
DIP/AZIMUTH: 90°/--

BORE No: R1-D28
PROJECT No: 202546.00
DATE:
SHEET 3 OF 3

RL	Depth (m)	Description of Strata	Degree of Weathering (EW HW MW SW FS FR)	Graphic Log	Rock Strength (Ex Low, Very Low, Low, Medium, High, Very High, Ex High)	Water	Fracture Spacing (m) (0.01, 0.05, 0.10, 0.50, 1.00)	Discontinuities (B - Bedding J - Joint S - Shear F - Fault)	Sampling & In Situ Testing: Type	Core Rec. %	RQD %	Test Results & Comments
-18	21											
-19	22											
-20	22.8											
-21	23											
-22	24											
-23	25											
-24	26											
-25	27											
-26	28											
-27	29											

RIG: **DRILLER:** **LOGGED:** **CASING:**

TYPE OF BORING:

WATER OBSERVATIONS:

REMARKS: Location coordinates are in MGA94 Zone 56.

SAMPLING & IN SITU TESTING LEGEND

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

Douglas Partners
Geotechnics / Environment / Groundwater

BOREHOLE LOG

CLIENT: DPT Operator Pty Ltd
PROJECT: Cockle Bay Park Redevelopment
LOCATION: 241-249 Wheat Road, Sydney

SURFACE LEVEL: 3.1 AHD
EASTING: 333763
NORTHING: 6250580
DIP/AZIMUTH: 90°/--

BORE No: R1-D40
PROJECT No: 202546.00
DATE:
SHEET 1 OF 3

RL	Depth (m)	Description of Strata	Degree of Weathering (EW HW MW SW FS FR)	Graphic Log	Rock Strength (Ex Low, Very Low, Low, Medium, High, Very High, Ex High)	Water	Fracture Spacing (m) (0.01, 0.05, 0.10, 0.50, 1.00)	Discontinuities (B - Bedding J - Joint S - Shear F - Fault)	Sampling & In Situ Testing: Type	Core Rec. %	RQD %	Test Results & Comments
3												
2	1											
1	2											
0	3											
-1	4	4.0										
-2	5											
-3	6											
-4	7											
-5	8											
-6	9											

RIG: **DRILLER:** **LOGGED:** **CASING:**

TYPE OF BORING:

WATER OBSERVATIONS:

REMARKS: Location coordinates are in MGA94 Zone 56.

SAMPLING & IN SITU TESTING LEGEND

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

Douglas Partners
Geotechnics / Environment / Groundwater

BOREHOLE LOG

CLIENT: DPT Operator Pty Ltd
PROJECT: Cockle Bay Park Redevelopment
LOCATION: 241-249 Wheat Road, Sydney

SURFACE LEVEL: 3.1 AHD
EASTING: 333763
NORTHING: 6250580
DIP/AZIMUTH: 90°/--

BORE No: R1-D40
PROJECT No: 202546.00
DATE:
SHEET 2 OF 3

RL	Depth (m)	Description of Strata	Degree of Weathering (EW HW MW SW FS FR)	Graphic Log	Rock Strength (Ex Low, Very Low, Low, Medium, High, Very High, Ex High)	Water	Fracture Spacing (m) (0.01, 0.05, 0.10, 0.50, 1.00)	Discontinuities (B - Bedding, J - Joint, S - Shear, F - Fault)	Sampling & In Situ Testing: Type	Core Rec. %	RQD %	Test Results & Comments
-7												
-8	11											
-9	12											
	12.3											
-10	13											
-11	14											
-12	15											
-13	16											
-14	17											
-15	18											
-16	19											

RIG: **DRILLER:** **LOGGED:** **CASING:**

TYPE OF BORING:

WATER OBSERVATIONS:

REMARKS: Location coordinates are in MGA94 Zone 56.

SAMPLING & IN SITU TESTING LEGEND

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

Douglas Partners
Geotechnics / Environment / Groundwater

BOREHOLE LOG

CLIENT: DPT Operator Pty Ltd
PROJECT: Cockle Bay Park Redevelopment
LOCATION: 241-249 Wheat Road, Sydney

SURFACE LEVEL: 3.1 AHD
EASTING: 333763
NORTHING: 6250580
DIP/AZIMUTH: 90°/--

BORE No: R1-D40
PROJECT No: 202546.00
DATE:
SHEET 3 OF 3

RL	Depth (m)	Description of Strata	Degree of Weathering (EW HW MW SW FS FR)	Graphic Log	Rock Strength (Ex Low, Very Low, Low, Medium, High, Very High, Ex High)	Water	Fracture Spacing (m) (0.01, 0.05, 0.10, 0.50, 1.00)	Discontinuities (B - Bedding J - Joint S - Shear F - Fault)	Sampling & In Situ Testing: Type	Core Rec. %	RQD %	Test Results & Comments
-17												
	20.7											
-18	21											
-19	22											
-20	23											
-21	24											
-22	25											
-23	26											
-24	27											
-25	28											
-26	29											

RIG: **DRILLER:** **LOGGED:** **CASING:**

TYPE OF BORING:

WATER OBSERVATIONS:

REMARKS: Location coordinates are in MGA94 Zone 56.

SAMPLING & IN SITU TESTING LEGEND

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

Douglas Partners
Geotechnics / Environment / Groundwater

BOREHOLE LOG

CLIENT: DPT Operator Pty Ltd
PROJECT: Cockle Bay Park Redevelopment
LOCATION: 241-249 Wheat Road, Sydney

SURFACE LEVEL: -5.2 AHD
EASTING: 333694
NORTHING: 6250572
DIP/AZIMUTH: 90°/--

BORE No: R2-L1
PROJECT No: 202546.00
DATE:
SHEET 1 OF 2

RL	Depth (m)	Description of Strata	Degree of Weathering (EW HW MW SW FS FR)	Graphic Log	Rock Strength (Ex Low, Very Low, Low, Medium, High, Very High, Ex High)	Water	Fracture Spacing (m) (0.01, 0.05, 0.10, 0.50, 1.00)	Discontinuities (B - Bedding, J - Joint, S - Shear, F - Fault)	Sampling & In Situ Testing: Type	Core Rec. %	RQD %	Test Results & Comments
-6	1											
-7	2	2.0										
-8	3											
-9	4	3.7										
-10	5											
-11	6											
-12	7											
-13	8	7.8										
-14	9	9.1										
		9.4										
-15												

RIG: **DRILLER:** **LOGGED:** **CASING:**

TYPE OF BORING:

WATER OBSERVATIONS:

REMARKS: Location coordinates are in MGA94 Zone 56.

SAMPLING & IN SITU TESTING LEGEND

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

Douglas Partners
Geotechnics / Environment / Groundwater

BOREHOLE LOG

CLIENT: DPT Operator Pty Ltd
PROJECT: Cockle Bay Park Redevelopment
LOCATION: 241-249 Wheat Road, Sydney

SURFACE LEVEL: -5.2 AHD
EASTING: 333694
NORTHING: 6250572
DIP/AZIMUTH: 90°/--

BORE No: R2-L1
PROJECT No: 202546.00
DATE:
SHEET 2 OF 2

RL	Depth (m)	Description of Strata	Degree of Weathering (EW HW MW SW FS FR)	Graphic Log	Rock Strength (Ex Low, Very Low, Low, Medium, High, Very High, Ex High)	Water	Fracture Spacing (m) (0.01, 0.05, 0.10, 0.50, 1.00)	Discontinuities (B - Bedding, J - Joint, S - Shear, F - Fault)	Sampling & In Situ Testing: Type	Core Rec. %	RQD %	Test Results & Comments
-16	11											
-17	12											
	12.2											
	12.6											
-18	13											
-19	14											
-20	15											
-21	15.8											
	16											
-22	17											
-23	18											
-24	19											
-25												

RIG: **DRILLER:** **LOGGED:** **CASING:**

TYPE OF BORING:

WATER OBSERVATIONS:

REMARKS: Location coordinates are in MGA94 Zone 56.

SAMPLING & IN SITU TESTING LEGEND

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

Douglas Partners
Geotechnics / Environment / Groundwater

BOREHOLE LOG

CLIENT: DPT Operator Pty Ltd
PROJECT: Cockle Bay Park Redevelopment
LOCATION: 241-249 Wheat Road, Sydney

SURFACE LEVEL: -4 AHD
EASTING: 333681
NORTHING: 6250506
DIP/AZIMUTH: 90°/--

BORE No: R2-L5
PROJECT No: 202546.00
DATE:
SHEET 1 OF 2

RL	Depth (m)	Description of Strata	Degree of Weathering (EW HW MW SW FS FR)	Graphic Log	Rock Strength (Ex Low, Very Low, Low, Medium, High, Very High, Ex High)	Water	Fracture Spacing (m) (0.01, 0.05, 0.10, 0.50, 1.00)	Discontinuities (B - Bedding J - Joint S - Shear F - Fault)	Sampling & In Situ Testing: Type	Core Rec. %	RQD %	Test Results & Comments
-4												
-5	1											
-6	2											
-7	3											
	3.8											
-8	4											
-9	5											
-10	6											
-11	7											
	7.2											
	7.5											
-12	8											
-13	9											

RIG: **DRILLER:** **LOGGED:** **CASING:**

TYPE OF BORING:

WATER OBSERVATIONS:

REMARKS: Location coordinates are in MGA94 Zone 56.

SAMPLING & IN SITU TESTING LEGEND

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

Douglas Partners
Geotechnics / Environment / Groundwater

BOREHOLE LOG

CLIENT: DPT Operator Pty Ltd
PROJECT: Cockle Bay Park Redevelopment
LOCATION: 241-249 Wheat Road, Sydney

SURFACE LEVEL: -4 AHD
EASTING: 333681
NORTHING: 6250506
DIP/AZIMUTH: 90°/--

BORE No: R2-L5
PROJECT No: 202546.00
DATE:
SHEET 2 OF 2

RL	Depth (m)	Description of Strata	Degree of Weathering (EW HW MW SW FS FR)	Graphic Log	Rock Strength (Ex Low, Very Low, Low, Medium, High, Very High, Ex High)	Water	Fracture Spacing (m) (0.01, 0.05, 0.10, 0.50, 1.00)	Discontinuities (B - Bedding J - Joint S - Shear F - Fault)	Sampling & In Situ Testing: Type	Core Rec. %	RQD %	Test Results & Comments
-4												
	10.34											
-15	11											
-16	12											
-17	13											
-18	14											
-19	15											
-20	16											
-21	17											
-22	18											
-23	19											

RIG: **DRILLER:** **LOGGED:** **CASING:**
TYPE OF BORING:
WATER OBSERVATIONS:
REMARKS: Location coordinates are in MGA94 Zone 56.

SAMPLING & IN SITU TESTING LEGEND

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

Douglas Partners
Geotechnics / Environment / Groundwater

BOREHOLE LOG

CLIENT: DPT Operator Pty Ltd
PROJECT: Cockle Bay Park Redevelopment
LOCATION: 241-249 Wheat Road, Sydney

SURFACE LEVEL: 3.5 AHD
EASTING: 333822
NORTHING: 6250707
DIP/AZIMUTH: 90°/--

BORE No: SS1
PROJECT No: 202546.00
DATE: 15 - 16/7/2021
SHEET 1 OF 2

RL	Depth (m)	Description of Strata	Degree of Weathering (EW HW MW SW FS FR)	Graphic Log	Rock Strength (Ex Low, Very Low, Low, Medium, High, Very High, Ex High)	Water	Fracture Spacing (m) (0.01, 0.05, 0.10, 0.50, 1.00)	Discontinuities (B - Bedding J - Joint S - Shear F - Fault)	Type	Core Rec. %	RQD %	Test Results & Comments
	0.35	CONCRETE: igneous gravel of 20mm nominal diameter						Unless otherwise stated, rock is fractured along rough, planar bedding, dipping 0-10°				
	0.6	FILL/Sandy GRAVEL: fine to coarse igneous gravel, dark grey, fine to coarse sand, trace silt, moist, appears generally in a medium dense to dense condition							E			
		below 0.4m: grading to fine to coarse sandstone and igneous gravel, brown							E			
	1.67	CONCRETE: sandstone and igneous gravel of up to 40mm diameter						1.67m: CORE LOSS: 490mm	C	75	70	
	2.16	CORE LOSS										
		SANDSTONE: medium to coarse grained, pale grey and yellow-brown, distinctly and indistinctly bedded at 0-20°, medium strength, slightly weathered, fractured to slightly fractured, Hawkesbury Sandstone						2.67-2.78m: B10°(x4), un, ti				PL(A) = 0.9
								3.39m: B20°, pl, cly vn 3.44m: B0°, pl, cly vn	C	100	95	PL(A) = 0.5 PL(A) = 1.3
	3.7	SANDSTONE: medium to coarse grained, orange-brown, high strength, moderately weathered, slightly fractured, Hawkesbury Sandstone										PL(A) = 1.2
		Below 4.21m: becoming red-brown, high strength with very high strength bands, highly weathered						4.21m: B0°, un, ro, cln	C	100	100	PL(A) = 1.4 PL(A) = 3.3
	5.53	SANDSTONE: medium to coarse grained, orange-brown, medium strength, moderately weathered, unbroken, Hawkesbury Sandstone										PL(A) = 0.8
								6.45m: B10°, pl, cly vn				PL(A) = 0.9
	7.05	Below 6.98m: becoming pale grey, low strength, highly weathered							C	100	100	PL(A) = 0.2 PL(A) = 1.2
		SANDSTONE: fine to medium grained, pale grey, with siltstone laminations, distinctly and indistinctly bedded at 5-10°, high strength, fresh, unbroken, Hawkesbury Sandstone										PL(A) = 1.1
		Below 7.8m: grading to medium to coarse grained										
		Between 8.3-9.8m: with siltstone specks, clasts and beds										PL(A) = 1.3
		Below 9.8m: medium bedded, with							C	100	97	PL(A) = 1.1

RIG: Comacchio 205 **DRILLER:** Ground Test **LOGGED:** LHS **CASING:** HQ to 1.0m

TYPE OF BORING: Diacore to 0.35m, NDD to 0.6m, Auger to 1.0m, NMLC Coring to 17.72m

WATER OBSERVATIONS: No free groundwater observed whilst augering

REMARKS: Location coordinates are in MGA94 Zone 56.

SAMPLING & IN SITU TESTING LEGEND

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

Douglas Partners
Geotechnics / Environment / Groundwater

BOREHOLE LOG

CLIENT: DPT Operator Pty Ltd
PROJECT: Cockle Bay Park Redevelopment
LOCATION: 241-249 Wheat Road, Sydney

SURFACE LEVEL: 3.5 AHD
EASTING: 333822
NORTHING: 6250707
DIP/AZIMUTH: 90°/--

BORE No: SS1
PROJECT No: 202546.00
DATE: 15 - 16/7/2021
SHEET 2 OF 2

RL	Depth (m)	Description of Strata	Degree of Weathering (EW HW MW SW FS FR)	Graphic Log	Rock Strength (Ex Low, Very Low, Low, Medium, High, Very High, Ex High)	Water	Fracture Spacing (m) (0.01, 0.05, 0.10, 0.50, 1.00)	Discontinuities (B - Bedding J - Joint S - Shear F - Fault)	Sampling & In Situ Testing: Type	Core Rec. %	RQD %	Test Results & Comments
-7		occasional cross-beds										
		SANDSTONE: fine to medium grained, pale grey, with siltstone laminations, distinctly and indistinctly bedded at 5-10°, high strength, fresh, unbroken, Hawkesbury Sandstone *(continued)*						10.23-10.42m: J sv, pl, ro, cln 10.29m: B0°, pl, cly vn 10.33m: B20°, un, cly vn	C	100	97	PL(A) = 1.3
	11	Between 10.29-10.34m: siltstone bed										
-8												PL(A) = 1.4
	12											
-9								12.55m: B0°, pl, cly vn				PL(A) = 1.3
	13								C	100	100	
-10								13.53m: B10°, pl, cly vn				PL(A) = 1.6
	14											
-11								14.56m: B0°, pl, cly vn				PL(A) = 1.1
	15											
-12								15.21m: B0°, un, cly 1mm				PL(A) = 1.4
	16								C	100	100	
-13		Below 16.18m: distinctly and indistinctly bedded at 20°										PL(A) = 1.4
	17							16.9m: B10°, pl, cly 3mm				
-14												PL(A) = 1.8
	17.72	Bore discontinued at 17.72m										
	18	- Limit of investigation										
-15												
	19											
-16												

RIG: Comacchio 205 **DRILLER:** Ground Test **LOGGED:** LHS **CASING:** HQ to 1.0m

TYPE OF BORING: Diacore to 0.35m, NDD to 0.6m, Auger to 1.0m, NMLC Coring to 17.72m

WATER OBSERVATIONS: No free groundwater observed whilst augering

REMARKS: Location coordinates are in MGA94 Zone 56.

SAMPLING & IN SITU TESTING LEGEND

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

Douglas Partners
Geotechnics / Environment / Groundwater

BOREHOLE LOG

CLIENT: DPT Operator Pty Ltd
PROJECT: Cockle Bay Park Redevelopment
LOCATION: 241-249 Wheat Road, Sydney

SURFACE LEVEL: 3.5 AHD
EASTING: 333825
NORTHING: 6250684
DIP/AZIMUTH: 90°/--

BORE No: SS2
PROJECT No: 202546.00
DATE: 14 - 15/7/2021
SHEET 1 OF 2

RL	Depth (m)	Description of Strata	Degree of Weathering (EW HW MW SW FS FR)	Graphic Log	Rock Strength (Ex Low, Very Low, Low, Medium, High, Very High, Ex High)	Water	Fracture Spacing (m) (0.01, 0.05, 0.10, 0.50, 1.00)	Discontinuities (B - Bedding J - Joint S - Shear F - Fault)	Sampling & In Situ Testing: Type	Core Rec. %	RQD %	Test Results & Comments
	0.05	PAVER										
	0.25	FILL/Gravelly SAND: fine to coarse, brown, fine to medium igneous gravel, moist, appears generally in a medium dense condition							E			
		FILL/Sandy GRAVEL: fine to coarse igneous and sandstone gravel, grey, fine to coarse sand, with sandstone cobbles and boulders, moist, appears generally in a medium dense to dense condition						Unless otherwise stated, rock is fractured along rough, planar bedding, dipping 0-10°	E			
									S/E			19,10/90 refusal
	2.79	SANDSTONE: medium to coarse grained, pale grey and orange-brown, medium and high strength, highly weathered, slightly fractured, Hawkesbury Sandstone										PL(A) = 1.5
												PL(A) = 0.6
		Between 3.51-3.64m: fine grained with carbonaceous laminations, very low strength						3.52m: B0°, pl, cly vn 3.64m: B0°, pl, cly 5mm				PL(A) = 0.07
		Below 4.05m: grading to pale grey and orange-brown, moderately weathered						3.66-3.69m: B0°(x3), pl, ro, fe stn 3.91m: B0°, pl, ro, fe stn	C	100	89	PL(A) = 1.7
								4.39-4.49m: B0°(x2), un, ti 4.75-5.26m: B10°(x5), un, ti				PL(A) = 1.2
		Below 5.5m: grading to orange and red-brown						5.65m: B0°, pl, cly vn				PL(A) = 1
		Below 6.52m: grading to pale grey and orange-brown, distinctly and indistinctly bedded at 0-20°, slightly weathered										PL(A) = 1.3
								7.04m: Cs, 80mm 7.22m: B0°, un, ro, cln 7.31m: B5°, pl, cly vn	C	100	97	PL(A) = 0.5
												PL(A) = 1.5
		Below 8.2m: grading to fresh						8.24m: B10°, pl, cly 1mm				PL(A) = 0.5
		Between 8.5-8.72m: with siltstone specks and clasts						8.64m: B10°, cu, ro, cln				PL(A) = 0.8
	8.8	SANDSTONE: medium to coarse grained, pale grey, distinctly and indistinctly bedded at 0-20°, high strength, fresh, unbroken, Hawkesbury Sandstone										PL(A) = 1.2
									C	100	97	
		Between 9.65-10.32m: grading to fine to medium grained						9.65m: B0°, pl, cly vn				PL(A) = 1.3

RIG: Comacchio 205 **DRILLER:** Ground Test **LOGGED:** LHS **CASING:** HQ to 1.1m

TYPE OF BORING: NDD 0.05m to 1.1m, Rotary wash bore to 2.79m, NMLC Coring to 17.81m

WATER OBSERVATIONS: No free groundwater observed whilst augering

REMARKS: Location coordinates are in MGA94 Zone 56. Groundwater well constructed: blank PVC 0.0 to 3.8m; Slotted PVC 3.8 to 17.81m; bentonite 0.0 to 3.3m; gravel 3.3 to 17.81m, gatic at surface

SAMPLING & IN SITU TESTING LEGEND

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

Douglas Partners
Geotechnics / Environment / Groundwater

BOREHOLE LOG

CLIENT: DPT Operator Pty Ltd
PROJECT: Cockle Bay Park Redevelopment
LOCATION: 241-249 Wheat Road, Sydney

SURFACE LEVEL: 3.5 AHD
EASTING: 333825
NORTHING: 6250684
DIP/AZIMUTH: 90°/--

BORE No: SS2
PROJECT No: 202546.00
DATE: 14 - 15/7/2021
SHEET 2 OF 2

RL	Depth (m)	Description of Strata	Degree of Weathering (EW HW MW SW FS FR)	Graphic Log	Rock Strength (Ex Low, Very Low, Low, Medium, High, Very High, Ex High)	Water	Fracture Spacing (m) (0.01, 0.05, 0.10, 0.50, 1.00)	Discontinuities (B - Bedding J - Joint S - Shear F - Fault)	Sampling & In Situ Testing: Type	Core Rec. %	RQD %	Test Results & Comments
-7	11	SANDSTONE: medium to coarse grained, pale grey, distinctly and indistinctly bedded at 0-20°, high strength, fresh, unbroken, Hawkesbury Sandstone *(continued)*						10.24m: B5°, pl, cly vn 10.31m: Cs, 15mm	C	100	97	PL(A) = 1.4
-8	12	Between 11.85-16.65m: with siltstone specks and clasts						12.08-12.56m: J 80°, un, ro , cln	C	100	100	PL(A) = 1.6 PL(A) = 1.1
-9	13							12.94-13.34m: J 80°, un, ro, cln				
-10	14								C	100	100	PL(A) = 1.6 PL(A) = 1.8
-11	15											
-12	16								C	100	100	PL(A) = 1.5 PL(A) = 1.3
-13	17											
-14	17.81	Between 17.45-17.5m: carbonaceous laminations										PL(A) = 1.4
-15	18	Bore discontinued at 17.81m - Limit of investigation										
-16	19											

RIG: Comacchio 205 **DRILLER:** Ground Test **LOGGED:** LHS **CASING:** HQ to 1.1m

TYPE OF BORING: NDD 0.05m to 1.1m, Rotary wash bore to 2.79m, NMLC Coring to 17.81m

WATER OBSERVATIONS: No free groundwater observed whilst augering

REMARKS: Location coordinates are in MGA94 Zone 56. Groundwater well constructed: blank PVC 0.0 to 3.8m; Slotted PVC 3.8 to 17.81m; bentonite 0.0 to 3.3m; gravel 3.3 to 17.81m, gatic at surface

SAMPLING & IN SITU TESTING LEGEND

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

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Geotechnics / Environment / Groundwater

BOREHOLE LOG

CLIENT: DPT Operator Pty Ltd
PROJECT: Cockle Bay Park Redevelopment
LOCATION: 241-249 Wheat Road, Sydney

SURFACE LEVEL: 2.2 AHD
EASTING: 333712
NORTHING: 6250691
DIP/AZIMUTH: 90°/--

BORE No: W1
PROJECT No: 202546.00
DATE: 6 - 11/7/2021
SHEET 1 OF 3

RL	Depth (m)	Description of Strata	Degree of Weathering (EW HW MW SW FS FR)	Graphic Log	Rock Strength (Ex Low, Very Low, Low, Medium, High, Very High, Ex High)	Water	Fracture Spacing (m) (0.01, 0.05, 0.10, 0.50, 1.00)	Discontinuities (B - Bedding, J - Joint, S - Shear, F - Fault)	Sampling & In Situ Testing: Type	Core Rec. %	RQD %	Test Results & Comments
2	0.07	PAVER										
	0.12	FILL/SAND: medium to coarse, brown, moist, appears poorly compacted										
	0.51	CONCRETE: igneous gravel of 20mm nominal diameter										
1		VOID										
0	2.25	WATER				06-07-21						
-1												
-2												
-3	5.2	FILL/SAND: medium to coarse, dark grey, with clay, sandstone cobbles, timber and possible brick fragments, wet, appears generally in a loose condition							S/E			7,12,17 N = 29
-4												
-5												
-6												
-7	9.5	SAND SP: medium to coarse, grey, wet, loose, estuarine										

RIG: Comacchio 205 **DRILLER:** Ground Test **LOGGED:** LHS **CASING:** HW to 11.5m; HQ to 13.0m

TYPE OF BORING: Diacore 0.07m to 0.51m, Rotary wash bore 5.2m to 11.75m, NMLC Coring to 20.57m

WATER OBSERVATIONS: Water observed at 2.25m at 10:36pm on 6 July 2021

REMARKS: Location coordinates are in MGA94 Zone 56.

SAMPLING & IN SITU TESTING LEGEND

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

Douglas Partners
Geotechnics / Environment / Groundwater

BOREHOLE LOG

CLIENT: DPT Operator Pty Ltd
PROJECT: Cockle Bay Park Redevelopment
LOCATION: 241-249 Wheat Road, Sydney

SURFACE LEVEL: 2.2 AHD
EASTING: 333712
NORTHING: 6250691
DIP/AZIMUTH: 90°/--

BORE No: W1
PROJECT No: 202546.00
DATE: 6 - 11/7/2021
SHEET 2 OF 3

RL	Depth (m)	Description of Strata	Degree of Weathering (EW HW MW SW FS FR)	Graphic Log	Rock Strength (Ex Low, Very Low, Low, Medium, High, Very High, Ex High)	Water	Fracture Spacing (m) (0.01, 0.05, 0.10, 0.50, 1.00)	Discontinuities (B - Bedding J - Joint S - Shear F - Fault)	Sampling & In Situ Testing: Type	Core Rec. %	RQD %	Test Results & Comments
-8		SAND SP: medium to coarse, grey, wet, loose, estuarine *(continued)*							S/E			2,4,2 N = 6
-9	11							Unless otherwise stated, rock is fractured along rough, planar bedding, dipping 0-10°				
-10	11.75 12	SANDSTONE: medium to coarse grained, red and yellow-brown, medium strength, highly to moderately weathered, slightly fractured, Hawkesbury Sandstone						12.08m: B20°, pl, ro, cln	C	100	100	PL(A) = 0.3
-11	13	Between 13.08-15.23m: unbroken						12.32-12.47m: J80°, pl, ro, cln 12.47m: B0°, un, ti 13.02m: Ds, 60mm	C	100	92	PL(A) = 0.5
-12	14	Below 14.15m: grading to slightly weathered, distinctly and indistinctly bedded at 20° Between 14.55-14.95m: distinctly and indistinctly bedded at 0-10°							C	100	100	PL(A) = 0.4
-13	15	Below 15.55m: distinctly and indistinctly bedded at 0-10°						15.23m: J40°, pl, ro, cln 15.6m: B20°, pl, ro, cln 15.8m: B0°, un, ro, cbs vn	C	100	100	PL(A) = 0.9 PL(A) = 0.7
-14	16							16.44m: B5°, pl, cly vn 16.57m: Ds, 10mm	C	100	99	PL(A) = 0.9
-15	17	Between 17.30-17.85m: massive Below 17.32m: fresh						17.11-17.32m: J80°, un, ro, fe stn				PL(A) = 0.6
-16	18 18.1	SANDSTONE: medium to coarse grained, pale grey, distinctly and indistinctly bedded at 0-10°, high strength, fresh, unbroken, Hawkesbury Sandstone						17.9m: B10°, pl, cly 3mm 17.92m: B0°, pl, cly 1mm				PL(A) = 0.5 PL(A) = 1.4 PL(A) = 1.2
-17	19	Between 18.9-19.05m: siltstone clasts and bits						18.92m: B0°, un, ro, cln	C	100	100	PL(A) = 1
	20.0											

RIG: Comacchio 205 **DRILLER:** Ground Test **LOGGED:** LHS **CASING:** HW to 11.5m; HQ to 13.0m

TYPE OF BORING: Diacore 0.07m to 0.51m, Rotary wash bore 5.2m to 11.75m, NMLC Coring to 20.57m

WATER OBSERVATIONS: Water observed at 2.25m at 10:36pm on 6 July 2021

REMARKS: Location coordinates are in MGA94 Zone 56.

SAMPLING & IN SITU TESTING LEGEND

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

Douglas Partners
Geotechnics / Environment / Groundwater

BOREHOLE LOG

CLIENT: DPT Operator Pty Ltd
PROJECT: Cockle Bay Park Redevelopment
LOCATION: 241-249 Wheat Road, Sydney

SURFACE LEVEL: 2.2 AHD
EASTING: 333712
NORTHING: 6250691
DIP/AZIMUTH: 90°/--

BORE No: W1
PROJECT No: 202546.00
DATE: 6 - 11/7/2021
SHEET 3 OF 3

RL	Depth (m)	Description of Strata	Degree of Weathering (EW HW MW SW FS FR)	Graphic Log	Rock Strength (Ex Low, Very Low, Low, Medium, High, Very High, Ex High)	Water	Fracture Spacing (m) (0.01, 0.05, 0.10, 0.50, 1.00)	Discontinuities (B - Bedding J - Joint S - Shear F - Fault)	Sampling & In Situ Testing: Type	Core Rec. %	RQD %	Test Results & Comments
-18		SANDSTONE: (continued)										
		Below 20.25m: distinctly and indistinctly crossbedded at 20° with siltstone specks							C	100	100	PL(A) = 1.1
	20.57	Bore discontinued at 20.57m - Limit of investigation										
-19	21											
-20	22											
-21	23											
-22	24											
-23	25											
-24	26											
-25	27											
-26	28											
-27	29											

RIG: Comacchio 205 **DRILLER:** Ground Test **LOGGED:** LHS **CASING:** HW to 11.5m; HQ to 13.0m

TYPE OF BORING: Diacore 0.07m to 0.51m, Rotary wash bore 5.2m to 11.75m, NMLC Coring to 20.57m

WATER OBSERVATIONS: Water observed at 2.25m at 10:36pm on 6 July 2021

REMARKS: Location coordinates are in MGA94 Zone 56.

SAMPLING & IN SITU TESTING LEGEND

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

Douglas Partners
Geotechnics / Environment / Groundwater

BOREHOLE LOG

CLIENT: DPT Operator Pty Ltd
PROJECT: Cockle Bay Park Redevelopment
LOCATION: 241-249 Wheat Road, Sydney

SURFACE LEVEL: 2.2 AHD
EASTING: 333698
NORTHING: 6250613
DIP/AZIMUTH: 90°/--

BORE No: W2
PROJECT No: 202546.00
DATE: 5 - 6/7/2021
SHEET 1 OF 3

RL	Depth (m)	Description of Strata	Degree of Weathering (EW HW MW SW FS FR)	Graphic Log	Rock Strength (Ex Low, Very Low, Low, Medium, High, Very High, Ex High)	Water	Fracture Spacing (m) (0.01, 0.05, 0.10, 0.50, 1.00)	Discontinuities (B - Bedding, J - Joint, S - Shear, F - Fault)	Sampling & In Situ Testing: Type	Core Rec. %	RQD %	Test Results & Comments
2	0.07	PAVER										
1.87	0.13	FILL/SAND: medium to coarse, brown, moist, appears poorly compacted										
1.67	0.53	CONCRETE: igneous gravel of 20mm nominal diameter										
1	1	VOID										
0	2					06-07-21						
0	2.05	WATER										
-1	3											
-2	4											
-3	5											
-4	6											
-5	7											
-6	8											
-7	9											
-7	9.2	CLAY CI: medium plasticity, grey, w>PL, very soft, estuarine										

RIG: Comacchio 205 **DRILLER:** Ground Test **LOGGED:** LHS **CASING:** HW to 13.5m; HQ to 20.4m

TYPE OF BORING: Diacore 0.13m to 0.53m, Rotary wash bore 9.2m to 20.4m, NMLC Coring to 28.3m

WATER OBSERVATIONS: Water observed at 2.05m at 10:06pm on 6 July 2021

REMARKS: Location coordinates are in MGA94 Zone 56. ^SPT at 10.75m undertaken within HW casing

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: DPT Operator Pty Ltd
PROJECT: Cockle Bay Park Redevelopment
LOCATION: 241-249 Wheat Road, Sydney

SURFACE LEVEL: 2.2 AHD
EASTING: 333698
NORTHING: 6250613
DIP/AZIMUTH: 90°/--

BORE No: W2
PROJECT No: 202546.00
DATE: 5 - 6/7/2021
SHEET 2 OF 3

RL	Depth (m)	Description of Strata	Degree of Weathering (EW HW MW SW FS FR)	Graphic Log	Rock Strength (Ex Low / Very Low / Low / Medium / High / Very High / Ex High)	Water	Fracture Spacing (m) (0.01 / 0.05 / 0.10 / 0.50 / 1.00)	Discontinuities (B - Bedding J - Joint S - Shear F - Fault)	Type	Core Rec. %	RQD %	Test Results & Comments
-8		CLAY CI: medium plasticity, grey, w>PL, very soft, estuarine *(continued)*										
	10.75											
-9	11	Clayey SAND SC: fine to coarse, pale brown, wet, very loose, estuarine							S^			1,0,0 N = 0
									U_{75}			pp = 0
-10	12											
-11	13								U_{75}			pp = 50
									S			3,2,1 N = 3
-12	14								S			1,0,3 N = 3
-13	15											
	15.5	CLAY CI: medium plasticity, grey, trace fine to medium sand, w>PL, very soft, estuarine										
-14	16								S			1,0,0 N = 0
-15	17 17.0	SAND SP: medium to coarse, grey, with clay, wet, dense, estuarine							S			12,21,25/130 refusal
-16	18											
		Below 18.5m: grading to grey mottled orange-brown, trace clay, medium dense										
-17	19							Unless otherwise stated, rock is fractured along rough, planar bedding, dipping 0-10°	S			8,14,12 N = 26

RIG: Comacchio 205 **DRILLER:** Ground Test **LOGGED:** LHS **CASING:** HW to 13.5m; HQ to 20.4m

TYPE OF BORING: Diacore 0.13m to 0.53m, Rotary wash bore 9.2m to 20.4m, NMLC Coring to 28.3m

WATER OBSERVATIONS: Water observed at 2.05m at 10:06pm on 6 July 2021

REMARKS: Location coordinates are in MGA94 Zone 56. ^SPT at 10.75m undertaken within HW casing

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: DPT Operator Pty Ltd
PROJECT: Cockle Bay Park Redevelopment
LOCATION: 241-249 Wheat Road, Sydney

SURFACE LEVEL: 2.2 AHD
EASTING: 333698
NORTHING: 6250613
DIP/AZIMUTH: 90°/--

BORE No: W2
PROJECT No: 202546.00
DATE: 5 - 6/7/2021
SHEET 3 OF 3

RL	Depth (m)	Description of Strata	Degree of Weathering (EW HW MW SW FS FR)	Graphic Log	Rock Strength (Ex Low, Very Low, Low, Medium, High, Very High, Ex High)	Water	Fracture Spacing (m) (0.01, 0.05, 0.10, 0.50, 1.00)	Discontinuities (B - Bedding J - Joint S - Shear F - Fault)	Sampling & In Situ Testing: Type	Core Rec. %	RQD %	Test Results & Comments
-18		SAND SP: medium to coarse, grey, with clay, wet, dense, estuarine *(continued)*										
	20.4	SANDSTONE: medium to coarse grained, brown, medium strength, moderately weathered, slightly fractured, Hawkesbury Sandstone						20.95m: B0°, pl, ro, fe stn 21.1m: Ds, 50mm 21.24m: B0°, pl, cly 3mm	C	100	97	PL(A) = 0.3 PL(A) = 0.4 PL(A) = 0.9 PL(A) = 1 PL(A) = 1.4
-19	21	Below 21.15m: grading to slightly weathered to fresh										
	21.5	SANDSTONE: medium to coarse grained, pale grey, distinctly and indistinctly bedded at 10-20°, high strength, fresh, slightly fractured, Hawkesbury Sandstone										
-20	22							22.19m: B5°, un, ro, cln				PL(A) = 1.2 PL(A) = 1.3
	23.05	SANDSTONE: fine grained, grey, with siltstone laminations, medium strength, fresh, slightly fractured, Hawkesbury Sandstone						23.04m: B0°, pl, cly vn 23.29m: B0°, pl, cly vn				PL(A) = 0.3
-21	23.3	SANDSTONE: medium to coarse grained, pale grey, distinctly and indistinctly crossbedded at 20°, high strength, fresh, unbroken, Hawkesbury Sandstone							C	100	100	PL(A) = 1.1
-22	24	Below 24.7m: distinctly and indistinctly bedded at 5-20° with siltstone laminations and specks										PL(A) = 1.9
-23	25							24.94m: B5°, pl, cly 10mm				PL(A) = 1.7
-24	26	Below 26.24m: slightly fractured						26.24m: B10°, pl, cly vn 26.28m: B10°, pl, cly 3mm 26.37m: B10°, pl, cly 1mm	C	100	100	PL(A) = 1.3
-25	27	Between 27.36-27.37m: carbonaceous lamination Below 27.45m: distinctly and indistinctly bedded at 0-5°						27.34m: B0°, un, cly 5mm				PL(A) = 1.1
-26	28	Below 27.91m: grading to massive						27.91m: B0°, pl, cly 5mm				PL(A) = 1.6
	28.3	Bore discontinued at 28.3m - Limit of investigation										
-27	29											

RIG: Comacchio 205 **DRILLER:** Ground Test **LOGGED:** LHS **CASING:** HW to 13.5m; HQ to 20.4m

TYPE OF BORING: Diacore 0.13m to 0.53m, Rotary wash bore 9.2m to 20.4m, NMLC Coring to 28.3m

WATER OBSERVATIONS: Water observed at 2.05m at 10:06pm on 6 July 2021

REMARKS: Location coordinates are in MGA94 Zone 56. ^SPT at 10.75m undertaken within HW casing

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: DPT Operator Pty Ltd
PROJECT: Cockle Bay Park Redevelopment
LOCATION: 241-249 Wheat Road, Sydney

SURFACE LEVEL: 2.2 AHD
EASTING: 333685
NORTHING: 6250541
DIP/AZIMUTH: 90°/--

BORE No: W3
PROJECT No: 202546.00
DATE: 3 - 5/7/2021
SHEET 1 OF 3

RL	Depth (m)	Description of Strata	Degree of Weathering (EW HW MW SW FS FR)	Graphic Log	Rock Strength (Ex Low, Very Low, Low, Medium, High, Very High, Ex High)	Water	Fracture Spacing (m) (0.01, 0.05, 0.10, 0.50, 1.00)	Discontinuities (B - Bedding, J - Joint, S - Shear, F - Fault)	Sampling & In Situ Testing: Type	Core Rec. %	RQD %	Test Results & Comments
2	0.07	PAVER										
1.87	0.13	FILL/SAND: medium to coarse, brown, moist, appears poorly compacted										
1.7	0.5	CONCRETE: igneous gravel of 20mm nominal diameter										
1		VOID										
0	2.05	WATER				04-07-21						
-1												
-2												
-3												
-4												
-5												
-6												
-7	8.9	CLAY CL: low plasticity, dark grey, trace medium sand and charcoal, sulphurous odour, w~PL, very soft, estuarine										

RIG: Comacchio 205 **DRILLER:** Ground Test **LOGGED:** LHS **CASING:** HW to 12.6m; HQ to 15.3m

TYPE OF BORING: Diacore 0.13m to 0.5m, Rotary wash bore 8.9m to 15.3m, NMLC Coring to 23.77m

WATER OBSERVATIONS: Water observed at 2.05m at 7:33pm on 4 July 2021

REMARKS: Location coordinates are in MGA94 Zone 56. ^SPT at 10.75m and 11.5m undertaken within HW casing; *Field replicate BD01/040721 taken at 13.0-13.45m depth

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: DPT Operator Pty Ltd
PROJECT: Cockle Bay Park Redevelopment
LOCATION: 241-249 Wheat Road, Sydney

SURFACE LEVEL: 2.2 AHD
EASTING: 333685
NORTHING: 6250541
DIP/AZIMUTH: 90°/--

BORE No: W3
PROJECT No: 202546.00
DATE: 3 - 5/7/2021
SHEET 2 OF 3

RL	Depth (m)	Description of Strata	Degree of Weathering (EW HW MW SW FS FR)	Graphic Log	Rock Strength (Ex Low, Very Low, Low, Medium, High, Very High, Ex High)	Water	Fracture Spacing (m) (0.01, 0.05, 0.10, 0.50, 1.00)	Discontinuities (B - Bedding J - Joint S - Shear F - Fault)	Type	Core Rec. %	RQD %	Test Results & Comments
-8		CLAY CL: low plasticity, dark grey, trace medium sand and charcoal, sulphurous odour, w~PL, very soft, estuarine *(continued)*										
-9	11								S^/E			0,0,0 N = 0
									S^/E			0,1,2 N = 3
-10	12											
	12.6	Sandy CLAY CL: low plasticity, red-brown mottled pale grey, fine to medium sand, w>PL, soft, estuarine										
-11	13								S/E			2,1,1 N = 2
-12	14 14.0	CLAYEY SILT MH: high plasticity, grey, w>PL, soft, estuarine						Unless otherwise stated, rock is fractured along rough, planar bedding, dipping 0-10°				
									S/E			0,1,3 N = 4
-13	15											
	15.67	SANDSTONE: medium to coarse grained, red and yellow-brown, low to medium strength with very low strength bands, extremely weathered then highly weathered, slightly fractured, Hawkesbury Sandstone						15.3m: CORE LOSS: 370mm	C	84	74	PL(A) = 0.1
-14	16											PL(A) = 0.1
												PL(A) = 0.3
-15	17											PL(A) = 0.3
								17.51m: B20°, pl, cly vn				PL(A) = 0.4
-16	18							18m: B10°, pl, ro, fe stn				PL(A) = 0.4
								18.74m: CORE LOSS: 200mm	C	93	88	
-17	19 18.94	Between 18.94-19.44m: with 15% clay bands, fractured to slightly fractured						18.94m: Ds, 20mm				PL(A) = 0.3
		Below 19.43m: grading to pale grey, fresh						19.18m: Cs, 60mm 19.34m: B5°, pl, cly 8mm 19.37m: B0°, pl, cly 10mm				PL(A) = 0.4 PL(A) = 0.8
	19.75	SANDSTONE:(continue next page)						19.38m: B5°, pl, ro, fe				PL(A) = 1.4
	20.0											

RIG: Comacchio 205 **DRILLER:** Ground Test **LOGGED:** LHS **CASING:** HW to 12.6m; HQ to 15.3m

TYPE OF BORING: Diacore 0.13m to 0.5m, Rotary wash bore 8.9m to 15.3m, NMLC Coring to 23.77m

WATER OBSERVATIONS: Water observed at 2.05m at 7:33pm on 4 July 2021

REMARKS: Location coordinates are in MGA94 Zone 56. ^SPT at 10.75m and 11.5m undertaken within HW casing; *Field replicate BD01/040721 taken at 13.0-13.45m depth

SAMPLING & IN SITU TESTING LEGEND

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

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Geotechnics / Environment / Groundwater

BOREHOLE LOG

CLIENT: DPT Operator Pty Ltd
PROJECT: Cockle Bay Park Redevelopment
LOCATION: 241-249 Wheat Road, Sydney

SURFACE LEVEL: 2.2 AHD
EASTING: 333685
NORTHING: 6250541
DIP/AZIMUTH: 90°/--

BORE No: W3
PROJECT No: 202546.00
DATE: 3 - 5/7/2021
SHEET 3 OF 3

RL	Depth (m)	Description of Strata	Degree of Weathering (EW HW MW SW FS FR)	Graphic Log	Rock Strength (Ex Low, Very Low, Low, Medium, High, Very High, Ex High)	Water	Fracture Spacing (m) (0.01, 0.05, 0.10, 0.50, 1.00)	Discontinuities (B - Bedding J - Joint S - Shear F - Fault)	Sampling & In Situ Testing: Type	Core Rec. %	RQD %	Test Results & Comments
-18		SANDSTONE: medium grained, grey, massive, high strength, fresh, unbroken, Hawkesbury Sandstone						stn 19.43m: B0°, pl, cly 3mm 19.95m: B20°, pl, ro, fe stn	C	93	88	PL(A) = 1.2
												PL(A) = 1.9
-19	21	Below 20.75m: grading to medium to coarse grained, pale grey, distinctly and indistinctly bedded at 0-20°						>>				PL(A) = 1.2
-20	22								C	100	100	
												PL(A) = 1
-21	23											PL(A) = 1.4
	23.77	Bore discontinued at 23.77m - Limit of investigation										
-22	24											
-23	25											
-24	26											
-25	27											
-26	28											
-27	29											

RIG: Comacchio 205 **DRILLER:** Ground Test **LOGGED:** LHS **CASING:** HW to 12.6m; HQ to 15.3m

TYPE OF BORING: Diacore 0.13m to 0.5m, Rotary wash bore 8.9m to 15.3m, NMLC Coring to 23.77m

WATER OBSERVATIONS: Water observed at 2.05m at 7:33pm on 4 July 2021

REMARKS: Location coordinates are in MGA94 Zone 56. ^SPT at 10.75m and 11.5m undertaken within HW casing; *Field replicate BD01/040721 taken at 13.0-13.45m depth

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: DPT Operator Pty Ltd
PROJECT: Cockle Bay Park Redevelopment
LOCATION: 241-249 Wheat Road, Sydney

SURFACE LEVEL: 2.2 AHD
EASTING: 333672
NORTHING: 6250475
DIP/AZIMUTH: 90°/--

BORE No: W4
PROJECT No: 202546.00
DATE: 1 - 2/7/2021
SHEET 1 OF 3

RL	Depth (m)	Description of Strata	Degree of Weathering (EW HW MW SW FS FR)	Graphic Log	Rock Strength (Ex Low, Very Low, Low, Medium, High, Very High, Ex High)	Water	Fracture Spacing (m) (0.01, 0.05, 0.10, 0.50, 1.00)	Discontinuities (B - Bedding, J - Joint, S - Shear, F - Fault)	Sampling & In Situ Testing: Type	Core Rec. %	RQD %	Test Results & Comments
2	0.07	PAVER										
1.89	0.11	FILL/SAND: medium to coarse, brown, moist, appears poorly compacted										
1.7	0.5	CONCRETE: igneous gravel of 20mm nominal diameter										
1		VOID										
0.15	2.05	WATER				01-07-21						
-5.7	7.9	CLAY CI: medium plasticity, dark grey, trace sand, sulphurous odour, w~PL, very soft, estuarine										

RIG: Comacchio 205 **DRILLER:** Ground Test **LOGGED:** LHS **CASING:** HW to 11.5m; HQ to 12.55m

TYPE OF BORING: Diacore 0.11m to 0.5m, Rotary wash bore 7.9m to 12.55m, NMLC Coring to 20.72m

WATER OBSERVATIONS: Water observed at 2.05m at 11:16pm on 1 July 2021

REMARKS: Location coordinates are in MGA94 Zone 56. ^SPT at 10.0m and 11.5m undertaken within HW casing

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: DPT Operator Pty Ltd
PROJECT: Cockle Bay Park Redevelopment
LOCATION: 241-249 Wheat Road, Sydney

SURFACE LEVEL: 2.2 AHD
EASTING: 333672
NORTHING: 6250475
DIP/AZIMUTH: 90°/--

BORE No: W4
PROJECT No: 202546.00
DATE: 1 - 2/7/2021
SHEET 2 OF 3

RL	Depth (m)	Description of Strata	Degree of Weathering (EW HW MW SW FS FR)	Graphic Log	Rock Strength (Ex Low / Very Low / Low / Medium / High / Very High / Ex High)	Water	Fracture Spacing (m) (0.01 0.05 0.10 0.50 1.00)	Discontinuities (B - Bedding J - Joint S - Shear F - Fault)	Sampling & In Situ Testing: Type	Core Rec. %	RQD %	Test Results & Comments
-8		CLAY CI: medium plasticity, dark grey, trace sand, sulphurous odour, w~PL, very soft, estuarine *(continued)*							S^/E			1,0,0 N = 0
-9	11											
	11.5	SAND SP: medium to coarse, brown, with clay, wet, medium dense, estuarine						Unless otherwise stated, rock is fractured along rough, planar bedding, dipping 0-10°	S^/E			0,3,7 N = 10
-10	12											
	12.55	SANDSTONE: medium to coarse grained, orange and red-brown, medium strength, highly to moderately weathered, slightly fractured, Hawkesbury Sandstone							S/E			6/100 refusal PL(A) = 0.8
-11	13	Below 13.38-15.45m: unbroken						13.38m: B10°, pl, ro, fe stn	C	100	100	PL(A) = 0.9
-12	14	Below 14.27m: grading to pale grey, distinctly and indistinctly bedded at 5-20°, slightly weathered then fresh with occasional slightly weathered bands										PL(A) = 0.7
-13	15							>>				PL(A) = 0.8
-14	16								C	100	100	PL(A) = 0.9
-15	17							17.37m: J10°, pl, ro, cln				PL(A) = 0.9
	17.75	SANDSTONE: medium to coarse grained, pale grey, distinctly and indistinctly bedded at 5-20°, high strength, fresh, unbroken, Hawkesbury Sandstone										PL(A) = 1.2
-16	18											PL(A) = 1.2
								18.62m: B0°, pl, cly vn				PL(A) = 1.7
-17	19								C	100	100	
								19.32m: B0°, pl, cly 1mm				PL(A) = 1.5
	20.0											

RIG: Comacchio 205 **DRILLER:** Ground Test **LOGGED:** LHS **CASING:** HW to 11.5m; HQ to 12.55m

TYPE OF BORING: Diacore 0.11m to 0.5m, Rotary wash bore 7.9m to 12.55m, NMLC Coring to 20.72m

WATER OBSERVATIONS: Water observed at 2.05m at 11:16pm on 1 July 2021

REMARKS: Location coordinates are in MGA94 Zone 56. ^SPT at 10.0m and 11.5m undertaken within HW casing

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: DPT Operator Pty Ltd
PROJECT: Cockle Bay Park Redevelopment
LOCATION: 241-249 Wheat Road, Sydney

SURFACE LEVEL: 2.2 AHD
EASTING: 333672
NORTHING: 6250475
DIP/AZIMUTH: 90°/--

BORE No: W4
PROJECT No: 202546.00
DATE: 1 - 2/7/2021
SHEET 3 OF 3

RL	Depth (m)	Description of Strata	Degree of Weathering (EW HW MW SW FS FR)	Graphic Log	Rock Strength (Ex Low, Very Low, Low, Medium, High, Very High, Ex High)	Water	Fracture Spacing (m) (0.01, 0.05, 0.10, 0.50, 1.00)	Discontinuities (B - Bedding J - Joint S - Shear F - Fault)	Sampling & In Situ Testing: Type	Core Rec. %	RQD %	Test Results & Comments
-18		SANDSTONE: (continued)							C	100	100	PL(A) = 1.7
	20.73	Bore discontinued at 20.73m - Limit of investigation						20.62m: B40°, cu, cly 1mm				
-19	21											
-20	22											
-21	23											
-22	24											
-23	25											
-24	26											
-25	27											
-26	28											
-27	29											

RIG: Comacchio 205 **DRILLER:** Ground Test **LOGGED:** LHS **CASING:** HW to 11.5m; HQ to 12.55m

TYPE OF BORING: Diacore 0.11m to 0.5m, Rotary wash bore 7.9m to 12.55m, NMLC Coring to 20.72m

WATER OBSERVATIONS: Water observed at 2.05m at 11:16pm on 1 July 2021

REMARKS: Location coordinates are in MGA94 Zone 56. ^SPT at 10.0m and 11.5m undertaken within HW casing

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: DPT Operator Pty Ltd
PROJECT: Cockle Bay Park Redevelopment
LOCATION: 241-249 Wheat Road, Sydney

SURFACE LEVEL: 2.5 AHD
EASTING: 333694
NORTHING: 6250483
DIP/AZIMUTH: 90°/--

BORE No: W5
PROJECT No: 202546.00
DATE: 7 - 8/7/2021
SHEET 1 OF 3

RL	Depth (m)	Description of Strata	Degree of Weathering (EW HW MW SW FS FR)	Graphic Log	Rock Strength (Ex Low, Very Low, Low, Medium, High, Very High, Ex High)	Water	Fracture Spacing (m) (0.01, 0.05, 0.10, 0.50, 1.00)	Discontinuities (B - Bedding J - Joint S - Shear F - Fault)	Sampling & In Situ Testing: Type	Core Rec. %	RQD %	Test Results & Comments
2.5	0.07	PAVER										
2.4	0.14											
2.3	0.2	FILL/SAND: medium to coarse, brown, moist, appears poorly compacted										
1.9	0.59	FILL/Sandy GRAVEL: fine to coarse igneous gravel, dark grey, fine to coarse sand, trace silt, moist, appears moderately compacted										
		CONCRETE: igneous gravel of 20mm nominal diameter										
0.8	1.7	VOID										
		WATER				07-07-21						
-4.25	6.75	CLAY CL: low plasticity, dark grey, trace fine to medium sand, sulphurous odour, w~PL, very soft, estuarine							S^/E			1,0,0 N = 0
									U_{75}			pp = 120
-7.5	10.0											

RIG: Comacchio 205 **DRILLER:** Ground Test **LOGGED:** LHS **CASING:** HW to 10.0m; HQ to 12.9m

TYPE OF BORING: Diacore 0.07m to 0.14m, Rotary wash bore 6.75m to 12.9m, NMLC Coring to 21.16m

WATER OBSERVATIONS: Water observed at 1.70m at 7:10pm on 7 July 2021

REMARKS: Location coordinates are in MGA94 Zone 56. ^SPT at 8.8m undertaken within HW casing; *Field replicate BD05/070721 taken at 11.5-11.95m depth

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: DPT Operator Pty Ltd
PROJECT: Cockle Bay Park Redevelopment
LOCATION: 241-249 Wheat Road, Sydney

SURFACE LEVEL: 2.5 AHD
EASTING: 333694
NORTHING: 6250483
DIP/AZIMUTH: 90°/--

BORE No: W5
PROJECT No: 202546.00
DATE: 7 - 8/7/2021
SHEET 2 OF 3

RL	Depth (m)	Description of Strata	Degree of Weathering (EW HW MW SW FS FR)	Graphic Log	Rock Strength (Ex Low / Very Low / Low / Medium / High / Very High / Ex High)	Water	Fracture Spacing (m) (0.01 / 0.05 / 0.10 / 0.50 / 1.00)	Discontinuities (B - Bedding J - Joint S - Shear F - Fault)	Type	Core Rec. %	RQD %	Test Results & Comments
-8		SAND SP: medium to coarse, grey, trace clay, wet, medium dense, estuarine							S/E			3,7,10 N = 17
-9	11 11.0	Sandy CLAY CL: low plasticity, brown, medium to coarse sand, w<PL, soft, estuarine							S/E*			2,1,1 N = 2
-10	12							Unless otherwise stated, rock is fractured along rough, planar bedding, dipping 0-10°	U_{75}			No Recovery
-11	13 12.9	SANDSTONE: medium to coarse, red and yellow-brown, medium strength, highly weathered, slightly fractured, Hawkesbury Sandstone						13.03m: B20°, pl, ro, cln 13.19m: Ds, 30mm				PL(A) = 0.4 PL(A) = 0.4
-12	13.35 14	SANDSTONE: medium to coarse grained, red and yellow-brown, high strength with medium strength bands, highly weathered, unbroken, Hawkesbury Sandstone							C	100	99	PL(A) = 1.3 PL(A) = 0.6 PL(A) = 1.2 PL(A) = 1.4 PL(A) = 1.4
-13	15	Below 14.8m: grading to moderately weathered Below 15.19m: with occasional cross-beds, slightly fractured						15.19m: B20°, pl, cly vn 15.43m: B0°, un, ro, cln				PL(A) = 1.2 PL(A) = 1.2
-14	16	Below 16.05m: grading to pale grey and brown, distinctly and indistinctly bedded at 5-20°, slightly weathered						16.05m: B0°, un, ro, cln 16.35m: B10°, pl, cly vn				PL(A) = 1.7 PL(A) = 1.1 PL(A) = 0.7
-15	17							16.9m: B10°, pl, cly 3mm 16.93m: B0°, un, cly 4mm 17.5m: B5°, un, ro, cln	C	100	98	PL(A) = 1
-16	18 18.33	SANDSTONE: medium to coarse grained, pale grey, distinctly and indistinctly bedded at 5-20°, high strength, fresh, unbroken, Hawkesbury Sandstone						18.29m: B20°, pl, cly vn 18.33m: B10°, pl, cly 1mm				PL(A) = 1.3
-17	19							19.76m: B0°, pl, cly vn	C	100	100	PL(A) = 1.7

RIG: Comacchio 205 **DRILLER:** Ground Test **LOGGED:** LHS **CASING:** HW to 10.0m; HQ to 12.9m

TYPE OF BORING: Diacore 0.07m to 0.14m, Rotary wash bore 6.75m to 12.9m, NMLC Coring to 21.16m

WATER OBSERVATIONS: Water observed at 1.70m at 7:10pm on 7 July 2021

REMARKS: Location coordinates are in MGA94 Zone 56. ^SPT at 8.8m undertaken within HW casing; *Field replicate BD05/070721 taken at 11.5-11.95m depth

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: DPT Operator Pty Ltd
PROJECT: Cockle Bay Park Redevelopment
LOCATION: 241-249 Wheat Road, Sydney

SURFACE LEVEL: 2.5 AHD
EASTING: 333694
NORTHING: 6250483
DIP/AZIMUTH: 90°/--

BORE No: W5
PROJECT No: 202546.00
DATE: 7 - 8/7/2021
SHEET 3 OF 3

RL	Depth (m)	Description of Strata	Degree of Weathering (EW HW MW SW FS FR)	Graphic Log	Rock Strength (Ex Low / Very Low / Low / Medium / High / Very High / Ex High)	Water	Fracture Spacing (m) (0.01 / 0.05 / 0.10 / 0.50 / 1.00)	Discontinuities (B - Bedding J - Joint S - Shear F - Fault)	Sampling & In Situ Testing: Type	Core Rec. %	RQD %	Test Results & Comments
-18	21	SANDSTONE: medium to coarse grained, pale grey, distinctly and indistinctly bedded at 5-20°, high strength, fresh, unbroken, Hawkesbury Sandstone *(continued)*							C	100	100	PL(A) = 2
-19	21.16	Bore discontinued at 21.16m - Limit of investigation										
-20	22											
-21	23											
-22	24											
-23	25											
-24	26											
-25	27											
-26	28											
-27	29											

RIG: Comacchio 205 **DRILLER:** Ground Test **LOGGED:** LHS **CASING:** HW to 10.0m; HQ to 12.9m

TYPE OF BORING: Diacore 0.07m to 0.14m, Rotary wash bore 6.75m to 12.9m, NMLC Coring to 21.16m

WATER OBSERVATIONS: Water observed at 1.70m at 7:10pm on 7 July 2021

REMARKS: Location coordinates are in MGA94 Zone 56. ^SPT at 8.8m undertaken within HW casing; *Field replicate BD05/070721 taken at 11.5-11.95m depth

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: DPT Operator Pty Ltd
PROJECT: Cockle Bay Park Redevelopment
LOCATION: 241-249 Wheat Road, Sydney

SURFACE LEVEL: 5.2 AHD
EASTING: 333795
NORTHING: 6250697
DIP/AZIMUTH: 90°/--

BORE No: WD1
PROJECT No: 202546.00
DATE: 19 - 20/9/2021
SHEET 1 OF 3

RL	Depth (m)	Description of Strata	Degree of Weathering (EW HW MW SW FS FR)	Graphic Log	Rock Strength (Ex Low, Very Low, Low, Medium, High, Very High, Ex High)	Water	Fracture Spacing (m) (0.01, 0.05, 0.10, 0.50, 1.00)	Discontinuities (B - Bedding J - Joint S - Shear F - Fault)	Sampling & In Situ Testing: Type	Core Rec. %	RQD %	Test Results & Comments
5		FILL/Sandy GRAVEL: medium to coarse pale grey, angular to subrounded, slightly cemented,							A/E			
4	0.8	FILL/GRAVEL: medium to coarse sandstone gravel, occasional cobbles and boulders, pale grey brown, trace bricks and wood, appears in a dense condition, moist to wet							A/E			
3	1								A			
2	2								A			
1	3								A			
0	4								S			5,7,8 N = 15
-1	4.8	FILL/Gravelly SAND: fine to medium, brown and pale grey, approximately 40% sandstone gravel/cobbles, appears in a dense to very dense condition, wet (possible weathered sandstone)							S			20/50 refusal
-2	6.5	Sandy CLAY Cl: medium plasticity, pale grey brown, fine to medium sand, w~PL, apparently stiff, residual										
-3	7.0	SANDSTONE: fine to medium grained, pale grey, very low to low strength, highly weathered, Hawkesbury Sandstone							S			20/50 refusal
-4	8.15	SANDSTONE: medium to coarse grained, pale grey then brown, medium then high strength, fresh then moderately weathered, slightly fractured, Hawkesbury Sandstone						8.18m: B5°, cly, fg, 20mm 8.65m: B0°, cly co 3mm 9.32-9.35m: Cs	C	100	95	PL(A) = 0.8 PL(A) = 1

RIG: Bobcat **DRILLER:** JJ **LOGGED:** SI **CASING:** HW to 3.0m; HQ to 7.0m

TYPE OF BORING: NDD to 2.0m, Rotary wash bore to 7.0m, NMLC Coring to 24.9m

WATER OBSERVATIONS: No free groundwater observed during NDD

REMARKS: Location coordinates are in MGA94 Zone 56.

SAMPLING & IN SITU TESTING LEGEND

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

Douglas Partners
Geotechnics / Environment / Groundwater

BOREHOLE LOG

CLIENT: DPT Operator Pty Ltd
PROJECT: Cockle Bay Park Redevelopment
LOCATION: 241-249 Wheat Road, Sydney

SURFACE LEVEL: 5.2 AHD
EASTING: 333795
NORTHING: 6250697
DIP/AZIMUTH: 90°/--

BORE No: WD1
PROJECT No: 202546.00
DATE: 19 - 20/9/2021
SHEET 2 OF 3

RL	Depth (m)	Description of Strata	Degree of Weathering (EW HW MW SW FS FR)	Graphic Log	Rock Strength (Ex Low, Very Low, Low, Medium, High, Very High, Ex High)	Water	Fracture Spacing (m) (0.01, 0.05, 0.10, 0.50, 1.00)	Discontinuities (B - Bedding J - Joint S - Shear F - Fault)	Sampling & In Situ Testing: Type	Core Rec. %	RQD %	Test Results & Comments
-5		SANDSTONE: medium to coarse grained, pale grey then brown, medium then high strength, fresh then moderately weathered, slightly fractured, Hawkesbury Sandstone *(continued)*						10.5m: B0°, cly co 5mm	C	100	100	PL(A) = 1.6
-6	11											PL(A) = 1.7
								11.48m: B5°, fe	C	100	100	
-7	12											PL(A) = 1.7
	12.75	SANDSTONE: medium to coarse grained, pale grey, cross bedded (10°-20°), high strength, fresh, slightly fractured and unbroken, Hawkesbury Sandstone						12.75m: B5°, fe				
-8	13											PL(A) = 1.8
								13.45m: B5°, cly vn, ti				
-9	14											PL(A) = 1.7
								14.25m: B10°(x2), cly vn, ti 14.35m: B10°(x2), cly vn, ti	C	100	100	
-10	15											PL(A) = 1.5
								15.4m: B5°, cly vn, ti				
-11	16											PL(A) = 1.9
								16.65m: B10°, cly vn				
-12	17											PL(A) = 2.1
								17.2m: B0°, cly 3mm	C	100	100	
-13	18											PL(A) = 1.7
								18.55m: B10°, cbs cly 1mm				
-14	19											PL(A) = 1
									C	100	100	

RIG: Bobcat **DRILLER:** JJ **LOGGED:** SI **CASING:** HW to 3.0m; HQ to 7.0m

TYPE OF BORING: NDD to 2.0m, Rotary wash bore to 7.0m, NMLC Coring to 24.9m

WATER OBSERVATIONS: No free groundwater observed during NDD

REMARKS: Location coordinates are in MGA94 Zone 56.

SAMPLING & IN SITU TESTING LEGEND

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

Douglas Partners
Geotechnics / Environment / Groundwater

BOREHOLE LOG

CLIENT: DPT Operator Pty Ltd
PROJECT: Cockle Bay Park Redevelopment
LOCATION: 241-249 Wheat Road, Sydney

SURFACE LEVEL: 5.2 AHD
EASTING: 333795
NORTHING: 6250697
DIP/AZIMUTH: 90°/--

BORE No: WD1
PROJECT No: 202546.00
DATE: 19 - 20/9/2021
SHEET 3 OF 3

RL	Depth (m)	Description of Strata	Degree of Weathering (EW HW MW SW FS FR)	Graphic Log	Rock Strength (Ex Low, Very Low, Low, Medium, High, Very High, Ex High)	Water	Fracture Spacing (m) (0.01, 0.05, 0.10, 0.50, 1.00)	Discontinuities (B - Bedding J - Joint S - Shear F - Fault)	Sampling & In Situ Testing: Type	Core Rec. %	RQD %	Test Results & Comments
-15		SANDSTONE: medium to coarse grained, pale grey, cross bedded (10°-20°), high strength, fresh, slightly fractured and unbroken, Hawkesbury Sandstone *(continued)*										PL(A) = 1.5
-16	21								C	100	100	PL(A) = 2.1
								21.45m: B0°, cly co 2mm				
								21.85m: J50°, pl, ro, cln				
-17	22							22.1m: J45°, pl, ro, cln				PL(A) = 1.3
								22.25m: J45°, pl, ro, cln				
-18	23											PL(A) = 1.6
									C	100	100	
-19	24											PL(A) = 2.2
	24.9	Bore discontinued at 24.9m - Limit of investigation										
-20	25											
-21	26											
-22	27											
-23	28											
-24	29											

RIG: Bobcat **DRILLER:** JJ **LOGGED:** SI **CASING:** HW to 3.0m; HQ to 7.0m

TYPE OF BORING: NDD to 2.0m, Rotary wash bore to 7.0m, NMLC Coring to 24.9m

WATER OBSERVATIONS: No free groundwater observed during NDD

REMARKS: Location coordinates are in MGA94 Zone 56.

SAMPLING & IN SITU TESTING LEGEND

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

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BOREHOLE LOG

CLIENT: DPT Operator Pty Ltd
PROJECT: Cockle Bay Park Redevelopment
LOCATION: 241-249 Wheat Road, Sydney

SURFACE LEVEL: 3.8 AHD
EASTING: 333792
NORTHING: 6250668
DIP/AZIMUTH: 90°/--

BORE No: WD2
PROJECT No: 202546.00
DATE: 19/9/2021
SHEET 1 OF 3

RL	Depth (m)	Description of Strata	Degree of Weathering (EW HW MW SW FS FR)	Graphic Log	Rock Strength (Ex Low, Very Low, Low, Medium, High, Very High, Ex High)	Water	Fracture Spacing (m) (0.01, 0.05, 0.10, 0.50, 1.00)	Discontinuities (B - Bedding J - Joint S - Shear F - Fault)	Type	Core Rec. %	RQD %	Test Results & Comments
	0.06	PAVERS: concrete pavement										
	0.3	FILL/SAND: fine to medium, pale brown, trace roadbase gravel, appears in a loose condition, dry							A/E A			
	1.0	FILL/Sandy GRAVEL: medium to coarse, pale brown, occasional cobbles of ripped sandstone, approximately 30% medium to coarse sand, appears in a medium dense to dense condition, moist										
		FILL/GRAVEL: medium to coarse sandstone gravel, with some sandstone boulders, trace sand, appears in a dense condition, moist										
	4.2	Clayey SAND: fine to medium, pale grey brown, apparently medium dense to dense, residual							A U 50			U 50 No Recovery
	5.45	SANDSTONE: medium grained, pale grey brown, indistinctly bedded and cross bedded (10°-20°), medium strength, moderately weathered, slightly fractured, Hawkesbury Sandstone							S			25/50 refusal PL(A) = 0.4
									C	100	90	PL(A) = 0.3
	6.75							6.50-6.60m: Ds 6.65m: B0°, cly 10mm CORE LOSS: 100mm				
												PL(A) = 0.4
								7.25m: B10°, cly co 2mm 7.35m: B10°, cly co 2mm 7.6m: B5°, cly co 7.75m: B10°, cly 5mm 7.85m: B5°, cly vn				
									C	97	97	PL(A) = 0.5
	8.77							8.35-8.38m: Cs 8.45m: J30°, ti 8.5m: J70°, pl, ro, cln 8.65m: Cs 20mm CORE LOSS: 120mm 8.77m: Cs 20mm				
	8.8	SANDSTONE: medium to coarse grained, pale grey and brown, cross bedded at 0°-25°, high strength, slightly weathered and fresh, slightly fractured and unbroken, Hawkesbury Sandstone										PL(A) = 1.3

RIG: Bobcat **DRILLER:** JJ **LOGGED:** SI **CASING:** HW to 3.0m; HQ to 5.4m

TYPE OF BORING: NDD to 2.0m, Rotary wash bore to 5.45m, NMLC Coring to 21.9m

WATER OBSERVATIONS: No free groundwater observed during NDD

REMARKS: Location coordinates are in MGA94 Zone 56.

SAMPLING & IN SITU TESTING LEGEND

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

Douglas Partners
Geotechnics / Environment / Groundwater

BOREHOLE LOG

CLIENT: DPT Operator Pty Ltd
PROJECT: Cockle Bay Park Redevelopment
LOCATION: 241-249 Wheat Road, Sydney

SURFACE LEVEL: 3.8 AHD
EASTING: 333792
NORTHING: 6250668
DIP/AZIMUTH: 90°/--

BORE No: WD2
PROJECT No: 202546.00
DATE: 19/9/2021
SHEET 2 OF 3

RL	Depth (m)	Description of Strata	Degree of Weathering (EW HW MW SW FS FR)	Graphic Log	Rock Strength (Ex Low / Very Low / Low / Medium / High / Very High / Ex High)	Water	Fracture Spacing (m) (0.01 / 0.05 / 0.10 / 0.50 / 1.00)	Discontinuities (B - Bedding J - Joint S - Shear F - Fault)	Sampling & In Situ Testing: Type	Core Rec. %	RQD %	Test Results & Comments
-7	11	SANDSTONE: medium to coarse grained, pale grey and brown, cross bedded at 0°-25°, high strength, slightly weathered and fresh, slightly fractured and unbroken, Hawkesbury Sandstone *(continued)*						10.9m: B10°, cly vn, ti	C	100	100	PL(A) = 1.4
												PL(A) = 1.9
-8	12								C	100	100	PL(A) = 1.7
-9								12.6m: B10°, cly vn, ti				
	13											PL(A) = 1.5
-10	14							14.4m: B5°, cly vn, ti	C	100	100	PL(A) = 2.3
-11	15											PL(A) = 2
-12	16							>>				PL(A) = 1.6
-13	17								C	100	100	PL(A) = 1.6
-14	18							18.25m: B0°, cbs co 1mm				PL(A) = 1.5
-15	19								C	100	100	PL(A) = 1.5
-16												

RIG: Bobcat **DRILLER:** JJ **LOGGED:** SI **CASING:** HW to 3.0m; HQ to 5.4m

TYPE OF BORING: NDD to 2.0m, Rotary wash bore to 5.45m, NMLC Coring to 21.9m

WATER OBSERVATIONS: No free groundwater observed during NDD

REMARKS: Location coordinates are in MGA94 Zone 56.

SAMPLING & IN SITU TESTING LEGEND

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

Douglas Partners
Geotechnics / Environment / Groundwater

BOREHOLE LOG

CLIENT: DPT Operator Pty Ltd
PROJECT: Cockle Bay Park Redevelopment
LOCATION: 241-249 Wheat Road, Sydney

SURFACE LEVEL: 3.8 AHD
EASTING: 333792
NORTHING: 6250668
DIP/AZIMUTH: 90°/--

BORE No: WD2
PROJECT No: 202546.00
DATE: 19/9/2021
SHEET 3 OF 3

RL	Depth (m)	Description of Strata	Degree of Weathering (EW HW MW SW FS FR)	Graphic Log	Rock Strength (Ex Low, Very Low, Low, Medium, High, Very High, Ex High)	Water	Fracture Spacing (m) (0.01, 0.05, 0.10, 0.50, 1.00)	Discontinuities (B - Bedding J - Joint S - Shear F - Fault)	Sampling & In Situ Testing: Type	Core Rec. %	RQD %	Test Results & Comments
-17	21	SANDSTONE: medium to coarse grained, pale grey and brown, cross bedded at 0°-25°, high strength, slightly weathered and fresh, slightly fractured and unbroken, Hawkesbury Sandstone *(continued)*						20.2m: Unconformity 20.60-21.10m: J80°, pl, ro, ti	C	100	100	PL(A) = 1.8
		Between 21.2-21.8m: siltstone clasts						21.6m: J25°, pl, ro, cln 21.70-21.80m: breccia siltstone clasts				PL(A) = 1.3
-18	21.9 22	Bore discontinued at 21.9m - Limit of investigation										
-19	23											
-20	24											
-21	25											
-22	26											
-23	27											
-24	28											
-25	29											
-26												

RIG: Bobcat **DRILLER:** JJ **LOGGED:** SI **CASING:** HW to 3.0m; HQ to 5.4m

TYPE OF BORING: NDD to 2.0m, Rotary wash bore to 5.45m, NMLC Coring to 21.9m

WATER OBSERVATIONS: No free groundwater observed during NDD

REMARKS: Location coordinates are in MGA94 Zone 56.

SAMPLING & IN SITU TESTING LEGEND

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

Douglas Partners
Geotechnics / Environment / Groundwater

BOREHOLE LOG

CLIENT: DPT Operator Pty Ltd
PROJECT: Cockle Bay Park Redevelopment
LOCATION: 241-249 Wheat Road, Sydney

SURFACE LEVEL: 4.8 AHD
EASTING: 333800
NORTHING: 6250639
DIP/AZIMUTH: 90°/--

BORE No: WD3
PROJECT No: 202546.00
DATE: 11 - 12/9/2021
SHEET 1 OF 3

RL	Depth (m)	Description of Strata	Degree of Weathering (EW HW MW SW FS FR)	Graphic Log	Rock Strength (Ex Low, Very Low, Low, Medium, High, Very High, Ex High)	Water	Fracture Spacing (m) (0.01, 0.05, 0.10, 0.50, 1.00)	Discontinuities (B - Bedding J - Joint S - Shear F - Fault)	Sampling & In Situ Testing: Type	Core Rec. %	RQD %	Test Results & Comments
4	0.13	CONCRETE: grey, igneous aggregate of 10mm nominal diameter, 10mm diameter steel reinforcement							A			
1	0.3	FILL/Sandy GRAVEL: fine to medium, igneous gravel, grey, fine to coarse sand, trace silt, dry, appears in a medium dense condition							A			
3		FILL/Gravelly SAND: fine to coarse, brown, fine to medium igneous and sandstone gravel, trace coarse asphalt and concrete gravel, dry, appears in a medium dense condition							A			
2									A			
2									S			9,10,11 N = 21
3												
1		Between 3.5-3.7m: possible concrete fragment							A			
4									S*			10,10,11 N = 21
0	5	5.0 Sandy CLAY CL: low plasticity, dark grey, fine to medium sand, w~PL, firm, estuarine										
-1									S			2,3,3 N = 6
6												
-2	7	7.0 SAND SP: fine to coarse, grey, trace clay and shells, wet, loose, estuarine										
-3									U_{50}			
8									S			2,2,3 N = 5
-4	9											
-5												

RIG: XC rig **DRILLER:** Terratest **LOGGED:** LHS **CASING:** HW to 3.5m; HQ to 10.65m

TYPE OF BORING: Diacore to 0.13m, Hand auger to 0.8m, Solid flight auger to 7.0m; Rotary wash bore to 10.65m; NMLC Coring to 25.35m

WATER OBSERVATIONS: Free groundwater observed at 7.0m depth whilst augering

REMARKS: Location coordinates are in MGA94 Zone 56. *Field replicate BD3/210911 taken at 4.0-4.45m depth

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: DPT Operator Pty Ltd
PROJECT: Cockle Bay Park Redevelopment
LOCATION: 241-249 Wheat Road, Sydney

SURFACE LEVEL: 4.8 AHD
EASTING: 333800
NORTHING: 6250639
DIP/AZIMUTH: 90°/--

BORE No: WD3
PROJECT No: 202546.00
DATE: 11 - 12/9/2021
SHEET 2 OF 3

RL	Depth (m)	Description of Strata	Degree of Weathering (EW HW MW SW FS FR)	Graphic Log	Rock Strength (Ex Low, Very Low, Low, Medium, High, Very High, Ex High)	Water	Fracture Spacing (m) (0.01, 0.05, 0.10, 0.50, 1.00)	Discontinuities (B - Bedding J - Joint S - Shear F - Fault)	Type	Core Rec. %	RQD %	Test Results & Comments
		SAND SP: fine to coarse, grey, trace clay and shells, wet, loose, estuarine *(continued)*						Unless otherwised stated, rock is fractured along rough, planar bedding, dipping 0-10°				
		Below 10.5m: grading to fine to medium, no shells, moist, dense, possibly residual							S			16 refusal bouncing
-6	10.8	SANDSTONE: fine to medium grained, grey, very low to low strength, highly weathered, fractured, Hawkesbury sandstone						10.82m: Cs, 10mm 10.88-10.91m: B0°(x2), pl, cly 1mm 11.2m: J60°, pl, ro, cln 11.31-11.34m: B0°(x2), pl, cly 3mm	C	100	78	PL(A) = 0.2 PL(A) = 1.2
-7	11.35	SANDSTONE: medium to coarse grained, pale grey, distinct and indistinct bedding at 0-10°, high strength, fresh, slightly fractured, Hawkesbury sandstone						12.09-12.27m: B20°(x2), pl, cly vnr 13.32m: B0°, pl, cly vnr	C	100	100	PL(A) = 1.3
-8	12											
-9	13								C	100	93	PL(A) = 1.5 PL(A) = 1.6
-10	14											
-11	15	Between 15.2-15.6m: siltstone specks						15.91m: B0°, pl, cly vnr	C	100	100	PL(A) = 1.5
-12	16							16.5-16.52m: B10°(x2), pl, cly vnr 16.91m: B10°, pl, cly vnr	C	100	99	PL(A) = 1.4 PL(A) = 2.3
-13	17											
-14	18							18.4m: B0°, pl, cly vnr 19.19m: B10°, pl, cly vnr	C	100	100	PL(A) = 1.5
-15	19	Between 19.75-19.85m: carbonaceous laminations						19.83m: B0°, un, cly vnr	C	100	100	PL(A) = 1.6

RIG: XC rig **DRILLER:** Terratest **LOGGED:** LHS **CASING:** HW to 3.5m; HQ to 10.65m

TYPE OF BORING: Diacore to 0.13m, Hand auger to 0.8m, Solid flight auger to 7.0m; Rotary wash bore to 10.65m; NMLC Coring to 25.35m

WATER OBSERVATIONS: Free groundwater observed at 7.0m depth whilst augering

REMARKS: Location coordinates are in MGA94 Zone 56. *Field replicate BD3/210911 taken at 4.0-4.45m depth

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: DPT Operator Pty Ltd
PROJECT: Cockle Bay Park Redevelopment
LOCATION: 241-249 Wheat Road, Sydney

SURFACE LEVEL: 4.8 AHD
EASTING: 333800
NORTHING: 6250639
DIP/AZIMUTH: 90°/--

BORE No: WD3
PROJECT No: 202546.00
DATE: 11 - 12/9/2021
SHEET 3 OF 3

RL	Depth (m)	Description of Strata	Degree of Weathering (EW HW MW SW FS FR)	Graphic Log	Rock Strength (Ex Low, Very Low, Low, Medium, High, Very High, Ex High)	Water	Fracture Spacing (m) (0.01, 0.05, 0.10, 0.50, 1.00)	Discontinuities (B - Bedding J - Joint S - Shear F - Fault)	Sampling & In Situ Testing: Type	Core Rec. %	RQD %	Test Results & Comments
-16	21	SANDSTONE: medium to coarse grained, pale grey, distinct and indistinct bedding at 0-10°, high strength, fresh, slightly fractured, Hawkesbury sandstone *(continued)*							C	100	100	PL(A) = 1.2
-17	22	Between 21.28-21.31m: carbonaceous laminations Between 21.77-21.78m: carbonaceous laminations						21.35m: B10°, un, cly vnr 21.78m: B0°, un, cly vnr	C	100	100	PL(A) = 1.3
-18	23	Between 22.36-22.4m: siltstone specks							C	100	100	PL(A) = 1.1
-19	24	Between 23.6-23.79m: grading to fine grained Between 24.02-24.12m: siltstone clasts and beds Between 24.12-24.18m: fine grained						23.6m: B0°, un, cly vnr 24.18m: Cs, 10mm	C	100	99	PL(A) = 1.8 PL(A) = 1.2
-20	25											PL(A) = 1.5
	25.35	Bore discontinued at 25.35m - Limit of investigation										
-21	26											
-22	27											
-23	28											
-24	29											
-25												

RIG: XC rig **DRILLER:** Terratest **LOGGED:** LHS **CASING:** HW to 3.5m; HQ to 10.65m

TYPE OF BORING: Diacore to 0.13m, Hand auger to 0.8m, Solid flight auger to 7.0m; Rotary wash bore to 10.65m; NMLC Coring to 25.35m

WATER OBSERVATIONS: Free groundwater observed at 7.0m depth whilst augering

REMARKS: Location coordinates are in MGA94 Zone 56. *Field replicate BD3/210911 taken at 4.0-4.45m depth

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

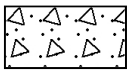
Symbols & Abbreviations

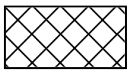
Graphic Symbols for Soil and Rock

General

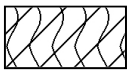

Asphalt

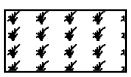

Road base

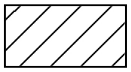

Concrete

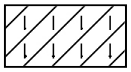

Filling

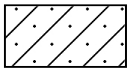
Soils


Topsoil

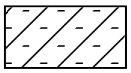

Peat

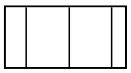

Clay

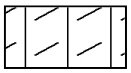

Silty clay

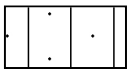

Sandy clay

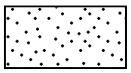

Gravelly clay

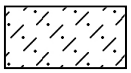

Shaly clay

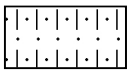

Silt


Clayey silt


Sandy silt

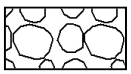

Sand

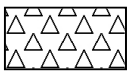

Clayey sand


Silty sand


Gravel

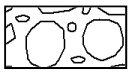

Sandy gravel


Cobbles, boulders

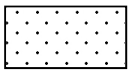

Talus

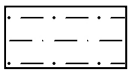
Sedimentary Rocks

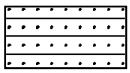

Boulder conglomerate

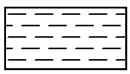

Conglomerate


Conglomeratic sandstone

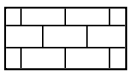

Sandstone


Siltstone

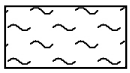

Laminite

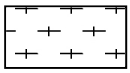

Mudstone, claystone, shale

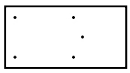

Coal


Limestone

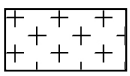
Metamorphic Rocks

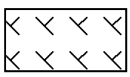

Slate, phyllite, schist

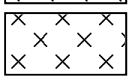

Gneiss

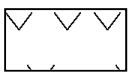

Quartzite

Igneous Rocks


Granite


Dolerite, basalt, andesite


Dacite, epidote


Tuff, breccia


Porphyry

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RESULTS OF ACID SULFATE SCREENING TESTS

Client: DPT Operator
Project: Cockle Bay Redevelopment
Project Location: Cockle Bay

Project No: 202546.00
pH Meter: ☐ TPS with Ionode IJ46/WP80 pH/Temp. Electrode
☑ YSI
Calibration Buffer: ☑ pH4 ☑ pH7 ☑ pH10

Sample Location	Depth (m)	pH_F (in distilled water) Date: Time:	pH_{FOX} (oxidised in H_2O_2) Date: Time:	Date: Time:	Date: Time:	Strength of Reaction (1,2,3,4)* F **	Soil Description
SS1	0.5	5.32	7.30			1	
	1.0	10.41	10.70			2	
SS2	0.1	8.50	8.34			1	
W1	10.45	8.34	7.94			1	
W3	10.75-11.2	7.02	6.99			1	
	11.5-11.95	7.84	8.09			2	*
	13.0-13.45	7.7	7.55			1	
	14.5-14.95	7.04	4.49			1	*
W4	10.0	8.01	7.00			2	
	11.5	7.94	7.34			3	
W5	8.8-9.25	8.36	5.84			3	*
	10-10.45	8.84	8.02			2	
	11.5-11.95	8.73	7.96			2	

Legend: * *1 denotes no or slight effervescence*
2 denotes moderate effervescence
3 denotes vigorous effervescence
4 denotes "volcano" ie. very vigorous effervescence, gas evolution and heat
** *F after reaction number indicates a bubbling/frothy reaction (organics)*

Operator: k.Plambeck
Date: 03.08.2021

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RESULTS OF ACID SULFATE SCREENING TESTS

Client: DPT Operator
Project: Cockle Bay Redevelopment
Project Location: Cockle Bay

Project No: 202546.00
pH Meter: ☐ TPS with Ionode IJ46/WP80 pH/Temp. Electrode
☑ YSI
Calibration Buffer: ☑ pH4 ☑ pH7 ☑ pH10

Sample Location	Depth (m)	pH_F (in distilled water) Date: Time:	pH_{FOX} (oxidised in H_2O_2) Date: Time:	Date: Time:	Date: Time:	Strength of Reaction (1,2,3,4)* F **	Soil Description
CW1	8.15-8.3	7.04	7.57			1	
CW1	8.75-9.0	7.51	8.09			1	
	10-10.45	6.82	7.96			1	
	12-12.45	3.79	3.12			2	
	13-13.45	3.83	3.19			2	*
	16-16.45	5.38	4.96			1	
	17.5-17.95	5.61	5.26			1	
	19-19.45	5.79	5.78			1	
	20.5-20.95	5.98	5.80			1	
CW2	0.1-0.2	6.07	7.92			1	
	0.4-0.5	8.11	8.34			1	
	0.9-1.0	8.59	7.94			1	
	1.4-1.5	8.78	8.01			1	
	~~9.0-9.45~~	8.52	7.64			1	
	9.9-10.35	7.98	2.98			2	*

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Operator: k.Plambeck
Date: 03.08.2021

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RESULTS OF ACID SULFATE SCREENING TESTS

Client: DPT Operator

Project: Cockle Bay Redevelopment

Project Location: Cockle Bay

Project No: 202546.00

pH Meter: ☐ TPS with Ionode IJ46/WP80 pH/Temp. Electrode
☑ YSI

Calibration Buffer: ☑ pH4 ☑ pH7 ☑ pH10

Sample Location	Depth (m)	pH_F (in distilled water) Date: / Time:	pH_{FOX} (oxidised in H_2O_2) Date: / Time:	Date: / Time:	Date: / Time:	Strength of Reaction (1,2,3,4)* F **	Soil Description
CW2	11.4-11.85	8.19	6.09			1	
	12.9-13.35	7.87	6.92			1	
	14.4-14.85	6.24	6.04			1	
CW3	0.1	8.24	7.54			3F	
	0.5	9.14	7.93			2F	
	1.0	8.84	7.93			1F	
CW4	0.05-0.15	10.76	10.54			1F	
	0.4-0.5	9.80	9.26			2F	
	0.9-1.0	9.72	8.61			3F	
	1.4-1.5	8.82	8.64			2F	
	1.9-2.0	8.55	7.28			2F	
	2.5-2.95	8.57	7.32			2F	
	5.5-5.95	8.78	7.06			1	
	7-7.45	8.84	7.67			1	
	8.5-8.95	8.23	7.53			1	

Legend:
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Operator: K. Plambeck

Date: 03.08.2021

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RESULTS OF ACID SULFATE SCREENING TESTS

Client: DPT Operator

Project: Cockle Bay Redevelopment

Project Location: Cockle Bay

Project No: 202546.00

pH Meter: ☐ TPS with Ionode IJ46/WP80 pH/Temp. Electrode
☑ YSI

Calibration Buffer: ☑ pH4 ☑ pH7 ☑ pH10

Sample Location	Depth (m)	pH_F (in distilled water) Date: / Time:	pH_{FOX} (oxidised in H_2O_2) Date: / Time:	Date: / Time:	Date: / Time:	Strength of Reaction (1,2,3,4)* F **	Soil Description
CW5	0.25-0.35	10.23	9.84			1	
	0.5-0.6	9.19	8.22			1	
	0.9-1.0	10.13	9.02			2	
	2.0	9.31	7.61			1	
	5.0	8.2	6.9			2	
	5.5-5.95	7.96	6.49			2	
	11.25-11.7	7.14	7.02			1	
	12.85-13.3	6.87	6.25			1	
CW6	0.1-0.2	8.34	8.16			2	
	0.5-0.6	8.69	7.79			1	
	0.9-1.0	9.02	8.03			1	
		8.66	7.32			1	
	6.85-7.3	8.13	7.37			2	
CW7	0.5	8.68	8.38			1	
	1.0	9.10	9.32			1	

Legend: * *1 denotes no or slight effervescence*
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** *F after reaction number indicates a bubbling/frothy reaction (organics)*

Operator: K. Plambeck

Date: 03.08.2021

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RESULTS OF ACID SULFATE SCREENING TESTS

Client: _____

Project: Cockle Bay

Project Location: _____

Project No: 202546.00

pH Meter: ☐ TPS with Ionode IJ46/WP80 pH/Temp. Electrode

☐ _____

Calibration Buffer: ☑ pH4
☑ pH7
☐ pH10

Sample Location	Depth (m)	pH_F (in distilled water)	pH_{FOX} (oxidised in H_2O_2)			Strength of Reaction	Soil Description
		Date: 31.8 Time: 9am	Date: 31.8 Time: 10am	Date: 31.8 Time: 11am	Date: 31.8 Time: 12pm	(1,2,3,4)* F **	
CW3	5.7-6.15	8.26	7.36	7.04	7.12	1	clay
	8.7-9.15	8.24	7.50	7.62	7.57	1	Silty sand
	11.7-12.15	8.26	7.46	7.26	7.34	1	Silty sand
	13.2-13.65	8.20	7.13	7.08	7.06	2	Silty sand
	14.7-15.15	8.25	7.35	7.26	7.29	1	Silty sand.
CW7	2-2.1	8.21	6.89	6.94	6.84	1	Fill
CP2	0.4-0.5	7.44	8.16	8.32	8.26	4 F	Fill
	0.9-1.0	8.24	8.13	8.29	8.22	4 F	Fill
	1.4-1.5	8.55	6.74	6.54	6.42	4 F	Fill *
	1.9-2.0	8.02	6.63	6.55	6.51	4 F	Fill
	2.4-2.5	7.95	6.19	5.98	5.95	3 F	clay *
	2.9-3.0	8.28	6.36	6.31	6.27	3 F	clay * *
	3.9-4.0	8.07	6.53	6.34	6.34	2 F	clay
	4.9-5.0	7.55	6.74	6.62	6.60	2 F	clay

Legend:
* *1 denotes no or slight effervescence*
2 denotes moderate effervescence
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** *F after reaction number indicates a bubbling/frothy reaction (organics)*

Operator: KP

Date: 31.08.21

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Groundwater Field Sheet

Project and Bore Installation Details	
Bore / Standpipe ID:	~~SS2~~ CW2
Project Name:	Cockle Bay
Project Number:	202546
Site Location:	
Bore GPS Co-ord:	
Installation Date:	
GW Level (during drilling):	m bgl
Well Depth:	m bgl
Screened Interval:	m bgl
Contaminants/Comments:	
Bore Development Details	
Date/Time:	~~2/9/21 1:40 PM~~
Purged By:	~~J~~
GW Level (pre-purge):	m bgl
Observed Well Depth:	m bgl
PSH observed:	Yes / No (interface / visual). Thickness if observed:
Estimated Bore Volume:	L
Total Volume Purged:	(target: no drill mud, min 3 well vol. or dry)
GW Level (post-purge):	m bgl
Equipment:	
Micropurge and Sampling Details	
Date/Time:	2/9/21 1:45 PM
Sampled By:	JH
Weather Conditions:	OVERCAST
GW Level (pre-purge):	2.97 m bgl
Observed Well Depth:	12.59 m bgl
PSH observed:	Yes / (No) (interface / visual). Thickness if observed:
Estimated Bore Volume:	69 L
GW Level (post sample):	2.97 m bgl
Total Volume Purged:	3 L
Equipment:	BLADDER PUMP

Water Quality Parameters

Time / Volume	Temp (°C)	DO (mg/L)	EC (µS or mS/cm)	pH	Turbidity	Redox (mV)
Stabilisation Criteria (3 readings)	***0.1° C***	**+/- 0.3 mg/L**	**+/- 3%**	**+/- 0.1**	**+/- 10%**	**+/- 10 mV**
30 / 0.5	19.8	5.78	44963	7.16	97	109.1
60 / 1.0	18.0	3.94	44868	7.06	57	110.3
90 / 1.5	17.7	3.31	44866	7.03	37	110
120 / 2.0	17.6	2.92	44858	7.02	32	109
150 / 2.5	17.6	2.72	44824	7.01	38	110
180 / 3.0	17.6	2.64	44873	7.01	35	110
Additional Readings Following stabilisation:	DO % Sat	SPC	TDS			

Sample Details

Sampling Depth (rationale):	8	m bgl,	MIDDLE OF COLUMN
Sample Appearance (e.g. colour, siltiness, odour):	NOT TURBID, CLEAR, NO ODOUR/SHEEN		
Sample ID:	CW2		
QA/QC Samples:	BD2/2021		
Sampling Containers and filtration:			
Comments / Observations:			

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Groundwater Field Sheet

Project and Bore Installation Details	
Bore / Standpipe ID:	~~SB2~~ CW3
Project Name:	Cockle Bay
Project Number:	202546
Site Location:	
Bore GPS Co-ord:	
Installation Date:	
GW Level (during drilling):	m bgl
Well Depth:	m bgl
Screened Interval:	m bgl
Contaminants/Comments:	

Bore Development Details	
Date/Time:	
Purged By:	
GW Level (pre-purge):	m bgl
Observed Well Depth:	m bgl
PSH observed:	Yes / No (interface / visual). Thickness if observed:
Estimated Bore Volume:	L
Total Volume Purged:	(target: no drill mud, min 3 well vol. or dry)
GW Level (post-purge):	m bgl
Equipment:	

Micropurge and Sampling Details	
Date/Time:	2/9/21 11:40 AM
Sampled By:	JH
Weather Conditions:	OVERCAST
GW Level (pre-purge):	2.81 m bgl
Observed Well Depth:	13.03 m bgl
PSH observed:	Yes / (No) (interface / visual). Thickness if observed:
Estimated Bore Volume:	73 L
GW Level (post sample):	3.08 m bgl
Total Volume Purged:	3.0 L
Equipment:	BLADDER PUMP

Water Quality Parameters

Time / Volume	Temp (°C)	DO (mg/L)	EC (µS or mS/cm)	pH	Turbidity	Redox (mV)
Stabilisation Criteria (3 readings)	***0.1° C***	**+/- 0.3 mg/L**	**+/- 3%**	**+/- 0.1**	**+/- 10%**	**+/- 10 mV**
30 / 0.5	20.5	2.46	24630	7.32	994	-128
60 / 1.0	20.4	1.27	25763	7.25	958	-143
90 / 1.5	20.3	0.61	26144	7.24	901	-155
120 / 2.0	20.3	0.31	26171	7.23	863	-162
150 / 2.5	20.3	0.29	26184	7.23	850	-168
180 / 3.0	20.2	0.26	26237	7.23	817	-170.9

Additional Readings Following stabilisation:	DO % Sat	SPC	TDS

Sample Details

Sampling Depth (rationale):	m bgl,	
Sample Appearance (e.g. colour, siltiness, odour):	MODERATELY TURBID, GREY, SULPHUR ODOUR, NO SHEEN	
Sample ID:	CW3	
QA/QC Samples:	BD1/2021	
Sampling Containers and filtration:		
Comments / Observations:		

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Groundwater Field Sheet

Project and Bore Installation Details

Bore / Standpipe ID:	~~SS2~~ CW5
Project Name:	Cockle Bay
Project Number:	202546
Site Location:	COCKLE BAY
Bore GPS Co-ord:	
Installation Date:	
GW Level (during drilling):	m bgl
Well Depth:	m bgl
Screened Interval:	m bgl
Contaminants/Comments:	

Bore Development Details

Date/Time:	2/9/21 9:00AM
Purged By:	JH
GW Level (pre-purge):	2.98 m bgl
Observed Well Depth:	4.58 m bgl
PSH observed:	Yes / (No) (interface / visual). Thickness if observed:
Estimated Bore Volume:	L
Total Volume Purged:	(target: no drill mud, min 3 well vol. or dry)
GW Level (post-purge):	m bgl
Equipment:	

Micropurge and Sampling Details

Date/Time:	2/9/21 9:00 AM
Sampled By:	JH
Weather Conditions:	OVERCAST
GW Level (pre-purge):	2.98 m bgl
Observed Well Depth:	4.58 m bgl
PSH observed:	Yes / (No) (interface / visual). Thickness if observed:
Estimated Bore Volume:	11.5 L
GW Level (post sample):	3.64 m bgl
Total Volume Purged:	2.0 L
Equipment:	BLADDER PUMP

Water Quality Parameters

Time / Volume	Temp (°C)	DO (mg/L)	EC (µS or mS/cm)	pH	Turbidity	Redox (mV)
Stabilisation Criteria (3 readings)	***0.1° C***	**+/- 0.3 mg/L**	**+/- 3%**	**+/- 0.1**	**+/- 10%**	**+/- 10 mV**
30 / 0.5	18.1	1.42	40263	7.09	2340	-44.8
60 / 1.0	18.0	0.92	40278	7.10	2263	-46.2
90 / 1.5	18.0	0.88	40309	7.11	2194	-47.1
120 / 2.0	17.9	0.77	40329	7.12	2140	-47.7

Additional Readings Following stabilisation:	DO % Sat	SPC	TDS			

Sample Details

Sampling Depth (rationale):	4	m bgl,	MIDDLE OF WATER COLUMN
Sample Appearance (e.g. colour, siltiness, odour):	MODERATELY TURBID, GREY, NO ODOUR/SHEEN		
Sample ID:	CW5		
QA/QC Samples:			
Sampling Containers and filtration:			
Comments / Observations:			

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Groundwater Field Sheet

Project and Bore Installation Details	
Bore / Standpipe ID:	~~BH2~~ CW6
Project Name:	Cockle Bay
Project Number:	202546
Site Location:	
Bore GPS Co-ord:	
Installation Date:	
GW Level (during drilling):	m bgl
Well Depth:	m bgl
Screened Interval:	m bgl
Contaminants/Comments:	
Bore Development Details	
Date/Time:	~~2/9/21 12:30 PM~~
Purged By:	~~JH~~
GW Level (pre-purge):	m bgl
Observed Well Depth:	m bgl
PSH observed:	Yes / No (interface / visual). Thickness if observed:
Estimated Bore Volume:	L
Total Volume Purged:	(target: no drill mud, min 3 well vol. or dry)
GW Level (post-purge):	m bgl
Equipment:	
Micropurge and Sampling Details	
Date/Time:	2/9/21 12:30 PM
Sampled By:	JH
Weather Conditions:	OVERCAST
GW Level (pre-purge):	2.89 m bgl
Observed Well Depth:	4.82 m bgl
PSH observed:	Yes / (No) (interface / visual). Thickness if observed:
Estimated Bore Volume:	13.9 L
GW Level (post sample):	3.81 m bgl
Total Volume Purged:	2.5 L
Equipment:	BLADDER PUMP

Water Quality Parameters

Time / Volume	Temp (°C)	DO (mg/L)	EC (µS or mS/cm)	pH	Turbidity	Redox (mV)
Stabilisation Criteria (3 readings)	***0.1° C***	**+/- 0.3 mg/L**	**+/- 3%**	**+/- 0.1**	**+/- 10%**	**+/- 10 mV**
~~30~~ / 0.5	20.0	3.34	3731	7.35	4219	-138
60 / 1.0	19.6	1.48	3378	7.32	3639	-138
90 / 1.5	19.3	0.79	3089	7.31	3712	-141
120 / 2.0	19.3	0.72	2997	7.31	3827	-138
150 / 2.5	19.3	0.68	2921	7.30	3963	-133
Additional Readings Following stabilisation:	DO % Sat	SPC	TDS			

Sample Details

Sampling Depth (rationale):	m bgl,
Sample Appearance (e.g. colour, siltiness, odour):	HIGHLY TURBID, GREY, NO SHEEN, UNKNOWN NASAL BURNING ODOUR
Sample ID:	CW6
QA/QC Samples:	—
Sampling Containers and filtration:	
Comments / Observations:	

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Groundwater Field Sheet

Project and Bore Installation Details	
Bore / Standpipe ID:	~~SS2~~ CP2
Project Name:	Cockle Bay
Project Number:	202546
Site Location:	
Bore GPS Co-ord:	
Installation Date:	
GW Level (during drilling):	m bgl
Well Depth:	m bgl
Screened Interval:	m bgl
Contaminants/Comments:	

Bore Development Details	
Date/Time:	
Purged By:	
GW Level (pre-purge):	m bgl
Observed Well Depth:	m bgl
PSH observed:	Yes / No (interface / visual). Thickness if observed:
Estimated Bore Volume:	L
Total Volume Purged:	(target: no drill mud, min 3 well vol. or dry)
GW Level (post-purge):	m bgl
Equipment:	

Micropurge and Sampling Details	
Date/Time:	3/9/21 11:15 AM
Sampled By:	JH
Weather Conditions:	SUNNY
GW Level (pre-purge):	4.39 m bgl
Observed Well Depth:	16.40 m bgl
PSH observed:	Yes / (No) (interface / visual). Thickness if observed:
Estimated Bore Volume:	86 L
GW Level (post sample):	5.41 m bgl
Total Volume Purged:	2.5 L
Equipment:	BLADDER PUMP

Water Quality Parameters

Time / Volume	Temp (°C)	DO (mg/L)	EC (µS or mS/cm)	pH	Turbidity	Redox (mV)
Stabilisation Criteria (3 readings)	***0.1° C***	**+/- 0.3 mg/L**	**+/- 3%**	**+/- 0.1**	**+/- 10%**	**+/- 10 mV**
60 / 0.5	19.4	3.04	19346	6.38	638	-67.5
120 / 1.0	19.6	1.78	20987	6.43	646	-81.1
180 / 1.5	19.6	1.27	21480	6.45	666	-89.1
240 / 2.0	19.7	1.12	21920	6.45	680	-90.4
300 / 2.5	19.7	1.04	22028	6.51	630	-92.6
Additional Readings Following stabilisation:	DO % Sat	SPC	TDS			

Sample Details

Sampling Depth (rationale):	10	m bgl,	MIDDLE OF COLUMN
Sample Appearance (e.g. colour, siltiness, odour):	SLIGHTLY TURBID, GREY, SULPHURIC ODOUR, NO SHEEN		
Sample ID:	CP2		
QA/QC Samples:	—		
Sampling Containers and filtration:			
Comments / Observations:			

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Groundwater Field Sheet

Project and Bore Installation Details

Bore / Standpipe ID:	SS2
Project Name:	Cockle Bay
Project Number:	202546
Site Location:	
Bore GPS Co-ord:	
Installation Date:	
GW Level (during drilling):	m bgl
Well Depth:	m bgl
Screened Interval:	m bgl
Contaminants/Comments:	

Bore Development Details

Date/Time:	
Purged By:	
GW Level (pre-purge):	m bgl
Observed Well Depth:	m bgl
PSH observed:	Yes / No (interface / visual). Thickness if observed:
Estimated Bore Volume:	L
Total Volume Purged:	(target: no drill mud, min 3 well vol. or dry)
GW Level (post-purge):	m bgl
Equipment:	

Micropurge and Sampling Details

Date/Time:	3/9/21 8:43 AM
Sampled By:	JH
Weather Conditions:	SUNNY
GW Level (pre-purge):	3.55 m bgl
Observed Well Depth:	16.98 m bgl
PSH observed:	Yes / (No) (interface / visual). Thickness if observed:
Estimated Bore Volume:	96 L
GW Level (post sample):	4.23 m bgl
Total Volume Purged:	3 L
Equipment:	BLADDER PUMP

Water Quality Parameters

Time / Volume	Temp (°C)	DO (mg/L)	EC (µS or mS/cm)	pH	Turbidity	Redox (mV)
Stabilisation Criteria (3 readings)	***0.1° C***	**+/- 0.3 mg/L**	**+/- 3%**	**+/- 0.1**	**+/- 10%**	**+/- 10 mV**
30 / 0.5	18.6	4.15	1953	4.27	521	297
60 / 1.0	19.1	2.70	1560	4.22	522	322
90 / 1.5	19.3	2.01	1662	4.21	550	342
120 / 2.0	19.6	1.36	1693	4.21	527	355
150 / 2.5	19.6	1.30	1691	4.21	515	359
180 / 3.0	19.7	1.27	1683	4.20	490	362
Additional Readings Following stabilisation:	DO % Sat	SPC	TDS			

Sample Details

Sampling Depth (rationale):	10 m bgl, MIDDLE OF COLUMN
Sample Appearance (e.g. colour, siltiness, odour):	MODERATLY TURBID, GREY, SLIGHT HC ODOUR, NO SHEEN
Sample ID:	SS2
QA/QC Samples:	—
Sampling Containers and filtration:	
Comments / Observations:	

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Landfill Gas Monitoring

Client: **DPT Operator**
Project: **Cockle Bay**
Location: CW3
Weather/ Site Conditions:
Well ID: CW3
Time: 11:15 AM

Date: 2/9/21
Project Numbe: 202546
Atmospheric Pressure Mb: 1029
Relative Borehole Pressure: -12.45/-0.07
Sampler: JH
Flow or Concentration taken first? FLOW

Time (sec)	Concentration (% v/v)			H_2S (ppm)	CO (ppm)	Flow (l/hr)	PID
	CH_4	CO_2	O_2				
Initial (0)	0	0.1	20.7	1	3	0.1	0.5
30			20.1	9	18	0.4	1.4
60			19.9	12	19	0.9	1.6
90			19.6	16	20	1.7	1.6
120			19.3	18	19	2.3	
150			19.2	21	16	2.6	
180				22	14	3.0	
210				23	13	3.1	
240				23	12	3.2	
270				24	9	3.2	
300			19.1	24	8	3.2	
330							
360							
390							
420							
450							
480							
510							
540							
570							
600							

Client: **DPT Operator**
Project: **Cockle Bay**
Location:
Weather/ Site Conditions:
Well ID: CW2
Time: 1:15 PM

Date: 2/9/21
Project Numbe: 202546
Atmospheric Pressure Mb: 1027
Relative Borehole Pressure: 0-03/0.09
Sampler: JH
Pressure Mb:
Flow or Concentration taken first? FLOW

Time (sec)	Concentration (% v/v)			H_2S (ppm)	CO (ppm)	Flow (l/hr)	PID
	CH_4	CO_2	O_2				
Initial (0)	0	0.1	21.0	0	1	0.0	0.2
30		0.0		1	2	0.1	0.5
60		0.0		1	1	0.2	
90		0.0		1	2	0.3	
120		0.1		3	4	0.4	
150				4	5		
180				5	7		0.8
210			20.9	7	8		
240				8	9		
270				9	9		1.2
300				10	9		1.2
330							
360							
390							
420							
450							
480							
510							
540							
570							
600							

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Landfill Gas Monitoring

Client: **DPT Operator** Date: 2/9/21

Project: **Cockle Bay** Project Numbe 202546

Location: CW6 Atmospheric Pressure Mb: 1030

Weather/ Site Conditions: OVERCAST Relative Borehole Pressure: 0.02

Well ID:	CW6			Sampler:	JH		
Time (sec)	Concentration (% v/v)			H_2S (ppm)	CO (ppm)	Flow (l/hr)	PID
	CH_4	CO_2	O_2				
Initial (0)	0.0	0.4	21.2	0	2	0.1	3.5
30	0	0.4	17.6	0	1	0.1	4.6
60	0	0.4	10.2	0	1	0.1	5.6
90	0	0.4	6.1	0	1	0.1	7.0
120	0	0.4	3.6	0	1	0.1	7.7
150	0	0.4	1.4	0	1	0.1	9.5
180	0	0.4	1.4	0	1	0.1	12.5
210	0	0.4	1.4	0	1	0.1	15.3
240	0	0.4	1.3	0	1	0.1	18.1
270	0	0.4	1.3	0	1	0.1	21.4
300	0	0.4	1.3	0	1	0.1	23.0
330							24.2
360							26.4
390							28.5
420							31.3
450							33.7
480							35.3
510							40.6
540							43.7

Client: **DPT Operator** Date: 2/9/21

Project: **Cockle Bay** Project Numbe 202546

Location: ~~CW3~~ CW5 Atmospheric Pressure Mb: 1030

Weather/ Site Conditions: ~~RAIN~~ OVERCAST Relative Borehole Pressure: 0.07

Well ID:	~~CW3~~ CW5			Sampler:	JH		
			Pressure Mb:				
Time (sec)	Concentration (% v/v)			H_2S (ppm)	CO (ppm)	Flow (l/hr)	PID
	CH_4	CO_2	O_2		0	0.1	
Initial (0)	0	0.4	20.3	0	0		1.4
30		0.4	20.4		1		1.3
60		0.5	20.3		0		1.2
90							1.1
120							1.0
150							2.0
180							1.9
210							1.8
240							1.8
270							1.6
300	↓	↓	↓	↓	↓	↓	1.6
330							
360							
390							
420							
450							
480							
510							
540							

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Landfill Gas Monitoring

Client: **DPT Operator**
Project: **Cockle Bay**
Location:
Weather/ Site Conditions: SUNNY
Well ID: SS2
Time: 8:20 AM

Date: 3/9
Project Numbe: 202546
Atmospheric Pressure Mb: 1026
Relative Borehole Pressure: -0.05/0.05
Sampler: JH
Flow or Concentration taken first? FLOW

Time (sec)	Concentration (% v/v)			H_2S (ppm)	CO (ppm)	Flow (l/hr)	PID
	CH_4	CO_2	O_2				
Initial (0)	0	3.5	18.9	0	0	0	0.5
30		4.6	17.2		1	0	1.0
60		5.7	16.2		0	0.1	1.2
90		6.4	15.6		1	0.1	1.3
120		6.7	15.4		0		1.2
150		6.7	15.3		1		
180		6.8	15.3		0		
210			15.2				
240							
270							
300							
330							
360							
390							
420							
450							
480							
510							
540							
570							
600							

Client: **DPT Operator**
Project: **Cockle Bay**
Location:
Weather/ Site Conditions: SUNNY
Well ID: CP2
Time: 11:00 AM

Date: 3/9
Project Numbe: 202546
Atmospheric Pressure Mb: 1024
Relative Borehole Pressure: -0.02/0.03
Sampler:
Pressure Mb:
Flow or Concentration taken first? FLOW

Time (sec)	Concentration (% v/v)			H_2S (ppm)	CO (ppm)	Flow (l/hr)	PID
	CH_4	CO_2	O_2				
Initial (0)	0	0.1	21.2	0	0	0.0	1.4
30		0.8	19.7	0	5		4.2
60		1.1	18.9	1	7		4.9
90		1.2	18.8	0	7		5.0
120		1.2	18.6	0	8		5.1
150		1.3	18.5	1	8		5.1
180			18.4		7		5.3
210					7		
240					7		
270			18.3		8		
300		1.4	18.3		8		
330							
360							
390							
420							
450							
480							
510							
540							
570							
600							

Appendix G

Laboratory Results Tables

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Table 1: Summary of Laboratory Results – Metals, TRH, BTEX, PAH, Phenol, OCP, OPP, PCB, Asbestos, Additional metals, Complete PAH suite, TRH, Complete OCP suite, Complete OPP suite, VOC

			Metals								TRH						BTEX				PAH			
			Arsenic	Cadmium	Total Chromium	Copper	Lead	Mercury (inorganic)	Nickel	Zinc	TRH C6 - C10	TRH >C10-C16	F1 ([C6-C10]-BTEX)	F2 (>C10-C16 less Naphthalene)	F3 (>C16-C34)	F4 (>C34-C40)	Benzene	Toluene	Ethylbenzene	Total Xylenes	Naphthalene [b]	Benzo(a)pyrene (BaP)	Benzo(a)pyrene TEQ	Total PAHs
		POL	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
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
CW2	0.4 - 0.5 m	30/06/2021	<4	<0.4	**14**	**17**	**34**	**0.1**	**12**	**36**	-	-	-	-	-	-	-	-	-	-	<0.1	**0.09**	<0.5	**0.5**
			300 100	90 -	300 330	17000 240	600 1100	80 -	1200 270	30000 820	- -	- 120	NL 180	NL -	300	2800	NL 50	NL 85	NL 70	NL 105	NL 170	- 0.7	3	300 -
CW4	0.9 - 1 m	30/06/2021	**6**	<0.4	**13**	**40**	**120**	**0.6**	**6**	**81**	-	-	-	-	-	-	-	-	-	-	<0.1	**0.75**	**1**	**6.3**
			300 100	90 -	300 330	17000 240	600 1100	80 -	1200 270	30000 820	- -	- 120	NL 180	NL -	300	2800	NL 50	NL 85	NL 70	NL 105	NL 170	- 0.7	3	300 -
CW5	0.5 - 0.6 m	30/06/2021	**6**	<0.4	**10**	**26**	**39**	<0.1	**13**	**87**	<25	<50	<25	<50	<100	<100	<0.2	<0.5	<1	<1	<1	<0.05	<0.5	**0.2**
			300 100	90 -	300 330	17000 240	600 1100	80 -	1200 270	30000 820	- -	- 120	NL 180	NL -	300	2800	NL 50	NL 85	NL 70	NL 105	NL 170	- 0.7	3	300 -
CW6	0.5 - 0.6 m	30/06/2021	**5**	<0.4	**11**	**36**	**120**	**0.2**	**13**	**180**	<25	<50	<25	<50	<100	<100	<0.2	<0.5	<1	<1	<1	**1.6**	**2.2**	**14**
			300 100	90 -	300 330	17000 240	600 1100	80 -	1200 270	30000 820	- -	- 120	NL 180	NL -	300	2800	NL 50	NL 85	NL 70	NL 105	NL 170	- 0.7	3	300 -
BD1/20210630	-	30/06/2021	**4**	<0.4	**9**	**36**	**79**	**0.2**	**11**	**90**	<25	<50	<25	<50	<100	<100	<0.2	<0.5	<1	<1	<1	**1.9**	**2.7**	**19**
			300 100	90 -	300 330	17000 240	600 1100	80 -	1200 270	30000 820	- -	- 120	NL 180	NL -	300	2800	NL 50	NL 85	NL 70	NL 105	NL 170	- 0.7	3	300 -
W4	10 m	-	**12**	**4**	**48**	**230**	**1200**	**3.8**	**28**	**1000**	<25	<50	<25	<50	**310**	**110**	<0.2	<0.5	<1	<1	<1	**0.96**	**1.4**	**12**
			300 100	90 -	300 330	17000 240	600 1100	80 -	1200 270	30000 820	- -	- 120	NL 180	NL -	300	2800	NL 50	NL 85	NL 70	NL 105	NL 170	- 0.7	3	300 -
W4	12.45 m	-	<4	<0.4	**30**	**41**	**28**	**0.3**	**17**	**36**	<25	<50	<25	<50	<100	<100	<0.2	<0.5	<1	<1	<1	**0.53**	**0.7**	**5**
			300 100	90 -	300 330	17000 240	600 1100	80 -	1200 270	30000 820	- -	- 120	NL 180	NL -	300	2800	NL 50	NL 85	NL 70	NL 105	NL 170	- 0.7	3	300 -
CW1	12 - 12.45 m	12/07/2021	<4	<0.4	**3**	<1	**3**	<0.1	<1	**2**	<25	<50	<25	<50	<100	<100	<0.2	<0.5	<1	<1	<1	<0.05	<0.5	<0.05
			300 100	90 -	300 330	17000 240	600 1100	80 -	1200 270	30000 820	- -	- 120	NL 180	NL -	300	2800	NL 50	NL 85	NL 70	NL 105	NL 170	- 0.7	3	300 -
BD/071/20721	-	12/07/2021	<4	<0.4	**3**	**3**	**3**	<0.1	<1	**2**	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	<0.1	<0.05	<0.5	<0.05
			300 100	90 -	300 330	17000 240	600 1100	80 -	1200 270	30000 820	- -	- 120	NL 180	NL -	300	2800	NL 50	NL 85	NL 70	NL 105	NL 170	- 0.7	3	300 -
CW1	14.5 - 14.95 m	12/07/2021	**9**	<0.4	**41**	**3**	**14**	<0.1	**3**	**7**	-	-	-	-	-	-	-	-	-	-	<0.1	<0.05	<0.5	<0.05
			300 100	90 -	300 330	17000 240	600 1100	80 -	1200 270	30000 820	- -	- 120	NL 180	NL -	300	2800	NL 50	NL 85	NL 70	NL 105	NL 170	- 0.7	3	300 -
CW2	2.8 - 3.2 m	12/07/2021	<4	<0.4	**7**	**30**	**9**	<0.1	**7**	**49**	<25	<50	<25	<50	<100	<100	<0.2	<0.5	<1	<1	<1	<0.05	<0.5	**0.2**
			300 100	90 -	300 330	17000 240	600 1100	80 -	1200 270	30000 820	- -	- 120	NL 180	NL -	300	2800	NL 50	NL 85	NL 70	NL 105	NL 170	- 0.7	3	300 -
CW2	7 - 7.45 m	12/07/2021	**6**	<0.4	**11**	**16**	**13**	<0.1	**11**	**76**	<25	<50	<25	<50	<100	<100	<0.2	<0.5	<1	<1	<1	<0.05	<0.5	**0.1**
			300 100	90 -	300 330	17000 240	600 1100	80 -	1200 270	30000 820	- -	- 120	NL 180	NL -	300	2800	NL 50	NL 85	NL 70	NL 105	NL 170	- 0.7	3	300 -
CW3	0.5 m	8/07/2021	**7**	<0.4	**23**	**53**	**45**	**0.1**	**30**	**100**	<25	<50	<25	<50	<100	<100	<0.2	<0.5	<1	<1	<1	**0.1**	<0.5	**0.71**
			300 100	90 -	300 330	17000 240	600 1100	80 -	1200 270	30000 820	- -	- 120	NL 180	NL -	300	2800	NL 50	NL 85	NL 70	NL 105	NL 170	- 0.7	3	300 -
CW5	2 m	7/07/2021	**5**	<0.4	**45**	**62**	**240**	**0.5**	**8**	**120**	<25	<50	<25	<50	**110**	<100	<0.2	<0.5	<1	<1	<1	**2.3**	**3.2**	**29**
			300 100	90 -	300 330	17000 240	600 1100	80 -	1200 270	30000 820	- -	- 120	NL 180	NL -	300	2800	NL 50	NL 85	NL 70	NL 105	NL 170	- 0.7	3	300 -
CW5	5.45 - 5.5 m	7/07/2021	**17**	<0.4	**20**	**6**	**15**	<0.1	**6**	**35**	<25	<50	<25	<50	<100	<100	<0.2	<0.5	<1	<1	<1	<0.05	<0.5	<0.05
			300 100	90 -	300 330	17000 240	600 1100	80 -	1200 270	30000 820	- -	- 120	NL 180	NL -	300	2800	NL 50	NL 85	NL 70	NL 105	NL 170	- 0.7	3	300 -
CW7	0.5 m	6/07/2021	<4	<0.4	**15**	**56**	**14**	<0.1	**150**	**62**	NT	NT	NT	NT	NT	NT	<0.2	<0.5	<1	<1	<0.1	**0.4**	<0.5	**3**
			300 100	90 -	300 330	17000 240	600 1100	80 -	1200 270	30000 820	- -	- 120	NL 180	NL -	300	2800	NL 50	NL 85	NL 70	NL 105	NL 170	- 0.7	3	300 -
BD/030607/21	-	6/07/2021	<4	<0.4	**18**	**60**	**21**	<0.1	**160**	**69**	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	<0.1	**0.1**	<0.5	**0.5**
			300 100	90 -	300 330	17000 240	600 1100	80 -	1200 270	30000 820	- -	- 120	NL 180	NL -	300	2800	NL 50	NL 85	NL 70	NL 105	NL 170	- 0.7	3	300 -
CW7	1 m	6/07/2021	<4	<0.4	**8**	**10**	**9**	<0.1	**18**	**39**	<25	<50	<25	<50	<100	<100	<0.2	<0.5	<1	<1	<1	<0.05	<0.5	**0.1**
			300 100	90 -	300 330	17000 240	600 1100	80 -	1200 270	30000 820	- -	- 120	NL 180	NL -	300	2800	NL 50	NL 85	NL 70	NL 105	NL 170	- 0.7	3	300 -
W1	8 - 8.45 m	9/07/2021	**5**	**0.6**	**16**	**51**	**1600**	**0.3**	**9**	**640**	<25	<50	<25	<50	**160**	<100	<0.2	<0.5	<1	<1	<1	**0.71**	**0.9**	**9.4**
			300 100	90 -	300 330	17000 240	600 1100	80 -	1200 270	30000 820	- -	- 120	NL 180	NL -	300	2800	NL 50	NL 85	NL 70	NL 105	NL 170	- 0.7	3	300 -
W1	10 - 10.43 m	9/07/2021	<4	<0.4	**5**	**20**	**30**	**0.1**	**1**	**30**	-	-	-	-	-	-	-	-	-	-	**0.1**	**0.95**	**1.2**	**12**
			300 100	90 -	300 330	17000 240	600 1100	80 -	1200 270	30000 820	- -	- 120	NL 180	NL -	300	2800	NL 50	NL 85	NL 70	NL 105	NL 170	- 0.7	3	300 -
W3	10.75 - 11.2 m	4/07/2021	**24**	**3**	**78**	**310**	**810**	**3.7**	**25**	**1100**	<25	**180**	<25	**180**	**3000**	**960**	<0.2	<0.5	<1	<1	<1	**6.4**	**8.9**	**51**
			300 100	90 -	300 330	17000 240	600 1100	80 -	1200 270	30000 820	- -	- 120	NL 180	NL -	300	2800	NL 50	NL 85	NL 70	NL 105	NL 170	- 0.7	3	300 -
W3	14 - 14.45 m	4/07/2021	**18**	<0.4	**87**	**10**	**17**	**0.1**	**3**	**17**	-	-	-	-	-	-	-	-	-	-	<0.1	<0.05	<0.5	<0.05
			300 100	90 -	300 330	17000 240	600 1100	80 -	1200 270	30000 820	- -	- 120	NL 180	NL -	300	2800	NL 50	NL 85	NL 70	NL 105	NL 170	- 0.7	3	300 -
W5	8.8 - 9.23 m	7/07/2021	**22**	**3**	**43**	**410**	**880**	**4.8**	**24**	**1400**	<25	**200**	<25	**200**	**4900**	**1300**	<0.2	<0.5	<1	<1	**1.2**	**26**	**35**	**240**
			300 100	90 -	300 330	17000 240	600 1100	80 -	1200 270	30000 820	- -	- 120	NL 180	NL -	300	2800	NL 50	NL 85	NL 70	NL 105	NL 170	- 0.7	3	300 -
W5	11.5 - 11.95 m	7/07/2021	<4	<0.4	**7**	**4**	**10**	<0.1	**2**	**16**	-	-	-	-	-	-	-	-	-	-	<0.1	<0.05	<0.5	<0.05
			300 100	90 -	300 330	17000 240	600 1100	80 -	1200 270	30000 820	- -	- 120	NL 180	NL -	300	2800	NL 50	NL 85	NL 70	NL 105	NL 170	- 0.7	3	300 -
CW4	2.5 - 2.95 m	19/07/2021	**13**	<0.4	**20**	**440**	**85**	**0.2**	**7**	**120**	-	-	-	-	-	-	-	-	-	-	<0.1	**0.2**	<0.5	**1.8**
			300 100	90 -	300 330	17000 240	600 1100	80 -	1200 270	30000 820	- -	- 120	NL 180	NL -	300	2800	NL 50	NL 85	NL 70	NL 105	NL 170	- 0.7	3	300 -
CW4	5.5 - 5.95 m	19/07/2021	**11**	<0.4	**18**	**7**	**10**	<0.1	**5**	**15**	<25	<50	<25	<50	<100	<100	<0.2	<0.5	<1	<1	<1	<0.05	<0.5	<0.05
			300 100	90 -	300 330	17000 240	600 1100	80 -	1200 270	30000 820	- -	- 120	NL 180	NL -	300	2800	NL 50	NL 85	NL 70	NL 105	NL 170	- 0.7	3	300 -
CW6	3.8 - 4.25 m	16/07/2021	<4	<0.4	**7**	**320**	**3**	<0.1	**2**	**10**	-	-	-	-	-	-	<0.2	<0.5	<1	<1	<0.1	**0.2**	<0.5	**3**
			300 100	90 -	300 330	17000 240	600 1100	80 -	1200 270	30000 820	- -	- 120	NL 180	NL -	300	2800	NL 50	NL 85	NL 70	NL 105	NL 170	- 0.7	3	300 -
SS1	0.5 m	14/07/2021	<4	<0.4	**12**	**6**	**17**	<0.1	**7**	**24**	<25	<50	<25	<50	<100	<100	<0.2	<0.5	<1	<1	<1	<0.05	<0.5	<0.05
			300 100	90 -	300 330	17000 240	600 1100	80 -	1200 270	30000 820	- -	- 120	NL 180	NL -	300	2800	NL 50	NL 85	NL 70	NL 105	NL 170	- 0.7	3	300 -
SS2	0.3 m	14/07/2021	<4	<0.4	**8**	**9**	**25**	<0.1	**6**	**32**	<25	<50	<25	<50	<100	<100	<0.2	<0.5	<1	<1	<1	**0.08**	<0.5	**0.3**
			300 100	90 -	300 330	17000 240	600 1100	80 -	1200 270	30000 820	- -	- 120	NL 180	NL -	300	2800	NL 50	NL 85	NL 70	NL 105	NL 170	- 0.7	3	300 -
SS2	2.5 - 2.7 m	14/07/2021	**6**	<0.4	**46**	**30**	**11**	<0.1	**1**	**12**	-	-	-	-	-	-	-	-	-	-	<0.1	<0.05	<0.5	<0.05
			300 100	90 -	300 330	17000 240	600 1100	80 -	1200 270	30000 820	- -	- 120	NL 180	NL -	300	2800	NL 50	NL 85	NL 70	NL 105	NL 170	- 0.7	3	300 -
CW3	4 - 4.45 m	4/08/2021	<4	<0.4	**44**	**29**	**9**	<0.1	**17**	**25**	<25	<50	<25	<50	<100	<100	<0.2	<0.5	<1	<1	<1	<0.05	<0.5	<0.05
			300 100	90 -	300 330	17000 240	600 1100	80 -	1200 270	30000 820	- -	- 120	NL 180	NL -	300	2800	NL 50	NL 85	NL 70	NL 105	NL 170	- 0.7	3	300 -
CW7	2 - 2.1 m	4/08/2021	<4	<0.4	**11**	**37**	**93**	**0.3**	**19**	**43**	<25	<50	<25	<50	<100	<100	<0.2	<0.5	<1	<1	<1	**0.2**	<0.5	**1.8**
			300 100	90 -	300 330	17000 240	600 1100	80 -	1200 270	30000 820	- -	- 120	NL 180	NL -	300	2800	NL 50	NL 85	NL 70	NL 105	NL 170	- 0.7	3	300 -
BD1/040821	-	4/08/2021	<5	<1	**6**	**26**	**115**	**0.2**	**4**	**28**	<10	<50	<10	<50	<100	<100	<0.2	<0.5	<0.5	<0.5	<1	<0.5	<0.5	NT
			300 100	90 -	300 330	17000 240	600 1100	80 -	1200 270	30000 820	- -	- 120	NL 180	NL -	300	2800	NL 50	NL 85	NL 70	NL 105	NL 170	- 0.7	3	300 -
CW7	4 - 4.1 m	4/08/2012	<4	<0.4	**9**	**58**	**590**	**0.3**	**9**	**30**	<25	<50	<25	<50	<100	<100	<0.2	<0.5	<1	<1	<1	<0.05	<0.5	<0.05
			300 100	90 -	300 330	17000 240	600 1100	80 -	1200 270	30000 820	- -	- 120	NL 180	NL -	300	2800	NL 50	NL 85	NL 70	NL 105	NL 170	- 0.7	3	300 -
CW7 - [TRIPLICATE]	2 - 2.1 m	4/08/2021	<4	<0.4	**12**	**47**	**110**	**0.3**	**15**	**51**	-	-	-	-	-	-	-	-	-	-	-	-	-	-
			300 100	90 -	300 330	17000 240	600 1100	80 -	1200 270	30000 820	- -	- 120	NL 180	NL -	300	2800	NL 50	NL 85	NL 70	NL 105	NL 170	- 0.7	3	300 -
CP2	0.4 - 0.5 m	20/08/2021	<4	<0.4	**68**	**39**	**29**	**0.2**	**69**	**61**	<25	<50	-	<50	<100	<100	<0.2	<0.5	<1	<1	<0.1	**0.05**	<0.5	**0.5**
			300 100	90 -	300 330	17000 240	600 1100	80 -	1200 270	30000 820	- -	- 120	NL 180	NL -	300	2800	NL 50	NL 85	NL 70	NL 105	NL 170	- 0.7	3	300 -
CP2	2.4 - 2.5 m	20/08/2021	**6**	<0.4	**12**	**28**	**74**	**0.7**	**6**	**130**	<25	<50	-	<50	<100	<100	-	-	-	-	<0.1	**0.08**	<0.5	**0.4**
			300 100	90 -	300 330	17000 240	600 1100	80 -	1200 270	30000 820	- -	- 120	NL 180	NL -	300	2800	NL 50	NL 85	NL 70	NL 105	NL 170	- 0.7	3	300 -
WD3	0.5-0.6 m	11/09/2021	**5**	<0.4	**37**	**38**	**79**	**0.2**	**34**	**88**	<25	<50	<25	<50	<100	<100	-	-	-	-	<0.1	**0.5**	**0.6**	**3.9**
			300 100	90 -	300 330	17000 240	600 1100	80 -	1200 270	30000 820	- -	- 120	NL 180	NL -	300	2800	NL 50	NL 85	NL 70	NL 105	NL 170	- 0.7	3	300 -
WD3	4-.4.45	11/09/2021	<4	<0.4	**37**	**30**	**53**	**<0.1**	**9**	**80**	-	-	-	-	-	-	-	-	-	-	<0.1	**0.2**	<0.5	**2.6**
			300 100	90 -	300 330	17000 240	600 1100	80 -	1200 270	30000 820	- -	- 120	NL 180	NL -	300	2800	NL 50	NL 85	NL 70	NL 105	NL 170	- 0.7	3	300 -
BD/032/10911	-	11/09/2021	<4	<0.4	**76**	**22**	**44**	**<0.1**	**7**	**47**	-	-	-	-	-	-	-	-	-	-	-	**1.3**	**2.1**	**19**
			300 100	90 -	300 330	17000 240	600 1100	80 -	1200 270	30000 820	- -	- 120	NL 180	NL -	300	2800	NL 50	NL 85	NL 70	NL 105	NL 170	- 0.7	3	300 -
CP1	1-1.1 m	18/09/2021	**6**	0.8	**12**	**130**	**3900**	**1.5**	**7**	**1100**	<25	<50	<25	<50	<100	<100	<0.2	<0.5	<1	<3	<0.1	**0.1**	<0.5	**0.66**
			300 100	90 -	300 330	17000 240	600 1100	80 -	1200 270	30000 820	- -	- 120	NL 180	NL -	300	2800	NL 50	NL 85	NL 70	NL 105	NL 170	- 0.7	3	300 -
BD01/180921	-	18/09/2021	<4	<0.4	**6**	**19**	**450**	**0.5**	**4**	**150**	-	-	-	-	-	-	-	-	-	-	<0.1	**0.1**	<0.5	**1.4**
			300 100	90 -	300 330	17000 240	600 1100	80 -	1200 270	30000 820	- -	- 120	NL 180	NL -	300	2800	NL 50	NL 85	NL 70	NL 105	NL 170	- 0.7	3	300 -
CP1	2-2.1 m	18/09/2021	**9**	0.5	**13**	**1200**	**2500**	**1.1**	**1**	**880**	-	-	-	-	-	-	-	-	-	-	<0.1	**0.5**	**0.8**	**5.9**
			300 100	90 -	300 330	17000 240	600 1100	80 -	1200 270	30000 820	- -	- 120	NL 180	NL -	300	2800	NL 50	NL 85	NL 70	NL 105	NL 170	- 0.7	3	300 -
WD1	0.4-0.5 m	19/09/2021	<4	<0.4	**15**	**35**	**20**	<0.1	<0.1	**69**	<25	<50	<25	<50	4000	<100	-	-	-	-	<0.1	**0.07**	<0.5	**0.2**
			300 100	90 -	300 330	17000 240	600 1100	80 -	1200 270	30000 820	- -	- 120	NL 180	NL -	300	2800	NL 50	NL 85	NL 70	NL 105	NL 170	- 0.7	3	300 -
WD1	0.9-1.0 m	19/09/2021	<4	<0.4	**17**	**48**	**28**	<0.1	<0.1	**94**	-	-	-	-	-	-	-	-	-	-	<0.1	<0.05	<0.5	<0.05
			300 100	90 -	300 330	17000 240	600 1100	80 -	1200 270	30000 820	- -	- 120	NL 180	NL -	300	2800	NL 50	NL 85	NL 70	NL 105	NL 170	- 0.7	3	300 -
WD2	0.2-0.3 m	20/09/2021	**5**	<0.4	**8**	**4**	**10**	<0.1	<0.1	**25**	<25	<50	<25	<50	<100	<100	-	-	-	-	<0.1	<0.05	<0.5	<0.05
			300 100	90 -	300 330	17000 240	600 1100	80 -	1200 270	30000 820	- -	- 120	NL 180	NL -	300	2800	NL 50	NL 85	NL 70	NL 105	NL 170	- 0.7	3	300 -
WD1	1.9-2.0 m	19/09/2021	<4	<0.4	**16**	**8**	**1500**	<0.1	<0.1	**7**	-	-	-	-	-	-	-	-	-	-	<0.1	<0.05	<0.5	**0.2**
			300 100	90 -	300 330	17000 240	600 1100	80 -	1200 270	30000 820	- -	- 120	NL 180	NL -	300	2800	NL 50	NL 85	NL 70	NL 105	NL 170	- 0.7	3	300 -

Lab result
HIL/HSL value EIL/ESL value

HIL/HSL exceedance EIL/ESL exceedance HIL/HSL and EIL/ESL exceedance ML exceedance ML and HIL/HSL or EIL/ESL exceedance
Indicates that asbestos has been detected by the lab, refer to the lab report Blue = DC exceedance HSL 0-<1 Exceedance

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

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

Notes:

a QA/QC replicate of sample listed directly below the primary sample
b Reported naphthalene laboratory result obtained from BTEXN suite
c Criteria applies to DDT only

Site Assessment Criteria (SAC):

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

SAC based on generic land use thresholds for Commercial/ industrial D
HIL D Commercial / Industrial (NEPC, 2013)
HSL D Commercial / Industrial (vapour intrusion) (NEPC, 2013)
DC HSL D Direct contact HSL D Commercial/industrial (direct contact) (CRC CARE, 2011)
EIL/ESL C/Ind Commercial and Industrial (NEPC, 2013)
ML C/Ind Commercial and Industrial (NEPC, 2013)

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Table 1: Summary of Laboratory Results – Metals, TRH, BTEX, PAH, Phenol, OCP, OPP, PCB, Asbestos, Additional metals, Complete PAH suite, TRH, Complete OCP suite, Complete OPP suite, VOC

			Phenol			OCP												OPP	PCB	Asbestos			Additional metals	TBT	TOC	VOC							
			Phenol	Cresols	Pentachlorophenol	DDD	DDT+DDE+DDD [c]	DDE	DDT	Aldrin & Dieldrin	Total Chlordane	Endrin	Total Endosulfan	Heptachlor	Hexachlorobenzene	Methoxychlor		Chlorpyrifos	total	Asbestos ID in soil >0.1g/kg	Trace Analysis	Asbestos (50 g)	Tin (inorganic, as Sn)	Tributyl tin	Total organic Carbon	1,2-Dichloroethene	cis-1,2-dichloroethene	tetrachloromethane	trans-1,2-dichloroethene	1,1,2-trichloroethylene	Vinyl Chloride	Total VOC
		PQL	5	0.6	1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1				1			1	1	1	1	1	1	1
Sample ID	Depth	Sample Date	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	-	-	-	mg/kg	µg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg
CW2	0.4 - 0.5 m	30/06/2021	<5			-	-	-	-	-	-	-	-	-	-	-		-	-	NAD	NAD	NAD	4	-	-	-	-	-	-	-	-	-
			120	4000	120	-	400	180	-	180	10	70	20	340	10	10	400	250	1													
CW4	0.9 - 1 m	30/06/2021	-			-	-	-	-	-	-	-	-	-	-	-		-	-	NAD	NAD	NAD	10	+	+	-	-	-	-	-	-	-
			120	4000	120	-	400	180	-	180	10	70	20	340	10	10	400	250	1													
CW5	0.5 - 0.6 m	30/06/2021	<0.1			<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1		<0.1	<0.1	NAD	NAD	NAD	1	-	6500	<1	<1	<1	<1	<1	<1	<1
			120	4000	120	-	400	180	-	180	10	70	20	340	10	10	400	250	1													
CW6	0.5 - 0.6 m	30/06/2021	<5			NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT		NT	NT	NAD	NAD	NAD	8	-	-	-	-	-	-	-	-	-
			120	4000	120	-	400	180	-	180	10	70	20	340	10	10	400	250	1													
BD1/20210630	-	30/06/2021	-			NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT		NT	NT	NAD	NAD	NAD	7	-	-	-	-	-	-	-	-	-
			120	4000	120	-	400	180	-	180	10	70	20	340	10	10	400	250	1													
W4	10 m	-	<5			-	-	-	-	-	-	-	-	-	-	-		-	-	NAD	NAD	NAD	38	+	+	-	-	-	-	-	-	-
			120	4000	120	-	400	180	-	180	10	70	20	340	10	10	400	250	1													
W4	12.45 m	-	<0.1			<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1		<0.1	<0.1	NAD	NAD	NAD	6	-	-	-	-	-	-	-	-	-
			120	4000	120	-	400	180	-	180	10	70	20	340	10	10	400	250	1													
CW1	12 - 12.45 m	12/07/2021	<5			<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1		<0.1	<0.1	NAD	NAD	NAD	NT	<0.5	-	-	-	-	-	-	-	-
			120	4000	120	-	400	180	-	180	10	70	20	340	10	10	400	250	1													
BD07/120721	-	12/07/2021	-			NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT		NT	NT	NAD	NAD	NAD	NT	-	-	-	-	-	-	-	-	-
			120	4000	120	-	400	180	-	180	10	70	20	340	10	10	400	250	1													
CW1	14.5 - 14.95 m	12/07/2021	-			-	-	-	-	-	-	-	-	-	-	-		-	-	NAD	NAD	NAD	-	-	-	-	-	-	-	-	-	-
			120	4000	120	-	400	180	-	180	10	70	20	340	10	10	400	250	1													
CW2	2.8 - 3.2 m	12/07/2021	<5			<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1		<0.1	<0.1	NAD	NAD	NAD	-	<0.5	-	-	-	-	-	-	-	-
			120	4000	120	-	400	180	-	180	10	70	20	340	10	10	400	250	1													
CW2	7 - 7.45 m	12/07/2021	-			-	-	-	-	-	-	-	-	-	-	-		-	-	NAD	NAD	NAD	-	-	-	-	-	-	-	-	-	-
			120	4000	120	-	400	180	-	180	10	70	20	340	10	10	400	250	1													
CW3	0.5 m	8/07/2021	<5			-	-	-	-	-	-	-	-	-	-	-		-	-	NAD	NAD	NAD	-	-	-	-	-	-	-	-	-	-
			120	4000	120	-	400	180	-	180	10	70	20	340	10	10	400	250	1													
CW5	2 m	7/07/2021	<5	<0.6	<1	-	-	-	-	-	-	-	-	-	-	-		-	-	NAD	NAD	NAD	-	<2	-	-	-	-	-	-	-	-
			120	4000	120	-	400	180	-	180	10	70	20	340	10	10	400	250	1													
CW5	5.45 - 5.5 m	7/07/2021	-			<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1		<0.1	<0.1	NAD	NAD	NAD	-	-	33000	<1	<1	<1	<1	<1	<1	<1
			120	4000	120	-	400	180	-	180	10	70	20	340	10	10	400	250	1													
CW7	0.5 m	6/07/2021	-			NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT		NT	NT	NAD	NAD	NAD	NT	-	-	<1	<1	<1	<1	<1	<1	<1
			120	4000	120	-	400	180	-	180	10	70	20	340	10	10	400	250	1													
BD03/060721	-	6/07/2021	-			NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT		NT	NT	NAD	NAD	NAD	NT	-	-	-	-	-	-	-	-	-
			120	4000	120	-	400	180	-	180	10	70	20	340	10	10	400	250	1													
CW7	1 m	6/07/2021	-			-	-	-	-	-	-	-	-	-	-	-		-	-	NAD	NAD	NAD	-	-	-	-	-	-	-	-	-	-
			120	4000	120	-	400	180	-	180	10	70	20	340	10	10	400	250	1													
W1	8 - 8.45 m	9/07/2021	<5	<0.6	<1	-	-	-	-	-	-	-	-	-	-	-		-	-	NAD	NAD	NAD	-	3	-	-	-	-	-	-	-	-
			120	4000	120	-	400	180	-	180	10	70	20	340	10	10	400	250	1													
W1	10 - 10.43 m	9/07/2021	-			-	-	-	-	-	-	-	-	-	-	-		-	-	NAD	NAD	NAD	-	-	-	-	-	-	-	-	-	-
			120	4000	120	-	400	180	-	180	10	70	20	340	10	10	400	250	1													
W3	10.75 - 11.2 m	4/07/2021	<5	<0.6	<1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1		<0.1	<0.1	NAD	NAD	NAD	-	83	-	-	-	-	-	-	-	-
			120	4000	120	-	400	180	-	180	10	70	20	340	10	10	400	250	1													
W3	14 - 14.45 m	4/07/2021	-			-	-	-	-	-	-	-	-	-	-	-		-	-	NAD	NAD	NAD	-	-	-	-	-	-	-	-	-	-
			120	4000	120	-	400	180	-	180	10	70	20	340	10	10	400	250	1													
W5	8.8 - 9.23 m	7/07/2021	<5	<0.6	<1	-	-	-	-	-	-	-	-	-	-	-		-	-	NAD	NAD	NAD	-	-	61000	<1	<1	<1	<1	<1	<1	<1
			120	4000	120	-	400	180	-	180	10	70	20	340	10	10	400	250	1													
W5	11.5 - 11.95 m	7/07/2021	-			-	-	-	-	-	-	-	-	-	-	-		-	-	NAD	NAD	NAD	-	85	-	-	-	-	-	-	-	-
			120	4000	120	-	400	180	-	180	10	70	20	340	10	10	400	250	1													
CW4	2.5 - 2.95 m	19/07/2021	<5			-	-	-	-	-	-	-	-	-	-	-		-	-	NAD	NAD	NAD	31	<0.5	-	-	-	-	-	-	-	-
			120	4000	120	-	400	180	-	180	10	70	20	340	10	10	400	250	1													
CW4	5.5 - 5.95 m	19/07/2021	-			-	-	-	-	-	-	-	-	-	-	-		-	-	NAD	NAD	NAD	<1	-	57000	-	-	-	-	-	-	-
			120	4000	120	-	400	180	-	180	10	70	20	340	10	10	400	250	1													
CW6	3.8 - 4.25 m	16/07/2021	-			-	-	-	-	-	-	-	-	-	-	-		-	-	NAD	NAD	NAD	<1	-	-	<1	<1	<1	<1	<1	<1	<1
			120	4000	120	-	400	180	-	180	10	70	20	340	10	10	400	250	1													
SS1	0.5 m	14/07/2021	<5			-	-	-	-	-	-	-	-	-	-	-		-	-	NAD	NAD	NAD	1	-	-	-	-	-	-	-	-	-
			120	4000	120	-	400	180	-	180	10	70	20	340	10	10	400	250	1													
SS2	0.3 m	14/07/2021	-			<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1		<0.1	<0.1	NAD	NAD	NAD	<1	-	-	-	-	-	-	-	-	-
			120	4000	120	-	400	180	-	180	10	70	20	340	10	10	400	250	1													
SS2	2.5 - 2.7 m	14/07/2021	<5			-	-	-	-	-	-	-	-	-	-	-		-	-	NAD	NAD	NAD	<1	-	-	-	-	-	-	-	-	-
			120	4000	120	-	400	180	-	180	10	70	20	340	10	10	400	250	1													
CW3	4 - 4.45 m	4/08/2021	-			-	-	-	-	-	-	-	-	-	-	-		-	-	NAD	NAD	NAD	-	-	-	-	-	-	-	-	-	-
			120	4000	120	-	400	180	-	180	10	70	20	340	10	10	400	250	1													
CW7	2 - 2.1 m	4/08/2021	<5	<0.6	<1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1		<0.1	<0.1	NAD	NAD	NAD	64	<0.5	-	<1	<1	<1	<1	<1	<1	<1
			120	4000	120	-	400	180	-	180	10	70	20	340	10	10	400	250	1													
BD1/040821	-	4/08/2021	-			NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT		NT	NT	-	-	-	NT	-	-	-	-	-	-	-	-	-
			120	4000	120	-	400	180	-	180	10	70	20	340	10	10	400	250	1													
CW7	4 - 4.1 m	4/08/2012	-			-	-	-	-	-	-	-	-	-	-	-		-	-	NAD	NAD	NAD	-	-	-	-	-	-	-	-	-	-
			120	4000	120	-	400	180	-	180	10	70	20	340	10	10	400	250	1													
CW7 - [TRIPLICATE]	2 - 2.1 m	4/08/2021	-			-	-	-	-	-	-	-	-	-	-	-		-	-	-	-	-	46	-	-	-	-	-	-	-	-	-
			120	4000	120	-	400	180	-	180	10	70	20	340	10	10	400	250	1													
CP2	0.4 - 0.5 m	20/08/2021	<5			<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1		<0.1	<0.1	NAD	NAD	NAD	8	-	-	<1	<1	<1	<1	<1	<1	<1
			120	4000	120	-	400	180	-	180	10	70	20	340	10	10	400	250	1													
CP2	2.4 - 2.5 m	20/08/2021	-			-	-	-	-	-	-	-	-	-	-	-		-	-	NAD	NAD	NAD	9	<2	10000	-	-	-	-	-	-	-
			120	4000	120	-	400	180	-	180	10	70	20	340	10	10	400	250	1													
WD3	0.5-0.6 m	11/09/2021	<5	<0.6	<1	-	-	-	-	-	-	-	-	-	-	-		-	-	NAD	NAD	NAD	6	<1.0	-	<1	<1	<1	<1	<1	<1	<1
			120	4000	120	-	400	180	-	180	10	70	20	340	10	10	400	250	1													
WD3	4-.4.45	11/09/2021	-			-	-	-	-	-	-	-	-	-	-	-		-	-	NAD	NAD	NAD	4	-	-	-	-	-	-	-	-	-
			120	4000	120	-	400	180	-	180	10	70	20	340	10	10	400	250	1													
BD03210911	-	11/09/2021	-	-	-	-	-	-	-	-	-	-	-	-	-	-		-	-	NAD	NAD	NAD	4	-	-	-	-	-	-	-	-	-
			120	4000	120	-	400	180	-	180	10	70	20	340	10	10	400	250	1													
CP1	1-1.1 m	18/09/2021	<5			<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1		<0.1	<0.1	NAD	NAD	NAD	-	-	-	-	-	-	-	-	-	-
			120	4000	120	-	400	180	-	180	10	70	20	340	10	10	400	250	1													
BD01/180921	-	18/09/2021	-			-	-	-	-	-	-	-	-	-	-	-		-	-	NAD	NAD	NAD	-	-	-	-	-	-	-	-	-	-
			120	4000	120	-	400	180	-	180	10	70	20	340	10	10	400	250	1													
CP1	2-2.1 m	18/09/2021	-			-	-	-	-	-	-	-	-	-	-	-		-	-	NAD	NAD	NAD	-	-	-	-	-	-	-	-	-	-
			120	4000	120	-	400	180	-	180	10	70	20	340	10	10	400	250	1													
WD1	0.4-0.5 m	19/09/2021	**0.2**	<0.6	<1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1		<0.1	<0.1	NAD	NAD	NAD	1	<0.5	-	-	-	-	-	-	-	-
			120	4000	120	-	400	180	-	180	10	70	20	340	10	10	400	250	1													
WD1	0.9-1.0 m	19/09/2021	-			-	-	-	-	-	-	-	-	-	-	-		-	-	NAD	NAD	NAD	2	-	-	-	-	-	-	-	-	-
			120	4000	120	-	400	180	-	180	10	70	20	340	10	10	400	250	1													
WD2	0.2-0.3 m	20/09/2021	-			<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1		<0.1	<0.1	NAD	NAD	NAD	<1	-	-	-	-	-	-	-	-	-
			120	4000	120	-	400	180	-	180	10	70	20	340	10	10	400	250	1													
WD1	1.9-2.0 m	19/09/2021	-			-	-	-	-	-	-	-	-	-	-	-		-	-	NAD	NAD	NAD	12	-	-	-	-	-	-	-	-	-
			120	4000	120	-	400	180	-	180	10	70	20	340	10	10	400	250	1													

Lab result
HIL/HSL value EIL/ESL value

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

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

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

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

Notes:

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

b Reported naphthalene laboratory result obtained from BTEXN suite

c Criteria applies to DDT only

Site Assessment Criteria (SAC):

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

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

HIL D Commercial / Industrial (NEPC, 2013)

HSL D Commercial / Industrial (vapour intrusion) (NEPC, 2013)

DC HSL D Direct contact HSL D Commercial/Industrial (direct contact) (CRC CARE, 2011)

EIL/ESL C/Ind Commercial and Industrial (NEPC, 2013)

ML C/Ind Commercial and Industrial (NEPC, 2013)

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Table 2: Summary of Laboratory Results – Metals, TRH, BTEX, PAH, Phenol, OCP, OPP, PCB, Asbestos, Additional metals, Complete PAH suite, TRH, Complete OCP suite, Complete OPP suite, VOC

			Metals								TRH						BTEX				PAH			
			Arsenic	Cadmium	Total Chromium	Copper	Lead	Mercury (inorganic)	Nickel	Zinc	TRH C6 - C10	TRH >C10-C16	F1 ([C6-C10]-BTEX)	F2 (>C10-C16 less Naphthalene)	F3 (>C16-C34)	F4 (>C34-C40)	Benzene	Toluene	Ethylbenzene	Total Xylenes	Naphthalene [b]	Benzo(a)pyrene (BaP)	Benzo(a)pyrene TEQ	Total PAHs
		POL	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
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
CW2	0.4 - 0.5 m	30/06/2021	<4	<0.4	**14**	**17**	**34**	**0.1**	**12**	**36**	-	-	-	-	-	-	-	-	-	-	<0.1	**0.09**	<0.5	**0.5**
			3000 160 900 - 3600 540 240000 330 1500 1800 730 - 6000 460 400000 1200								-	- 170 260 215 NL -			1700	3300	3 75 NL 135	NL 165	230 180	NL 370	- 1.4	40	- 4000 -	
CW4	0.9 - 1 m	30/06/2021	**6**	<0.4	**13**	**40**	**120**	**0.6**	**6**	**81**	-	-	-	-	-	-	-	-	-	-	<0.1	**0.75**	**1**	**6.3**
			3000 160 900 - 3600 540 240000 330 1500 1800 730 - 6000 460 400000 1200								-	- 170 260 215 NL -			1700	3300	3 75 NL 135	NL 165	230 180	NL 370	- 1.4	40	- 4000 -	
CW5	0.5 - 0.6 m	30/06/2021	**6**	<0.4	**10**	**26**	**39**	<0.1	**13**	**87**	<25	<50	<25	<50	<100	<100	<0.2	<0.5	<1	<1	<1	<0.05	<0.5	**0.2**
			3000 160 900 - 3600 540 240000 330 1500 1800 730 - 6000 460 400000 1200								-	- 170 260 215 NL -			1700	3300	3 75 NL 135	NL 165	230 180	NL 370	- 1.4	40	- 4000 -	
CW6	0.5 - 0.6 m	30/06/2021	**5**	<0.4	**11**	**36**	**120**	**0.2**	**13**	**180**	<25	<50	<25	<50	<100	<100	<0.2	<0.5	<1	<1	<1	**1.6**	**2.2**	**14**
			3000 160 900 - 3600 540 240000 330 1500 1800 730 - 6000 460 400000 1200								-	- 170 260 215 NL -			1700	3300	3 75 NL 135	NL 165	230 180	NL 370	- 1.4	40	- 4000 -	
BD1/20210630	0 m	30/06/2021	**4**	<0.4	**9**	**36**	**79**	**0.2**	**11**	**90**	<25	<50	<25	<50	<100	<100	<0.2	<0.5	<1	<1	<1	**1.9**	**2.7**	**19**
			3000 160 900 - 3600 540 240000 330 1500 1800 730 - 6000 460 400000 1200								-	- 170 260 215 NL -			1700	3300	3 75 NL 135	NL 165	230 180	NL 370	- 1.4	40	- 4000 -	
W4	10 m	-	**12**	**4**	**48**	**230**	**1200**	**3.8**	**28**	**1000**	<25	<50	<25	<50	**310**	**110**	<0.2	<0.5	<1	<1	<1	**0.96**	**1.4**	**12**
			3000 160 900 - 3600 540 240000 330 1500 1800 730 - 6000 460 400000 1200								-	- 170 NL 215 NL -			1700	3300	3 75 NL 135	NL 165	230 180	NL 370	- 1.4	40	- 4000 -	
W4	12.45 m	-	<4	<0.4	**30**	**41**	**28**	**0.3**	**17**	**36**	<25	<50	<25	<50	<100	<100	<0.2	<0.5	<1	<1	**0.53**	**0.7**	**5**	
			3000 160 900 - 3600 540 240000 330 1500 1800 730 - 6000 460 400000 1200								-	- 170 NL 215 NL -			1700	3300	3 75 NL 135	NL 165	230 180	NL 370	- 1.4	40	- 4000 -	
CW1	12 - 12.45 m	12/07/2021	<4	<0.4	**3**	<1	**3**	<0.1	<1	**2**	<25	<50	<25	<50	<100	<100	<0.2	<0.5	<1	<1	<1	<0.05	<0.5	<0.05
			3000 160 900 - 3600 540 240000 330 1500 1800 730 - 6000 460 400000 1200								-	- 170 NL 215 NL -			1700	3300	3 75 NL 135	NL 165	230 180	NL 370	- 1.4	40	- 4000 -	
BD/071/20721	0 m	12/07/2021	<4	<0.4	**3**	<1	**3**	<0.1	<1	**2**	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	<0.1	<0.05	<0.5	<0.05
			3000 160 900 - 3600 540 240000 330 1500 1800 730 - 6000 460 400000 1200								-	- 170 260 215 NL -			1700	3300	3 75 NL 135	NL 165	230 180	NL 370	- 1.4	40	- 4000 -	
CW1	14.5 - 14.95 m	12/07/2021	**9**	<0.4	**41**	**3**	**14**	<0.1	**3**	**7**	-	-	-	-	-	-	-	-	-	-	<0.1	<0.05	<0.5	<0.05
			3000 160 900 - 3600 540 240000 330 1500 1800 730 - 6000 460 400000 1200								-	- 170 NL 215 NL -			1700	3300	3 75 NL 135	NL 165	230 180	NL 370	- 1.4	40	- 4000 -	
CW2	2.8 - 3.2 m	12/07/2021	<4	<0.4	**7**	**30**	**9**	<0.1	**7**	**49**	<25	<50	<25	<50	<100	<100	<0.2	<0.5	<1	<1	<1	<0.05	<0.5	**0.2**
			3000 160 900 - 3600 540 240000 330 1500 1800 730 - 6000 460 400000 1200								-	- 170 630 215 NL -			1700	3300	3 75 NL 135	NL 165	230 180	NL 370	- 1.4	40	- 4000 -	
CW2	7 - 7.45 m	12/07/2021	**6**	<0.4	**11**	**16**	**13**	<0.1	**11**	**76**	<25	<50	<25	<50	<100	<100	<0.2	<0.5	<1	<1	<1	<0.05	<0.5	**0.1**
			3000 160 900 - 3600 540 240000 330 1500 1800 730 - 6000 460 400000 1200								-	- 170 NL 215 NL -			1700	3300	3 75 NL 135	NL 165	230 180	NL 370	- 1.4	40	- 4000 -	
CW3	0.5 m	8/07/2021	**7**	<0.4	**23**	**53**	**45**	**0.1**	**30**	**100**	<25	<50	<25	<50	<100	<100	<0.2	<0.5	<1	<1	<1	**0.1**	<0.5	**0.71**
			3000 160 900 - 3600 540 240000 330 1500 1800 730 - 6000 460 400000 1200								-	- 170 260 215 NL -			1700	3300	3 75 NL 135	NL 165	230 180	NL 370	- 1.4	40	- 4000 -	
CW5	2 m	7/07/2021	**5**	<0.4	**45**	**62**	**240**	**0.5**	**8**	**120**	<25	<50	<25	<50	**110**	<100	<0.2	<0.5	<1	<1	<1	**2.3**	**3.2**	**29**
			3000 160 900 - 3600 540 240000 330 1500 1800 730 - 6000 460 400000 1200								-	- 170 630 215 NL -			1700	3300	3 75 NL 135	NL 165	230 180	NL 370	- 1.4	40	- 4000 -	
CW5	5.45 - 5.5 m	7/07/2021	**17**	<0.4	**20**	**6**	**15**	<0.1	**6**	**35**	<25	<50	<25	<50	<100	<100	<0.2	<0.5	<1	<1	<1	<0.05	<0.5	<0.05
			3000 160 900 - 3600 540 240000 330 1500 1800 730 - 6000 460 400000 1200								-	- 170 NL 215 NL -			1700	3300	3 75 NL 135	NL 165	230 180	NL 370	- 1.4	40	- 4000 -	
CW7	0.5 m	6/07/2021	<4	<0.4	**15**	**56**	**14**	<0.1	**150**	**62**	NT	NT	NT	NT	NT	NT	<0.2	<0.5	<1	<1	<0.1	**0.4**	<0.5	**3**
			3000 160 900 - 3600 540 240000 330 1500 1800 730 - 6000 460 400000 1200								-	- 170 260 215 NL -			1700	3300	3 75 NL 135	NL 165	230 180	NL 370	- 1.4	40	- 4000 -	
BD/030/60721	0 m	6/07/2021	<4	<0.4	**18**	**60**	**21**	<0.1	**160**	**69**	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	<0.1	**0.1**	<0.5	**0.5**
			3000 160 900 - 3600 540 240000 330 1500 1800 730 - 6000 460 400000 1200								-	- 170 260 215 NL -			1700	3300	3 75 NL 135	NL 165	230 180	NL 370	- 1.4	40	- 4000 -	
CW7	1 m	6/07/2021	<4	<0.4	**8**	**10**	**9**	<0.1	**18**	**39**	<25	<50	<25	<50	<100	<100	<0.2	<0.5	<1	<1	<1	<0.05	<0.5	**0.1**
			3000 160 900 - 3600 540 240000 330 1500 1800 730 - 6000 460 400000 1200								-	- 170 260 215 NL -			1700	3300	3 75 NL 135	NL 165	230 180	NL 370	- 1.4	40	- 4000 -	
W1	8 - 8.45 m	9/07/2021	**5**	**0.6**	**16**	**51**	**1600**	**0.3**	**9**	**640**	<25	<50	<25	<50	**160**	<100	<0.2	<0.5	<1	<1	<1	**0.71**	**0.9**	**9.4**
			3000 160 900 - 3600 540 240000 330 1500 1800 730 - 6000 460 400000 1200								-	- 170 NL 215 NL -			1700	3300	3 75 NL 135	NL 165	230 180	NL 370	- 1.4	40	- 4000 -	
W1	10 - 10.43 m	9/07/2021	<4	<0.4	**5**	**20**	**30**	**0.1**	**1**	**30**	-	-	-	-	-	-	-	-	-	-	**0.1**	**0.95**	**1.2**	**12**
			3000 160 900 - 3600 540 240000 330 1500 1800 730 - 6000 460 400000 1200								-	- 170 NL 215 NL -			1700	3300	3 75 NL 135	NL 165	230 180	NL 370	- 1.4	40	- 4000 -	
W3	10.75 - 11.2 m	4/07/2021	**24**	**3**	**78**	**310**	**810**	**3.7**	**25**	**1100**	<25	**180**	<25	**180**	**3000**	**960**	<0.2	<0.5	<1	<1	<1	**6.4**	**8.9**	**51**
			3000 160 900 - 3600 540 240000 330 1500 1800 730 - 6000 460 400000 1200								-	- 170 NL 215 NL -			1700	3300	3 75 NL 135	NL 165	230 180	NL 370	- 1.4	40	- 4000 -	
W3	14 - 14.45 m	4/07/2021	**18**	<0.4	**87**	**10**	**17**	**0.1**	**3**	**17**	-	-	-	-	-	-	-	-	-	-	<0.1	<0.05	<0.5	<0.05
			3000 160 900 - 3600 540 240000 330 1500 1800 730 - 6000 460 400000 1200								-	- 170 NL 215 NL -			1700	3300	3 75 NL 135	NL 165	230 180	NL 370	- 1.4	40	- 4000 -	
W5	8.8 - 9.23 m	7/07/2021	**22**	**3**	**43**	**410**	**880**	**4.8**	**24**	**1400**	<25	**200**	<25	**200**	**4900**	**1300**	<0.2	<0.5	<1	<1	**1.2**	**26**	**35**	**240**
			3000 160 900 - 3600 540 240000 330 1500 1800 730 - 6000 460 400000 1200								-	- 170 NL 215 NL -			1700	3300	3 75 NL 135	NL 165	230 180	NL 370	- 1.4	40	- 4000 -	
W5	11.5 - 11.95 m	7/07/2021	<4	<0.4	**7**	**4**	**10**	<0.1	**2**	**16**	-	-	-	-	-	-	-	-	-	-	<0.1	<0.05	<0.5	<0.05
			3000 160 900 - 3600 540 240000 330 1500 1800 730 - 6000 460 400000 1200								-	- 170 NL 215 NL -			1700	3300	3 75 NL 135	NL 165	230 180	NL 370	- 1.4	40	- 4000 -	
CW4	2.5 - 2.95 m	19/07/2021	**13**	<0.4	**20**	**440**	**85**	**0.2**	**7**	**120**	-	-	-	-	-	-	-	-	-	-	<0.1	**0.2**	<0.5	**1.8**
			3000 160 900 - 3600 540 240000 330 1500 1800 730 - 6000 460 400000 1200								-	- 170 630 215 NL -			1700	3300	3 75 NL 135	NL 165	230 180	NL 370	- 1.4	40	- 4000 -	
CW4	5.5 - 5.95 m	19/07/2021	**11**	<0.4	**18**	**7**	**10**	<0.1	**5**	**15**	<25	<50	<25	<50	<100	<100	<0.2	<0.5	<1	<1	<1	<0.05	<0.5	<0.05
			3000 160 900 - 3600 540 240000 330 1500 1800 730 - 6000 460 400000 1200								-	- 170 NL 215 NL -			1700	3300	3 75 NL 135	NL 165	230 180	NL 370	- 1.4	40	- 4000 -	
CW6	3.8 - 4.25 m	16/07/2021	<4	<0.4	**7**	**320**	**3**	<0.1	**2**	**10**	-	-	-	-	-	-	<0.2	<0.5	<1	<1	<0.1	**0.2**	<0.5	**3**
			3000 160 900 - 3600 540 240000 330 1500 1800 730 - 6000 460 400000 1200								-	- 170 630 215 NL -			1700	3300	3 75 NL 135	NL 165	230 180	NL 370	- 1.4	40	- 4000 -	
SS1	0.5 m	14/07/2021	<4	<0.4	**12**	**6**	**17**	<0.1	**7**	**24**	<25	<50	<25	<50	<100	<100	<0.2	<0.5	<1	<1	<1	<0.05	<0.5	<0.05
			3000 160 900 - 3600 540 240000 330 1500 1800 730 - 6000 460 400000 1200								-	- 170 260 215 NL -			1700	3300	3 75 NL 135	NL 165	230 180	NL 370	- 1.4	40	- 4000 -	
SS2	0.3 m	14/07/2021	<4	<0.4	**8**	**9**	**25**	<0.1	**6**	**32**	<25	<50	<25	<50	<100	<100	<0.2	<0.5	<1	<1	<1	**0.08**	<0.5	**0.3**
			3000 160 900 - 3600 540 240000 330 1500 1800 730 - 6000 460 400000 1200								-	- 170 260 215 NL -			1700	3300	3 75 NL 135	NL 165	230 180	NL 370	- 1.4	40	- 4000 -	
SS2	2.5 - 2.7 m	14/07/2021	**6**	<0.4	**46**	**30**	**11**	<0.1	**1**	**12**	-	-	-	-	-	-	-	-	-	-	<0.1	<0.05	<0.5	<0.05
			3000 160 900 - 3600 540 240000 330 1500 1800 730 - 6000 460 400000 1200								-	- 170 630 215 NL -			1700	3300	3 75 NL 135	NL 165	230 180	NL 370	- 1.4	40	- 4000 -	
CW3	4 - 4.45 m	4/08/2021	<4	<0.4	**44**	**29**	**9**	<0.1	**17**	**25**	<25	<50	<25	<50	<100	<100	<0.2	<0.5	<1	<1	<1	<0.05	<0.5	<0.05
			3000 160 900 - 3600 540 240000 330 1500 1800 730 - 6000 460 400000 1200								-	- 170 260 215 NL -			1700	3300	3 75 NL 135	NL 165	230 180	NL 370	- 1.4	40	- 4000 -	
CW7	2 - 2.1 m	4/08/2021	<4	<0.4	**11**	**37**	**93**	**0.3**	**19**	**43**	<25	<50	<25	<50	<100	<100	<0.2	<0.5	<1	<1	<1	**0.2**	<0.5	**1.8**
			3000 160 900 - 3600 540 240000 330 1500 1800 730 - 6000 460 400000 1200								-	- 170 260 215 NL -			1700	3300	3 75 NL 135	NL 165	230 180	NL 370	- 1.4	40	- 4000 -	
BD/L/040821	0 m	4/08/2021	<5	<1	**6**	**26**	**115**	**0.2**	**4**	**28**	<10	<50	<10	<50	<100	<100	<0.2	<0.5	<0.5	<0.5	<1	<0.5	<0.5	NT
			3000 160 900 - 3600 540 240000 330 1500 1800 730 - 6000 460 400000 1200								-	- 170 260 215 NL -			1700	3300	3 75 NL 135	NL 165	230 180	NL 370	- 1.4	40	- 4000 -	
CW7	4 - 4.1 m	4/08/2012	<4	<0.4	**9**	**58**	**590**	**0.3**	**9**	**30**	<25	<50	<25	<50	<100	<100	<0.2	<0.5	<1	<1	<1	<0.05	<0.5	<0.05
			3000 160 900 - 3600 540 240000 330 1500 1800 730 - 6000 460 400000 1200								-	- 170 NL 215 NL -			1700	3300	3 75 NL 135	NL 165	230 180	NL 370	- 1.4	40	- 4000 -	
CW7 - [TRIPLICATE]	2 - 2.1 m	4/08/2021	<4	<0.4	**12**	**47**	**110**	**0.3**	**15**	**51**	-	-	-	-	-	-	-	-	-	-	-	-	-	-
			3000 160 900 - 3600 540 240000 330 1500 1800 730 - 6000 460 400000 1200								-	- 170 630 215 NL -			1700	3300	3 75 NL 135	NL 165	230 180	NL 370	- 1.4	40	- 4000 -	
CP2	0.4 - 0.5 m	20/08/2021	<4	<0.4	**68**	**39**	**29**	**0.2**	**69**	**61**	<25	<50	-	<50	<100	<100	<0.2	<0.5	<1	<1	<0.1	**0.05**	<0.5	**0.5**
			3000 160 900 - 3600 540 240000 330 1500 1800 730 - 6000 460 400000 1200								-	- 170 260 215 NL -			1700	3300	3 75 NL 135	NL 165	230 180	NL 370	- 1.4	40	- 4000 -	
CP2	2.4 - 2.5 m	20/08/2021	**6**	<0.4	**12**	**28**	**74**	**0.7**	**6**	**130**	<25	<50	-	<50	<100	<100	-	-	-	-	<0.1	**0.08**	<0.5	**0.4**
			3000 160 900 - 3600 540 240000 330 1500 1800 730 - 6000 460 400000 1200								-	- 170 630 215 NL -			1700	3300	3 75 NL 135	NL 165	230 180	NL 370	- 1.4	40	- 4000 -	
WD3	0.5-0.6 m	11/09/2021	**5**	<0.4	**37**	**38**	**79**	**0.2**	**34**	**88**	<25	<50	<25	<50	<100	<100					<0.1	**0.5**	**0.6**	**3.9**
			3000 160 900 - 3600 540 240000 330 1500 1800 730 - 6000 460 400000 1200								-	- 170 260 215 NL -			1700	3300	3 75 NL 135	NL 165	230 180	NL 370	- 1.4	40	- 4000 -	
WD3	4-.4.45	11/09/2021	<4	<0.4	**37**	**30**	**53**	**<0.1**	**9**	**80**	-	-	-	-	-	-	-	-	-	-	<0.1	**0.2**	<0.5	**2.6**
			3000 160 900 - 3600 540 240000 330 1500 1800 730 - 6000 460 400000 1200								-	- 170 260 215 NL -			1700	3300	3 75 NL 135	NL 165	230 180	NL 370	- 1.4	40	- 4000 -	
BD/03/210911		11/09/2021	<4	<0.4	**76**	**22**	**44**	**<0.1**	**7**	**47**	-	-	-	-	-	-	-	-	-	-	-	**1.3**	**2.1**	**19**
			3000 160 900 - 3600 540 240000 330 1500 1800 730 - 6000 460 400000 1200								-	- 170 260 215 NL -			1700	3300	3 75 NL 135	NL 165	230 180	NL 370	- 1.4	40	- 4000 -	
CP1	1-1.1 m	18/09/2021	**6**	0.8	**12**	**130**	**3900**	**1.5**	**7**	**1100**	<25	<50	<25	<50	<100	<100	<0.2	<0.5	<1	<3	<0.1	**0.1**	<0.5	**0.66**
			3000 160 900 - 3600 540 240000 330 1500 1800 730 - 6000 460 400000 1200								-	- 170 260 215 NL -			1700	3300	3 75 NL 135	NL 165	230 180	NL 370	- 1.4	40	- 4000 -	
BD/01/180921		18/09/2021	<4	<0.4	**6**	**19**	**450**	**0.5**	**4**	**150**	-	-	-	-	-	-	-	-	-	-	<0.1	**0.1**	<0.5	**1.4**
			3000 160 900 - 3600 540 240000 330 1500 1800 730 - 6000 460 400000 1200								-	- 170 260 215 NL -			1700	3300	3 75 NL 135	NL 165	230 180	NL 370	- 1.4	40	- 4000 -	
CP1	2-2.1 m	18/09/2021	**9**	0.5	**13**	**1200**	**2500**	**1.1**	**1**	**880**	-	-	-	-	-	-	-	-	-	-	<0.1	**0.5**	**0.8**	**5.9**
			3000 160 900 - 3600 540 240000 330 1500 1800 730 - 6000 460 400000 1200								-	- 170 260 215 NL -			1700	3300	3 75 NL 135	NL 165	230 180	NL 370	- 1.4	40	- 4000 -	
WD1	0.4-0.5 m	19/09/2021	<4	<0.4	**15**	**35**	**20**	<0.1	<0.1	**69**	<25	<50	<25	<50	4000	<100	-	-	-	-	<0.1	**0.07**	<0.5	**0.2**
			3000 160 900 - 3600 540 240000 330 1500 1800 730 - 6000 460 400000 1200								-	- 170 260 215 NL -			1700	3300	3 75 NL 135	NL 165	230 180	NL 370	- 1.4	40	- 4000 -	
WD1	0.9-1.0 m	19/09/2021	<4	<0.4	**17**	**48**	**28**	<0.1	<0.1	**94**	-	-	-	-	-	-	-	-	-	-	<0.1	<0.05	<0.5	<0.05
			3000 160 900 - 3600 540 240000 330 1500 1800 730 - 6000 460 400000 1200								-	- 170 260 215 NL -			1700	3300	3 75 NL 135	NL 165	230 180	NL 370	- 1.4	40	- 4000 -	
WD2	0.2-0.3 m	20/09/2021	**5**	<0.4	**8**	**4**	**10**	<0.1	<0.1	**25**	<25	<50	<25	<50	<100	<100	-	-	-	-	<0.1	<0.05	<0.5	<0.05
			3000 160 900 - 3600 540 240000 330 1500 1800 730 - 6000 460 400000 1200								-	- 170 260 215 NL -			1700	3300	3 75 NL 135	NL 165	230 180	NL 370	- 1.4	40	- 4000 -	
WD1	1.9-2.0 m	19/09/2021	<4	<0.4	**16**	**8**	**1500**	<0.1	<0.1	**7**	-	-	-	-	-	-	-	-	-	-	<0.1	<0.05	<0.5	**0.2**
			3000 160 900 - 3600 540 240000 330 1500 1800 730 - 6000 460 400000 1200								-	- 170 260 215 NL -			1700	3300	3 75 NL 135	NL 165	230 180	NL 370	- 1.4	40	- 4000 -	

Lab result

HIL/HSL value EIL/ESL value

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

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

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

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

Notes:

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

b Reported naphthalene laboratory result obtained from BTEXN suite

c Criteria applies to DDT only

Site Assessment Criteria (SAC):

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

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

HIL D Commercial / Industrial (NEPC, 2013)

HSL D Commercial / Industrial (vapour intrusion) (NEPC, 2013)

DC HSL D Direct contact HSL D Commercial/industrial (direct contact) (CRC CARE, 2011)

EIL/ESL C/Ind Commercial and Industrial (NEPC, 2013)

ML C/Ind Commercial and Industrial (NEPC, 2013)

Douglas Partners
Geotechnics / Environment / Groundwater

Table 2: Summary of Laboratory Results – Metals, TRH, BTEX, PAH, Phenol, OCP, OPP, PCB, Asbestos, Additional metals, Complete PAH suite, TRH, Complete OCP suite, Complete OPP suite, VOC

			Phenol			OCP												OPP	PCB	Asbestos			Additional metals	TBT	TOC	VOC							
			Total Phenol	Cresols	Pentachlorophenol	DDD	DDT+DDE+DDD [C]	DDE	DDT	Aldrin & Dieldrin	Total Chlordane	Endrin	Total Endosulfan	Heptachlor	Hexachlorobenzene	Methoxychlor		Chlorpyrifos	Total	Asbestos ID in soil >0.1g/kg	Trace Analysis	Asbestos (50 g)	Tin (inorganic, as Sn)	Tributyl tin	Total organic Carbon	1,2-Dichloroethene	cis-1,2-dichloroethene	tetrachloromethene	trans-1,2-dichloroethene	1,1,2-trichloroethylene	Vinyl Chloride	Total VOC
		POL	5	0.6	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				1			1	1	1	1	1	1	1
Sample ID	Depth	Sample Date	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg		mg/kg	mg/kg	-	-	-	mg/kg	µg/kg		mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg
CW2	0.4 - 0.5 m	30/06/2021	<5			-	-	-	-	-	-	-	-	-	-	-		-	-	NAD	NAD	NAD	4	-	-	-	-	-	-	-	-	-
			660	25000	660	-	3600	640	-	640	45	530	100	2000	50	80	2500	2000	7													
CW4	0.9 - 1 m	30/06/2021	-			-	-	-	-	-	-	-	-	-	-	-		-	-	NAD	NAD	NAD	10	-	-	-	-	-	-	-	-	-
			660	25000	660	-	3600	640	-	640	45	530	100	2000	50	80	2500	2000	7													
CW5	0.5 - 0.6 m	30/06/2021	<0.1			<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1		<0.1	<0.1	NAD	NAD	NAD	1	-	6500	<1	<1	<1	<1	<1	<1	<1
			660	25000	660	-	3600	640	-	640	45	530	100	2000	50	80	2500	2000	7													
CW6	0.5 - 0.6 m	30/06/2021	<5			NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT		NT	NT	NAD	NAD	NAD	8	-	-	-	-	-	-	-	-	-
			660	25000	660	-	3600	640	-	640	45	530	100	2000	50	80	2500	2000	7													
BD1/20210630	0 m	30/06/2021	-			NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT		NT	NT	NAD	NAD	NAD	7	-	-	-	-	-	-	-	-	-
			660	25000	660	-	3600	640	-	640	45	530	100	2000	50	80	2500	2000	7													
W4	10 m	-	<5			-	-	-	-	-	-	-	-	-	-	-		-	-	NAD	NAD	NAD	38	-	-	-	-	-	-	-	-	-
			660	25000	660	-	3600	640	-	640	45	530	100	2000	50	80	2500	2000	7													
W4	12.45 m	-	<0.1			<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1		<0.1	<0.1	NAD	NAD	NAD	6	-	-	-	-	-	-	-	-	-
			660	25000	660	-	3600	640	-	640	45	530	100	2000	50	80	2500	2000	7													
CW1	12 - 12.45 m	12/07/2021	<5			<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1		<0.1	<0.1	NAD	NAD	NAD	NT	<0.5	-	-	-	-	-	-	-	-
			660	25000	660	-	3600	640	-	640	45	530	100	2000	50	80	2500	2000	7													
BD07/120721	0 m	12/07/2021	-			NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT		NT	NT	NAD	NAD	NAD	NT	-	-	-	-	-	-	-	-	-
			660	25000	660	-	3600	640	-	640	45	530	100	2000	50	80	2500	2000	7													
CW1	14.5 - 14.95 m	12/07/2021	-			-	-	-	-	-	-	-	-	-	-	-		-	-	NAD	NAD	NAD	-	-	-	-	-	-	-	-	-	-
			660	25000	660	-	3600	640	-	640	45	530	100	2000	50	80	2500	2000	7													
CW2	2.8 - 3.2 m	12/07/2021	<5			<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1		<0.1	<0.1	NAD	NAD	NAD	-	<0.5	-	-	-	-	-	-	-	-
			660	25000	660	-	3600	640	-	640	45	530	100	2000	50	80	2500	2000	7													
CW2	7 - 7.45 m	12/07/2021	-			-	-	-	-	-	-	-	-	-	-	-		-	-	NAD	NAD	NAD	-	-	-	-	-	-	-	-	-	-
			660	25000	660	-	3600	640	-	640	45	530	100	2000	50	80	2500	2000	7													
CW3	0.5 m	8/07/2021	<5			-	-	-	-	-	-	-	-	-	-	-		-	-	NAD	NAD	NAD	-	-	-	-	-	-	-	-	-	-
			660	25000	660	-	3600	640	-	640	45	530	100	2000	50	80	2500	2000	7													
CW5	2 m	7/07/2021	<5	<0.6	<1	-	-	-	-	-	-	-	-	-	-	-		-	-	NAD	NAD	NAD	-	<2	-	-	-	-	-	-	-	-
			660	25000	660	-	3600	640	-	640	45	530	100	2000	50	80	2500	2000	7													
CW5	5.45 - 5.5 m	7/07/2021	-			<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1		<0.1	<0.1	NAD	NAD	NAD	-	-	33000	<1	<1	<1	<1	<1	<1	<1
			660	25000	660	-	3600	640	-	640	45	530	100	2000	50	80	2500	2000	7													
CW7	0.5 m	6/07/2021	-			NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT		NT	NT	NAD	NAD	NAD	NT	-	-	<1	<1	<1	<1	<1	<1	<1
			660	25000	660	-	3600	640	-	640	45	530	100	2000	50	80	2500	2000	7													
BD03/060721	0 m	6/07/2021	-			NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT		NT	NT	NAD	NAD	NAD	NT	-	-	-	-	-	-	-	-	-
			660	25000	660	-	3600	640	-	640	45	530	100	2000	50	80	2500	2000	7													
CW7	1 m	6/07/2021	-			-	-	-	-	-	-	-	-	-	-	-		-	-	NAD	NAD	NAD	-	-	-	-	-	-	-	-	-	-
			660	25000	660	-	3600	640	-	640	45	530	100	2000	50	80	2500	2000	7													
W1	8 - 8.45 m	9/07/2021	<5	<0.6	<1	-	-	-	-	-	-	-	-	-	-	-		-	-	NAD	NAD	NAD	-	3	-	-	-	-	-	-	-	-
			660	25000	660	-	3600	640	-	640	45	530	100	2000	50	80	2500	2000	7													
W1	10 - 10.43 m	9/07/2021	-			-	-	-	-	-	-	-	-	-	-	-		-	-	NAD	NAD	NAD	-	-	-	-	-	-	-	-	-	-
			660	25000	660	-	3600	640	-	640	45	530	100	2000	50	80	2500	2000	7													
W3	10.75 - 11.2 m	4/07/2021	<5	<0.6	<1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1		<0.1	<0.1	NAD	NAD	NAD	-	83	-	-	-	-	-	-	-	-
			660	25000	660	-	3600	640	-	640	45	530	100	2000	50	80	2500	2000	7													
W3	14 - 14.45 m	4/07/2021	-			-	-	-	-	-	-	-	-	-	-	-		-	-	NAD	NAD	NAD	-	-	-	-	-	-	-	-	-	-
			660	25000	660	-	3600	640	-	640	45	530	100	2000	50	80	2500	2000	7													
W5	8.8 - 9.23 m	7/07/2021	<5	<0.6	<1	-	-	-	-	-	-	-	-	-	-	-		-	-	NAD	NAD	NAD	-	-	61000	<1	<1	<1	<1	<1	<1	<1
			660	25000	660	-	3600	640	-	640	45	530	100	2000	50	80	2500	2000	7													
W5	11.5 - 11.95 m	7/07/2021	-			-	-	-	-	-	-	-	-	-	-	-		-	-	NAD	NAD	NAD	-	85	-	-	-	-	-	-	-	-
			660	25000	660	-	3600	640	-	640	45	530	100	2000	50	80	2500	2000	7													
CW4	2.5 - 2.95 m	19/07/2021	<5			-	-	-	-	-	-	-	-	-	-	-		-	-	NAD	NAD	NAD	31	<0.5	-	-	-	-	-	-	-	-
			660	25000	660	-	3600	640	-	640	45	530	100	2000	50	80	2500	2000	7													
CW4	5.5 - 5.95 m	19/07/2021	-			-	-	-	-	-	-	-	-	-	-	-		-	-	NAD	NAD	NAD	<1	-	57000	-	-	-	-	-	-	-
			660	25000	660	-	3600	640	-	640	45	530	100	2000	50	80	2500	2000	7													
CW6	3.8 - 4.25 m	16/07/2021	-			-	-	-	-	-	-	-	-	-	-	-		-	-	NAD	NAD	NAD	<1	-	-	<1	<1	<1	<1	<1	<1	<1
			660	25000	660	-	3600	640	-	640	45	530	100	2000	50	80	2500	2000	7													
SS1	0.5 m	14/07/2021	<5			-	-	-	-	-	-	-	-	-	-	-		-	-	NAD	NAD	NAD	1	-	-	-	-	-	-	-	-	-
			660	25000	660	-	3600	640	-	640	45	530	100	2000	50	80	2500	2000	7													
SS2	0.3 m	14/07/2021	-			<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1		<0.1	<0.1	NAD	NAD	NAD	<1	-	-	-	-	-	-	-	-	-
			660	25000	660	-	3600	640	-	640	45	530	100	2000	50	80	2500	2000	7													
SS2	2.5 - 2.7 m	14/07/2021	<5			-	-	-	-	-	-	-	-	-	-	-		-	-	NAD	NAD	NAD	<1	-	-	-	-	-	-	-	-	-
			660	25000	660	-	3600	640	-	640	45	530	100	2000	50	80	2500	2000	7													
CW3	4 - 4.45 m	4/08/2021	-			-	-	-	-	-	-	-	-	-	-	-		-	-	NAD	NAD	NAD	-	-	-	-	-	-	-	-	-	-
			660	25000	660	-	3600	640	-	640	45	530	100	2000	50	80	2500	2000	7													
CW7	2 - 2.1 m	4/08/2021	<5	<0.6	<1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1		<0.1	<0.1	NAD	NAD	NAD	64	<0.5	-	<1	<1	<1	<1	<1	<1	<1
			660	25000	660	-	3600	640	-	640	45	530	100	2000	50	80	2500	2000	7													
BD1/040821	0 m	4/08/2021	-			NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT		NT	NT	-	-	-	NT	-	-	-	-	-	-	-	-	-
			660	25000	660	-	3600	640	-	640	45	530	100	2000	50	80	2500	2000	7													
CW7	4 - 4.1 m	4/08/2012	-			-	-	-	-	-	-	-	-	-	-	-		-	-	NAD	NAD	NAD	-	-	-	-	-	-	-	-	-	-
			660	25000	660	-	3600	640	-	640	45	530	100	2000	50	80	2500	2000	7													
CW7 - [TRIPLICATE]	2 - 2.1 m	4/08/2021	-			-	-	-	-	-	-	-	-	-	-	-		-	-	-	-	-	46	-	-	-	-	-	-	-	-	-
			660	25000	660	-	3600	640	-	640	45	530	100	2000	50	80	2500	2000	7													
CP2	0.4 - 0.5 m	20/08/2021	<5			<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1		<0.1	<0.1	NAD	NAD	NAD	8	-	-	<1	<1	<1	<1	<1	<1	<1
			660	25000	660	-	3600	640	-	640	45	530	100	2000	50	80	2500	2000	7													
CP2	2.4 - 2.5 m	20/08/2021	-			-	-	-	-	-	-	-	-	-	-	-		-	-	NAD	NAD	NAD	9	<2	10000	-	-	-	-	-	-	-
			660	25000	660	-	3600	640	-	640	45	530	100	2000	50	80	2500	2000	7													
WD3	0.5-0.6 m	11/09/2021	<5	<0.6	<1	-	-	-	-	-	-	-	-	-	-	-		-	-	NAD	NAD	NAD	6	<1.0	-	<1	<1	<1	<1	<1	<1	<1
			660	25000	660	-	3600	640	-	640	45	530	100	2000	50	80	2500	2000	7													
WD3	4-.4.45	11/09/2021	-			-	-	-	-	-	-	-	-	-	-	-		-	-	NAD	NAD	NAD	4	-	-	-	-	-	-	-	-	-
			660	25000	660	-	3600	640	-	640	45	530	100	2000	50	80	2500	2000	7													
BD03210911		11/09/2021	-	-	-	-	-	-	-	-	-	-	-	-	-	-		-	-	NAD	NAD	NAD	4	-	-	-	-	-	-	-	-	-
			660	25000	660	-	3600	640	-	640	45	530	100	2000	50	80	2500	2000	7													
CP1	1-1.1 m	18/09/2021	<5			<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1		<0.1	<0.1	NAD	NAD	NAD	-	-	-	-	-	-	-	-	-	-
			660	25000	660	-	3600	640	-	640	45	530	100	2000	50	80	2500	2000	7													
BD01/180921		18/09/2021	-			-	-	-	-	-	-	-	-	-	-	-		-	-	NAD	NAD	NAD	-	-	-	-	-	-	-	-	-	-
			660	25000	660	-	3600	640	-	640	45	530	100	2000	50	80	2500	2000	7													
CP1	2-2.1 m	18/09/2021	-			-	-	-	-	-	-	-	-	-	-	-		-	-	NAD	NAD	NAD	-	-	-	-	-	-	-	-	-	-
			660	25000	660	-	3600	640	-	640	45	530	100	2000	50	80	2500	2000	7													
WD1	0.4-0.5 m	19/09/2021	**0.2**	<0.6	<1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1		<0.1	<0.1	NAD	NAD	NAD	1	<0.5	-	-	-	-	-	-	-	-
			660	25000	660	-	3600	640	-	640	45	530	100	2000	50	80	2500	2000	7													
WD1	0.9-1.0 m	19/09/2021	-			-	-	-	-	-	-	-	-	-	-	-		-	-	NAD	NAD	NAD	2	-	-	-	-	-	-	-	-	-
			660	25000	660	-	3600	640	-	640	45	530	100	2000	50	80	2500	2000	7													
WD2	0.2-0.3 m	20/09/2021	-			<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1		<0.1	<0.1	NAD	NAD	NAD	<1	-	-	-	-	-	-	-	-	-
			660	25000	660	-	3600	640	-	640	45	530	100	2000	50	80	2500	2000	7													
WD1	1.9-2.0 m	19/09/2021	-			-	-	-	-	-	-	-	-	-	-	-		-	-	NAD	NAD	NAD	12	-	-	-	-	-	-	-	-	-
			660	25000	660	-	3600	640	-	640	45	530	100	2000	50	80	2500	2000	7													

Lab result
HIL/HSL value ESL/EIL value

HIL/HSL exceedance ESL/EIL exceedance HIL/HSL and ESL/EIL exceedance ML exceedance ML and HIL/HSL or EIL/ESL exceedance
indicates that asbestos has been detected by the lab, refer to the lab report Blue = DC exceedance HSL 0-<1 Exceedance

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

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

Notes:

a QA/QC replicate of sample listed directly below the primary sample
b Reported naphthalene laboratory result obtained from BTEXN suite
c Criteria applies to DDT only

Site Assessment Criteria (SAC):

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

SAC based on generic land use thresholds for Commercial/ industrial D
HIL D Commercial / Industrial (NEPC, 2013)
HSL D Commercial / Industrial (vapour intrusion) (NEPC, 2013)
DC HSL D Direct contact HSL D Commercial/industrial (direct contact) (CRC CARE, 2011)
EIL/ESL C/Ind Commercial and industrial (NEPC, 2013)
ML C/Ind Commercial and industrial (NEPC, 2013)

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Table 3: Summary of Laboratory Results – Metals, TRH, BTEX, PAH, Phenol, OCP, OPP, PCB, Asbestos, VOC, Additional Metals

			Metals											TRH					BTEX						PAH		
			Arsenic	Cadmium	Total Chromium	Copper	Lead	TCLP Lead	Mercury (inorganic)	TCLP Mercury	Nickel	TCLP 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)	TCLP Benzo(a)pyrene (BaP)	Total PAHs
		PQL	4	0.4	1	1	1	0.03	0.1	0.0005	1	0.01	1	25	50	100	100	50	0.2	0.5	1	2	1	3	0.05	0.001	0.05
Sample ID	Depth	Sample Date	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/l	mg/kg	mg/L	mg/kg	mg/l	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/l	mg/kg
CW2	0.4 - 0.5 m	30/06/2021	<4	<0.4	14	17	34	-	0.1	-	12	-	36	-	-	-	-	-	-	-	-	-	-	-	0.09	-	0.5
CW4	0.9 - 1 m	30/06/2021	6	<0.4	13	40	120	0.04	0.6	-	6	-	81	-	-	-	-	-	-	-	-	-	-	-	0.75	-	6.3
CW5	0.5 - 0.6 m	30/06/2021	6	<0.4	10	26	39	-	<0.1	-	13	-	87	<25	<50	<100	<100	<50	<0.2	<0.5	<1	<2	<1	<3	<0.05	<0.001	0.2
CW6	0.5 - 0.6 m	30/06/2021	5	<0.4	11	36	120	0.08	0.2	-	13	-	180	<25	<50	<100	<100	<50	<0.2	<0.5	<1	<2	<1	<3	1.6	<0.001	14
BD1/20210630	0 m	30/06/2021	4	<0.4	9	36	79	-	0.2	-	11	-	90	<25	<50	<100	<100	<50	<0.2	<0.5	<1	<2	<1	<3	1.9	NT	19
W4	10 m	30/06/2021	12	4	48	230	1200	1.5	3.8	-	28	-	1000	<25	<50	130	230	360	<0.2	<0.5	<1	<2	<1	<3	0.96	<0.001	12
W4	12.45 m	30/06/2021	<4	<0.4	30	41	28	-	0.3	-	17	-	36	<25	<50	<100	<100	<50	<0.2	<0.5	<1	<2	<1	<3	0.53	-	5
CW1	12 - 12.45 m	12/07/2021	<4	<0.4	3	<1	3	-	<0.1	-	<1	-	2	<25	<50	<100	<100	<50	<0.2	<0.5	<1	<2	<1	<3	<0.05	NT	<0.05
BD07/120721	0 m	12/07/2021	<4	<0.4	3	<1	3	-	<0.1	-	<1	-	2	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	<0.05	NT	<0.05
CW1	14.5 - 14.95 m	12/07/2021	9	<0.4	41	3	14	-	<0.1	-	3	-	7	-	-	-	-	-	-	-	-	-	-	-	<0.05	-	<0.05
CW2	2.8 - 3.2 m	12/07/2021	<4	<0.4	7	30	9	-	<0.1	-	7	-	49	<25	<50	<100	<100	<50	<0.2	<0.5	<1	<2	<1	<3	<0.05	-	0.2
CW2	7 - 7.45 m	12/07/2021	6	<0.4	11	16	13	-	<0.1	-	11	-	76	<25	<50	<100	<100	<50	<0.2	<0.5	<1	<2	<1	<3	<0.05	-	0.1
CW3	0.5 m	8/07/2021	7	<0.4	23	53	45	-	0.1	-	30	-	100	<25	<50	<100	<100	<50	<0.2	<0.5	<1	<2	<1	<3	0.1	-	0.71
CW5	2 m	7/07/2021	5	<0.4	45	62	240	<0.03	0.5	-	8	-	120	<25	<50	<100	<100	<50	<0.2	<0.5	<1	<2	<1	<3	2.3	<0.01	29
CW5	5.45 - 5.5 m	7/07/2021	17	<0.4	20	6	15	-	<0.1	-	6	-	35	<25	<50	<100	<100	<50	<0.2	<0.5	<1	<2	<1	<3	<0.05	-	<0.05
CW7	0.5 m	6/07/2021	<4	<0.4	15	56	14	NT	<0.1	-	150	0.06	62	-	-	-	-	-	<0.2	<0.5	<1	<2	<1	NT	0.4	NT	3
BD03/060721	0 m	6/07/2021	<4	<0.4	18	60	21	NT	<0.1	-	160	0.06	69	-	-	-	-	-	NT	NT	NT	NT	NT	NT	0.1	NT	0.5
CW7	1 m	6/07/2021	<4	<0.4	8	10	9	-	<0.1	-	18	-	39	<25	<50	<100	<100	<50	<0.2	<0.5	<1	<2	<1	<3	<0.05	-	0.1
W1	8 - 8.45 m	9/07/2021	5	0.6	16	51	1600	1.1	0.3	-	9	-	640	<25	<50	<100	<100	<50	<0.2	<0.5	<1	<2	<1	<3	0.71	-	9.4
W1	10 - 10.43 m	9/07/2021	<4	<0.4	5	20	30	-	0.1	-	1	-	30	-	-	-	-	-	-	-	-	-	-	-	0.95	<0.001	12
W3	10.75 - 11.2 m	4/07/2021	24	3	78	310	810	0.06	3.7	-	25	-	1100	<25	91	1700	1800	3591	<0.2	<0.5	<1	<2	<1	<3	6.4	<0.001	51
W3	14 - 14.45 m	4/07/2021	18	<0.4	87	10	17	-	0.1	-	3	-	17	-	-	-	-	-	-	-	-	-	-	-	<0.05	-	<0.05
W5	8.8 - 9.23 m	7/07/2021	22	3	43	410	880	0.79	4.8	<0.0005	24	-	1400	<25	120	2900	2600	5620	<0.2	<0.5	<1	<2	<1	<3	26	<0.001	240
W5	11.5 - 11.95 m	7/07/2021	<4	<0.4	7	4	10	-	<0.1	-	2	-	16	-	-	-	-	-	-	-	-	-	-	-	<0.05	-	<0.05
CW4	2.5 - 2.95 m	19/07/2021	13	<0.4	20	440	85	-	0.2	-	7	-	120	-	-	-	-	-	-	-	-	-	-	-	0.2	-	1.8
CW4	5.5 - 5.95 m	19/07/2021	11	<0.4	18	7	10	-	<0.1	-	5	-	15	<25	<50	<100	<100	<50	<0.2	<0.5	<1	<2	<1	<3	<0.05	-	<0.05
CW6	3.8 - 4.25 m	16/07/2021	<4	<0.4	7	320	3	-	<0.1	-	2	-	10	-	-	-	-	-	<0.2	<0.5	<1	<2	<1	-	0.2	-	3
SS1	0.5 m	14/07/2021	<4	<0.4	12	6	17	-	<0.1	-	7	-	24	<25	<50	<100	<100	<50	<0.2	<0.5	<1	<2	<1	<3	<0.05	-	<0.05
SS2	0.3 m	14/07/2021	<4	<0.4	8	9	25	-	<0.1	-	6	-	32	<25	<50	<100	<100	<50	<0.2	<0.5	<1	<2	<1	<3	0.08	-	0.3
SS2	2.5 - 2.7 m	14/07/2021	6	<0.4	46	30	11	-	<0.1	-	1	-	12	-	-	-	-	-	-	-	-	-	-	-	<0.05	-	<0.05
CW3	4 - 4.45 m	9/08/2021	<4	<0.4	44	29	9	-	<0.1	-	17	-	25	<25	<50	<100	<100	<50	<0.2	<0.5	<1	<2	<1	<3	<0.05	-	<0.05
CW7	2 - 2.1 m	4/08/2021	<4	<0.4	11	37	93	-	0.3	-	19	-	43	<25	<50	<100	<100	<50	<0.2	<0.5	<1	<2	<1	<3	0.2	-	1.8
BD1/040821	0 m	4/08/2021	<5	<1	6	26	115	-	0.2	-	4	-	28	<10	<50	<100	<100	<50	<0.2	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	-	-
CW7	4 - 4.1 m	4/08/2021	<4	<0.4	9	58	590	3.2	0.3	-	9	-	30	<25	<50	<100	<100	<50	<0.2	<0.5	<1	<2	<1	<3	<0.05	-	-
CW7 - [TRIPLICATE]	2 - 2.1 m	4/08/2021	<4	<0.4	12	47	110	-	0.3	-	15	-	51	-	-	-	-	-	-	-	-	-	-	-	-	-	-
CP2	0.4 - 0.5 m	20/08/2021	<4	<0.4	68	39	29	-	0.2	-	69	0.3	61	<25	<50	<100	<100	<50	<0.2	<0.5	<1	<2	<1	<3	0.05	-	0.5
CP2	2.4 - 2.5 m	20/08/2021	6	<0.4	12	28	74	-	0.7	-	6	-	130	<25	<50	<100	<100	<50	-	-	-	-	-	-	0.08	-	0.4
WD3	0.5 - 0.6 m	11/09/2021	5	<0.4	37	38	79	-	0.2	-	34	-	88	<25	<50	<100	<100	<50	<0.2	<0.5	<1	<2	<1	-	0.5	-	3.9
WD3	4 - 4.45 m	11/09/2021	<4	<0.4	37	30	53	-	<0.1	-	9	-	80	-	-	-	-	-	-	-	-	-	-	-	0.2	-	2.6
BD03/210911	0 m	11/09/2021	<4	<0.4	76	22	44	-	<0.1	-	7	-	47	-	-	-	-	-	-	-	-	-	-	-	1.3	<0.001	19
CP1	1 - 1.1 m	19/06/2021	6	0.8	12	130	3900	11	1.5	-	7	-	1100	<25	<50	<100	<100	<50	<0.2	<0.5	<1	<2	<1	<3	0.1	-	0.66
BD01 / 180921	0 m	19/06/2021	<4	<0.4	6	19	450	-	0.5	-	1	-	150	-	-	-	-	-	-	-	-	-	-	-	0.1	-	1.4
CP1	2 - 2.1 m	19/06/2021	9	0.5	13	1200	2500	3.3	1.1	-	4	-	880	-	-	-	-	-	-	-	-	-	-	-	0.5	-	5.9
WD1	0.4-0.5	19/09/2021	<4	<0.4	15	35	20	-	<0.1	-	13	-	69	<25	<50	2100	1900	4000	-	-	-	-	-	-	0.07	-	0.2
WD1	0.9-1.0	19/09/2021	<4	<0.4	17	48	28	-	<0.1	-	60	0.03	94	-	-	-	-	-	-	-	-	-	-	-	<0.05	-	<0.05
WD1	1.9-2.0	19/09/2021	<4	<0.4	16	8	1500	0.05	<0.1	-	2	-	7	-	-	-	-	-	-	-	-	-	-	-	0.05	-	0.2
WD2	0.2-0.3	20/09/2021	5	<0.4	8	4	10	-	<0.1	-	5	-	25	<25	<50	<100	<100	<50	-	-	-	-	-	-	<0.05	-	<0.05
																											Waste Classific
CT1			100	20	100	NC	100	N/A	4	N/A	40	N/A	NC	650	NC	NC	NC	10000	10	288	600	NC	NC	1000	0.8	N/A	200
SCC1			500	100	1900	NC	1500	N/A	50	N/A	1050	N/A	NC	650	NC	NC	NC	10000	18	518	1080	NC	NC	1800	10	N/A	200
TCLP1			N/A	N/A	N/A	NC	N/A	5	N/A	0.2	N/A	2	NC	N/A	NC	NC	NC	N/A	N/A	N/A	N/A	NC	NC	N/A	N/A	0.04	N/A
CT2			400	80	400	NC	400	N/A	16	N/A	160	N/A	NC	2600	NC	NC	NC	40000	40	1152	2400	NC	NC	4000	3.2	N/A	800
SCC2			2000	400	7600	NC	6000	N/A	200	N/A	4200	N/A	NC	2600	NC	NC	NC	40000	72	2073	4320	NC	NC	7200	23	N/A	800
TCLP2			N/A	N/A	N/A	NC	N/A	20	N/A	0.8	N/A	8	NC	N/A	NC	NC	NC	N/A	N/A	N/A	N/A	NC	NC	N/A	N/A	0.16	N/A

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

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

Notes:

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

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

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

d Criteria for scheduled chemicals used as an initial screen

e Criteria for Chlorpyrifos used as initial screen

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

PQL Practical quantitation limit

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

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

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

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

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

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

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Table 3: Summary of Laboratory Results – Metals, TRH, BTEX, PAH, Phenol, OCP, OPP, PCB, Asbestos, VOC, Additional Metals

			Phenol					OCP		OPP	PCB	Asbestos			VOC																Additional Metals	Tributyl Tin	Total Organic Carbon
			2-Methylphenol (o-Cresol)	Phenol	2,4,5-trichlorophenol	2,4,6-trichlorophenol	Phenol (non-halogenated)	Total Endosulfan	Total Analysed OCP	Total Analysed OPP	Total PCB	Asbestos ID in soil >0.1g/kg	Trace Analysis	Total Asbestos	carbon tetrachloride	Monochlorobenzene	Chloroform	1,2-dichlorobenzene	1,4-dichlorobenzene	1,2-dichloroethane	1,1-Dichloroethene	Styrene (vinylbenzene)	1,1,1,2-tetrachloroethane	1,1,2,2-tetrachloroethane	tetrachloroethene	1,1,1-trichloroethane	1,1,2-trichloroethane	1,1,2-trichloroethylene	Vinyl Chloride	Tin (inorganic, SnIV)	Tributyl Tin	
		PQL	0.2	5	0.2	0.2	0.2	0.1	0.1	0.1	0.1				1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	0.5	1
Sample ID	Depth	Sample Date	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	-	-	-	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	µg/kg	mg/kg
CW2	0.4 - 0.5 m	30/06/2021	-	<5	-	-	-	-	-	-	-	NAD	NAD	NAD	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	4	-	-
CW4	0.9 - 1 m	30/06/2021	-	-	-	-	-	-	-	-	-	NAD	NAD	NAD	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	10	-	-
CW5	0.5 - 0.6 m	30/06/2021	-	-	-	-	-	<0.1	<0.1	<0.1	<0.1	NAD	NAD	NAD	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	1	-	6500
CW6	0.5 - 0.6 m	30/06/2021	-	<5	-	-	-	-	-	-	NT	NAD	NAD	NAD	NT	NT	-	-	-	-	-	-	-	-	-	-	-	-	-	8	-	-
BD1/20210630	0 m	30/06/2021	-	-	-	-	-	-	-	-	NT	NAD	NAD	NAD	NT	NT	-	-	-	-	-	-	-	-	-	-	-	-	-	7	-	-
W4	10 m	30/06/2021	-	<5	-	-	-	-	-	-	-	NAD	NAD	NAD	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	38	-	-
W4	12.45 m	30/06/2021	-	-	-	-	-	<0.1	<0.1	<0.1	<0.1	NAD	NAD	NAD	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	6	-	-
CW1	12 - 12.45 m	12/07/2021	-	<5	-	-	-	<0.1	<0.1	<0.1	<0.1	-	-	-	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	<0.5	-
BD07/120721	0 m	12/07/2021	-	-	-	-	-	NT	NT	NT	NT	NAD	NAD	NAD	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	-	-
CW1	14.5 - 14.95 m	12/07/2021	-	-	-	-	-	-	-	-	-	NAD	NAD	NAD	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
CW2	2.8 - 3.2 m	12/07/2021	-	<5	-	-	-	<0.1	<0.1	<0.1	<0.1	NAD	NAD	NAD	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	<0.5	-
CW2	7 - 7.45 m	12/07/2021	-	-	-	-	-	-	-	-	-	NAD	NAD	NAD	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
CW3	0.5 m	8/07/2021	-	<5	-	-	-	-	-	-	-	NAD	NAD	NAD	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
CW5	2 m	7/07/2021	<0.2	<5	<0.2	<0.2	<0.2	-	-	-	-	NAD	NAD	NAD	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	<2	-
CW5	5.45 - 5.5 m	7/07/2021	-	-	-	-	-	<0.1	<0.1	<0.1	<0.1	NAD	NAD	NAD	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	-	-	33000
CW7	0.5 m	6/07/2021	-	-	-	-	-	-	-	-	-	NAD	NAD	NAD	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	NT	-	-
BD03/060721	0 m	6/07/2021	-	-	-	-	-	-	-	-	-	NAD	NAD	NAD	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
CW7	1 m	6/07/2021	-	-	-	-	-	-	-	-	-	NAD	NAD	NAD	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
W1	8 - 8.45 m	9/07/2021	<0.2	<5	<0.2	<0.2	<0.2	-	-	-	-	NAD	NAD	NAD	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	3	-
W1	10 - 10.43 m	9/07/2021	-	-	-	-	-	-	-	-	-	NAD	NAD	NAD	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
W3	10.75 - 11.2 m	4/07/2021	<0.2	<5	<0.2	<0.2	<0.2	<0.1	<0.1	<0.1	<0.1	NAD	NAD	NAD	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	83	-
W3	14 - 14.45 m	4/07/2021	-	-	-	-	-	-	-	-	-	NAD	NAD	NAD	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
W5	8.8 - 9.23 m	7/07/2021	<0.2	<5	<0.2	<0.2	<0.2	-	-	-	-	NAD	NAD	NAD	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	-	-	61000
W5	11.5 - 11.95 m	7/07/2021	-	-	-	-	-	-	-	-	-	NAD	NAD	NAD	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	85	-
CW4	2.5 - 2.95 m	19/07/2021	-	<5	-	-	-	-	-	-	-	NAD	NAD	NAD	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	31	<0.5	-
CW4	5.5 - 5.95 m	19/07/2021	-	-	-	-	-	-	-	-	-	NAD	NAD	NAD	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	<1	-	57000
CW6	3.8 - 4.25 m	16/07/2021	-	-	-	-	-	-	-	-	-	NAD	NAD	NAD	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	-	-
SS1	0.5 m	14/07/2021	-	<5	-	-	-	-	-	-	-	NAD	NAD	NAD	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	1	-	-
SS2	0.3 m	14/07/2021	-	-	-	-	-	<0.1	<0.1	<0.1	<0.1	NAD	NAD	NAD	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	<1	-	-
SS2	2.5 - 2.7 m	14/07/2021	-	<5	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	<1	-	-
CW3	4 - 4.45 m	9/08/2021	-	-	-	-	-	-	-	-	-	NAD	NAD	NAD	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
CW7	2 - 2.1 m	4/08/2021	<0.2	<5	<0.2	<0.2	<0.2	<0.1	<0.1	<0.1	<0.1	NAD	NAD	NAD	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	64	<0.5	-
BD1/040821	0 m	4/08/2021	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
CW7	4 - 4.1 m	4/08/2021	-	-	-	-	-	-	-	-	-	NAD	NAD	NAD	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
CW7 - [TRIPLICATE]	2 - 2.1 m	4/08/2021	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	46	-	-
CP2	0.4 - 0.5 m	20/08/2021	-	<5	-	-	-	<0.1	<0.1	<0.1	<0.1	NAD	NAD	NAD	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	8	-	-
CP2	2.4 - 2.5 m	20/08/2021	-	-	-	-	-	-	-	-	-	NAD	NAD	NAD																	9	<2	10000
WD3	0.5 - 0.6 m	11/09/2021	<0.2	<5	<0.2	<0.2	<0.2	-	-	-	-	NAD	NAD	NAD	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	6	<1	-
WD3	4 - 4.45 m	11/09/2021	-	-	-	-	-	-	-	-	-	NAD	NAD	NAD	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	4	-	-
BD03/210911	0 m	11/09/2021	-	-	-	-	-	-	-	-	-	NAD	NAD	NAD	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	4	-	-
CP1	1 - 1.1 m	19/06/2021	-	<5	-	-	-	<0.1	<0.1	<0.1	<0.1	NAD	NAD	NAD	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	300	-	-
BD01 / 180921	0 m	19/06/2021	-	-	-	-	-	-	-	-	-	NAD	NAD	NAD	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	22	-	-
CP1	2 - 2.1 m	19/06/2021	-	-	-	-	-	-	-	-	-	NAD	NAD	NAD	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	590	-	-
WD1	0.4-0.5	19/09/2021	<0.2	-	<0.2	<0.2	0.2	<0.1	<0.1	<0.1	<0.1	NAD	NAD	NAD	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	1	<0.5	-
WD1	0.9-1.0	19/09/2021	-	-	-	-	-	-	-	-	-	NAD	NAD	NAD	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	2	-	-
WD1	1.9-2.0	19/09/2021	-	-	-	-	-	-	-	-	-	NAD	NAD	NAD	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	12	-	-
WD2	0.2-0.3	20/09/2021	-	-	-	-	-	<0.1	<0.1	<0.1	<0.1	NAD	NAD	NAD	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	<1	-	-
ation Criteria [f]																																
CT1			4000	288	8000	40	288	60	<50	4	<50	NC	NC	NC	10	2000	120	86	150	10	14	60	200	26	14	600	24	10	4	NC	NC	NC
SCC1			7200	518	14400	72	518	108	<50	7.5	<50	NC	NC	NC	18	3600	126	4.3	7.5	0.5	0.7	108	360	46.8	25.2	1080	43.2	18	7.2	NC	NC	NC
TCLP1			N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	NC	NC	NC	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	NC	NC	NC
CT2			16000	1152	32000	160	1152	240	<50	16	<50	NC	NC	NC	40	8000	480	344	600	40	56	240	800	104	56	2400	96	40	16	NC	NC	NC
SCC2			28800	2073	57600	288	2073	432	<50	30	<50	NC	NC	NC	72	14400	864	620	1080	72	100	432	1440	187.2	100.8	4320	172.8	72	28.8	NC	NC	NC
TCLP2			N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	NC	NC	NC	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	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

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

Notes:

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

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

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

d Criteria for scheduled chemicals used as an initial screen

e Criteria for Chlorpyrifos used as initial screen

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

PQL Practical quantitation limit

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

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

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

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

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

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

Table 4: Summary of Acid Sulfate Soil Results

Sample ID	Sample Depth [a] (m)	Sample Description	Screening Test Results				Laboratory Results								
			pH			Strength of Reaction [b]	pH_{KCL}	S_{KCL}	Scr %S	s-TAA %S	S_{NAS} %S	s-ANC_{BT} %S	Net Acidity[c] %S	Net Acidity - Exisiting and Potential Acidity %S	Liming Rate without ANCE (ELS Calculation) kg CaCO3/t
			pH_F	pH_{FOX}	pH_F - pH_{FOX}										
CP2	0.4-0.5	Fill	7.4	8.3	-0.8	**4F**	-	-	-	-	-	-	-	-	-
CP2	0.9-1.0	Fill	8.2	8.2	0.0	**4F**	-	-	-	-	-	-	-	-	-
CP2	1.4-1.5	Fill	8.6	6.4	**2.1**	**4F**	**8.7**	NT	**0.09**	<0.01	NT	**1.30**	<0.005	**0.090**	**4.2**
CP2	1.9-2.0	Fill	8.0	6.5	**1.5**	**4F**	-	-	-	-	-	-	-	-	-
CP2	2.4-2.5	Sandy Clay	8.0	6.0	**2.0**	**3F**	-	-	-	-	-	-	-	-	-
CP2	2.9-3.0	Sandy Clay	8.3	5.3	**3.0**	**3F**	**7.6**	NT	**0.05**	<0.01	NT	**0.30**	<0.005	**0.050**	**2.3**
CP2	3.9-4.0	Sandy Clay	8.1	6.3	**1.7**	2F	-	-	-	-	-	-	-	-	-
CP2	4.9-5.0	Sandy Clay	7.6	6.6	**1.0**	2F	-	-	-	-	-	-	-	-	-
CW1	8.15-8.3	Fill	7.0	7.6	**-0.5**	1	-	-	-	-	-	-	-	-	-
CW1	8.75-9	Fill	7.5	8.1	**-0.6**	1	-	-	-	-	-	-	-	-	-
CW1	10.1-10.45	Fill	6.8	6.8	**0.0**	1	-	-	-	-	-	-	-	-	-
CW1	12-12.45	Sandy Clay	3.8	3.1	**0.7**	2	-	-	-	-	-	-	-	-	-
CW1	13-13.45	Sandy Clay	3.8	3.2	**0.6**	2	**3.1**	0.009	<0.005	0.1	NT	NT	**0.12**	**0.120**	**6.0**
CW1	16-16.45	Sandy Clay	5.4	5.0	**0.4**	1	-	-	-	-	-	-	-	-	-
CW1	17.5-17.65	Sandy Clay	6.6	5.3	**1.4**	1	-	-	-	-	-	-	-	-	-
CW1	19-19.45	Sand	5.8	5.8	**0.0**	1	-	-	-	-	-	-	-	-	-
CW1	20.5-20.95	Sand	6.0	5.8	**0.2**	1	-	-	-	-	-	-	-	-	-
CW2	0.1-0.2	Fill	6.1	7.9	**-1.9**	1	-	-	-	-	-	-	-	-	-
CW2	0.4-0.5	Fill	8.1	8.3	**-0.2**	1	-	-	-	-	-	-	-	-	-
CW2	0.9-1.0	Fill	5.9	7.9	**-2.1**	1	-	-	-	-	-	-	-	-	-
CW2	1.4-1.5	Fill	8.8	8.0	**0.8**	1	-	-	-	-	-	-	-	-	-
CW2	9-9.15	Fill	8.5	7.6	**0.9**	1	-	-	-	-	-	-	-	-	-
CW2	9.9-10.35	Sandy Clay	8.0	3.0	**5.0**	2	**8.5**	NT	**2.10**	<0.01	NT	0.72	1.60	**2.100**	**100.0**
CW2	11.4-11.85	Sandy Clay	8.2	6.1	**2.1**	1	-	-	-	-	-	-	-	-	-
CW2	12.9-13.35	Sandy Clay	7.9	6.9	**1.0**	1	-	-	-	-	-	-	-	-	-
CW2	14.4-14.85	Sandy Clay	6.2	6.0	**0.2**	1	-	-	-	-	-	-	-	-	-
CW3	0.10	Fill	8.2	7.5	**0.7**	**3F**	-	-	-	-	-	-	-	-	-
CW3	0.50	Fill	9.1	7.9	**1.2**	**2F**	-	-	-	-	-	-	-	-	-
CW3	1.00	Fill	8.8	7.9	**0.9**	1F	-	-	-	-	-	-	-	-	-
CW3	5.7-6.15	Clay	8.3	7.1	**1.1**	1	-	-	-	-	-	-	-	-	-
CW3	8.7-9.15	Silty sand	8.2	7.6	0.7	1	-	-	-	-	-	-	-	-	-
CW3	11.7-12.15	Silty sand	8.3	7.3	0.9	1	-	-	-	-	-	-	-	-	-
CW3	13.2-13.65	Silty sand	8.2	7.1	**1.1**	2	-	-	-	-	-	-	-	-	-
CW3	14.7-15.15	Silty sand	8.3	7.3	**1.0**	1	-	-	-	-	-	-	-	-	-
CW4	0.05-0.15	Fill	10.8	10.5	**0.2**	1F	-	-	-	-	-	-	-	-	-
CW4	0.4-0.5	Fill	9.8	9.3	**0.5**	**2F**	-	-	-	-	-	-	-	-	-
CW4	0.9-1.0	Fill	9.7	8.6	**1.1**	**3F**	-	-	-	-	-	-	-	-	-
CW4	1.4-1.5	Fill	8.8	8.6	**0.2**	**2F**	-	-	-	-	-	-	-	-	-
CW4	1.9-2	Fill	8.6	7.3	**1.3**	**2F**	-	-	-	-	-	-	-	-	-
CW4	2.5-2.95	Fill	8.6	7.3	**1.3**	2F	-	-	-	-	-	-	-	-	-
CW4	5.5-5.95	Sandy Clay	8.8	7.1	**1.7**	1	-	-	-	-	-	-	-	-	-
CW4	7-7.45	Sandy Clay	8.8	7.7	**1.2**	1	-	-	-	-	-	-	-	-	-
CW4	8.5-8.95	Sandy Clay	8.2	7.5	**0.7**	1	-	-	-	-	-	-	-	-	-
CW5	0.25-0.35	Sandy Clay	10.2	9.8	**0.4**	1	-	-	-	-	-	-	-	-	-
CW5	0.5-0.6	Fill	9.2	9.2	**-0.1**	1	-	-	-	-	-	-	-	-	-
CW5	0.9-1	Fill	10.1	9.0	**1.1**	**2**	-	-	-	-	-	-	-	-	-
CW5	2.00	Fill	9.3	7.6	**1.7**	1	-	-	-	-	-	-	-	-	-
CW5	5.00	Sandy Clay	8.2	6.9	**1.3**	**2**	-	-	-	-	-	-	-	-	-
CW5	5.5-5.95	Sandy Clay	8.0	6.5	**1.5**	**3**	**8.8**	NT	**1.40**	<0.01	NT	**1.80**	0.20	**1.400**	**65.0**
CW5	11.25-11.7	Sandy Clay	7.1	7.0	**0.1**	1	-	-	-	-	-	-	-	-	-
CW5	12.85-13.3	Sandy Clay	6.9	6.3	**0.6**	1	-	-	-	-	-	-	-	-	-
CW6	0.1-0.2	Fill	8.3	8.1	**0.2**	**2**	-	-	-	-	-	-	-	-	-
CW6	0.5-0.6	Fill	8.7	7.8	**0.9**	1	-	-	-	-	-	-	-	-	-
CW6	0.9-1.0	Fill	9.0	8.1	**0.9**	1	-	-	-	-	-	-	-	-	-
CW6	6.85-7.3	Sandy Clay	8.1	7.4	**0.8**	**2**	-	-	-	-	-	-	-	-	-
CW7	2-2.1	Fill	8.2	6.8	**1.4**	1	-	-	-	-	-	-	-	-	-
CW7	0.50	Fill	8.7	8.4	**0.3**	1	-	-	-	-	-	-	-	-	-
CW7	1.00	Fill	9.1	9.3	**-0.2**	1	-	-	-	-	-	-	-	-	-
SS1	0.50	Fill	5.3	7.3	**-2.0**	1	-	-	-	-	-	-	-	-	-
SS1	1.00	Fill	10.4	10.7	**-0.3**	**2**	-	-	-	-	-	-	-	-	-
SS2	0.10	Fill	8.5	8.3	**0.2**	1	-	-	-	-	-	-	-	-	-
W1	10.45	Sand	8.3	7.9	**0.4**	1	-	-	-	-	-	-	-	-	-
W3	10.75-11.2	Sandy Clay	7.0	7.0	**0.0**	1	-	-	-	-	-	-	-	-	-
W3	11.5-11.95	Sandy Clay	7.8	6.1	**1.8**	2	**9.1**	NT	**0.74**	<0.01	NT	**0.83**	0.19	**0.740**	**35.0**
W3	13-13.45	Sandy Clay	7.7	7.6	**0.2**	1	-	-	-	-	-	-	-	-	-
W3	14.5-14.95	Sandy Clay	7.0	4.5	**2.6**	1	**4.3**	0.031	**<0.005**	0.04	NT	**NT**	0.04	**0.040**	**2.1**
W4	10.00	Sandy Clay	8.0	7.0	**1.0**	**2**	-	-	-	-	-	-	-	-	-
W4	11.50	Sand	7.9	7.3	**0.6**	**3**	-	-	-	-	-	-	-	-	-
W5	8.8-9.25	Sandy Clay	8.4	5.8	**2.5**	**3**	-	-	-	-	-	-	-	-	-
W5	10-10.45	Sand	8.8	8.0	**0.8**	**2**	-	-	-	-	-	-	-	-	-
W5	11.5-11.95	Sandy Clay	8.7	8.0	**0.8**	2	-	-	-	-	-	-	-	-	-
WD1	0.4-0.5	Fill	6.7	6.4	**0.3**	2	-	-	-	-	-	-	-	-	-
WD1	0.9-1.0	Fill	6.9	6.6	**0.3**	3	-	-	-	-	-	-	-	-	-
WD1	1.4-1.5	Fill	7.2	6.5	**0.7**	1	-	-	-	-	-	-	-	-	-
WD1	1.9-2.0	Fill	6.4	2.8	**3.6**	1	6.1	NT	0.07	<0.01	NT	NT	0.074	0.074	3.5
WD1	4-4.45	Fill	6.0	3.4	**2.6**	1	-	-	-	-	-	-	-	-	-
WD1	5.00	Fill	5.6	3.7	**1.9**	1	-	-	-	-	-	-	-	-	-
WD1	7-7.05	Sandy Clay	4.2	3.7	**0.5**	1	4.7	NT	<0.005	0.02	NT	NT	0.022	0.022	1
Guideline		Coarse sands, poorly buffered	<4[d]	<3.5[e]	≥1[e]	-	Coarse sands, poorly buffered							0.01	
		Coarse sands to loamy sands and peats					Coarse sands to loamy sands and peats							0.03	
		Medium sandy loams to light clays					Medium sandy loams to light clays							0.06[f]/0.03[g]	
		Fine medium to heavy clays & silty clays					Fine medium to heavy clays & silty clays							0.1[f]/0.03[g]	

Notes to Table ?:

a Depth below ground surface

b Strength of Reaction

1 denotes no or slight reaction

2 denotes moderate reaction

3 denotes high reaction

4 denotes very vigorous reaction

F denotes bubbling/frothy reaction indicative of organics

H denotes heat generated

c Calculated by the laboratory based on the ABA equation in ASS Laboratory Methods Guidelines (Ref ?)

d For actual acid sulphate soils (ASS)

e Indicative value only for Potential Acid Sulphate Soils (PASS)

f QASSIT Action Criteria for disturbance of 1-1000 tonnes of material

g QASSIT Action Criteria for disturbance of more than 1000 tonnes of material

Bold results indicative of ASS

Shaded results indicate an exceedence of QASSIT action criteria for disturbance of more than 1000 tonnes of material

pH_F - Soil pH Test (1:5 soil:distilled water)

pH_{FOX} - Soil Peroxide pH Test (1:4 soil:distilled water following oxidation of soil with 30% hydrogen peroxide (H_20_2))

*Laboratory methods used to quantify ANC are likely to overestimate environmental effectiveness

									Field_ID	CP2	CW2	BD2	CW3	BD1	CW5	CW6	SS2
									LocCode	CP2	CW2	CW2	CW3	CW3	CW5	CW6	SS2
									WellCode								
									Sampled_Date-Time	3/09/2021	2/09/2021	2/09/2021	2/09/2021	2/09/2021	2/09/2021	2/09/2021	3/09/2021
				ANZG (2018) Marine water (unknown reliability) toxicant DGVs	ANZG (2018) Marine water 95% toxicant DGVs	ANZG (2018) Marine water 99% toxicant DGVs	Recreational water quality and aesthetics	NEPM 2013 Table 1A(4) Rec HSL C GW for Vapour Intrusion, Sand	NEPM 2013 Table 1A(4) Comm/Ind HSL D GW for Vapour Intrusion, Sand								
Chem_Group	**ChemName**	**Units**	**EQL**					**2-4m**	**2-4m**								
Inorganics	Ferrous Iron	mg/L	0.05							44	0.18	-	6.6		2.4	5.1	0.41
	TSS	mg/L	5							730	90	-	2400		3800	14,000	470
Metals	Arsenic (Filtered)	mg/L	0.001				0.05			0.009	<0.001	<0.001	<0.001	<0.001	0.003	<0.001	<0.001
	Cadmium (Filtered)	mg/L	0.0001		0.0055	**0.0007**	0.005			<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	0.0003
	Chromium (III+VI) (Filtered)	mg/L	0.001				0.05			<0.001	0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001
	Copper (Filtered)	mg/L	0.001		0.0013	**0.0003**	1			<0.001	<0.001	<0.001	<0.001	0.004	<0.001	<0.001	**0.012**
	Ferric Iron	mg/L	0.05							<0.05	<0.05	-	<0.05	-	1.1	0.72	<0.05
	Iron (Filtered)	mg/L	0.01				0.3			38	0.01	0.02	5.6	-	3.5	5.8	0.4
	Lead (Filtered)	mg/L	0.001		0.0044	**0.0022**	0.05			<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	**0.038**
	Mercury (Filtered)	mg/L	0.00005		0.0004	**0.0001**	0.001			<0.00005	<0.00005	<0.00005	<0.00005	<0.0001	<0.00005	<0.00005	<0.00005
	Nickel (Filtered)	mg/L	0.001		0.07	**0.007**	0.1			**0.009**	0.002	0.002	**0.009**	**0.008**	0.003	0.006	**0.033**
	Tin (Filtered)	mg/L	0.001							<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001
	Tributyltin as SN	mg/L	0.000002		0.000006	**0.0000004**				<0.000002	<0.000002	-	<0.000002	-	<0.000002	<0.000002	<0.000002
	Zinc (Filtered)	mg/L	0.001		0.015	**0.007**	5			0.003	**0.013**	**0.015**	0.001	**<0.005**	0.002	0.001	**0.077**
TPH	C10-C16	mg/L	0.05							<0.05	<0.05	<0.05	<0.05	<0.02	**0.077**	**0.052**	<0.05
	C16-C34	mg/L	0.1							<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	0.35	<0.1
	C34-C40	mg/L	0.1							<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1
	Oil and Grease	mg/L	5							<5	<5	-	<5		<5	<5	<5
	F2-NAPHTHALENE	mg/L	0.05					NL	NL	<0.05	<0.05	<0.05	<0.05	<0.1	**0.077**	**0.052**	<0.05
	C6 - C9	mg/L	0.01							<0.01	<0.01	<0.01	<0.01	<0.2	<0.01	<0.01	<0.01
	C10 - C14	mg/L	0.05							<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05
	C15 - C28	mg/L	0.1							<0.1	<0.1	<0.1	<0.1	<0.1	**0.14**	**0.37**	<0.1
	C29-C36	mg/L	0.1							<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1
	C6-C10 less BTEX (F1)	mg/L	0.01					NL	6	<0.01	<0.01	<0.01	<0.01	<0.02	<0.01	<0.01	<0.01
	C6-C10	mg/L	0.01							<0.01	<0.01	<0.01	<0.01	<0.02	<0.01	<0.01	<0.01
BTEX	Benzene	mg/L	0.001		0.7	**0.5**	0.01	NL	5	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001
	Ethylbenzene	mg/L	0.001	0.005				NL	NL	<0.001	<0.001	<0.001	<0.001	<0.002	<0.001	<0.001	<0.001
	Toluene	mg/L	0.001	0.18				NL	NL	<0.001	<0.001	<0.001	<0.001	<0.002	<0.001	<0.001	<0.001
	Xylene (m & p)	mg/L	0.002							<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002
	Xylene (o)	mg/L	0.001	0.35						<0.001	<0.001	<0.001	<0.001	<0.002	<0.001	<0.001	<0.001
MAH	1,2,4-trimethylbenzene	mg/L	0.001							<0.001	<0.001	<0.001	<0.001	<0.005	<0.001	<0.001	<0.001
	1,3,5-trimethylbenzene	mg/L	0.001							<0.001	<0.001	<0.001	<0.001	<0.005	<0.001	<0.001	<0.001
	Isopropylbenzene	mg/L	0.001	0.03						<0.001	<0.001	<0.001	<0.001	<0.005	<0.001	<0.001	<0.001
	n-butylbenzene	mg/L	0.001							<0.001	<0.001	<0.001	<0.001	<0.005	<0.001	<0.001	<0.001
	n-propylbenzene	mg/L	0.001							<0.001	<0.001	<0.001	<0.001	<0.005	<0.001	<0.001	<0.001
	p-isopropyltoluene	mg/L	0.001							<0.001	<0.001	<0.001	<0.001	<0.005	<0.001	<0.001	<0.001
	sec-butylbenzene	mg/L	0.001							<0.001	<0.001	<0.001	<0.001	<0.005	<0.001	<0.001	<0.001
	Styrene	mg/L	0.001							<0.001	<0.001	<0.001	<0.001	<0.005	<0.001	<0.001	<0.001
	tert-butylbenzene	mg/L	0.001							<0.001	<0.001	<0.001	<0.001	<0.005	<0.001	<0.001	<0.001
Chlorinated Hydrocarbons	1,1,1,2-tetrachloroethane	mg/L	0.001							<0.001	<0.001	<0.001	<0.001	<0.005	<0.001	<0.001	<0.001
	1,1,1-trichloroethane	mg/L	0.001	0.27						<0.001	<0.001	<0.001	<0.001	<0.005	<0.001	<0.001	<0.001
	1,1,2,2-tetrachloroethane	mg/L	0.001							<0.001	<0.001	<0.001	<0.001	<0.005	<0.001	<0.001	<0.001
	1,1,2-trichloroethane	mg/L	0.001	0.33	1.9	**0.14**				<0.001	<0.001	<0.001	<0.001	<0.005	<0.001	<0.001	<0.001
	1,1-dichloroethane	mg/L	0.001							<0.001	<0.001	<0.001	<0.001	<0.005	<0.001	<0.001	<0.001
	1,1-dichloroethene	mg/L	0.001	0.7	0.7	**0.5**	0.0003			<0.001	<0.001	<0.001	<0.001	<0.005	<0.001	<0.001	<0.001
	1,1-dichloropropene	mg/L	0.001							<0.001	<0.001	<0.001	<0.001	<0.005	<0.001	<0.001	<0.001
	1,2,3-trichloropropane	mg/L	0.001							<0.001	<0.001	<0.001	<0.001	<0.005	<0.001	<0.001	<0.001
	1,2-dibromo-3-chloropropane	mg/L	0.001							<0.001	<0.001	<0.001	<0.001	<0.005	<0.001	<0.001	<0.001
	1,2-dichloroethane	mg/L	0.001	1.9			0.01			<0.001	<0.001	<0.001	<0.001	<0.005	<0.001	<0.001	<0.001
	1,2-dichloropropane	mg/L	0.001	0.9						<0.001	<0.001	<0.001	<0.001	<0.005	<0.001	<0.001	<0.001
	1,3-dichloropropane	mg/L	0.001	1.1						<0.001	<0.001	<0.001	<0.001	<0.005	<0.001	<0.001	<0.001
	2,2-dichloropropane	mg/L	0.001							<0.001	<0.001	<0.001	<0.001	<0.005	<0.001	<0.001	<0.001
	Bromochloromethane	mg/L	0.001							<0.001	<0.001	<0.001	<0.001	<0.005	<0.001	<0.001	<0.001
	Bromodichloromethane	mg/L	0.001							<0.001	<0.001	<0.001	<0.001	<0.005	<0.001	<0.001	<0.001
	Bromoform	mg/L	0.001							<0.001	<0.001	<0.001	<0.001	<0.005	<0.001	<0.001	<0.001
	Carbon tetrachloride	mg/L	0.001	0.24			0.003			<0.001	<0.001	<0.001	<0.001	<0.005	<0.001	<0.001	<0.001
	Chlorodibromomethane	mg/L	0.001							<0.001	<0.001	<0.001	<0.001	<0.005	<0.001	<0.001	<0.001
	Chloroethane	mg/L	0.01							<0.01	<0.01	<0.01	<0.01	<0.05	<0.01	<0.01	<0.01
	Chloroform	mg/L	0.001	0.37						<0.001	<0.001	<0.001	<0.001	<0.005	<0.001	<0.001	0.002
	Chloromethane	mg/L	0.01							<0.01	<0.01	<0.01	<0.01	<0.05	<0.01	<0.01	<0.01
	cis-1,2-dichloroethene	mg/L	0.001							<0.001	<0.001	<0.001	<0.001	<0.005	<0.001	<0.001	<0.001
	cis-1,3-dichloropropene	mg/L	0.001							<0.001	<0.001	<0.001	<0.001	<0.005	<0.001	<0.001	<0.001
	Dibromomethane	mg/L	0.001							<0.001	<0.001	<0.001	<0.001	<0.005	<0.001	<0.001	<0.001
	Hexachlorobutadiene	mg/L	0.001							<0.001	<0.001	<0.001	<0.001	<0.005	<0.001	<0.001	<0.001
	Trichloroethene	mg/L	0.001		0.33	**0.2**	0.03			<0.001	<0.001	<0.001	<0.001	<0.005	<0.001	<0.001	<0.001
	Tetrachloroethene	mg/L	0.001	0.07			0.01			<0.001	<0.001	<0.001	<0.001	<0.005	<0.001	<0.001	<0.001
	trans-1,2-dichloroethene	mg/L	0.001							<0.001	<0.001	<0.001	<0.001	<0.005	<0.001	<0.001	<0.001
	trans-1,3-dichloropropene	mg/L	0.001							<0.001	<0.001	<0.001	<0.001	<0.005	<0.001	<0.001	<0.001
	Vinyl chloride	mg/L	0.01	0.1						<0.01	<0.01	<0.01	<0.01	<0.05	<0.01	<0.01	<0.01
Halogenated Hydrocarbons	1,2-dibromoethane	mg/L	0.001							<0.001	<0.001	<0.001	<0.001	<0.005	<0.001	<0.001	<0.001
	Bromomethane	mg/L	0.01							<0.01	<0.01	<0.01	<0.01	<0.05	<0.01	<0.01	<0.01
	Dichlorodifluoromethane	mg/L	0.01							<0.01	<0.01	<0.01	<0.01	<0.05	<0.01	<0.01	<0.01
	Trichlorofluoromethane	mg/L	0.01							<0.01	<0.01	<0.01	<0.01	<0.05	<0.01	<0.01	<0.01
Halogenated Benzenes	1,2,3-trichlorobenzene	mg/L	0.001	0.003						<0.001	<0.001	<0.001	<0.001	<0.005	<0.001	<0.001	<0.001
	1,2,4-trichlorobenzene	mg/L	0.001		0.08	**0.02**				<0.001	<0.001	<0.001	<0.001	<0.005	<0.001	<0.001	<0.001
	1,2-dichlorobenzene	mg/L	0.001	0.16						<0.001	<0.001	<0.001	<0.001	<0.005	<0.001	<0.001	<0.001
	1,3-dichlorobenzene	mg/L	0.001	0.26						<0.001	<0.001	<0.001	<0.001	<0.005	<0.001	<0.001	<0.001
	1,4-dichlorobenzene	mg/L	0.001	0.06						<0.001	<0.001	<0.001	<0.001	<0.005	<0.001	<0.001	<0.001
	2-chlorotoluene	mg/L	0.001							<0.001	<0.001	<0.001	<0.001	<0.005	<0.001	<0.001	<0.001
	4-chlorotoluene	mg/L	0.001							<0.001	<0.001	<0.001	<0.001	<0.005	<0.001	<0.001	<0.001
	Bromobenzene	mg/L	0.001							<0.001	<0.001	<0.001	<0.001	<0.005	<0.001	<0.001	<0.001
	Chlorobenzene	mg/L	0.001	0.055						<0.001	<0.001	<0.001	<0.001	<0.005	<0.001	<0.001	<0.001
	Hexachlorobenzene	mg/L	0.000001	0.00005						<0.000001	<0.000001	-	<0.000001	-	<0.000001	<0.000001	<0.000001
Solvents	Cyclohexane	mg/L	0.001							<0.001	<0.001	<0.001	<0.001	<0.005	<0.001	<0.001	<0.001
PAH/Phenols	2,4-dimethylphenol	mg/L	0.001	0.002						<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001
	2,4-dinitrophenol	mg/L	0.02	0.045						<0.02	<0.02	<0.02	<0.02	<0.001	<0.02	<0.02	<0.02
	2-methylphenol	mg/L	0.001							<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001
	2-nitrophenol	mg/L	0.001	0.002						<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001
	4,6-Dinitro-2-methylphenol	mg/L	0.01							<0.01	<0.01	<0.01	<0.01	<0.001	<0.01	<0.01	<0.01
	4-chloro-3-methylphenol	mg/L	0.005							<0.005	<0.005	<0.005	<0.005	<0.001	<0.005	<0.005	<0.005
	4-nitrophenol	mg/L	0.02	0.058						<0.02	<0.02	<0.02	<0.02	<0.001	<0.02	<0.02	<0.02
	Acenaphthene	mg/L	0.001							<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001
	Acenaphthylene	mg/L	0.001							<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001
	Anthracene	mg/L	0.001	0.0001						<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001
	Benzo(j+k)fluoranthene	µg/L	2							<2	<2	<2	<2	<0.001	<2	<2	<2
	Benz(a)anthracene	mg/L	0.001							<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001
	Benzo(a) pyrene	mg/L	0.001	0.0001			0.00001			<0.001	<0.001	<0.001	<0.001	<0.0005	<0.001	<0.001	<0.001
	Benzo(g,h,i)peryiene	mg/L	0.001							<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001
	Chrysene	mg/L	0.001							<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001
	Dibenz(a,h)anthracene	mg/L	0.001							<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001
	fluoranthene	mg/L	0.001	0.001						<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001
	Fluorene	mg/L	0.001							<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001
	Indeno(1,2,3-c,d)pyrene	mg/L	0.001							<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001
	Naphthalene	mg/L	0.001		0.07	**0.05**		NL	NL	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001
	Phenanthrene	mg/L	0.001	0.0006						<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001
	Phenol	mg/L	0.001		0.4	**0.27**				<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001
	Pyrene	mg/L	0.001							<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001
Halogenated Phenols	2,3,4,6-tetrachlorophenol	mg/L	0.001	0.01			0.001			<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001
	2,4,5-trichlorophenol	mg/L	0.001	0.004			0.001			<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001
	2,4,6-trichlorophenol	mg/L	0.001	0.003			0.01			<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001
	2,4-dichlorophenol	mg/L	0.001	0.12						<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001
	2,6-dichlorophenol	mg/L	0.001	0.034						<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001
	2-chlorophenol	mg/L	0.001	0.34						<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001
	3/4-Methylphenol (m/p-cresol)	mg/L	0.002							<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002
	Pentachlorophenol	mg/L	0.005		0.022	**0.011**	0.01			<0.005	<0.005	<0.005	<0.005	<0.002	<0.005	<0.005	<0.005
Polychlorinated Biphenyls	Arochlor 1016	mg/L	0.00001							<0.00001	<0.00001	-	<0.00001	-	<0.00001	<0.00001	<0.00001
	Arochlor 1221	mg/L	0.00001							<0.00001	<0.00001	-	<0.00001	-	<0.00001	<0.00001	<0.00001
	Arochlor 1232	mg/L	0.00001							<0.00001	<0.00001	-	<0.00001	-	<0.00001	<0.00001	<0.00001
	Arochlor 1242	mg/L	0.00001	0.0003						<0.00001	<0.00001	-	<0.00001	-	<0.00001	<0.00001	<0.00001
	Arochlor 1248	mg/L	0.00001							<0.00001	<0.00001	-	<0.00001	-	<0.00001	<0.00001	<0.00001
	Arochlor 1254	mg/L	0.00001	0.00001						<0.00001	<0.00001	-	<0.00001	-	<0.00001	<0.00001	<0.00001
	Arochlor 1260	mg/L	0.00001							<0.00001	<0.00001	-	<0.00001	-	<0.00001	<0.00001	<0.00001
Organochlorine Pesticides	4,4-DDE	mg/L	0.000001	0.0000005						<0.000001	<0.000001	-	<0.000001	-	<0.000001	<0.000001	<0.000001
	a-BHC	mg/L	0.000001							<0.000001	<0.000001	-	<0.000001	-	<0.000001	<0.000001	<0.000001
	Aldrin	mg/L	0.000001	0.000003			0.001			<0.000001	<0.000001	-	<0.000001	-	<0.000001	<0.000001	<0.000001
	b-BHC	mg/L	0.000001							<0.000001	<0.000001	-	<0.000001	-	<0.000001	<0.000001	<0.000001
	Chlordane (cis)	mg/L	0.000001							<0.000001	<0.000001	-	<0.000001	-	<0.000001	<0.000001	<0.000001
	Chlordane (trans)	mg/L	0.000001							<0.000001	<0.000001	-	<0.000001	-	<0.000001	<0.000001	<0.000001
	d-BHC	mg/L	0.000001							<0.000001	<0.000001	-	<0.000001	-	<0.000001	<0.000001	<0.000001
	DDD	mg/L	0.000001							<0.000001	<0.000001	-	<0.000001	-	<0.000001	<0.000001	<0.000001
	DDT	mg/L	0.000001	0.0000004			0.003			<0.000001	<0.000001	-	<0.000001	-	<0.000001	<0.000001	<0.000001
	Dieldrin	mg/L	0.000001	0.00001			0.001			<0.000001	<0.000001	-	<0.000001	-	<0.000001	<0.000001	**0.00004**
	Endosulfan I	mg/L	0.000002							<0.000002	<0.000002	-	<0.000002	-	<0.000002	<0.000002	<0.000002
	Endosulfan II	mg/L	0.000002							<0.000002	<0.000002	-	<0.000002	-	<0.000002	<0.000002	<0.000002
	Endosulfan sulphate	mg/L	0.000001							<0.000001	<0.000001	-	<0.000001	-	<0.000001	<0.000001	<0.000001
	Endrin	mg/L	0.000001		0.000008	**0.000004**	0.001			<0.000001	<0.000001	-	<0.000001	-	<0.000001	<0.000001	<0.000001
	Endrin aldehyde	mg/L	0.000001							<0.000001	<0.000001	-	<0.000001	-	<0.000001	<0.000001	<0.000001
	g-BHC (Lindane)	mg/L	0.000001	0.000007			0.01			<0.000001	<0.000001	-	<0.000001	-	<0.000001	<0.000001	<0.000001
	Heptachlor	mg/L	0.000001	0.0000004			0.003			<0.000001	<0.000001	-	<0.000001	-	<0.000001	<0.000001	<0.000001
	Heptachlor epoxide	mg/L	0.000001							<0.000001	<0.000001	-	<0.000001	-	<0.000001	<0.000001	<0.000001
	Methoxychlor	mg/L	0.000001	0.000004						<0.000001	<0.000001	-	<0.000001	-	<0.000001	<0.000001	<0.000001
Organophosphorous Pesticides	Azinophos methyl	mg/L	0.00002	0.00001			0.01			<0.00002	<0.00002	-	<0.00002	-	<0.00002	<0.00002	<0.00002
	Bromophos-ethyl	mg/L	0.0002				0.02			<0.0002	<0.0002	-	<0.0002	-	<0.0002	<0.0002	<0.0002
	Chlorpyrifos	mg/L	0.000009		0.000009	**0.0000005**	0.002			<0.000009	<0.000009	-	<0.000009	-	<0.000009	<0.000009	<0.000009
	Chlorpyrifos-methyl	mg/L	0.0002							<0.0002	<0.0002	-	<0.0002	-	<0.0002	<0.0002	<0.0002
	Diazinon	mg/L	0.00001	0.00001			0.01			<0.00001	<0.00001	-	<0.00001	-	<0.00001	<0.00001	<0.00001
	Dichlorvos	mg/L	0.0002				0.02			<0.0002	<0.0002	-	<0.0002	-	<0.0002	<0.0002	<0.0002
	Dimethoate	mg/L	0.00015	0.00015			0.1			<0.00015	<0.00015	-	<0.00015	-	<0.00015	<0.00015	<0.00015
	Ethion	mg/L	0.0002				0.006			<0.0002	<0.0002	-	<0.0002	-	<0.0002	<0.0002	<0.0002
	Fenitrothion	mg/L	0.0002	0.000001			0.02			<0.0002	<0.0002	-	<0.0002	-	<0.0002	<0.0002	<0.0002
	Malathion	mg/L	0.00005	0.00005			0.1			<0.00005	<0.00005	-	<0.00005	-	<0.00005	<0.00005	<0.00005
	Methyl parathion	mg/L	0.0002				0.006			<0.0002	<0.0002	-	<0.0002	-	<0.0002	<0.0002	<0.0002
	Ronnel	mg/L	0.0002				0.06			<0.0002	<0.0002	-	<0.0002	-	<0.0002	<0.0002	<0.0002
Pesticides	Parathion	mg/L	0.000004	0.000004			0.03			<0.000004	<0.000004	-	<0.000004	-	<0.000004	<0.000004	<0.000004

Appendix H

Laboratory Certificates, Chain of Custody
and Sample Receipt Information

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 279443

Client Details

Client	Douglas Partners Pty Ltd
Attention	Rhys McMillan
Address	96 Hermitage Rd, West Ryde, NSW, 2114

Sample Details

Your Reference	**202546.00, Cockle Bay**
Number of Samples	8 Soil
Date samples received	29/09/2021
Date completed instructions received	29/09/2021

Analysis Details

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

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

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

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

Report Details

Date results requested by	08/10/2021
Date of Issue	11/10/2021

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Asbestos Approved By
Analysed by Asbestos Approved Analyst: Ridwan Wijaya
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, LC Supervisor
Lucy Zhu, Asbestos Supervisor
Priya Samarawickrama, Senior Chemist

Authorised By



Nancy Zhang, Laboratory Manager

TRH in Soil (C6-C9) NEPM			
Our Reference		279443-1	279443-3
Your Reference	UNITS	WD1	WD2
Depth		0.4-0.5	0.2-0.3
Date Sampled		19/09/2021	20/09/2021
Type of sample		Soil	Soil
Date extracted	-	05/10/2021	05/10/2021
Date analysed	-	06/10/2021	06/10/2021
TRH C_6 - C_9	mg/kg	<25	<25
TRH C_6 - C_{10}	mg/kg	<25	<25
Surrogate aaa-Trifluorotoluene	%	105	87

svTRH (C10-C40) in Soil			
Our Reference		279443-1	279443-3
Your Reference	UNITS	WD1	WD2
Depth		0.4-0.5	0.2-0.3
Date Sampled		19/09/2021	20/09/2021
Type of sample		Soil	Soil
Date extracted	-	05/10/2021	05/10/2021
Date analysed	-	06/10/2021	06/10/2021
TRH C_{10} - C_{14}	mg/kg	<50	<50
TRH C_{15} - C_{28}	mg/kg	2,100	<100
TRH C_{29} - C_{36}	mg/kg	1,900	<100
Total +ve TRH (C10-C36)	mg/kg	4,000	<50
TRH >C_{10} -C_{16}	mg/kg	<50	<50
TRH >C_{16} -C_{34}	mg/kg	4,000	<100
TRH >C_{34} -C_{40}	mg/kg	<100	<100
Total +ve TRH (>C10-C40)	mg/kg	4,000	<50
Surrogate o-Terphenyl	%	112	107

PAHs in Soil					
Our Reference		279443-1	279443-2	279443-3	279443-5
Your Reference	UNITS	WD1	WD1	WD2	WD1
Depth		0.4-0.5	0.9-1.0	0.2-0.3	1.9-2.0
Date Sampled		19/09/2021	19/09/2021	20/09/2021	19/09/2021
Type of sample		Soil	Soil	Soil	Soil
Date extracted	-	05/10/2021	05/10/2021	05/10/2021	05/10/2021
Date analysed	-	07/10/2021	07/10/2021	07/10/2021	07/10/2021
Naphthalene	mg/kg	<0.1	<0.1	<0.1	<0.1
Acenaphthylene	mg/kg	<0.1	<0.1	<0.1	<0.1
Acenaphthene	mg/kg	<0.1	<0.1	<0.1	<0.1
Fluorene	mg/kg	<0.1	<0.1	<0.1	<0.1
Phenanthrene	mg/kg	<0.1	<0.1	<0.1	<0.1
Anthracene	mg/kg	<0.1	<0.1	<0.1	<0.1
Fluoranthene	mg/kg	<0.1	<0.1	<0.1	<0.1
Pyrene	mg/kg	0.1	<0.1	<0.1	0.2
Benzo(a)anthracene	mg/kg	<0.1	<0.1	<0.1	<0.1
Chrysene	mg/kg	<0.1	<0.1	<0.1	<0.1
Benzo(b,j+k)fluoranthene	mg/kg	<0.2	<0.2	<0.2	<0.2
Benzo(a)pyrene	mg/kg	0.07	<0.05	<0.05	0.05
Indeno(1,2,3-c,d)pyrene	mg/kg	<0.1	<0.1	<0.1	<0.1
Dibenzo(a,h)anthracene	mg/kg	<0.1	<0.1	<0.1	<0.1
Benzo(g,h,i)perylene	mg/kg	<0.1	<0.1	<0.1	<0.1
Total +ve PAH's	mg/kg	0.2	<0.05	<0.05	0.2
Benzo(a)pyrene TEQ calc (zero)	mg/kg	<0.5	<0.5	<0.5	<0.5
Benzo(a)pyrene TEQ calc(half)	mg/kg	<0.5	<0.5	<0.5	<0.5
Benzo(a)pyrene TEQ calc(PQL)	mg/kg	<0.5	<0.5	<0.5	<0.5
Surrogate p-Terphenyl-d14	%	103	107	100	97

Organochlorine Pesticides in soil			
Our Reference		279443-1	279443-3
Your Reference	UNITS	WD1	WD2
Depth		0.4-0.5	0.2-0.3
Date Sampled		19/09/2021	20/09/2021
Type of sample		Soil	Soil
Date extracted	-	05/10/2021	05/10/2021
Date analysed	-	07/10/2021	07/10/2021
alpha-BHC	mg/kg	<0.1	<0.1
HCB	mg/kg	<0.1	<0.1
beta-BHC	mg/kg	<0.1	<0.1
gamma-BHC	mg/kg	<0.1	<0.1
Heptachlor	mg/kg	<0.1	<0.1
delta-BHC	mg/kg	<0.1	<0.1
Aldrin	mg/kg	<0.1	<0.1
Heptachlor Epoxide	mg/kg	<0.1	<0.1
gamma-Chlordane	mg/kg	<0.1	<0.1
alpha-chlordane	mg/kg	<0.1	<0.1
Endosulfan I	mg/kg	<0.1	<0.1
pp-DDE	mg/kg	<0.1	<0.1
Dieldrin	mg/kg	<0.1	<0.1
Endrin	mg/kg	<0.1	<0.1
Endosulfan II	mg/kg	<0.1	<0.1
pp-DDD	mg/kg	<0.1	<0.1
Endrin Aldehyde	mg/kg	<0.1	<0.1
pp-DDT	mg/kg	<0.1	<0.1
Endosulfan Sulphate	mg/kg	<0.1	<0.1
Methoxychlor	mg/kg	<0.1	<0.1
Total +ve DDT+DDD+DDE	mg/kg	<0.1	<0.1
Surrogate TCMX	%	90	92

Organophosphorus Pesticides in Soil			
Our Reference		279443-1	279443-3
Your Reference	UNITS	WD1	WD2
Depth		0.4-0.5	0.2-0.3
Date Sampled		19/09/2021	20/09/2021
Type of sample		Soil	Soil
Date extracted	-	05/10/2021	05/10/2021
Date analysed	-	07/10/2021	07/10/2021
Dichlorvos	mg/kg	<0.1	<0.1
Dimethoate	mg/kg	<0.1	<0.1
Diazinon	mg/kg	<0.1	<0.1
Chlorpyriphos-methyl	mg/kg	<0.1	<0.1
Ronnel	mg/kg	<0.1	<0.1
Fenitrothion	mg/kg	<0.1	<0.1
Malathion	mg/kg	<0.1	<0.1
Chlorpyriphos	mg/kg	<0.1	<0.1
Parathion	mg/kg	<0.1	<0.1
Bromophos-ethyl	mg/kg	<0.1	<0.1
Ethion	mg/kg	<0.1	<0.1
Azinphos-methyl (Guthion)	mg/kg	<0.1	<0.1
Surrogate TCMX	%	90	92

PCBs in Soil			
Our Reference		279443-1	279443-3
Your Reference	UNITS	WD1	WD2
Depth		0.4-0.5	0.2-0.3
Date Sampled		19/09/2021	20/09/2021
Type of sample		Soil	Soil
Date extracted	-	05/10/2021	05/10/2021
Date analysed	-	07/10/2021	07/10/2021
Aroclor 1016	mg/kg	<0.1	<0.1
Aroclor 1221	mg/kg	<0.1	<0.1
Aroclor 1232	mg/kg	<0.1	<0.1
Aroclor 1242	mg/kg	<0.1	<0.1
Aroclor 1248	mg/kg	<0.1	<0.1
Aroclor 1254	mg/kg	<0.1	<0.1
Aroclor 1260	mg/kg	<0.1	<0.1
Total +ve PCBs (1016-1260)	mg/kg	<0.1	<0.1
Surrogate TCMX	%	90	92

Acid Extractable metals in soil						
Our Reference		279443-1	279443-2	279443-3	279443-5	279443-9
Your Reference	UNITS	WD1	WD1	WD2	WD1	WD1 - [TRIPLICATE]
Depth		0.4-0.5	0.9-1.0	0.2-0.3	1.9-2.0	0.4-0.5
Date Sampled		19/09/2021	19/09/2021	20/09/2021	19/09/2021	19/09/2021
Type of sample		Soil	Soil	Soil	Soil	Soil
Date prepared	-	06/10/2021	06/10/2021	06/10/2021	06/10/2021	06/10/2021
Date analysed	-	06/10/2021	06/10/2021	06/10/2021	06/10/2021	06/10/2021
Arsenic	mg/kg	<4	<4	5	<4	<4
Cadmium	mg/kg	<0.4	<0.4	<0.4	<0.4	<0.4
Chromium	mg/kg	15	17	8	16	15
Copper	mg/kg	35	48	4	8	25
Lead	mg/kg	20	28	10	1,500	24
Mercury	mg/kg	<0.1	<0.1	<0.1	<0.1	0.1
Nickel	mg/kg	13	60	5	2	10
Zinc	mg/kg	69	94	25	7	65
Tin	mg/kg	1	2	<1	12	2

Speciated Phenols in Soil		
Our Reference		279443-1
Your Reference	UNITS	WD1
Depth		0.4-0.5
Date Sampled		19/09/2021
Type of sample		Soil
Date extracted	-	05/10/2021
Date analysed	-	07/10/2021
Phenol	mg/kg	0.2
2-Chlorophenol	mg/kg	<0.2
4-Chloro-3-methylphenol	mg/kg	<1
2-Methylphenol (o-cresol)	mg/kg	<0.2
3/4-Methylphenol (m/p-cresol)	mg/kg	<0.4
2-Nitrophenol	mg/kg	<0.2
2,4 -Dimethylphenol	mg/kg	<0.2
2,4-Dichlorophenol	mg/kg	<0.2
2,6-Dichlorophenol	mg/kg	<0.2
2,4,5-Trichlorophenol	mg/kg	<0.2
2,4,6-Trichlorophenol	mg/kg	<0.2
2,4-Dinitrophenol	mg/kg	<4
4-Nitrophenol	mg/kg	<4
2346-Tetrachlorophenol	mg/kg	<0.2
2-methyl-4,6-Dinitrophenol	mg/kg	<2
Pentachlorophenol	mg/kg	<1
Surrogate 2-fluorophenol	%	89
Surrogate Phenol-d_6	%	79
Surrogate 2,4,6-Tribromophenol	%	62
Surrogate p-Terphenyl-d_{14}	%	108

Moisture					
Our Reference		279443-1	279443-2	279443-3	279443-5
Your Reference	UNITS	WD1	WD1	WD2	WD1
Depth		0.4-0.5	0.9-1.0	0.2-0.3	1.9-2.0
Date Sampled		19/09/2021	19/09/2021	20/09/2021	19/09/2021
Type of sample		Soil	Soil	Soil	Soil
Date prepared	-	05/10/2021	05/10/2021	05/10/2021	05/10/2021
Date analysed	-	06/10/2021	06/10/2021	06/10/2021	06/10/2021
Moisture	%	7.6	7.4	1.6	27

Asbestos ID - soils					
Our Reference		279443-1	279443-2	279443-3	279443-5
Your Reference	UNITS	WD1	WD1	WD2	WD1
Depth		0.4-0.5	0.9-1.0	0.2-0.3	1.9-2.0
Date Sampled		19/09/2021	19/09/2021	20/09/2021	19/09/2021
Type of sample		Soil	Soil	Soil	Soil
Date analysed	-	08/10/2021	08/10/2021	08/10/2021	08/10/2021
Sample mass tested	g	Approx. 30g	Approx. 100g	Approx. 60g	Approx. 30g
Sample Description	-	Grey coarse-grained soil & rocks	Grey coarse-grained soil & rocks	Brown fine-grained soil & rocks	Grey coarse-grained soil & rocks
Asbestos ID in soil	-	No asbestos detected at reporting limit of 0.1g/kg Organic fibres detected	No asbestos detected at reporting limit of 0.1g/kg Organic fibres detected	No asbestos detected at reporting limit of 0.1g/kg Organic fibres detected	No asbestos detected at reporting limit of 0.1g/kg Organic fibres detected
Asbestos comments	-	NO	NO	NO	NO
Trace Analysis	-	No asbestos detected	No asbestos detected	No asbestos detected	No asbestos detected

Tributyl Tin in Soil		
Our Reference		279443-1
Your Reference	UNITS	WD1
Depth		0.4-0.5
Date Sampled		19/09/2021
Type of sample		Soil
Date extracted	-	08/10/2021
Date analysed	-	11/10/2021
Tributyltin as Sn	µg/kg	<0.5
Surrogate Triphenyltin	%	90

sPOCAS field test						
Our Reference		279443-1	279443-2	279443-4	279443-5	279443-6
Your Reference	UNITS	WD1	WD1	WD1	WD1	WD1
Depth		0.4-0.5	0.9-1.0	1.4-1.5	1.9-2.0	4-4.45
Date Sampled		19/09/2021	19/09/2021	19/09/2021	19/09/2021	19/09/2021
Type of sample		Soil	Soil	Soil	Soil	Soil
Date prepared	-	30/09/2021	30/09/2021	30/09/2021	30/09/2021	30/09/2021
Date analysed	-	30/09/2021	30/09/2021	30/09/2021	30/09/2021	30/09/2021
pH_F (field pH test)*	pH Units	6.7	6.9	7.2	6.4	6.0
pH_{FOX} (field peroxide test)*	pH Units	6.4	6.6	6.5	2.8	3.4
Reaction Rate*	-	Medium reaction	High reaction	Low reaction	Low reaction	Low reaction

sPOCAS field test			
Our Reference		279443-7	279443-8
Your Reference	UNITS	WD1	WD1
Depth		5.0	7.0-7.05
Date Sampled		19/09/2021	19/09/2021
Type of sample		Soil	Soil
Date prepared	-	30/09/2021	30/09/2021
Date analysed	-	30/09/2021	30/09/2021
pH_F (field pH test)*	pH Units	5.6	4.2
pH_{FOX} (field peroxide test)*	pH Units	3.7	3.7
Reaction Rate*	-	Low reaction	Low reaction

Chromium Suite			
Our Reference		279443-5	279443-8
Your Reference	UNITS	WD1	WD1
Depth		1.9-2.0	7.0-7.05
Date Sampled		19/09/2021	19/09/2021
Type of sample		Soil	Soil
Date prepared	-	05/10/2021	05/10/2021
Date analysed	-	05/10/2021	05/10/2021
pH $_{kcl}$	pH units	6.1	4.7
s-TAA pH 6.5	%w/w S	<0.01	0.02
TAA pH 6.5	moles H^+ /t	<5	11
Chromium Reducible Sulfur	%w/w	0.07	<0.005
a-Chromium Reducible Sulfur	moles H^+ /t	46	<3
S_{HCl}	%w/w S	[NT]	[NT]
S_{KCl}	%w/w S	[NT]	[NT]
S_{NAS}	%w/w S	[NT]	[NT]
ANC_{BT}	% $CaCO_3$	[NT]	[NT]
s-ANC_{BT}	%w/w S	[NT]	[NT]
s-Net Acidity	%w/w S	0.074	0.022
a-Net Acidity	moles H^+ /t	46	14
Liming rate	kg $CaCO_3$ /t	3	1
a-Net Acidity without ANCE	moles H^+ /t	46	14
Liming rate without ANCE	kg $CaCO_3$ /t	3.5	1.0
s-Net Acidity without ANCE	%w/w S	0.074	0.022

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.
Ext-054	Analysed by MPL Envirolab
Inorg-008	Moisture content determined by heating at 105+/-5 °C for a minimum of 12 hours.
Inorg-063	pH- measured using pH meter and electrode. Soil is oxidised with Hydrogen Peroxide or extracted with water. Based on section H, Acid Sulfate Soils Laboratory Methods Guidelines, Version 2.1 - June 2004. To ensure accurate results these tests are recommended to be done in the field as pH may change with time thus these results may not be representative of true field conditions.
Inorg-068	Chromium Reducible Sulfur - Hydrogen Sulfide is quantified by iodometric titration after distillation to determine potential acidity.
Metals-020	Determination of various metals by ICP-AES.
Metals-021	Determination of Mercury by Cold Vapour AAS.
Org-020	Soil samples are extracted with Dichloromethane/Acetone and waters with Dichloromethane and analysed by GC-FID. F2 = (>C10-C16)-Naphthalene as per NEPM B1 Guideline on Investigation Levels for Soil and Groundwater (HSLs Tables 1A (3, 4)). Note Naphthalene is determined from the VOC analysis.
Org-020	Soil samples are extracted with Dichloromethane/Acetone and waters with Dichloromethane and analysed by GC-FID. F2 = (>C10-C16)-Naphthalene as per NEPM B1 Guideline on Investigation Levels for Soil and Groundwater (HSLs Tables 1A (3, 4)). Note Naphthalene is determined from the VOC analysis. Note, the Total +ve TRH PQL is reflective of the lowest individual PQL and is therefore "Total +ve TRH" is simply a sum of the positive individual TRH fractions (>C10-C40).
Org-021	Soil samples are extracted with dichloromethane/acetone and waters with dichloromethane and analysed by GC-ECD.
Org-021	Soil samples are extracted with dichloromethane/acetone and waters with dichloromethane and analysed by GC-ECD. Note, the Total +ve PCBs PQL is reflective of the lowest individual PQL and is therefore" Total +ve PCBs" is simply a sum of the positive individual PCBs.
Org-022	Determination of VOCs sampled onto coconut shell charcoal sorbent tubes, that can be desorbed using carbon disulphide, and analysed by GC-MS.
Org-022/025	Soil samples are extracted with Dichloromethane/Acetone and waters with Dichloromethane and analysed by GC-MS/GC-MSMS.

Method ID	Methodology Summary
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. 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.

QUALITY CONTROL: TRH in Soil (C6-C9) NEPM						Duplicate			Spike Recovery %	
Test Description	Units	PQL	Method	Blank	#	Base	Dup.	RPD	LCS-2	[NT]
Date extracted	-			05/10/2021	1	05/10/2021	05/10/2021		05/10/2021	[NT]
Date analysed	-			06/10/2021	1	06/10/2021	06/10/2021		06/10/2021	[NT]
TRH C_6 - C_9	mg/kg	25	Org-023	<25	1	<25	<25	0	102	[NT]
TRH C_6 - C_{10}	mg/kg	25	Org-023	<25	1	<25	<25	0	102	[NT]
Surrogate aaa-Trifluorotoluene	%		Org-023	98	1	105	91	14	71	[NT]

QUALITY CONTROL: svTRH (C10-C40) in Soil						Duplicate			Spike Recovery %	
Test Description	Units	PQL	Method	Blank	#	Base	Dup.	RPD	LCS-2	[NT]
Date extracted	-			05/10/2021	1	05/10/2021	05/10/2021		05/10/2021	[NT]
Date analysed	-			06/10/2021	1	06/10/2021	06/10/2021		06/10/2021	[NT]
TRH C_{10} - C_{14}	mg/kg	50	Org-020	<50	1	<50	<50	0	102	[NT]
TRH C_{15} - C_{28}	mg/kg	100	Org-020	<100	1	2100	<100	182	90	[NT]
TRH C_{29} - C_{36}	mg/kg	100	Org-020	<100	1	1900	180	165	106	[NT]
TRH >C_{10} -C_{16}	mg/kg	50	Org-020	<50	1	<50	<50	0	102	[NT]
TRH >C_{16} -C_{34}	mg/kg	100	Org-020	<100	1	4000	170	184	90	[NT]
TRH >C_{34} -C_{40}	mg/kg	100	Org-020	<100	1	<100	410	122	106	[NT]
Surrogate o-Terphenyl	%		Org-020	100	1	112	105	6	93	[NT]

QUALITY CONTROL: PAHs in Soil						Duplicate			Spike Recovery %	
Test Description	Units	PQL	Method	Blank	#	Base	Dup.	RPD	LCS-2	[NT]
Date extracted	-			05/10/2021	1	05/10/2021	05/10/2021		05/10/2021	[NT]
Date analysed	-			07/10/2021	1	07/10/2021	07/10/2021		07/10/2021	[NT]
Naphthalene	mg/kg	0.1	Org-022/025	<0.1	1	<0.1	<0.1	0	109	[NT]
Acenaphthylene	mg/kg	0.1	Org-022/025	<0.1	1	<0.1	<0.1	0	[NT]	[NT]
Acenaphthene	mg/kg	0.1	Org-022/025	<0.1	1	<0.1	<0.1	0	103	[NT]
Fluorene	mg/kg	0.1	Org-022/025	<0.1	1	<0.1	<0.1	0	113	[NT]
Phenanthrene	mg/kg	0.1	Org-022/025	<0.1	1	<0.1	0.3	100	135	[NT]
Anthracene	mg/kg	0.1	Org-022/025	<0.1	1	<0.1	<0.1	0	[NT]	[NT]
Fluoranthene	mg/kg	0.1	Org-022/025	<0.1	1	<0.1	0.4	120	121	[NT]
Pyrene	mg/kg	0.1	Org-022/025	<0.1	1	0.1	0.4	120	117	[NT]
Benzo(a)anthracene	mg/kg	0.1	Org-022/025	<0.1	1	<0.1	0.4	120	[NT]	[NT]
Chrysene	mg/kg	0.1	Org-022/025	<0.1	1	<0.1	0.2	67	91	[NT]
Benzo(b,j+k)fluoranthene	mg/kg	0.2	Org-022/025	<0.2	1	<0.2	0.3	40	[NT]	[NT]
Benzo(a)pyrene	mg/kg	0.05	Org-022/025	<0.05	1	0.07	0.2	96	126	[NT]
Indeno(1,2,3-c,d)pyrene	mg/kg	0.1	Org-022/025	<0.1	1	<0.1	<0.1	0	[NT]	[NT]
Dibenzo(a,h)anthracene	mg/kg	0.1	Org-022/025	<0.1	1	<0.1	<0.1	0	[NT]	[NT]
Benzo(g,h,i)perylene	mg/kg	0.1	Org-022/025	<0.1	1	<0.1	0.1	0	[NT]	[NT]
Surrogate p-Terphenyl-d14	%		Org-022/025	83	1	103	94	9	110	[NT]

QUALITY CONTROL: Organochlorine Pesticides in soil						Duplicate			Spike Recovery %	
Test Description	Units	PQL	Method	Blank	#	Base	Dup.	RPD	LCS-2	[NT]
Date extracted	-			05/10/2021	1	05/10/2021	05/10/2021		05/10/2021	[NT]
Date analysed	-			07/10/2021	1	07/10/2021	07/10/2021		07/10/2021	[NT]
alpha-BHC	mg/kg	0.1	Org-022/025	<0.1	1	<0.1	<0.1	0	106	[NT]
HCB	mg/kg	0.1	Org-022/025	<0.1	1	<0.1	<0.1	0	[NT]	[NT]
beta-BHC	mg/kg	0.1	Org-022/025	<0.1	1	<0.1	<0.1	0	114	[NT]
gamma-BHC	mg/kg	0.1	Org-022/025	<0.1	1	<0.1	<0.1	0	[NT]	[NT]
Heptachlor	mg/kg	0.1	Org-022/025	<0.1	1	<0.1	<0.1	0	85	[NT]
delta-BHC	mg/kg	0.1	Org-022/025	<0.1	1	<0.1	<0.1	0	[NT]	[NT]
Aldrin	mg/kg	0.1	Org-022/025	<0.1	1	<0.1	<0.1	0	120	[NT]
Heptachlor Epoxide	mg/kg	0.1	Org-022/025	<0.1	1	<0.1	<0.1	0	116	[NT]
gamma-Chlordane	mg/kg	0.1	Org-022/025	<0.1	1	<0.1	<0.1	0	[NT]	[NT]
alpha-chlordane	mg/kg	0.1	Org-022/025	<0.1	1	<0.1	<0.1	0	[NT]	[NT]
Endosulfan I	mg/kg	0.1	Org-022/025	<0.1	1	<0.1	<0.1	0	[NT]	[NT]
pp-DDE	mg/kg	0.1	Org-022/025	<0.1	1	<0.1	<0.1	0	119	[NT]
Dieldrin	mg/kg	0.1	Org-022/025	<0.1	1	<0.1	<0.1	0	128	[NT]
Endrin	mg/kg	0.1	Org-022/025	<0.1	1	<0.1	<0.1	0	119	[NT]
Endosulfan II	mg/kg	0.1	Org-022/025	<0.1	1	<0.1	<0.1	0	[NT]	[NT]
pp-DDD	mg/kg	0.1	Org-022/025	<0.1	1	<0.1	<0.1	0	120	[NT]
Endrin Aldehyde	mg/kg	0.1	Org-022/025	<0.1	1	<0.1	<0.1	0	[NT]	[NT]
pp-DDT	mg/kg	0.1	Org-022/025	<0.1	1	<0.1	<0.1	0	[NT]	[NT]
Endosulfan Sulphate	mg/kg	0.1	Org-022/025	<0.1	1	<0.1	<0.1	0	92	[NT]
Methoxychlor	mg/kg	0.1	Org-022/025	<0.1	1	<0.1	<0.1	0	[NT]	[NT]
Surrogate TCMX	%		Org-022/025	84	1	90	87	3	100	[NT]

QUALITY CONTROL: Organophosphorus Pesticides in Soil						Duplicate			Spike Recovery %	
Test Description	Units	PQL	Method	Blank	#	Base	Dup.	RPD	LCS-2	[NT]
Date extracted	-			05/10/2021	1	05/10/2021	05/10/2021		05/10/2021	[NT]
Date analysed	-			07/10/2021	1	07/10/2021	07/10/2021		07/10/2021	[NT]
Dichlorvos	mg/kg	0.1	Org-022/025	<0.1	1	<0.1	<0.1	0	102	[NT]
Dimethoate	mg/kg	0.1	Org-022/025	<0.1	1	<0.1	<0.1	0	[NT]	[NT]
Diazinon	mg/kg	0.1	Org-022/025	<0.1	1	<0.1	<0.1	0	[NT]	[NT]
Chlorpyriphos-methyl	mg/kg	0.1	Org-022/025	<0.1	1	<0.1	<0.1	0	[NT]	[NT]
Ronnel	mg/kg	0.1	Org-022/025	<0.1	1	<0.1	<0.1	0	122	[NT]
Fenitrothion	mg/kg	0.1	Org-022/025	<0.1	1	<0.1	<0.1	0	75	[NT]
Malathion	mg/kg	0.1	Org-022/025	<0.1	1	<0.1	<0.1	0	101	[NT]
Chlorpyriphos	mg/kg	0.1	Org-022/025	<0.1	1	<0.1	<0.1	0	126	[NT]
Parathion	mg/kg	0.1	Org-022/025	<0.1	1	<0.1	<0.1	0	87	[NT]
Bromophos-ethyl	mg/kg	0.1	Org-022	<0.1	1	<0.1	<0.1	0	[NT]	[NT]
Ethion	mg/kg	0.1	Org-022/025	<0.1	1	<0.1	<0.1	0	90	[NT]
Azinphos-methyl (Guthion)	mg/kg	0.1	Org-022/025	<0.1	1	<0.1	<0.1	0	[NT]	[NT]
Surrogate TCMX	%		Org-022/025	84	1	90	87	3	100	[NT]

QUALITY CONTROL: PCBs in Soil						Duplicate			Spike Recovery %	
Test Description	Units	PQL	Method	Blank	#	Base	Dup.	RPD	LCS-2	[NT]
Date extracted	-			05/10/2021	1	05/10/2021	05/10/2021		05/10/2021	[NT]
Date analysed	-			07/10/2021	1	07/10/2021	07/10/2021		07/10/2021	[NT]
Aroclor 1016	mg/kg	0.1	Org-021	<0.1	1	<0.1	<0.1	0	[NT]	[NT]
Aroclor 1221	mg/kg	0.1	Org-021	<0.1	1	<0.1	<0.1	0	[NT]	[NT]
Aroclor 1232	mg/kg	0.1	Org-021	<0.1	1	<0.1	<0.1	0	[NT]	[NT]
Aroclor 1242	mg/kg	0.1	Org-021	<0.1	1	<0.1	<0.1	0	[NT]	[NT]
Aroclor 1248	mg/kg	0.1	Org-021	<0.1	1	<0.1	<0.1	0	[NT]	[NT]
Aroclor 1254	mg/kg	0.1	Org-021	<0.1	1	<0.1	<0.1	0	120	[NT]
Aroclor 1260	mg/kg	0.1	Org-021	<0.1	1	<0.1	<0.1	0	[NT]	[NT]
Surrogate TCMX	%		Org-021	84	1	90	87	3	100	[NT]

QUALITY CONTROL: Acid Extractable metals in soil						Duplicate			Spike Recovery %	
Test Description	Units	PQL	Method	Blank	#	Base	Dup.	RPD	LCS-2	[NT]
Date prepared	-			06/10/2021	1	06/10/2021	06/10/2021		06/10/2021	[NT]
Date analysed	-			06/10/2021	1	06/10/2021	06/10/2021		06/10/2021	[NT]
Arsenic	mg/kg	4	Metals-020	<4	1	<4	<4	0	95	[NT]
Cadmium	mg/kg	0.4	Metals-020	<0.4	1	<0.4	<0.4	0	94	[NT]
Chromium	mg/kg	1	Metals-020	<1	1	15	12	22	102	[NT]
Copper	mg/kg	1	Metals-020	<1	1	35	34	3	96	[NT]
Lead	mg/kg	1	Metals-020	<1	1	20	20	0	98	[NT]
Mercury	mg/kg	0.1	Metals-021	<0.1	1	<0.1	<0.1	0	86	[NT]
Nickel	mg/kg	1	Metals-020	<1	1	13	7	60	98	[NT]
Zinc	mg/kg	1	Metals-020	<1	1	69	51	30	103	[NT]
Tin	mg/kg	1	Metals-020	<1	1	1	2	67	89	[NT]

QUALITY CONTROL: Speciated Phenols in Soil						Duplicate			Spike Recovery %	
Test Description	Units	PQL	Method	Blank	#	Base	Dup.	RPD	LCS-2	279443-1
Date extracted	-			05/10/2021	1	05/10/2021	05/10/2021		05/10/2021	05/10/2021
Date analysed	-			07/10/2021	1	07/10/2021	07/10/2021		07/10/2021	07/10/2021
Phenol	mg/kg	0.2	Org-022/025	<0.2	1	0.2	<0.2	0	119	101
2-Chlorophenol	mg/kg	0.2	Org-022/025	<0.2	1	<0.2	<0.2	0	97	117
4-Chloro-3-methylphenol	mg/kg	1	Org-022/025	<1	1	<1	<1	0	[NT]	[NT]
2-Methylphenol (o-cresol)	mg/kg	0.2	Org-022/025	<0.2	1	<0.2	<0.2	0	66	110
3/4-Methylphenol (m/p-cresol)	mg/kg	0.4	Org-022/025	<0.4	1	<0.4	<0.4	0	[NT]	[NT]
2-Nitrophenol	mg/kg	0.2	Org-022/025	<0.2	1	<0.2	<0.2	0	[NT]	[NT]
2,4 -Dimethylphenol	mg/kg	0.2	Org-022/025	<0.2	1	<0.2	<0.2	0	[NT]	[NT]
2,4-Dichlorophenol	mg/kg	0.2	Org-022/025	<0.2	1	<0.2	<0.2	0	[NT]	[NT]
2,6-Dichlorophenol	mg/kg	0.2	Org-022/025	<0.2	1	<0.2	<0.2	0	118	70
2,4,5-Trichlorophenol	mg/kg	0.2	Org-022/025	<0.2	1	<0.2	<0.2	0	[NT]	[NT]
2,4,6-Trichlorophenol	mg/kg	0.2	Org-022/025	<0.2	1	<0.2	<0.2	0	[NT]	[NT]
2,4-Dinitrophenol	mg/kg	4	Org-022/025	<4	1	<4	<4	0	[NT]	[NT]
4-Nitrophenol	mg/kg	4	Org-022/025	<4	1	<4	<4	0	78	124
2346-Tetrachlorophenol	mg/kg	0.2	Org-022/025	<0.2	1	<0.2	<0.2	0	[NT]	[NT]
2-methyl-4,6-Dinitrophenol	mg/kg	2	Org-022/025	<2	1	<2	<2	0	[NT]	[NT]
Pentachlorophenol	mg/kg	1	Org-022/025	<1	1	<1	<1	0	65	118
Surrogate 2-fluorophenol	%		Org-022/025	94	1	89	85	5	88	101
Surrogate Phenol-d_6	%		Org-022/025	63	1	79	81	2	86	99
Surrogate 2,4,6-Tribromophenol	%		Org-022/025	68	1	62	115	60	86	99
Surrogate p-Terphenyl-d_{14}	%		Org-022/025	95	1	108	105	3	107	107

QUALITY CONTROL: Tributyl Tin in Soil						Duplicate			Spike Recovery %	
Test Description	Units	PQL	Method	Blank	#	Base	Dup.	RPD	LCS-2	279443-1
Date extracted	-			08/10/2021	1	08/10/2021	08/10/2021		08/10/2021	08/10/2021
Date analysed	-			11/10/2021	1	11/10/2021	11/10/2021		11/10/2021	11/10/2021
Tributyltin as Sn	µg/kg	0.5	Ext-054	<0.5	1	<0.5	<0.5	0	94	93
Surrogate Triphenyltin	%		Ext-054	97	1	90	97	7	94	96

QUALITY CONTROL: sPOCAS field test						Duplicate			Spike Recovery %	
Test Description	Units	PQL	Method	Blank	#	Base	Dup.	RPD	LCS-2	[NT]
Date prepared	-			30/09/2021	1	30/09/2021	30/09/2021		30/09/2021	[NT]
Date analysed	-			30/09/2021	1	30/09/2021	30/09/2021		30/09/2021	[NT]
pH_F (field pH test)*	pH Units		Inorg-063	[NT]	1	6.7	6.6	2	100	[NT]
pH_{FOX} (field peroxide test)*	pH Units		Inorg-063	[NT]	1	6.4	6.4	0	99	[NT]

QUALITY CONTROL: Chromium Suite						Duplicate			Spike Recovery %	
Test Description	Units	PQL	Method	Blank	#	Base	Dup.	RPD	LCS-2	[NT]
Date prepared	-			05/10/2021	[NT]	[NT]	[NT]	[NT]	05/10/2021	[NT]
Date analysed	-			05/10/2021	[NT]	[NT]	[NT]	[NT]	05/10/2021	[NT]
pH $_{kcl}$	pH units		Inorg-068	[NT]	[NT]	[NT]	[NT]	[NT]	97	[NT]
s-TAA pH 6.5	%w/w S	0.01	Inorg-068	<0.01	[NT]	[NT]	[NT]	[NT]	[NT]	[NT]
TAA pH 6.5	moles H^+ /t	5	Inorg-068	<5	[NT]	[NT]	[NT]	[NT]	98	[NT]
Chromium Reducible Sulfur	%w/w	0.005	Inorg-068	<0.005	[NT]	[NT]	[NT]	[NT]	[NT]	[NT]
a-Chromium Reducible Sulfur	moles H^+ /t	3	Inorg-068	<3	[NT]	[NT]	[NT]	[NT]	109	[NT]
S_{HCl}	%w/w S	0.005	Inorg-068	<0.005	[NT]	[NT]	[NT]	[NT]	[NT]	[NT]
S_{KCl}	%w/w S	0.005	Inorg-068	<0.005	[NT]	[NT]	[NT]	[NT]	[NT]	[NT]
S_{NAS}	%w/w S	0.005	Inorg-068	<0.005	[NT]	[NT]	[NT]	[NT]	[NT]	[NT]
ANC_{BT}	% $CaCO_3$	0.05	Inorg-068	<0.05	[NT]	[NT]	[NT]	[NT]	[NT]	[NT]
s-ANC_{BT}	%w/w S	0.05	Inorg-068	<0.05	[NT]	[NT]	[NT]	[NT]	[NT]	[NT]
s-Net Acidity	%w/w S	0.005	Inorg-068	<0.005	[NT]	[NT]	[NT]	[NT]	[NT]	[NT]
a-Net Acidity	moles H^+ /t	5	Inorg-068	<5	[NT]	[NT]	[NT]	[NT]	[NT]	[NT]
Liming rate	kg $CaCO_3$ /t	0.75	Inorg-068	<0.75	[NT]	[NT]	[NT]	[NT]	[NT]	[NT]
a-Net Acidity without ANCE	moles H^+ /t	5	Inorg-068	<5	[NT]	[NT]	[NT]	[NT]	[NT]	[NT]
Liming rate without ANCE	kg $CaCO_3$ /t	0.75	Inorg-068	<0.75	[NT]	[NT]	[NT]	[NT]	[NT]	[NT]
s-Net Acidity without ANCE	%w/w S	0.005	Inorg-068	<0.005	[NT]	[NT]	[NT]	[NT]	[NT]	[NT]

Result Definitions

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NA	Test not required
INS	Insufficient sample for this test
PQL	Practical Quantitation Limit
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RPD	Relative Percent Difference
LCS	Laboratory Control Sample
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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

Acid Extractable Metals in Soil: The laboratory RPD acceptance criteria has been exceeded for 279443-1 for Ni. Therefore a triplicate result has been issued as laboratory sample number 279443-9.

TRH_S_NEPM:The RPD for duplicate results is accepted due to the non homogenous nature of sample/s 279443-1,1d.

Tributyltin as Sn analysed by MPL Laboratories. Report No. 270154

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12 Ashley St Chatswood NSW 2067
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customerservice@envirolab.com.au
www.envirolab.com.au

CERTIFICATE OF ANALYSIS 279443-A

Client Details

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

Sample Details

Your Reference	**202546.00, Cockle Bay**
Number of Samples	additional analysis
Date samples received	29/09/2021
Date completed instructions received	11/10/2021

Analysis Details

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

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

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

Report Details

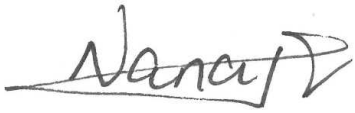
Date results requested by	14/10/2021
Date of Issue	14/10/2021

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Results Approved By
Hannah Nguyen, Metals Supervisor

Authorised By



Nancy Zhang, Laboratory Manager

Metals from Leaching Fluid pH 2.9 or 5		
Our Reference		279443-A-5
Your Reference	UNITS	WD1
Depth		1.9-2.0
Date Sampled		19/09/2021
Type of sample		Soil
Date extracted	-	14/10/2021
Date analysed	-	14/10/2021
pH of soil for fluid# determ.	pH units	8.0
pH of soil TCLP (after HCl)	pH units	2.1
Extraction fluid used	-	1
pH of final Leachate	pH units	5.0
Lead	mg/L	0.05

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

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	-			14/10/2021	[NT]	[NT]	[NT]	[NT]	14/10/2021	[NT]
Date analysed	-			14/10/2021	[NT]	[NT]	[NT]	[NT]	14/10/2021	[NT]
Lead	mg/L	0.03	Metals-020	<0.03	[NT]	[NT]	[NT]	[NT]	98	[NT]

Result Definitions

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<	Less than
>	Greater than
RPD	Relative Percent Difference
LCS	Laboratory Control Sample
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Quality Control Definitions

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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.
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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 279443 202546.00, Cockle Bay

Ref: 279443-A
TAT: Standard
Due: 18/10/2021
MT.

279443-A

From: Kurt Plambeck <kurt.plambeck@douglaspartners.com.au>
Sent: Monday, 11 October 2021 2:21 PM
To: Greta Petzold <GPetzold@envirolab.com.au>
Subject: RE: Results for Registration 279443 202546.00, Cockle Bay

CAUTION: This email originated from outside of the organisation. Do not act on instructions, click links or open attachments unless you recognise the sender and know the content is authentic and safe.

Greta,

Can you please run sample WD1/1.9-2.0 (5) for TCLP on lead

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

If you are not the intended recipient of this email, please notify us immediately and be aware that any disclosure, copying, distribution or use of the contents of this information is prohibited.

From: Greta Petzold <GPetzold@envirolab.com.au>
Sent: Friday, 8 October 2021 6:06 PM
To: Rhys McMillan <Rhys.McMillan@douglaspartners.com.au>; Kurt Plambeck <kurt.plambeck@douglaspartners.com.au>
Subject: Results for Registration 279443 202546.00, Cockle Bay

Hi Rhys,

Please find a prelim report attached. TBT results will be ready early next week. I will send a final report as soon as we receive these.

Have a great weekend

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

Envirolab Services Pty Ltd
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12 Ashley St Chatswood NSW 2067
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customerservice@envirolab.com.au
www.envirolab.com.au

CERTIFICATE OF ANALYSIS 279443-B

Client Details

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

Sample Details

Your Reference	**202546.00, Cockle Bay**
Number of Samples	additional analysis
Date samples received	29/09/2021
Date completed instructions received	12/10/2021

Analysis Details

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

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

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

Report Details

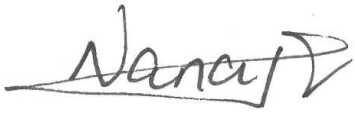
Date results requested by	14/10/2021
Date of Issue	14/10/2021

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Results Approved By
Hannah Nguyen, Metals Supervisor

Authorised By



Nancy Zhang, Laboratory Manager

Metals from Leaching Fluid pH 2.9 or 5		
Our Reference		279443-B-2
Your Reference	UNITS	WD1
Depth		0.9-1.0
Date Sampled		19/09/2021
Type of sample		Soil
Date extracted	-	14/10/2021
Date analysed	-	14/10/2021
pH of soil for fluid# determ.	pH units	7.6
pH of soil TCLP (after HCl)	pH units	2.0
Extraction fluid used	-	1
pH of final Leachate	pH units	5.2
Nickel	mg/L	0.03

Method ID	Methodology Summary
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Test Description	Units	PQL	Method	Blank	#	Base	Dup.	RPD	LCS-W1	[NT]
Date extracted	-			14/10/2021	[NT]	[NT]	[NT]	[NT]	14/10/2021	[NT]
Date analysed	-			14/10/2021	[NT]	[NT]	[NT]	[NT]	14/10/2021	[NT]
Nickel	mg/L	0.02	Metals-020	<0.02	[NT]	[NT]	[NT]	[NT]	99	[NT]

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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 279443 202546.00, Cockle Bay

Ref: 279443-B.
TAT: 3 days.
Due: 15/10/2021
MT

279443-B

From: Kurt Plambeck <kurt.plambeck@douglaspartners.com.au>
Sent: Tuesday, 12 October 2021 5:00 PM
To: Greta Petzold <GPetzold@envirolab.com.au>
Subject: RE: Results for Registration 279443 202546.00, Cockle Bay

CAUTION: This email originated from outside of the organisation. Do not act on instructions, click links or open attachments unless you recognise the sender and know the content is authentic and safe.

Greta,

(2)
Can you also run WD1/0.9-1.0 for nickel on 3 day turnaround

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

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From: Kurt Plambeck
Sent: Monday, 11 October 2021 2:21 PM
To: Greta Petzold <GPetzold@envirolab.com.au>
Subject: RE: Results for Registration 279443 202546.00, Cockle Bay

Greta, (279443-A)

Can you please run sample WD1/1.9-2.0 for TCLP on lead

Kurt Plambeck | Senior Associate/Environmental Scientist
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CERTIFICATE OF ANALYSIS 278105

Client Details

Client	Douglas Partners Pty Ltd
Attention	Rhys McMillan
Address	96 Hermitage Rd, West Ryde, NSW, 2114

Sample Details

Your Reference	**202546.00, Cockle Bay**
Number of Samples	10 Soil
Date samples received	15/09/2021
Date completed instructions received	16/09/2021

Analysis Details

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

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

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

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

Report Details

Date results requested by	23/09/2021
Date of Issue	23/09/2021

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Asbestos Approved By
Analysed by Asbestos Approved Analyst: Panika Wongchanda
Authorised by Asbestos Approved Signatory: Matt Mansfield

Results Approved By
Dragana Tomas, Senior Chemist
Hannah Nguyen, Metals Supervisor
Matt Mansfield, QHSE manager
Nancy Zhang, Laboratory Manager, Sydney
Priya Samarawickrama, Senior Chemist
Steven Luong, Organics Supervisor

Authorised By



Nancy Zhang, Laboratory Manager

VOCs in soil		
Our Reference		278105-2
Your Reference	UNITS	WD3
Depth		0.5-0.6
Date Sampled		11/09/2021
Type of sample		Soil
Date extracted	-	16/09/2021
Date analysed	-	16/09/2021
Dichlorodifluoromethane	mg/kg	<1
Chloromethane	mg/kg	<1
Vinyl Chloride	mg/kg	<1
Bromomethane	mg/kg	<1
Chloroethane	mg/kg	<1
Trichlorofluoromethane	mg/kg	<1
1,1-Dichloroethene	mg/kg	<1
trans-1,2-dichloroethene	mg/kg	<1
1,1-dichloroethane	mg/kg	<1
cis-1,2-dichloroethene	mg/kg	<1
bromochloromethane	mg/kg	<1
chloroform	mg/kg	<1
2,2-dichloropropane	mg/kg	<1
1,2-dichloroethane	mg/kg	<1
1,1,1-trichloroethane	mg/kg	<1
1,1-dichloropropene	mg/kg	<1
Cyclohexane	mg/kg	<1
carbon tetrachloride	mg/kg	<1
Benzene	mg/kg	<0.2
dibromomethane	mg/kg	<1
1,2-dichloropropane	mg/kg	<1
trichloroethene	mg/kg	<1
bromodichloromethane	mg/kg	<1
trans-1,3-dichloropropene	mg/kg	<1
cis-1,3-dichloropropene	mg/kg	<1
1,1,2-trichloroethane	mg/kg	<1
Toluene	mg/kg	<0.5
1,3-dichloropropane	mg/kg	<1
dibromochloromethane	mg/kg	<1
1,2-dibromoethane	mg/kg	<1
tetrachloroethene	mg/kg	<1
1,1,1,2-tetrachloroethane	mg/kg	<1
chlorobenzene	mg/kg	<1

VOCs in soil		
Our Reference		278105-2
Your Reference	UNITS	WD3
Depth		0.5-0.6
Date Sampled		11/09/2021
Type of sample		Soil
Ethylbenzene	mg/kg	<1
bromoform	mg/kg	<1
m+p-xylene	mg/kg	<2
styrene	mg/kg	<1
1,1,2,2-tetrachloroethane	mg/kg	<1
o-Xylene	mg/kg	<1
1,2,3-trichloropropane	mg/kg	<1
isopropylbenzene	mg/kg	<1
bromobenzene	mg/kg	<1
n-propyl benzene	mg/kg	<1
2-chlorotoluene	mg/kg	<1
4-chlorotoluene	mg/kg	<1
1,3,5-trimethyl benzene	mg/kg	<1
tert-butyl benzene	mg/kg	<1
1,2,4-trimethyl benzene	mg/kg	<1
1,3-dichlorobenzene	mg/kg	<1
sec-butyl benzene	mg/kg	<1
1,4-dichlorobenzene	mg/kg	<1
4-isopropyl toluene	mg/kg	<1
1,2-dichlorobenzene	mg/kg	<1
n-butyl benzene	mg/kg	<1
1,2-dibromo-3-chloropropane	mg/kg	<1
1,2,4-trichlorobenzene	mg/kg	<1
hexachlorobutadiene	mg/kg	<1
1,2,3-trichlorobenzene	mg/kg	<1
Surrogate Dibromofluorometha	%	103
Surrogate aaa-Trifluorotoluene	%	98
Surrogate Toluene-d_8	%	99
Surrogate 4-Bromofluorobenzene	%	119

TRH in Soil (C6-C9) NEPM		
Our Reference		278105-2
Your Reference	UNITS	WD3
Depth		0.5-0.6
Date Sampled		11/09/2021
Type of sample		Soil
Date extracted	-	16/09/2021
Date analysed	-	16/09/2021
TRH C_6 - C_9	mg/kg	<25
TRH C_6 - C_{10}	mg/kg	<25
Surrogate aaa-Trifluorotoluene	%	98

svTRH (C10-C40) in Soil		
Our Reference		278105-2
Your Reference	UNITS	WD3
Depth		0.5-0.6
Date Sampled		11/09/2021
Type of sample		Soil
Date extracted	-	16/09/2021
Date analysed	-	16/09/2021
TRH C_{10} - C_{14}	mg/kg	<50
TRH C_{15} - C_{28}	mg/kg	<100
TRH C_{29} - C_{36}	mg/kg	<100
Total +ve TRH (C10-C36)	mg/kg	<50
TRH >C_{10} -C_{16}	mg/kg	<50
TRH >C_{10} - C_{16} less Naphthalene (F2)	mg/kg	<50
TRH >C_{16} -C_{34}	mg/kg	<100
TRH >C_{34} -C_{40}	mg/kg	<100
Total +ve TRH (>C10-C40)	mg/kg	<50
Surrogate o-Terphenyl	%	74

PAHs in Soil				
Our Reference		278105-2	278105-7	278105-10
Your Reference	UNITS	WD3	WD3	BD03/210911
Depth		0.5-0.6	4-4.45	-
Date Sampled		11/09/2021	11/09/2021	11/09/2021
Type of sample		Soil	Soil	Soil
Date extracted	-	16/09/2021	16/09/2021	16/09/2021
Date analysed	-	17/09/2021	17/09/2021	17/09/2021
Naphthalene	mg/kg	<0.1	<0.1	<0.1
Acenaphthylene	mg/kg	<0.1	<0.1	0.1
Acenaphthene	mg/kg	<0.1	<0.1	<0.1
Fluorene	mg/kg	<0.1	<0.1	0.1
Phenanthrene	mg/kg	0.2	0.2	2.5
Anthracene	mg/kg	<0.1	0.1	1
Fluoranthene	mg/kg	0.7	0.3	3.0
Pyrene	mg/kg	0.6	0.3	2.6
Benzo(a)anthracene	mg/kg	0.4	0.3	1.6
Chrysene	mg/kg	0.4	0.2	1.1
Benzo(b,j+k)fluoranthene	mg/kg	0.7	0.6	4.0
Benzo(a)pyrene	mg/kg	0.5	0.2	1.3
Indeno(1,2,3-c,d)pyrene	mg/kg	0.2	0.2	1.2
Dibenzo(a,h)anthracene	mg/kg	<0.1	<0.1	0.2
Benzo(g,h,i)perylene	mg/kg	0.3	0.1	0.8
Total +ve PAH's	mg/kg	3.9	2.6	19
Benzo(a)pyrene TEQ calc (zero)	mg/kg	0.6	<0.5	2.1
Benzo(a)pyrene TEQ calc(half)	mg/kg	0.6	<0.5	2.1
Benzo(a)pyrene TEQ calc(PQL)	mg/kg	0.7	<0.5	2.1
Surrogate p-Terphenyl-d14	%	107	99	102

Acid Extractable metals in soil				
Our Reference		278105-2	278105-7	278105-10
Your Reference	UNITS	WD3	WD3	BD03/210911
Depth		0.5-0.6	4-4.45	-
Date Sampled		11/09/2021	11/09/2021	11/09/2021
Type of sample		Soil	Soil	Soil
Date prepared	-	17/09/2021	17/09/2021	17/09/2021
Date analysed	-	17/09/2021	17/09/2021	17/09/2021
Arsenic	mg/kg	5	<4	<4
Cadmium	mg/kg	<0.4	<0.4	<0.4
Chromium	mg/kg	37	37	76
Copper	mg/kg	38	30	22
Lead	mg/kg	79	53	44
Mercury	mg/kg	0.2	<0.1	<0.1
Nickel	mg/kg	34	9	7
Zinc	mg/kg	88	80	47
Tin	mg/kg	6	4	4

Misc Soil - Inorg		
Our Reference		278105-2
Your Reference	UNITS	WD3
Depth		0.5-0.6
Date Sampled		11/09/2021
Type of sample		Soil
Date prepared	-	20/09/2021
Date analysed	-	20/09/2021
Total Phenolics (as Phenol)	mg/kg	<5

Speciated Phenols in Soil		
Our Reference		278105-2
Your Reference	UNITS	WD3
Depth		0.5-0.6
Date Sampled		11/09/2021
Type of sample		Soil
Date extracted	-	16/09/2021
Date analysed	-	22/09/2021
Phenol	mg/kg	<0.2
2-Chlorophenol	mg/kg	<0.2
4-Chloro-3-methylphenol	mg/kg	<1
2-Methylphenol (o-cresol)	mg/kg	<0.2
3/4-Methylphenol (m/p-cresol)	mg/kg	<0.4
2-Nitrophenol	mg/kg	<0.2
2,4 -Dimethylphenol	mg/kg	<0.2
2,4-Dichlorophenol	mg/kg	<0.2
2,6-Dichlorophenol	mg/kg	<0.2
2,4,5-Trichlorophenol	mg/kg	<0.2
2,4,6-Trichlorophenol	mg/kg	<0.2
2,4-Dinitrophenol	mg/kg	<4
4-Nitrophenol	mg/kg	<4
2346-Tetrachlorophenol	mg/kg	<0.2
2-methyl-4,6-Dinitrophenol	mg/kg	<2
Pentachlorophenol	mg/kg	<1
Surrogate 2-fluorophenol	%	107
Surrogate Phenol-d_6	%	120
Surrogate 2,4,6-Tribromophenol	%	98
Surrogate p-Terphenyl-d_{14}	%	115

Moisture				
Our Reference		278105-2	278105-7	278105-10
Your Reference	UNITS	WD3	WD3	BD03/210911
Depth		0.5-0.6	4-4.45	-
Date Sampled		11/09/2021	11/09/2021	11/09/2021
Type of sample		Soil	Soil	Soil
Date prepared	-	16/09/2021	17/09/2021	17/09/2021
Date analysed	-	17/09/2021	20/09/2021	20/09/2021
Moisture	%	19	6.6	5.2

Asbestos ID - soils				
Our Reference		278105-2	278105-7	278105-10
Your Reference	UNITS	WD3	WD3	BD03/210911
Depth		0.5-0.6	4-4.45	-
Date Sampled		11/09/2021	11/09/2021	11/09/2021
Type of sample		Soil	Soil	Soil
Date analysed	-	23/09/2021	23/09/2021	23/09/2021
Sample mass tested	g	Approx. 15g	Approx. 50g	Approx. 50g
Sample Description	-	Brown coarse-grained soil & rocks	Brown coarse-grained soil & rocks	Brown coarse-grained soil & rocks
Asbestos ID in soil	-	No asbestos detected at reporting limit of 0.1g/kg Organic fibres detected	No asbestos detected at reporting limit of 0.1g/kg Organic fibres detected	No asbestos detected at reporting limit of 0.1g/kg Organic fibres detected
Asbestos comments	-	NO	NO	NO
Trace Analysis	-	No asbestos detected	No asbestos detected	No asbestos detected

Misc Inorg - Soil			
Our Reference		278105-2	278105-7
Your Reference	UNITS	WD3	WD3
Depth		0.5-0.6	4-4.45
Date Sampled		11/09/2021	11/09/2021
Type of sample		Soil	Soil
Date prepared	-	21/09/2021	21/09/2021
Date analysed	-	21/09/2021	21/09/2021
pH 1:5 soil:water	pH Units	7.6	8.2

Tributyl Tin in Soil		
Our Reference		278105-2
Your Reference	UNITS	WD3
Depth		0.5-0.6
Date Sampled		11/09/2021
Type of sample		Soil
Date extracted	-	22/09/2021
Date analysed	-	22/09/2021
Tributyltin as Sn	µg/kg	<1.0
Surrogate Triphenyltin	%	97

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.
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.
Metals-020	Determination of various metals by ICP-AES.
Metals-021	Determination of Mercury by Cold Vapour AAS.
Org-020	Soil samples are extracted with Dichloromethane/Acetone and waters with Dichloromethane and analysed by GC-FID. F2 = (>C10-C16)-Naphthalene as per NEPM B1 Guideline on Investigation Levels for Soil and Groundwater (HSLs Tables 1A (3, 4)). Note Naphthalene is determined from the VOC analysis.
Org-020	Soil samples are extracted with Dichloromethane/Acetone and waters with Dichloromethane and analysed by GC-FID. F2 = (>C10-C16)-Naphthalene as per NEPM B1 Guideline on Investigation Levels for Soil and Groundwater (HSLs Tables 1A (3, 4)). Note Naphthalene is determined from the VOC analysis. Note, the Total +ve TRH PQL is reflective of the lowest individual PQL and is therefore "Total +ve TRH" is simply a sum of the positive individual TRH fractions (>C10-C40).
Org-022/025	Soil samples are extracted with Dichloromethane/Acetone and waters with Dichloromethane and analysed by GC-MS/GC-MSMS.

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

QUALITY CONTROL: VOCs in soil					Duplicate				Spike Recovery %	
Test Description	Units	PQL	Method	Blank	#	Base	Dup.	RPD	LCS-10	[NT]
Date extracted	-			16/09/2021	[NT]	[NT]	[NT]	[NT]	16/09/2021	[NT]
Date analysed	-			16/09/2021	[NT]	[NT]	[NT]	[NT]	16/09/2021	[NT]
Dichlorodifluoromethane	mg/kg	1	Org-023	<1	[NT]	[NT]	[NT]	[NT]	[NT]	[NT]
Chloromethane	mg/kg	1	Org-023	<1	[NT]	[NT]	[NT]	[NT]	[NT]	[NT]
Vinyl Chloride	mg/kg	1	Org-023	<1	[NT]	[NT]	[NT]	[NT]	[NT]	[NT]
Bromomethane	mg/kg	1	Org-023	<1	[NT]	[NT]	[NT]	[NT]	[NT]	[NT]
Chloroethane	mg/kg	1	Org-023	<1	[NT]	[NT]	[NT]	[NT]	[NT]	[NT]
Trichlorofluoromethane	mg/kg	1	Org-023	<1	[NT]	[NT]	[NT]	[NT]	[NT]	[NT]
1,1-Dichloroethene	mg/kg	1	Org-023	<1	[NT]	[NT]	[NT]	[NT]	[NT]	[NT]
trans-1,2-dichloroethene	mg/kg	1	Org-023	<1	[NT]	[NT]	[NT]	[NT]	[NT]	[NT]
1,1-dichloroethane	mg/kg	1	Org-023	<1	[NT]	[NT]	[NT]	[NT]	98	[NT]
cis-1,2-dichloroethene	mg/kg	1	Org-023	<1	[NT]	[NT]	[NT]	[NT]	[NT]	[NT]
bromochloromethane	mg/kg	1	Org-023	<1	[NT]	[NT]	[NT]	[NT]	[NT]	[NT]
chloroform	mg/kg	1	Org-023	<1	[NT]	[NT]	[NT]	[NT]	88	[NT]
2,2-dichloropropane	mg/kg	1	Org-023	<1	[NT]	[NT]	[NT]	[NT]	[NT]	[NT]
1,2-dichloroethane	mg/kg	1	Org-023	<1	[NT]	[NT]	[NT]	[NT]	77	[NT]
1,1,1-trichloroethane	mg/kg	1	Org-023	<1	[NT]	[NT]	[NT]	[NT]	83	[NT]
1,1-dichloropropene	mg/kg	1	Org-023	<1	[NT]	[NT]	[NT]	[NT]	[NT]	[NT]
Cyclohexane	mg/kg	1	Org-023	<1	[NT]	[NT]	[NT]	[NT]	[NT]	[NT]
carbon tetrachloride	mg/kg	1	Org-023	<1	[NT]	[NT]	[NT]	[NT]	[NT]	[NT]
Benzene	mg/kg	0.2	Org-023	<0.2	[NT]	[NT]	[NT]	[NT]	[NT]	[NT]
dibromomethane	mg/kg	1	Org-023	<1	[NT]	[NT]	[NT]	[NT]	[NT]	[NT]
1,2-dichloropropane	mg/kg	1	Org-023	<1	[NT]	[NT]	[NT]	[NT]	[NT]	[NT]
trichloroethene	mg/kg	1	Org-023	<1	[NT]	[NT]	[NT]	[NT]	80	[NT]
bromodichloromethane	mg/kg	1	Org-023	<1	[NT]	[NT]	[NT]	[NT]	81	[NT]
trans-1,3-dichloropropene	mg/kg	1	Org-023	<1	[NT]	[NT]	[NT]	[NT]	[NT]	[NT]
cis-1,3-dichloropropene	mg/kg	1	Org-023	<1	[NT]	[NT]	[NT]	[NT]	[NT]	[NT]
1,1,2-trichloroethane	mg/kg	1	Org-023	<1	[NT]	[NT]	[NT]	[NT]	[NT]	[NT]
Toluene	mg/kg	0.5	Org-023	<0.5	[NT]	[NT]	[NT]	[NT]	[NT]	[NT]
1,3-dichloropropane	mg/kg	1	Org-023	<1	[NT]	[NT]	[NT]	[NT]	[NT]	[NT]
dibromochloromethane	mg/kg	1	Org-023	<1	[NT]	[NT]	[NT]	[NT]	80	[NT]
1,2-dibromoethane	mg/kg	1	Org-023	<1	[NT]	[NT]	[NT]	[NT]	[NT]	[NT]
tetrachloroethene	mg/kg	1	Org-023	<1	[NT]	[NT]	[NT]	[NT]	87	[NT]
1,1,1,2-tetrachloroethane	mg/kg	1	Org-023	<1	[NT]	[NT]	[NT]	[NT]	[NT]	[NT]
chlorobenzene	mg/kg	1	Org-023	<1	[NT]	[NT]	[NT]	[NT]	[NT]	[NT]
Ethylbenzene	mg/kg	1	Org-023	<1	[NT]	[NT]	[NT]	[NT]	[NT]	[NT]
bromoform	mg/kg	1	Org-023	<1	[NT]	[NT]	[NT]	[NT]	[NT]	[NT]
m+p-xylene	mg/kg	2	Org-023	<2	[NT]	[NT]	[NT]	[NT]	[NT]	[NT]
styrene	mg/kg	1	Org-023	<1	[NT]	[NT]	[NT]	[NT]	[NT]	[NT]
1,1,2,2-tetrachloroethane	mg/kg	1	Org-023	<1	[NT]	[NT]	[NT]	[NT]	[NT]	[NT]

QUALITY CONTROL: VOCs in soil					Duplicate				Spike Recovery %	
Test Description	Units	PQL	Method	Blank	#	Base	Dup.	RPD	LCS-10	[NT]
o-Xylene	mg/kg	1	Org-023	<1	[NT]	[NT]	[NT]	[NT]	[NT]	[NT]
1,2,3-trichloropropane	mg/kg	1	Org-023	<1	[NT]	[NT]	[NT]	[NT]	[NT]	[NT]
isopropylbenzene	mg/kg	1	Org-023	<1	[NT]	[NT]	[NT]	[NT]	[NT]	[NT]
bromobenzene	mg/kg	1	Org-023	<1	[NT]	[NT]	[NT]	[NT]	[NT]	[NT]
n-propyl benzene	mg/kg	1	Org-023	<1	[NT]	[NT]	[NT]	[NT]	[NT]	[NT]
2-chlorotoluene	mg/kg	1	Org-023	<1	[NT]	[NT]	[NT]	[NT]	[NT]	[NT]
4-chlorotoluene	mg/kg	1	Org-023	<1	[NT]	[NT]	[NT]	[NT]	[NT]	[NT]
1,3,5-trimethyl benzene	mg/kg	1	Org-023	<1	[NT]	[NT]	[NT]	[NT]	[NT]	[NT]
tert-butyl benzene	mg/kg	1	Org-023	<1	[NT]	[NT]	[NT]	[NT]	[NT]	[NT]
1,2,4-trimethyl benzene	mg/kg	1	Org-023	<1	[NT]	[NT]	[NT]	[NT]	[NT]	[NT]
1,3-dichlorobenzene	mg/kg	1	Org-023	<1	[NT]	[NT]	[NT]	[NT]	[NT]	[NT]
sec-butyl benzene	mg/kg	1	Org-023	<1	[NT]	[NT]	[NT]	[NT]	[NT]	[NT]
1,4-dichlorobenzene	mg/kg	1	Org-023	<1	[NT]	[NT]	[NT]	[NT]	[NT]	[NT]
4-isopropyl toluene	mg/kg	1	Org-023	<1	[NT]	[NT]	[NT]	[NT]	[NT]	[NT]
1,2-dichlorobenzene	mg/kg	1	Org-023	<1	[NT]	[NT]	[NT]	[NT]	[NT]	[NT]
n-butyl benzene	mg/kg	1	Org-023	<1	[NT]	[NT]	[NT]	[NT]	[NT]	[NT]
1,2-dibromo-3-chloropropane	mg/kg	1	Org-023	<1	[NT]	[NT]	[NT]	[NT]	[NT]	[NT]
1,2,4-trichlorobenzene	mg/kg	1	Org-023	<1	[NT]	[NT]	[NT]	[NT]	[NT]	[NT]
hexachlorobutadiene	mg/kg	1	Org-023	<1	[NT]	[NT]	[NT]	[NT]	[NT]	[NT]
1,2,3-trichlorobenzene	mg/kg	1	Org-023	<1	[NT]	[NT]	[NT]	[NT]	[NT]	[NT]
Surrogate Dibromofluorometha	%		Org-023	104	[NT]	[NT]	[NT]	[NT]	104	[NT]
Surrogate aaa-Trifluorotoluene	%		Org-023	98	[NT]	[NT]	[NT]	[NT]	90	[NT]
Surrogate Toluene-d_8	%		Org-023	99	[NT]	[NT]	[NT]	[NT]	102	[NT]
Surrogate 4-Bromofluorobenzene	%		Org-023	118	[NT]	[NT]	[NT]	[NT]	117	[NT]

QUALITY CONTROL: TRH in Soil (C6-C9) NEPM						Duplicate			Spike Recovery %	
Test Description	Units	PQL	Method	Blank	#	Base	Dup.	RPD	LCS-10	[NT]
Date extracted	-			16/09/2021	[NT]	[NT]	[NT]	[NT]	16/09/2021	[NT]
Date analysed	-			16/09/2021	[NT]	[NT]	[NT]	[NT]	16/09/2021	[NT]
TRH C_6 - C_9	mg/kg	25	Org-023	<25	[NT]	[NT]	[NT]	[NT]	91	[NT]
TRH C_6 - C_{10}	mg/kg	25	Org-023	<25	[NT]	[NT]	[NT]	[NT]	91	[NT]
Surrogate aaa-Trifluorotoluene	%		Org-023	98	[NT]	[NT]	[NT]	[NT]	90	[NT]

QUALITY CONTROL: svTRH (C10-C40) in Soil						Duplicate			Spike Recovery %	
Test Description	Units	PQL	Method	Blank	#	Base	Dup.	RPD	LCS-11	[NT]
Date extracted	-			16/09/2021	[NT]	[NT]	[NT]	[NT]	16/09/2021	[NT]
Date analysed	-			16/09/2021	[NT]	[NT]	[NT]	[NT]	16/09/2021	[NT]
TRH C_{10} - C_{14}	mg/kg	50	Org-020	<50	[NT]	[NT]	[NT]	[NT]	86	[NT]
TRH C_{15} - C_{28}	mg/kg	100	Org-020	<100	[NT]	[NT]	[NT]	[NT]	82	[NT]
TRH C_{29} - C_{36}	mg/kg	100	Org-020	<100	[NT]	[NT]	[NT]	[NT]	89	[NT]
TRH >C_{10} -C_{16}	mg/kg	50	Org-020	<50	[NT]	[NT]	[NT]	[NT]	86	[NT]
TRH >C_{16} -C_{34}	mg/kg	100	Org-020	<100	[NT]	[NT]	[NT]	[NT]	82	[NT]
TRH >C_{34} -C_{40}	mg/kg	100	Org-020	<100	[NT]	[NT]	[NT]	[NT]	89	[NT]
Surrogate o-Terphenyl	%		Org-020	79	[NT]	[NT]	[NT]	[NT]	118	[NT]

QUALITY CONTROL: PAHs in Soil						Duplicate			Spike Recovery %	
Test Description	Units	PQL	Method	Blank	#	Base	Dup.	RPD	LCS-11	[NT]
Date extracted	-			16/09/2021	[NT]	[NT]	[NT]	[NT]	16/09/2021	[NT]
Date analysed	-			17/09/2021	[NT]	[NT]	[NT]	[NT]	17/09/2021	[NT]
Naphthalene	mg/kg	0.1	Org-022/025	<0.1	[NT]	[NT]	[NT]	[NT]	90	[NT]
Acenaphthylene	mg/kg	0.1	Org-022/025	<0.1	[NT]	[NT]	[NT]	[NT]	[NT]	[NT]
Acenaphthene	mg/kg	0.1	Org-022/025	<0.1	[NT]	[NT]	[NT]	[NT]	95	[NT]
Fluorene	mg/kg	0.1	Org-022/025	<0.1	[NT]	[NT]	[NT]	[NT]	90	[NT]
Phenanthrene	mg/kg	0.1	Org-022/025	<0.1	[NT]	[NT]	[NT]	[NT]	108	[NT]
Anthracene	mg/kg	0.1	Org-022/025	<0.1	[NT]	[NT]	[NT]	[NT]	[NT]	[NT]
Fluoranthene	mg/kg	0.1	Org-022/025	<0.1	[NT]	[NT]	[NT]	[NT]	104	[NT]
Pyrene	mg/kg	0.1	Org-022/025	<0.1	[NT]	[NT]	[NT]	[NT]	87	[NT]
Benzo(a)anthracene	mg/kg	0.1	Org-022/025	<0.1	[NT]	[NT]	[NT]	[NT]	[NT]	[NT]
Chrysene	mg/kg	0.1	Org-022/025	<0.1	[NT]	[NT]	[NT]	[NT]	73	[NT]
Benzo(b,j+k)fluoranthene	mg/kg	0.2	Org-022/025	<0.2	[NT]	[NT]	[NT]	[NT]	[NT]	[NT]
Benzo(a)pyrene	mg/kg	0.05	Org-022/025	<0.05	[NT]	[NT]	[NT]	[NT]	100	[NT]
Indeno(1,2,3-c,d)pyrene	mg/kg	0.1	Org-022/025	<0.1	[NT]	[NT]	[NT]	[NT]	[NT]	[NT]
Dibenzo(a,h)anthracene	mg/kg	0.1	Org-022/025	<0.1	[NT]	[NT]	[NT]	[NT]	[NT]	[NT]
Benzo(g,h,i)perylene	mg/kg	0.1	Org-022/025	<0.1	[NT]	[NT]	[NT]	[NT]	[NT]	[NT]
Surrogate p-Terphenyl-d14	%		Org-022/025	105	[NT]	[NT]	[NT]	[NT]	121	[NT]

QUALITY CONTROL: Acid Extractable metals in soil						Duplicate			Spike Recovery %	
Test Description	Units	PQL	Method	Blank	#	Base	Dup.	RPD	LCS-1	[NT]
Date prepared	-			17/09/2021	[NT]	[NT]	[NT]	[NT]	17/09/2021	[NT]
Date analysed	-			17/09/2021	[NT]	[NT]	[NT]	[NT]	17/09/2021	[NT]
Arsenic	mg/kg	4	Metals-020	<4	[NT]	[NT]	[NT]	[NT]	101	[NT]
Cadmium	mg/kg	0.4	Metals-020	<0.4	[NT]	[NT]	[NT]	[NT]	100	[NT]
Chromium	mg/kg	1	Metals-020	<1	[NT]	[NT]	[NT]	[NT]	112	[NT]
Copper	mg/kg	1	Metals-020	<1	[NT]	[NT]	[NT]	[NT]	102	[NT]
Lead	mg/kg	1	Metals-020	<1	[NT]	[NT]	[NT]	[NT]	109	[NT]
Mercury	mg/kg	0.1	Metals-021	<0.1	[NT]	[NT]	[NT]	[NT]	101	[NT]
Nickel	mg/kg	1	Metals-020	<1	[NT]	[NT]	[NT]	[NT]	107	[NT]
Zinc	mg/kg	1	Metals-020	<1	[NT]	[NT]	[NT]	[NT]	111	[NT]
Tin	mg/kg	1	Metals-020	<1	[NT]	[NT]	[NT]	[NT]	102	[NT]

QUALITY CONTROL: Misc Soil - Inorg					Duplicate				Spike Recovery %	
Test Description	Units	PQL	Method	Blank	#	Base	Dup.	RPD	LCS-1	[NT]
Date prepared	-			20/09/2021	[NT]	[NT]	[NT]	[NT]	20/09/2021	[NT]
Date analysed	-			20/09/2021	[NT]	[NT]	[NT]	[NT]	20/09/2021	[NT]
Total Phenolics (as Phenol)	mg/kg	5	Inorg-031	<5	[NT]	[NT]	[NT]	[NT]	102	[NT]

QUALITY CONTROL: Speciated Phenols in Soil						Duplicate			Spike Recovery %	
Test Description	Units	PQL	Method	Blank	#	Base	Dup.	RPD	LCS-11	[NT]
Date extracted	-			16/09/2021	[NT]	[NT]	[NT]	[NT]	16/09/2021	[NT]
Date analysed	-			22/09/2021	[NT]	[NT]	[NT]	[NT]	22/09/2021	[NT]
Phenol	mg/kg	0.2	Org-022/025	<0.2	[NT]	[NT]	[NT]	[NT]	114	[NT]
2-Chlorophenol	mg/kg	0.2	Org-022/025	<0.2	[NT]	[NT]	[NT]	[NT]	114	[NT]
4-Chloro-3-methylphenol	mg/kg	1	Org-022/025	<1	[NT]	[NT]	[NT]	[NT]	[NT]	[NT]
2-Methylphenol (o-cresol)	mg/kg	0.2	Org-022/025	<0.2	[NT]	[NT]	[NT]	[NT]	49	[NT]
3/4-Methylphenol (m/p-cresol)	mg/kg	0.4	Org-022/025	<0.4	[NT]	[NT]	[NT]	[NT]	[NT]	[NT]
2-Nitrophenol	mg/kg	0.2	Org-022/025	<0.2	[NT]	[NT]	[NT]	[NT]	[NT]	[NT]
2,4 -Dimethylphenol	mg/kg	0.2	Org-022/025	<0.2	[NT]	[NT]	[NT]	[NT]	[NT]	[NT]
2,4-Dichlorophenol	mg/kg	0.2	Org-022/025	<0.2	[NT]	[NT]	[NT]	[NT]	[NT]	[NT]
2,6-Dichlorophenol	mg/kg	0.2	Org-022/025	<0.2	[NT]	[NT]	[NT]	[NT]	122	[NT]
2,4,5-Trichlorophenol	mg/kg	0.2	Org-022/025	<0.2	[NT]	[NT]	[NT]	[NT]	[NT]	[NT]
2,4,6-Trichlorophenol	mg/kg	0.2	Org-022/025	<0.2	[NT]	[NT]	[NT]	[NT]	[NT]	[NT]
2,4-Dinitrophenol	mg/kg	4	Org-022/025	<4	[NT]	[NT]	[NT]	[NT]	[NT]	[NT]
4-Nitrophenol	mg/kg	4	Org-022/025	<4	[NT]	[NT]	[NT]	[NT]	48	[NT]
2346-Tetrachlorophenol	mg/kg	0.2	Org-022/025	<0.2	[NT]	[NT]	[NT]	[NT]	[NT]	[NT]
2-methyl-4,6-Dinitrophenol	mg/kg	2	Org-022/025	<2	[NT]	[NT]	[NT]	[NT]	[NT]	[NT]
Pentachlorophenol	mg/kg	1	Org-022/025	<1	[NT]	[NT]	[NT]	[NT]	110	[NT]
Surrogate 2-fluorophenol	%		Org-022/025	99	[NT]	[NT]	[NT]	[NT]	93	[NT]
Surrogate Phenol-d_6	%		Org-022/025	86	[NT]	[NT]	[NT]	[NT]	90	[NT]
Surrogate 2,4,6-Tribromophenol	%		Org-022/025	89	[NT]	[NT]	[NT]	[NT]	95	[NT]
Surrogate p-Terphenyl-d_{14}	%		Org-022/025	105	[NT]	[NT]	[NT]	[NT]	105	[NT]

QUALITY CONTROL: Misc Inorg - Soil						Duplicate			Spike Recovery %	
Test Description	Units	PQL	Method	Blank	#	Base	Dup.	RPD	LCS-1	[NT]
Date prepared	-			21/09/2021	[NT]	[NT]	[NT]	[NT]	21/09/2021	[NT]
Date analysed	-			21/09/2021	[NT]	[NT]	[NT]	[NT]	21/09/2021	[NT]
pH 1:5 soil:water	pH Units		Inorg-001	[NT]	[NT]	[NT]	[NT]	[NT]	98	[NT]

QUALITY CONTROL: Tributyl Tin in Soil					Duplicate				Spike Recovery %	
Test Description	Units	PQL	Method	Blank	#	Base	Dup.	RPD	LCS-1	[NT]
Date extracted	-			22/09/2021	2	22/09/2021	22/09/2021		22/09/2021	[NT]
Date analysed	-			22/09/2021	2	22/09/2021	22/09/2021		22/09/2021	[NT]
Tributyltin as Sn	µg/kg	0.5	Ext-054	<0.5	2	<1.0	<1.0	0	83	[NT]
Surrogate Triphenyltin	%		Ext-054	94	2	97	99	2	95	[NT]

Result Definitions

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

Quality Control Definitions

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

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

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

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

Laboratory Acceptance Criteria

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

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

Spikes for Physical and Aggregate Tests are not applicable.

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

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

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

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

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

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

Measurement Uncertainty estimates are available for most tests upon request.

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

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

Report Comments

Asbestos: A portion of the supplied sample was sub-sampled for asbestos analysis according to Envirolab procedures.
We cannot guarantee that this sub-sample is indicative of the entire sample. Envirolab recommends supplying 40-50g of sample in its own container.
Note: Samples 278105-2, 7 & 10 were sub-sampled from jars provided by the client.

TBT analysed by MPL, report no 269146.
Organotin Compounds in Soil - Some PQLS have been raised due to decreased internal standard efficiency. This may be due to sample matrix interferences

Douglas Partners
Geotechnics | Environment | Groundwater

CHAIN OF CUSTODY DESPATCH SHEET

Project No:	202546.00	**Suburb:**	Cockle Bay	**To:**	*Envirolab Services*
Project Manager:	Rhys McMillan	**Order Number:**		**Sampler:**	*12 Ashley St, Chatswood NSW 2067*
Email:	Rhys.McMillan@douglaspartners.com.au / 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	Sample ID: Depth From	Sample ID: Depth To	Date Sampled	Sample Type: S - soil W - water	Container Type: G - glass P - plastic	Analytes: Metals, TRH, PAH, OCP, OPP, PCB, Asbestos	Analytes: Metals, TRH, PAH, Asbestos	Analytes: Metals, PAH, Asbestos	Analytes: VOC	Analytes: pH	Analytes: TOC	Analytes: CEC	Analytes: BTEX	Analytes: Total phenols	Analytes: Speciated phenols	Analytes: TBT	Notes/ Preservation/ Additional Requirements
1.	WD3	0.15	0.3	11/09/21														Contact DP before disposing samples
2.	WD3	0.5	0.6	11/09/21				X		X	X				x	X	X	include Sn in metals
3.	WD3	1	1.1	11/09/21														
4.	WD3	1.5	1.6	11/09/21														
5.	WD3	2	2.1	11/09/21														
6.	WD3	2.5	2.95	11/09/21														
7.	WD3	4	4.45	11/09/21					X		x							
8.	WD3	5	5.45	11/09/21														
9.	WD3	8	8.45	11/09/21														
10.	BD03/210911								X									

Metals to analyse:		**LAB RECEIPT**	
Number of samples in container:	**Transported to laboratory by:**	**Lab Ref. No:**	ES2210S
Send results to:	Douglas Partners Pty Ltd	**Received by:**	ES Sydney
Address:	96 Hermitage Road, West Ryde NSW 2114 **Phone:** (02) 9809 0666	**Date & Time:**	15/09/2021 13:35
Relinquished by:	KP **Date:** 15/09/2021 **Signed:**	**Signed:**	

Updated COC 16/09/2021 10:04

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	Rhys McMillan, Kurt Plambeck

Sample Login Details

Your reference	202546.00, Cockle Bay
Envirolab Reference	278105
Date Sample Received	15/09/2021
Date Instructions Received	15/09/2021
Date Results Expected to be Reported	On Hold

Sample Condition

Samples received in appropriate condition for analysis	Yes
No. of Samples Provided	10 Soil
Turnaround Time Requested	Standard
Temperature on Receipt (°C)	10
Cooling Method	Ice Pack
Sampling Date Provided	YES

Comments

Nil

Please direct any queries to:

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

Analysis Underway, details on the following page:

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

Sample ID	VOCs in soil	vTRH(C6-C10)/BTEXN in Soil	svTRH (C10-C40) in Soil	PAHs in Soil	Organochlorine Pesticides in soil	Organophosphorus Pesticides in Soil	PCBsin Soil	Acid Extractable metalsin soil	Misc Soil - Inorg	Asbestos ID - soils	Misc Inorg - Soil	Coal Tar	Tributyl Tin in Soil	On Hold
WD3-0.15-0.3														✓
WD3-0.5-0.6														✓
WD3-1-1.1														✓
WD3-1.5-1.6														✓
WD3-2-2.1														✓
WD3-2.5-2.95														✓
WD3-4-4.45														✓
WD3-5-5.45														✓
WD3-8-8.45														✓
BD03/210911														✓

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

Additional Info

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

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CERTIFICATE OF ANALYSIS 278105-A

Client Details

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

Sample Details

Your Reference	**202546.00, Cockle Bay**
Number of Samples	additional analysis
Date samples received	15/09/2021
Date completed instructions received	24/09/2021

Analysis Details

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

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

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

Report Details

Date results requested by	01/10/2021
Date of Issue	28/09/2021

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Results Approved By
Dragana Tomas, Senior Chemist

Authorised By



Nancy Zhang, Laboratory Manager

PAHs in TCLP (USEPA 1311)		
Our Reference		278105-A-10
Your Reference	UNITS	BD03/210911
Depth		-
Date Sampled		11/09/2021
Type of sample		Soil
pH of soil for fluid# determ.	pH units	9.3
pH of soil TCLP (after HCl)	pH units	1.7
Extraction fluid used	-	1
pH of final Leachate	pH units	5.2
Date extracted	-	27/09/2021
Date analysed	-	28/09/2021
Naphthalene in TCLP	mg/L	<0.001
Acenaphthylene in TCLP	mg/L	<0.001
Acenaphthene in TCLP	mg/L	<0.001
Fluorene in TCLP	mg/L	<0.001
Phenanthrene in TCLP	mg/L	0.002
Anthracene in TCLP	mg/L	0.001
Fluoranthene in TCLP	mg/L	<0.001
Pyrene in TCLP	mg/L	<0.001
Benzo(a)anthracene in TCLP	mg/L	<0.001
Chrysene in TCLP	mg/L	<0.001
Benzo(bjk)fluoranthene in TCLP	mg/L	<0.002
Benzo(a)pyrene in TCLP	mg/L	<0.001
Indeno(1,2,3-c,d)pyrene - TCLP	mg/L	<0.001
Dibenzo(a,h)anthracene in TCLP	mg/L	<0.001
Benzo(g,h,i)perylene in TCLP	mg/L	<0.001
Total +ve PAH's	mg/L	0.0031
Surrogate p-Terphenyl-d14	%	102

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

QUALITY CONTROL: PAHs in TCLP (USEPA 1311)						Duplicate			Spike Recovery %	
Test Description	Units	PQL	Method	Blank	#	Base	Dup.	RPD	LCS-W2	[NT]
Date extracted	-			27/09/2021	[NT]	[NT]	[NT]	[NT]	27/09/2021	[NT]
Date analysed	-			28/09/2021	[NT]	[NT]	[NT]	[NT]	28/09/2021	[NT]
Naphthalene in TCLP	mg/L	0.001	Org-022/025	<0.001	[NT]	[NT]	[NT]	[NT]	96	[NT]
Acenaphthylene in TCLP	mg/L	0.001	Org-022/025	<0.001	[NT]	[NT]	[NT]	[NT]	[NT]	[NT]
Acenaphthene in TCLP	mg/L	0.001	Org-022/025	<0.001	[NT]	[NT]	[NT]	[NT]	80	[NT]
Fluorene in TCLP	mg/L	0.001	Org-022/025	<0.001	[NT]	[NT]	[NT]	[NT]	89	[NT]
Phenanthrene in TCLP	mg/L	0.001	Org-022/025	<0.001	[NT]	[NT]	[NT]	[NT]	104	[NT]
Anthracene in TCLP	mg/L	0.001	Org-022/025	<0.001	[NT]	[NT]	[NT]	[NT]	[NT]	[NT]
Fluoranthene in TCLP	mg/L	0.001	Org-022/025	<0.001	[NT]	[NT]	[NT]	[NT]	88	[NT]
Pyrene in TCLP	mg/L	0.001	Org-022/025	<0.001	[NT]	[NT]	[NT]	[NT]	93	[NT]
Benzo(a)anthracene in TCLP	mg/L	0.001	Org-022/025	<0.001	[NT]	[NT]	[NT]	[NT]	[NT]	[NT]
Chrysene in TCLP	mg/L	0.001	Org-022/025	<0.001	[NT]	[NT]	[NT]	[NT]	92	[NT]
Benzo(bjk)fluoranthene in TCLP	mg/L	0.002	Org-022/025	<0.002	[NT]	[NT]	[NT]	[NT]	[NT]	[NT]
Benzo(a)pyrene in TCLP	mg/L	0.001	Org-022/025	<0.001	[NT]	[NT]	[NT]	[NT]	98	[NT]
Indeno(1,2,3-c,d)pyrene - TCLP	mg/L	0.001	Org-022/025	<0.001	[NT]	[NT]	[NT]	[NT]	[NT]	[NT]
Dibenzo(a,h)anthracene in TCLP	mg/L	0.001	Org-022/025	<0.001	[NT]	[NT]	[NT]	[NT]	[NT]	[NT]
Benzo(g,h,i)perylene in TCLP	mg/L	0.001	Org-022/025	<0.001	[NT]	[NT]	[NT]	[NT]	[NT]	[NT]
Surrogate p-Terphenyl-d14	%		Org-022/025	99	[NT]	[NT]	[NT]	[NT]	105	[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 278105 202546.00, Cockle Bay

Ref: 278105-A.
TAT: Standard
Due: 01/10/2021
MT

From: Kurt Plambeck <kurt.plambeck@douglaspartners.com.au>
Sent: Friday, 24 September 2021 11:39 AM
To: Aileen Hie <AHie@envirolab.com.au>
Subject: FW: Results for Registration 278105 202546.00, Cockle Bay

CAUTION: This email originated from outside of the organisation. Do not act on instructions, click links or open attachments unless you recognise the sender and know the content is authentic and safe.

Hi Aileen,

Can you please book in the TCLP per the below.

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

If you are not the intended recipient of this email, please notify us immediately and be aware that any disclosure, copying, distribution or use of the contents of this information is prohibited.

From: Kurt Plambeck
Sent: Friday, 24 September 2021 11:37 AM
To: 'Nancy Zhang' <NZhang@envirolab.com.au>
Subject: RE: Results for Registration 278105 202546.00, Cockle Bay

Hi Nancy,

Can you please run sample BD03 (10) for TCLP on PAH.

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

Envirolab Services Pty Ltd
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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	202546.00, Cockle Bay
Envirolab Reference	278105-A
Date Sample Received	15/09/2021
Date Instructions Received	24/09/2021
Date Results Expected to be Reported	01/10/2021

Sample Condition

Samples received in appropriate condition for analysis	Yes
No. of Samples Provided	additional analysis
Turnaround Time Requested	Standard
Temperature on Receipt (°C)	10
Cooling Method	Ice Pack
Sampling Date Provided	YES

Comments

Nil

Please direct any queries to:

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

Analysis Underway, details on the following page:

Envirolab Services Pty Ltd
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12 Ashley St Chatswood NSW 2067
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customerservice@envirolab.com.au
www.envirolab.com.au

Sample ID	pH of soil for fluid#determ.	pH of soil TCLP (after HCl)	Extraction fluid used	pH of final Leachate	Naphthalene in TCLP	Acenaphthylene in TCLP	Acenaphthene in TCLP	Fluorene in TCLP	Phenanthrene in TCLP	Anthracene in TCLP	Fluoranthene in TCLP	Pyrene in TCLP	Benzo(a)anthracene in TCLP	Chrysene in TCLP	Benzo(b)fluoranthene in TCLP	Benzo(a)pyrene in TCLP	Indeno(1,2,3-c,d)pyrene - TCLP	Dibenzo(a,h)anthracene in TCLP	Benzo(g,h,i)perylene in TCLP	Total +vePAH's	Surrogate p-Terphenyl-d14	On Hold
WD3-0.15-0.3																						✓
WD3-0.5-0.6																						✓
WD3-1-1.1																						✓
WD3-1.5-1.6																						✓
WD3-2-2.1																						✓
WD3-2.5-2.95																						✓
WD3-4-4.45																						✓
WD3-5-5.45																						✓
WD3-8-8.45																						✓
BD03/210911	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	

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

Additional Info

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

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

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

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

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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 278761

Client Details

Client	Douglas Partners Pty Ltd
Attention	Rhys McMillan
Address	96 Hermitage Rd, West Ryde, NSW, 2114

Sample Details

Your Reference	**202546.00, Cockle Bay**
Number of Samples	8 soil
Date samples received	22/09/2021
Date completed instructions received	22/09/2021

Analysis Details

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

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

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

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

Report Details

Date results requested by	29/09/2021
Date of Issue	29/09/2021

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

Results Approved By
Dragana Tomas, Senior Chemist
Hannah Nguyen, Metals Supervisor
Lucy Zhu, Asbestos Supervisor
Priya Samarawickrama, Senior Chemist

Authorised By



Nancy Zhang, Laboratory Manager

vTRH(C6-C10)/BTEXN in Soil		
Our Reference		278761-3
Your Reference	UNITS	CP1
Depth		1-1.1
Date Sampled		19/06/2021
Type of sample		soil
Date extracted	-	24/09/2021
Date analysed	-	24/09/2021
TRH C_6 - C_9	mg/kg	<25
TRH C_6 - C_{10}	mg/kg	<25
vTPH C_6 - C_{10} less BTEX (F1)	mg/kg	<25
Benzene	mg/kg	<0.2
Toluene	mg/kg	<0.5
Ethylbenzene	mg/kg	<1
m+p-xylene	mg/kg	<2
o-Xylene	mg/kg	<1
naphthalene	mg/kg	<1
Total +ve Xylenes	mg/kg	<3
Surrogate aaa-Trifluorotoluene	%	82

svTRH (C10-C40) in Soil		
Our Reference		278761-3
Your Reference	UNITS	CP1
Depth		1-1.1
Date Sampled		19/06/2021
Type of sample		soil
Date extracted	-	24/09/2021
Date analysed	-	26/09/2021
TRH C_{10} - C_{14}	mg/kg	<50
TRH C_{15} - C_{28}	mg/kg	<100
TRH C_{29} - C_{36}	mg/kg	<100
Total +ve TRH (C10-C36)	mg/kg	<50
TRH >C_{10} -C_{16}	mg/kg	<50
TRH >C_{10} - C_{16} less Naphthalene (F2)	mg/kg	<50
TRH >C_{16} -C_{34}	mg/kg	<100
TRH >C_{34} -C_{40}	mg/kg	<100
Total +ve TRH (>C10-C40)	mg/kg	<50
Surrogate o-Terphenyl	%	74

PAHs in Soil				
Our Reference		278761-3	278761-5	278761-8
Your Reference	UNITS	CP1	CP1	BD01 / 180921
Depth		1-1.1	2-2.1	-
Date Sampled		19/06/2021	19/06/2021	19/06/2021
Type of sample		soil	soil	soil
Date extracted	-	24/09/2021	24/09/2021	24/09/2021
Date analysed	-	24/09/2021	24/09/2021	24/09/2021
Naphthalene	mg/kg	<0.1	<0.1	<0.1
Acenaphthylene	mg/kg	<0.1	<0.1	<0.1
Acenaphthene	mg/kg	<0.1	<0.1	<0.1
Fluorene	mg/kg	<0.1	<0.1	<0.1
Phenanthrene	mg/kg	<0.1	0.5	0.1
Anthracene	mg/kg	<0.1	<0.1	<0.1
Fluoranthene	mg/kg	0.1	1	0.2
Pyrene	mg/kg	0.2	0.8	0.2
Benzo(a)anthracene	mg/kg	<0.1	0.4	<0.1
Chrysene	mg/kg	0.1	0.5	0.1
Benzo(b,j+k)fluoranthene	mg/kg	<0.2	2	0.4
Benzo(a)pyrene	mg/kg	0.1	0.5	0.1
Indeno(1,2,3-c,d)pyrene	mg/kg	<0.1	0.3	0.1
Dibenzo(a,h)anthracene	mg/kg	<0.1	<0.1	<0.1
Benzo(g,h,i)perylene	mg/kg	0.1	0.3	0.2
Total +ve PAH's	mg/kg	0.66	5.9	1.4
Benzo(a)pyrene TEQ calc (zero)	mg/kg	<0.5	0.8	<0.5
Benzo(a)pyrene TEQ calc(half)	mg/kg	<0.5	0.8	<0.5
Benzo(a)pyrene TEQ calc(PQL)	mg/kg	<0.5	0.9	<0.5
Surrogate p-Terphenyl-d14	%	85	72	72

Organochlorine Pesticides in soil		
Our Reference		278761-3
Your Reference	UNITS	CP1
Depth		1-1.1
Date Sampled		19/06/2021
Type of sample		soil
Date extracted	-	24/09/2021
Date analysed	-	24/09/2021
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	%	86

Organophosphorus Pesticides in Soil		
Our Reference		278761-3
Your Reference	UNITS	CP1
Depth		1-1.1
Date Sampled		19/06/2021
Type of sample		soil
Date extracted	-	24/09/2021
Date analysed	-	24/09/2021
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	%	86

PCBs in Soil		
Our Reference		278761-3
Your Reference	UNITS	CP1
Depth		1-1.1
Date Sampled		19/06/2021
Type of sample		soil
Date extracted	-	24/09/2021
Date analysed	-	24/09/2021
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	%	86

Acid Extractable metals in soil				
Our Reference		278761-3	278761-5	278761-8
Your Reference	UNITS	CP1	CP1	BD01 / 180921
Depth		1-1.1	2-2.1	-
Date Sampled		19/06/2021	19/06/2021	19/06/2021
Type of sample		soil	soil	soil
Date prepared	-	29/09/2021	29/09/2021	29/09/2021
Date analysed	-	29/09/2021	29/09/2021	29/09/2021
Arsenic	mg/kg	6	9	<4
Cadmium	mg/kg	0.8	0.5	<0.4
Chromium	mg/kg	12	13	6
Copper	mg/kg	130	1,200	19
Lead	mg/kg	3,900	2,500	450
Mercury	mg/kg	1.5	1.1	0.5
Nickel	mg/kg	7	4	1
Zinc	mg/kg	1,100	880	150
Tin	mg/kg	300	590	22

Misc Soil - Inorg		
Our Reference		278761-3
Your Reference	UNITS	CP1
Depth		1-1.1
Date Sampled		19/06/2021
Type of sample		soil
Date prepared	-	27/09/2021
Date analysed	-	27/09/2021
Total Phenolics (as Phenol)	mg/kg	<5

Misc Inorg - Soil			
Our Reference		278761-3	278761-5
Your Reference	UNITS	CP1	CP1
Depth		1-1.1	2-2.1
Date Sampled		19/06/2021	19/06/2021
Type of sample		soil	soil
Date prepared	-	27/09/2021	27/09/2021
Date analysed	-	27/09/2021	27/09/2021
pH 1:5 soil:water	pH Units	8.9	8.4

Moisture				
Our Reference		278761-3	278761-5	278761-8
Your Reference	UNITS	CP1	CP1	BD01 / 180921
Depth		1-1.1	2-2.1	-
Date Sampled		19/06/2021	19/06/2021	19/06/2021
Type of sample		soil	soil	soil
Date prepared	-	24/09/2021	24/09/2021	24/09/2021
Date analysed	-	27/09/2021	27/09/2021	27/09/2021
Moisture	%	12	14	11

Asbestos ID - soils				
Our Reference		278761-3	278761-5	278761-8
Your Reference	UNITS	CP1	CP1	BD01 / 180921
Depth		1-1.1	2-2.1	-
Date Sampled		19/06/2021	19/06/2021	19/06/2021
Type of sample		soil	soil	soil
Date analysed	-	28/09/2021	28/09/2021	28/09/2021
Sample mass tested	g	Approx. 30g	Approx. 40g	Approx. 35g
Sample Description	-	Brown fine-grained soil & rocks	Brown fine-grained soil & rocks	Brown fine-grained soil & rocks
Asbestos ID in soil	-	No asbestos detected at reporting limit of 0.1g/kg Organic fibres detected	No asbestos detected at reporting limit of 0.1g/kg Organic fibres detected	No asbestos detected at reporting limit of 0.1g/kg Organic fibres detected
Asbestos comments	-	NO	NO	NO
Trace Analysis	-	No asbestos detected	No asbestos detected	No asbestos detected

Method ID	Methodology Summary
ASB-001	Asbestos ID - Qualitative identification of asbestos in bulk samples using Polarised Light Microscopy and Dispersion Staining Techniques including Synthetic Mineral Fibre and Organic Fibre as per Australian Standard 4964-2004.
Inorg-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.
Metals-020	Determination of various metals by ICP-AES.
Metals-021	Determination of Mercury by Cold Vapour AAS.
Org-020	Soil samples are extracted with Dichloromethane/Acetone and waters with Dichloromethane and analysed by GC-FID. F2 = (>C10-C16)-Naphthalene as per NEPM B1 Guideline on Investigation Levels for Soil and Groundwater (HSLs Tables 1A (3, 4)). Note Naphthalene is determined from the VOC analysis.
Org-020	Soil samples are extracted with Dichloromethane/Acetone and waters with Dichloromethane and analysed by GC-FID. F2 = (>C10-C16)-Naphthalene as per NEPM B1 Guideline on Investigation Levels for Soil and Groundwater (HSLs Tables 1A (3, 4)). Note Naphthalene is determined from the VOC analysis. Note, the Total +ve TRH PQL is reflective of the lowest individual PQL and is therefore "Total +ve TRH" is simply a sum of the positive individual TRH fractions (>C10-C40).
Org-021	Soil samples are extracted with dichloromethane/acetone and waters with dichloromethane and analysed by GC-ECD.
Org-021	Soil samples are extracted with dichloromethane/acetone and waters with dichloromethane and analysed by GC-ECD. Note, the Total +ve PCBs PQL is reflective of the lowest individual PQL and is therefore" Total +ve PCBs" is simply a sum of the positive individual PCBs.
Org-022	Determination of VOCs sampled onto coconut shell charcoal sorbent tubes, that can be desorbed using carbon disulphide, and analysed by GC-MS.
Org-022/025	Soil samples are extracted with Dichloromethane/Acetone and waters with Dichloromethane and analysed by GC-MS/GC-MSMS.
Org-022/025	Soil samples are extracted with dichloromethane/acetone and waters with dichloromethane and analysed by GC-MS/GC-MSMS. Note, the Total +ve reported DDD+DDE+DDT PQL is reflective of the lowest individual PQL and is therefore simply a sum of the positive individually report DDD+DDE+DDT.

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

QUALITY CONTROL: vTRH(C6-C10)/BTEXN in Soil						Duplicate			Spike Recovery %	
Test Description	Units	PQL	Method	Blank	#	Base	Dup.	RPD	LCS-7	278761-3
Date extracted	-			24/09/2021	[NT]	[NT]	[NT]	[NT]	24/09/2021	24/09/2021
Date analysed	-			24/09/2021	[NT]	[NT]	[NT]	[NT]	24/09/2021	24/09/2021
TRH C_6 - C_9	mg/kg	25	Org-023	<25	[NT]	[NT]	[NT]	[NT]	99	107
TRH C_6 - C_{10}	mg/kg	25	Org-023	<25	[NT]	[NT]	[NT]	[NT]	99	107
Benzene	mg/kg	0.2	Org-023	<0.2	[NT]	[NT]	[NT]	[NT]	98	108
Toluene	mg/kg	0.5	Org-023	<0.5	[NT]	[NT]	[NT]	[NT]	91	105
Ethylbenzene	mg/kg	1	Org-023	<1	[NT]	[NT]	[NT]	[NT]	102	109
m+p-xylene	mg/kg	2	Org-023	<2	[NT]	[NT]	[NT]	[NT]	101	110
o-Xylene	mg/kg	1	Org-023	<1	[NT]	[NT]	[NT]	[NT]	97	105
naphthalene	mg/kg	1	Org-023	<1	[NT]	[NT]	[NT]	[NT]	[NT]	[NT]
Surrogate aaa-Trifluorotoluene	%		Org-023	88	[NT]	[NT]	[NT]	[NT]	89	101

QUALITY CONTROL: svTRH (C10-C40) in Soil						Duplicate			Spike Recovery %	
Test Description	Units	PQL	Method	Blank	#	Base	Dup.	RPD	LCS-7	278761-3
Date extracted	-			25/09/2021	[NT]	[NT]	[NT]	[NT]	25/09/2021	24/09/2021
Date analysed	-			26/09/2021	[NT]	[NT]	[NT]	[NT]	26/09/2021	26/09/2021
TRH C_{10} - C_{14}	mg/kg	50	Org-020	<50	[NT]	[NT]	[NT]	[NT]	104	109
TRH C_{15} - C_{28}	mg/kg	100	Org-020	<100	[NT]	[NT]	[NT]	[NT]	99	106
TRH C_{29} - C_{36}	mg/kg	100	Org-020	<100	[NT]	[NT]	[NT]	[NT]	92	95
TRH >C_{10} -C_{16}	mg/kg	50	Org-020	<50	[NT]	[NT]	[NT]	[NT]	104	109
TRH >C_{16} -C_{34}	mg/kg	100	Org-020	<100	[NT]	[NT]	[NT]	[NT]	99	106
TRH >C_{34} -C_{40}	mg/kg	100	Org-020	<100	[NT]	[NT]	[NT]	[NT]	92	95
Surrogate o-Terphenyl	%		Org-020	74	[NT]	[NT]	[NT]	[NT]	111	74

QUALITY CONTROL: PAHs in Soil						Duplicate			Spike Recovery %	
Test Description	Units	PQL	Method	Blank	#	Base	Dup.	RPD	LCS-7	278761-3
Date extracted	-			24/09/2021	[NT]	[NT]	[NT]	[NT]	24/09/2021	24/09/2021
Date analysed	-			24/09/2021	[NT]	[NT]	[NT]	[NT]	24/09/2021	24/09/2021
Naphthalene	mg/kg	0.1	Org-022/025	<0.1	[NT]	[NT]	[NT]	[NT]	101	78
Acenaphthylene	mg/kg	0.1	Org-022/025	<0.1	[NT]	[NT]	[NT]	[NT]	[NT]	[NT]
Acenaphthene	mg/kg	0.1	Org-022/025	<0.1	[NT]	[NT]	[NT]	[NT]	103	124
Fluorene	mg/kg	0.1	Org-022/025	<0.1	[NT]	[NT]	[NT]	[NT]	95	93
Phenanthrene	mg/kg	0.1	Org-022/025	<0.1	[NT]	[NT]	[NT]	[NT]	106	103
Anthracene	mg/kg	0.1	Org-022/025	<0.1	[NT]	[NT]	[NT]	[NT]	[NT]	[NT]
Fluoranthene	mg/kg	0.1	Org-022/025	<0.1	[NT]	[NT]	[NT]	[NT]	90	100
Pyrene	mg/kg	0.1	Org-022/025	<0.1	[NT]	[NT]	[NT]	[NT]	99	103
Benzo(a)anthracene	mg/kg	0.1	Org-022/025	<0.1	[NT]	[NT]	[NT]	[NT]	[NT]	[NT]
Chrysene	mg/kg	0.1	Org-022/025	<0.1	[NT]	[NT]	[NT]	[NT]	83	85
Benzo(b,j+k)fluoranthene	mg/kg	0.2	Org-022/025	<0.2	[NT]	[NT]	[NT]	[NT]	[NT]	[NT]
Benzo(a)pyrene	mg/kg	0.05	Org-022/025	<0.05	[NT]	[NT]	[NT]	[NT]	102	90
Indeno(1,2,3-c,d)pyrene	mg/kg	0.1	Org-022/025	<0.1	[NT]	[NT]	[NT]	[NT]	[NT]	[NT]
Dibenzo(a,h)anthracene	mg/kg	0.1	Org-022/025	<0.1	[NT]	[NT]	[NT]	[NT]	[NT]	[NT]
Benzo(g,h,i)perylene	mg/kg	0.1	Org-022/025	<0.1	[NT]	[NT]	[NT]	[NT]	[NT]	[NT]
Surrogate p-Terphenyl-d14	%		Org-022/025	77	[NT]	[NT]	[NT]	[NT]	95	84

QUALITY CONTROL: Organochlorine Pesticides in soil					Duplicate				Spike Recovery %	
Test Description	Units	PQL	Method	Blank	#	Base	Dup.	RPD	LCS-7	278761-3
Date extracted	-			24/09/2021	[NT]	[NT]	[NT]	[NT]	24/09/2021	24/09/2021
Date analysed	-			24/09/2021	[NT]	[NT]	[NT]	[NT]	24/09/2021	24/09/2021
alpha-BHC	mg/kg	0.1	Org-022/025	<0.1	[NT]	[NT]	[NT]	[NT]	92	92
HCB	mg/kg	0.1	Org-022/025	<0.1	[NT]	[NT]	[NT]	[NT]	[NT]	[NT]
beta-BHC	mg/kg	0.1	Org-022/025	<0.1	[NT]	[NT]	[NT]	[NT]	85	89
gamma-BHC	mg/kg	0.1	Org-022/025	<0.1	[NT]	[NT]	[NT]	[NT]	[NT]	[NT]
Heptachlor	mg/kg	0.1	Org-022/025	<0.1	[NT]	[NT]	[NT]	[NT]	85	85
delta-BHC	mg/kg	0.1	Org-022/025	<0.1	[NT]	[NT]	[NT]	[NT]	[NT]	[NT]
Aldrin	mg/kg	0.1	Org-022/025	<0.1	[NT]	[NT]	[NT]	[NT]	89	85
Heptachlor Epoxide	mg/kg	0.1	Org-022/025	<0.1	[NT]	[NT]	[NT]	[NT]	78	76
gamma-Chlordane	mg/kg	0.1	Org-022/025	<0.1	[NT]	[NT]	[NT]	[NT]	[NT]	[NT]
alpha-chlordane	mg/kg	0.1	Org-022/025	<0.1	[NT]	[NT]	[NT]	[NT]	[NT]	[NT]
Endosulfan I	mg/kg	0.1	Org-022/025	<0.1	[NT]	[NT]	[NT]	[NT]	[NT]	[NT]
pp-DDE	mg/kg	0.1	Org-022/025	<0.1	[NT]	[NT]	[NT]	[NT]	82	82
Dieldrin	mg/kg	0.1	Org-022/025	<0.1	[NT]	[NT]	[NT]	[NT]	92	92
Endrin	mg/kg	0.1	Org-022/025	<0.1	[NT]	[NT]	[NT]	[NT]	78	76
Endosulfan II	mg/kg	0.1	Org-022/025	<0.1	[NT]	[NT]	[NT]	[NT]	[NT]	[NT]
pp-DDD	mg/kg	0.1	Org-022/025	<0.1	[NT]	[NT]	[NT]	[NT]	68	82
Endrin Aldehyde	mg/kg	0.1	Org-022/025	<0.1	[NT]	[NT]	[NT]	[NT]	[NT]	[NT]
pp-DDT	mg/kg	0.1	Org-022/025	<0.1	[NT]	[NT]	[NT]	[NT]	[NT]	[NT]
Endosulfan Sulphate	mg/kg	0.1	Org-022/025	<0.1	[NT]	[NT]	[NT]	[NT]	76	76
Methoxychlor	mg/kg	0.1	Org-022/025	<0.1	[NT]	[NT]	[NT]	[NT]	[NT]	[NT]
Surrogate TCMX	%		Org-022/025	84	[NT]	[NT]	[NT]	[NT]	100	104

QUALITY CONTROL: Organophosphorus Pesticides in Soil					Duplicate				Spike Recovery %	
Test Description	Units	PQL	Method	Blank	#	Base	Dup.	RPD	LCS-7	278761-3
Date extracted	-			24/09/2021	[NT]	[NT]	[NT]	[NT]	24/09/2021	24/09/2021
Date analysed	-			24/09/2021	[NT]	[NT]	[NT]	[NT]	24/09/2021	24/09/2021
Dichlorvos	mg/kg	0.1	Org-022/025	<0.1	[NT]	[NT]	[NT]	[NT]	127	124
Dimethoate	mg/kg	0.1	Org-022/025	<0.1	[NT]	[NT]	[NT]	[NT]	[NT]	[NT]
Diazinon	mg/kg	0.1	Org-022/025	<0.1	[NT]	[NT]	[NT]	[NT]	[NT]	[NT]
Chlorpyriphos-methyl	mg/kg	0.1	Org-022/025	<0.1	[NT]	[NT]	[NT]	[NT]	[NT]	[NT]
Ronnel	mg/kg	0.1	Org-022/025	<0.1	[NT]	[NT]	[NT]	[NT]	87	85
Fenitrothion	mg/kg	0.1	Org-022/025	<0.1	[NT]	[NT]	[NT]	[NT]	71	81
Malathion	mg/kg	0.1	Org-022/025	<0.1	[NT]	[NT]	[NT]	[NT]	126	120
Chlorpyriphos	mg/kg	0.1	Org-022/025	<0.1	[NT]	[NT]	[NT]	[NT]	90	90
Parathion	mg/kg	0.1	Org-022/025	<0.1	[NT]	[NT]	[NT]	[NT]	87	87
Bromophos-ethyl	mg/kg	0.1	Org-022	<0.1	[NT]	[NT]	[NT]	[NT]	[NT]	[NT]
Ethion	mg/kg	0.1	Org-022/025	<0.1	[NT]	[NT]	[NT]	[NT]	72	70
Azinphos-methyl (Guthion)	mg/kg	0.1	Org-022/025	<0.1	[NT]	[NT]	[NT]	[NT]	[NT]	[NT]
Surrogate TCMX	%		Org-022/025	84	[NT]	[NT]	[NT]	[NT]	100	104

QUALITY CONTROL: PCBs in Soil						Duplicate			Spike Recovery %	
Test Description	Units	PQL	Method	Blank	#	Base	Dup.	RPD	LCS-7	278761-3
Date extracted	-			24/09/2021	[NT]	[NT]	[NT]	[NT]	24/09/2021	24/09/2021
Date analysed	-			24/09/2021	[NT]	[NT]	[NT]	[NT]	24/09/2021	24/09/2021
Aroclor 1016	mg/kg	0.1	Org-021	<0.1	[NT]	[NT]	[NT]	[NT]	[NT]	[NT]
Aroclor 1221	mg/kg	0.1	Org-021	<0.1	[NT]	[NT]	[NT]	[NT]	[NT]	[NT]
Aroclor 1232	mg/kg	0.1	Org-021	<0.1	[NT]	[NT]	[NT]	[NT]	[NT]	[NT]
Aroclor 1242	mg/kg	0.1	Org-021	<0.1	[NT]	[NT]	[NT]	[NT]	[NT]	[NT]
Aroclor 1248	mg/kg	0.1	Org-021	<0.1	[NT]	[NT]	[NT]	[NT]	[NT]	[NT]
Aroclor 1254	mg/kg	0.1	Org-021	<0.1	[NT]	[NT]	[NT]	[NT]	84	82
Aroclor 1260	mg/kg	0.1	Org-021	<0.1	[NT]	[NT]	[NT]	[NT]	[NT]	[NT]
Surrogate TCMX	%		Org-021	84	[NT]	[NT]	[NT]	[NT]	100	102

QUALITY CONTROL: Acid Extractable metals in soil						Duplicate			Spike Recovery %	
Test Description	Units	PQL	Method	Blank	#	Base	Dup.	RPD	LCS-7	278761-3
Date prepared	-			29/09/2021	[NT]	[NT]	[NT]	[NT]	29/09/2021	29/09/2021
Date analysed	-			29/09/2021	[NT]	[NT]	[NT]	[NT]	29/09/2021	29/09/2021
Arsenic	mg/kg	4	Metals-020	<4	[NT]	[NT]	[NT]	[NT]	104	92
Cadmium	mg/kg	0.4	Metals-020	<0.4	[NT]	[NT]	[NT]	[NT]	105	82
Chromium	mg/kg	1	Metals-020	<1	[NT]	[NT]	[NT]	[NT]	117	94
Copper	mg/kg	1	Metals-020	<1	[NT]	[NT]	[NT]	[NT]	109	116
Lead	mg/kg	1	Metals-020	<1	[NT]	[NT]	[NT]	[NT]	110	#
Mercury	mg/kg	0.1	Metals-021	<0.1	[NT]	[NT]	[NT]	[NT]	89	#
Nickel	mg/kg	1	Metals-020	<1	[NT]	[NT]	[NT]	[NT]	108	89
Zinc	mg/kg	1	Metals-020	<1	[NT]	[NT]	[NT]	[NT]	99	#
Tin	mg/kg	1	Metals-020	<1	[NT]	[NT]	[NT]	[NT]	105	#

QUALITY CONTROL: Misc Soil - Inorg					Duplicate				Spike Recovery %	
Test Description	Units	PQL	Method	Blank	#	Base	Dup.	RPD	LCS-7	[NT]
Date prepared	-			27/09/2021	[NT]	[NT]	[NT]	[NT]	27/09/2021	[NT]
Date analysed	-			27/09/2021	[NT]	[NT]	[NT]	[NT]	27/09/2021	[NT]
Total Phenolics (as Phenol)	mg/kg	5	Inorg-031	<5	[NT]	[NT]	[NT]	[NT]	101	[NT]

QUALITY CONTROL: Misc Inorg - Soil						Duplicate			Spike Recovery %	
Test Description	Units	PQL	Method	Blank	#	Base	Dup.	RPD	LCS-7	[NT]
Date prepared	-			27/09/2021	[NT]	[NT]	[NT]	[NT]	27/09/2021	[NT]
Date analysed	-			27/09/2021	[NT]	[NT]	[NT]	[NT]	27/09/2021	[NT]
pH 1:5 soil:water	pH Units		Inorg-001	[NT]	[NT]	[NT]	[NT]	[NT]	101	[NT]

Result Definitions

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

Quality Control Definitions

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

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

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

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

Laboratory Acceptance Criteria

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

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

Spikes for Physical and Aggregate Tests are not applicable.

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

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

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

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

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

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

Measurement Uncertainty estimates are available for most tests upon request.

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

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

Report Comments

BTEX/TRH/PAH/OCP/OP/Phenols/pH
Samples were out of the recommended holding time for this analysis.

Asbestos: A portion of the supplied sample was sub-sampled for asbestos analysis according to Envirolab procedures.
We cannot guarantee that this sub-sample is indicative of the entire sample. Envirolab recommends supplying 40-50g of sample in its own container.
Note: Samples 278761-3, 5, 8 were sub-sampled from jars provided by the client.

8 metals in soil - # Percent recovery is not applicable due to the high concentration of the element/s in the sample/s. However an acceptable recovery was obtained for the LCS.

Douglas Partners
Geotechnics / Environment / Groundwater

CHAIN OF CUSTODY DESPATCH SHEET

Project No:	202546.00	**Suburb:**	Cockle Bay	**To:**	*Envirolab Services*
Project Manager:	Rhys McMillan	**Order Number:**		**Sampler:**	*12 Ashley St, Chatswood NSW 2067*
Email:	Rhys.McMillan@douglaspartners.com.au / 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: Metals, TRH, PAH, OCP, OPP, PCB, Asbestos	Metals, TRH, PAH, Asbestos	Metals, PAH, Asbestos	VOC	pH	TOC	CEC	BTEX	Total phenols	Speciated phenols	TBT	Notes/ Preservation/ Additional Requirements
1	CP1	0.2	0.3	19/06/21														Contact DP before disposing samples
2	CP1	0.5	0.6	19/06/21														include Sn in metals
3	CP1	1	1.1	19/06/21			X				X				X			
4	CP1	1.5	1.6	19/06/21														
5	CP1	2	2.1	19/06/21					X		X							
6	CP1	2.5	2.6	19/06/21														
7	CP1	2.9	3	19/06/21														
8	BD01/180921								X									

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

Job No: 278761
Date Received: 22/09/21
Time Received: 1650
Received By: CM
Temp: Cool/Ambient
Cooling: Ice/Icepack
Security: Intact/Broken/None

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 211	**Phone:** (02) 9809 0666	
Relinquished by:	KP	**Date:** 15/09/2021	**Signed:**

LAB RECEIPT

Lab Ref. No:	
Received by:	Christine
Date & Time:	22/09/21 1650
Signed:	CM

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	Rhys McMillan

Sample Login Details

Your reference	202546.00, Cockle Bay
Envirolab Reference	278761
Date Sample Received	22/09/2021
Date Instructions Received	22/09/2021
Date Results Expected to be Reported	29/09/2021

Sample Condition

Samples received in appropriate condition for analysis	Yes
No. of Samples Provided	8 soil
Turnaround Time Requested	Standard
Temperature on Receipt (°C)	2
Cooling Method	Ice
Sampling Date Provided	YES

Comments

Nil

Please direct any queries to:

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

Analysis Underway, details on the following page:

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

Sample ID	vTRH(C6-C10)/BTEXN in Soil	svTRH (C10-C40) in Soil	PAHs in Soil	Organochlorine Pesticides in soil	Organophosphorus Pesticides in Soil	PCBsin Soil	Acid Extractable metalsin soil	Misc Soil - Inorg	Misc Inorg - Soil	Asbestos ID - soils	On Hold
CP1-0.2-0.3											✓
CP1-0.5-0.6											✓
CP1-1-1.1	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	
CP1-1.5-1.6											✓
CP1-2-2.1			✓				✓		✓	✓	
CP1-2.5-2.6											✓
CP1-2.9-3											✓
BD01 / 190921			✓				✓			✓	

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

Additional Info

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

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customerservice@envirolab.com.au
www.envirolab.com.au

CERTIFICATE OF ANALYSIS 278761-A

Client Details

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

Sample Details

Your Reference	**202546.00, Cockle Bay**
Number of Samples	additional analysis
Date samples received	22/09/2021
Date completed instructions received	29/09/2021

Analysis Details

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

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

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

Report Details

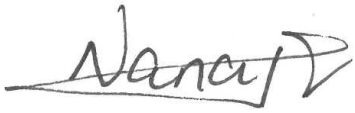
Date results requested by	07/10/2021
Date of Issue	07/10/2021

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

Results Approved By
Hannah Nguyen, Metals Supervisor

Authorised By



Nancy Zhang, Laboratory Manager

Metals from Leaching Fluid pH 2.9 or 5			
Our Reference		278761-A-3	278761-A-5
Your Reference	UNITS	CP1	CP1
Depth		1-1.1	2-2.1
Date Sampled		19/06/2021	19/06/2021
Type of sample		soil	soil
Date extracted	-	05/10/2021	05/10/2021
Date analysed	-	05/10/2021	05/10/2021
pH of soil for fluid# determ.	pH units	9.3	9.0
pH of soil TCLP (after HCl)	pH units	1.9	1.9
Extraction fluid used	-	1	1
pH of final Leachate	pH units	5.6	5.2
Lead	mg/L	11	3.3

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

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	-			05/10/2021	[NT]	[NT]	[NT]	[NT]	05/10/2021	[NT]
Date analysed	-			05/10/2021	[NT]	[NT]	[NT]	[NT]	05/10/2021	[NT]
Lead	mg/L	0.03	Metals-020	<0.03	[NT]	[NT]	[NT]	[NT]	91	[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 278761 202546.00, Cockle Bay

Ref: 278761-A.
TAT: Standard.
Due: 07/10/2021
MT

From: Kurt Plambeck <kurt.plambeck@douglaspartners.com.au>
Sent: Wednesday, 29 September 2021 5:46 PM
To: Greta Petzold <GPetzold@envirolab.com.au>
Subject: RE: Results for Registration 278761 202546.00, Cockle Bay

CAUTION: This email originated from outside of the organisation. Do not act on instructions, click links or open attachments unless you recognise the sender and know the content is authentic and safe.

Greta,

Can you please schedule TCLP for lead on sample CP1/1-1.1 (3) and CP1/2-2.1 (5).

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

If you are not the intended recipient of this email, please notify us immediately and be aware that any disclosure, copying, distribution or use of the contents of this information is prohibited.

From: Greta Petzold <GPetzold@envirolab.com.au>
Sent: Wednesday, 29 September 2021 5:29 PM
To: Rhys McMillan <Rhys.McMillan@douglaspartners.com.au>; Kurt Plambeck <kurt.plambeck@douglaspartners.com.au>
Subject: Results for Registration 278761 202546.00, Cockle Bay

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

Please note that a hard copy will not be posted.

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

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	202546.00, Cockle Bay
Envirolab Reference	278761-A
Date Sample Received	22/09/2021
Date Instructions Received	29/09/2021
Date Results Expected to be Reported	07/10/2021

Sample Condition

Samples received in appropriate condition for analysis	Yes
No. of Samples Provided	additional analysis
Turnaround Time Requested	Standard
Temperature on Receipt (°C)	2
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	pH of soil for fluid#determ.	pH of soil TCLP (after HCl)	Extraction fluid used	pH of final Leachate	Lead	On Hold
CP1-0.2-0.3						✓
CP1-0.5-0.6						✓
CP1-1-1.1	✓	✓	✓	✓	✓	
CP1-1.5-1.6						✓
CP1-2-2.1	✓	✓	✓	✓	✓	
CP1-2.5-2.6						✓
CP1-2.9-3						✓
BD01 / 180921						✓

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

Additional Info

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

Douglas Partners
Geotechnics | Environment | Groundwater

CHAIN OF CUSTODY DESPATCH SHEET

Project No:	202546.00	**Suburb:**	Cockle Bay	**To:**	*Envirolab Services*
Project Manager:	Rhys McMillan	**Order Number:**		**Sampler:**	*12 Ashley St, Chatswood NSW 2067.*
Email:	Rhys.McMillan@douglaspartners.com.au / 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: Metals, TRH, PAH, OCP, OPP, PCB, Asbestos	Metals, TRH, PAH, Asbestos	Metals, PAH, Asbestos	VOC	pH	TOC	CEC	BTEX	Total phenols	Speciated phenols	TBT	Notes/ Preservation/ Additional Requirements
	WD1			19/9														Contact DP before disposing samples
1	WD1	0.4	0.5				X									X	X	include Sn in metals
2	WD1	0.9	1.0						X									
3	WD2	0.2	0.3	20/9			X											

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

Job No: 279443
Date Received: 20/9/21
Time Received: 1130
Received By: AB
Temp: Cool/Ambient
Cooling: Ice/Icepack
Security: Intact/Broken/None

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 211	**Phone:** (02) 9809 0666	
Relinquished by:	KP	**Date:** 15/09/2021	**Signed:**

LAB RECEIPT

Lab Ref. No:	279443
Received by:	AB
Date & Time:	20/9/21 1130
Signed:	

Douglas Partners
Geotechnics | Environment | Groundwater

CHAIN OF CUSTODY DESPATCH SHEET

Project No:	202546.00	**Suburb:**	Cockle Bay	**To:**	*Envirolab Services*
Project Manager:	Rhys McMillan	**Order Number:**		**Dispatch date:**	**15/09/2021**
					12 Ashley St, Chatswood NSW 2067

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: Metals, TRH, PAH, OCP, OPP, PCB	Analytes: Metals, TRH, PAH, Asbestos	Analytes: Metals, PAH, Asbestos	Analytes: VOC	Analytes: ASS pH screen	Analytes: chromium suite / sulphate	Analytes: CEC	Analytes: BTEX	Analytes: Total phenols	Analytes: Speciated phenols	Analytes: TBT	Notes/ Preservation/ Additional Requirements
1	WD1	0.4	0.5	29/9							X							Bags
2		0.9	1.0								X							
3		1.4	1.5								X							
5		1.9	2.0						X		X	X						✓ Include Sn
6		4	4.45								X							
7		5.0									X							
8		7.0	7.05								X	X						

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

Job No: 279443
Date Received: 29/9/21
Time Received: 1130
Received By: AB
Temp: ~~Cool~~/Ambient
Cooling: Ice/~~Icepack~~
Security: ~~Intact~~/Broken/None

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	Rhys McMillan

Sample Login Details

Your reference	202546.00, Cockle Bay
Envirolab Reference	279443
Date Sample Received	29/09/2021
Date Instructions Received	29/09/2021
Date Results Expected to be Reported	08/10/2021

Sample Condition

Samples received in appropriate condition for analysis	Yes
No. of Samples Provided	8 Soil
Turnaround Time Requested	Standard
Temperature on Receipt (°C)	8
Cooling Method	Ice Pack
Sampling Date Provided	YES

Comments

Nil

Please direct any queries to:

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

Analysis Underway, details on the following page:

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

Sample ID	TRH in Soil (C6-C9) NEPM	svTRH (C10-C40) in Soil	PAHs in Soil	Organochlorine Pesticides in soil	Organophosphorus Pesticides in Soil	PCBsin Soil	Acid Extractable metalsin soil	Speciated Phenols in Soil	Asbestos ID - soils	Tributyl Tin in Soil	sPOCAS field test	Chromium Suite
WD1-0.4-0.5	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	
WD1-0.9-1.0			✓				✓		✓		✓	
WD2-0.2-0.3	✓	✓	✓	✓	✓	✓	✓		✓			
WD1-1.4-1.5											✓	
WD1-1.9-2.0			✓				✓		✓		✓	✓
WD1-4-4.45											✓	
WD1-5.0											✓	
WD1-7.0-7.05											✓	✓

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

Additional Info

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

Ming To

Subject: FW: Results for Registration 279443 202546.00, Cockle Bay

Ref: 279443-A
TAT: Standard
Due: 18/10/2021
MT.

279443-A

From: Kurt Plambeck <kurt.plambeck@douglaspartners.com.au>
Sent: Monday, 11 October 2021 2:21 PM
To: Greta Petzold <GPetzold@envirolab.com.au>
Subject: RE: Results for Registration 279443 202546.00, Cockle Bay

CAUTION: This email originated from outside of the organisation. Do not act on instructions, click links or open attachments unless you recognise the sender and know the content is authentic and safe.

Greta,

Can you please run sample WD1/1.9-2.0 (5) for TCLP on lead

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

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From: Greta Petzold <GPetzold@envirolab.com.au>
Sent: Friday, 8 October 2021 6:06 PM
To: Rhys McMillan <Rhys.McMillan@douglaspartners.com.au>; Kurt Plambeck <kurt.plambeck@douglaspartners.com.au>
Subject: Results for Registration 279443 202546.00, Cockle Bay

Hi Rhys,

Please find a prelim report attached. TBT results will be ready early next week. I will send a final report as soon as we receive these.

Have a great weekend

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

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

SAMPLE RECEIPT ADVICE

Client Details

Client	Douglas Partners Pty Ltd
Attention	Kurt Plambeck

Sample Login Details

Your reference	202546.00, Cockle Bay
Envirolab Reference	279443-A
Date Sample Received	29/09/2021
Date Instructions Received	11/10/2021
Date Results Expected to be Reported	18/10/2021

Sample Condition

Samples received in appropriate condition for analysis	Yes
No. of Samples Provided	additional analysis
Turnaround Time Requested	Standard
Temperature on Receipt (°C)	8
Cooling Method	Ice Pack
Sampling Date Provided	YES

Comments

Nil

Please direct any queries to:

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

Analysis Underway, details on the following page:

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

Sample ID	pH of soil for fluid#determ.	pH of soil TCLP (after HCl)	Extraction fluid used	pH of final Leachate	Lead	On Hold
WD1-0.4-0.5						✓
WD1-0.9-1.0						✓
WD2-0.2-0.3						✓
WD1-1.4-1.5						✓
WD1-1.9-2.0	✓	✓	✓	✓	✓	
WD1-4-4.45						✓
WD1-5.0						✓
WD1-7.0-7.05						✓
WD1 - [TRIPLICATE]-0.4-0.5						✓

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

Additional Info

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

ALS Environmental

CERTIFICATE OF ANALYSIS

Work Order	: **ES2132509**	Page	: 1 of 8
Client	: **DOUGLAS PARTNERS PTY LTD**	Laboratory	: Environmental Division Sydney
Contact	: RHYS MCMILLAN	Contact	: Sepan Mahamad
Address	: 96 HERMITAGE ROAD WEST RYDE NSW, AUSTRALIA 2114	Address	: 277-289 Woodpark Road Smithfield NSW Australia 2164
Telephone	: ----	Telephone	: +61 2 8784 8555
Project	: 202546.00	Date Samples Received	: 08-Sep-2021 09:25
Order number	: ----	Date Analysis Commenced	: 08-Sep-2021
C-O-C number	: ----	Issue Date	: 15-Sep-2021 16:23
Sampler	: ----		
Site	: Cockle Bay		
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*
Edwandy Fadjar	Organic Coordinator	Sydney Organics, Smithfield, NSW
Ivan Taylor	Analyst	Sydney Inorganics, 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.

- EP075 (SIM): Where reported, 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.
- EP080: Where reported, Total Xylenes is the sum of the reported concentrations of m&p-Xylene and o-Xylene at or above the LOR.
- EP074: Where reported, Total Trihalomethanes is the sum of the reported concentrations of all Trihalomethanes at or above the LOR.
- EP074: Where reported, Total Trimethylbenzenes is the sum of the reported concentrations of 1.2.3-Trimethylbenzene, 1.2.4-Trimethylbenzene and 1.3.5-Trimethylbenzene at or above the LOR.
- EP075(SIM): Where reported, Total Cresol is the sum of the reported concentrations of 2-Methylphenol and 3- & 4-Methylphenol at or above the LOR.
- EG035: Poor matrix spike recovery was obtained for Mercury on sample ES2132455 # 2. Confirmed by re-analysis.

Analytical Results

Sub-Matrix: WATER (Matrix: WATER)				Sample ID	BD1	----	----	----	----
				Sampling date / time	07-Sep-2021 00:00	----	----	----	----
Compound	CAS Number	LOR	Unit		ES2132509-001	--------	--------	--------	--------
					Result	----	----	----	----
EG020F: Dissolved Metals by ICP-MS									
Arsenic	7440-38-2	0.001	mg/L		<0.001	----	----	----	----
Cadmium	7440-43-9	0.0001	mg/L		<0.0001	----	----	----	----
Chromium	7440-47-3	0.001	mg/L		<0.001	----	----	----	----
Copper	7440-50-8	0.001	mg/L		**0.004**	----	----	----	----
Lead	7439-92-1	0.001	mg/L		<0.001	----	----	----	----
Nickel	7440-02-0	0.001	mg/L		**0.008**	----	----	----	----
Tin	7440-31-5	0.001	mg/L		<0.001	----	----	----	----
Zinc	7440-66-6	0.005	mg/L		<0.005	----	----	----	----
EG035F: Dissolved Mercury by FIMS									
Mercury	7439-97-6	0.0001	mg/L		<0.0001	----	----	----	----
EP074A: Monocyclic Aromatic Hydrocarbons									
Styrene	100-42-5	5	µg/L		<5	----	----	----	----
Isopropylbenzene	98-82-8	5	µg/L		<5	----	----	----	----
n-Propylbenzene	103-65-1	5	µg/L		<5	----	----	----	----
1.3.5-Trimethylbenzene	108-67-8	5	µg/L		<5	----	----	----	----
sec-Butylbenzene	135-98-8	5	µg/L		<5	----	----	----	----
1.2.4-Trimethylbenzene	95-63-6	5	µg/L		<5	----	----	----	----
tert-Butylbenzene	98-06-6	5	µg/L		<5	----	----	----	----
p-Isopropyltoluene	99-87-6	5	µg/L		<5	----	----	----	----
n-Butylbenzene	104-51-8	5	µg/L		<5	----	----	----	----
EP074B: Oxygenated Compounds									
Vinyl Acetate	108-05-4	50	µg/L		<50	----	----	----	----
2-Butanone (MEK)	78-93-3	50	µg/L		<50	----	----	----	----
4-Methyl-2-pentanone (MIBK)	108-10-1	50	µg/L		<50	----	----	----	----
2-Hexanone (MBK)	591-78-6	50	µg/L		<50	----	----	----	----
EP074C: Sulfonated Compounds									
Carbon disulfide	75-15-0	5	µg/L		<5	----	----	----	----
EP074D: Fumigants									
2.2-Dichloropropane	594-20-7	5	µg/L		<5	----	----	----	----
1.2-Dichloropropane	78-87-5	5	µg/L		<5	----	----	----	----
cis-1.3-Dichloropropylene	10061-01-5	5	µg/L		<5	----	----	----	----
trans-1.3-Dichloropropylene	10061-02-6	5	µg/L		<5	----	----	----	----
1.2-Dibromoethane (EDB)	106-93-4	5	µg/L		<5	----	----	----	----
EP074E: Halogenated Aliphatic Compounds									

Analytical Results

Sub-Matrix: WATER (Matrix: WATER)				Sample ID	BD1	----	----	----	----
				Sampling date / time	07-Sep-2021 00:00	----	----	----	----
Compound	CAS Number	LOR	Unit		ES2132509-001	--------	--------	--------	--------
					Result	----	----	----	----
EP074E: Halogenated Aliphatic Compounds - Continued									
Dichlorodifluoromethane	75-71-8	50	µg/L		<50	----	----	----	----
Chloromethane	74-87-3	50	µg/L		<50	----	----	----	----
Vinyl chloride	75-01-4	50	µg/L		<50	----	----	----	----
Bromomethane	74-83-9	50	µg/L		<50	----	----	----	----
Chloroethane	75-00-3	50	µg/L		<50	----	----	----	----
Trichlorofluoromethane	75-69-4	50	µg/L		<50	----	----	----	----
1.1-Dichloroethene	75-35-4	5	µg/L		<5	----	----	----	----
Iodomethane	74-88-4	5	µg/L		<5	----	----	----	----
trans-1.2-Dichloroethene	156-60-5	5	µg/L		<5	----	----	----	----
1.1-Dichloroethane	75-34-3	5	µg/L		<5	----	----	----	----
cis-1.2-Dichloroethene	156-59-2	5	µg/L		<5	----	----	----	----
1.1.1-Trichloroethane	71-55-6	5	µg/L		<5	----	----	----	----
1.1-Dichloropropylene	563-58-6	5	µg/L		<5	----	----	----	----
Carbon Tetrachloride	56-23-5	5	µg/L		<5	----	----	----	----
1.2-Dichloroethane	107-06-2	5	µg/L		<5	----	----	----	----
Trichloroethene	79-01-6	5	µg/L		<5	----	----	----	----
Dibromomethane	74-95-3	5	µg/L		<5	----	----	----	----
1.1.2-Trichloroethane	79-00-5	5	µg/L		<5	----	----	----	----
1.3-Dichloropropane	142-28-9	5	µg/L		<5	----	----	----	----
Tetrachloroethene	127-18-4	5	µg/L		<5	----	----	----	----
1.1.1.2-Tetrachloroethane	630-20-6	5	µg/L		<5	----	----	----	----
trans-1.4-Dichloro-2-butene	110-57-6	5	µg/L		<5	----	----	----	----
cis-1.4-Dichloro-2-butene	1476-11-5	5	µg/L		<5	----	----	----	----
1.1.2.2-Tetrachloroethane	79-34-5	5	µg/L		<5	----	----	----	----
1.2.3-Trichloropropane	96-18-4	5	µg/L		<5	----	----	----	----
Pentachloroethane	76-01-7	5	µg/L		<5	----	----	----	----
1.2-Dibromo-3-chloropropane	96-12-8	5	µg/L		<5	----	----	----	----
Hexachlorobutadiene	87-68-3	5	µg/L		<5	----	----	----	----
EP074F: Halogenated Aromatic Compounds									
Chlorobenzene	108-90-7	5	µg/L		<5	----	----	----	----
Bromobenzene	108-86-1	5	µg/L		<5	----	----	----	----
2-Chlorotoluene	95-49-8	5	µg/L		<5	----	----	----	----
4-Chlorotoluene	106-43-4	5	µg/L		<5	----	----	----	----
1.3-Dichlorobenzene	541-73-1	5	µg/L		<5	----	----	----	----
1.4-Dichlorobenzene	106-46-7	5	µg/L		<5	----	----	----	----

Analytical Results

Sub-Matrix: WATER (Matrix: WATER)				Sample ID	BD1	----	----	----	----
				Sampling date / time	07-Sep-2021 00:00	----	----	----	----
Compound	CAS Number	LOR	Unit		ES2132509-001	--------	--------	--------	--------
					Result	----	----	----	----
EP074F: Halogenated Aromatic Compounds - Continued									
1.2-Dichlorobenzene	95-50-1	5	µg/L		<5	----	----	----	----
1.2.4-Trichlorobenzene	120-82-1	5	µg/L		<5	----	----	----	----
1.2.3-Trichlorobenzene	87-61-6	5	µg/L		<5	----	----	----	----
EP074G: Trihalomethanes									
Chloroform	67-66-3	5	µg/L		<5	----	----	----	----
Bromodichloromethane	75-27-4	5	µg/L		<5	----	----	----	----
Dibromochloromethane	124-48-1	5	µg/L		<5	----	----	----	----
Bromoform	75-25-2	5	µg/L		<5	----	----	----	----
EP075(SIM)A: Phenolic Compounds									
Phenol	108-95-2	1.0	µg/L		<1.0	----	----	----	----
2-Chlorophenol	95-57-8	1.0	µg/L		<1.0	----	----	----	----
2-Methylphenol	95-48-7	1.0	µg/L		<1.0	----	----	----	----
3- & 4-Methylphenol	1319-77-3	2.0	µg/L		<2.0	----	----	----	----
2-Nitrophenol	88-75-5	1.0	µg/L		<1.0	----	----	----	----
2.4-Dimethylphenol	105-67-9	1.0	µg/L		<1.0	----	----	----	----
2.4-Dichlorophenol	120-83-2	1.0	µg/L		<1.0	----	----	----	----
2.6-Dichlorophenol	87-65-0	1.0	µg/L		<1.0	----	----	----	----
4-Chloro-3-methylphenol	59-50-7	1.0	µg/L		<1.0	----	----	----	----
2.4.6-Trichlorophenol	88-06-2	1.0	µg/L		<1.0	----	----	----	----
2.4.5-Trichlorophenol	95-95-4	1.0	µg/L		<1.0	----	----	----	----
Pentachlorophenol	87-86-5	2.0	µg/L		<2.0	----	----	----	----
EP075(SIM)B: Polynuclear Aromatic Hydrocarbons									
Naphthalene	91-20-3	1.0	µg/L		<1.0	----	----	----	----
Acenaphthylene	208-96-8	1.0	µg/L		<1.0	----	----	----	----
Acenaphthene	83-32-9	1.0	µg/L		<1.0	----	----	----	----
Fluorene	86-73-7	1.0	µg/L		<1.0	----	----	----	----
Phenanthrene	85-01-8	1.0	µg/L		<1.0	----	----	----	----
Anthracene	120-12-7	1.0	µg/L		<1.0	----	----	----	----
Fluoranthene	206-44-0	1.0	µg/L		<1.0	----	----	----	----
Pyrene	129-00-0	1.0	µg/L		<1.0	----	----	----	----
Benz(a)anthracene	56-55-3	1.0	µg/L		<1.0	----	----	----	----
Chrysene	218-01-9	1.0	µg/L		<1.0	----	----	----	----
Benzo(b+j)fluoranthene	205-99-2 205-82-3	1.0	µg/L		<1.0	----	----	----	----
Benzo(k)fluoranthene	207-08-9	1.0	µg/L		<1.0	----	----	----	----

Analytical Results

Sub-Matrix: WATER (Matrix: WATER)				Sample ID	BD1	----	----	----	----
				Sampling date / time	07-Sep-2021 00:00	----	----	----	----
Compound	CAS Number	LOR	Unit		ES2132509-001	--------	--------	--------	--------
					Result	----	----	----	----
EP075(SIM)B: Polynuclear Aromatic Hydrocarbons - Continued									
Benzo(a)pyrene	50-32-8	0.5	µg/L		<0.5	----	----	----	----
Indeno(1.2.3.cd)pyrene	193-39-5	1.0	µg/L		<1.0	----	----	----	----
Dibenz(a.h)anthracene	53-70-3	1.0	µg/L		<1.0	----	----	----	----
Benzo(g.h.i)perylene	191-24-2	1.0	µg/L		<1.0	----	----	----	----
^ Sum of polycyclic aromatic hydrocarbons	----	0.5	µg/L		<0.5	----	----	----	----
^ Benzo(a)pyrene TEQ (zero)	----	0.5	µg/L		<0.5	----	----	----	----
EP080/071: Total Petroleum Hydrocarbons									
C6 - C9 Fraction	----	20	µg/L		<20	----	----	----	----
C10 - C14 Fraction	----	50	µg/L		<50	----	----	----	----
C15 - C28 Fraction	----	100	µg/L		<100	----	----	----	----
C29 - C36 Fraction	----	50	µg/L		<50	----	----	----	----
^ C10 - C36 Fraction (sum)	----	50	µg/L		<50	----	----	----	----
EP080/071: Total Recoverable Hydrocarbons - NEPM 2013 Fractions									
C6 - C10 Fraction	C6_C10	20	µg/L		<20	----	----	----	----
^ C6 - C10 Fraction minus BTEX (F1)	C6_C10-BTEX	20	µg/L		<20	----	----	----	----
>C10 - C16 Fraction	----	100	µg/L		<100	----	----	----	----
>C16 - C34 Fraction	----	100	µg/L		<100	----	----	----	----
>C34 - C40 Fraction	----	100	µg/L		<100	----	----	----	----
^ >C10 - C40 Fraction (sum)	----	100	µg/L		<100	----	----	----	----
^ >C10 - C16 Fraction minus Naphthalene (F2)	----	100	µg/L		<100	----	----	----	----
EP080: BTEXN									
Benzene	71-43-2	1	µg/L		<1	----	----	----	----
Toluene	108-88-3	2	µg/L		<2	----	----	----	----
Ethylbenzene	100-41-4	2	µg/L		<2	----	----	----	----
meta- & para-Xylene	108-38-3 106-42-3	2	µg/L		<2	----	----	----	----
ortho-Xylene	95-47-6	2	µg/L		<2	----	----	----	----
^ Total Xylenes	----	2	µg/L		<2	----	----	----	----
^ Sum of BTEX	----	1	µg/L		<1	----	----	----	----
Naphthalene	91-20-3	5	µg/L		<5	----	----	----	----
EP074S: VOC Surrogates									
1.2-Dichloroethane-D4	17060-07-0	5	%		130	----	----	----	----
Toluene-D8	2037-26-5	5	%		128	----	----	----	----

Analytical Results

Sub-Matrix: WATER (Matrix: WATER)				Sample ID	BD1	----	----	----	----
				Sampling date / time	07-Sep-2021 00:00	----	----	----	----
Compound	CAS Number	LOR	Unit		ES2132509-001	--------	--------	--------	--------
					Result	----	----	----	----
EP074S: VOC Surrogates - Continued									
4-Bromofluorobenzene	460-00-4	5	%		**119**	----	----	----	----
EP075(SIM)S: Phenolic Compound Surrogates									
Phenol-d6	13127-88-3	1.0	%		**19.2**	----	----	----	----
2-Chlorophenol-D4	93951-73-6	1.0	%		**41.7**	----	----	----	----
2.4.6-Tribromophenol	118-79-6	1.0	%		**36.3**	----	----	----	----
EP075(SIM)T: PAH Surrogates									
2-Fluorobiphenyl	321-60-8	1.0	%		**51.0**	----	----	----	----
Anthracene-d10	1719-06-8	1.0	%		**75.4**	----	----	----	----
4-Terphenyl-d14	1718-51-0	1.0	%		**99.9**	----	----	----	----
EP080S: TPH(V)/BTEX Surrogates									
1.2-Dichloroethane-D4	17060-07-0	2	%		**121**	----	----	----	----
Toluene-D8	2037-26-5	2	%		**116**	----	----	----	----
4-Bromofluorobenzene	460-00-4	2	%		**113**	----	----	----	----

Surrogate Control Limits

Sub-Matrix: **WATER**

Compound	CAS Number	Recovery Limits (%) Low	High
EP074S: VOC Surrogates			
1.2-Dichloroethane-D4	17060-07-0	78	133
Toluene-D8	2037-26-5	79	129
4-Bromofluorobenzene	460-00-4	81	124
EP075(SIM)S: Phenolic Compound Surrogates			
Phenol-d6	13127-88-3	10	44
2-Chlorophenol-D4	93951-73-6	14	94
2.4.6-Tribromophenol	118-79-6	17	125
EP075(SIM)T: PAH Surrogates			
2-Fluorobiphenyl	321-60-8	20	104
Anthracene-d10	1719-06-8	27	113
4-Terphenyl-d14	1718-51-0	32	112
EP080S: TPH(V)/BTEX Surrogates			
1.2-Dichloroethane-D4	17060-07-0	71	137
Toluene-D8	2037-26-5	79	131
4-Bromofluorobenzene	460-00-4	70	128

QUALITY CONTROL REPORT

Work Order	: **ES2132509**	Page	: 1 of 11
Client	: **DOUGLAS PARTNERS PTY LTD**	Laboratory	: Environmental Division Sydney
Contact	: RHYS MCMILLAN	Contact	: Sepan Mahamad
Address	: 96 HERMITAGE ROAD WEST RYDE NSW, AUSTRALIA 2114	Address	: 277-289 Woodpark Road Smithfield NSW Australia 2164
Telephone	: ----	Telephone	: +61 2 8784 8555
Project	: 202546.00	Date Samples Received	: 08-Sep-2021
Order number	: ----	Date Analysis Commenced	: 08-Sep-2021
C-O-C number	: ----	Issue Date	: 15-Sep-2021
Sampler	: ----		
Site	: Cockle Bay		
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*
Edwandy Fadjar	Organic Coordinator	Sydney Organics, Smithfield, NSW
Ivan Taylor	Analyst	Sydney Inorganics, 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: **WATER**

				Laboratory Duplicate (DUP) Report					
Laboratory sample ID	Sample ID	Method: Compound	CAS Number	LOR	Unit	Original Result	Duplicate Result	RPD (%)	Acceptable RPD (%)
EG020F: Dissolved Metals by ICP-MS (QC Lot: 3895200)									
ES2132455-001	Anonymous	EG020A-F: Cadmium	7440-43-9	0.0001	mg/L	<0.0001	<0.0001	0.0	No Limit
		EG020A-F: Arsenic	7440-38-2	0.001	mg/L	<0.001	<0.001	0.0	No Limit
		EG020A-F: Chromium	7440-47-3	0.001	mg/L	<0.001	<0.001	0.0	No Limit
		EG020A-F: Copper	7440-50-8	0.001	mg/L	<0.001	<0.001	0.0	No Limit
		EG020A-F: Lead	7439-92-1	0.001	mg/L	<0.001	<0.001	0.0	No Limit
		EG020A-F: Nickel	7440-02-0	0.001	mg/L	<0.001	<0.001	0.0	No Limit
		EG020A-F: Tin	7440-31-5	0.001	mg/L	<0.001	<0.001	0.0	No Limit
		EG020A-F: Zinc	7440-66-6	0.005	mg/L	0.023	0.021	8.3	No Limit
WN2110184-001	Anonymous	EG020A-F: Cadmium	7440-43-9	0.0001	mg/L	<0.0001	<0.0001	0.0	No Limit
		EG020A-F: Arsenic	7440-38-2	0.001	mg/L	<0.001	<0.001	0.0	No Limit
		EG020A-F: Chromium	7440-47-3	0.001	mg/L	<0.001	<0.001	0.0	No Limit
		EG020A-F: Copper	7440-50-8	0.001	mg/L	0.004	0.004	0.0	No Limit
		EG020A-F: Lead	7439-92-1	0.001	mg/L	<0.001	<0.001	0.0	No Limit
		EG020A-F: Nickel	7440-02-0	0.001	mg/L	<0.001	<0.001	0.0	No Limit
		EG020A-F: Tin	7440-31-5	0.001	mg/L	<0.001	<0.001	0.0	No Limit
		EG020A-F: Zinc	7440-66-6	0.005	mg/L	0.011	0.011	0.0	No Limit
EG035F: Dissolved Mercury by FIMS (QC Lot: 3895201)									
ES2132455-004	Anonymous	EG035F: Mercury	7439-97-6	0.0001	mg/L	<0.0001	<0.0001	0.0	No Limit
ES2132627-003	Anonymous	EG035F: Mercury	7439-97-6	0.0001	mg/L	<0.0001	<0.0001	0.0	No Limit
EP074A: Monocyclic Aromatic Hydrocarbons (QC Lot: 3896451)									
ES2132500-015	Anonymous	EP074: Styrene	100-42-5	5	µg/L	<5	<5	0.0	No Limit
		EP074: Isopropylbenzene	98-82-8	5	µg/L	<5	<5	0.0	No Limit
		EP074: n-Propylbenzene	103-65-1	5	µg/L	<5	<5	0.0	No Limit
		EP074: 1.3.5-Trimethylbenzene	108-67-8	5	µg/L	<5	<5	0.0	No Limit

Sub-Matrix: **WATER**

				Laboratory Duplicate (DUP) Report					
Laboratory sample ID	*Sample ID*	*Method: Compound*	*CAS Number*	*LOR*	*Unit*	*Original Result*	*Duplicate Result*	*RPD (%)*	*Acceptable RPD (%)*
EP074A: Monocyclic Aromatic Hydrocarbons (QC Lot: 3896451) - continued									
ES2132500-015	Anonymous	EP074: sec-Butylbenzene	135-98-8	5	µg/L	<5	<5	0.0	No Limit
		EP074: 1.2.4-Trimethylbenzene	95-63-6	5	µg/L	<5	<5	0.0	No Limit
		EP074: tert-Butylbenzene	98-06-6	5	µg/L	<5	<5	0.0	No Limit
		EP074: p-Isopropyltoluene	99-87-6	5	µg/L	<5	<5	0.0	No Limit
		EP074: n-Butylbenzene	104-51-8	5	µg/L	<5	<5	0.0	No Limit
ES2132739-001	Anonymous	EP074: Styrene	100-42-5	5	µg/L	<5	<5	0.0	No Limit
		EP074: Isopropylbenzene	98-82-8	5	µg/L	<5	<5	0.0	No Limit
		EP074: n-Propylbenzene	103-65-1	5	µg/L	<5	<5	0.0	No Limit
		EP074: 1.3.5-Trimethylbenzene	108-67-8	5	µg/L	<5	<5	0.0	No Limit
		EP074: sec-Butylbenzene	135-98-8	5	µg/L	<5	<5	0.0	No Limit
		EP074: 1.2.4-Trimethylbenzene	95-63-6	5	µg/L	<5	<5	0.0	No Limit
		EP074: tert-Butylbenzene	98-06-6	5	µg/L	<5	<5	0.0	No Limit
		EP074: p-Isopropyltoluene	99-87-6	5	µg/L	<5	<5	0.0	No Limit
		EP074: n-Butylbenzene	104-51-8	5	µg/L	<5	<5	0.0	No Limit
EP074B: Oxygenated Compounds (QC Lot: 3896451)									
ES2132500-015	Anonymous	EP074: Vinyl Acetate	108-05-4	50	µg/L	<50	<50	0.0	No Limit
		EP074: 2-Butanone (MEK)	78-93-3	50	µg/L	<50	<50	0.0	No Limit
		EP074: 4-Methyl-2-pentanone (MIBK)	108-10-1	50	µg/L	<50	<50	0.0	No Limit
		EP074: 2-Hexanone (MBK)	591-78-6	50	µg/L	<50	<50	0.0	No Limit
ES2132739-001	Anonymous	EP074: Vinyl Acetate	108-05-4	50	µg/L	<50	<50	0.0	No Limit
		EP074: 2-Butanone (MEK)	78-93-3	50	µg/L	<50	<50	0.0	No Limit
		EP074: 4-Methyl-2-pentanone (MIBK)	108-10-1	50	µg/L	<50	<50	0.0	No Limit
		EP074: 2-Hexanone (MBK)	591-78-6	50	µg/L	<50	<50	0.0	No Limit
EP074C: Sulfonated Compounds (QC Lot: 3896451)									
ES2132500-015	Anonymous	EP074: Carbon disulfide	75-15-0	5	µg/L	<5	<5	0.0	No Limit
ES2132739-001	Anonymous	EP074: Carbon disulfide	75-15-0	5	µg/L	<5	<5	0.0	No Limit
EP074D: Fumigants (QC Lot: 3896451)									
ES2132500-015	Anonymous	EP074: 2.2-Dichloropropane	594-20-7	5	µg/L	<5	<5	0.0	No Limit
		EP074: 1.2-Dichloropropane	78-87-5	5	µg/L	<5	<5	0.0	No Limit
		EP074: cis-1.3-Dichloropropylene	10061-01-5	5	µg/L	<5	<5	0.0	No Limit
		EP074: trans-1.3-Dichloropropylene	10061-02-6	5	µg/L	<5	<5	0.0	No Limit
		EP074: 1.2-Dibromoethane (EDB)	106-93-4	5	µg/L	<5	<5	0.0	No Limit
ES2132739-001	Anonymous	EP074: 2.2-Dichloropropane	594-20-7	5	µg/L	<5	<5	0.0	No Limit
		EP074: 1.2-Dichloropropane	78-87-5	5	µg/L	<5	<5	0.0	No Limit
		EP074: cis-1.3-Dichloropropylene	10061-01-5	5	µg/L	<5	<5	0.0	No Limit
		EP074: trans-1.3-Dichloropropylene	10061-02-6	5	µg/L	<5	<5	0.0	No Limit
		EP074: 1.2-Dibromoethane (EDB)	106-93-4	5	µg/L	<5	<5	0.0	No Limit
EP074E: Halogenated Aliphatic Compounds (QC Lot: 3896451)									
ES2132500-015	Anonymous	EP074: 1.1-Dichloroethene	75-35-4	5	µg/L	<5	<5	0.0	No Limit

Sub-Matrix: **WATER**

				Laboratory Duplicate (DUP) Report					
Laboratory sample ID	*Sample ID*	*Method: Compound*	*CAS Number*	*LOR*	*Unit*	*Original Result*	*Duplicate Result*	*RPD (%)*	*Acceptable RPD (%)*
EP074E: Halogenated Aliphatic Compounds (QC Lot: 3896451) - continued									
ES2132500-015	Anonymous	EP074: Iodomethane	74-88-4	5	µg/L	<5	<5	0.0	No Limit
		EP074: trans-1.2-Dichloroethene	156-60-5	5	µg/L	<5	<5	0.0	No Limit
		EP074: 1.1-Dichloroethane	75-34-3	5	µg/L	<5	<5	0.0	No Limit
		EP074: cis-1.2-Dichloroethene	156-59-2	5	µg/L	<5	<5	0.0	No Limit
		EP074: 1.1.1-Trichloroethane	71-55-6	5	µg/L	<5	<5	0.0	No Limit
		EP074: 1.1-Dichloropropylene	563-58-6	5	µg/L	<5	<5	0.0	No Limit
		EP074: Carbon Tetrachloride	56-23-5	5	µg/L	<5	<5	0.0	No Limit
		EP074: 1.2-Dichloroethane	107-06-2	5	µg/L	<5	<5	0.0	No Limit
		EP074: Trichloroethene	79-01-6	5	µg/L	<5	<5	0.0	No Limit
		EP074: Dibromomethane	74-95-3	5	µg/L	<5	<5	0.0	No Limit
		EP074: 1.1.2-Trichloroethane	79-00-5	5	µg/L	<5	<5	0.0	No Limit
		EP074: 1.3-Dichloropropane	142-28-9	5	µg/L	<5	<5	0.0	No Limit
		EP074: Tetrachloroethene	127-18-4	5	µg/L	<5	<5	0.0	No Limit
		EP074: 1.1.1.2-Tetrachloroethane	630-20-6	5	µg/L	<5	<5	0.0	No Limit
		EP074: trans-1.4-Dichloro-2-butene	110-57-6	5	µg/L	<5	<5	0.0	No Limit
		EP074: cis-1.4-Dichloro-2-butene	1476-11-5	5	µg/L	<5	<5	0.0	No Limit
		EP074: 1.1.2.2-Tetrachloroethane	79-34-5	5	µg/L	<5	<5	0.0	No Limit
		EP074: 1.2.3-Trichloropropane	96-18-4	5	µg/L	<5	<5	0.0	No Limit
		EP074: Pentachloroethane	76-01-7	5	µg/L	<5	<5	0.0	No Limit
		EP074: 1.2-Dibromo-3-chloropropane	96-12-8	5	µg/L	<5	<5	0.0	No Limit
		EP074: Hexachlorobutadiene	87-68-3	5	µg/L	<5	<5	0.0	No Limit
		EP074: Dichlorodifluoromethane	75-71-8	50	µg/L	<50	<50	0.0	No Limit
		EP074: Chloromethane	74-87-3	50	µg/L	<50	<50	0.0	No Limit
		EP074: Vinyl chloride	75-01-4	50	µg/L	<50	<50	0.0	No Limit
		EP074: Bromomethane	74-83-9	50	µg/L	<50	<50	0.0	No Limit
		EP074: Chloroethane	75-00-3	50	µg/L	<50	<50	0.0	No Limit
		EP074: Trichlorofluoromethane	75-69-4	50	µg/L	<50	<50	0.0	No Limit
ES2132739-001	Anonymous	EP074: 1.1-Dichloroethene	75-35-4	5	µg/L	<5	<5	0.0	No Limit
		EP074: Iodomethane	74-88-4	5	µg/L	<5	<5	0.0	No Limit
		EP074: trans-1.2-Dichloroethene	156-60-5	5	µg/L	<5	<5	0.0	No Limit
		EP074: 1.1-Dichloroethane	75-34-3	5	µg/L	<5	<5	0.0	No Limit
		EP074: cis-1.2-Dichloroethene	156-59-2	5	µg/L	<5	<5	0.0	No Limit
		EP074: 1.1.1-Trichloroethane	71-55-6	5	µg/L	<5	<5	0.0	No Limit
		EP074: 1.1-Dichloropropylene	563-58-6	5	µg/L	<5	<5	0.0	No Limit
		EP074: Carbon Tetrachloride	56-23-5	5	µg/L	<5	<5	0.0	No Limit
		EP074: 1.2-Dichloroethane	107-06-2	5	µg/L	<5	<5	0.0	No Limit
		EP074: Trichloroethene	79-01-6	5	µg/L	<5	<5	0.0	No Limit
		EP074: Dibromomethane	74-95-3	5	µg/L	<5	<5	0.0	No Limit
		EP074: 1.1.2-Trichloroethane	79-00-5	5	µg/L	<5	<5	0.0	No Limit
		EP074: 1.3-Dichloropropane	142-28-9	5	µg/L	<5	<5	0.0	No Limit

Sub-Matrix: **WATER**

				Laboratory Duplicate (DUP) Report					
Laboratory sample ID	*Sample ID*	*Method: Compound*	*CAS Number*	*LOR*	*Unit*	*Original Result*	*Duplicate Result*	*RPD (%)*	*Acceptable RPD (%)*
EP074E: Halogenated Aliphatic Compounds (QC Lot: 3896451) - continued									
ES2132739-001	Anonymous	EP074: Tetrachloroethene	127-18-4	5	µg/L	<5	<5	0.0	No Limit
		EP074: 1.1.1.2-Tetrachloroethane	630-20-6	5	µg/L	<5	<5	0.0	No Limit
		EP074: trans-1.4-Dichloro-2-butene	110-57-6	5	µg/L	<5	<5	0.0	No Limit
		EP074: cis-1.4-Dichloro-2-butene	1476-11-5	5	µg/L	<5	<5	0.0	No Limit
		EP074: 1.1.2.2-Tetrachloroethane	79-34-5	5	µg/L	<5	<5	0.0	No Limit
		EP074: 1.2.3-Trichloropropane	96-18-4	5	µg/L	<5	<5	0.0	No Limit
		EP074: Pentachloroethane	76-01-7	5	µg/L	<5	<5	0.0	No Limit
		EP074: 1.2-Dibromo-3-chloropropane	96-12-8	5	µg/L	<5	<5	0.0	No Limit
		EP074: Hexachlorobutadiene	87-68-3	5	µg/L	<5	<5	0.0	No Limit
		EP074: Dichlorodifluoromethane	75-71-8	50	µg/L	<50	<50	0.0	No Limit
		EP074: Chloromethane	74-87-3	50	µg/L	<50	<50	0.0	No Limit
		EP074: Vinyl chloride	75-01-4	50	µg/L	<50	<50	0.0	No Limit
		EP074: Bromomethane	74-83-9	50	µg/L	<50	<50	0.0	No Limit
		EP074: Chloroethane	75-00-3	50	µg/L	<50	<50	0.0	No Limit
		EP074: Trichlorofluoromethane	75-69-4	50	µg/L	<50	<50	0.0	No Limit
EP074F: Halogenated Aromatic Compounds (QC Lot: 3896451)									
ES2132500-015	Anonymous	EP074: Chlorobenzene	108-90-7	5	µg/L	<5	<5	0.0	No Limit
		EP074: Bromobenzene	108-86-1	5	µg/L	<5	<5	0.0	No Limit
		EP074: 2-Chlorotoluene	95-49-8	5	µg/L	<5	<5	0.0	No Limit
		EP074: 4-Chlorotoluene	106-43-4	5	µg/L	<5	<5	0.0	No Limit
		EP074: 1.3-Dichlorobenzene	541-73-1	5	µg/L	<5	<5	0.0	No Limit
		EP074: 1.4-Dichlorobenzene	106-46-7	5	µg/L	<5	<5	0.0	No Limit
		EP074: 1.2-Dichlorobenzene	95-50-1	5	µg/L	<5	<5	0.0	No Limit
		EP074: 1.2.4-Trichlorobenzene	120-82-1	5	µg/L	<5	<5	0.0	No Limit
		EP074: 1.2.3-Trichlorobenzene	87-61-6	5	µg/L	<5	<5	0.0	No Limit
ES2132739-001	Anonymous	EP074: Chlorobenzene	108-90-7	5	µg/L	<5	<5	0.0	No Limit
		EP074: Bromobenzene	108-86-1	5	µg/L	<5	<5	0.0	No Limit
		EP074: 2-Chlorotoluene	95-49-8	5	µg/L	<5	<5	0.0	No Limit
		EP074: 4-Chlorotoluene	106-43-4	5	µg/L	<5	<5	0.0	No Limit
		EP074: 1.3-Dichlorobenzene	541-73-1	5	µg/L	<5	<5	0.0	No Limit
		EP074: 1.4-Dichlorobenzene	106-46-7	5	µg/L	<5	<5	0.0	No Limit
		EP074: 1.2-Dichlorobenzene	95-50-1	5	µg/L	<5	<5	0.0	No Limit
		EP074: 1.2.4-Trichlorobenzene	120-82-1	5	µg/L	<5	<5	0.0	No Limit
		EP074: 1.2.3-Trichlorobenzene	87-61-6	5	µg/L	<5	<5	0.0	No Limit
EP074G: Trihalomethanes (QC Lot: 3896451)									
ES2132500-015	Anonymous	EP074: Chloroform	67-66-3	5	µg/L	<5	<5	0.0	No Limit
		EP074: Bromodichloromethane	75-27-4	5	µg/L	<5	<5	0.0	No Limit
		EP074: Dibromochloromethane	124-48-1	5	µg/L	<5	<5	0.0	No Limit
		EP074: Bromoform	75-25-2	5	µg/L	<5	<5	0.0	No Limit
ES2132739-001	Anonymous	EP074: Chloroform	67-66-3	5	µg/L	<5	<5	0.0	No Limit

Sub-Matrix: **WATER**

				Laboratory Duplicate (DUP) Report					
Laboratory sample ID	*Sample ID*	*Method: Compound*	*CAS Number*	*LOR*	*Unit*	*Original Result*	*Duplicate Result*	*RPD (%)*	*Acceptable RPD (%)*
EP074G: Trihalomethanes (QC Lot: 3896451) - continued									
ES2132739-001	Anonymous	EP074: Bromodichloromethane	75-27-4	5	µg/L	<5	<5	0.0	No Limit
		EP074: Dibromochloromethane	124-48-1	5	µg/L	<5	<5	0.0	No Limit
		EP074: Bromoform	75-25-2	5	µg/L	<5	<5	0.0	No Limit
EP080/071: Total Petroleum Hydrocarbons (QC Lot: 3896450)									
ES2132500-015	Anonymous	EP080: C6 - C9 Fraction	----	20	µg/L	<20	<20	0.0	No Limit
ES2132739-001	Anonymous	EP080: C6 - C9 Fraction	----	20	µg/L	<20	<20	0.0	No Limit
EP080/071: Total Recoverable Hydrocarbons - NEPM 2013 Fractions (QC Lot: 3896450)									
ES2132500-015	Anonymous	EP080: C6 - C10 Fraction	C6_C10	20	µg/L	<20	<20	0.0	No Limit
ES2132739-001	Anonymous	EP080: C6 - C10 Fraction	C6_C10	20	µg/L	<20	<20	0.0	No Limit
EP080: BTEXN (QC Lot: 3896450)									
ES2132500-015	Anonymous	EP080: Benzene	71-43-2	1	µg/L	<1	<1	0.0	No Limit
		EP080: Toluene	108-88-3	2	µg/L	<2	<2	0.0	No Limit
		EP080: Ethylbenzene	100-41-4	2	µg/L	<2	<2	0.0	No Limit
		EP080: meta- & para-Xylene	108-38-3 106-42-3	2	µg/L	<2	<2	0.0	No Limit
		EP080: ortho-Xylene	95-47-6	2	µg/L	<2	<2	0.0	No Limit
		EP080: Naphthalene	91-20-3	5	µg/L	<5	<5	0.0	No Limit
ES2132739-001	Anonymous	EP080: Benzene	71-43-2	1	µg/L	<1	<1	0.0	No Limit
		EP080: Toluene	108-88-3	2	µg/L	<2	<2	0.0	No Limit
		EP080: Ethylbenzene	100-41-4	2	µg/L	<2	<2	0.0	No Limit
		EP080: meta- & para-Xylene	108-38-3 106-42-3	2	µg/L	<2	<2	0.0	No Limit
		EP080: ortho-Xylene	95-47-6	2	µg/L	<2	<2	0.0	No Limit
		EP080: Naphthalene	91-20-3	5	µg/L	<5	<5	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: **WATER**

				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
EG020F: Dissolved Metals by ICP-MS (QCLot: 3895200)								
EG020A-F: Arsenic	7440-38-2	0.001	mg/L	<0.001	0.1 mg/L	93.1	85.0	114
EG020A-F: Cadmium	7440-43-9	0.0001	mg/L	<0.0001	0.1 mg/L	94.0	84.0	110
EG020A-F: Chromium	7440-47-3	0.001	mg/L	<0.001	0.1 mg/L	91.6	85.0	111
EG020A-F: Copper	7440-50-8	0.001	mg/L	<0.001	0.1 mg/L	92.8	81.0	111
EG020A-F: Lead	7439-92-1	0.001	mg/L	<0.001	0.1 mg/L	90.4	83.0	111
EG020A-F: Nickel	7440-02-0	0.001	mg/L	<0.001	0.1 mg/L	92.7	82.0	112
EG020A-F: Tin	7440-31-5	0.001	mg/L	<0.001	0.1 mg/L	99.2	77.0	115
EG020A-F: Zinc	7440-66-6	0.005	mg/L	<0.005	0.1 mg/L	95.5	81.0	117
EG035F: Dissolved Mercury by FIMS (QCLot: 3895201)								
EG035F: Mercury	7439-97-6	0.0001	mg/L	<0.0001	0.01 mg/L	102	83.0	105
EP074A: Monocyclic Aromatic Hydrocarbons (QCLot: 3896451)								
EP074: Styrene	100-42-5	5	µg/L	<5	10 µg/L	96.4	73.0	119
EP074: Isopropylbenzene	98-82-8	5	µg/L	<5	10 µg/L	95.1	76.0	118
EP074: n-Propylbenzene	103-65-1	5	µg/L	<5	10 µg/L	92.1	69.0	119
EP074: 1.3.5-Trimethylbenzene	108-67-8	5	µg/L	<5	10 µg/L	94.1	74.0	116
EP074: sec-Butylbenzene	135-98-8	5	µg/L	<5	10 µg/L	91.4	73.0	119
EP074: 1.2.4-Trimethylbenzene	95-63-6	5	µg/L	<5	10 µg/L	95.2	74.0	116
EP074: tert-Butylbenzene	98-06-6	5	µg/L	<5	10 µg/L	92.3	72.0	116
EP074: p-Isopropyltoluene	99-87-6	5	µg/L	<5	10 µg/L	92.2	71.0	119
EP074: n-Butylbenzene	104-51-8	5	µg/L	<5	10 µg/L	90.8	65.0	123
EP074B: Oxygenated Compounds (QCLot: 3896451)								
EP074: Vinyl Acetate	108-05-4	50	µg/L	<50	100 µg/L	103	61.4	134
EP074: 2-Butanone (MEK)	78-93-3	50	µg/L	<50	100 µg/L	83.2	73.6	130
EP074: 4-Methyl-2-pentanone (MIBK)	108-10-1	50	µg/L	<50	100 µg/L	107	66.0	132
EP074: 2-Hexanone (MBK)	591-78-6	50	µg/L	<50	100 µg/L	89.6	65.0	137
EP074C: Sulfonated Compounds (QCLot: 3896451)								
EP074: Carbon disulfide	75-15-0	5	µg/L	<5	10 µg/L	91.5	72.8	127
EP074D: Fumigants (QCLot: 3896451)								
EP074: 2.2-Dichloropropane	594-20-7	5	µg/L	<5	10 µg/L	95.6	68.0	122
EP074: 1.2-Dichloropropane	78-87-5	5	µg/L	<5	10 µg/L	99.0	76.0	118
EP074: cis-1.3-Dichloropropylene	10061-01-5	5	µg/L	<5	10 µg/L	99.1	62.0	120
EP074: trans-1.3-Dichloropropylene	10061-02-6	5	µg/L	<5	10 µg/L	101	60.0	114
EP074: 1.2-Dibromoethane (EDB)	106-93-4	5	µg/L	<5	10 µg/L	99.4	69.0	117
EP074E: Halogenated Aliphatic Compounds (QCLot: 3896451)								

Sub-Matrix: **WATER**

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
EP074E: Halogenated Aliphatic Compounds (QCLot: 3896451) - continued								
EP074: Dichlorodifluoromethane	75-71-8	50	µg/L	<50	100 µg/L	73.6	60.6	138
EP074: Chloromethane	74-87-3	50	µg/L	<50	100 µg/L	87.2	67.4	130
EP074: Vinyl chloride	75-01-4	50	µg/L	<50	100 µg/L	83.9	69.4	129
EP074: Bromomethane	74-83-9	50	µg/L	<50	100 µg/L	82.6	56.0	140
EP074: Chloroethane	75-00-3	50	µg/L	<50	100 µg/L	92.0	61.0	139
EP074: Trichlorofluoromethane	75-69-4	50	µg/L	<50	100 µg/L	92.4	69.0	131
EP074: 1.1-Dichloroethene	75-35-4	5	µg/L	<5	10 µg/L	90.4	70.0	124
EP074: Iodomethane	74-88-4	5	µg/L	<5	10 µg/L	80.4	70.2	128
EP074: trans-1.2-Dichloroethene	156-60-5	5	µg/L	<5	10 µg/L	94.3	74.0	118
EP074: 1.1-Dichloroethane	75-34-3	5	µg/L	<5	10 µg/L	97.5	74.0	120
EP074: cis-1.2-Dichloroethene	156-59-2	5	µg/L	<5	10 µg/L	99.9	77.0	119
EP074: 1.1.1-Trichloroethane	71-55-6	5	µg/L	<5	10 µg/L	95.0	67.0	119
EP074: 1.1-Dichloropropylene	563-58-6	5	µg/L	<5	10 µg/L	94.2	73.0	119
EP074: Carbon Tetrachloride	56-23-5	5	µg/L	<5	10 µg/L	96.0	62.0	120
EP074: 1.2-Dichloroethane	107-06-2	5	µg/L	<5	10 µg/L	98.5	73.0	123
EP074: Trichloroethene	79-01-6	5	µg/L	<5	10 µg/L	97.0	76.0	118
EP074: Dibromomethane	74-95-3	5	µg/L	<5	10 µg/L	103	73.0	119
EP074: 1.1.2-Trichloroethane	79-00-5	5	µg/L	<5	10 µg/L	98.7	72.0	126
EP074: 1.3-Dichloropropane	142-28-9	5	µg/L	<5	10 µg/L	99.8	71.0	129
EP074: Tetrachloroethene	127-18-4	5	µg/L	<5	10 µg/L	87.2	72.0	124
EP074: 1.1.1.2-Tetrachloroethane	630-20-6	5	µg/L	<5	10 µg/L	94.0	66.0	114
EP074: trans-1.4-Dichloro-2-butene	110-57-6	5	µg/L	<5	10 µg/L	94.8	60.0	120
EP074: cis-1.4-Dichloro-2-butene	1476-11-5	5	µg/L	<5	10 µg/L	98.6	70.6	128
EP074: 1.1.2.2-Tetrachloroethane	79-34-5	5	µg/L	<5	10 µg/L	100	70.0	124
EP074: 1.2.3-Trichloropropane	96-18-4	5	µg/L	<5	10 µg/L	99.6	74.0	126
EP074: Pentachloroethane	76-01-7	5	µg/L	<5	10 µg/L	97.2	71.8	126
EP074: 1.2-Dibromo-3-chloropropane	96-12-8	5	µg/L	<5	10 µg/L	88.4	66.4	136
EP074: Hexachlorobutadiene	87-68-3	5	µg/L	<5	10 µg/L	86.9	58.0	130
EP074F: Halogenated Aromatic Compounds (QCLot: 3896451)								
EP074: Chlorobenzene	108-90-7	5	µg/L	<5	10 µg/L	95.1	79.0	117
EP074: Bromobenzene	108-86-1	5	µg/L	<5	10 µg/L	93.8	76.0	116
EP074: 2-Chlorotoluene	95-49-8	5	µg/L	<5	10 µg/L	94.4	73.0	119
EP074: 4-Chlorotoluene	106-43-4	5	µg/L	<5	10 µg/L	92.9	73.0	119
EP074: 1.3-Dichlorobenzene	541-73-1	5	µg/L	<5	10 µg/L	92.1	75.0	117
EP074: 1.4-Dichlorobenzene	106-46-7	5	µg/L	<5	10 µg/L	92.4	74.0	118
EP074: 1.2-Dichlorobenzene	95-50-1	5	µg/L	<5	10 µg/L	91.3	75.0	117
EP074: 1.2.4-Trichlorobenzene	120-82-1	5	µg/L	<5	10 µg/L	86.6	61.0	125
EP074: 1.2.3-Trichlorobenzene	87-61-6	5	µg/L	<5	10 µg/L	86.2	67.0	123
EP074G: Trihalomethanes (QCLot: 3896451)								

Sub-Matrix: **WATER**

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
EP074G: Trihalomethanes (QCLot: 3896451) - continued								
EP074: Chloroform	67-66-3	5	µg/L	<5	10 µg/L	99.0	72.0	120
EP074: Bromodichloromethane	75-27-4	5	µg/L	<5	10 µg/L	100	64.0	118
EP074: Dibromochloromethane	124-48-1	5	µg/L	<5	10 µg/L	95.9	65.0	115
EP074: Bromoform	75-25-2	5	µg/L	<5	10 µg/L	101	73.5	126
EP075(SIM)A: Phenolic Compounds (QCLot: 3890941)								
EP075(SIM): Phenol	108-95-2	1	µg/L	<1.0	5 µg/L	44.4	24.5	61.9
EP075(SIM): 2-Chlorophenol	95-57-8	1	µg/L	<1.0	5 µg/L	66.7	52.0	90.0
EP075(SIM): 2-Methylphenol	95-48-7	1	µg/L	<1.0	5 µg/L	69.9	51.0	91.0
EP075(SIM): 3- & 4-Methylphenol	1319-77-3	2	µg/L	<2.0	10 µg/L	65.7	44.0	88.0
EP075(SIM): 2-Nitrophenol	88-75-5	1	µg/L	<1.0	5 µg/L	68.6	48.0	100
EP075(SIM): 2.4-Dimethylphenol	105-67-9	1	µg/L	<1.0	5 µg/L	68.8	49.0	99.0
EP075(SIM): 2.4-Dichlorophenol	120-83-2	1	µg/L	<1.0	5 µg/L	77.6	53.0	105
EP075(SIM): 2.6-Dichlorophenol	87-65-0	1	µg/L	<1.0	5 µg/L	72.7	57.0	105
EP075(SIM): 4-Chloro-3-methylphenol	59-50-7	1	µg/L	<1.0	5 µg/L	76.9	53.0	99.0
EP075(SIM): 2.4.6-Trichlorophenol	88-06-2	1	µg/L	<1.0	5 µg/L	80.3	50.0	106
EP075(SIM): 2.4.5-Trichlorophenol	95-95-4	1	µg/L	<1.0	5 µg/L	78.8	51.0	105
EP075(SIM): Pentachlorophenol	87-86-5	2	µg/L	<2.0	10 µg/L	30.0	10.0	95.0
EP075(SIM)B: Polynuclear Aromatic Hydrocarbons (QCLot: 3890941)								
EP075(SIM): Naphthalene	91-20-3	1	µg/L	<1.0	5 µg/L	71.5	50.0	94.0
EP075(SIM): Acenaphthylene	208-96-8	1	µg/L	<1.0	5 µg/L	75.5	63.6	114
EP075(SIM): Acenaphthene	83-32-9	1	µg/L	<1.0	5 µg/L	75.8	62.2	113
EP075(SIM): Fluorene	86-73-7	1	µg/L	<1.0	5 µg/L	77.6	63.9	115
EP075(SIM): Phenanthrene	85-01-8	1	µg/L	<1.0	5 µg/L	86.8	62.6	116
EP075(SIM): Anthracene	120-12-7	1	µg/L	<1.0	5 µg/L	73.7	64.3	116
EP075(SIM): Fluoranthene	206-44-0	1	µg/L	<1.0	5 µg/L	95.5	63.6	118
EP075(SIM): Pyrene	129-00-0	1	µg/L	<1.0	5 µg/L	94.8	63.1	118
EP075(SIM): Benz(a)anthracene	56-55-3	1	µg/L	<1.0	5 µg/L	95.0	64.1	117
EP075(SIM): Chrysene	218-01-9	1	µg/L	<1.0	5 µg/L	86.6	62.5	116
EP075(SIM): Benzo(b+j)fluoranthene	205-99-2 205-82-3	1	µg/L	<1.0	5 µg/L	97.0	61.7	119
EP075(SIM): Benzo(k)fluoranthene	207-08-9	1	µg/L	<1.0	5 µg/L	88.5	63.0	115
EP075(SIM): Benzo(a)pyrene	50-32-8	0.5	µg/L	<0.5	5 µg/L	89.8	63.3	117
EP075(SIM): Indeno(1.2.3.cd)pyrene	193-39-5	1	µg/L	<1.0	5 µg/L	79.2	59.9	118
EP075(SIM): Dibenz(a.h)anthracene	53-70-3	1	µg/L	<1.0	5 µg/L	72.3	61.2	117
EP075(SIM): Benzo(g.h.i)perylene	191-24-2	1	µg/L	<1.0	5 µg/L	78.6	59.1	118
EP080/071: Total Petroleum Hydrocarbons (QCLot: 3890939)								
EP071: C10 - C14 Fraction	----	50	µg/L	<50	400 µg/L	87.1	55.8	112
EP071: C15 - C28 Fraction	----	100	µg/L	<100	600 µg/L	82.2	71.6	113

Sub-Matrix: **WATER**

Method: Compound	CAS Number	LOR	Unit	Method Blank (MB) Report: Result	Laboratory Control Spike (LCS) Report: Spike Concentration	Spike Recovery (%): LCS	Acceptable Limits (%): Low	Acceptable Limits (%): High
EP080/071: Total Petroleum Hydrocarbons (QCLot: 3890939) - continued								
EP071: C29 - C36 Fraction	----	50	µg/L	<50	400 µg/L	94.8	56.0	121
EP080/071: Total Petroleum Hydrocarbons (QCLot: 3896450)								
EP080: C6 - C9 Fraction	----	20	µg/L	<20	260 µg/L	89.4	75.0	127
EP080/071: Total Recoverable Hydrocarbons - NEPM 2013 Fractions (QCLot: 3890939)								
EP071: >C10 - C16 Fraction	----	100	µg/L	<100	500 µg/L	85.8	57.9	119
EP071: >C16 - C34 Fraction	----	100	µg/L	<100	700 µg/L	77.0	62.5	110
EP071: >C34 - C40 Fraction	----	100	µg/L	<100	300 µg/L	89.3	61.5	121
EP080/071: Total Recoverable Hydrocarbons - NEPM 2013 Fractions (QCLot: 3896450)								
EP080: C6 - C10 Fraction	C6_C10	20	µg/L	<20	310 µg/L	90.8	75.0	127
EP080: BTEXN (QCLot: 3896450)								
EP080: Benzene	71-43-2	1	µg/L	<1	10 µg/L	104	70.0	122
EP080: Toluene	108-88-3	2	µg/L	<2	10 µg/L	105	69.0	123
EP080: Ethylbenzene	100-41-4	2	µg/L	<2	10 µg/L	98.4	70.0	120
EP080: meta- & para-Xylene	108-38-3 106-42-3	2	µg/L	<2	10 µg/L	102	69.0	121
EP080: ortho-Xylene	95-47-6	2	µg/L	<2	10 µg/L	104	72.0	122
EP080: Naphthalene	91-20-3	5	µg/L	<5	10 µg/L	85.7	70.0	120

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: **WATER**

Laboratory sample ID	Sample ID	Method: Compound	CAS Number	Matrix Spike (MS) Report: Spike Concentration	SpikeRecovery(%): MS	Acceptable Limits (%): Low	Acceptable Limits (%): High
EG020F: Dissolved Metals by ICP-MS (QCLot: 3895200)							
ES2132455-003	Anonymous	EG020A-F: Arsenic	7440-38-2	1 mg/L	123	70.0	130
		EG020A-F: Cadmium	7440-43-9	0.25 mg/L	126	70.0	130
		EG020A-F: Chromium	7440-47-3	1 mg/L	123	70.0	130
		EG020A-F: Copper	7440-50-8	1 mg/L	126	70.0	130
		EG020A-F: Lead	7439-92-1	1 mg/L	127	70.0	130
		EG020A-F: Nickel	7440-02-0	1 mg/L	124	70.0	130
		EG020A-F: Zinc	7440-66-6	1 mg/L	126	70.0	130
EG035F: Dissolved Mercury by FIMS (QCLot: 3895201)							
ES2132455-002	Anonymous	EG035F: Mercury	7439-97-6	0.01 mg/L	# 57.6	70.0	130
EP074E: Halogenated Aliphatic Compounds (QCLot: 3896451)							
ES2132500-015	Anonymous	EP074: 1.1-Dichloroethene	75-35-4	25 µg/L	130	70.0	130

Sub-Matrix: **WATER**

				Matrix Spike (MS) Report			
				Spike	SpikeRecovery(%)	Acceptable Limits (%)	
Laboratory sample ID	Sample ID	Method: Compound	CAS Number	Concentration	MS	Low	High
EP074E: Halogenated Aliphatic Compounds (QCLot: 3896451) - continued							
ES2132500-015	Anonymous	EP074: Trichloroethene	79-01-6	25 µg/L	128	70.0	130
EP074F: Halogenated Aromatic Compounds (QCLot: 3896451)							
ES2132500-015	Anonymous	EP074: Chlorobenzene	108-90-7	25 µg/L	124	70.0	130
EP080/071: Total Petroleum Hydrocarbons (QCLot: 3896450)							
ES2132500-015	Anonymous	EP080: C6 - C9 Fraction	----	325 µg/L	115	70.0	130
EP080/071: Total Recoverable Hydrocarbons - NEPM 2013 Fractions (QCLot: 3896450)							
ES2132500-015	Anonymous	EP080: C6 - C10 Fraction	C6_C10	375 µg/L	115	70.0	130
EP080: BTEXN (QCLot: 3896450)							
ES2132500-015	Anonymous	EP080: Benzene	71-43-2	25 µg/L	116	70.0	130
		EP080: Toluene	108-88-3	25 µg/L	112	70.0	130
		EP080: Ethylbenzene	100-41-4	25 µg/L	110	70.0	130
		EP080: meta- & para-Xylene	108-38-3 106-42-3	25 µg/L	110	70.0	130
		EP080: ortho-Xylene	95-47-6	25 µg/L	111	70.0	130
		EP080: Naphthalene	91-20-3	25 µg/L	87.8	70.0	130

ALS Environmental

QA/QC Compliance Assessment to assist with Quality Review

Work Order	: **ES2132509**	Page	: 1 of 5
Client	: **DOUGLAS PARTNERS PTY LTD**	Laboratory	: Environmental Division Sydney
Contact	: RHYS MCMILLAN	Telephone	: +61 2 8784 8555
Project	: 202546.00	Date Samples Received	: 08-Sep-2021
Site	: Cockle Bay	Issue Date	: 15-Sep-2021
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.**
- **Matrix Spike outliers exist - please see following pages for full details.**
- **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

- **Quality Control Sample Frequency Outliers exist - please see following pages for full details.**

Outliers : Quality Control Samples

Duplicates, Method Blanks, Laboratory Control Samples and Matrix Spikes

Matrix: **WATER**

Compound Group Name	Laboratory Sample ID	Client Sample ID	Analyte	CAS Number	Data	Limits	Comment
Matrix Spike (MS) Recoveries							
EG035F: Dissolved Mercury by FIMS	ES2132455--002	Anonymous	**Mercury**	7439-97-6	57.6 %	70.0-130%	**Recovery less than lower data quality objective**

Outliers : Frequency of Quality Control Samples

Matrix: **WATER**

Quality Control Sample Type	Count		Rate (%)		Quality Control Specification
Method	QC	Regular	Actual	Expected	
Laboratory Duplicates (DUP)					
PAH/Phenols (GC/MS - SIM)	0	2	0.00	10.00	NEPM 2013 B3 & ALS QC Standard
TRH - Semivolatile Fraction	0	8	0.00	10.00	NEPM 2013 B3 & ALS QC Standard
Matrix Spikes (MS)					
PAH/Phenols (GC/MS - SIM)	0	2	0.00	5.00	NEPM 2013 B3 & ALS QC Standard
TRH - Semivolatile Fraction	0	8	0.00	5.00	NEPM 2013 B3 & ALS QC Standard

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: **WATER**

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*
EG020F: Dissolved Metals by ICP-MS							
Clear Plastic Bottle - Nitric Acid; Filtered (EG020A-F)							
BD1	**07-Sep-2021**	**----**	----	----	**10-Sep-2021**	06-Mar-2022	✓
EG035F: Dissolved Mercury by FIMS							
Clear Plastic Bottle - Nitric Acid; Filtered (EG035F)							
BD1	**07-Sep-2021**	**----**	----	----	**13-Sep-2021**	05-Oct-2021	✓
EP074A: Monocyclic Aromatic Hydrocarbons							
Clear glass VOC vial - HCl (EP074)							
BD1	**07-Sep-2021**	**13-Sep-2021**	21-Sep-2021	✓	**13-Sep-2021**	21-Sep-2021	✓
EP074B: Oxygenated Compounds							
Clear glass VOC vial - HCl (EP074)							
BD1	**07-Sep-2021**	**13-Sep-2021**	21-Sep-2021	✓	**13-Sep-2021**	21-Sep-2021	✓

Matrix: **WATER**

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
EP074C: Sulfonated Compounds							
Clear glass VOC vial - HCl (EP074)							
BD1	**07-Sep-2021**	**13-Sep-2021**	21-Sep-2021	✓	**13-Sep-2021**	21-Sep-2021	✓
EP074D: Fumigants							
Clear glass VOC vial - HCl (EP074)							
BD1	**07-Sep-2021**	**13-Sep-2021**	21-Sep-2021	✓	**13-Sep-2021**	21-Sep-2021	✓
EP074E: Halogenated Aliphatic Compounds							
Clear glass VOC vial - HCl (EP074)							
BD1	**07-Sep-2021**	**13-Sep-2021**	21-Sep-2021	✓	**13-Sep-2021**	21-Sep-2021	✓
EP074F: Halogenated Aromatic Compounds							
Clear glass VOC vial - HCl (EP074)							
BD1	**07-Sep-2021**	**13-Sep-2021**	21-Sep-2021	✓	**13-Sep-2021**	21-Sep-2021	✓
EP074G: Trihalomethanes							
Clear glass VOC vial - HCl (EP074)							
BD1	**07-Sep-2021**	**13-Sep-2021**	21-Sep-2021	✓	**13-Sep-2021**	21-Sep-2021	✓
EP075(SIM)A: Phenolic Compounds							
Amber Glass Bottle - Unpreserved (EP075(SIM))							
BD1	**07-Sep-2021**	**08-Sep-2021**	14-Sep-2021	✓	**10-Sep-2021**	18-Oct-2021	✓
EP075(SIM)B: Polynuclear Aromatic Hydrocarbons							
Amber Glass Bottle - Unpreserved (EP075(SIM))							
BD1	**07-Sep-2021**	**08-Sep-2021**	14-Sep-2021	✓	**10-Sep-2021**	18-Oct-2021	✓
EP080/071: Total Petroleum Hydrocarbons							
Amber Glass Bottle - Unpreserved (EP071)							
BD1	**07-Sep-2021**	**08-Sep-2021**	14-Sep-2021	✓	**10-Sep-2021**	18-Oct-2021	✓
Clear glass VOC vial - HCl (EP080)							
BD1	**07-Sep-2021**	**13-Sep-2021**	21-Sep-2021	✓	**13-Sep-2021**	21-Sep-2021	✓
EP080/071: Total Recoverable Hydrocarbons - NEPM 2013 Fractions							
Amber Glass Bottle - Unpreserved (EP071)							
BD1	**07-Sep-2021**	**08-Sep-2021**	14-Sep-2021	✓	**10-Sep-2021**	18-Oct-2021	✓
Clear glass VOC vial - HCl (EP080)							
BD1	**07-Sep-2021**	**13-Sep-2021**	21-Sep-2021	✓	**13-Sep-2021**	21-Sep-2021	✓
EP080: BTEXN							
Clear glass VOC vial - HCl (EP080)							
BD1	**07-Sep-2021**	**13-Sep-2021**	21-Sep-2021	✓	**13-Sep-2021**	21-Sep-2021	✓

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: **WATER**

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)							
Dissolved Mercury by FIMS	EG035F	2	16	**12.50**	**10.00**	✓	NEPM 2013 B3 & ALS QC Standard
Dissolved Metals by ICP-MS - Suite A	EG020A-F	2	17	**11.76**	**10.00**	✓	NEPM 2013 B3 & ALS QC Standard
PAH/Phenols (GC/MS - SIM)	EP075(SIM)	0	2	**0.00**	**10.00**	×	NEPM 2013 B3 & ALS QC Standard
TRH - Semivolatile Fraction	EP071	0	8	**0.00**	**10.00**	×	NEPM 2013 B3 & ALS QC Standard
TRH Volatiles/BTEX	EP080	2	13	**15.38**	**10.00**	✓	NEPM 2013 B3 & ALS QC Standard
Volatile Organic Compounds	EP074	2	13	**15.38**	**10.00**	✓	NEPM 2013 B3 & ALS QC Standard
Laboratory Control Samples (LCS)							
Dissolved Mercury by FIMS	EG035F	1	16	**6.25**	**5.00**	✓	NEPM 2013 B3 & ALS QC Standard
Dissolved Metals by ICP-MS - Suite A	EG020A-F	1	17	**5.88**	**5.00**	✓	NEPM 2013 B3 & ALS QC Standard
PAH/Phenols (GC/MS - SIM)	EP075(SIM)	1	2	**50.00**	**5.00**	✓	NEPM 2013 B3 & ALS QC Standard
TRH - Semivolatile Fraction	EP071	1	8	**12.50**	**5.00**	✓	NEPM 2013 B3 & ALS QC Standard
TRH Volatiles/BTEX	EP080	1	13	**7.69**	**5.00**	✓	NEPM 2013 B3 & ALS QC Standard
Volatile Organic Compounds	EP074	1	13	**7.69**	**5.00**	✓	NEPM 2013 B3 & ALS QC Standard
Method Blanks (MB)							
Dissolved Mercury by FIMS	EG035F	1	16	**6.25**	**5.00**	✓	NEPM 2013 B3 & ALS QC Standard
Dissolved Metals by ICP-MS - Suite A	EG020A-F	1	17	**5.88**	**5.00**	✓	NEPM 2013 B3 & ALS QC Standard
PAH/Phenols (GC/MS - SIM)	EP075(SIM)	1	2	**50.00**	**5.00**	✓	NEPM 2013 B3 & ALS QC Standard
TRH - Semivolatile Fraction	EP071	1	8	**12.50**	**5.00**	✓	NEPM 2013 B3 & ALS QC Standard
TRH Volatiles/BTEX	EP080	1	13	**7.69**	**5.00**	✓	NEPM 2013 B3 & ALS QC Standard
Volatile Organic Compounds	EP074	1	13	**7.69**	**5.00**	✓	NEPM 2013 B3 & ALS QC Standard
Matrix Spikes (MS)							
Dissolved Mercury by FIMS	EG035F	1	16	**6.25**	**5.00**	✓	NEPM 2013 B3 & ALS QC Standard
Dissolved Metals by ICP-MS - Suite A	EG020A-F	1	17	**5.88**	**5.00**	✓	NEPM 2013 B3 & ALS QC Standard
PAH/Phenols (GC/MS - SIM)	EP075(SIM)	0	2	**0.00**	**5.00**	×	NEPM 2013 B3 & ALS QC Standard
TRH - Semivolatile Fraction	EP071	0	8	**0.00**	**5.00**	×	NEPM 2013 B3 & ALS QC Standard
TRH Volatiles/BTEX	EP080	1	13	**7.69**	**5.00**	✓	NEPM 2013 B3 & ALS QC Standard
Volatile Organic Compounds	EP074	1	13	**7.69**	**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
Dissolved Metals by ICP-MS - Suite A	EG020A-F	WATER	In house: Referenced to APHA 3125; USEPA SW846 - 6020, ALS QWI-EN/EG020. Samples are 0.45µm filtered prior to analysis. The ICPMS technique utilizes a highly efficient argon plasma to ionize selected elements. Ions are then passed into a high vacuum mass spectrometer, which separates the analytes based on their distinct mass to charge ratios prior to their measurement by a discrete dynode ion detector.
Dissolved Mercury by FIMS	EG035F	WATER	In house: Referenced to AS 3550, APHA 3112 Hg - B (Flow-injection (SnCl2)(Cold Vapour generation) AAS) Samples are 0.45µm filtered prior to analysis. FIM-AAS is an automated flameless atomic absorption technique. A bromate/bromide reagent is used to oxidise any organic mercury compounds in the filtered sample. The ionic mercury is reduced online to atomic mercury vapour by SnCl2 which is then purged into a heated quartz cell. Quantification is by comparing absorbance against a calibration curve. This method is compliant with NEPM Schedule B(3).
TRH - Semivolatile Fraction	EP071	WATER	In house: Referenced to USEPA SW 846 - 8015 The sample extract is analysed by Capillary GC/FID and quantification is by comparison against an established 5 point calibration curve of n-Alkane standards. This method is compliant with the QC requirements of NEPM Schedule B(3)
Volatile Organic Compounds	EP074	WATER	In house: Referenced to USEPA SW 846 - 8260 Water samples are directly purged prior to analysis by Capillary GC/MS and quantification is by comparison against an established 5 point calibration curve. This method is compliant with NEPM Schedule B(3)
PAH/Phenols (GC/MS - SIM)	EP075(SIM)	WATER	In house: Referenced to USEPA SW 846 - 8270 Sample extracts are analysed by Capillary GC/MS in SIM Mode 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	WATER	In house: Referenced to USEPA SW 846 - 8260 Water samples are directly purged prior to analysis by Capillary GC/MS and quantification is by comparison against an established 5 point calibration curve. Alternatively, a sample is equilibrated in a headspace vial and a portion of the headspace determined by GCMS analysis. This method is compliant with the QC requirements of NEPM Schedule B(3)

Preparation Methods	Method	Matrix	Method Descriptions
Separatory Funnel Extraction of Liquids	ORG14	WATER	In house: Referenced to USEPA SW 846 - 3510 100 mL to 1L of sample is transferred to a separatory funnel and serially extracted three times using DCM for each extract. The resultant extracts are combined, dehydrated and concentrated for analysis. This method is compliant with NEPM Schedule B(3) . ALS default excludes sediment which may be resident in the container.
Volatiles Water Preparation	ORG16-W	WATER	A 5 mL aliquot or 5 mL of a diluted sample is added to a 40 mL VOC vial for purging.

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CHAIN OF CUSTODY DESPATCH SHEET

Project No:	202546.00	**Suburb:**	Cockle Bay	**To:**	*Envirolab Services*
Project Manager:	Rhys McMillan	**Order Number:**		**Sampler:**	*12 Ashley St, Chatswood NSW 2067*
Email:	Rhys.McMillan@douglaspartners.com.au / 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: 9 metals(incl Sn)	PAH, TRH, BTEX	speciated phenols	VOC	OCP, OPP, PCB	TBT	iron (total, feric and ferrous)	TSS	oil and grease	BTEX		Notes/ Preservation/ Additional Requirements
1	SS2						X	X	X	X	X	X	X	X	X			
2	CP2						X	X	X	X	X	X	X	X	X			
3	CW2						X	X	X	X	X	X	X	X	X			
4	CW3						X	X	X	X	X	X	X	X	X			
5	CW5						X	X	X	X	X	X	X	X	X			
6	CW6						X	X	X	X	X	X	X	X	X			
—	BD1/	(1)					X	X	X	X								inter
7	BD2/						X	X	X	X								intra
8	spike															X		
9	blank															X		
10	rinsate						X	X	X	X								

ENVIROLAB GROUP
Environmental Division Sydney
Work Order Reference
ES2132509
Telephone : + 61-2-8784 8555

Job No: 277283
Date Received: 03/09/21
Time Received: 1645
Received By: CH
Temp: Cool/Ambient
Cooling: Ice/Icepack

Metals to analyse:		**LAB RECEIPT**	
Number of samples in container:	**Transported to laboratory by:**	**Lab Ref. No:**	
Send results to:	Douglas Partners Pty Ltd	**Received by:**	Christina
Address:	96 Hermitage Road, West Ryde NSW 211	**Phone:** (02) 9809 0666	**Date & Time:** 03/09/21 1645
Relinquished by:	**Date:**	**Signed:**	**Signed:**

ELS MD
KBM 7/9/21, 1135

rec FAN 8/9/21 9:25

Douglas Partners
Geotechnics | Environment | Groundwater

CHAIN OF CUSTODY DESPATCH SHEET

Project No:	202546.00	**Suburb:**	Cockle Bay	**To:**	*Envirolab Services*
Project Manager:	Rhys McMillan	**Order Number:**		**Sampler:**	*12 Ashley St, Chatswood NSW 2067.*
Email:	Rhys.McMillan@douglaspartners.com.au / 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: Metals, TRH, PAH, OCP, OPP, PCB, Asbestos	Metals, TRH, PAH, Asbestos	Metals, PAH, Asbestos	VOC	pH	TOC	CEC	BTEX	Total phenols	Speciated phenols	TBT	Notes/ Preservation/ Additional Requirements
	WD1			19/9														Contact DP before disposing samples
1	WD1	0.4	0.5				X									X	X	include Sn in metals
2	WD1	0.9	1.0						X									
3	WD2	0.2	0.3	20/9			X											

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

Job No: 279443
Date Received: 20/9/21
Time Received: 1130
Received By: AB
Temp: Cool/Ambient
Cooling: Ice/Icepack
Security: Intact/Broken/None

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 211	**Phone:** (02) 9809 0666	
Relinquished by:	KP	**Date:** 15/09/2021	**Signed:**

LAB RECEIPT

Lab Ref. No:	279443
Received by:	AB
Date & Time:	20/9/21 1130
Signed:	

Douglas Partners
Geotechnics | Environment | Groundwater

CHAIN OF CUSTODY DESPATCH SHEET

Project No:	202546.00	**Suburb:**	Cockle Bay	**To:**	*Envirolab Services*
Project Manager:	Rhys McMillan	**Order Number:**		**Dispatch date:**	**15/09/2021**
					12 Ashley St, Chatswood NSW 2067

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: Metals, TRH, PAH, OCP, OPP, PCB	Analytes: Metals, TRH, PAH, Asbestos	Analytes: Metals, PAH, Asbestos	Analytes: VOC	Analytes: ASS pH screen	Analytes: chromium suite / sulphate	Analytes: CEC	Analytes: BTEX	Analytes: Total phenols	Analytes: Speciated phenols	Analytes: TBT	Notes/ Preservation/ Additional Requirements
1	WD1	0.4	0.5	29/9							X							Bags
2		0.9	1.0								X							
3		1.4	1.5								X							
5		1.9	2.0						X		X	X						✓ Include Sn
6		4	4.45								X							
7		5.0									X							
8		7.0	7.05								X	X						

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

Job No: 279443
Date Received: 29/9/21
Time Received: 1130
Received By: AB
Temp: ~~Cool~~/Ambient
Cooling: Ice/~~Icepack~~
Security: ~~Intact~~/Broken/None

CERTIFICATE OF ANALYSIS

Work Order	: **ES2130624**	Page	: 1 of 6
Client	: **DOUGLAS PARTNERS PTY LTD**	Laboratory	: Environmental Division Sydney
Contact	: RHYS MCMILLAN	Contact	: Sepan Mahamad
Address	: 96 HERMITAGE ROAD WEST RYDE NSW, AUSTRALIA 2114	Address	: 277-289 Woodpark Road Smithfield NSW Australia 2164
Telephone	: ----	Telephone	: +61 2 8784 8555
Project	: 202546.00	Date Samples Received	: 23-Aug-2021 16:50
Order number	: ----	Date Analysis Commenced	: 24-Aug-2021
C-O-C number	: ----	Issue Date	: 30-Aug-2021 12:13
Sampler	: ----		
Site	: Cockle Bay		
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*
Edwandy Fadjar	Organic Coordinator	Sydney Inorganics, Smithfield, NSW
Edwandy Fadjar	Organic Coordinator	Sydney Organics, Smithfield, NSW
Ivan Taylor	Analyst	Sydney Inorganics, Smithfield, NSW

General Comments

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

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

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

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

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

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

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

- Benzo(a)pyrene Toxicity Equivalent Quotient (TEQ) per the NEPM (2013) is the sum total of the concentration of the eight carcinogenic PAHs multiplied by their Toxicity Equivalence Factor (TEF) relative to Benzo(a)pyrene. TEF values are provided in brackets as follows: Benz(a)anthracene (0.1), Chrysene (0.01), Benzo(b+j) & Benzo(k)fluoranthene (0.1), Benzo(a)pyrene (1.0), Indeno(1.2.3.cd)pyrene (0.1), Dibenz(a.h)anthracene (1.0), Benzo(g.h.i)perylene (0.01). Less than LOR results for 'TEQ Zero' are treated as zero, for 'TEQ 1/2LOR' are treated as half the reported LOR, and for 'TEQ LOR' are treated as being equal to the reported LOR. Note: TEQ 1/2LOR and TEQ LOR will calculate as 0.6mg/Kg and 1.2mg/Kg respectively for samples with non-detects for all of the eight TEQ PAHs.
- EP080: Where reported, Total Xylenes is the sum of the reported concentrations of m&p-Xylene and o-Xylene at or above the LOR.
- EP075(SIM): Where reported, Total Cresol is the sum of the reported concentrations of 2-Methylphenol and 3- & 4-Methylphenol at or above the LOR.
- EG035T: Positive Hg result has been confirmed by reanalysis.
- EP075(SIM): Surrogate recovery bias low due to sample matrix interferences.

Analytical Results

Sub-Matrix: SOIL (Matrix: SOIL)			Sample ID	BD1/040821	----	----	----	----
			Sampling date / time	04-Aug-2021 00:00	----	----	----	----
Compound	CAS Number	LOR	Unit	ES2130624-001	--------	--------	--------	--------
				Result	----	----	----	----
EA055: Moisture Content (Dried @ 105-110°C)								
Moisture Content	----	1.0	%	**11.4**	----	----	----	----
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	**6**	----	----	----	----
Copper	7440-50-8	5	mg/kg	**26**	----	----	----	----
Lead	7439-92-1	5	mg/kg	**115**	----	----	----	----
Nickel	7440-02-0	2	mg/kg	**4**	----	----	----	----
Zinc	7440-66-6	5	mg/kg	**28**	----	----	----	----
EG035T: Total Recoverable Mercury by FIMS								
Mercury	7439-97-6	0.1	mg/kg	**0.2**	----	----	----	----
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	----	----	----	----

Analytical Results

Sub-Matrix: SOIL (Matrix: SOIL)				Sample ID	BD1/040821	----	----	----	----
				Sampling date / time	04-Aug-2021 00:00	----	----	----	----
Compound	CAS Number	LOR	Unit		ES2130624-001	--------	--------	--------	--------
					Result	----	----	----	----
EP080/071: Total Petroleum Hydrocarbons - Continued									
C10 - C14 Fraction	----	50	mg/kg		<50	----	----	----	----
C15 - C28 Fraction	----	100	mg/kg		<100	----	----	----	----
C29 - C36 Fraction	----	100	mg/kg		<100	----	----	----	----
^ **C10 - C36 Fraction (sum)**	----	50	mg/kg		<50	----	----	----	----
EP080/071: Total Recoverable Hydrocarbons - NEPM 2013 Fractions									
C6 - C10 Fraction	C6_C10	10	mg/kg		<10	----	----	----	----
^ **C6 - C10 Fraction minus BTEX (F1)**	C6_C10-BTEX	10	mg/kg		<10	----	----	----	----
>C10 - C16 Fraction	----	50	mg/kg		<50	----	----	----	----
>C16 - C34 Fraction	----	100	mg/kg		<100	----	----	----	----
>C34 - C40 Fraction	----	100	mg/kg		<100	----	----	----	----
^ **>C10 - C40 Fraction (sum)**	----	50	mg/kg		<50	----	----	----	----
^ **>C10 - C16 Fraction minus Naphthalene (F2)**	----	50	mg/kg		<50	----	----	----	----
EP080: BTEXN									
Benzene	71-43-2	0.2	mg/kg		<0.2	----	----	----	----
Toluene	108-88-3	0.5	mg/kg		<0.5	----	----	----	----
Ethylbenzene	100-41-4	0.5	mg/kg		<0.5	----	----	----	----
meta- & para-Xylene	108-38-3 106-42-3	0.5	mg/kg		<0.5	----	----	----	----
ortho-Xylene	95-47-6	0.5	mg/kg		<0.5	----	----	----	----
^ **Sum of BTEX**	----	0.2	mg/kg		<0.2	----	----	----	----
^ **Total Xylenes**	----	0.5	mg/kg		<0.5	----	----	----	----
Naphthalene	91-20-3	1	mg/kg		<1	----	----	----	----
EP075(SIM)S: Phenolic Compound Surrogates									
Phenol-d6	13127-88-3	0.5	%		**94.8**	----	----	----	----
2-Chlorophenol-D4	93951-73-6	0.5	%		**93.6**	----	----	----	----
2.4.6-Tribromophenol	118-79-6	0.5	%		**91.4**	----	----	----	----
EP075(SIM)T: PAH Surrogates									
2-Fluorobiphenyl	321-60-8	0.5	%		**102**	----	----	----	----
Anthracene-d10	1719-06-8	0.5	%		**102**	----	----	----	----
4-Terphenyl-d14	1718-51-0	0.5	%		**92.0**	----	----	----	----
EP080S: TPH(V)/BTEX Surrogates									
1.2-Dichloroethane-D4	17060-07-0	0.2	%		**113**	----	----	----	----
Toluene-D8	2037-26-5	0.2	%		**121**	----	----	----	----

Analytical Results

Sub-Matrix: SOIL (Matrix: SOIL)				Sample ID	BD1/040821	----	----	----	----
				Sampling date / time	04-Aug-2021 00:00	----	----	----	----
Compound	CAS Number	LOR	Unit		ES2130624-001	--------	--------	--------	--------
					Result	----	----	----	----
EP080S: TPH(V)/BTEX Surrogates - Continued									
4-Bromofluorobenzene	460-00-4	0.2	%		**105**	----	----	----	----

Surrogate Control Limits

Sub-Matrix: **SOIL**

Compound	CAS Number	Recovery Limits (%) Low	High
EP075(SIM)S: Phenolic Compound Surrogates			
Phenol-d6	13127-88-3	63	123
2-Chlorophenol-D4	93951-73-6	66	122
2.4.6-Tribromophenol	118-79-6	40	138
EP075(SIM)T: PAH Surrogates			
2-Fluorobiphenyl	321-60-8	70	122
Anthracene-d10	1719-06-8	66	128
4-Terphenyl-d14	1718-51-0	65	129
EP080S: TPH(V)/BTEX Surrogates			
1.2-Dichloroethane-D4	17060-07-0	73	133
Toluene-D8	2037-26-5	74	132
4-Bromofluorobenzene	460-00-4	72	130

ALS Environmental

QUALITY CONTROL REPORT

Work Order	: **ES2130624**	Page	: 1 of 7
Client	: **DOUGLAS PARTNERS PTY LTD**	Laboratory	: Environmental Division Sydney
Contact	: RHYS MCMILLAN	Contact	: Sepan Mahamad
Address	: 96 HERMITAGE ROAD WEST RYDE NSW, AUSTRALIA 2114	Address	: 277-289 Woodpark Road Smithfield NSW Australia 2164
Telephone	: ----	Telephone	: +61 2 8784 8555
Project	: 202546.00	Date Samples Received	: 23-Aug-2021
Order number	: ----	Date Analysis Commenced	: 24-Aug-2021
C-O-C number	: ----	Issue Date	: 30-Aug-2021
Sampler	: ----		
Site	: Cockle Bay		
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*
Edwandy Fadjar	Organic Coordinator	Sydney Inorganics, Smithfield, NSW
Edwandy Fadjar	Organic Coordinator	Sydney Organics, Smithfield, NSW
Ivan Taylor	Analyst	Sydney Inorganics, 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: 3868176)									
ES2130587-011	Anonymous	EG005T: Cadmium	7440-43-9	1	mg/kg	<1	<1	0.0	No Limit
		EG005T: Chromium	7440-47-3	2	mg/kg	16	14	8.0	No Limit
		EG005T: Nickel	7440-02-0	2	mg/kg	12	12	0.0	No Limit
		EG005T: Arsenic	7440-38-2	5	mg/kg	7	7	0.0	No Limit
		EG005T: Copper	7440-50-8	5	mg/kg	26	28	7.6	No Limit
		EG005T: Lead	7439-92-1	5	mg/kg	59	58	2.3	0% - 50%
		EG005T: Zinc	7440-66-6	5	mg/kg	293	293	0.0	0% - 20%
ES2130634-005	Anonymous	EG005T: Cadmium	7440-43-9	1	mg/kg	<1	<1	0.0	No Limit
		EG005T: Chromium	7440-47-3	2	mg/kg	22	24	9.7	0% - 50%
		EG005T: Nickel	7440-02-0	2	mg/kg	36	39	7.3	0% - 50%
		EG005T: Arsenic	7440-38-2	5	mg/kg	<5	<5	0.0	No Limit
		EG005T: Copper	7440-50-8	5	mg/kg	116	114	1.7	0% - 20%
		EG005T: Lead	7439-92-1	5	mg/kg	23	18	20.0	No Limit
		EG005T: Zinc	7440-66-6	5	mg/kg	474	398	17.6	0% - 20%
EA055: Moisture Content (Dried @ 105-110°C) (QC Lot: 3868180)									
ES2130611-001	Anonymous	EA055: Moisture Content	----	0.1	%	1.9	2.0	5.1	No Limit
ES2130634-009	Anonymous	EA055: Moisture Content	----	0.1	%	8.0	7.8	2.7	No Limit
EG035T: Total Recoverable Mercury by FIMS (QC Lot: 3868177)									
ES2130587-011	Anonymous	EG035T: Mercury	7439-97-6	0.1	mg/kg	<0.1	<0.1	0.0	No Limit
ES2130634-005	Anonymous	EG035T: Mercury	7439-97-6	0.1	mg/kg	<0.1	<0.1	0.0	No Limit
EP075(SIM)B: Polynuclear Aromatic Hydrocarbons (QC Lot: 3862607)									
ES2130634-001	Anonymous	EP075(SIM): Naphthalene	91-20-3	0.5	mg/kg	<0.5	<0.5	0.0	No Limit
		EP075(SIM): Acenaphthylene	208-96-8	0.5	mg/kg	<0.5	<0.5	0.0	No Limit

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: 3862607) - continued									
ES2130634-001	Anonymous	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
ES2130634-008	Anonymous	EP075(SIM): Naphthalene	91-20-3	0.5	mg/kg	<0.5	<0.5	0.0	No Limit
		EP075(SIM): Acenaphthylene	208-96-8	0.5	mg/kg	<0.5	<0.5	0.0	No Limit
		EP075(SIM): Acenaphthene	83-32-9	0.5	mg/kg	<0.5	<0.5	0.0	No Limit
		EP075(SIM): Fluorene	86-73-7	0.5	mg/kg	<0.5	<0.5	0.0	No Limit
		EP075(SIM): Phenanthrene	85-01-8	0.5	mg/kg	<0.5	<0.5	0.0	No Limit
		EP075(SIM): Anthracene	120-12-7	0.5	mg/kg	<0.5	<0.5	0.0	No Limit
		EP075(SIM): Fluoranthene	206-44-0	0.5	mg/kg	<0.5	<0.5	0.0	No Limit
		EP075(SIM): Pyrene	129-00-0	0.5	mg/kg	<0.5	<0.5	0.0	No Limit
		EP075(SIM): Benz(a)anthracene	56-55-3	0.5	mg/kg	<0.5	<0.5	0.0	No Limit
		EP075(SIM): Chrysene	218-01-9	0.5	mg/kg	<0.5	<0.5	0.0	No Limit
		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: 3862606)									
ES2130634-001	Anonymous	EP071: C15 - C28 Fraction	----	100	mg/kg	760	680	10.1	No Limit

Sub-Matrix: **SOIL**

				Laboratory Duplicate (DUP) Report					
Laboratory sample ID	*Sample ID*	*Method: Compound*	*CAS Number*	*LOR*	*Unit*	*Original Result*	*Duplicate Result*	*RPD (%)*	*Acceptable RPD (%)*
EP080/071: Total Petroleum Hydrocarbons (QC Lot: 3862606) - continued									
ES2130634-001	Anonymous	EP071: C29 - C36 Fraction	----	100	mg/kg	880	810	8.5	No Limit
		EP071: C10 - C14 Fraction	----	50	mg/kg	70	70	0.0	No Limit
ES2130634-008	Anonymous	EP071: C15 - C28 Fraction	----	100	mg/kg	<100	<100	0.0	No Limit
		EP071: C29 - C36 Fraction	----	100	mg/kg	<100	<100	0.0	No Limit
		EP071: C10 - C14 Fraction	----	50	mg/kg	<50	<50	0.0	No Limit
EP080/071: Total Petroleum Hydrocarbons (QC Lot: 3863285)									
ES2130590-082	Anonymous	EP080: C6 - C9 Fraction	----	10	mg/kg	<10	<10	0.0	No Limit
ES2130590-090	Anonymous	EP080: C6 - C9 Fraction	----	10	mg/kg	<10	<10	0.0	No Limit
EP080/071: Total Recoverable Hydrocarbons - NEPM 2013 Fractions (QC Lot: 3862606)									
ES2130634-001	Anonymous	EP071: >C16 - C34 Fraction	----	100	mg/kg	1270	1150	10.0	0% - 50%
		EP071: >C34 - C40 Fraction	----	100	mg/kg	700	640	9.7	No Limit
		EP071: >C10 - C16 Fraction	----	50	mg/kg	180	170	0.0	No Limit
ES2130634-008	Anonymous	EP071: >C16 - C34 Fraction	----	100	mg/kg	<100	<100	0.0	No Limit
		EP071: >C34 - C40 Fraction	----	100	mg/kg	<100	<100	0.0	No Limit
		EP071: >C10 - C16 Fraction	----	50	mg/kg	<50	<50	0.0	No Limit
EP080/071: Total Recoverable Hydrocarbons - NEPM 2013 Fractions (QC Lot: 3863285)									
ES2130590-082	Anonymous	EP080: C6 - C10 Fraction	C6_C10	10	mg/kg	<10	<10	0.0	No Limit
ES2130590-090	Anonymous	EP080: C6 - C10 Fraction	C6_C10	10	mg/kg	<10	<10	0.0	No Limit
EP080: BTEXN (QC Lot: 3863285)									
ES2130590-082	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
ES2130590-090	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: 3868176)								
EG005T: Arsenic	7440-38-2	5	mg/kg	<5	121.1 mg/kg	111	88.0	113
EG005T: Cadmium	7440-43-9	1	mg/kg	<1	0.74 mg/kg	106	70.0	130
EG005T: Chromium	7440-47-3	2	mg/kg	<2	19.6 mg/kg	121	68.0	132
EG005T: Copper	7440-50-8	5	mg/kg	<5	52.9 mg/kg	106	89.0	111
EG005T: Lead	7439-92-1	5	mg/kg	<5	60.8 mg/kg	106	82.0	119
EG005T: Nickel	7440-02-0	2	mg/kg	<2	15.3 mg/kg	110	80.0	120
EG005T: Zinc	7440-66-6	5	mg/kg	<5	139.3 mg/kg	107	66.0	133
EG035T: Total Recoverable Mercury by FIMS (QCLot: 3868177)								
EG035T: Mercury	7439-97-6	0.1	mg/kg	<0.1	0.087 mg/kg	100	70.0	125
EP075(SIM)B: Polynuclear Aromatic Hydrocarbons (QCLot: 3862607)								
EP075(SIM): Naphthalene	91-20-3	0.5	mg/kg	<0.5	6 mg/kg	102	77.0	125
EP075(SIM): Acenaphthylene	208-96-8	0.5	mg/kg	<0.5	6 mg/kg	104	72.0	124
EP075(SIM): Acenaphthene	83-32-9	0.5	mg/kg	<0.5	6 mg/kg	110	73.0	127
EP075(SIM): Fluorene	86-73-7	0.5	mg/kg	<0.5	6 mg/kg	104	72.0	126
EP075(SIM): Phenanthrene	85-01-8	0.5	mg/kg	<0.5	6 mg/kg	107	75.0	127
EP075(SIM): Anthracene	120-12-7	0.5	mg/kg	<0.5	6 mg/kg	111	77.0	127
EP075(SIM): Fluoranthene	206-44-0	0.5	mg/kg	<0.5	6 mg/kg	108	73.0	127
EP075(SIM): Pyrene	129-00-0	0.5	mg/kg	<0.5	6 mg/kg	108	74.0	128
EP075(SIM): Benz(a)anthracene	56-55-3	0.5	mg/kg	<0.5	6 mg/kg	97.0	69.0	123
EP075(SIM): Chrysene	218-01-9	0.5	mg/kg	<0.5	6 mg/kg	105	75.0	127
EP075(SIM): Benzo(b+j)fluoranthene	205-99-2 205-82-3	0.5	mg/kg	<0.5	6 mg/kg	97.2	68.0	116
EP075(SIM): Benzo(k)fluoranthene	207-08-9	0.5	mg/kg	<0.5	6 mg/kg	103	74.0	126
EP075(SIM): Benzo(a)pyrene	50-32-8	0.5	mg/kg	<0.5	6 mg/kg	105	70.0	126
EP075(SIM): Indeno(1.2.3.cd)pyrene	193-39-5	0.5	mg/kg	<0.5	6 mg/kg	97.9	61.0	121
EP075(SIM): Dibenz(a.h)anthracene	53-70-3	0.5	mg/kg	<0.5	6 mg/kg	99.9	62.0	118
EP075(SIM): Benzo(g.h.i)perylene	191-24-2	0.5	mg/kg	<0.5	6 mg/kg	95.8	63.0	121
EP080/071: Total Petroleum Hydrocarbons (QCLot: 3862606)								
EP071: C10 - C14 Fraction	----	50	mg/kg	<50	300 mg/kg	104	75.0	129
EP071: C15 - C28 Fraction	----	100	mg/kg	<100	450 mg/kg	94.2	77.0	131
EP071: C29 - C36 Fraction	----	100	mg/kg	<100	300 mg/kg	92.0	71.0	129
EP080/071: Total Petroleum Hydrocarbons (QCLot: 3863285)								
EP080: C6 - C9 Fraction	----	10	mg/kg	<10	26 mg/kg	89.1	68.4	128
EP080/071: Total Recoverable Hydrocarbons - NEPM 2013 Fractions (QCLot: 3862606)								

Sub-Matrix: **SOIL**

Method: Compound	CAS Number	LOR	Unit	Method Blank (MB) Report: Result	Laboratory Control Spike (LCS) Report: Spike Concentration	LCS: Spike Recovery (%)	Acceptable Limits (%): Low	Acceptable Limits (%): High
EP080/071: Total Recoverable Hydrocarbons - NEPM 2013 Fractions (QCLot: 3862606) - continued								
EP071: >C10 - C16 Fraction	----	50	mg/kg	<50	375 mg/kg	102	77.0	125
EP071: >C16 - C34 Fraction	----	100	mg/kg	<100	525 mg/kg	91.2	74.0	138
EP071: >C34 - C40 Fraction	----	100	mg/kg	<100	225 mg/kg	90.6	63.0	131
EP080/071: Total Recoverable Hydrocarbons - NEPM 2013 Fractions (QCLot: 3863285)								
EP080: C6 - C10 Fraction	C6_C10	10	mg/kg	<10	31 mg/kg	92.2	68.4	128
EP080: BTEXN (QCLot: 3863285)								
EP080: Benzene	71-43-2	0.2	mg/kg	<0.2	1 mg/kg	102	62.0	116
EP080: Toluene	108-88-3	0.5	mg/kg	<0.5	1 mg/kg	94.6	67.0	121
EP080: Ethylbenzene	100-41-4	0.5	mg/kg	<0.5	1 mg/kg	95.8	65.0	117
EP080: meta- & para-Xylene	108-38-3 106-42-3	0.5	mg/kg	<0.5	2 mg/kg	100	66.0	118
EP080: ortho-Xylene	95-47-6	0.5	mg/kg	<0.5	1 mg/kg	98.8	68.0	120
EP080: Naphthalene	91-20-3	1	mg/kg	<1	1 mg/kg	96.6	63.0	119

Matrix Spike (MS) Report

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

Sub-Matrix: **SOIL**

Laboratory sample ID	Sample ID	Method: Compound	CAS Number	Matrix Spike (MS) Report: Spike Concentration	SpikeRecovery(%): MS	Acceptable Limits (%): Low	Acceptable Limits (%): High
EG005(ED093)T: Total Metals by ICP-AES (QCLot: 3868176)							
ES2130587-011	Anonymous	EG005T: Arsenic	7440-38-2	50 mg/kg	104	70.0	130
		EG005T: Cadmium	7440-43-9	50 mg/kg	104	70.0	130
		EG005T: Chromium	7440-47-3	50 mg/kg	102	68.0	132
		EG005T: Copper	7440-50-8	250 mg/kg	107	70.0	130
		EG005T: Lead	7439-92-1	250 mg/kg	105	70.0	130
		EG005T: Nickel	7440-02-0	50 mg/kg	103	70.0	130
		EG005T: Zinc	7440-66-6	250 mg/kg	120	66.0	133
EG035T: Total Recoverable Mercury by FIMS (QCLot: 3868177)							
ES2130587-011	Anonymous	EG035T: Mercury	7439-97-6	5 mg/kg	109	70.0	130
EP075(SIM)B: Polynuclear Aromatic Hydrocarbons (QCLot: 3862607)							
ES2130634-001	Anonymous	EP075(SIM): Acenaphthene	83-32-9	10 mg/kg	95.9	70.0	130
		EP075(SIM): Pyrene	129-00-0	10 mg/kg	101	70.0	130
EP080/071: Total Petroleum Hydrocarbons (QCLot: 3862606)							
ES2130634-001	Anonymous	EP071: C10 - C14 Fraction	----	480 mg/kg	120	73.0	137
		EP071: C15 - C28 Fraction	----	3100 mg/kg	110	53.0	131

Sub-Matrix: **SOIL**

				Matrix Spike (MS) Report			
				Spike	SpikeRecovery(%)	Acceptable Limits (%)	
Laboratory sample ID	Sample ID	Method: Compound	CAS Number	Concentration	MS	Low	High
EP080/071: Total Petroleum Hydrocarbons (QCLot: 3862606) - continued							
ES2130634-001	Anonymous	EP071: C29 - C36 Fraction	----	2060 mg/kg	117	52.0	132
EP080/071: Total Petroleum Hydrocarbons (QCLot: 3863285)							
ES2130590-082	Anonymous	EP080: C6 - C9 Fraction	----	32.5 mg/kg	97.4	70.0	130
EP080/071: Total Recoverable Hydrocarbons - NEPM 2013 Fractions (QCLot: 3862606)							
ES2130634-001	Anonymous	EP071: >C10 - C16 Fraction	----	860 mg/kg	117	73.0	137
		EP071: >C16 - C34 Fraction	----	4320 mg/kg	115	53.0	131
		EP071: >C34 - C40 Fraction	----	890 mg/kg	103	52.0	132
EP080/071: Total Recoverable Hydrocarbons - NEPM 2013 Fractions (QCLot: 3863285)							
ES2130590-082	Anonymous	EP080: C6 - C10 Fraction	C6_C10	37.5 mg/kg	99.0	70.0	130
EP080: BTEXN (QCLot: 3863285)							
ES2130590-082	Anonymous	EP080: Benzene	71-43-2	2.5 mg/kg	83.5	70.0	130
		EP080: Toluene	108-88-3	2.5 mg/kg	90.6	70.0	130
		EP080: Ethylbenzene	100-41-4	2.5 mg/kg	92.5	70.0	130
		EP080: meta- & para-Xylene	108-38-3 106-42-3	2.5 mg/kg	92.8	70.0	130
		EP080: ortho-Xylene	95-47-6	2.5 mg/kg	93.5	70.0	130
		EP080: Naphthalene	91-20-3	2.5 mg/kg	94.6	70.0	130

ALS Environmental

QA/QC Compliance Assessment to assist with Quality Review

Work Order	: **ES2130624**	Page	: 1 of 5
Client	: **DOUGLAS PARTNERS PTY LTD**	Laboratory	: Environmental Division Sydney
Contact	: RHYS MCMILLAN	Telephone	: +61 2 8784 8555
Project	: 202546.00	Date Samples Received	: 23-Aug-2021
Site	: Cockle Bay	Issue Date	: 30-Aug-2021
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

- **Analysis Holding Time Outliers exist - please see following pages for full details.**

Outliers : Frequency of Quality Control Samples

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

Outliers : Analysis Holding Time Compliance

Matrix: **SOIL**

Method / Container / Client Sample ID(s)	Extraction / Preparation			Analysis		
	Date extracted	Due for extraction	Days overdue	Date analysed	Due for analysis	Days overdue
EA055: Moisture Content (Dried @ 105-110°C)						
Soil Glass Jar - Unpreserved						
BD1/040821	----	----	----	26-Aug-2021	18-Aug-2021	**8**
EP075(SIM)B: Polynuclear Aromatic Hydrocarbons						
Soil Glass Jar - Unpreserved						
BD1/040821	25-Aug-2021	18-Aug-2021	**7**	----	----	----
EP080/071: Total Petroleum Hydrocarbons						
Soil Glass Jar - Unpreserved						
BD1/040821	24-Aug-2021	18-Aug-2021	**6**	25-Aug-2021	18-Aug-2021	**7**
Soil Glass Jar - Unpreserved						
BD1/040821	25-Aug-2021	18-Aug-2021	**7**	----	----	----
EP080/071: Total Recoverable Hydrocarbons - NEPM 2013 Fractions						
Soil Glass Jar - Unpreserved						
BD1/040821	24-Aug-2021	18-Aug-2021	**6**	25-Aug-2021	18-Aug-2021	**7**
Soil Glass Jar - Unpreserved						
BD1/040821	25-Aug-2021	18-Aug-2021	**7**	----	----	----
EP080: BTEXN						
Soil Glass Jar - Unpreserved						
BD1/040821	24-Aug-2021	18-Aug-2021	**6**	25-Aug-2021	18-Aug-2021	**7**

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)							
BD1/040821	**04-Aug-2021**	**----**	----	----	**26-Aug-2021**	18-Aug-2021	✗
EG005(ED093)T: Total Metals by ICP-AES							
Soil Glass Jar - Unpreserved (EG005T)							
BD1/040821	**04-Aug-2021**	**26-Aug-2021**	31-Jan-2022	✓	**27-Aug-2021**	31-Jan-2022	✓

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
EG035T: Total Recoverable Mercury by FIMS							
Soil Glass Jar - Unpreserved (EG035T)							
BD1/040821	**04-Aug-2021**	**26-Aug-2021**	01-Sep-2021	✓	**27-Aug-2021**	01-Sep-2021	✓
EP075(SIM)B: Polynuclear Aromatic Hydrocarbons							
Soil Glass Jar - Unpreserved (EP075(SIM))							
BD1/040821	**04-Aug-2021**	**25-Aug-2021**	18-Aug-2021	×	**26-Aug-2021**	04-Oct-2021	✓
EP080/071: Total Petroleum Hydrocarbons							
Soil Glass Jar - Unpreserved (EP080)							
BD1/040821	**04-Aug-2021**	**24-Aug-2021**	18-Aug-2021	×	**25-Aug-2021**	18-Aug-2021	×
Soil Glass Jar - Unpreserved (EP071)							
BD1/040821	**04-Aug-2021**	**25-Aug-2021**	18-Aug-2021	×	**25-Aug-2021**	04-Oct-2021	✓
EP080/071: Total Recoverable Hydrocarbons - NEPM 2013 Fractions							
Soil Glass Jar - Unpreserved (EP080)							
BD1/040821	**04-Aug-2021**	**24-Aug-2021**	18-Aug-2021	×	**25-Aug-2021**	18-Aug-2021	×
Soil Glass Jar - Unpreserved (EP071)							
BD1/040821	**04-Aug-2021**	**25-Aug-2021**	18-Aug-2021	×	**25-Aug-2021**	04-Oct-2021	✓
EP080: BTEXN							
Soil Glass Jar - Unpreserved (EP080)							
BD1/040821	**04-Aug-2021**	**24-Aug-2021**	18-Aug-2021	×	**25-Aug-2021**	18-Aug-2021	×

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	17	**11.76**	**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	19	**10.53**	**10.00**	✓	NEPM 2013 B3 & ALS QC Standard
TRH Volatiles/BTEX	EP080	2	15	**13.33**	**10.00**	✓	NEPM 2013 B3 & ALS QC Standard
Laboratory Control Samples (LCS)							
PAH/Phenols (SIM)	EP075(SIM)	1	17	**5.88**	**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	19	**5.26**	**5.00**	✓	NEPM 2013 B3 & ALS QC Standard
TRH Volatiles/BTEX	EP080	1	15	**6.67**	**5.00**	✓	NEPM 2013 B3 & ALS QC Standard
Method Blanks (MB)							
PAH/Phenols (SIM)	EP075(SIM)	1	17	**5.88**	**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	19	**5.26**	**5.00**	✓	NEPM 2013 B3 & ALS QC Standard
TRH Volatiles/BTEX	EP080	1	15	**6.67**	**5.00**	✓	NEPM 2013 B3 & ALS QC Standard
Matrix Spikes (MS)							
PAH/Phenols (SIM)	EP075(SIM)	1	17	**5.88**	**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	19	**5.26**	**5.00**	✓	NEPM 2013 B3 & ALS QC Standard
TRH Volatiles/BTEX	EP080	1	15	**6.67**	**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 AS 3550, APHA 3112 Hg - B (Flow-injection (SnCl2) (Cold Vapour generation) AAS) FIM-AAS is an automated flameless atomic absorption technique. Mercury in solids are determined following an appropriate acid digestion. Ionic mercury is reduced online to atomic mercury vapour by SnCl2 which is then purged into a heated quartz cell. Quantification is by comparing absorbance against a calibration curve. This method is compliant with NEPM Schedule B(3)
TRH - Semivolatile Fraction	EP071	SOIL	In house: Referenced to USEPA SW 846 - 8015 Sample extracts are analysed by Capillary GC/FID and quantified against alkane standards over the range C10 - C40. Compliant with NEPM Schedule B(3).
PAH/Phenols (SIM)	EP075(SIM)	SOIL	In house: Referenced to USEPA SW 846 - 8270. Extracts are analysed by Capillary GC/MS in Selective Ion Mode (SIM) and quantification is by comparison against an established 5 point calibration curve. This method is compliant with NEPM Schedule B(3)
TRH Volatiles/BTEX	EP080	SOIL	In house: Referenced to USEPA SW 846 - 8260. Extracts are analysed by Purge and Trap, Capillary GC/MS. Quantification is by comparison against an established 5 point calibration curve. Compliant with NEPM Schedule B(3) amended.

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

SAMPLE RECEIPT NOTIFICATION (SRN)

Work Order : **ES2130624**

Client	: **DOUGLAS PARTNERS PTY LTD**	Laboratory	: Environmental Division Sydney
Contact	: RHYS MCMILLAN	Contact	: Sepan Mahamad
Address	: 96 HERMITAGE ROAD WEST RYDE NSW, AUSTRALIA 2114	Address	: 277-289 Woodpark Road Smithfield NSW Australia 2164
E-mail	: rhys.mcmillan@douglaspartners.com.au	E-mail	: Sepan.Mahamad@ALSGlobal.com
Telephone	: ----	Telephone	: +61 2 8784 8555
Facsimile	: ----	Facsimile	: +61-2-8784 8500
Project	: 202546.00	Page	: 1 of 3
Order number	: ----	Quote number	: EM2017DOUPAR0002 (EN/222)
C-O-C number	: ----	QC Level	: NEPM 2013 B3 & ALS QC Standard
Site	: Cockle Bay		
Sampler	:		

Dates

Date Samples Received	: 23-Aug-2021 16:50	Issue Date	: 24-Aug-2021
Client Requested Due Date	: 30-Aug-2021	Scheduled Reporting Date	: **30-Aug-2021**

Delivery Details

Mode of Delivery	: Undefined	Security Seal	: Intact.
No. of coolers/boxes	: 1	Temperature	: 12.2'C - Ice Bricks present
Receipt Detail	: FOAM ESKY	No. of samples received / analysed	: 1 / 1

General Comments

- This report contains the following information:
  - Sample Container(s)/Preservation Non-Compliances
  - Summary of Sample(s) and Requested Analysis
  - Proactive Holding Time Report
  - Requested Deliverables
- **Asbestos analysis cannot be conducted as no Asbestos bag received.**
- **Please refer to the Proactive Holding Time Report table below which summarises breaches of recommended holding times that have occurred prior to samples/instructions being received at the laboratory. The laboratory will process these samples unless instructions are received from you indicating you do not wish to proceed. The absence of this summary table indicates that all samples have been received within the recommended holding times for the analysis requested.**
- Please direct any queries you have regarding this work order to the above ALS laboratory contact.
- Analytical work for this work order will be conducted at ALS Sydney.
- Sample Disposal - Aqueous (3 weeks), Solid (2 months ± 1 week) from receipt of samples.
- Please be aware that APHA/NEPM recommends water and soil samples be chilled to less than or equal to 6°C for chemical analysis, and less than or equal to 10°C but unfrozen for Microbiological analysis. Where samples are received above this temperature, it should be taken into consideration when interpreting results. Refer to ALS EnviroMail 85 for ALS recommendations of the best practice for chilling samples after sampling and for maintaining a cool temperature during transit.

Sample Container(s)/Preservation Non-Compliances

All comparisons are made against pretreatment/preservation AS, APHA, USEPA standards.

- **No sample container / preservation non-compliance exists.**

Summary of Sample(s) and Requested Analysis

Some items described below may be part of a laboratory process necessary for the execution of client requested tasks. Packages may contain additional analyses, such as the determination of moisture content and preparation tasks, that are included in the package.
If no sampling time is provided, the sampling time will default 00:00 on the date of sampling. If no sampling date is provided, the sampling date will be assumed by the laboratory and displayed in brackets without a time component

Matrix: **SOIL**

Laboratory sample ID	*Sampling date / time*	*Sample ID*	SOIL - EA055-103 Moisture Content	SOIL - EP075 SIM PAH only SIM - PAH only	SOIL - S-02 8 Metals (incl. Digestion)	SOIL - TPH only TRH (C6 - C40)
ES2130624-001	04-Aug-2021 00:00	BD1/040821	✓	✓	✓	✓

Proactive Holding Time Report

The following table summarises breaches of recommended holding times that have occurred prior to samples/instructions being received at the laboratory.

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

Method / Client Sample ID(s)	Container	Due for extraction	Due for analysis	Samples Received		Instructions Received	
				Date	Evaluation	Date	Evaluation
EA055: Moisture Content							
BD1/040821	Soil Glass Jar - Unpreserved	----	18-Aug-2021	23-Aug-2021	×	----	----
EP071: TRH - Semivolatile Fraction							
BD1/040821	Soil Glass Jar - Unpreserved	18-Aug-2021	27-Sep-2021	23-Aug-2021	×	----	----
EP075(SIM): PAH/Phenols (SIM)							
BD1/040821	Soil Glass Jar - Unpreserved	18-Aug-2021	27-Sep-2021	23-Aug-2021	×	----	----
EP080: TRH Volatiles/BTEX							
BD1/040821	Soil Glass Jar - Unpreserved	18-Aug-2021	18-Aug-2021	23-Aug-2021	×	----	----

Requested Deliverables

ACCOUNTS PAYABLE INVOICES

- A4 - AU Tax Invoice (INV)	Email	apinvoices@douglaspartners.com.au

KURT PLAMBECK

- *AU Certificate of Analysis - NATA (COA)	Email	kurt.plambeck@douglaspartners.com.au
- *AU Interpretive QC Report - DEFAULT (Anon QCI Rep) (QCI)	Email	kurt.plambeck@douglaspartners.com.au
- *AU QC Report - DEFAULT (Anon QC Rep) - NATA (QC)	Email	kurt.plambeck@douglaspartners.com.au
- A4 - AU Sample Receipt Notification - Environmental HT (SRN)	Email	kurt.plambeck@douglaspartners.com.au
- Chain of Custody (CoC) (COC)	Email	kurt.plambeck@douglaspartners.com.au
- EDI Format - ESDAT (ESDAT)	Email	kurt.plambeck@douglaspartners.com.au
- EDI Format - XTab (XTAB)	Email	kurt.plambeck@douglaspartners.com.au

RHYS MCMILLAN

- *AU Certificate of Analysis - NATA (COA)	Email	rhys.mcmillan@douglaspartners.com.au
- *AU Interpretive QC Report - DEFAULT (Anon QCI Rep) (QCI)	Email	rhys.mcmillan@douglaspartners.com.au
- *AU QC Report - DEFAULT (Anon QC Rep) - NATA (QC)	Email	rhys.mcmillan@douglaspartners.com.au
- A4 - AU Sample Receipt Notification - Environmental HT (SRN)	Email	rhys.mcmillan@douglaspartners.com.au
- Chain of Custody (CoC) (COC)	Email	rhys.mcmillan@douglaspartners.com.au
- EDI Format - ESDAT (ESDAT)	Email	rhys.mcmillan@douglaspartners.com.au
- EDI Format - XTab (XTAB)	Email	rhys.mcmillan@douglaspartners.com.au

30/8.

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CHAIN OF CUSTODY DESPATCH SHEET

Project No:	202546.00	**Suburb:**	Cockle Bay	**To:**	Envirolab Services
Project Manager:	Rhys McMillan	**Order Number:**		**Sampler:**	12 Ashley St, Chatswood NSW 2067
Email:	Rhys.McMillan@douglaspartners.com.au / 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: Metals, TRH, PAH, OCP, OPP, PCB, Asbestos	Metals, TRH, PAH, Asbestos	Metals, PAH, Asbestos	VOC	pH	TOC	CEC	BTEX	Phenols	Cresole / coal tar cresotes	TBT, Tin	Notes/ Preservation/ Additional Requirements
1	CW3	4	4.45					X										
2	CW3	5.7	6.15															
3	CW7	2	2.1				X			X	X		X		X	X	X	
4	CW7	4	4.1					X										
(1) 5	BD1/040821							X										intra-lab dup
6	BD1/090821													X				
7	Spike 3													X				
8	Blank 3																	

Environmental Division
Sydney
Work Order Reference
ES2130624

Telephone : +61-2-8784 8555

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

Job No: 276326
Date Received: 20/08/21
Time Received: 1545
Received By: CH
Temp: Cool/Ambient 4°C
Cooling: Ice/Icepack
Security: Intact/Broken/None

Metals to analyse:			**LAB RECEIPT**
Number of samples in container:		**Transported to laboratory by:**	**Lab Ref. No:**
Send results to:	Douglas Partners Pty Ltd		**Received by:** Christine
Address:	96 Hermitage Road, West Ryde NSW 2114	**Phone:** (02) 9809 0666	**Date & Time:** 20/08/21 1545
Relinquished by:	KP 20/8/21	**Date:** **Signed:**	**Signed:**
Project Manager:	Rhys McMillan	**Order Number:** **Dispatch date:**	12 Ashley St, Chatswood NSW 2067

Relinquished by: ELV SMD
A-BVI ~~AB~~
23/8/21

Rec - Sophie
Aus - 23/8/21
1650

SAMPLE RECEIPT NOTIFICATION (SRN)

Work Order : **ES2132509**

Client	: **DOUGLAS PARTNERS PTY LTD**	Laboratory	: Environmental Division Sydney
Contact	: RHYS MCMILLAN	Contact	: Sepan Mahamad
Address	: 96 HERMITAGE ROAD WEST RYDE NSW, AUSTRALIA 2114	Address	: 277-289 Woodpark Road Smithfield NSW Australia 2164
E-mail	: rhys.mcmillan@douglaspartners.com.au	E-mail	: Sepan.Mahamad@ALSGlobal.com
Telephone	: ----	Telephone	: +61 2 8784 8555
Facsimile	: ----	Facsimile	: +61-2-8784 8500
Project	: 202546.00	Page	: 1 of 3
Order number	: ----	Quote number	: EM2017DOUPAR0002 (EN/222)
C-O-C number	: ----	QC Level	: NEPM 2013 B3 & ALS QC Standard
Site	: Cockle Bay		
Sampler	:		

Dates

Date Samples Received	: 08-Sep-2021 09:25	Issue Date	: 08-Sep-2021
Client Requested Due Date	: 15-Sep-2021	Scheduled Reporting Date	: **15-Sep-2021**

Delivery Details

Mode of Delivery	: Carrier	Security Seal	: Intact.
No. of coolers/boxes	: 1	Temperature	: 6.6'C - Ice Bricks present
Receipt Detail	: ESKY	No. of samples received / analysed	: 1 / 1

General Comments

- This report contains the following information:
  - Sample Container(s)/Preservation Non-Compliances
  - Summary of Sample(s) and Requested Analysis
  - Proactive Holding Time Report
  - Requested Deliverables
- **Please refer to the Proactive Holding Time Report table below which summarises breaches of recommended holding times that have occurred prior to samples/instructions being received at the laboratory. The laboratory will process these samples unless instructions are received from you indicating you do not wish to proceed. The absence of this summary table indicates that all samples have been received within the recommended holding times for the analysis requested.**
- Please direct any queries you have regarding this work order to the above ALS laboratory contact.
- Analytical work for this work order will be conducted at ALS Sydney.
- Sample Disposal - Aqueous (3 weeks), Solid (2 months ± 1 week) from receipt of samples.
- Please be aware that APHA/NEPM recommends water and soil samples be chilled to less than or equal to 6°C for chemical analysis, and less than or equal to 10°C but unfrozen for Microbiological analysis. Where samples are received above this temperature, it should be taken into consideration when interpreting results. Refer to ALS EnviroMail 85 for ALS recommendations of the best practice for chilling samples after sampling and for maintaining a cool temperature during transit.

Sample Container(s)/Preservation Non-Compliances

All comparisons are made against pretreatment/preservation AS, APHA, USEPA standards.

- **No sample container / preservation non-compliance exists.**

Summary of Sample(s) and Requested Analysis

Some items described below may be part of a laboratory process necessary for the execution of client requested tasks. Packages may contain additional analyses, such as the determination of moisture content and preparation tasks, that are included in the package.
If no sampling time is provided, the sampling time will default 00:00 on the date of sampling. If no sampling date is provided, the sampling date will be assumed by the laboratory and displayed in brackets without a time component

Matrix: **WATER**

Laboratory sample ID	Sampling date / time	Sample ID	WATER - EG020F Dissolved Metals by ICP/MS	WATER - EP074 (water) minus BTEXN Volatile Organic Compounds (minus BTEXN)	WATER - W-27 TRH/BTEXN/PAH/Phenols/8 Metals
ES2132509-001	07-Sep-2021 00:00	BD1	✓	✓	✓

Proactive Holding Time Report

Sample(s) have been received within the recommended holding times for the requested analysis.

Requested Deliverables

ACCOUNTS PAYABLE INVOICES

- A4 - AU Tax Invoice (INV)	Email	apinvoices@douglaspartners.com.au

KURT PLAMBECK

- *AU Certificate of Analysis - NATA (COA)	Email	kurt.plambeck@douglaspartners.com.au
- *AU Interpretive QC Report - DEFAULT (Anon QCI Rep) (QCI)	Email	kurt.plambeck@douglaspartners.com.au
- *AU QC Report - DEFAULT (Anon QC Rep) - NATA (QC)	Email	kurt.plambeck@douglaspartners.com.au
- A4 - AU Sample Receipt Notification - Environmental HT (SRN)	Email	kurt.plambeck@douglaspartners.com.au
- Chain of Custody (CoC) (COC)	Email	kurt.plambeck@douglaspartners.com.au
- EDI Format - ESDAT (ESDAT)	Email	kurt.plambeck@douglaspartners.com.au
- EDI Format - XTab (XTAB)	Email	kurt.plambeck@douglaspartners.com.au

RHYS MCMILLAN

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- *AU QC Report - DEFAULT (Anon QC Rep) - NATA (QC)	Email	rhys.mcmillan@douglaspartners.com.au
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- EDI Format - XTab (XTAB)	Email	rhys.mcmillan@douglaspartners.com.au

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CHAIN OF CUSTODY DESPATCH SHEET

Project No:	202546.00	**Suburb:**	Cockle Bay	**To:**	*Envirolab Services*
Project Manager:	Rhys McMillan	**Order Number:**		**Sampler:**	*12 Ashley St, Chatswood NSW 2067*
Email:	Rhys.McMillan@douglaspartners.com.au / 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: 9 metals(incl Sn)	PAH, TRH, BTEX	speciated phenols	VOC	OCP, OPP, PCB	TBT	iron (total, feric and ferrous)	TSS	oil and grease	BTEX		Notes/ Preservation/ Additional Requirements
1	SS2						X	X	X	X	X	X	X	X	X			
2	CP2						X	X	X	X	X	X	X	X	X			
3	CW2						X	X	X	X	X	X	X	X	X			
4	CW3						X	X	X	X	X	X	X	X	X			
5	CW5						X	X	X	X	X	X	X	X	X			
6	CW6						X	X	X	X	X	X	X	X	X			
—	BD1/	(1)					X	X	X	X								inter
7	BD2/						X	X	X	X								intra
8	spike															X		
9	blank															X		
10	rinsate						X	X	X	X								

ENVIROLAB GROUP
Environmental Division Sydney
Work Order Reference
ES2132509
Telephone : + 61-2-8784 8555

Job No: 277283
Date Received: 03/09/21
Time Received: 1645
Received By: CH
Temp: Cool/Ambient
Cooling: Ice/Icepack

Metals to analyse:		**LAB RECEIPT**	
Number of samples in container:	**Transported to laboratory by:**	**Lab Ref. No:**	
Send results to:	Douglas Partners Pty Ltd	**Received by:**	Christina
Address:	96 Hermitage Road, West Ryde NSW 211	**Phone:** (02) 9809 0666	**Date & Time:** 03/09/21 1645
Relinquished by:	**Date:**	**Signed:**	**Signed:**

ELS MD
KBM 7/9/21, 1135

rec FAN 8/9/21 9:25

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 275143

Client Details

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

Sample Details

Your Reference	**202546.00, Cockle Bay**
Number of Samples	15 Soil
Date samples received	03/08/2021
Date completed instructions received	03/08/2021

Analysis Details

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

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

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

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

Report Details

Date results requested by	11/08/2021
Date of Issue	11/08/2021

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Results Approved By
Priya Samarawickrama, Senior Chemist

Authorised By

Nancy Zhang, Laboratory Manager

Misc Inorg - Soil						
Our Reference		275143-7	275143-8	275143-9	275143-10	275143-11
Your Reference	UNITS	CW1	CW1	CW2	CW4	CW5
Depth		13-13.45	19-19.45	9-9.15	7-7.45	12.85-13.3
Type of sample		Soil	Soil	Soil	Soil	Soil
Date prepared	-	05/08/2021	05/08/2021	05/08/2021	05/08/2021	05/08/2021
Date analysed	-	05/08/2021	05/08/2021	05/08/2021	05/08/2021	05/08/2021
pH 1:5 soil:water	pH Units	3.4	5.9	9.1	9.1	6.8
Electrical Conductivity 1:5 soil:water	µS/cm	2,600	150	890	400	1,800
Chloride, Cl 1:5 soil:water	mg/kg	3,500	180	1,000	380	2,300
Sulphate, SO4 1:5 soil:water	mg/kg	<10	30	220	36	360

Misc Inorg - Soil					
Our Reference		275143-12	275143-13	275143-14	275143-15
Your Reference	UNITS	W1	W3	W4	W5
Depth		10-10.45	10.75-11.2	11.5-11.95	11.5-11.95
Type of sample		Soil	Soil	Soil	Soil
Date prepared	-	05/08/2021	05/08/2021	05/08/2021	05/08/2021
Date analysed	-	05/08/2021	05/08/2021	05/08/2021	05/08/2021
pH 1:5 soil:water	pH Units	9.4	7.9	8.2	8.6
Electrical Conductivity 1:5 soil:water	µS/cm	300	11,000	7,400	1,600
Chloride, Cl 1:5 soil:water	mg/kg	220	17,000	11,000	2,300
Sulphate, SO4 1:5 soil:water	mg/kg	140	210	200	<10

Chromium Suite						
Our Reference		275143-1	275143-2	275143-3	275143-4	275143-5
Your Reference	UNITS	CW1	CW2	CW5	W3	W3
Depth		13-13.45	9.9-10.35	5.5-5.95	11.5-11.95	14.5-14.95
Type of sample		Soil	Soil	Soil	Soil	Soil
Date prepared	-	09/08/2021	09/08/2021	09/08/2021	09/08/2021	09/08/2021
Date analysed	-	09/08/2021	09/08/2021	09/08/2021	09/08/2021	09/08/2021
pH $_{kcl}$	pH units	3.1	8.5	8.8	9.1	4.3
s-TAA pH 6.5	%w/w S	0.12	<0.01	<0.01	<0.01	0.04
TAA pH 6.5	moles H^+ /t	74	<5	<5	<5	25
Chromium Reducible Sulfur	%w/w	<0.005	2.1	1.4	0.74	<0.005
a-Chromium Reducible Sulfur	moles H^+ /t	<3	1,300	860	460	<3
S_{HCl}	%w/w S	0.008	[NT]	[NT]	[NT]	0.024
S_{KCl}	%w/w S	0.009	[NT]	[NT]	[NT]	0.031
S_{NAS}	%w/w S	<0.005	[NT]	[NT]	[NT]	<0.005
ANC_{BT}	% $CaCO_3$	[NT]	2.2	5.6	2.6	[NT]
s-ANC_{BT}	%w/w S	[NT]	0.72	1.8	0.83	[NT]
s-Net Acidity	%w/w S	0.12	1.6	0.20	0.19	0.044
a-Net Acidity	moles H^+ /t	75	1,000	130	120	28
Liming rate	kg $CaCO_3$ /t	6	77	9.4	8.8	2
a-Net Acidity without ANCE	moles H^+ /t	75	1,300	860	460	28
Liming rate without ANCE	kg $CaCO_3$ /t	5.6	100	65	35	2.1
s-Net Acidity without ANCE	%w/w S	0.12	2.1	1.4	0.74	0.044

Chromium Suite		
Our Reference		275143-6
Your Reference	UNITS	W5
Depth		8.8-8.95
Type of sample		Soil
Date prepared	-	09/08/2021
Date analysed	-	09/08/2021
pH $_{kcl}$	pH units	8.6
s-TAA pH 6.5	%w/w S	<0.01
TAA pH 6.5	moles H^+ /t	<5
Chromium Reducible Sulfur	%w/w	2.1
a-Chromium Reducible Sulfur	moles H^+ /t	1,300
S_{HCl}	%w/w S	[NT]
S_{KCl}	%w/w S	[NT]
S_{NAS}	%w/w S	[NT]
ANC_{BT}	% $CaCO_3$	2.8
s-ANC_{BT}	%w/w S	0.91
s-Net Acidity	%w/w S	1.5
a-Net Acidity	moles H^+ /t	900
Liming rate	kg $CaCO_3$ /t	68
a-Net Acidity without ANCE	moles H^+ /t	1,300
Liming rate without ANCE	kg $CaCO_3$ /t	97
s-Net Acidity without ANCE	%w/w S	2.1

Method ID	Methodology Summary
Inorg-001	pH - Measured using pH meter and electrode in accordance with APHA latest edition, 4500-H+. Please note that the results for water analyses are indicative only, as analysis outside of the APHA storage times.
Inorg-002	Conductivity and Salinity - measured using a conductivity cell at 25°C in accordance with APHA latest edition 2510 and Rayment & Lyons.
Inorg-068	Chromium Reducible Sulfur - Hydrogen Sulfide is quantified by iodometric titration after distillation to determine potential acidity. Based on Acid Sulfate Soils Laboratory Methods Guidelines, Version 2.1 - June 2004.
Inorg-081	Anions - a range of Anions are determined by Ion Chromatography, in accordance with APHA latest edition, 4110-B. Waters samples are filtered on receipt prior to analysis. Alternatively determined by colourimetry/turbidity using Discrete Analyser.

QUALITY CONTROL: Misc Inorg - Soil						Duplicate			Spike Recovery %	
Test Description	Units	PQL	Method	Blank	#	Base	Dup.	RPD	LCS-1	275143-9
Date prepared	-			05/08/2021	8	05/08/2021	05/08/2021		05/08/2021	05/08/2021
Date analysed	-			05/08/2021	8	05/08/2021	05/08/2021		05/08/2021	05/08/2021
pH 1:5 soil:water	pH Units		Inorg-001	[NT]	8	5.9	6.0	2	101	[NT]
Electrical Conductivity 1:5 soil:water	µS/cm	1	Inorg-002	<1	8	150	140	7	103	[NT]
Chloride, Cl 1:5 soil:water	mg/kg	10	Inorg-081	<10	8	180	160	12	96	#
Sulphate, SO4 1:5 soil:water	mg/kg	10	Inorg-081	<10	8	30	27	11	107	89

QUALITY CONTROL: Chromium Suite						Duplicate			Spike Recovery %	
Test Description	Units	PQL	Method	Blank	#	Base	Dup.	RPD	LCS-1	[NT]
Date prepared	-			09/08/2021	1	09/08/2021	09/08/2021		09/08/2021	[NT]
Date analysed	-			09/08/2021	1	09/08/2021	09/08/2021		09/08/2021	[NT]
pH $_{kcl}$	pH units		Inorg-068	[NT]	1	3.1	3.2	3	96	[NT]
s-TAA pH 6.5	%w/w S	0.01	Inorg-068	<0.01	1	0.12	0.12	0	[NT]	[NT]
TAA pH 6.5	moles H^+ /t	5	Inorg-068	<5	1	74	74	0	97	[NT]
Chromium Reducible Sulfur	%w/w	0.005	Inorg-068	<0.005	1	<0.005	<0.005	0	[NT]	[NT]
a-Chromium Reducible Sulfur	moles H^+ /t	3	Inorg-068	<3	1	<3	<3	0	110	[NT]
S_{HCl}	%w/w S	0.005	Inorg-068	<0.005	1	0.008	0.008	0	[NT]	[NT]
S_{KCl}	%w/w S	0.005	Inorg-068	<0.005	1	0.009	0.009	0	[NT]	[NT]
S_{NAS}	%w/w S	0.005	Inorg-068	<0.005	1	<0.005	<0.005	0	[NT]	[NT]
ANC_{BT}	% $CaCO_3$	0.05	Inorg-068	<0.05	1	[NT]	[NT]		[NT]	[NT]
s-ANC_{BT}	%w/w S	0.05	Inorg-068	<0.05	1	[NT]	[NT]		[NT]	[NT]
s-Net Acidity	%w/w S	0.005	Inorg-068	<0.005	1	0.12	0.12	0	[NT]	[NT]
a-Net Acidity	moles H^+ /t	5	Inorg-068	<5	1	75	75	0	[NT]	[NT]
Liming rate	kg $CaCO_3$ /t	0.75	Inorg-068	<0.75	1	6	6	0	[NT]	[NT]
a-Net Acidity without ANCE	moles H^+ /t	5	Inorg-068	<5	1	75	75	0	[NT]	[NT]
Liming rate without ANCE	kg $CaCO_3$ /t	0.75	Inorg-068	<0.75	1	5.6	5.7	2	[NT]	[NT]
s-Net Acidity without ANCE	%w/w S	0.005	Inorg-068	<0.005	1	0.12	0.12	0	[NT]	[NT]

Result Definitions

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

Quality Control Definitions

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

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

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

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

Laboratory Acceptance Criteria

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

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

Spikes for Physical and Aggregate Tests are not applicable.

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

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

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

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

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

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

Measurement Uncertainty estimates are available for most tests upon request.

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

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

Report Comments

MISC_INORG: Chloride # Percent recovery not reported due to the high concentration of the analyte/s in the sample/s. However an acceptable recovery was obtained for the LCS.

Douglas Partners
Geotechnics | Environment | Groundwater

CHAIN OF CUSTODY DESPATCH SHEET

Project No:	202546.00	**Suburb:**	Cockle Bay	**To:**	*Envirolab Services*
Project Manager:	Rhys McMillan	**Order Number:**		**Sampler:**	*12 Ashley St, Chatswood NSW 2067*
Email:	Rhys.McMillan@douglaspartners.com.au / 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, then handle, transport and store in accordance with FPM HAZID)		

	Sample ID				Sample Type	Container Type	Analytes											
Lab ID	Location / Other ID	Depth From	Depth To	Date Sampled	S - soil W - water	G - glass P - plastic	Chromium reducile sulphur suite	Aggresity Suite										Notes/ Preservation/ Additional Requirements
1	CW1	13	13.45				X											
2	CW2	9.9	10.35				X											
3	CW5	5.5	5.95				X											
4	W3	11.5	11.95				X											
5	W3	14.5	14.95				X											
6	W5	8.8	8.95				X											
7	CW1 / [illegible]	13	13.45					X										
8	CW1	19	19.45					X										
9	CW2	9	9.15					X										
10	CW4	7	7.45					X										
11	CW5	12.85	13.3					X										
12	W1	10	10.45					X										
13	W3	10.75	11.2					X										

Metals to analyse:		**LAB RECEIPT**	
Number of samples in container:	**Transported to laboratory by:**	**Lab Ref. No:**	275143
Send results to:	Douglas Partners Pty Ltd	**Received by:**	V. VEGA
Address:	96 Hermitage Road, West Ryde NSW 211	**Phone:** (02) 9809 0666	**Date & Time:** 3/8/21 @ 1620
Relinquished by:	KP	**Date:** ~~20/07/2021~~ 3/8/21	**Signed:** KP **Signed:**

Douglas Partners
Geotechnics / Environment / Groundwater

CHAIN OF CUSTODY DESPATCH SHEET

Project No:	202546.00	**Suburb:**	Cockle Bay	**To:**	*Envirolab Services*
Project Manager:	Rhys McMillan	**Order Number:**		**Dispatch date:**	**20/07/2021**
					12 Ashley St, Chatswood NSW 2067

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: Chromium reducile sulphur suite	Analytes: Aggresity Suite	Analytes	Analytes	Analytes	Analytes	Analytes	Analytes	Analytes	Analytes	Analytes	Notes/ Preservation/ Additional Requirements
✓ 14	W4	11.5	11.95					X										
✓ 15	W5	11.5	11.95					X										

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12 Ashley St Chatswood NSW 2067
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customerservice@envirolab.com.au
www.envirolab.com.au

SAMPLE RECEIPT ADVICE

Client Details

Client	Douglas Partners Pty Ltd
Attention	Rhys McMillan, Kurt Plambeck

Sample Login Details

Your reference	202546.00, Cockle Bay
Envirolab Reference	275143
Date Sample Received	03/08/2021
Date Instructions Received	03/08/2021
Date Results Expected to be Reported	10/08/2021

Sample Condition

Samples received in appropriate condition for analysis	Yes
No. of Samples Provided	15 Soil
Turnaround Time Requested	Standard
Temperature on Receipt (°C)	18
Cooling Method	Ice
Sampling Date Provided	Not Provided on the COC

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	Misc Inorg - Soil	Chromium Suite
CW1-13-13.45		✓
CW2-9.9-10.35		✓
CW5-5.5-5.95		✓
W3-11.5-11.95		✓
W3-14.5-14.95		✓
W5-8.8-8.95		✓
CW1-13-13.45	✓	
CW1-19-19.45	✓	
CW2-9-9.15	✓	
CW4-7-7.45	✓	
CW5-12.85-13.3	✓	
W1-10-10.45	✓	
W3-10.75-11.2	✓	
W4-11.5-11.95	✓	
W5-11.5-11.95	✓	

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

Additional Info

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

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CERTIFICATE OF ANALYSIS 276891

Client Details

Client	Douglas Partners Pty Ltd
Attention	Rhys McMillan
Address	96 Hermitage Rd, West Ryde, NSW, 2114

Sample Details

Your Reference	**202546.00, Cockle Bay**
Number of Samples	2 Soil
Date samples received	31/08/2021
Date completed instructions received	31/08/2021

Analysis Details

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

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

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

Report Details

Date results requested by	07/09/2021
Date of Issue	06/09/2021

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Results Approved By
Priya Samarawickrama, Senior Chemist

Authorised By

Nancy Zhang, Laboratory Manager

Chromium Suite			
Our Reference		276891-1	276891-2
Your Reference	UNITS	CP2	CP2
Depth		1.4-1.5	2.9-3.0
Type of sample		Soil	Soil
Date prepared	-	01/09/2021	01/09/2021
Date analysed	-	01/09/2021	01/09/2021
pH $_{kcl}$	pH units	8.7	7.6
s-TAA pH 6.5	%w/w S	<0.01	<0.01
TAA pH 6.5	moles H^+ /t	<5	<5
Chromium Reducible Sulfur	%w/w	0.09	0.05
a-Chromium Reducible Sulfur	moles H^+ /t	56	31
S_{HCl}	%w/w S	[NT]	[NT]
S_{KCl}	%w/w S	[NT]	[NT]
S_{NAS}	%w/w S	[NT]	[NT]
ANC_{BT}	% $CaCO_3$	4.0	0.95
s-ANC_{BT}	%w/w S	1.3	0.30
s-Net Acidity	%w/w S	<0.005	<0.005
a-Net Acidity	moles H^+ /t	<5	<5
Liming rate	kg $CaCO_3$ /t	<0.75	<0.75
a-Net Acidity without ANCE	moles H^+ /t	56	31
Liming rate without ANCE	kg $CaCO_3$ /t	4.2	2.3
s-Net Acidity without ANCE	%w/w S	0.090	0.050

Method ID	Methodology Summary
Inorg-068	Chromium Reducible Sulfur - Hydrogen Sulfide is quantified by iodometric titration after distillation to determine potential acidity.

QUALITY CONTROL: Chromium Suite						Duplicate			Spike Recovery %	
Test Description	Units	PQL	Method	Blank	#	Base	Dup.	RPD	LCS-1	[NT]
Date prepared	-			01/09/2021	[NT]	[NT]	[NT]	[NT]	01/09/2021	[NT]
Date analysed	-			01/09/2021	[NT]	[NT]	[NT]	[NT]	01/09/2021	[NT]
pH $_{kcl}$	pH units		Inorg-068	[NT]	[NT]	[NT]	[NT]	[NT]	96	[NT]
s-TAA pH 6.5	%w/w S	0.01	Inorg-068	<0.01	[NT]	[NT]	[NT]	[NT]	[NT]	[NT]
TAA pH 6.5	moles H^+ /t	5	Inorg-068	<5	[NT]	[NT]	[NT]	[NT]	96	[NT]
Chromium Reducible Sulfur	%w/w	0.005	Inorg-068	<0.005	[NT]	[NT]	[NT]	[NT]	[NT]	[NT]
a-Chromium Reducible Sulfur	moles H^+ /t	3	Inorg-068	<3	[NT]	[NT]	[NT]	[NT]	110	[NT]
S_{HCl}	%w/w S	0.005	Inorg-068	<0.005	[NT]	[NT]	[NT]	[NT]	[NT]	[NT]
S_{KCl}	%w/w S	0.005	Inorg-068	<0.005	[NT]	[NT]	[NT]	[NT]	[NT]	[NT]
S_{NAS}	%w/w S	0.005	Inorg-068	<0.005	[NT]	[NT]	[NT]	[NT]	[NT]	[NT]
ANC_{BT}	% $CaCO_3$	0.05	Inorg-068	<0.05	[NT]	[NT]	[NT]	[NT]	[NT]	[NT]
s-ANC_{BT}	%w/w S	0.05	Inorg-068	<0.05	[NT]	[NT]	[NT]	[NT]	[NT]	[NT]
s-Net Acidity	%w/w S	0.005	Inorg-068	<0.005	[NT]	[NT]	[NT]	[NT]	[NT]	[NT]
a-Net Acidity	moles H^+ /t	5	Inorg-068	<5	[NT]	[NT]	[NT]	[NT]	[NT]	[NT]
Liming rate	kg $CaCO_3$ /t	0.75	Inorg-068	<0.75	[NT]	[NT]	[NT]	[NT]	[NT]	[NT]
a-Net Acidity without ANCE	moles H^+ /t	5	Inorg-068	<5	[NT]	[NT]	[NT]	[NT]	[NT]	[NT]
Liming rate without ANCE	kg $CaCO_3$ /t	0.75	Inorg-068	<0.75	[NT]	[NT]	[NT]	[NT]	[NT]	[NT]
s-Net Acidity without ANCE	%w/w S	0.005	Inorg-068	<0.005	[NT]	[NT]	[NT]	[NT]	[NT]	[NT]

Result Definitions

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

Quality Control Definitions

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

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

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

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

Laboratory Acceptance Criteria

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

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

Spikes for Physical and Aggregate Tests are not applicable.

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

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

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

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

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

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

Measurement Uncertainty estimates are available for most tests upon request.

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

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

Douglas Partners
Geotechnics | Environment | Groundwater

CHAIN OF CUSTODY DESPATCH SHEET

Project No:	202546.00	**Suburb:**	Cockle Bay	**To:**	*Envirolab Services*
Project Manager:	Rhys McMillan	**Order Number:**		**Sampler:**	*12 Ashley St, Chatswood NSW 2067*
Email:	Rhys.McMillan@douglaspartners.com.au / 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	Sample ID: Depth From	Sample ID: Depth To	Date Sampled	Sample Type: S - soil W - water	Container Type: G - glass P - plastic	Analytes: Chromium Sulphur Suite										Notes/ Preservation/ Additional Requirements
1	CP2 / Vap	1.4	1.5				X										
2	CP2	2.9	3.0				X										

Metals to analyse:

Number of samples in container:

Transported to laboratory by:

Send results to: Douglas Partners Pty Ltd

LAB RECEIPT 276891

Lab Ref. No:

Received by: CMalone

31/8/24 1485

KP 31/8/24

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	Rhys McMillan

Sample Login Details

Your reference	202546.00, Cockle Bay
Envirolab Reference	276891
Date Sample Received	31/08/2021
Date Instructions Received	31/08/2021
Date Results Expected to be Reported	07/09/2021

Sample Condition

Samples received in appropriate condition for analysis	Yes
No. of Samples Provided	2 Soil
Turnaround Time Requested	Standard
Temperature on Receipt (°C)	9.0
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	Chromium Suite
CP2-1.4-1.5	✓
CP2-2.9-3.0	✓

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

Additional Info

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

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customerservice@envirolab.com.au
www.envirolab.com.au

CERTIFICATE OF ANALYSIS 277283

Client Details

Client	Douglas Partners Pty Ltd
Attention	Rhys McMillan
Address	96 Hermitage Rd, West Ryde, NSW, 2114

Sample Details

Your Reference	**202546.00, Cockle Bay**
Number of Samples	10 Water
Date samples received	03/09/2021
Date completed instructions received	06/09/2021

Analysis Details

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

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

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

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

Report Details

Date results requested by	13/09/2021
Date of Issue	13/09/2021

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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
Greta Petzold, Senior Report Coordinator
Hannah Nguyen, Metals Supervisor
Priya Samarawickrama, Senior Chemist
Steven Luong, Organics Supervisor

Authorised By

Nancy Zhang, Laboratory Manager

VOCs in water						
Our Reference	UNITS	277283-1	277283-2	277283-3	277283-4	277283-5
Your Reference		SS2	CP2	CW2	CW3	CW5
Type of sample		Water	Water	Water	Water	Water
Date extracted	-	07/09/2021	07/09/2021	07/09/2021	07/09/2021	07/09/2021
Date analysed	-	07/09/2021	07/09/2021	07/09/2021	07/09/2021	07/09/2021
Dichlorodifluoromethane	µg/L	<10	<10	<10	<10	<10
Chloromethane	µg/L	<10	<10	<10	<10	<10
Vinyl Chloride	µg/L	<10	<10	<10	<10	<10
Bromomethane	µg/L	<10	<10	<10	<10	<10
Chloroethane	µg/L	<10	<10	<10	<10	<10
Trichlorofluoromethane	µg/L	<10	<10	<10	<10	<10
1,1-Dichloroethene	µg/L	<1	<1	<1	<1	<1
Trans-1,2-dichloroethene	µg/L	<1	<1	<1	<1	<1
1,1-dichloroethane	µg/L	<1	<1	<1	<1	<1
Cis-1,2-dichloroethene	µg/L	<1	<1	<1	<1	<1
Bromochloromethane	µg/L	<1	<1	<1	<1	<1
Chloroform	µg/L	2	<1	<1	<1	<1
2,2-dichloropropane	µg/L	<1	<1	<1	<1	<1
1,2-dichloroethane	µg/L	<1	<1	<1	<1	<1
1,1,1-trichloroethane	µg/L	<1	<1	<1	<1	<1
1,1-dichloropropene	µg/L	<1	<1	<1	<1	<1
Cyclohexane	µg/L	<1	<1	<1	<1	<1
Carbon tetrachloride	µg/L	<1	<1	<1	<1	<1
Benzene	µg/L	<1	<1	<1	<1	<1
Dibromomethane	µg/L	<1	<1	<1	<1	<1
1,2-dichloropropane	µg/L	<1	<1	<1	<1	<1
Trichloroethene	µg/L	<1	<1	<1	<1	<1
Bromodichloromethane	µg/L	<1	<1	<1	<1	<1
trans-1,3-dichloropropene	µg/L	<1	<1	<1	<1	<1
cis-1,3-dichloropropene	µg/L	<1	<1	<1	<1	<1
1,1,2-trichloroethane	µg/L	<1	<1	<1	<1	<1
Toluene	µg/L	<1	<1	<1	<1	<1
1,3-dichloropropane	µg/L	<1	<1	<1	<1	<1
Dibromochloromethane	µg/L	<1	<1	<1	<1	<1
1,2-dibromoethane	µg/L	<1	<1	<1	<1	<1
Tetrachloroethene	µg/L	<1	<1	<1	<1	<1
1,1,1,2-tetrachloroethane	µg/L	<1	<1	<1	<1	<1
Chlorobenzene	µg/L	<1	<1	<1	<1	<1
Ethylbenzene	µg/L	<1	<1	<1	<1	<1
Bromoform	µg/L	<1	<1	<1	<1	<1

VOCs in water						
Our Reference		277283-1	277283-2	277283-3	277283-4	277283-5
Your Reference	UNITS	SS2	CP2	CW2	CW3	CW5
Type of sample		Water	Water	Water	Water	Water
m+p-xylene	µg/L	<2	<2	<2	<2	<2
Styrene	µg/L	<1	<1	<1	<1	<1
1,1,2,2-tetrachloroethane	µg/L	<1	<1	<1	<1	<1
o-xylene	µg/L	<1	<1	<1	<1	<1
1,2,3-trichloropropane	µg/L	<1	<1	<1	<1	<1
Isopropylbenzene	µg/L	<1	<1	<1	<1	<1
Bromobenzene	µg/L	<1	<1	<1	<1	<1
n-propyl benzene	µg/L	<1	<1	<1	<1	<1
2-chlorotoluene	µg/L	<1	<1	<1	<1	<1
4-chlorotoluene	µg/L	<1	<1	<1	<1	<1
1,3,5-trimethyl benzene	µg/L	<1	<1	<1	<1	<1
Tert-butyl benzene	µg/L	<1	<1	<1	<1	<1
1,2,4-trimethyl benzene	µg/L	<1	<1	<1	<1	<1
1,3-dichlorobenzene	µg/L	<1	<1	<1	<1	<1
Sec-butyl benzene	µg/L	<1	<1	<1	<1	<1
1,4-dichlorobenzene	µg/L	<1	<1	<1	<1	<1
4-isopropyl toluene	µg/L	<1	<1	<1	<1	<1
1,2-dichlorobenzene	µg/L	<1	<1	<1	<1	<1
n-butyl benzene	µg/L	<1	<1	<1	<1	<1
1,2-dibromo-3-chloropropane	µg/L	<1	<1	<1	<1	<1
1,2,4-trichlorobenzene	µg/L	<1	<1	<1	<1	<1
Hexachlorobutadiene	µg/L	<1	<1	<1	<1	<1
1,2,3-trichlorobenzene	µg/L	<1	<1	<1	<1	<1
Surrogate Dibromofluoromethane	%	100	100	100	99	99
Surrogate toluene-d8	%	88	87	87	87	87
Surrogate 4-BFB	%	97	98	95	96	96

VOCs in water				
Our Reference		277283-6	277283-7	277283-10
Your Reference	UNITS	CW6	BD2	rinsate
Type of sample		Water	Water	Water
Date extracted	-	07/09/2021	07/09/2021	07/09/2021
Date analysed	-	07/09/2021	07/09/2021	07/09/2021
Dichlorodifluoromethane	µg/L	<10	<10	<10
Chloromethane	µg/L	<10	<10	<10
Vinyl Chloride	µg/L	<10	<10	<10
Bromomethane	µg/L	<10	<10	<10
Chloroethane	µg/L	<10	<10	<10
Trichlorofluoromethane	µg/L	<10	<10	<10
1,1-Dichloroethene	µg/L	<1	<1	<1
Trans-1,2-dichloroethene	µg/L	<1	<1	<1
1,1-dichloroethane	µg/L	<1	<1	<1
Cis-1,2-dichloroethene	µg/L	<1	<1	<1
Bromochloromethane	µg/L	<1	<1	<1
Chloroform	µg/L	<1	<1	<1
2,2-dichloropropane	µg/L	<1	<1	<1
1,2-dichloroethane	µg/L	<1	<1	<1
1,1,1-trichloroethane	µg/L	<1	<1	<1
1,1-dichloropropene	µg/L	<1	<1	<1
Cyclohexane	µg/L	<1	<1	<1
Carbon tetrachloride	µg/L	<1	<1	<1
Benzene	µg/L	<1	<1	<1
Dibromomethane	µg/L	<1	<1	<1
1,2-dichloropropane	µg/L	<1	<1	<1
Trichloroethene	µg/L	<1	<1	<1
Bromodichloromethane	µg/L	<1	<1	<1
trans-1,3-dichloropropene	µg/L	<1	<1	<1
cis-1,3-dichloropropene	µg/L	<1	<1	<1
1,1,2-trichloroethane	µg/L	<1	<1	<1
Toluene	µg/L	<1	<1	<1
1,3-dichloropropane	µg/L	<1	<1	<1
Dibromochloromethane	µg/L	<1	<1	<1
1,2-dibromoethane	µg/L	<1	<1	<1
Tetrachloroethene	µg/L	<1	<1	<1
1,1,1,2-tetrachloroethane	µg/L	<1	<1	<1
Chlorobenzene	µg/L	<1	<1	<1
Ethylbenzene	µg/L	<1	<1	<1
Bromoform	µg/L	<1	<1	<1

VOCs in water				
Our Reference	UNITS	277283-6	277283-7	277283-10
Your Reference		CW6	BD2	rinsate
Type of sample		Water	Water	Water
m+p-xylene	µg/L	<2	<2	<2
Styrene	µg/L	<1	<1	<1
1,1,2,2-tetrachloroethane	µg/L	<1	<1	<1
o-xylene	µg/L	<1	<1	<1
1,2,3-trichloropropane	µg/L	<1	<1	<1
Isopropylbenzene	µg/L	<1	<1	<1
Bromobenzene	µg/L	<1	<1	<1
n-propyl benzene	µg/L	<1	<1	<1
2-chlorotoluene	µg/L	<1	<1	<1
4-chlorotoluene	µg/L	<1	<1	<1
1,3,5-trimethyl benzene	µg/L	<1	<1	<1
Tert-butyl benzene	µg/L	<1	<1	<1
1,2,4-trimethyl benzene	µg/L	<1	<1	<1
1,3-dichlorobenzene	µg/L	<1	<1	<1
Sec-butyl benzene	µg/L	<1	<1	<1
1,4-dichlorobenzene	µg/L	<1	<1	<1
4-isopropyl toluene	µg/L	<1	<1	<1
1,2-dichlorobenzene	µg/L	<1	<1	<1
n-butyl benzene	µg/L	<1	<1	<1
1,2-dibromo-3-chloropropane	µg/L	<1	<1	<1
1,2,4-trichlorobenzene	µg/L	<1	<1	<1
Hexachlorobutadiene	µg/L	<1	<1	<1
1,2,3-trichlorobenzene	µg/L	<1	<1	<1
Surrogate Dibromofluoromethane	%	100	99	99
Surrogate toluene-d8	%	87	87	87
Surrogate 4-BFB	%	97	95	96

vTRH(C6-C10)/BTEXN in Water						
Our Reference		277283-1	277283-2	277283-3	277283-4	277283-5
Your Reference	UNITS	SS2	CP2	CW2	CW3	CW5
Type of sample		Water	Water	Water	Water	Water
Date extracted	-	07/09/2021	07/09/2021	07/09/2021	07/09/2021	07/09/2021
Date analysed	-	07/09/2021	07/09/2021	07/09/2021	07/09/2021	07/09/2021
TRH C_6 - C_9	µg/L	<10	<10	<10	<10	<10
TRH C_6 - C_{10}	µg/L	<10	<10	<10	<10	<10
TRH C_6 - C_{10} less BTEX (F1)	µg/L	<10	<10	<10	<10	<10
Benzene	µg/L	<1	<1	<1	<1	<1
Toluene	µg/L	<1	<1	<1	<1	<1
Ethylbenzene	µg/L	<1	<1	<1	<1	<1
m+p-xylene	µg/L	<2	<2	<2	<2	<2
o-xylene	µg/L	<1	<1	<1	<1	<1
Naphthalene	µg/L	<1	<1	<1	<1	<1
Surrogate Dibromofluoromethane	%	100	100	100	99	99
Surrogate toluene-d8	%	88	87	87	87	87
Surrogate 4-BFB	%	97	98	95	96	96

vTRH(C6-C10)/BTEXN in Water						
Our Reference		277283-6	277283-7	277283-8	277283-9	277283-10
Your Reference	UNITS	CW6	BD2	spike	blank	rinsate
Type of sample		Water	Water	Water	Water	Water
Date extracted	-	07/09/2021	07/09/2021	07/09/2021	07/09/2021	07/09/2021
Date analysed	-	07/09/2021	07/09/2021	07/09/2021	07/09/2021	07/09/2021
TRH C_6 - C_9	µg/L	<10	<10	[NA]	[NA]	<10
TRH C_6 - C_{10}	µg/L	<10	<10	[NA]	[NA]	<10
TRH C_6 - C_{10} less BTEX (F1)	µg/L	<10	<10	[NA]	[NA]	<10
Benzene	µg/L	<1	<1	99%	<1	<1
Toluene	µg/L	<1	<1	98%	<1	<1
Ethylbenzene	µg/L	<1	<1	110%	<1	<1
m+p-xylene	µg/L	<2	<2	110%	<2	<2
o-xylene	µg/L	<1	<1	105%	<1	<1
Naphthalene	µg/L	<1	<1	[NT]	<1	<1
Surrogate Dibromofluoromethane	%	100	99	100	99	99
Surrogate toluene-d8	%	87	87	90	87	87
Surrogate 4-BFB	%	97	95	93	95	96

svTRH (C10-C40) in Water						
Our Reference		277283-1	277283-2	277283-3	277283-4	277283-5
Your Reference	UNITS	SS2	CP2	CW2	CW3	CW5
Type of sample		Water	Water	Water	Water	Water
Date extracted	-	09/09/2021	09/09/2021	09/09/2021	09/09/2021	09/09/2021
Date analysed	-	11/09/2021	11/09/2021	11/09/2021	11/09/2021	11/09/2021
TRH C_{10} - C_{14}	µg/L	<50	<50	<50	<50	<50
TRH C_{15} - C_{28}	µg/L	<100	<100	<100	<100	140
TRH C_{29} - C_{36}	µg/L	<100	<100	<100	<100	<100
Total +ve TRH (C10-C36)	µg/L	<50	<50	<50	<50	140
TRH >C_{10} - C_{16}	µg/L	<50	<50	<50	<50	77
TRH >C_{10} - C_{16} less Naphthalene (F2)	µg/L	<50	<50	<50	<50	77
TRH >C_{16} - C_{34}	µg/L	<100	<100	<100	<100	<100
TRH >C_{34} - C_{40}	µg/L	<100	<100	<100	<100	<100
Total +ve TRH (>C10-C40)	µg/L	<50	<50	<50	<50	80
Surrogate o-Terphenyl	%	97	80	77	76	74

svTRH (C10-C40) in Water				
Our Reference		277283-6	277283-7	277283-10
Your Reference	UNITS	CW6	BD2	rinsate
Type of sample		Water	Water	Water
Date extracted	-	09/09/2021	09/09/2021	09/09/2021
Date analysed	-	11/09/2021	11/09/2021	11/09/2021
TRH C_{10} - C_{14}	µg/L	<50	<50	<50
TRH C_{15} - C_{28}	µg/L	370	<100	270
TRH C_{29} - C_{36}	µg/L	<100	<100	<100
Total +ve TRH (C10-C36)	µg/L	370	<50	270
TRH >C_{10} - C_{16}	µg/L	52	<50	250
TRH >C_{10} - C_{16} less Naphthalene (F2)	µg/L	52	<50	250
TRH >C_{16} - C_{34}	µg/L	350	<100	<100
TRH >C_{34} - C_{40}	µg/L	<100	<100	<100
Total +ve TRH (>C10-C40)	µg/L	400	<50	250
Surrogate o-Terphenyl	%	63	86	85

PAHs in Water						
Our Reference		277283-1	277283-2	277283-3	277283-4	277283-5
Your Reference	UNITS	SS2	CP2	CW2	CW3	CW5
Type of sample		Water	Water	Water	Water	Water
Date extracted	-	09/09/2021	09/09/2021	09/09/2021	09/09/2021	09/09/2021
Date analysed	-	10/09/2021	10/09/2021	10/09/2021	10/09/2021	10/09/2021
Naphthalene	µg/L	<1	<1	<1	<1	<1
Acenaphthylene	µg/L	<1	<1	<1	<1	<1
Acenaphthene	µg/L	<1	<1	<1	<1	<1
Fluorene	µg/L	<1	<1	<1	<1	<1
Phenanthrene	µg/L	<1	<1	<1	<1	<1
Anthracene	µg/L	<1	<1	<1	<1	<1
Fluoranthene	µg/L	<1	<1	<1	<1	<1
Pyrene	µg/L	<1	<1	<1	<1	<1
Benzo(a)anthracene	µg/L	<1	<1	<1	<1	<1
Chrysene	µg/L	<1	<1	<1	<1	<1
Benzo(b,j+k)fluoranthene	µg/L	<2	<2	<2	<2	<2
Benzo(a)pyrene	µg/L	<1	<1	<1	<1	<1
Indeno(1,2,3-c,d)pyrene	µg/L	<1	<1	<1	<1	<1
Dibenzo(a,h)anthracene	µg/L	<1	<1	<1	<1	<1
Benzo(g,h,i)perylene	µg/L	<1	<1	<1	<1	<1
Benzo(a)pyrene TEQ	µg/L	<5	<5	<5	<5	<5
Total +ve PAH's	µg/L	NIL (+)VE	NIL (+)VE	NIL (+)VE	NIL (+)VE	NIL (+)VE
Surrogate p-Terphenyl-d14	%	107	90	90	85	92

PAHs in Water				
Our Reference		277283-6	277283-7	277283-10
Your Reference	UNITS	CW6	BD2	rinsate
Type of sample		Water	Water	Water
Date extracted	-	09/09/2021	09/09/2021	09/09/2021
Date analysed	-	10/09/2021	10/09/2021	10/09/2021
Naphthalene	µg/L	<1	<1	<1
Acenaphthylene	µg/L	<1	<1	<1
Acenaphthene	µg/L	<1	<1	<1
Fluorene	µg/L	<1	<1	<1
Phenanthrene	µg/L	<1	<1	<1
Anthracene	µg/L	<1	<1	<1
Fluoranthene	µg/L	<1	<1	<1
Pyrene	µg/L	<1	<1	<1
Benzo(a)anthracene	µg/L	<1	<1	<1
Chrysene	µg/L	<1	<1	<1
Benzo(b,j+k)fluoranthene	µg/L	<2	<2	<2
Benzo(a)pyrene	µg/L	<1	<1	<1
Indeno(1,2,3-c,d)pyrene	µg/L	<1	<1	<1
Dibenzo(a,h)anthracene	µg/L	<1	<1	<1
Benzo(g,h,i)perylene	µg/L	<1	<1	<1
Benzo(a)pyrene TEQ	µg/L	<5	<5	<5
Total +ve PAH's	µg/L	NIL (+)VE	NIL (+)VE	NIL (+)VE
Surrogate p-Terphenyl-d14	%	89	99	103

OCPs in Water - Trace Level						
Our Reference		277283-1	277283-2	277283-3	277283-4	277283-5
Your Reference	UNITS	SS2	CP2	CW2	CW3	CW5
Type of sample		Water	Water	Water	Water	Water
Date extracted	-	09/09/2021	09/09/2021	09/09/2021	09/09/2021	09/09/2021
Date analysed	-	10/09/2021	10/09/2021	10/09/2021	10/09/2021	10/09/2021
alpha-BHC	µg/L	<0.001	<0.001	<0.001	<0.001	<0.001
HCB	µg/L	<0.001	<0.001	<0.001	<0.001	<0.001
beta-BHC	µg/L	<0.001	<0.001	<0.001	<0.001	<0.001
gamma-BHC	µg/L	<0.001	<0.001	<0.001	<0.001	<0.001
Heptachlor	µg/L	<0.001	<0.001	<0.001	<0.001	<0.001
delta-BHC	µg/L	<0.001	<0.001	<0.001	<0.001	<0.001
Aldrin	µg/L	<0.001	<0.001	<0.001	<0.001	<0.001
Heptachlor Epoxide	µg/L	<0.001	<0.001	<0.001	<0.001	<0.001
gamma-Chlordane	µg/L	<0.001	<0.001	<0.001	<0.001	<0.001
alpha-Chlordane	µg/L	<0.001	<0.001	<0.001	<0.001	<0.001
Endosulfan I	µg/L	<0.002	<0.002	<0.002	<0.002	<0.002
pp-DDE	µg/L	<0.001	<0.001	<0.001	<0.001	<0.001
Dieldrin	µg/L	0.040	<0.001	<0.001	<0.001	<0.001
Endrin	µg/L	<0.001	<0.001	<0.001	<0.001	<0.001
Endosulfan II	µg/L	<0.002	<0.002	<0.002	<0.002	<0.002
pp-DDD	µg/L	<0.001	<0.001	<0.001	<0.001	<0.001
Endrin Aldehyde	µg/L	<0.001	<0.001	<0.001	<0.001	<0.001
pp-DDT	µg/L	<0.001	<0.001	<0.001	<0.001	<0.001
Endosulfan Sulphate	µg/L	<0.001	<0.001	<0.001	<0.001	<0.001
Methoxychlor	µg/L	<0.001	<0.001	<0.001	<0.001	<0.001
Surrogate TCMX	%	62	94	61	66	95

OCPs in Water - Trace Level		
Our Reference		277283-6
Your Reference	UNITS	CW6
Type of sample		Water
Date extracted	-	09/09/2021
Date analysed	-	10/09/2021
alpha-BHC	µg/L	<0.001
HCB	µg/L	<0.001
beta-BHC	µg/L	<0.001
gamma-BHC	µg/L	<0.001
Heptachlor	µg/L	<0.001
delta-BHC	µg/L	<0.001
Aldrin	µg/L	<0.001
Heptachlor Epoxide	µg/L	<0.001
gamma-Chlordane	µg/L	<0.001
alpha-Chlordane	µg/L	<0.001
Endosulfan I	µg/L	<0.002
pp-DDE	µg/L	<0.001
Dieldrin	µg/L	<0.001
Endrin	µg/L	<0.001
Endosulfan II	µg/L	<0.002
pp-DDD	µg/L	<0.001
Endrin Aldehyde	µg/L	<0.001
pp-DDT	µg/L	<0.001
Endosulfan Sulphate	µg/L	<0.001
Methoxychlor	µg/L	<0.001
Surrogate TCMX	%	82

OP in water Trace ANZECCF/ADWG						
Our Reference		277283-1	277283-2	277283-3	277283-4	277283-5
Your Reference	UNITS	SS2	CP2	CW2	CW3	CW5
Type of sample		Water	Water	Water	Water	Water
Date extracted	-	09/09/2021	09/09/2021	09/09/2021	09/09/2021	09/09/2021
Date analysed	-	10/09/2021	10/09/2021	10/09/2021	10/09/2021	10/09/2021
Dichlorovos	µg/L	<0.2	<0.2	<0.2	<0.2	<0.2
Dimethoate	µg/L	<0.15	<0.15	<0.15	<0.15	<0.15
Diazinon	µg/L	<0.01	<0.01	<0.01	<0.01	<0.01
Chlorpyriphos-methyl	µg/L	<0.2	<0.2	<0.2	<0.2	<0.2
Methyl Parathion	µg/L	<0.2	<0.2	<0.2	<0.2	<0.2
Ronnel	µg/L	<0.2	<0.2	<0.2	<0.2	<0.2
Fenitrothion	µg/L	<0.2	<0.2	<0.2	<0.2	<0.2
Malathion	µg/L	<0.05	<0.05	<0.05	<0.05	<0.05
Chlorpyriphos	µg/L	<0.009	<0.009	<0.009	<0.009	<0.009
Parathion	µg/L	<0.004	<0.004	<0.004	<0.004	<0.004
Bromophos ethyl	µg/L	<0.2	<0.2	<0.2	<0.2	<0.2
Ethion	µg/L	<0.2	<0.2	<0.2	<0.2	<0.2
Azinphos-methyl (Guthion)	µg/L	<0.02	<0.02	<0.02	<0.02	<0.02
Surrogate TCMX	%	62	94	61	66	95

OP in water Trace ANZECCF/ADWG		
Our Reference		277283-6
Your Reference	UNITS	CW6
Type of sample		Water
Date extracted	-	09/09/2021
Date analysed	-	10/09/2021
Dichlorovos	µg/L	<0.2
Dimethoate	µg/L	<0.15
Diazinon	µg/L	<0.01
Chlorpyriphos-methyl	µg/L	<0.2
Methyl Parathion	µg/L	<0.2
Ronnel	µg/L	<0.2
Fenitrothion	µg/L	<0.2
Malathion	µg/L	<0.05
Chlorpyriphos	µg/L	<0.009
Parathion	µg/L	<0.004
Bromophos ethyl	µg/L	<0.2
Ethion	µg/L	<0.2
Azinphos-methyl (Guthion)	µg/L	<0.02
Surrogate TCMX	%	82

PCBs in Water - Trace Level						
Our Reference		277283-1	277283-2	277283-3	277283-4	277283-5
Your Reference	UNITS	SS2	CP2	CW2	CW3	CW5
Type of sample		Water	Water	Water	Water	Water
Date extracted	-	09/09/2021	09/09/2021	09/09/2021	09/09/2021	09/09/2021
Date analysed	-	10/09/2021	10/09/2021	10/09/2021	10/09/2021	10/09/2021
Aroclor 1016	µg/L	<0.01	<0.01	<0.01	<0.01	<0.01
Aroclor 1221	µg/L	<0.01	<0.01	<0.01	<0.01	<0.01
Aroclor 1232	µg/L	<0.01	<0.01	<0.01	<0.01	<0.01
Aroclor 1242	µg/L	<0.01	<0.01	<0.01	<0.01	<0.01
Aroclor 1248	µg/L	<0.01	<0.01	<0.01	<0.01	<0.01
Aroclor 1254	µg/L	<0.01	<0.01	<0.01	<0.01	<0.01
Aroclor 1260	µg/L	<0.01	<0.01	<0.01	<0.01	<0.01
Surrogate TCMX	%	62	94	61	66	95

PCBs in Water - Trace Level		
Our Reference		277283-6
Your Reference	UNITS	CW6
Type of sample		Water
Date extracted	-	09/09/2021
Date analysed	-	10/09/2021
Aroclor 1016	µg/L	<0.01
Aroclor 1221	µg/L	<0.01
Aroclor 1232	µg/L	<0.01
Aroclor 1242	µg/L	<0.01
Aroclor 1248	µg/L	<0.01
Aroclor 1254	µg/L	<0.01
Aroclor 1260	µg/L	<0.01
Surrogate TCMX	%	82

Speciated Phenols in water						
Our Reference		277283-1	277283-2	277283-3	277283-4	277283-5
Your Reference	UNITS	SS2	CP2	CW2	CW3	CW5
Type of sample		Water	Water	Water	Water	Water
Date extracted	-	09/09/2021	09/09/2021	09/09/2021	09/09/2021	09/09/2021
Date analysed	-	10/09/2021	10/09/2021	10/09/2021	10/09/2021	10/09/2021
Phenol	µg/L	<1	<1	<1	<1	<1
2-Chlorophenol	µg/L	<1	<1	<1	<1	<1
4-Chloro-3-Methylphenol	µg/L	<5	<5	<5	<5	<5
2-Methylphenol (0-Cresol)	µg/L	<1	<1	<1	<1	<1
3/4-Methylphenol (m/p-Cresol)	µg/L	<2	<2	<2	<2	<2
2-Nitrophenol	µg/L	<1	<1	<1	<1	<1
2,4-Dimethylphenol	µg/L	<1	<1	<1	<1	<1
2,4-Dichlorophenol	µg/L	<1	<1	<1	<1	<1
2,6-Dichlorophenol	µg/L	<1	<1	<1	<1	<1
2,4,5-Trichlorophenol	µg/L	<1	<1	<1	<1	<1
2,4,6-Trichlorophenol	µg/L	<1	<1	<1	<1	<1
2,4-Dinitrophenol	µg/L	<20	<20	<20	<20	<20
4-Nitrophenol	µg/L	<20	<20	<20	<20	<20
2346-Tetrachlorophenol	µg/L	<1	<1	<1	<1	<1
2-methyl-4,6-Dinitrophenol	µg/L	<10	<10	<10	<10	<10
Pentachlorophenol	µg/L	<5	<5	<5	<5	<5
Surrogate 2-fluorophenol	%	16	18	22	20	19
Surrogate Phenol-d_6	%	9.0	12	14	11	12
Surrogate 2,4,6-Tribromophenol	%	37	25	35	36	34
Surrogate *p*-Terphenyl-d_{14}	%	77	63	76	90	62

Speciated Phenols in water				
Our Reference	UNITS	277283-6	277283-7	277283-10
Your Reference		CW6	BD2	rinsate
Type of sample		Water	Water	Water
Date extracted	-	09/09/2021	09/09/2021	09/09/2021
Date analysed	-	10/09/2021	10/09/2021	10/09/2021
Phenol	µg/L	<1	<1	<1
2-Chlorophenol	µg/L	<1	<1	<1
4-Chloro-3-Methylphenol	µg/L	<5	<5	<5
2-Methylphenol (0-Cresol)	µg/L	<1	<1	<1
3/4-Methylphenol (m/p-Cresol)	µg/L	<2	<2	<2
2-Nitrophenol	µg/L	<1	<1	<1
2,4-Dimethylphenol	µg/L	<1	<1	<1
2,4-Dichlorophenol	µg/L	<1	<1	<1
2,6-Dichlorophenol	µg/L	<1	<1	<1
2,4,5-Trichlorophenol	µg/L	<1	<1	<1
2,4,6-Trichlorophenol	µg/L	<1	<1	<1
2,4-Dinitrophenol	µg/L	<20	<20	<20
4-Nitrophenol	µg/L	<20	<20	<20
2346-Tetrachlorophenol	µg/L	<1	<1	<1
2-methyl-4,6-Dinitrophenol	µg/L	<10	<10	<10
Pentachlorophenol	µg/L	<5	<5	<5
Surrogate 2-fluorophenol	%	13	60	52
Surrogate Phenol-d_6	%	7.0	55	44
Surrogate 2,4,6-Tribromophenol	%	30	95	102
Surrogate *p*-Terphenyl-d_{14}	%	62	99	103

HM in water - dissolved						
Our Reference		277283-1	277283-2	277283-3	277283-4	277283-5
Your Reference	UNITS	SS2	CP2	CW2	CW3	CW5
Type of sample		Water	Water	Water	Water	Water
Date prepared	-	07/09/2021	07/09/2021	07/09/2021	07/09/2021	07/09/2021
Date analysed	-	07/09/2021	07/09/2021	07/09/2021	07/09/2021	07/09/2021
Arsenic-Dissolved	µg/L	<1	9	<1	<1	3
Cadmium-Dissolved	µg/L	0.3	<0.1	<0.1	<0.1	<0.1
Chromium-Dissolved	µg/L	<1	<1	1	<1	<1
Copper-Dissolved	µg/L	12	<1	<1	<1	<1
Lead-Dissolved	µg/L	38	<1	<1	<1	<1
Mercury-Dissolved	µg/L	<0.05	<0.05	<0.05	<0.05	<0.05
Nickel-Dissolved	µg/L	33	9	2	9	3
Zinc-Dissolved	µg/L	77	3	13	1	2
Tin-Dissolved	µg/L	<1	<1	<1	<1	<1
Iron-Dissolved	µg/L	400	38,000	10	5,600	3,500

HM in water - dissolved				
Our Reference		277283-6	277283-7	277283-10
Your Reference	UNITS	CW6	BD2	rinsate
Type of sample		Water	Water	Water
Date prepared	-	07/09/2021	07/09/2021	07/09/2021
Date analysed	-	07/09/2021	07/09/2021	07/09/2021
Arsenic-Dissolved	µg/L	<1	<1	<1
Cadmium-Dissolved	µg/L	<0.1	<0.1	<0.1
Chromium-Dissolved	µg/L	<1	<1	<1
Copper-Dissolved	µg/L	<1	<1	<1
Lead-Dissolved	µg/L	<1	<1	<1
Mercury-Dissolved	µg/L	<0.05	<0.05	<0.05
Nickel-Dissolved	µg/L	6	2	<1
Zinc-Dissolved	µg/L	1	15	<1
Tin-Dissolved	µg/L	<1	<1	<1
Iron-Dissolved	µg/L	5,800	20	<10

Miscellaneous Inorganics						
Our Reference		277283-1	277283-2	277283-3	277283-4	277283-5
Your Reference	UNITS	SS2	CP2	CW2	CW3	CW5
Type of sample		Water	Water	Water	Water	Water
Date prepared	-	06/09/2021	06/09/2021	06/09/2021	06/09/2021	06/09/2021
Date analysed	-	06/09/2021	06/09/2021	06/09/2021	06/09/2021	06/09/2021
Ferrous Iron	mg/L	0.41	44	0.18	6.6	2.4
Ferric Iron (by calculation)	mg/L	<0.05	<0.05	<0.05	<0.05	1.1
Total Suspended Solids	mg/L	470	730	90	2,400	3,800
Oil & Grease (LLE)	mg/L	<5	<5	<5	<5	<5

Miscellaneous Inorganics		
Our Reference		277283-6
Your Reference	UNITS	CW6
Type of sample		Water
Date prepared	-	06/09/2021
Date analysed	-	06/09/2021
Ferrous Iron	mg/L	5.1
Ferric Iron (by calculation)	mg/L	0.72
Total Suspended Solids	mg/L	14,000
Oil & Grease (LLE)	mg/L	<5

Tributyl Tin in Water						
Our Reference		277283-1	277283-2	277283-3	277283-4	277283-5
Your Reference	UNITS	SS2	CP2	CW2	CW3	CW5
Type of sample		Water	Water	Water	Water	Water
Date extracted	-	08/09/2021	08/09/2021	08/09/2021	08/09/2021	08/09/2021
Date analysed	-	10/09/2021	10/09/2021	10/09/2021	10/09/2021	10/09/2021
Tributyltin as Sn	µg/L	<0.002	<0.002	<0.002	<0.002	<0.002
Surrogate Triphenyltin	%	86	85	87	90	87

Tributyl Tin in Water		
Our Reference		277283-6
Your Reference	UNITS	CW6
Type of sample		Water
Date extracted	-	08/09/2021
Date analysed	-	10/09/2021
Tributyltin as Sn	µg/L	<0.002
Surrogate Triphenyltin	%	85

Method ID	Methodology Summary
Ext-054	Analysed by MPL Envirolab
Inorg-003	Oil & Grease - determine gravimetrically following extraction with Hexane, in accordance with APHA latest edition, 5520-B.
Inorg-019	Suspended Solids - determined gravimetricially by filtration of the sample. The samples are dried at 104+/-5°C.
Inorg-076	Ferrous Iron is determined colourimetrically by discrete analyser. Waters samples are filtered on receipt prior to analysis.
Metals-021	Determination of Mercury by Cold Vapour AAS.
Metals-022	Determination of various metals by ICP-MS.
Org-020	Soil samples are extracted with Dichloromethane/Acetone and waters with Dichloromethane and analysed by GC-FID. F2 = (>C10-C16)-Naphthalene as per NEPM B1 Guideline on Investigation Levels for Soil and Groundwater (HSLs Tables 1A (3, 4)). Note Naphthalene is determined from the VOC analysis.
Org-021	Soil samples are extracted with dichloromethane/acetone and waters with dichloromethane and analysed by GC-ECD.
Org-022/025	Soil samples are extracted with Dichloromethane/Acetone and waters with Dichloromethane and analysed by GC-MS/GC-MSMS.
Org-022/025	Soil samples are extracted with Dichloromethane/Acetone and waters with Dichloromethane and analysed by GC-MS/GC-MSMS.
Org-022/025	Soil samples are extracted with Dichloromethane/Acetone and waters with Dichloromethane and analysed by GC-MS/GC-MSMS. Benzo(a)pyrene TEQ as per NEPM B1 Guideline on Investigation Levels for Soil and Groundwater - 2013.
Org-023	Water samples are analysed directly by purge and trap GC-MS.
Org-023	Soil samples are extracted with methanol and spiked into water prior to analysing by purge and trap GC-MS. Water samples are analysed directly by purge and trap GC-MS. F1 = (C6-C10)-BTEX as per NEPM B1 Guideline on Investigation Levels for Soil and Groundwater.

QUALITY CONTROL: VOCs in water						Duplicate			Spike Recovery %	
Test Description	Units	PQL	Method	Blank	#	Base	Dup.	RPD	LCS-W1	[NT]
Date extracted	-			07/09/2021	1	07/09/2021	08/09/2021		07/09/2021	[NT]
Date analysed	-			07/09/2021	1	07/09/2021	08/09/2021		07/09/2021	[NT]
Dichlorodifluoromethane	µg/L	10	Org-023	<10	1	<10	<10	0	[NT]	[NT]
Chloromethane	µg/L	10	Org-023	<10	1	<10	<10	0	[NT]	[NT]
Vinyl Chloride	µg/L	10	Org-023	<10	1	<10	<10	0	[NT]	[NT]
Bromomethane	µg/L	10	Org-023	<10	1	<10	<10	0	[NT]	[NT]
Chloroethane	µg/L	10	Org-023	<10	1	<10	<10	0	[NT]	[NT]
Trichlorofluoromethane	µg/L	10	Org-023	<10	1	<10	<10	0	[NT]	[NT]
1,1-Dichloroethene	µg/L	1	Org-023	<1	1	<1	<1	0	[NT]	[NT]
Trans-1,2-dichloroethene	µg/L	1	Org-023	<1	1	<1	<1	0	[NT]	[NT]
1,1-dichloroethane	µg/L	1	Org-023	<1	1	<1	<1	0	97	[NT]
Cis-1,2-dichloroethene	µg/L	1	Org-023	<1	1	<1	<1	0	[NT]	[NT]
Bromochloromethane	µg/L	1	Org-023	<1	1	<1	<1	0	[NT]	[NT]
Chloroform	µg/L	1	Org-023	<1	1	2	2	0	104	[NT]
2,2-dichloropropane	µg/L	1	Org-023	<1	1	<1	<1	0	[NT]	[NT]
1,2-dichloroethane	µg/L	1	Org-023	<1	1	<1	<1	0	109	[NT]
1,1,1-trichloroethane	µg/L	1	Org-023	<1	1	<1	<1	0	94	[NT]
1,1-dichloropropene	µg/L	1	Org-023	<1	1	<1	<1	0	[NT]	[NT]
Cyclohexane	µg/L	1	Org-023	<1	1	<1	<1	0	[NT]	[NT]
Carbon tetrachloride	µg/L	1	Org-023	<1	1	<1	<1	0	[NT]	[NT]
Benzene	µg/L	1	Org-023	<1	1	<1	<1	0	[NT]	[NT]
Dibromomethane	µg/L	1	Org-023	<1	1	<1	<1	0	[NT]	[NT]
1,2-dichloropropane	µg/L	1	Org-023	<1	1	<1	<1	0	[NT]	[NT]
Trichloroethene	µg/L	1	Org-023	<1	1	<1	<1	0	90	[NT]
Bromodichloromethane	µg/L	1	Org-023	<1	1	<1	<1	0	95	[NT]
trans-1,3-dichloropropene	µg/L	1	Org-023	<1	1	<1	<1	0	[NT]	[NT]
cis-1,3-dichloropropene	µg/L	1	Org-023	<1	1	<1	<1	0	[NT]	[NT]
1,1,2-trichloroethane	µg/L	1	Org-023	<1	1	<1	<1	0	[NT]	[NT]
Toluene	µg/L	1	Org-023	<1	1	<1	<1	0	[NT]	[NT]
1,3-dichloropropane	µg/L	1	Org-023	<1	1	<1	<1	0	[NT]	[NT]
Dibromochloromethane	µg/L	1	Org-023	<1	1	<1	<1	0	86	[NT]
1,2-dibromoethane	µg/L	1	Org-023	<1	1	<1	<1	0	[NT]	[NT]
Tetrachloroethene	µg/L	1	Org-023	<1	1	<1	<1	0	87	[NT]
1,1,1,2-tetrachloroethane	µg/L	1	Org-023	<1	1	<1	<1	0	[NT]	[NT]
Chlorobenzene	µg/L	1	Org-023	<1	1	<1	<1	0	[NT]	[NT]
Ethylbenzene	µg/L	1	Org-023	<1	1	<1	<1	0	[NT]	[NT]
Bromoform	µg/L	1	Org-023	<1	1	<1	<1	0	[NT]	[NT]
m+p-xylene	µg/L	2	Org-023	<2	1	<2	<2	0	[NT]	[NT]
Styrene	µg/L	1	Org-023	<1	1	<1	<1	0	[NT]	[NT]
1,1,2,2-tetrachloroethane	µg/L	1	Org-023	<1	1	<1	<1	0	[NT]	[NT]

QUALITY CONTROL: VOCs in water						Duplicate			Spike Recovery %	
Test Description	Units	PQL	Method	Blank	#	Base	Dup.	RPD	LCS-W1	[NT]
o-xylene	µg/L	1	Org-023	<1	1	<1	<1	0	[NT]	[NT]
1,2,3-trichloropropane	µg/L	1	Org-023	<1	1	<1	<1	0	[NT]	[NT]
Isopropylbenzene	µg/L	1	Org-023	<1	1	<1	<1	0	[NT]	[NT]
Bromobenzene	µg/L	1	Org-023	<1	1	<1	<1	0	[NT]	[NT]
n-propyl benzene	µg/L	1	Org-023	<1	1	<1	<1	0	[NT]	[NT]
2-chlorotoluene	µg/L	1	Org-023	<1	1	<1	<1	0	[NT]	[NT]
4-chlorotoluene	µg/L	1	Org-023	<1	1	<1	<1	0	[NT]	[NT]
1,3,5-trimethyl benzene	µg/L	1	Org-023	<1	1	<1	<1	0	[NT]	[NT]
Tert-butyl benzene	µg/L	1	Org-023	<1	1	<1	<1	0	[NT]	[NT]
1,2,4-trimethyl benzene	µg/L	1	Org-023	<1	1	<1	<1	0	[NT]	[NT]
1,3-dichlorobenzene	µg/L	1	Org-023	<1	1	<1	<1	0	[NT]	[NT]
Sec-butyl benzene	µg/L	1	Org-023	<1	1	<1	<1	0	[NT]	[NT]
1,4-dichlorobenzene	µg/L	1	Org-023	<1	1	<1	<1	0	[NT]	[NT]
4-isopropyl toluene	µg/L	1	Org-023	<1	1	<1	<1	0	[NT]	[NT]
1,2-dichlorobenzene	µg/L	1	Org-023	<1	1	<1	<1	0	[NT]	[NT]
n-butyl benzene	µg/L	1	Org-023	<1	1	<1	<1	0	[NT]	[NT]
1,2-dibromo-3-chloropropane	µg/L	1	Org-023	<1	1	<1	<1	0	[NT]	[NT]
1,2,4-trichlorobenzene	µg/L	1	Org-023	<1	1	<1	<1	0	[NT]	[NT]
Hexachlorobutadiene	µg/L	1	Org-023	<1	1	<1	<1	0	[NT]	[NT]
1,2,3-trichlorobenzene	µg/L	1	Org-023	<1	1	<1	<1	0	[NT]	[NT]
Surrogate Dibromofluoromethane	%		Org-023	100	1	100	98	2	101	[NT]
Surrogate toluene-d8	%		Org-023	87	1	88	88	0	89	[NT]
Surrogate 4-BFB	%		Org-023	96	1	97	94	3	95	[NT]

QUALITY CONTROL: VOCs in water					Duplicate				Spike Recovery %	
Test Description	Units	PQL	Method	Blank	#	Base	Dup.	RPD	[NT]	[NT]
Date extracted	-			[NT]	10	07/09/2021	08/09/2021		[NT]	[NT]
Date analysed	-			[NT]	10	07/09/2021	08/09/2021		[NT]	[NT]
Dichlorodifluoromethane	µg/L	10	Org-023	[NT]	10	<10	<10	0	[NT]	[NT]
Chloromethane	µg/L	10	Org-023	[NT]	10	<10	<10	0	[NT]	[NT]
Vinyl Chloride	µg/L	10	Org-023	[NT]	10	<10	<10	0	[NT]	[NT]
Bromomethane	µg/L	10	Org-023	[NT]	10	<10	<10	0	[NT]	[NT]
Chloroethane	µg/L	10	Org-023	[NT]	10	<10	<10	0	[NT]	[NT]
Trichlorofluoromethane	µg/L	10	Org-023	[NT]	10	<10	<10	0	[NT]	[NT]
1,1-Dichloroethene	µg/L	1	Org-023	[NT]	10	<1	<1	0	[NT]	[NT]
Trans-1,2-dichloroethene	µg/L	1	Org-023	[NT]	10	<1	<1	0	[NT]	[NT]
1,1-dichloroethane	µg/L	1	Org-023	[NT]	10	<1	<1	0	[NT]	[NT]
Cis-1,2-dichloroethene	µg/L	1	Org-023	[NT]	10	<1	<1	0	[NT]	[NT]
Bromochloromethane	µg/L	1	Org-023	[NT]	10	<1	<1	0	[NT]	[NT]
Chloroform	µg/L	1	Org-023	[NT]	10	<1	<1	0	[NT]	[NT]
2,2-dichloropropane	µg/L	1	Org-023	[NT]	10	<1	<1	0	[NT]	[NT]
1,2-dichloroethane	µg/L	1	Org-023	[NT]	10	<1	<1	0	[NT]	[NT]
1,1,1-trichloroethane	µg/L	1	Org-023	[NT]	10	<1	<1	0	[NT]	[NT]
1,1-dichloropropene	µg/L	1	Org-023	[NT]	10	<1	<1	0	[NT]	[NT]
Cyclohexane	µg/L	1	Org-023	[NT]	10	<1	<1	0	[NT]	[NT]
Carbon tetrachloride	µg/L	1	Org-023	[NT]	10	<1	<1	0	[NT]	[NT]
Benzene	µg/L	1	Org-023	[NT]	10	<1	<1	0	[NT]	[NT]
Dibromomethane	µg/L	1	Org-023	[NT]	10	<1	<1	0	[NT]	[NT]
1,2-dichloropropane	µg/L	1	Org-023	[NT]	10	<1	<1	0	[NT]	[NT]
Trichloroethene	µg/L	1	Org-023	[NT]	10	<1	<1	0	[NT]	[NT]
Bromodichloromethane	µg/L	1	Org-023	[NT]	10	<1	<1	0	[NT]	[NT]
trans-1,3-dichloropropene	µg/L	1	Org-023	[NT]	10	<1	<1	0	[NT]	[NT]
cis-1,3-dichloropropene	µg/L	1	Org-023	[NT]	10	<1	<1	0	[NT]	[NT]
1,1,2-trichloroethane	µg/L	1	Org-023	[NT]	10	<1	<1	0	[NT]	[NT]
Toluene	µg/L	1	Org-023	[NT]	10	<1	<1	0	[NT]	[NT]
1,3-dichloropropane	µg/L	1	Org-023	[NT]	10	<1	<1	0	[NT]	[NT]
Dibromochloromethane	µg/L	1	Org-023	[NT]	10	<1	<1	0	[NT]	[NT]
1,2-dibromoethane	µg/L	1	Org-023	[NT]	10	<1	<1	0	[NT]	[NT]
Tetrachloroethene	µg/L	1	Org-023	[NT]	10	<1	<1	0	[NT]	[NT]
1,1,1,2-tetrachloroethane	µg/L	1	Org-023	[NT]	10	<1	<1	0	[NT]	[NT]
Chlorobenzene	µg/L	1	Org-023	[NT]	10	<1	<1	0	[NT]	[NT]
Ethylbenzene	µg/L	1	Org-023	[NT]	10	<1	<1	0	[NT]	[NT]
Bromoform	µg/L	1	Org-023	[NT]	10	<1	<1	0	[NT]	[NT]
m+p-xylene	µg/L	2	Org-023	[NT]	10	<2	<2	0	[NT]	[NT]
Styrene	µg/L	1	Org-023	[NT]	10	<1	<1	0	[NT]	[NT]
1,1,2,2-tetrachloroethane	µg/L	1	Org-023	[NT]	10	<1	<1	0	[NT]	[NT]

QUALITY CONTROL: VOCs in water					Duplicate				Spike Recovery %	
Test Description	Units	PQL	Method	Blank	#	Base	Dup.	RPD	[NT]	[NT]
o-xylene	µg/L	1	Org-023	[NT]	10	<1	<1	0	[NT]	[NT]
1,2,3-trichloropropane	µg/L	1	Org-023	[NT]	10	<1	<1	0	[NT]	[NT]
Isopropylbenzene	µg/L	1	Org-023	[NT]	10	<1	<1	0	[NT]	[NT]
Bromobenzene	µg/L	1	Org-023	[NT]	10	<1	<1	0	[NT]	[NT]
n-propyl benzene	µg/L	1	Org-023	[NT]	10	<1	<1	0	[NT]	[NT]
2-chlorotoluene	µg/L	1	Org-023	[NT]	10	<1	<1	0	[NT]	[NT]
4-chlorotoluene	µg/L	1	Org-023	[NT]	10	<1	<1	0	[NT]	[NT]
1,3,5-trimethyl benzene	µg/L	1	Org-023	[NT]	10	<1	<1	0	[NT]	[NT]
Tert-butyl benzene	µg/L	1	Org-023	[NT]	10	<1	<1	0	[NT]	[NT]
1,2,4-trimethyl benzene	µg/L	1	Org-023	[NT]	10	<1	<1	0	[NT]	[NT]
1,3-dichlorobenzene	µg/L	1	Org-023	[NT]	10	<1	<1	0	[NT]	[NT]
Sec-butyl benzene	µg/L	1	Org-023	[NT]	10	<1	<1	0	[NT]	[NT]
1,4-dichlorobenzene	µg/L	1	Org-023	[NT]	10	<1	<1	0	[NT]	[NT]
4-isopropyl toluene	µg/L	1	Org-023	[NT]	10	<1	<1	0	[NT]	[NT]
1,2-dichlorobenzene	µg/L	1	Org-023	[NT]	10	<1	<1	0	[NT]	[NT]
n-butyl benzene	µg/L	1	Org-023	[NT]	10	<1	<1	0	[NT]	[NT]
1,2-dibromo-3-chloropropane	µg/L	1	Org-023	[NT]	10	<1	<1	0	[NT]	[NT]
1,2,4-trichlorobenzene	µg/L	1	Org-023	[NT]	10	<1	<1	0	[NT]	[NT]
Hexachlorobutadiene	µg/L	1	Org-023	[NT]	10	<1	<1	0	[NT]	[NT]
1,2,3-trichlorobenzene	µg/L	1	Org-023	[NT]	10	<1	<1	0	[NT]	[NT]
Surrogate Dibromofluoromethane	%		Org-023	[NT]	10	99	98	1	[NT]	[NT]
Surrogate toluene-d8	%		Org-023	[NT]	10	87	86	1	[NT]	[NT]
Surrogate 4-BFB	%		Org-023	[NT]	10	96	94	2	[NT]	[NT]

QUALITY CONTROL: vTRH(C6-C10)/BTEXN in Water						Duplicate			Spike Recovery %	
Test Description	Units	PQL	Method	Blank	#	Base	Dup.	RPD	LCS-W1	[NT]
Date extracted	-			07/09/2021	1	07/09/2021	08/09/2021		07/09/2021	[NT]
Date analysed	-			07/09/2021	1	07/09/2021	08/09/2021		07/09/2021	[NT]
TRH C_6 - C_9	µg/L	10	Org-023	<10	1	<10	<10	0	98	[NT]
TRH C_6 - C_{10}	µg/L	10	Org-023	<10	1	<10	<10	0	98	[NT]
Benzene	µg/L	1	Org-023	<1	1	<1	<1	0	94	[NT]
Toluene	µg/L	1	Org-023	<1	1	<1	<1	0	91	[NT]
Ethylbenzene	µg/L	1	Org-023	<1	1	<1	<1	0	100	[NT]
m+p-xylene	µg/L	2	Org-023	<2	1	<2	<2	0	102	[NT]
o-xylene	µg/L	1	Org-023	<1	1	<1	<1	0	98	[NT]
Naphthalene	µg/L	1	Org-023	<1	1	<1	<1	0	[NT]	[NT]
Surrogate Dibromofluoromethane	%		Org-023	100	1	100	98	2	101	[NT]
Surrogate toluene-d8	%		Org-023	87	1	88	88	0	89	[NT]
Surrogate 4-BFB	%		Org-023	96	1	97	94	3	95	[NT]

QUALITY CONTROL: vTRH(C6-C10)/BTEXN in Water						Duplicate			Spike Recovery %	
Test Description	Units	PQL	Method	Blank	#	Base	Dup.	RPD	[NT]	[NT]
Date extracted	-			[NT]	10	07/09/2021	08/09/2021		[NT]	[NT]
Date analysed	-			[NT]	10	07/09/2021	08/09/2021		[NT]	[NT]
TRH C_6 - C_9	µg/L	10	Org-023	[NT]	10	<10	<10	0	[NT]	[NT]
TRH C_6 - C_{10}	µg/L	10	Org-023	[NT]	10	<10	<10	0	[NT]	[NT]
Benzene	µg/L	1	Org-023	[NT]	10	<1	<1	0	[NT]	[NT]
Toluene	µg/L	1	Org-023	[NT]	10	<1	<1	0	[NT]	[NT]
Ethylbenzene	µg/L	1	Org-023	[NT]	10	<1	<1	0	[NT]	[NT]
m+p-xylene	µg/L	2	Org-023	[NT]	10	<2	<2	0	[NT]	[NT]
o-xylene	µg/L	1	Org-023	[NT]	10	<1	<1	0	[NT]	[NT]
Naphthalene	µg/L	1	Org-023	[NT]	10	<1	<1	0	[NT]	[NT]
Surrogate Dibromofluoromethane	%		Org-023	[NT]	10	99	98	1	[NT]	[NT]
Surrogate toluene-d8	%		Org-023	[NT]	10	87	86	1	[NT]	[NT]
Surrogate 4-BFB	%		Org-023	[NT]	10	96	94	2	[NT]	[NT]

QUALITY CONTROL: svTRH (C10-C40) in Water						Duplicate			Spike Recovery %	
Test Description	Units	PQL	Method	Blank	#	Base	Dup.	RPD	LCS-W2	[NT]
Date extracted	-			09/09/2021	7	09/09/2021	09/09/2021		09/09/2021	[NT]
Date analysed	-			11/09/2021	7	11/09/2021	11/09/2021		11/09/2021	[NT]
TRH C_{10} - C_{14}	µg/L	50	Org-020	<50	7	<50	<50	0	111	[NT]
TRH C_{15} - C_{28}	µg/L	100	Org-020	<100	7	<100	<100	0	121	[NT]
TRH C_{29} - C_{36}	µg/L	100	Org-020	<100	7	<100	<100	0	93	[NT]
TRH >C_{10} - C_{16}	µg/L	50	Org-020	<50	7	<50	<50	0	111	[NT]
TRH >C_{16} - C_{34}	µg/L	100	Org-020	<100	7	<100	<100	0	121	[NT]
TRH >C_{34} - C_{40}	µg/L	100	Org-020	<100	7	<100	<100	0	93	[NT]
Surrogate o-Terphenyl	%		Org-020	96	7	86	99	14	105	[NT]

QUALITY CONTROL: PAHs in Water						Duplicate			Spike Recovery %	
Test Description	Units	PQL	Method	Blank	#	Base	Dup.	RPD	LCS-W2	[NT]
Date extracted	-			09/09/2021	7	09/09/2021	09/09/2021		09/09/2021	[NT]
Date analysed	-			10/09/2021	7	10/09/2021	10/09/2021		10/09/2021	[NT]
Naphthalene	µg/L	1	Org-022/025	<1	7	<1	<1	0	115	[NT]
Acenaphthylene	µg/L	1	Org-022/025	<1	7	<1	<1	0	[NT]	[NT]
Acenaphthene	µg/L	1	Org-022/025	<1	7	<1	<1	0	90	[NT]
Fluorene	µg/L	1	Org-022/025	<1	7	<1	<1	0	93	[NT]
Phenanthrene	µg/L	1	Org-022/025	<1	7	<1	<1	0	116	[NT]
Anthracene	µg/L	1	Org-022/025	<1	7	<1	<1	0	[NT]	[NT]
Fluoranthene	µg/L	1	Org-022/025	<1	7	<1	<1	0	93	[NT]
Pyrene	µg/L	1	Org-022/025	<1	7	<1	<1	0	102	[NT]
Benzo(a)anthracene	µg/L	1	Org-022/025	<1	7	<1	<1	0	[NT]	[NT]
Chrysene	µg/L	1	Org-022/025	<1	7	<1	<1	0	106	[NT]
Benzo(b,j+k)fluoranthene	µg/L	2	Org-022/025	<2	7	<2	<2	0	[NT]	[NT]
Benzo(a)pyrene	µg/L	1	Org-022/025	<1	7	<1	<1	0	83	[NT]
Indeno(1,2,3-c,d)pyrene	µg/L	1	Org-022/025	<1	7	<1	<1	0	[NT]	[NT]
Dibenzo(a,h)anthracene	µg/L	1	Org-022/025	<1	7	<1	<1	0	[NT]	[NT]
Benzo(g,h,i)perylene	µg/L	1	Org-022/025	<1	7	<1	<1	0	[NT]	[NT]
Surrogate p-Terphenyl-d14	%		Org-022/025	87	7	99	103	4	89	[NT]

QUALITY CONTROL: OCPs in Water - Trace Level						Duplicate			Spike Recovery %	
Test Description	Units	PQL	Method	Blank	#	Base	Dup.	RPD	LCS-W1	[NT]
Date extracted	-			09/09/2021	[NT]	[NT]	[NT]	[NT]	09/09/2021	[NT]
Date analysed	-			10/09/2021	[NT]	[NT]	[NT]	[NT]	10/09/2021	[NT]
alpha-BHC	µg/L	0.001	Org-022/025	<0.001	[NT]	[NT]	[NT]	[NT]	129	[NT]
HCB	µg/L	0.001	Org-022/025	<0.001	[NT]	[NT]	[NT]	[NT]	[NT]	[NT]
beta-BHC	µg/L	0.001	Org-022/025	<0.001	[NT]	[NT]	[NT]	[NT]	128	[NT]
gamma-BHC	µg/L	0.001	Org-022/025	<0.001	[NT]	[NT]	[NT]	[NT]	[NT]	[NT]
Heptachlor	µg/L	0.001	Org-022/025	<0.001	[NT]	[NT]	[NT]	[NT]	122	[NT]
delta-BHC	µg/L	0.001	Org-022/025	<0.001	[NT]	[NT]	[NT]	[NT]	[NT]	[NT]
Aldrin	µg/L	0.001	Org-022/025	<0.001	[NT]	[NT]	[NT]	[NT]	132	[NT]
Heptachlor Epoxide	µg/L	0.001	Org-022/025	<0.001	[NT]	[NT]	[NT]	[NT]	132	[NT]
gamma-Chlordane	µg/L	0.001	Org-022/025	<0.001	[NT]	[NT]	[NT]	[NT]	[NT]	[NT]
alpha-Chlordane	µg/L	0.001	Org-022/025	<0.001	[NT]	[NT]	[NT]	[NT]	[NT]	[NT]
Endosulfan I	µg/L	0.002	Org-022/025	<0.002	[NT]	[NT]	[NT]	[NT]	[NT]	[NT]
pp-DDE	µg/L	0.001	Org-022/025	<0.001	[NT]	[NT]	[NT]	[NT]	127	[NT]
Dieldrin	µg/L	0.001	Org-022/025	<0.001	[NT]	[NT]	[NT]	[NT]	117	[NT]
Endrin	µg/L	0.001	Org-022/025	<0.001	[NT]	[NT]	[NT]	[NT]	135	[NT]
Endosulfan II	µg/L	0.002	Org-022/025	<0.002	[NT]	[NT]	[NT]	[NT]	[NT]	[NT]
pp-DDD	µg/L	0.001	Org-022/025	<0.001	[NT]	[NT]	[NT]	[NT]	127	[NT]
Endrin Aldehyde	µg/L	0.001	Org-022/025	<0.001	[NT]	[NT]	[NT]	[NT]	[NT]	[NT]
pp-DDT	µg/L	0.001	Org-022/025	<0.001	[NT]	[NT]	[NT]	[NT]	[NT]	[NT]
Endosulfan Sulphate	µg/L	0.001	Org-022/025	<0.001	[NT]	[NT]	[NT]	[NT]	122	[NT]
Methoxychlor	µg/L	0.001	Org-022/025	<0.001	[NT]	[NT]	[NT]	[NT]	[NT]	[NT]
Surrogate TCMX	%		Org-022/025	96	[NT]	[NT]	[NT]	[NT]	72	[NT]

QUALITY CONTROL: OP in water Trace ANZECCF/ADWG						Duplicate			Spike Recovery %	
Test Description	Units	PQL	Method	Blank	#	Base	Dup.	RPD	LCS-W1	[NT]
Date extracted	-			09/09/2021	[NT]	[NT]	[NT]	[NT]	09/09/2021	[NT]
Date analysed	-			10/09/2021	[NT]	[NT]	[NT]	[NT]	10/09/2021	[NT]
Dichlorovos	µg/L	0.2	Org-022/025	<0.2	[NT]	[NT]	[NT]	[NT]	114	[NT]
Dimethoate	µg/L	0.15	Org-022/025	<0.15	[NT]	[NT]	[NT]	[NT]	[NT]	[NT]
Diazinon	µg/L	0.01	Org-022/025	<0.01	[NT]	[NT]	[NT]	[NT]	[NT]	[NT]
Chlorpyriphos-methyl	µg/L	0.2	Org-022/025	<0.2	[NT]	[NT]	[NT]	[NT]	[NT]	[NT]
Methyl Parathion	µg/L	0.2	Org-022/025	<0.2	[NT]	[NT]	[NT]	[NT]	[NT]	[NT]
Ronnel	µg/L	0.2	Org-022/025	<0.2	[NT]	[NT]	[NT]	[NT]	121	[NT]
Fenitrothion	µg/L	0.2	Org-022/025	<0.2	[NT]	[NT]	[NT]	[NT]	104	[NT]
Malathion	µg/L	0.05	Org-022/025	<0.05	[NT]	[NT]	[NT]	[NT]	127	[NT]
Chlorpyriphos	µg/L	0.009	Org-022/025	<0.009	[NT]	[NT]	[NT]	[NT]	132	[NT]
Parathion	µg/L	0.004	Org-022/025	<0.004	[NT]	[NT]	[NT]	[NT]	98	[NT]
Bromophos ethyl	µg/L	0.2	Org-022/025	<0.2	[NT]	[NT]	[NT]	[NT]	[NT]	[NT]
Ethion	µg/L	0.2	Org-022/025	<0.2	[NT]	[NT]	[NT]	[NT]	106	[NT]
Azinphos-methyl (Guthion)	µg/L	0.02	Org-022/025	<0.02	[NT]	[NT]	[NT]	[NT]	[NT]	[NT]
Surrogate TCMX	%		Org-022/025	96	[NT]	[NT]	[NT]	[NT]	72	[NT]

QUALITY CONTROL: PCBs in Water - Trace Level						Duplicate			Spike Recovery %	
Test Description	Units	PQL	Method	Blank	#	Base	Dup.	RPD	LCS-W1	[NT]
Date extracted	-			09/09/2021	[NT]	[NT]	[NT]	[NT]	09/09/2021	[NT]
Date analysed	-			10/09/2021	[NT]	[NT]	[NT]	[NT]	10/09/2021	[NT]
Aroclor 1016	µg/L	0.01	Org-021	<0.01	[NT]	[NT]	[NT]	[NT]	[NT]	[NT]
Aroclor 1221	µg/L	0.01	Org-021	<0.01	[NT]	[NT]	[NT]	[NT]	[NT]	[NT]
Aroclor 1232	µg/L	0.01	Org-021	<0.01	[NT]	[NT]	[NT]	[NT]	[NT]	[NT]
Aroclor 1242	µg/L	0.01	Org-021	<0.01	[NT]	[NT]	[NT]	[NT]	[NT]	[NT]
Aroclor 1248	µg/L	0.01	Org-021	<0.01	[NT]	[NT]	[NT]	[NT]	[NT]	[NT]
Aroclor 1254	µg/L	0.01	Org-021	<0.01	[NT]	[NT]	[NT]	[NT]	120	[NT]
Aroclor 1260	µg/L	0.01	Org-021	<0.01	[NT]	[NT]	[NT]	[NT]	[NT]	[NT]
Surrogate TCMX	%		Org-021	96	[NT]	[NT]	[NT]	[NT]	72	[NT]

QUALITY CONTROL: Speciated Phenols in water						Duplicate			Spike Recovery %	
Test Description	Units	PQL	Method	Blank	#	Base	Dup.	RPD	LCS-W1	277283-7
Date extracted	-			09/09/2021	7	09/09/2021	09/09/2021		09/09/2021	09/09/2021
Date analysed	-			10/09/2021	7	10/09/2021	10/09/2021		10/09/2021	10/09/2021
Phenol	µg/L	1	Org-022/025	<1	7	<1	<1	0	60	90
2-Chlorophenol	µg/L	1	Org-022/025	<1	7	<1	<1	0	126	109
4-Chloro-3-Methylphenol	µg/L	5	Org-022/025	<5	7	<5	<5	0	[NT]	[NT]
2-Methylphenol (0-Cresol)	µg/L	1	Org-022/025	<1	7	<1	<1	0	52	72
3/4-Methylphenol (m/p-Cresol)	µg/L	2	Org-022/025	<2	7	<2	<2	0	[NT]	[NT]
2-Nitrophenol	µg/L	1	Org-022/025	<1	7	<1	<1	0	[NT]	[NT]
2,4-Dimethylphenol	µg/L	1	Org-022/025	<1	7	<1	<1	0	[NT]	[NT]
2,4-Dichlorophenol	µg/L	1	Org-022/025	<1	7	<1	<1	0	[NT]	[NT]
2,6-Dichlorophenol	µg/L	1	Org-022/025	<1	7	<1	<1	0	106	115
2,4,5-Trichlorophenol	µg/L	1	Org-022/025	<1	7	<1	<1	0	[NT]	[NT]
2,4,6-Trichlorophenol	µg/L	1	Org-022/025	<1	7	<1	<1	0	[NT]	[NT]
2,4-Dinitrophenol	µg/L	20	Org-022/025	<20	7	<20	<20	0	[NT]	[NT]
4-Nitrophenol	µg/L	20	Org-022/025	<20	7	<20	<20	0	75	102
2346-Tetrachlorophenol	µg/L	1	Org-022/025	<1	7	<1	<1	0	[NT]	[NT]
2-methyl-4,6-Dinitrophenol	µg/L	10	Org-022/025	<10	7	<10	<10	0	[NT]	[NT]
Pentachlorophenol	µg/L	5	Org-022/025	<5	7	<5	<5	0	117	99
Surrogate 2-fluorophenol	%		Org-022/025	53	7	60	63	5	47	68
Surrogate Phenol-d_6	%		Org-022/025	42	7	55	55	0	38	60
Surrogate 2,4,6-Tribromophenol	%		Org-022/025	105	7	95	102	7	94	107
Surrogate p-Terphenyl-d_{14}	%		Org-022/025	107	7	99	103	4	90	107

QUALITY CONTROL: HM in water - dissolved						Duplicate			Spike Recovery %	
Test Description	Units	PQL	Method	Blank	#	Base	Dup.	RPD	LCS-W3	277283-2
Date prepared	-			07/09/2021	1	07/09/2021	07/09/2021		07/09/2021	07/09/2021
Date analysed	-			07/09/2021	1	07/09/2021	07/09/2021		07/09/2021	07/09/2021
Arsenic-Dissolved	µg/L	1	Metals-022	<1	1	<1	<1	0	93	86
Cadmium-Dissolved	µg/L	0.1	Metals-022	<0.1	1	0.3	0.3	0	94	88
Chromium-Dissolved	µg/L	1	Metals-022	<1	1	<1	<1	0	92	86
Copper-Dissolved	µg/L	1	Metals-022	<1	1	12	11	9	91	78
Lead-Dissolved	µg/L	1	Metals-022	<1	1	38	36	5	93	83
Mercury-Dissolved	µg/L	0.05	Metals-021	<0.05	1	<0.05	<0.05	0	114	[NT]
Nickel-Dissolved	µg/L	1	Metals-022	<1	1	33	32	3	91	78
Zinc-Dissolved	µg/L	1	Metals-022	<1	1	77	74	4	93	81
Tin-Dissolved	µg/L	1	Metals-022	<1	1	<1	<1	0	93	89
Iron-Dissolved	µg/L	10	Metals-022	<10	1	400	380	5	93	#

QUALITY CONTROL: Miscellaneous Inorganics						Duplicate			Spike Recovery %	
Test Description	Units	PQL	Method	Blank	#	Base	Dup.	RPD	LCS-W1	[NT]
Date prepared	-			06/09/2021	1	06/09/2021	06/09/2021		06/09/2021	[NT]
Date analysed	-			06/09/2021	1	06/09/2021	06/09/2021		06/09/2021	[NT]
Ferrous Iron	mg/L	0.05	Inorg-076	<0.05	1	0.41	0.41	0	102	[NT]
Ferric Iron (by calculation)	mg/L	0.05		<0.05	1	<0.05	<0.05	0	[NT]	[NT]
Total Suspended Solids	mg/L	5	Inorg-019	<5	1	470	460	2	97	[NT]
Oil & Grease (LLE)	mg/L	5	Inorg-003	<5	1	<5	[NT]		94	[NT]

QUALITY CONTROL: Tributyl Tin in Water						Duplicate			Spike Recovery %	
Test Description	Units	PQL	Method	Blank	#	Base	Dup.	RPD	LCS-W1	[NT]
Date extracted	-			08/09/2021	1	08/09/2021	08/09/2021		08/09/2021	[NT]
Date analysed	-			10/09/2021	1	10/09/2021	10/09/2021		10/09/2021	[NT]
Tributyltin as Sn	µg/L	0.002	Ext-054	<0.002	1	<0.002	<0.002	0	111	[NT]
Surrogate Triphenyltin	%		Ext-054	88	1	86	86	0	86	[NT]

Result Definitions

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

Quality Control Definitions

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

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

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

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

Laboratory Acceptance Criteria

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

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

Spikes for Physical and Aggregate Tests are not applicable.

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

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

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

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

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

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

Measurement Uncertainty estimates are available for most tests upon request.

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

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

Report Comments

8 HM in water - dissolved - # Percent recovery is not applicable due to the high concentration of the element/s in the sample/s. However an acceptable recovery was obtained for the LCS.

Fe2+ is slightly higher than iron dissolved for sample #1-->4.This may be due to preservation technique is different between the two methods.

Tributyltin as Sn analysed by MPL Laboratories. Report No. 268473

TRH Water(C10-C40) NEPM - The positive result in the rinsate sample is due to a single peak with no hydrocarbon profile that is consistent with the use of plastic containers.

Douglas Partners
Geotechnics / Environment / Groundwater

CHAIN OF CUSTODY DESPATCH SHEET

Project No:	202546.00	**Suburb:**	Cockle Bay	**To:**	*Envirolab Services*
Project Manager:	Rhys McMillan	**Order Number:**		**Sampler:**	*12 Ashley St, Chatswood NSW 2067*
Email:	Rhys.McMillan@douglaspartners.com.au / 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: 9 metals(incl Sn)	PAH, TRH, BTEX	speciated phenols	VOC	OCP, OPP, PCB	TBT	iron (total, feric and ferrous)	TSS	oil and grease	BTEX		Notes/ Preservation/ Additional Requirements
1	SS2						X	X	X	X	X	X	X	X	X			
2	CP2						X	X	X	X	X	X	X	X	X			
3	CW2						X	X	X	X	X	X	X	X	X			
4	CW3						X	X	X	X	X	X	X	X	X			
5	CW5						X	X	X	X	X	X	X	X	X			
6	CW6						X	X	X	X	X	X	X	X	X			
—	BD1/						X	X	X	X								inter
7	BD2/						X	X	X	X								intra
8	spike															X		
9	blank															X		
10	rinsate						X	X	X	X								

ENVIROLAB
Envirolab Servic
12 Ashley St
Chatswood NSW 20
Ph: (02) 9910 62

~~Job No:~~ 277283.
~~Date Received:~~ 03/09/21
Time Received: 1645
Received By: CH
Temp: Cool/Ambient
Cooling: Ice/Icepack
~~Security: Intact/Broken~~

Metals to analyse:		**LAB RECEIPT**	
Number of samples in container:	**Transported to laboratory by:**	**Lab Ref. No:**	277283
Send results to:	Douglas Partners Pty Ltd	**Received by:**	Christina
Address:	96 Hermitage Road, West Ryde NSW 2114 **Phone:** (02) 9809 0666	**Date & Time:**	03/09/21 1645
Relinquished by:	**Date:** **Signed:**	**Signed:**	

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

SAMPLE RECEIPT ADVICE

Client Details

Client	Douglas Partners Pty Ltd
Attention	Rhys McMillan

Sample Login Details

Your reference	202546.00, Cockle Bay
Envirolab Reference	277283
Date Sample Received	03/09/2021
Date Instructions Received	06/09/2021
Date Results Expected to be Reported	13/09/2021

Sample Condition

Samples received in appropriate condition for analysis	Broken Sample
No. of Samples Provided	10 Water
Turnaround Time Requested	Standard
Temperature on Receipt (°C)	5
Cooling Method	Ice Pack
Sampling Date Provided	YES

Comments

One of the vials of CW6 broken in transit

Please contact the laboratory within 24 hours if you wish to cancel the aformentioned testing. Otherwise testing will proceed as per the COC and hence invoice accordingly.

Please direct any queries to:

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

Analysis Underway, details on the following page:

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

Sample ID	VOCs in water	vTRH(C6-C10)/BTEXN in Water	svTRH (C10-C40) in Water	PAHsin Water	OCPs in Water - Trace Level	OP in water Trace ANZECCF/ADWG	PCBs in Water - Trace Level	Speciated Phenols in water	HM in water - dissolved	Ferrous Iron	Ferric Iron (by calculation)	Total Suspended Solids	Oil & Grease (LLE)	Tributyl Tin in Water
SS2	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
CP2	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
CW2	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
CW3	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
CW5	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
CW6	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
BD2	✓	✓	✓	✓	✓	✓	✓	✓	✓					
spike		✓												
blank		✓												
rinsate	✓	✓	✓	✓				✓	✓					

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

Additional Info

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

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customerservice@envirolab.com.au
www.envirolab.com.au

CERTIFICATE OF ANALYSIS 273301

Client Details

Client	Douglas Partners Pty Ltd
Attention	Rhys McMillan
Address	96 Hermitage Rd, West Ryde, NSW, 2114

Sample Details

Your Reference	**202546.00, Cockle Bay**
Number of Samples	22 Soil
Date samples received	05/07/2021
Date completed instructions received	05/07/2021

Analysis Details

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

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

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

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

Report Details

Date results requested by	12/07/2021
Date of Issue	28/07/2021
Reissue Details	This report replaces R00 due to the addition of Sn results.

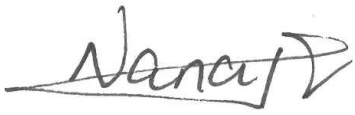
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Asbestos Approved By
Analysed by Asbestos Approved Identifier: Panika Wongchanda
Authorised by Asbestos Approved Signatory: Lucy Zhu

Results Approved By
Dragana Tomas, Senior Chemist
Giovanni Agosti, Group Technical Manager
Hannah Nguyen, Senior Chemist
Lucy Zhu, Asbestos Supervisor
Priya Samarawickrama, Senior Chemist
Thomas Beenie, Lab Technician

Authorised By



Nancy Zhang, Laboratory Manager

VOCs in soil		
Our Reference		273301-10
Your Reference	UNITS	CW5
Depth		0.5-0.6
Type of sample		Soil
Date Sampled		30/06/2021
Date extracted	-	06/07/2021
Date analysed	-	07/07/2021
Dichlorodifluoromethane	mg/kg	<1
Chloromethane	mg/kg	<1
Vinyl Chloride	mg/kg	<1
Bromomethane	mg/kg	<1
Chloroethane	mg/kg	<1
Trichlorofluoromethane	mg/kg	<1
1,1-Dichloroethene	mg/kg	<1
trans-1,2-dichloroethene	mg/kg	<1
1,1-dichloroethane	mg/kg	<1
cis-1,2-dichloroethene	mg/kg	<1
bromochloromethane	mg/kg	<1
chloroform	mg/kg	<1
2,2-dichloropropane	mg/kg	<1
1,2-dichloroethane	mg/kg	<1
1,1,1-trichloroethane	mg/kg	<1
1,1-dichloropropene	mg/kg	<1
Cyclohexane	mg/kg	<1
carbon tetrachloride	mg/kg	<1
Benzene	mg/kg	<0.2
dibromomethane	mg/kg	<1
1,2-dichloropropane	mg/kg	<1
trichloroethene	mg/kg	<1
bromodichloromethane	mg/kg	<1
trans-1,3-dichloropropene	mg/kg	<1
cis-1,3-dichloropropene	mg/kg	<1
1,1,2-trichloroethane	mg/kg	<1
Toluene	mg/kg	<0.5
1,3-dichloropropane	mg/kg	<1
dibromochloromethane	mg/kg	<1
1,2-dibromoethane	mg/kg	<1
tetrachloroethene	mg/kg	<1
1,1,1,2-tetrachloroethane	mg/kg	<1
chlorobenzene	mg/kg	<1

VOCs in soil		
Our Reference		273301-10
Your Reference	UNITS	CW5
Depth		0.5-0.6
Type of sample		Soil
Date Sampled		30/06/2021
Ethylbenzene	mg/kg	<1
bromoform	mg/kg	<1
m+p-xylene	mg/kg	<2
styrene	mg/kg	<1
1,1,2,2-tetrachloroethane	mg/kg	<1
o-Xylene	mg/kg	<1
1,2,3-trichloropropane	mg/kg	<1
isopropylbenzene	mg/kg	<1
bromobenzene	mg/kg	<1
n-propyl benzene	mg/kg	<1
2-chlorotoluene	mg/kg	<1
4-chlorotoluene	mg/kg	<1
1,3,5-trimethyl benzene	mg/kg	<1
tert-butyl benzene	mg/kg	<1
1,2,4-trimethyl benzene	mg/kg	<1
1,3-dichlorobenzene	mg/kg	<1
sec-butyl benzene	mg/kg	<1
1,4-dichlorobenzene	mg/kg	<1
4-isopropyl toluene	mg/kg	<1
1,2-dichlorobenzene	mg/kg	<1
n-butyl benzene	mg/kg	<1
1,2-dibromo-3-chloropropane	mg/kg	<1
1,2,4-trichlorobenzene	mg/kg	<1
hexachlorobutadiene	mg/kg	<1
1,2,3-trichlorobenzene	mg/kg	<1
Surrogate Dibromofluorometha	%	100
Surrogate aaa-Trifluorotoluene	%	94
Surrogate Toluene-d_8	%	98
Surrogate 4-Bromofluorobenzene	%	96

vTRH(C6-C10)/BTEXN in Soil						
Our Reference		273301-10	273301-14	273301-16	273301-18	273301-20
Your Reference	UNITS	CW5	CW6	BD1/20210630	W4	W4
Depth		0.5-0.6	0.5-0.6	.	10	12.45
Type of sample		Soil	Soil	Soil	Soil	Soil
Date Sampled		30/06/2021	30/06/2021	30/06/2021	.	.
Date extracted	-	06/07/2021	06/07/2021	06/07/2021	06/07/2021	06/07/2021
Date analysed	-	07/07/2021	07/07/2021	07/07/2021	07/07/2021	07/07/2021
TRH C_6 - C_9	mg/kg	<25	<25	<25	<25	<25
TRH C_6 - C_{10}	mg/kg	<25	<25	<25	<25	<25
vTPH C_6 - C_{10} less BTEX (F1)	mg/kg	<25	<25	<25	<25	<25
Benzene	mg/kg	<0.2	<0.2	<0.2	<0.2	<0.2
Toluene	mg/kg	<0.5	<0.5	<0.5	<0.5	<0.5
Ethylbenzene	mg/kg	<1	<1	<1	<1	<1
m+p-xylene	mg/kg	<2	<2	<2	<2	<2
o-Xylene	mg/kg	<1	<1	<1	<1	<1
naphthalene	mg/kg	<1	<1	<1	<1	<1
Total +ve Xylenes	mg/kg	<3	<3	<3	<3	<3
Surrogate aaa-Trifluorotoluene	%	94	99	90	82	85

vTRH(C6-C10)/BTEXN in Soil			
Our Reference		273301-21	273301-22
Your Reference	UNITS	Spike 1	Blank 1
Depth		.	.
Type of sample		Soil	Soil
Date Sampled		.	.
Date extracted	-	06/07/2021	06/07/2021
Date analysed	-	07/07/2021	07/07/2021
Benzene	mg/kg	116%	<0.2
Toluene	mg/kg	87%	<0.5
Ethylbenzene	mg/kg	83%	<1
m+p-xylene	mg/kg	82%	<2
o-Xylene	mg/kg	81%	<1
naphthalene	mg/kg	[NA]	<1
Total +ve Xylenes	mg/kg	[NA]	<3
Surrogate aaa-Trifluorotoluene	%	92	103

svTRH (C10-C40) in Soil						
Our Reference		273301-10	273301-14	273301-16	273301-18	273301-20
Your Reference	UNITS	CW5	CW6	BD1/20210630	W4	W4
Depth		0.5-0.6	0.5-0.6	.	10	12.45
Type of sample		Soil	Soil	Soil	Soil	Soil
Date Sampled		30/06/2021	30/06/2021	30/06/2021	.	.
Date extracted	-	06/07/2021	06/07/2021	06/07/2021	06/07/2021	06/07/2021
Date analysed	-	07/07/2021	07/07/2021	07/07/2021	07/07/2021	07/07/2021
TRH C_{10} - C_{14}	mg/kg	<50	<50	<50	<50	<50
TRH C_{15} - C_{28}	mg/kg	<100	<100	<100	130	<100
TRH C_{29} - C_{36}	mg/kg	<100	<100	<100	230	<100
TRH >C_{10} -C_{16}	mg/kg	<50	<50	<50	<50	<50
TRH >C_{10} - C_{16} less Naphthalene (F2)	mg/kg	<50	<50	<50	<50	<50
TRH >C_{16} -C_{34}	mg/kg	<100	<100	<100	310	<100
TRH >C_{34} -C_{40}	mg/kg	<100	<100	<100	110	<100
Total +ve TRH (>C10-C40)	mg/kg	<50	<50	<50	420	<50
Surrogate o-Terphenyl	%	91	86	77	88	80

PAHs in Soil						
Our Reference		273301-2	273301-7	273301-10	273301-14	273301-16
Your Reference	UNITS	CW2	CW4	CW5	CW6	BD1/20210630
Depth		0.4-0.5	0.9-1	0.5-0.6	0.5-0.6	.
Type of sample		Soil	Soil	Soil	Soil	Soil
Date Sampled		30/06/2021	30/06/2021	30/06/2021	30/06/2021	30/06/2021
Date extracted	-	07/07/2021	07/07/2021	07/07/2021	07/07/2021	07/07/2021
Date analysed	-	08/07/2021	08/07/2021	08/07/2021	08/07/2021	08/07/2021
Naphthalene	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Acenaphthylene	mg/kg	<0.1	<0.1	<0.1	0.1	0.2
Acenaphthene	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Fluorene	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Phenanthrene	mg/kg	<0.1	0.4	<0.1	1	1.6
Anthracene	mg/kg	<0.1	<0.1	<0.1	0.3	0.4
Fluoranthene	mg/kg	0.2	1.1	<0.1	2.4	3.4
Pyrene	mg/kg	0.2	1.1	<0.1	2.3	3.4
Benzo(a)anthracene	mg/kg	<0.1	0.6	0.1	1.4	2.2
Chrysene	mg/kg	<0.1	0.6	0.1	1.3	1.6
Benzo(b,j+k)fluoranthene	mg/kg	<0.2	1	<0.2	2.1	2.6
Benzo(a)pyrene	mg/kg	0.09	0.75	<0.05	1.6	1.9
Indeno(1,2,3-c,d)pyrene	mg/kg	<0.1	0.3	<0.1	0.6	0.7
Dibenzo(a,h)anthracene	mg/kg	<0.1	<0.1	<0.1	0.2	0.2
Benzo(g,h,i)perylene	mg/kg	<0.1	0.3	<0.1	0.7	0.7
Total +ve PAH's	mg/kg	0.5	6.3	0.2	14	19
Benzo(a)pyrene TEQ calc (zero)	mg/kg	<0.5	1	<0.5	2.2	2.7
Benzo(a)pyrene TEQ calc(half)	mg/kg	<0.5	1.0	<0.5	2.2	2.7
Benzo(a)pyrene TEQ calc(PQL)	mg/kg	<0.5	1.1	<0.5	2.2	2.7
Surrogate p-Terphenyl-d14	%	106	109	102	101	116

PAHs in Soil			
Our Reference		273301-18	273301-20
Your Reference	UNITS	W4	W4
Depth		10	12.45
Type of sample		Soil	Soil
Date Sampled		.	.
Date extracted	-	07/07/2021	07/07/2021
Date analysed	-	08/07/2021	08/07/2021
Naphthalene	mg/kg	<0.1	<0.1
Acenaphthylene	mg/kg	<0.1	<0.1
Acenaphthene	mg/kg	0.2	<0.1
Fluorene	mg/kg	0.2	<0.1
Phenanthrene	mg/kg	1.0	0.3
Anthracene	mg/kg	0.4	<0.1
Fluoranthene	mg/kg	2.3	1.0
Pyrene	mg/kg	2.5	1
Benzo(a)anthracene	mg/kg	1	0.5
Chrysene	mg/kg	1	0.5
Benzo(b,j+k)fluoranthene	mg/kg	1	0.8
Benzo(a)pyrene	mg/kg	0.96	0.53
Indeno(1,2,3-c,d)pyrene	mg/kg	0.4	0.2
Dibenzo(a,h)anthracene	mg/kg	0.1	<0.1
Benzo(g,h,i)perylene	mg/kg	0.4	0.2
Total +ve PAH's	mg/kg	12	5.0
Benzo(a)pyrene TEQ calc (zero)	mg/kg	1.4	0.7
Benzo(a)pyrene TEQ calc(half)	mg/kg	1.4	0.7
Benzo(a)pyrene TEQ calc(PQL)	mg/kg	1.4	0.8
Surrogate p-Terphenyl-d14	%	114	111

Organochlorine Pesticides in soil			
Our Reference		273301-10	273301-20
Your Reference	UNITS	CW5	W4
Depth		0.5-0.6	12.45
Type of sample		Soil	Soil
Date Sampled		30/06/2021	.
Date extracted	-	07/07/2021	07/07/2021
Date analysed	-	08/07/2021	08/07/2021
alpha-BHC	mg/kg	<0.1	<0.1
HCB	mg/kg	<0.1	<0.1
beta-BHC	mg/kg	<0.1	<0.1
gamma-BHC	mg/kg	<0.1	<0.1
Heptachlor	mg/kg	<0.1	<0.1
delta-BHC	mg/kg	<0.1	<0.1
Aldrin	mg/kg	<0.1	<0.1
Heptachlor Epoxide	mg/kg	<0.1	<0.1
gamma-Chlordane	mg/kg	<0.1	<0.1
alpha-chlordane	mg/kg	<0.1	<0.1
Endosulfan I	mg/kg	<0.1	<0.1
pp-DDE	mg/kg	<0.1	<0.1
Dieldrin	mg/kg	<0.1	<0.1
Endrin	mg/kg	<0.1	<0.1
Endosulfan II	mg/kg	<0.1	<0.1
pp-DDD	mg/kg	<0.1	<0.1
Endrin Aldehyde	mg/kg	<0.1	<0.1
pp-DDT	mg/kg	<0.1	<0.1
Endosulfan Sulphate	mg/kg	<0.1	<0.1
Methoxychlor	mg/kg	<0.1	<0.1
Total +ve DDT+DDD+DDE	mg/kg	<0.1	<0.1
Surrogate TCMX	%	95	102

Organophosphorus Pesticides in Soil			
Our Reference		273301-10	273301-20
Your Reference	UNITS	CW5	W4
Depth		0.5-0.6	12.45
Type of sample		Soil	Soil
Date Sampled		30/06/2021	.
Date extracted	-	07/07/2021	07/07/2021
Date analysed	-	08/07/2021	08/07/2021
Dichlorvos	mg/kg	<0.1	<0.1
Dimethoate	mg/kg	<0.1	<0.1
Diazinon	mg/kg	<0.1	<0.1
Chlorpyriphos-methyl	mg/kg	<0.1	<0.1
Ronnel	mg/kg	<0.1	<0.1
Fenitrothion	mg/kg	<0.1	<0.1
Malathion	mg/kg	<0.1	<0.1
Chlorpyriphos	mg/kg	<0.1	<0.1
Parathion	mg/kg	<0.1	<0.1
Bromophos-ethyl	mg/kg	<0.1	<0.1
Ethion	mg/kg	<0.1	<0.1
Azinphos-methyl (Guthion)	mg/kg	<0.1	<0.1
Surrogate TCMX	%	86	89

PCBs in Soil			
Our Reference		273301-10	273301-20
Your Reference	UNITS	CW5	W4
Depth		0.5-0.6	12.45
Type of sample		Soil	Soil
Date Sampled		30/06/2021	.
Date extracted	-	07/07/2021	07/07/2021
Date analysed	-	08/07/2021	08/07/2021
Aroclor 1016	mg/kg	<0.1	<0.1
Aroclor 1221	mg/kg	<0.1	<0.1
Aroclor 1232	mg/kg	<0.1	<0.1
Aroclor 1242	mg/kg	<0.1	<0.1
Aroclor 1248	mg/kg	<0.1	<0.1
Aroclor 1254	mg/kg	<0.1	<0.1
Aroclor 1260	mg/kg	<0.1	<0.1
Total +ve PCBs (1016-1260)	mg/kg	<0.1	<0.1
Surrogate TCMX	%	95	102

Acid Extractable metals in soil						
Our Reference		273301-2	273301-7	273301-10	273301-14	273301-16
Your Reference	UNITS	CW2	CW4	CW5	CW6	BD1/20210630
Depth		0.4-0.5	0.9-1	0.5-0.6	0.5-0.6	.
Type of sample		Soil	Soil	Soil	Soil	Soil
Date Sampled		30/06/2021	30/06/2021	30/06/2021	30/06/2021	30/06/2021
Date prepared	-	06/07/2021	06/07/2021	06/07/2021	06/07/2021	06/07/2021
Date analysed	-	08/07/2021	08/07/2021	08/07/2021	08/07/2021	08/07/2021
Arsenic	mg/kg	<4	6	6	5	4
Cadmium	mg/kg	<0.4	<0.4	<0.4	<0.4	<0.4
Chromium	mg/kg	14	13	10	11	9
Copper	mg/kg	17	40	26	36	36
Lead	mg/kg	34	120	39	120	79
Mercury	mg/kg	0.1	0.6	<0.1	0.2	0.2
Nickel	mg/kg	12	6	13	13	11
Zinc	mg/kg	36	81	87	180	90
Tin	mg/kg	4	10	1	8	7

Acid Extractable metals in soil			
Our Reference		273301-18	273301-20
Your Reference	UNITS	W4	W4
Depth		10	12.45
Type of sample		Soil	Soil
Date Sampled		.	.
Date prepared	-	06/07/2021	06/07/2021
Date analysed	-	08/07/2021	08/07/2021
Arsenic	mg/kg	12	<4
Cadmium	mg/kg	4	<0.4
Chromium	mg/kg	48	30
Copper	mg/kg	230	41
Lead	mg/kg	1,200	28
Mercury	mg/kg	3.8	0.3
Nickel	mg/kg	28	17
Zinc	mg/kg	1,000	36
Tin	mg/kg	38	6

Moisture						
Our Reference		273301-2	273301-7	273301-10	273301-14	273301-16
Your Reference	UNITS	CW2	CW4	CW5	CW6	BD1/20210630
Depth		0.4-0.5	0.9-1	0.5-0.6	0.5-0.6	.
Type of sample		Soil	Soil	Soil	Soil	Soil
Date Sampled		30/06/2021	30/06/2021	30/06/2021	30/06/2021	30/06/2021
Date prepared	-	06/07/2021	06/07/2021	06/07/2021	06/07/2021	06/07/2021
Date analysed	-	07/07/2021	07/07/2021	07/07/2021	07/07/2021	07/07/2021
Moisture	%	16	16	14	18	14

Moisture			
Our Reference		273301-18	273301-20
Your Reference	UNITS	W4	W4
Depth		10	12.45
Type of sample		Soil	Soil
Date Sampled		.	.
Date prepared	-	06/07/2021	06/07/2021
Date analysed	-	07/07/2021	07/07/2021
Moisture	%	46	19

Asbestos ID - soils						
Our Reference		273301-2	273301-7	273301-10	273301-14	273301-16
Your Reference	UNITS	CW2	CW4	CW5	CW6	BD1/20210630
Depth		0.4-0.5	0.9-1	0.5-0.6	0.5-0.6	.
Type of sample		Soil	Soil	Soil	Soil	Soil
Date Sampled		30/06/2021	30/06/2021	30/06/2021	30/06/2021	30/06/2021
Date analysed	-	12/07/2021	12/07/2021	12/07/2021	12/07/2021	12/07/2021
Sample mass tested	g	Approx. 60g	Approx. 35g	Approx. 40g	Approx. 30g	Approx. 40g
Sample Description	-	Brown coarse-grained soil & rocks	Brown coarse-grained soil & rocks	Brown coarse-grained soil & rocks	Brown coarse-grained soil & rocks	Brown coarse-grained soil & rocks
Asbestos ID in soil	-	No asbestos detected at reporting limit of 0.1g/kg Organic fibres detected	No asbestos detected at reporting limit of 0.1g/kg Organic fibres detected	No asbestos detected at reporting limit of 0.1g/kg Organic fibres detected	No asbestos detected at reporting limit of 0.1g/kg Organic fibres detected	No asbestos detected at reporting limit of 0.1g/kg Organic fibres detected
Asbestos comments	-	NO	NO	NO	NO	NO
Trace Analysis	-	No asbestos detected	No asbestos detected	No asbestos detected	No asbestos detected	No asbestos detected

Asbestos ID - soils			
Our Reference		273301-18	273301-20
Your Reference	UNITS	W4	W4
Depth		10	12.45
Type of sample		Soil	Soil
Date Sampled		.	.
Date analysed	-	12/07/2021	12/07/2021
Sample mass tested	g	Approx. 20g	Approx. 35g
Sample Description	-	Brown coarse-grained soil & rocks	Brown fine-grained soil & rocks
Asbestos ID in soil	-	No asbestos detected at reporting limit of 0.1g/kg Organic fibres detected	No asbestos detected at reporting limit of 0.1g/kg Organic fibres detected
Asbestos comments	-	NO	NO
Trace Analysis	-	No asbestos detected	No asbestos detected

Misc Inorg - Soil						
Our Reference		273301-2	273301-7	273301-10	273301-14	273301-16
Your Reference	UNITS	CW2	CW4	CW5	CW6	BD1/20210630
Depth		0.4-0.5	0.9-1	0.5-0.6	0.5-0.6	.
Type of sample		Soil	Soil	Soil	Soil	Soil
Date Sampled		30/06/2021	30/06/2021	30/06/2021	30/06/2021	30/06/2021
Date prepared	-	07/07/2021	07/07/2021	07/07/2021	07/07/2021	07/07/2021
Date analysed	-	07/07/2021	07/07/2021	07/07/2021	07/07/2021	07/07/2021
pH 1:5 soil:water	pH Units	10.1	8.6	9.1	8.9	9.4
Total Organic Carbon (Walkley Black)	mg/kg	[NA]	[NA]	6,500	[NA]	[NA]

Misc Inorg - Soil		
Our Reference		273301-18
Your Reference	UNITS	W4
Depth		10
Type of sample		Soil
Date Sampled		.
Date prepared	-	07/07/2021
Date analysed	-	07/07/2021
pH 1:5 soil:water	pH Units	8.5

CEC		
Our Reference		273301-2
Your Reference	UNITS	CW2
Depth		0.4-0.5
Type of sample		Soil
Date Sampled		30/06/2021
Date prepared	-	08/07/2021
Date analysed	-	09/07/2021
Exchangeable Ca	meq/100g	16
Exchangeable K	meq/100g	0.2
Exchangeable Mg	meq/100g	0.82
Exchangeable Na	meq/100g	0.22
Cation Exchange Capacity	meq/100g	17

Method ID	Methodology Summary
ASB-001	Asbestos ID - Qualitative identification of asbestos in bulk samples using Polarised Light Microscopy and Dispersion Staining Techniques including Synthetic Mineral Fibre and Organic Fibre as per Australian Standard 4964-2004.
Inorg-001	pH - Measured using pH meter and electrode in accordance with APHA latest edition, 4500-H+. Please note that the results for water analyses are indicative only, as analysis outside of the APHA storage times.
Inorg-008	Moisture content determined by heating at 105+/-5 °C for a minimum of 12 hours.
Inorg-036	Total Organic Carbon or Matter - A titrimetric method that measures the oxidisable organic content of soils.
Metals-020	Determination of various metals by ICP-AES.
Metals-020	Determination of exchangeable cations and cation exchange capacity in soils using 1M Ammonium Chloride exchange and ICP-AES analytical finish.
Metals-021	Determination of Mercury by Cold Vapour AAS.
Org-020	Soil samples are extracted with Dichloromethane/Acetone and waters with Dichloromethane and analysed by GC-FID. F2 = (>C10-C16)-Naphthalene as per NEPM B1 Guideline on Investigation Levels for Soil and Groundwater (HSLs Tables 1A (3, 4)). Note Naphthalene is determined from the VOC analysis.
Org-020	Soil samples are extracted with Dichloromethane/Acetone and waters with Dichloromethane and analysed by GC-FID. F2 = (>C10-C16)-Naphthalene as per NEPM B1 Guideline on Investigation Levels for Soil and Groundwater (HSLs Tables 1A (3, 4)). Note Naphthalene is determined from the VOC analysis. Note, the Total +ve TRH PQL is reflective of the lowest individual PQL and is therefore "Total +ve TRH" is simply a sum of the positive individual TRH fractions (>C10-C40).
Org-021	Soil samples are extracted with dichloromethane/acetone and waters with dichloromethane and analysed by GC-ECD.
Org-021	Soil samples are extracted with dichloromethane/acetone and waters with dichloromethane and analysed by GC-ECD. Note, the Total +ve PCBs PQL is reflective of the lowest individual PQL and is therefore" Total +ve PCBs" is simply a sum of the positive individual PCBs.
Org-022	Determination of VOCs sampled onto coconut shell charcoal sorbent tubes, that can be desorbed using carbon disulphide, and analysed by GC-MS.
Org-022/025	Soil samples are extracted with Dichloromethane/Acetone and waters with Dichloromethane and analysed by GC-MS/GC-MSMS.
Org-022/025	Soil samples are extracted with dichloromethane/acetone and waters with dichloromethane and analysed by GC-MS/GC-MSMS. Note, the Total +ve reported DDD+DDE+DDT PQL is reflective of the lowest individual PQL and is therefore simply a sum of the positive individually report DDD+DDE+DDT.

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

QUALITY CONTROL: VOCs in soil						Duplicate			Spike Recovery %	
Test Description	Units	PQL	Method	Blank	#	Base	Dup.	RPD	LCS-5	[NT]
Date extracted	-			06/07/2021	10	06/07/2021	06/07/2021		06/07/2021	[NT]
Date analysed	-			07/07/2021	10	07/07/2021	07/07/2021		07/07/2021	[NT]
Dichlorodifluoromethane	mg/kg	1	Org-023	<1	10	<1	<1	0	[NT]	[NT]
Chloromethane	mg/kg	1	Org-023	<1	10	<1	<1	0	[NT]	[NT]
Vinyl Chloride	mg/kg	1	Org-023	<1	10	<1	<1	0	[NT]	[NT]
Bromomethane	mg/kg	1	Org-023	<1	10	<1	<1	0	[NT]	[NT]
Chloroethane	mg/kg	1	Org-023	<1	10	<1	<1	0	[NT]	[NT]
Trichlorofluoromethane	mg/kg	1	Org-023	<1	10	<1	<1	0	[NT]	[NT]
1,1-Dichloroethene	mg/kg	1	Org-023	<1	10	<1	<1	0	[NT]	[NT]
trans-1,2-dichloroethene	mg/kg	1	Org-023	<1	10	<1	<1	0	[NT]	[NT]
1,1-dichloroethane	mg/kg	1	Org-023	<1	10	<1	<1	0	117	[NT]
cis-1,2-dichloroethene	mg/kg	1	Org-023	<1	10	<1	<1	0	[NT]	[NT]
bromochloromethane	mg/kg	1	Org-023	<1	10	<1	<1	0	[NT]	[NT]
chloroform	mg/kg	1	Org-023	<1	10	<1	<1	0	119	[NT]
2,2-dichloropropane	mg/kg	1	Org-023	<1	10	<1	<1	0	[NT]	[NT]
1,2-dichloroethane	mg/kg	1	Org-023	<1	10	<1	<1	0	115	[NT]
1,1,1-trichloroethane	mg/kg	1	Org-023	<1	10	<1	<1	0	121	[NT]
1,1-dichloropropene	mg/kg	1	Org-023	<1	10	<1	<1	0	[NT]	[NT]
Cyclohexane	mg/kg	1	Org-023	<1	10	<1	<1	0	[NT]	[NT]
carbon tetrachloride	mg/kg	1	Org-023	<1	10	<1	<1	0	[NT]	[NT]
Benzene	mg/kg	0.2	Org-023	<0.2	10	<0.2	<0.2	0	[NT]	[NT]
dibromomethane	mg/kg	1	Org-023	<1	10	<1	<1	0	[NT]	[NT]
1,2-dichloropropane	mg/kg	1	Org-023	<1	10	<1	<1	0	[NT]	[NT]
trichloroethene	mg/kg	1	Org-023	<1	10	<1	<1	0	113	[NT]
bromodichloromethane	mg/kg	1	Org-023	<1	10	<1	<1	0	119	[NT]
trans-1,3-dichloropropene	mg/kg	1	Org-023	<1	10	<1	<1	0	[NT]	[NT]
cis-1,3-dichloropropene	mg/kg	1	Org-023	<1	10	<1	<1	0	[NT]	[NT]
1,1,2-trichloroethane	mg/kg	1	Org-023	<1	10	<1	<1	0	[NT]	[NT]
Toluene	mg/kg	0.5	Org-023	<0.5	10	<0.5	<0.5	0	[NT]	[NT]
1,3-dichloropropane	mg/kg	1	Org-023	<1	10	<1	<1	0	[NT]	[NT]
dibromochloromethane	mg/kg	1	Org-023	<1	10	<1	<1	0	110	[NT]
1,2-dibromoethane	mg/kg	1	Org-023	<1	10	<1	<1	0	[NT]	[NT]
tetrachloroethene	mg/kg	1	Org-023	<1	10	<1	<1	0	115	[NT]
1,1,1,2-tetrachloroethane	mg/kg	1	Org-023	<1	10	<1	<1	0	[NT]	[NT]
chlorobenzene	mg/kg	1	Org-023	<1	10	<1	<1	0	[NT]	[NT]
Ethylbenzene	mg/kg	1	Org-023	<1	10	<1	<1	0	[NT]	[NT]
bromoform	mg/kg	1	Org-023	<1	10	<1	<1	0	[NT]	[NT]
m+p-xylene	mg/kg	2	Org-023	<2	10	<2	<2	0	[NT]	[NT]
styrene	mg/kg	1	Org-023	<1	10	<1	<1	0	[NT]	[NT]
1,1,2,2-tetrachloroethane	mg/kg	1	Org-023	<1	10	<1	<1	0	[NT]	[NT]

QUALITY CONTROL: VOCs in soil						Duplicate			Spike Recovery %	
Test Description	Units	PQL	Method	Blank	#	Base	Dup.	RPD	LCS-5	[NT]
o-Xylene	mg/kg	1	Org-023	<1	10	<1	<1	0	[NT]	[NT]
1,2,3-trichloropropane	mg/kg	1	Org-023	<1	10	<1	<1	0	[NT]	[NT]
isopropylbenzene	mg/kg	1	Org-023	<1	10	<1	<1	0	[NT]	[NT]
bromobenzene	mg/kg	1	Org-023	<1	10	<1	<1	0	[NT]	[NT]
n-propyl benzene	mg/kg	1	Org-023	<1	10	<1	<1	0	[NT]	[NT]
2-chlorotoluene	mg/kg	1	Org-023	<1	10	<1	<1	0	[NT]	[NT]
4-chlorotoluene	mg/kg	1	Org-023	<1	10	<1	<1	0	[NT]	[NT]
1,3,5-trimethyl benzene	mg/kg	1	Org-023	<1	10	<1	<1	0	[NT]	[NT]
tert-butyl benzene	mg/kg	1	Org-023	<1	10	<1	<1	0	[NT]	[NT]
1,2,4-trimethyl benzene	mg/kg	1	Org-023	<1	10	<1	<1	0	[NT]	[NT]
1,3-dichlorobenzene	mg/kg	1	Org-023	<1	10	<1	<1	0	[NT]	[NT]
sec-butyl benzene	mg/kg	1	Org-023	<1	10	<1	<1	0	[NT]	[NT]
1,4-dichlorobenzene	mg/kg	1	Org-023	<1	10	<1	<1	0	[NT]	[NT]
4-isopropyl toluene	mg/kg	1	Org-023	<1	10	<1	<1	0	[NT]	[NT]
1,2-dichlorobenzene	mg/kg	1	Org-023	<1	10	<1	<1	0	[NT]	[NT]
n-butyl benzene	mg/kg	1	Org-023	<1	10	<1	<1	0	[NT]	[NT]
1,2-dibromo-3-chloropropane	mg/kg	1	Org-023	<1	10	<1	<1	0	[NT]	[NT]
1,2,4-trichlorobenzene	mg/kg	1	Org-023	<1	10	<1	<1	0	[NT]	[NT]
hexachlorobutadiene	mg/kg	1	Org-023	<1	10	<1	<1	0	[NT]	[NT]
1,2,3-trichlorobenzene	mg/kg	1	Org-023	<1	10	<1	<1	0	[NT]	[NT]
Surrogate Dibromofluorometha	%		Org-023	101	10	100	102	2	101	[NT]
Surrogate aaa-Trifluorotoluene	%		Org-023	104	10	94	99	5	115	[NT]
Surrogate Toluene-d_8	%		Org-023	99	10	98	99	1	100	[NT]
Surrogate 4-Bromofluorobenzene	%		Org-023	97	10	96	98	2	98	[NT]

QUALITY CONTROL: vTRH(C6-C10)/BTEXN in Soil						Duplicate			Spike Recovery %	
Test Description	Units	PQL	Method	Blank	#	Base	Dup.	RPD	LCS-5	273301-20
Date extracted	-			06/07/2021	10	06/07/2021	06/07/2021		06/07/2021	06/07/2021
Date analysed	-			07/07/2021	10	07/07/2021	07/07/2021		07/07/2021	07/07/2021
TRH C_6 - C_9	mg/kg	25	Org-023	<25	10	<25	<25	0	117	104
TRH C_6 - C_{10}	mg/kg	25	Org-023	<25	10	<25	<25	0	117	104
Benzene	mg/kg	0.2	Org-023	<0.2	10	<0.2	<0.2	0	115	103
Toluene	mg/kg	0.5	Org-023	<0.5	10	<0.5	<0.5	0	114	101
Ethylbenzene	mg/kg	1	Org-023	<1	10	<1	<1	0	122	109
m+p-xylene	mg/kg	2	Org-023	<2	10	<2	<2	0	117	104
o-Xylene	mg/kg	1	Org-023	<1	10	<1	<1	0	120	107
naphthalene	mg/kg	1	Org-023	<1	10	<1	<1	0	[NT]	[NT]
Surrogate aaa-Trifluorotoluene	%		Org-023	104	10	94	99	5	115	76

QUALITY CONTROL: svTRH (C10-C40) in Soil						Duplicate			Spike Recovery %	
Test Description	Units	PQL	Method	Blank	#	Base	Dup.	RPD	LCS-5	273301-20
Date extracted	-			06/07/2021	10	06/07/2021	06/07/2021		06/07/2021	06/07/2021
Date analysed	-			07/07/2021	10	07/07/2021	07/07/2021		07/07/2021	07/07/2021
TRH C_{10} - C_{14}	mg/kg	50	Org-020	<50	10	<50	<50	0	94	77
TRH C_{15} - C_{28}	mg/kg	100	Org-020	<100	10	<100	<100	0	105	84
TRH C_{29} - C_{36}	mg/kg	100	Org-020	<100	10	<100	<100	0	80	87
TRH >C_{10} -C_{16}	mg/kg	50	Org-020	<50	10	<50	<50	0	94	77
TRH >C_{16} -C_{34}	mg/kg	100	Org-020	<100	10	<100	<100	0	105	84
TRH >C_{34} -C_{40}	mg/kg	100	Org-020	<100	10	<100	<100	0	80	87
Surrogate o-Terphenyl	%		Org-020	78	10	91	87	4	101	80

QUALITY CONTROL: PAHs in Soil						Duplicate			Spike Recovery %	
Test Description	Units	PQL	Method	Blank	#	Base	Dup.	RPD	LCS-5	273301-20
Date extracted	-			07/07/2021	10	07/07/2021	07/07/2021		07/07/2021	07/07/2021
Date analysed	-			08/07/2021	10	08/07/2021	08/07/2021		08/07/2021	08/07/2021
Naphthalene	mg/kg	0.1	Org-022/025	<0.1	10	<0.1	<0.1	0	103	99
Acenaphthylene	mg/kg	0.1	Org-022/025	<0.1	10	<0.1	<0.1	0	[NT]	[NT]
Acenaphthene	mg/kg	0.1	Org-022/025	<0.1	10	<0.1	<0.1	0	99	94
Fluorene	mg/kg	0.1	Org-022/025	<0.1	10	<0.1	<0.1	0	89	88
Phenanthrene	mg/kg	0.1	Org-022/025	<0.1	10	<0.1	0.1	0	120	93
Anthracene	mg/kg	0.1	Org-022/025	<0.1	10	<0.1	<0.1	0	[NT]	[NT]
Fluoranthene	mg/kg	0.1	Org-022/025	<0.1	10	<0.1	0.1	0	119	71
Pyrene	mg/kg	0.1	Org-022/025	<0.1	10	<0.1	0.1	0	130	73
Benzo(a)anthracene	mg/kg	0.1	Org-022/025	<0.1	10	0.1	<0.1	0	[NT]	[NT]
Chrysene	mg/kg	0.1	Org-022/025	<0.1	10	0.1	0.1	0	71	92
Benzo(b,j+k)fluoranthene	mg/kg	0.2	Org-022/025	<0.2	10	<0.2	<0.2	0	[NT]	[NT]
Benzo(a)pyrene	mg/kg	0.05	Org-022/025	<0.05	10	<0.05	0.07	33	97	90
Indeno(1,2,3-c,d)pyrene	mg/kg	0.1	Org-022/025	<0.1	10	<0.1	<0.1	0	[NT]	[NT]
Dibenzo(a,h)anthracene	mg/kg	0.1	Org-022/025	<0.1	10	<0.1	<0.1	0	[NT]	[NT]
Benzo(g,h,i)perylene	mg/kg	0.1	Org-022/025	<0.1	10	<0.1	<0.1	0	[NT]	[NT]
Surrogate p-Terphenyl-d14	%		Org-022/025	102	10	102	99	3	118	108

QUALITY CONTROL: Organochlorine Pesticides in soil						Duplicate			Spike Recovery %	
Test Description	Units	PQL	Method	Blank	#	Base	Dup.	RPD	LCS-5	273301-20
Date extracted	-			07/07/2021	10	07/07/2021	07/07/2021		07/07/2021	07/07/2021
Date analysed	-			08/07/2021	10	08/07/2021	08/07/2021		08/07/2021	08/07/2021
alpha-BHC	mg/kg	0.1	Org-022/025	<0.1	10	<0.1	<0.1	0	96	97
HCB	mg/kg	0.1	Org-022/025	<0.1	10	<0.1	<0.1	0	[NT]	[NT]
beta-BHC	mg/kg	0.1	Org-022/025	<0.1	10	<0.1	<0.1	0	98	102
gamma-BHC	mg/kg	0.1	Org-022/025	<0.1	10	<0.1	<0.1	0	[NT]	[NT]
Heptachlor	mg/kg	0.1	Org-022/025	<0.1	10	<0.1	<0.1	0	125	99
delta-BHC	mg/kg	0.1	Org-022/025	<0.1	10	<0.1	<0.1	0	[NT]	[NT]
Aldrin	mg/kg	0.1	Org-022/025	<0.1	10	<0.1	<0.1	0	123	95
Heptachlor Epoxide	mg/kg	0.1	Org-022/025	<0.1	10	<0.1	<0.1	0	130	114
gamma-Chlordane	mg/kg	0.1	Org-022/025	<0.1	10	<0.1	<0.1	0	[NT]	[NT]
alpha-chlordane	mg/kg	0.1	Org-022/025	<0.1	10	<0.1	<0.1	0	[NT]	[NT]
Endosulfan I	mg/kg	0.1	Org-022/025	<0.1	10	<0.1	<0.1	0	[NT]	[NT]
pp-DDE	mg/kg	0.1	Org-022/025	<0.1	10	<0.1	<0.1	0	128	106
Dieldrin	mg/kg	0.1	Org-022/025	<0.1	10	<0.1	<0.1	0	130	111
Endrin	mg/kg	0.1	Org-022/025	<0.1	10	<0.1	<0.1	0	125	111
Endosulfan II	mg/kg	0.1	Org-022/025	<0.1	10	<0.1	<0.1	0	[NT]	[NT]
pp-DDD	mg/kg	0.1	Org-022/025	<0.1	10	<0.1	<0.1	0	112	95
Endrin Aldehyde	mg/kg	0.1	Org-022/025	<0.1	10	<0.1	<0.1	0	[NT]	[NT]
pp-DDT	mg/kg	0.1	Org-022/025	<0.1	10	<0.1	<0.1	0	[NT]	[NT]
Endosulfan Sulphate	mg/kg	0.1	Org-022/025	<0.1	10	<0.1	<0.1	0	93	91
Methoxychlor	mg/kg	0.1	Org-022/025	<0.1	10	<0.1	<0.1	0	[NT]	[NT]
Surrogate TCMX	%		Org-022/025	85	10	95	93	2	100	99

QUALITY CONTROL: Organophosphorus Pesticides in Soil						Duplicate			Spike Recovery %	
Test Description	Units	PQL	Method	Blank	#	Base	Dup.	RPD	LCS-5	273301-20
Date extracted	-			07/07/2021	10	07/07/2021	07/07/2021		07/07/2021	07/07/2021
Date analysed	-			08/07/2021	10	08/07/2021	08/07/2021		08/07/2021	08/07/2021
Dichlorvos	mg/kg	0.1	Org-022/025	<0.1	10	<0.1	<0.1	0	124	69
Dimethoate	mg/kg	0.1	Org-022/025	<0.1	10	<0.1	<0.1	0	[NT]	[NT]
Diazinon	mg/kg	0.1	Org-022/025	<0.1	10	<0.1	<0.1	0	[NT]	[NT]
Chlorpyriphos-methyl	mg/kg	0.1	Org-022/025	<0.1	10	<0.1	<0.1	0	[NT]	[NT]
Ronnel	mg/kg	0.1	Org-022/025	<0.1	10	<0.1	<0.1	0	126	89
Fenitrothion	mg/kg	0.1	Org-022/025	<0.1	10	<0.1	<0.1	0	77	83
Malathion	mg/kg	0.1	Org-022/025	<0.1	10	<0.1	<0.1	0	84	96
Chlorpyriphos	mg/kg	0.1	Org-022/025	<0.1	10	<0.1	<0.1	0	120	111
Parathion	mg/kg	0.1	Org-022/025	<0.1	10	<0.1	<0.1	0	108	94
Bromophos-ethyl	mg/kg	0.1	Org-022	<0.1	10	<0.1	<0.1	0	[NT]	[NT]
Ethion	mg/kg	0.1	Org-022/025	<0.1	10	<0.1	<0.1	0	85	117
Azinphos-methyl (Guthion)	mg/kg	0.1	Org-022/025	<0.1	10	<0.1	<0.1	0	[NT]	[NT]
Surrogate TCMX	%		Org-022/025	87	10	86	83	4	100	88

QUALITY CONTROL: PCBs in Soil						Duplicate			Spike Recovery %	
Test Description	Units	PQL	Method	Blank	#	Base	Dup.	RPD	LCS-5	273301-20
Date extracted	-			07/07/2021	10	07/07/2021	07/07/2021		07/07/2021	07/07/2021
Date analysed	-			08/07/2021	10	08/07/2021	08/07/2021		08/07/2021	08/07/2021
Aroclor 1016	mg/kg	0.1	Org-021	<0.1	10	<0.1	<0.1	0	[NT]	[NT]
Aroclor 1221	mg/kg	0.1	Org-021	<0.1	10	<0.1	<0.1	0	[NT]	[NT]
Aroclor 1232	mg/kg	0.1	Org-021	<0.1	10	<0.1	<0.1	0	[NT]	[NT]
Aroclor 1242	mg/kg	0.1	Org-021	<0.1	10	<0.1	<0.1	0	[NT]	[NT]
Aroclor 1248	mg/kg	0.1	Org-021	<0.1	10	<0.1	<0.1	0	[NT]	[NT]
Aroclor 1254	mg/kg	0.1	Org-021	<0.1	10	<0.1	<0.1	0	130	120
Aroclor 1260	mg/kg	0.1	Org-021	<0.1	10	<0.1	<0.1	0	[NT]	[NT]
Surrogate TCMX	%		Org-021	85	10	95	93	2	100	99

QUALITY CONTROL: Acid Extractable metals in soil						Duplicate			Spike Recovery %	
Test Description	Units	PQL	Method	Blank	#	Base	Dup.	RPD	LCS-5	273301-20
Date prepared	-			06/07/2021	10	06/07/2021	06/07/2021		06/07/2021	06/07/2021
Date analysed	-			08/07/2021	10	08/07/2021	08/07/2021		08/07/2021	08/07/2021
Arsenic	mg/kg	4	Metals-020	<4	10	6	6	0	80	99
Cadmium	mg/kg	0.4	Metals-020	<0.4	10	<0.4	<0.4	0	76	90
Chromium	mg/kg	1	Metals-020	<1	10	10	9	11	79	90
Copper	mg/kg	1	Metals-020	<1	10	26	28	7	80	94
Lead	mg/kg	1	Metals-020	<1	10	39	44	12	79	#
Mercury	mg/kg	0.1	Metals-021	<0.1	10	<0.1	<0.1	0	103	#
Nickel	mg/kg	1	Metals-020	<1	10	13	12	8	78	86
Zinc	mg/kg	1	Metals-020	<1	10	87	88	1	84	86
Tin	mg/kg	1	Metals-020	<1	10	1	1	0	98	[NT]

QUALITY CONTROL: Misc Inorg - Soil						Duplicate			Spike Recovery %	
Test Description	Units	PQL	Method	Blank	#	Base	Dup.	RPD	LCS-5	[NT]
Date prepared	-			07/07/2021	[NT]	[NT]	[NT]	[NT]	07/07/2021	[NT]
Date analysed	-			07/07/2021	[NT]	[NT]	[NT]	[NT]	07/07/2021	[NT]
pH 1:5 soil:water	pH Units		Inorg-001	[NT]	[NT]	[NT]	[NT]	[NT]	101	[NT]
Total Organic Carbon (Walkley Black)	mg/kg	1000	Inorg-036	<1000	[NT]	[NT]	[NT]	[NT]	100	[NT]

QUALITY CONTROL: CEC						Duplicate			Spike Recovery %	
Test Description	Units	PQL	Method	Blank	#	Base	Dup.	RPD	LCS-5	[NT]
Date prepared	-			08/07/2021	[NT]	[NT]	[NT]	[NT]	08/07/2021	[NT]
Date analysed	-			09/07/2021	[NT]	[NT]	[NT]	[NT]	09/07/2021	[NT]
Exchangeable Ca	meq/100g	0.1	Metals-020	<0.1	[NT]	[NT]	[NT]	[NT]	96	[NT]
Exchangeable K	meq/100g	0.1	Metals-020	<0.1	[NT]	[NT]	[NT]	[NT]	105	[NT]
Exchangeable Mg	meq/100g	0.1	Metals-020	<0.1	[NT]	[NT]	[NT]	[NT]	99	[NT]
Exchangeable Na	meq/100g	0.1	Metals-020	<0.1	[NT]	[NT]	[NT]	[NT]	105	[NT]

Result Definitions

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

Quality Control Definitions

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

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

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

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

Laboratory Acceptance Criteria

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

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

Spikes for Physical and Aggregate Tests are not applicable.

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

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

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

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

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

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

Measurement Uncertainty estimates are available for most tests upon request.

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

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

Report Comments

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

Acid Extractable Metals in Soil:
- # Percent recovery is not possible to report due to the inhomogeneous nature of the elements in the sample. However an acceptable recovery was obtained for the LCS.

Douglas Partners
Geotechnics | Environment | Groundwater

CHAIN OF CUSTODY DESPATCH SHEET

Project No:	202546.00	**Suburb:**	Cockle Bay	**To:**	*Envirolab Services*
Project Manager:	Rhys McMillan	**Order Number:**		**Sampler:**	*12 Ashley St, Chatswood NSW 2067*
Email:	Rhys.McMillan@douglaspartners.com.au / 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: Metals, TRH, PAH, OCP, OPP, PCB, Asbestos	Metals, TRH, PAH, Asbestos	Metals, PAH, Asbestos	VOC	pH	TOC	CEC	BTEX	Phenols	Cresole / coal tar cresotes	TBT, Tin	Notes/ Preservation/ Additional Requirements
1	CW2	0.1	0.2	30/06/21	s													**Please contact DP before disposing samples**
2	CW2	0.4	0.5	30/06/21	s				X		X		X					
3	CW2	0.9	1	30/06/21	s													
4	CW2	1.4	1.5	30/06/21	s													
5	CW4	0.05	0.15	30/06/21	s													
6	CW4	0.4	0.5	30/06/21	s													
7	CW4	0.9	1	30/06/21	s				X		X							
8	CW4	1.4	1.5	30/06/21	s													
9	CW5	0.25	0.35	30/06/21	s													
10	CW5	0.5	0.6	30/06/21	s		X			X	X	X						
11	CW5	0.9	1	30/06/21	s													
12	CW5	1.4	1.5	30/06/21	s													
13	CW6	0.1	0.2	30/06/21	s													
14	CW6	0.5	0.6	30/06/21	s			X			X							

Metals to analyse:			**LAB RECEIPT**
Number of samples in container:	**Transported to laboratory by:**		**Lab Ref. No:** 273301
Send results to:	Douglas Partners Pty Ltd		**Received by:** A-BNE, ELS SYD
Address:	96 Hermitage Road, West Ryde NSW 2114	**Phone:** (02) 9809 0666	**Date & Time:** 5/7/21 1330
Relinquished by:	**Date:**	**Signed:**	**Signed:**

Douglas Partners
Geotechnics / Environment / Groundwater

CHAIN OF CUSTODY DESPATCH SHEET

Project No:	202546.00	**Suburb:**	Cockle Bay	**To:**	*Envirolab Services*
Project Manager:	Rhys McMillan	**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	Metals, TRH, PAH, OCP, OPP, PCB, Asbestos	Metals, TRH, PAH, Asbestos	Metals, PAH, Asbestos	VOC	pH	TOC	CEC	BTEX	Phenols	Cresole / coal tar cresotes	TBT, Tin	
15	CW6	0.9	1.0 AB	30/06/21	s													
16	BD1/20210630			30/06/21	s			X			X							
17	BD2/20210630			30/06/21	s													
18	W4		10		s			X			X							
19	W4		11.5		s													
20	W4		12.45		s		X											
21	spike 1				s									X				
22	Blank 1				s									X				

273301 AB.

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 273301-A

Client Details

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

Sample Details

Your Reference	**202546.00, Cockle Bay**
Number of Samples	additional analysis
Date samples received	05/07/2021
Date completed instructions received	14/07/2021

Analysis Details

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

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

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

Report Details

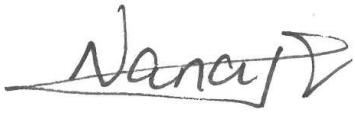
Date results requested by	21/07/2021
Date of Issue	21/07/2021

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

Results Approved By
Hannah Nguyen, Senior Chemist
Steven Luong, Organics Supervisor

Authorised By



Nancy Zhang, Laboratory Manager

TCLP Preparation - Acid				
Our Reference		273301-A-7	273301-A-14	273301-A-18
Your Reference	UNITS	CW4	CW6	W4
Depth		0.9-1	0.5-0.6	10
Type of sample		Soil	Soil	Soil
Date Sampled		30/06/2021	30/06/2021	.
pH of soil for fluid# determ.	pH units	8.3	9.3	9.0
pH of soil TCLP (after HCl)	pH units	1.8	1.9	1.9
Extraction fluid used	-	1	1	1
pH of final Leachate	pH units	5.1	5.4	5.7

PAHs in TCLP (USEPA 1311)		
Our Reference		273301-A-18
Your Reference	UNITS	W4
Depth		10
Type of sample		Soil
Date Sampled		.
Date extracted	-	21/07/2021
Date analysed	-	21/07/2021
Naphthalene in TCLP	mg/L	<0.001
Acenaphthylene in TCLP	mg/L	<0.001
Acenaphthene in TCLP	mg/L	<0.001
Fluorene in TCLP	mg/L	<0.001
Phenanthrene in TCLP	mg/L	0.001
Anthracene in TCLP	mg/L	<0.001
Fluoranthene in TCLP	mg/L	<0.001
Pyrene in TCLP	mg/L	<0.001
Benzo(a)anthracene in TCLP	mg/L	<0.001
Chrysene in TCLP	mg/L	<0.001
Benzo(bjk)fluoranthene in TCLP	mg/L	<0.002
Benzo(a)pyrene in TCLP	mg/L	<0.001
Indeno(1,2,3-c,d)pyrene - TCLP	mg/L	<0.001
Dibenzo(a,h)anthracene in TCLP	mg/L	<0.001
Benzo(g,h,i)perylene in TCLP	mg/L	<0.001
Total +ve PAH's	mg/L	0.001
Surrogate p-Terphenyl-d14	%	126

Metals from Leaching Fluid pH 2.9 or 5				
Our Reference		273301-A-7	273301-A-14	273301-A-18
Your Reference	UNITS	CW4	CW6	W4
Depth		0.9-1	0.5-0.6	10
Type of sample		Soil	Soil	Soil
Date Sampled		30/06/2021	30/06/2021	.
Date extracted	-	19/07/2021	19/07/2021	19/07/2021
Date analysed	-	19/07/2021	19/07/2021	19/07/2021
Lead	mg/L	0.04	0.08	1.5

Method ID	Methodology Summary
INORG-004	Toxicity Characteristic Leaching Procedure (TCLP) using Zero Headspace Extraction (zHE) using AS4439 and USEPA 1311.
Inorg-004	Toxicity Characteristic Leaching Procedure (TCLP) using AS 4439 and USEPA 1311. Please note that the mass used may be scaled down from default based on sample mass available. Samples are stored at 2-6oC before and after leachate preparation.
Metals-020	Determination of various metals by ICP-AES following buffer determination as per USEPA 1311 and hence AS 4439.3 2019. Extraction Fluid 1 refers to pH 5.0 buffer and Extraction Fluid 2 is the pH 2.9 buffer.
Org-022/025	Leachates are extracted with Dichloromethane and analysed by GC-MS/GC-MSMS.

QUALITY CONTROL: PAHs in TCLP (USEPA 1311)						Duplicate			Spike Recovery %	
Test Description	Units	PQL	Method	Blank	#	Base	Dup.	RPD	LCS-W1	[NT]
Date extracted	-			21/07/2021	[NT]	[NT]	[NT]	[NT]	21/07/2021	[NT]
Date analysed	-			21/07/2021	[NT]	[NT]	[NT]	[NT]	21/07/2021	[NT]
Naphthalene in TCLP	mg/L	0.001	Org-022/025	<0.001	[NT]	[NT]	[NT]	[NT]	101	[NT]
Acenaphthylene in TCLP	mg/L	0.001	Org-022/025	<0.001	[NT]	[NT]	[NT]	[NT]	[NT]	[NT]
Acenaphthene in TCLP	mg/L	0.001	Org-022/025	<0.001	[NT]	[NT]	[NT]	[NT]	92	[NT]
Fluorene in TCLP	mg/L	0.001	Org-022/025	<0.001	[NT]	[NT]	[NT]	[NT]	97	[NT]
Phenanthrene in TCLP	mg/L	0.001	Org-022/025	<0.001	[NT]	[NT]	[NT]	[NT]	100	[NT]
Anthracene in TCLP	mg/L	0.001	Org-022/025	<0.001	[NT]	[NT]	[NT]	[NT]	[NT]	[NT]
Fluoranthene in TCLP	mg/L	0.001	Org-022/025	<0.001	[NT]	[NT]	[NT]	[NT]	94	[NT]
Pyrene in TCLP	mg/L	0.001	Org-022/025	<0.001	[NT]	[NT]	[NT]	[NT]	95	[NT]
Benzo(a)anthracene in TCLP	mg/L	0.001	Org-022/025	<0.001	[NT]	[NT]	[NT]	[NT]	[NT]	[NT]
Chrysene in TCLP	mg/L	0.001	Org-022/025	<0.001	[NT]	[NT]	[NT]	[NT]	90	[NT]
Benzo(bjk)fluoranthene in TCLP	mg/L	0.002	Org-022/025	<0.002	[NT]	[NT]	[NT]	[NT]	[NT]	[NT]
Benzo(a)pyrene in TCLP	mg/L	0.001	Org-022/025	<0.001	[NT]	[NT]	[NT]	[NT]	114	[NT]
Indeno(1,2,3-c,d)pyrene - TCLP	mg/L	0.001	Org-022/025	<0.001	[NT]	[NT]	[NT]	[NT]	[NT]	[NT]
Dibenzo(a,h)anthracene in TCLP	mg/L	0.001	Org-022/025	<0.001	[NT]	[NT]	[NT]	[NT]	[NT]	[NT]
Benzo(g,h,i)perylene in TCLP	mg/L	0.001	Org-022/025	<0.001	[NT]	[NT]	[NT]	[NT]	[NT]	[NT]
Surrogate p-Terphenyl-d14	%		Org-022/025	117	[NT]	[NT]	[NT]	[NT]	98	[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	-			19/07/2021	7	19/07/2021	19/07/2021		19/07/2021	[NT]
Date analysed	-			19/07/2021	7	19/07/2021	19/07/2021		19/07/2021	[NT]
Lead	mg/L	0.03	Metals-020	<0.03	7	0.04	0.05	22	80	[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.

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

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

Spikes for Physical and Aggregate Tests are not applicable.

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

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

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

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

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

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

Measurement Uncertainty estimates are available for most tests upon request.

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

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

Ming To

From: Greta Petzold
Sent: Wednesday, 14 July 2021 4:17 PM
To: Kurt Plambeck; Samplereceipt
Subject: RE: Results for Registration 273301 202546.00, Cockle Bay

Follow Up Flag: Follow up
Flag Status: Flagged

Categories: Additional

Ref: 273301-A.
TAT: Standard.
Due: 21/07/2021
MT

Hi Kurt,

No worries, we'll get that booked in for you.

Cheers

Kind Regards,

Greta Petzold | Senior Report Coordinator | Envirolab Services

Great Science. Great Service.

12 Ashley Street Chatswood NSW 2067
T 612 9910 6200
E GPetzold@envirolab.com.au | W www.envirolab.com.au

Follow us on: LinkedIn | Facebook | Twitter

Samples will be analysed per our T&C's.

From: Kurt Plambeck <kurt.plambeck@douglaspartners.com.au>
Sent: Wednesday, 14 July 2021 4:15 PM
To: Greta Petzold <GPetzold@envirolab.com.au>
Subject: RE: Results for Registration 273301 202546.00, Cockle Bay

CAUTION: This email originated from outside of the organisation. Do not act on instructions, click links or open attachments unless you recognise the sender and know the content is authentic and safe.

Greta,

Can you please run TCLP on samples
(18) (7) (14)
W4/10, CW4/0-0.1 and CW6/0.5-0.6 – lead
(18) W4/10 – PAH

Thanks

Ming To

From: Kurt Plambeck <kurt.plambeck@douglaspartners.com.au>
Sent: Wednesday, 14 July 2021 4:28 PM
To: Ming To
Subject: RE: Results for Registration 273301 202546.00, Cockle Bay

273301-A.

CAUTION: This email originated from outside of the organisation. Do not act on instructions, click links or open attachments unless you recognise the sender and know the content is authentic and safe.

Sorry that should have read 0.9-1.0

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: 0402 057 147 | E: kurt.plambeck@douglaspartners.com.au

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

If you are not the intended recipient of this email, please notify us immediately and be aware that any disclosure, copying, distribution or use of the contents of this information is prohibited.

From: Ming To <MTo@envirolab.com.au>
Sent: Wednesday, 14 July 2021 4:26 PM
To: Kurt Plambeck <kurt.plambeck@douglaspartners.com.au>
Subject: RE: Results for Registration 273301 202546.00, Cockle Bay

Hi Kurt,

There's no sample CW4 with depth 0-0.1 in this job.
Can you please confirm which sample you need analysed?

CW4	0.05	0.15
CW4	0.4	0.5
CW4	0.9	1
CW4	1.4	1.5

Thanks,

Kind Regards,

Ming To | Customer Service | Envirolab Services

Great Science. Great Service.

12 Ashley Street Chatswood NSW 2067
T 612 9910 6200
E MTo@envirolab.com.au | W www.envirolab.com.au

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 273301-B

Client Details

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

Sample Details

Your Reference	**202546.00, Cockle Bay**
Number of Samples	additional analysis
Date samples received	05/07/2021
Date completed instructions received	05/08/2021

Analysis Details

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

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

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

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

Report Details

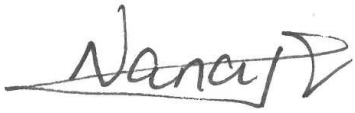
Date results requested by	13/08/2021
Date of Issue	13/08/2021

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

Results Approved By
Priya Samarawickrama, Senior Chemist
Steven Luong, Organics Supervisor

Authorised By



Nancy Zhang, Laboratory Manager

Misc Soil - Inorg				
Our Reference		273301-B-2	273301-B-14	273301-B-18
Your Reference	UNITS	CW2	CW6	W4
Depth		0.4-0.5	0.5-0.6	10
Type of sample		Soil	Soil	Soil
Date Sampled		30/06/2021	30/06/2021	.
Date prepared	-	09/08/2021	09/08/2021	09/08/2021
Date analysed	-	09/08/2021	09/08/2021	09/08/2021
Total Phenolics (as Phenol)	mg/kg	<5	<5	<5

PAHs in TCLP (USEPA 1311)			
Our Reference		273301-B-10	273301-B-14
Your Reference	UNITS	CW5	CW6
Depth		0.5-0.6	0.5-0.6
Type of sample		Soil	Soil
Date Sampled		30/06/2021	30/06/2021
pH of soil for fluid# determ.	pH units	9.1	9.4
pH of soil TCLP (after HCl)	pH units	1.8	1.9
Extraction fluid used	-	1	1
pH of final Leachate	pH units	5.1	5.3
Date extracted	-	10/08/2021	09/08/2021
Date analysed	-	10/08/2021	09/08/2021
Naphthalene in TCLP	mg/L	<0.001	<0.001
Acenaphthylene in TCLP	mg/L	<0.001	<0.001
Acenaphthene in TCLP	mg/L	<0.001	<0.001
Fluorene in TCLP	mg/L	<0.001	<0.001
Phenanthrene in TCLP	mg/L	<0.001	<0.001
Anthracene in TCLP	mg/L	<0.001	<0.001
Fluoranthene in TCLP	mg/L	<0.001	<0.001
Pyrene in TCLP	mg/L	<0.001	<0.001
Benzo(a)anthracene in TCLP	mg/L	<0.001	<0.001
Chrysene in TCLP	mg/L	<0.001	<0.001
Benzo(bjk)fluoranthene in TCLP	mg/L	<0.002	<0.002
Benzo(a)pyrene in TCLP	mg/L	<0.001	<0.001
Indeno(1,2,3-c,d)pyrene - TCLP	mg/L	<0.001	<0.001
Dibenzo(a,h)anthracene in TCLP	mg/L	<0.001	<0.001
Benzo(g,h,i)perylene in TCLP	mg/L	<0.001	<0.001
Total +ve PAH's	mg/L	NIL (+)VE	NIL (+)VE
Surrogate p-Terphenyl-d14	%	91	97

Method ID	Methodology Summary
INORG-004	Toxicity Characteristic Leaching Procedure (TCLP) using Zero Headspace Extraction (zHE) using AS4439 and USEPA 1311.
Inorg-004	Toxicity Characteristic Leaching Procedure (TCLP) using AS 4439 and USEPA 1311. Please note that the mass used may be scaled down from default based on sample mass available. Samples are stored at 2-6oC before and after leachate preparation.
Inorg-031	Total Phenolics by segmented flow analyser (in line distillation with colourimetric finish). Solids are extracted in a caustic media prior to analysis.
Org-022/025	Leachates are extracted with Dichloromethane and analysed by GC-MS/GC-MSMS.

QUALITY CONTROL: Misc Soil - Inorg					Duplicate				Spike Recovery %	
Test Description	Units	PQL	Method	Blank	#	Base	Dup.	RPD	LCS-1	[NT]
Date prepared	-			09/08/2021	[NT]	[NT]	[NT]	[NT]	09/08/2021	[NT]
Date analysed	-			09/08/2021	[NT]	[NT]	[NT]	[NT]	09/08/2021	[NT]
Total Phenolics (as Phenol)	mg/kg	5	Inorg-031	<5	[NT]	[NT]	[NT]	[NT]	101	[NT]

QUALITY CONTROL: PAHs in TCLP (USEPA 1311)						Duplicate			Spike Recovery %	
Test Description	Units	PQL	Method	Blank	#	Base	Dup.	RPD	LCS-W1	[NT]
Date extracted	-			10/08/2021	[NT]	[NT]	[NT]	[NT]	10/08/2021	[NT]
Date analysed	-			10/08/2021	[NT]	[NT]	[NT]	[NT]	10/08/2021	[NT]
Naphthalene in TCLP	mg/L	0.001	Org-022/025	<0.001	[NT]	[NT]	[NT]	[NT]	74	[NT]
Acenaphthylene in TCLP	mg/L	0.001	Org-022/025	<0.001	[NT]	[NT]	[NT]	[NT]	[NT]	[NT]
Acenaphthene in TCLP	mg/L	0.001	Org-022/025	<0.001	[NT]	[NT]	[NT]	[NT]	65	[NT]
Fluorene in TCLP	mg/L	0.001	Org-022/025	<0.001	[NT]	[NT]	[NT]	[NT]	75	[NT]
Phenanthrene in TCLP	mg/L	0.001	Org-022/025	<0.001	[NT]	[NT]	[NT]	[NT]	64	[NT]
Anthracene in TCLP	mg/L	0.001	Org-022/025	<0.001	[NT]	[NT]	[NT]	[NT]	[NT]	[NT]
Fluoranthene in TCLP	mg/L	0.001	Org-022/025	<0.001	[NT]	[NT]	[NT]	[NT]	76	[NT]
Pyrene in TCLP	mg/L	0.001	Org-022/025	<0.001	[NT]	[NT]	[NT]	[NT]	79	[NT]
Benzo(a)anthracene in TCLP	mg/L	0.001	Org-022/025	<0.001	[NT]	[NT]	[NT]	[NT]	[NT]	[NT]
Chrysene in TCLP	mg/L	0.001	Org-022/025	<0.001	[NT]	[NT]	[NT]	[NT]	94	[NT]
Benzo(bjk)fluoranthene in TCLP	mg/L	0.002	Org-022/025	<0.002	[NT]	[NT]	[NT]	[NT]	[NT]	[NT]
Benzo(a)pyrene in TCLP	mg/L	0.001	Org-022/025	<0.001	[NT]	[NT]	[NT]	[NT]	68	[NT]
Indeno(1,2,3-c,d)pyrene - TCLP	mg/L	0.001	Org-022/025	<0.001	[NT]	[NT]	[NT]	[NT]	[NT]	[NT]
Dibenzo(a,h)anthracene in TCLP	mg/L	0.001	Org-022/025	<0.001	[NT]	[NT]	[NT]	[NT]	[NT]	[NT]
Benzo(g,h,i)perylene in TCLP	mg/L	0.001	Org-022/025	<0.001	[NT]	[NT]	[NT]	[NT]	[NT]	[NT]
Surrogate p-Terphenyl-d14	%		Org-022/025	94	[NT]	[NT]	[NT]	[NT]	85	[NT]

QUALITY CONTROL: PAHs in TCLP (USEPA 1311)						Duplicate			Spike Recovery %	
Test Description	Units	PQL	Method	Blank	#	Base	Dup.	RPD	LCS-W2	[NT]
Date extracted	-			[NT]	[NT]	[NT]	[NT]	[NT]	09/08/2021	[NT]
Date analysed	-			[NT]	[NT]	[NT]	[NT]	[NT]	09/08/2021	[NT]
Naphthalene in TCLP	mg/L	0.001	Org-022/025	[NT]	[NT]	[NT]	[NT]	[NT]	83	[NT]
Acenaphthene in TCLP	mg/L	0.001	Org-022/025	[NT]	[NT]	[NT]	[NT]	[NT]	73	[NT]
Fluorene in TCLP	mg/L	0.001	Org-022/025	[NT]	[NT]	[NT]	[NT]	[NT]	82	[NT]
Phenanthrene in TCLP	mg/L	0.001	Org-022/025	[NT]	[NT]	[NT]	[NT]	[NT]	104	[NT]
Fluoranthene in TCLP	mg/L	0.001	Org-022/025	[NT]	[NT]	[NT]	[NT]	[NT]	83	[NT]
Pyrene in TCLP	mg/L	0.001	Org-022/025	[NT]	[NT]	[NT]	[NT]	[NT]	88	[NT]
Chrysene in TCLP	mg/L	0.001	Org-022/025	[NT]	[NT]	[NT]	[NT]	[NT]	76	[NT]
Benzo(a)pyrene in TCLP	mg/L	0.001	Org-022/025	[NT]	[NT]	[NT]	[NT]	[NT]	87	[NT]
Surrogate p-Terphenyl-d14	%		Org-022/025	[NT]	[NT]	[NT]	[NT]	[NT]	96	[NT]

Result Definitions

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

Quality Control Definitions

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

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

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

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

Laboratory Acceptance Criteria

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

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

Spikes for Physical and Aggregate Tests are not applicable.

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

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

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

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

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

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

Measurement Uncertainty estimates are available for most tests upon request.

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

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

Report Comments

Out of recommended holding time

Ming To

Subject: FW: Reports 273301, 274103, 274471 Cockle Bay

Ref: 273301-B.
TAT: Standard
Due: 13/08/2021 MT

From: Kurt Plambeck <kurt.plambeck@douglaspartners.com.au>
Sent: Thursday, 5 August 2021 4:42 PM
To: Simon Song <SSong@envirolab.com.au>
Subject: Reports 273301, 274103, 274471 Cockle Bay

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Simon,

Can you please run the below additional analysis

	Sample ID	Lab Report	TCLP Hg	TCLP PAH	TBT	Cresols and coal tar	Total Phenols
10	CW5/0.5-0.6	273301		X			
14	CW6/0.5-0.6	273301		X			X
18	W4/10	273301			X		X
2.	CW2/0.4-0.5	273301					X
	CW1/12-12.45	274103			X		X
	CW2/2.8-3.2	274103			X		X
	CW5/2.0	274103			X	X	X
	W1/8-8.45	274103			X	X	X
	W3/10.75-11.2	274103			X	X	X
	W5/8.8-9.23	274103	X		X	X	X
	CW3/0.5	274103					X
	CW4/2.5-2.95	274471			X		X
	SS1/0.5	274471					X
	SS2/2.5-2.7	274471					X

Also for report 274103 can you report tin for all samples that metals were tested for.

Regards

Ming To

From: Kurt Plambeck <kurt.plambeck@douglaspartners.com.au>
Sent: Thursday, 5 August 2021 5:08 PM 273301-B.
To: Simon Song
Cc: Ming To
Subject: RE: Reports 273301, 274103, 274471 Cockle Bay

Categories: Additional

CAUTION: This email originated from outside of the organisation. Do not act on instructions, click links or open attachments unless you recognise the sender and know the content is authentic and safe.

Hi Simon,

That's fine. Client was warned about holding times and still took forever to approve the additional analysis

---

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

If you are not the intended recipient of this email, please notify us immediately and be aware that any disclosure, copying, distribution or use of the contents of this information is prohibited.

From: Simon Song <SSong@envirolab.com.au>
Sent: Thursday, 5 August 2021 5:06 PM
To: Kurt Plambeck <kurt.plambeck@douglaspartners.com.au>
Cc: Ming To <MTo@envirolab.com.au>
Subject: RE: Reports 273301, 274103, 274471 Cockle Bay

Hi Kurt,
Is that ok they are out of recommended holding time?
For 'Cresols and coal tar', we just test PAH and Speciated Phenols, PAH had been done already, we can run Speciated Phenols only.

Kind Regards,

Simon Song | Senior Customer Service | Envirolab Services

Great Science. Great Service.

12 Ashley Street Chatswood NSW 2067
T 612 9910 6200
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Envirolab Services Pty Ltd
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SAMPLE RECEIPT ADVICE

Client Details

Client	Douglas Partners Pty Ltd
Attention	Kurt Plambeck

Sample Login Details

Your reference	202546.00, Cockle Bay
Envirolab Reference	273301-B
Date Sample Received	05/07/2021
Date Instructions Received	05/08/2021
Date Results Expected to be Reported	13/08/2021

Sample Condition

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

Comments

Out of recommended holding time

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	Misc Soil - Inorg	pH of soil for fluid#determ.	pH of soil TCLP (after HCl)	Extraction fluid used	pH of final Leachate	Naphthalene in TCLP	Acenaphthylene in TCLP	Acenaphthene in TCLP	Fluorene in TCLP	Phenanthrene in TCLP	Anthracene in TCLP	Fluoranthene in TCLP	Pyrene in TCLP	Benzo(a)anthracene in TCLP	Chrysene in TCLP	Benzo(b)fluoranthene in TCLP	Benzo(k)fluoranthene in TCLP	Benzo(a)pyrene in TCLP	Indeno(1,2,3-c,d)pyrene - TCLP	Dibenzo(a,h)anthracene in TCLP	Benzo(g,h,i)perylene in TCLP	Total +vePAH's	Surrogate p-Terphenyl-d14	Tributyl Tin in Soil	On Hold
CW2-0.1-0.2																									✓
CW2-0.4-0.5	✓																								
CW2-0.9-1																									✓
CW2-1.4-1.5																									✓
CW4-0.05-0.15																									✓
CW4-0.4-0.5																									✓
CW4-0.9-1																									✓
CW4-1.4-1.5																									✓
CW5-0.25-0.35																									✓
CW5-0.5-0.6		✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓		
CW5-0.9-1																									✓
CW5-1.4-1.5																									✓
CW6-0.1-0.2																									✓
CW6-0.5-0.6	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓		
CW6-0.9-1.0																									✓
BD1/20210630-.																									✓
BD2/20210630-.																									✓
W4-10	✓																							✓	
W4-11.5																									✓
W4-12.45																									✓

Envirolab Services Pty Ltd
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Sample ID	Misc Soil - Inorg	pH of soil for fluid#determ.	pH of soil TCLP (after HCl)	Extraction fluid used	pH of final Leachate	Naphthalene in TCLP	Acenaphthylene in TCLP	Acenaphthene in TCLP	Fluorene in TCLP	Phenanthrene in TCLP	Anthracene in TCLP	Fluoranthene in TCLP	Pyrene in TCLP	Benzo(a)anthracene in TCLP	Chrysene in TCLP	Benzo(bjk)fluoranthene in TCLP	Benzo(a)pyrene in TCLP	Indeno(1,2,3-c,d)pyrene - TCLP	Dibenzo(a,h)anthracene in TCLP	Benzo(g,h,i)perylene in TCLP	Total +vePAH's	Surrogate p-Terphenyl-d14	Tributyl Tin in Soil	On Hold
Spike 1 -.																								✓
Blank 1 -.																								✓

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

Additional Info

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

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

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

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

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www.envirolab.com.au

CERTIFICATE OF ANALYSIS 274103

Client Details

Client	Douglas Partners Pty Ltd
Attention	Rhys McMillan
Address	96 Hermitage Rd, West Ryde, NSW, 2114

Sample Details

Your Reference	**202546.00, Cockle Bay**
Number of Samples	33 Soil
Date samples received	14/07/2021
Date completed instructions received	14/07/2021

Analysis Details

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

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

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

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

Report Details

Date results requested by	21/07/2021
Date of Issue	21/07/2021

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

Results Approved By
Dragana Tomas, Senior Chemist
Giovanni Agosti, Group Technical Manager
Hannah Nguyen, Senior Chemist
Josh Williams, LC Supervisor
Lucy Zhu, Asbestos Supervisor
Nancy Zhang, Laboratory Manager, Sydney
Steven Luong, Organics Supervisor

Authorised By



Nancy Zhang, Laboratory Manager

VOCs in soil				
Our Reference		274103-16	274103-18	274103-25
Your Reference	UNITS	CW5	CW7	W5
Depth		5.5-5.45	0.5	8.8-9.23
Date Sampled		7/07/2021	6/07/2021	7/07/2021
Type of sample		Soil	Soil	Soil
Date extracted	-	15/07/2021	15/07/2021	15/07/2021
Date analysed	-	15/07/2021	15/07/2021	15/07/2021
Dichlorodifluoromethane	mg/kg	<1	<1	<1
Chloromethane	mg/kg	<1	<1	<1
Vinyl Chloride	mg/kg	<1	<1	<1
Bromomethane	mg/kg	<1	<1	<1
Chloroethane	mg/kg	<1	<1	<1
Trichlorofluoromethane	mg/kg	<1	<1	<1
1,1-Dichloroethene	mg/kg	<1	<1	<1
trans-1,2-dichloroethene	mg/kg	<1	<1	<1
1,1-dichloroethane	mg/kg	<1	<1	<1
cis-1,2-dichloroethene	mg/kg	<1	<1	<1
bromochloromethane	mg/kg	<1	<1	<1
chloroform	mg/kg	<1	<1	<1
2,2-dichloropropane	mg/kg	<1	<1	<1
1,2-dichloroethane	mg/kg	<1	<1	<1
1,1,1-trichloroethane	mg/kg	<1	<1	<1
1,1-dichloropropene	mg/kg	<1	<1	<1
Cyclohexane	mg/kg	<1	<1	<1
carbon tetrachloride	mg/kg	<1	<1	<1
Benzene	mg/kg	<0.2	<0.2	<0.2
dibromomethane	mg/kg	<1	<1	<1
1,2-dichloropropane	mg/kg	<1	<1	<1
trichloroethene	mg/kg	<1	<1	<1
bromodichloromethane	mg/kg	<1	<1	<1
trans-1,3-dichloropropene	mg/kg	<1	<1	<1
cis-1,3-dichloropropene	mg/kg	<1	<1	<1
1,1,2-trichloroethane	mg/kg	<1	<1	<1
Toluene	mg/kg	<0.5	<0.5	<0.5
1,3-dichloropropane	mg/kg	<1	<1	<1
dibromochloromethane	mg/kg	<1	<1	<1
1,2-dibromoethane	mg/kg	<1	<1	<1
tetrachloroethene	mg/kg	<1	<1	<1
1,1,1,2-tetrachloroethane	mg/kg	<1	<1	<1
chlorobenzene	mg/kg	<1	<1	<1

VOCs in soil				
Our Reference		274103-16	274103-18	274103-25
Your Reference	UNITS	CW5	CW7	W5
Depth		5.5-5.45	0.5	8.8-9.23
Date Sampled		7/07/2021	6/07/2021	7/07/2021
Type of sample		Soil	Soil	Soil
Ethylbenzene	mg/kg	<1	<1	<1
bromoform	mg/kg	<1	<1	<1
m+p-xylene	mg/kg	<2	<2	<2
styrene	mg/kg	<1	<1	<1
1,1,2,2-tetrachloroethane	mg/kg	<1	<1	<1
o-Xylene	mg/kg	<1	<1	<1
1,2,3-trichloropropane	mg/kg	<1	<1	<1
isopropylbenzene	mg/kg	<1	<1	<1
bromobenzene	mg/kg	<1	<1	<1
n-propyl benzene	mg/kg	<1	<1	<1
2-chlorotoluene	mg/kg	<1	<1	<1
4-chlorotoluene	mg/kg	<1	<1	<1
1,3,5-trimethyl benzene	mg/kg	<1	<1	<1
tert-butyl benzene	mg/kg	<1	<1	<1
1,2,4-trimethyl benzene	mg/kg	<1	<1	<1
1,3-dichlorobenzene	mg/kg	<1	<1	<1
sec-butyl benzene	mg/kg	<1	<1	<1
1,4-dichlorobenzene	mg/kg	<1	<1	<1
4-isopropyl toluene	mg/kg	<1	<1	<1
1,2-dichlorobenzene	mg/kg	<1	<1	<1
n-butyl benzene	mg/kg	<1	<1	<1
1,2-dibromo-3-chloropropane	mg/kg	<1	<1	<1
1,2,4-trichlorobenzene	mg/kg	<1	<1	<1
hexachlorobutadiene	mg/kg	<1	<1	<1
1,2,3-trichlorobenzene	mg/kg	<1	<1	<1
Surrogate Dibromofluorometha	%	104	105	104
Surrogate aaa-Trifluorotoluene	%	106	117	99
Surrogate Toluene-d_8	%	100	100	101
Surrogate 4-Bromofluorobenzene	%	109	110	110

vTRH(C6-C10)/BTEXN in Soil						
Our Reference		274103-1	274103-6	274103-9	274103-12	274103-15
Your Reference	UNITS	CW1	CW2	CW2	CW3	CW5
Depth		12-12.45	2.8-3.2	7-7.45	0.5	2
Date Sampled		12/07/2021	12/07/2021	12/07/2021	8/07/2021	7/07/2021
Type of sample		Soil	Soil	Soil	Soil	Soil
Date extracted	-	15/07/2021	15/07/2021	15/07/2021	15/07/2021	15/07/2021
Date analysed	-	15/07/2021	15/07/2021	15/07/2021	15/07/2021	15/07/2021
TRH C_6 - C_9	mg/kg	<25	<25	<25	<25	<25
TRH C_6 - C_{10}	mg/kg	<25	<25	<25	<25	<25
vTPH C_6 - C_{10} less BTEX (F1)	mg/kg	<25	<25	<25	<25	<25
Benzene	mg/kg	<0.2	<0.2	<0.2	<0.2	<0.2
Toluene	mg/kg	<0.5	<0.5	<0.5	<0.5	<0.5
Ethylbenzene	mg/kg	<1	<1	<1	<1	<1
m+p-xylene	mg/kg	<2	<2	<2	<2	<2
o-Xylene	mg/kg	<1	<1	<1	<1	<1
naphthalene	mg/kg	<1	<1	<1	<1	<1
Total +ve Xylenes	mg/kg	<3	<3	<3	<3	<3
Surrogate aaa-Trifluorotoluene	%	110	108	109	112	111

vTRH(C6-C10)/BTEXN in Soil						
Our Reference		274103-16	274103-19	274103-20	274103-22	274103-25
Your Reference	UNITS	CW5	CW7	W1	W3	W5
Depth		5.5-5.45	1	8-8.45	10.75-11.2	8.8-9.23
Date Sampled		7/07/2021	6/07/2021	9/07/2021	4/07/2021	7/07/2021
Type of sample		Soil	Soil	Soil	Soil	Soil
Date extracted	-	15/07/2021	15/07/2021	15/07/2021	15/07/2021	15/07/2021
Date analysed	-	15/07/2021	15/07/2021	15/07/2021	15/07/2021	15/07/2021
TRH C_6 - C_9	mg/kg	<25	<25	<25	<25	<25
TRH C_6 - C_{10}	mg/kg	<25	<25	<25	<25	<25
vTPH C_6 - C_{10} less BTEX (F1)	mg/kg	<25	<25	<25	<25	<25
Benzene	mg/kg	<0.2	<0.2	<0.2	<0.2	<0.2
Toluene	mg/kg	<0.5	<0.5	<0.5	<0.5	<0.5
Ethylbenzene	mg/kg	<1	<1	<1	<1	<1
m+p-xylene	mg/kg	<2	<2	<2	<2	<2
o-Xylene	mg/kg	<1	<1	<1	<1	<1
naphthalene	mg/kg	<1	<1	<1	<1	<1
Total +ve Xylenes	mg/kg	<3	<3	<3	<3	<3
Surrogate aaa-Trifluorotoluene	%	106	117	114	91	99

vTRH(C6-C10)/BTEXN in Soil			
Our Reference		274103-32	274103-33
Your Reference	UNITS	Spike 2	Blank 2
Depth		-	-
Date Sampled		9/07/2021	9/07/2021
Type of sample		Soil	Soil
Date extracted	-	15/07/2021	15/07/2021
Date analysed	-	15/07/2021	15/07/2021
TRH C_6 - C_9	mg/kg	[NA]	<25
TRH C_6 - C_{10}	mg/kg	[NA]	<25
vTPH C_6 - C_{10} less BTEX (F1)	mg/kg	[NA]	<25
Benzene	mg/kg	89%	<0.2
Toluene	mg/kg	89%	<0.5
Ethylbenzene	mg/kg	72%	<1
m+p-xylene	mg/kg	72%	<2
o-Xylene	mg/kg	70%	<1
naphthalene	mg/kg	[NA]	<1
Total +ve Xylenes	mg/kg	[NA]	<3
Surrogate aaa-Trifluorotoluene	%	73	122

svTRH (C10-C40) in Soil						
Our Reference		274103-1	274103-6	274103-9	274103-12	274103-15
Your Reference	UNITS	CW1	CW2	CW2	CW3	CW5
Depth		12-12.45	2.8-3.2	7-7.45	0.5	2
Date Sampled		12/07/2021	12/07/2021	12/07/2021	8/07/2021	7/07/2021
Type of sample		Soil	Soil	Soil	Soil	Soil
Date extracted	-	15/07/2021	15/07/2021	15/07/2021	15/07/2021	15/07/2021
Date analysed	-	17/07/2021	17/07/2021	17/07/2021	17/07/2021	20/07/2021
TRH C_{10} - C_{14}	mg/kg	<50	<50	<50	<50	<50
TRH C_{15} - C_{28}	mg/kg	<100	<100	<100	<100	<100
TRH C_{29} - C_{36}	mg/kg	<100	<100	<100	<100	<100
TRH >C_{10} -C_{16}	mg/kg	<50	<50	<50	<50	<50
TRH >C_{10} - C_{16} less Naphthalene (F2)	mg/kg	<50	<50	<50	<50	<50
TRH >C_{16} -C_{34}	mg/kg	<100	<100	<100	<100	110
TRH >C_{34} -C_{40}	mg/kg	<100	<100	<100	<100	<100
Total +ve TRH (>C10-C40)	mg/kg	<50	<50	<50	<50	110
Surrogate o-Terphenyl	%	84	70	72	79	79

svTRH (C10-C40) in Soil						
Our Reference		274103-16	274103-19	274103-20	274103-22	274103-25
Your Reference	UNITS	CW5	CW7	W1	W3	W5
Depth		5.5-5.45	1	8-8.45	10.75-11.2	8.8-9.23
Date Sampled		7/07/2021	6/07/2021	9/07/2021	4/07/2021	7/07/2021
Type of sample		Soil	Soil	Soil	Soil	Soil
Date extracted	-	15/07/2021	15/07/2021	15/07/2021	15/07/2021	15/07/2021
Date analysed	-	17/07/2021	17/07/2021	20/07/2021	17/07/2021	17/07/2021
TRH C_{10} - C_{14}	mg/kg	<50	<50	<50	91	120
TRH C_{15} - C_{28}	mg/kg	<100	<100	<100	1,700	2,900
TRH C_{29} - C_{36}	mg/kg	<100	<100	<100	1,800	2,600
TRH >C_{10} -C_{16}	mg/kg	<50	<50	<50	180	200
TRH >C_{10} - C_{16} less Naphthalene (F2)	mg/kg	<50	<50	<50	180	200
TRH >C_{16} -C_{34}	mg/kg	<100	<100	160	3,000	4,900
TRH >C_{34} -C_{40}	mg/kg	<100	<100	<100	960	1,300
Total +ve TRH (>C10-C40)	mg/kg	<50	<50	160	4,200	6,400
Surrogate o-Terphenyl	%	82	79	80	110	138

PAHs in Soil						
Our Reference		274103-1	274103-3	274103-5	274103-6	274103-9
Your Reference	UNITS	CW1	CW1	BD07/120721	CW2	CW2
Depth		12-12.45	14.5-14.95	-	2.8-3.2	7-7.45
Date Sampled		12/07/2021	12/07/2021	12/07/2021	12/07/2021	12/07/2021
Type of sample		Soil	Soil	Soil	Soil	Soil
Date extracted	-	15/07/2021	15/07/2021	15/07/2021	15/07/2021	15/07/2021
Date analysed	-	19/07/2021	19/07/2021	19/07/2021	19/07/2021	19/07/2021
Naphthalene	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Acenaphthylene	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Acenaphthene	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Fluorene	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Phenanthrene	mg/kg	<0.1	<0.1	<0.1	0.2	0.1
Anthracene	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Fluoranthene	mg/kg	<0.1	<0.1	<0.1	<0.1	<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	0.2	0.1
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	%	116	122	111	114	110

PAHs in Soil						
Our Reference		274103-12	274103-15	274103-16	274103-18	274103-19
Your Reference	UNITS	CW3	CW5	CW5	CW7	CW7
Depth		0.5	2	5.5-5.45	0.5	1
Date Sampled		8/07/2021	7/07/2021	7/07/2021	6/07/2021	6/07/2021
Type of sample		Soil	Soil	Soil	Soil	Soil
Date extracted	-	15/07/2021	15/07/2021	15/07/2021	15/07/2021	15/07/2021
Date analysed	-	19/07/2021	19/07/2021	19/07/2021	19/07/2021	19/07/2021
Naphthalene	mg/kg	0.1	0.2	<0.1	<0.1	<0.1
Acenaphthylene	mg/kg	<0.1	0.5	<0.1	<0.1	<0.1
Acenaphthene	mg/kg	<0.1	0.1	<0.1	<0.1	<0.1
Fluorene	mg/kg	<0.1	0.4	<0.1	<0.1	<0.1
Phenanthrene	mg/kg	0.1	4.4	<0.1	<0.1	0.1
Anthracene	mg/kg	<0.1	0.8	<0.1	<0.1	<0.1
Fluoranthene	mg/kg	0.2	5.0	<0.1	0.3	<0.1
Pyrene	mg/kg	0.2	5.0	<0.1	0.5	<0.1
Benzo(a)anthracene	mg/kg	<0.1	2.7	<0.1	0.4	<0.1
Chrysene	mg/kg	<0.1	2.4	<0.1	0.5	<0.1
Benzo(b,j+k)fluoranthene	mg/kg	<0.2	3.4	<0.2	0.5	<0.2
Benzo(a)pyrene	mg/kg	0.1	2.3	<0.05	0.4	<0.05
Indeno(1,2,3-c,d)pyrene	mg/kg	<0.1	0.9	<0.1	0.1	<0.1
Dibenzo(a,h)anthracene	mg/kg	<0.1	0.2	<0.1	<0.1	<0.1
Benzo(g,h,i)perylene	mg/kg	<0.1	1.2	<0.1	0.2	<0.1
Total +ve PAH's	mg/kg	0.71	29	<0.05	3.0	0.1
Benzo(a)pyrene TEQ calc (zero)	mg/kg	<0.5	3.2	<0.5	<0.5	<0.5
Benzo(a)pyrene TEQ calc(half)	mg/kg	<0.5	3.2	<0.5	0.5	<0.5
Benzo(a)pyrene TEQ calc(PQL)	mg/kg	<0.5	3.2	<0.5	0.6	<0.5
Surrogate p-Terphenyl-d14	%	123	113	130	109	113

PAHs in Soil						
Our Reference		274103-20	274103-21	274103-22	274103-24	274103-25
Your Reference	UNITS	W1	W1	W3	W3	W5
Depth		8-8.45	10-10.43	10.75-11.2	14-14.45	8.8-9.23
Date Sampled		9/07/2021	9/07/2021	4/07/2021	4/07/2021	7/07/2021
Type of sample		Soil	Soil	Soil	Soil	Soil
Date extracted	-	15/07/2021	15/07/2021	15/07/2021	15/07/2021	15/07/2021
Date analysed	-	19/07/2021	19/07/2021	19/07/2021	19/07/2021	19/07/2021
Naphthalene	mg/kg	0.1	0.1	0.7	<0.1	1.2
Acenaphthylene	mg/kg	0.1	0.1	0.7	<0.1	1
Acenaphthene	mg/kg	0.2	0.2	0.2	<0.1	0.6
Fluorene	mg/kg	0.2	0.2	0.3	<0.1	1.2
Phenanthrene	mg/kg	1.5	1.9	1.5	<0.1	6.4
Anthracene	mg/kg	0.3	0.6	0.9	<0.1	3.0
Fluoranthene	mg/kg	1.4	1.9	4.7	<0.1	39
Pyrene	mg/kg	1.6	2.0	11	<0.1	62
Benzo(a)anthracene	mg/kg	0.6	0.7	3.5	<0.1	16
Chrysene	mg/kg	0.6	0.8	3.4	<0.1	15
Benzo(b,j+k)fluoranthene	mg/kg	1	1	8.7	<0.2	38
Benzo(a)pyrene	mg/kg	0.71	0.95	6.4	<0.05	26
Indeno(1,2,3-c,d)pyrene	mg/kg	0.4	0.5	4.2	<0.1	15
Dibenzo(a,h)anthracene	mg/kg	<0.1	<0.1	0.7	<0.1	2.3
Benzo(g,h,i)perylene	mg/kg	0.5	0.5	3.9	<0.1	13
Total +ve PAH's	mg/kg	9.4	12	51	<0.05	240
Benzo(a)pyrene TEQ calc (zero)	mg/kg	0.9	1.2	8.9	<0.5	35
Benzo(a)pyrene TEQ calc(half)	mg/kg	1	1.3	8.9	<0.5	35
Benzo(a)pyrene TEQ calc(PQL)	mg/kg	1.0	1.3	8.9	<0.5	35
Surrogate p-Terphenyl-d14	%	117	92	110	117	113

PAHs in Soil			
Our Reference		274103-27	274103-29
Your Reference	UNITS	W5	BD03/060721
Depth		11.5-11.95	-
Date Sampled		7/07/2021	6/07/2021
Type of sample		Soil	Soil
Date extracted	-	15/07/2021	15/07/2021
Date analysed	-	19/07/2021	19/07/2021
Naphthalene	mg/kg	<0.1	<0.1
Acenaphthylene	mg/kg	<0.1	<0.1
Acenaphthene	mg/kg	<0.1	<0.1
Fluorene	mg/kg	<0.1	<0.1
Phenanthrene	mg/kg	<0.1	<0.1
Anthracene	mg/kg	<0.1	<0.1
Fluoranthene	mg/kg	<0.1	0.2
Pyrene	mg/kg	<0.1	0.2
Benzo(a)anthracene	mg/kg	<0.1	<0.1
Chrysene	mg/kg	<0.1	0.1
Benzo(b,j+k)fluoranthene	mg/kg	<0.2	<0.2
Benzo(a)pyrene	mg/kg	<0.05	0.1
Indeno(1,2,3-c,d)pyrene	mg/kg	<0.1	<0.1
Dibenzo(a,h)anthracene	mg/kg	<0.1	<0.1
Benzo(g,h,i)perylene	mg/kg	<0.1	<0.1
Total +ve PAH's	mg/kg	<0.05	0.50
Benzo(a)pyrene TEQ calc (zero)	mg/kg	<0.5	<0.5
Benzo(a)pyrene TEQ calc(half)	mg/kg	<0.5	<0.5
Benzo(a)pyrene TEQ calc(PQL)	mg/kg	<0.5	<0.5
Surrogate p-Terphenyl-d14	%	118	115

Organochlorine Pesticides in soil					
Our Reference		274103-1	274103-6	274103-16	274103-22
Your Reference	UNITS	CW1	CW2	CW5	W3
Depth		12-12.45	2.8-3.2	5.5-5.45	10.75-11.2
Date Sampled		12/07/2021	12/07/2021	7/07/2021	4/07/2021
Type of sample		Soil	Soil	Soil	Soil
Date extracted	-	15/07/2021	15/07/2021	15/07/2021	15/07/2021
Date analysed	-	19/07/2021	19/07/2021	19/07/2021	19/07/2021
alpha-BHC	mg/kg	<0.1	<0.1	<0.1	<0.1
HCB	mg/kg	<0.1	<0.1	<0.1	<0.1
beta-BHC	mg/kg	<0.1	<0.1	<0.1	<0.1
gamma-BHC	mg/kg	<0.1	<0.1	<0.1	<0.1
Heptachlor	mg/kg	<0.1	<0.1	<0.1	<0.1
delta-BHC	mg/kg	<0.1	<0.1	<0.1	<0.1
Aldrin	mg/kg	<0.1	<0.1	<0.1	<0.1
Heptachlor Epoxide	mg/kg	<0.1	<0.1	<0.1	<0.1
gamma-Chlordane	mg/kg	<0.1	<0.1	<0.1	<0.1
alpha-chlordane	mg/kg	<0.1	<0.1	<0.1	<0.1
Endosulfan I	mg/kg	<0.1	<0.1	<0.1	<0.1
pp-DDE	mg/kg	<0.1	<0.1	<0.1	<0.1
Dieldrin	mg/kg	<0.1	<0.1	<0.1	<0.1
Endrin	mg/kg	<0.1	<0.1	<0.1	<0.1
Endosulfan II	mg/kg	<0.1	<0.1	<0.1	<0.1
pp-DDD	mg/kg	<0.1	<0.1	<0.1	<0.1
Endrin Aldehyde	mg/kg	<0.1	<0.1	<0.1	<0.1
pp-DDT	mg/kg	<0.1	<0.1	<0.1	<0.1
Endosulfan Sulphate	mg/kg	<0.1	<0.1	<0.1	<0.1
Methoxychlor	mg/kg	<0.1	<0.1	<0.1	<0.1
Total +ve DDT+DDD+DDE	mg/kg	<0.1	<0.1	<0.1	<0.1
Surrogate TCMX	%	127	104	137	105

Organophosphorus Pesticides in Soil					
Our Reference		274103-1	274103-6	274103-16	274103-22
Your Reference	UNITS	CW1	CW2	CW5	W3
Depth		12-12.45	2.8-3.2	5.5-5.45	10.75-11.2
Date Sampled		12/07/2021	12/07/2021	7/07/2021	4/07/2021
Type of sample		Soil	Soil	Soil	Soil
Date extracted	-	15/07/2021	15/07/2021	15/07/2021	15/07/2021
Date analysed	-	19/07/2021	19/07/2021	19/07/2021	19/07/2021
Dichlorvos	mg/kg	<0.1	<0.1	<0.1	<0.1
Dimethoate	mg/kg	<0.1	<0.1	<0.1	<0.1
Diazinon	mg/kg	<0.1	<0.1	<0.1	<0.1
Chlorpyriphos-methyl	mg/kg	<0.1	<0.1	<0.1	<0.1
Ronnel	mg/kg	<0.1	<0.1	<0.1	<0.1
Fenitrothion	mg/kg	<0.1	<0.1	<0.1	<0.1
Malathion	mg/kg	<0.1	<0.1	<0.1	<0.1
Chlorpyriphos	mg/kg	<0.1	<0.1	<0.1	<0.1
Parathion	mg/kg	<0.1	<0.1	<0.1	<0.1
Bromophos-ethyl	mg/kg	<0.1	<0.1	<0.1	<0.1
Ethion	mg/kg	<0.1	<0.1	<0.1	<0.1
Azinphos-methyl (Guthion)	mg/kg	<0.1	<0.1	<0.1	<0.1
Surrogate TCMX	%	127	104	137	105

PCBs in Soil					
Our Reference		274103-1	274103-6	274103-16	274103-22
Your Reference	UNITS	CW1	CW2	CW5	W3
Depth		12-12.45	2.8-3.2	5.5-5.45	10.75-11.2
Date Sampled		12/07/2021	12/07/2021	7/07/2021	4/07/2021
Type of sample		Soil	Soil	Soil	Soil
Date extracted	-	15/07/2021	15/07/2021	15/07/2021	15/07/2021
Date analysed	-	19/07/2021	19/07/2021	19/07/2021	19/07/2021
Aroclor 1016	mg/kg	<0.1	<0.1	<0.1	<0.1
Aroclor 1221	mg/kg	<0.1	<0.1	<0.1	<0.1
Aroclor 1232	mg/kg	<0.1	<0.1	<0.1	<0.1
Aroclor 1242	mg/kg	<0.1	<0.1	<0.1	<0.1
Aroclor 1248	mg/kg	<0.1	<0.1	<0.1	<0.1
Aroclor 1254	mg/kg	<0.1	<0.1	<0.1	<0.1
Aroclor 1260	mg/kg	<0.1	<0.1	<0.1	<0.1
Total +ve PCBs (1016-1260)	mg/kg	<0.1	<0.1	<0.1	<0.1
Surrogate TCMX	%	127	104	137	105

Acid Extractable metals in soil						
Our Reference		274103-1	274103-3	274103-5	274103-6	274103-9
Your Reference	UNITS	CW1	CW1	BD07/120721	CW2	CW2
Depth		12-12.45	14.5-14.95	-	2.8-3.2	7-7.45
Date Sampled		12/07/2021	12/07/2021	12/07/2021	12/07/2021	12/07/2021
Type of sample		Soil	Soil	Soil	Soil	Soil
Date prepared	-	19/07/2021	19/07/2021	19/07/2021	19/07/2021	19/07/2021
Date analysed	-	19/07/2021	19/07/2021	19/07/2021	19/07/2021	19/07/2021
Arsenic	mg/kg	<4	9	<4	<4	6
Cadmium	mg/kg	<0.4	<0.4	<0.4	<0.4	<0.4
Chromium	mg/kg	3	41	3	7	11
Copper	mg/kg	<1	3	<1	30	16
Lead	mg/kg	3	14	3	9	13
Mercury	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Nickel	mg/kg	<1	3	<1	7	11
Zinc	mg/kg	2	7	2	49	76

Acid Extractable metals in soil						
Our Reference		274103-12	274103-15	274103-16	274103-18	274103-19
Your Reference	UNITS	CW3	CW5	CW5	CW7	CW7
Depth		0.5	2	5.5-5.45	0.5	1
Date Sampled		8/07/2021	7/07/2021	7/07/2021	6/07/2021	6/07/2021
Type of sample		Soil	Soil	Soil	Soil	Soil
Date prepared	-	19/07/2021	19/07/2021	19/07/2021	19/07/2021	19/07/2021
Date analysed	-	19/07/2021	19/07/2021	19/07/2021	19/07/2021	19/07/2021
Arsenic	mg/kg	7	5	17	<4	<4
Cadmium	mg/kg	<0.4	<0.4	<0.4	<0.4	<0.4
Chromium	mg/kg	23	45	20	15	8
Copper	mg/kg	53	62	6	56	10
Lead	mg/kg	45	240	15	14	9
Mercury	mg/kg	0.1	0.5	<0.1	<0.1	<0.1
Nickel	mg/kg	30	8	6	150	18
Zinc	mg/kg	100	120	35	62	39

Acid Extractable metals in soil						
Our Reference		274103-20	274103-21	274103-22	274103-24	274103-25
Your Reference	UNITS	W1	W1	W3	W3	W5
Depth		8-8.45	10-10.43	10.75-11.2	14-14.45	8.8-9.23
Date Sampled		9/07/2021	9/07/2021	4/07/2021	4/07/2021	7/07/2021
Type of sample		Soil	Soil	Soil	Soil	Soil
Date prepared	-	19/07/2021	19/07/2021	19/07/2021	19/07/2021	19/07/2021
Date analysed	-	19/07/2021	19/07/2021	19/07/2021	19/07/2021	19/07/2021
Arsenic	mg/kg	5	<4	24	18	22
Cadmium	mg/kg	0.6	<0.4	3	<0.4	3
Chromium	mg/kg	16	5	78	87	43
Copper	mg/kg	51	20	310	10	410
Lead	mg/kg	1,600	30	810	17	880
Mercury	mg/kg	0.3	0.1	3.7	0.1	4.8
Nickel	mg/kg	9	1	25	3	24
Zinc	mg/kg	640	30	1,100	17	1,400

Acid Extractable metals in soil			
Our Reference		274103-27	274103-29
Your Reference	UNITS	W5	BD03/060721
Depth		11.5-11.95	-
Date Sampled		7/07/2021	6/07/2021
Type of sample		Soil	Soil
Date prepared	-	19/07/2021	19/07/2021
Date analysed	-	19/07/2021	19/07/2021
Arsenic	mg/kg	<4	<4
Cadmium	mg/kg	<0.4	<0.4
Chromium	mg/kg	7	18
Copper	mg/kg	4	60
Lead	mg/kg	10	21
Mercury	mg/kg	<0.1	<0.1
Nickel	mg/kg	2	160
Zinc	mg/kg	16	69

Moisture						
Our Reference		274103-1	274103-3	274103-5	274103-6	274103-9
Your Reference	UNITS	CW1	CW1	BD07/120721	CW2	CW2
Depth		12-12.45	14.5-14.95	-	2.8-3.2	7-7.45
Date Sampled		12/07/2021	12/07/2021	12/07/2021	12/07/2021	12/07/2021
Type of sample		Soil	Soil	Soil	Soil	Soil
Date prepared	-	15/07/2021	15/07/2021	15/07/2021	15/07/2021	15/07/2021
Date analysed	-	16/07/2021	16/07/2021	16/07/2021	16/07/2021	16/07/2021
Moisture	%	13	27	12	24	16

Moisture						
Our Reference		274103-12	274103-15	274103-16	274103-18	274103-19
Your Reference	UNITS	CW3	CW5	CW5	CW7	CW7
Depth		0.5	2	5.5-5.45	0.5	1
Date Sampled		8/07/2021	7/07/2021	7/07/2021	6/07/2021	6/07/2021
Type of sample		Soil	Soil	Soil	Soil	Soil
Date prepared	-	15/07/2021	15/07/2021	15/07/2021	15/07/2021	15/07/2021
Date analysed	-	16/07/2021	16/07/2021	16/07/2021	16/07/2021	16/07/2021
Moisture	%	11	16	32	6.1	8.1

Moisture						
Our Reference		274103-20	274103-21	274103-22	274103-24	274103-25
Your Reference	UNITS	W1	W1	W3	W3	W5
Depth		8-8.45	10-10.43	10.75-11.2	14-14.45	8.8-9.23
Date Sampled		9/07/2021	9/07/2021	4/07/2021	4/07/2021	7/07/2021
Type of sample		Soil	Soil	Soil	Soil	Soil
Date prepared	-	15/07/2021	15/07/2021	15/07/2021	15/07/2021	15/07/2021
Date analysed	-	16/07/2021	16/07/2021	16/07/2021	16/07/2021	16/07/2021
Moisture	%	16	21	57	26	40

Moisture			
Our Reference		274103-27	274103-29
Your Reference	UNITS	W5	BD03/060721
Depth		11.5-11.95	-
Date Sampled		7/07/2021	6/07/2021
Type of sample		Soil	Soil
Date prepared	-	15/07/2021	15/07/2021
Date analysed	-	16/07/2021	16/07/2021
Moisture	%	15	7.1

Asbestos ID - soils						
Our Reference		274103-1	274103-3	274103-5	274103-6	274103-9
Your Reference	UNITS	CW1	CW1	BD07/120721	CW2	CW2
Depth		12-12.45	14.5-14.95	-	2.8-3.2	7-7.45
Date Sampled		12/07/2021	12/07/2021	12/07/2021	12/07/2021	12/07/2021
Type of sample		Soil	Soil	Soil	Soil	Soil
Date analysed	-	21/07/2021	21/07/2021	21/07/2021	21/07/2021	21/07/2021
Sample mass tested	g	Approx. 45g	Approx. 35g	Approx. 50g	Approx. 40g	Approx. 40g
Sample Description	-	Brown coarse-grained soil & rocks	Brown coarse-grained soil & rocks	Beige fine-grained soil & rocks	Brown coarse-grained soil & rocks	Brown coarse-grained soil & rocks
Asbestos ID in soil	-	No asbestos detected at reporting limit of 0.1g/kg Organic fibres detected	No asbestos detected at reporting limit of 0.1g/kg Organic fibres detected	No asbestos detected at reporting limit of 0.1g/kg Organic fibres detected	No asbestos detected at reporting limit of 0.1g/kg Organic fibres detected	No asbestos detected at reporting limit of 0.1g/kg Organic fibres detected
Trace Analysis	-	No asbestos detected	No asbestos detected	No asbestos detected	No asbestos detected	No asbestos detected

Asbestos ID - soils						
Our Reference		274103-12	274103-15	274103-16	274103-18	274103-19
Your Reference	UNITS	CW3	CW5	CW5	CW7	CW7
Depth		0.5	2	5.5-5.45	0.5	1
Date Sampled		8/07/2021	7/07/2021	7/07/2021	6/07/2021	6/07/2021
Type of sample		Soil	Soil	Soil	Soil	Soil
Date analysed	-	21/07/2021	21/07/2021	21/07/2021	21/07/2021	21/07/2021
Sample mass tested	g	Approx. 45g	Approx. 40g	Approx. 30g	Approx. 50g	Approx. 50g
Sample Description	-	Brown coarse-grained soil & rocks	Brown coarse-grained soil & rocks	Brown coarse-grained soil & rocks	Brown coarse-grained soil & rocks	Brown 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		274103-20	274103-21	274103-22	274103-24	274103-25
Your Reference	UNITS	W1	W1	W3	W3	W5
Depth		8-8.45	10-10.43	10.75-11.2	14-14.45	8.8-9.23
Date Sampled		9/07/2021	9/07/2021	4/07/2021	4/07/2021	7/07/2021
Type of sample		Soil	Soil	Soil	Soil	Soil
Date analysed	-	21/07/2021	21/07/2021	21/07/2021	21/07/2021	21/07/2021
Sample mass tested	g	Approx. 40g	Approx. 40g	Approx. 20g	Approx. 40g	Approx. 30g
Sample Description	-	Brown coarse-grained soil & rocks	Grey fine-grained soil & rocks	Brown coarse-grained soil & rocks	Brown coarse-grained soil & rocks	Brown fine-grained soil & rocks
Asbestos ID in soil	-	No asbestos detected at reporting limit of 0.1g/kg Organic fibres detected	No asbestos detected at reporting limit of 0.1g/kg Organic fibres detected	No asbestos detected at reporting limit of 0.1g/kg Organic fibres detected	No asbestos detected at reporting limit of 0.1g/kg Organic fibres detected	No asbestos detected at reporting limit of 0.1g/kg Organic fibres detected
Trace Analysis	-	No asbestos detected	No asbestos detected	No asbestos detected	No asbestos detected	No asbestos detected

Asbestos ID - soils			
Our Reference		274103-27	274103-29
Your Reference	UNITS	W5	BD03/060721
Depth		11.5-11.95	-
Date Sampled		7/07/2021	6/07/2021
Type of sample		Soil	Soil
Date analysed	-	21/07/2021	21/07/2021
Sample mass tested	g	Approx. 40g	Approx. 50g
Sample Description	-	Red coarse-grained soil & rocks	Brown coarse-grained soil & rocks
Asbestos ID in soil	-	No asbestos detected at reporting limit of 0.1g/kg Organic fibres detected	No asbestos detected at reporting limit of 0.1g/kg Organic fibres detected
Trace Analysis	-	No asbestos detected	No asbestos detected

Misc Inorg - Soil						
Our Reference		274103-1	274103-3	274103-6	274103-9	274103-12
Your Reference	UNITS	CW1	CW1	CW2	CW2	CW3
Depth		12-12.45	14.5-14.95	2.8-3.2	7-7.45	0.5
Date Sampled		12/07/2021	12/07/2021	12/07/2021	12/07/2021	8/07/2021
Type of sample		Soil	Soil	Soil	Soil	Soil
Date prepared	-	15/07/2021	15/07/2021	15/07/2021	15/07/2021	15/07/2021
Date analysed	-	19/07/2021	19/07/2021	19/07/2021	19/07/2021	19/07/2021
pH 1:5 soil:water	pH Units	3.5	6.5	10.4	9.0	9.7

Misc Inorg - Soil						
Our Reference		274103-15	274103-16	274103-18	274103-21	274103-24
Your Reference	UNITS	CW5	CW5	CW7	W1	W3
Depth		2	5.5-5.45	0.5	10-10.43	14-14.45
Date Sampled		7/07/2021	7/07/2021	6/07/2021	9/07/2021	4/07/2021
Type of sample		Soil	Soil	Soil	Soil	Soil
Date prepared	-	15/07/2021	15/07/2021	15/07/2021	15/07/2021	15/07/2021
Date analysed	-	19/07/2021	19/07/2021	19/07/2021	19/07/2021	19/07/2021
pH 1:5 soil:water	pH Units	9.2	8.6	9.4	9.4	5.3
Total Organic Carbon (Walkley Black)	mg/kg	[NA]	33,000	[NA]	[NA]	[NA]

Misc Inorg - Soil			
Our Reference		274103-25	274103-27
Your Reference	UNITS	W5	W5
Depth		8.8-9.23	11.5-11.95
Date Sampled		7/07/2021	7/07/2021
Type of sample		Soil	Soil
Date prepared	-	15/07/2021	15/07/2021
Date analysed	-	19/07/2021	19/07/2021
pH 1:5 soil:water	pH Units	8.4	8.8
Total Organic Carbon (Walkley Black)	mg/kg	61,000	[NA]

CEC		
Our Reference		274103-15
Your Reference	UNITS	CW5
Depth		2
Date Sampled		7/07/2021
Type of sample		Soil
Date prepared	-	19/07/2021
Date analysed	-	19/07/2021
Exchangeable Ca	meq/100g	23
Exchangeable K	meq/100g	0.6
Exchangeable Mg	meq/100g	3.8
Exchangeable Na	meq/100g	1.5
Cation Exchange Capacity	meq/100g	28

Method ID	Methodology Summary
ASB-001	Asbestos ID - Qualitative identification of asbestos in bulk samples using Polarised Light Microscopy and Dispersion Staining Techniques including Synthetic Mineral Fibre and Organic Fibre as per Australian Standard 4964-2004.
Inorg-001	pH - Measured using pH meter and electrode in accordance with APHA latest edition, 4500-H+. Please note that the results for water analyses are indicative only, as analysis outside of the APHA storage times.
Inorg-008	Moisture content determined by heating at 105+/-5 °C for a minimum of 12 hours.
Inorg-036	Total Organic Carbon or Matter - A titrimetric method that measures the oxidisable organic content of soils.
Metals-020	Determination of various metals by ICP-AES.
Metals-020	Determination of exchangeable cations and cation exchange capacity in soils using 1M Ammonium Chloride exchange and ICP-AES analytical finish.
Metals-021	Determination of Mercury by Cold Vapour AAS.
Org-020	Soil samples are extracted with Dichloromethane/Acetone and waters with Dichloromethane and analysed by GC-FID. F2 = (>C10-C16)-Naphthalene as per NEPM B1 Guideline on Investigation Levels for Soil and Groundwater (HSLs Tables 1A (3, 4)). Note Naphthalene is determined from the VOC analysis.
Org-020	Soil samples are extracted with Dichloromethane/Acetone and waters with Dichloromethane and analysed by GC-FID. F2 = (>C10-C16)-Naphthalene as per NEPM B1 Guideline on Investigation Levels for Soil and Groundwater (HSLs Tables 1A (3, 4)). Note Naphthalene is determined from the VOC analysis. Note, the Total +ve TRH PQL is reflective of the lowest individual PQL and is therefore "Total +ve TRH" is simply a sum of the positive individual TRH fractions (>C10-C40).
Org-021	Soil samples are extracted with dichloromethane/acetone and waters with dichloromethane and analysed by GC-ECD.
Org-021	Soil samples are extracted with dichloromethane/acetone and waters with dichloromethane and analysed by GC-ECD. Note, the Total +ve PCBs PQL is reflective of the lowest individual PQL and is therefore" Total +ve PCBs" is simply a sum of the positive individual PCBs.
Org-022	Determination of VOCs sampled onto coconut shell charcoal sorbent tubes, that can be desorbed using carbon disulphide, and analysed by GC-MS.
Org-022/025	Soil samples are extracted with Dichloromethane/Acetone and waters with Dichloromethane and analysed by GC-MS/GC-MSMS.
Org-022/025	Soil samples are extracted with dichloromethane/acetone and waters with dichloromethane and analysed by GC-MS/GC-MSMS. Note, the Total +ve reported DDD+DDE+DDT PQL is reflective of the lowest individual PQL and is therefore simply a sum of the positive individually report DDD+DDE+DDT.

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

QUALITY CONTROL: VOCs in soil						Duplicate			Spike Recovery %	
Test Description	Units	PQL	Method	Blank	#	Base	Dup.	RPD	LCS-6	[NT]
Date extracted	-			15/07/2021	16	15/07/2021	15/07/2021		15/07/2021	[NT]
Date analysed	-			15/07/2021	16	15/07/2021	15/07/2021		15/07/2021	[NT]
Dichlorodifluoromethane	mg/kg	1	Org-023	<1	16	<1	<1	0	[NT]	[NT]
Chloromethane	mg/kg	1	Org-023	<1	16	<1	<1	0	[NT]	[NT]
Vinyl Chloride	mg/kg	1	Org-023	<1	16	<1	<1	0	[NT]	[NT]
Bromomethane	mg/kg	1	Org-023	<1	16	<1	<1	0	[NT]	[NT]
Chloroethane	mg/kg	1	Org-023	<1	16	<1	<1	0	[NT]	[NT]
Trichlorofluoromethane	mg/kg	1	Org-023	<1	16	<1	<1	0	[NT]	[NT]
1,1-Dichloroethene	mg/kg	1	Org-023	<1	16	<1	<1	0	[NT]	[NT]
trans-1,2-dichloroethene	mg/kg	1	Org-023	<1	16	<1	<1	0	[NT]	[NT]
1,1-dichloroethane	mg/kg	1	Org-023	<1	16	<1	<1	0	105	[NT]
cis-1,2-dichloroethene	mg/kg	1	Org-023	<1	16	<1	<1	0	[NT]	[NT]
bromochloromethane	mg/kg	1	Org-023	<1	16	<1	<1	0	[NT]	[NT]
chloroform	mg/kg	1	Org-023	<1	16	<1	<1	0	128	[NT]
2,2-dichloropropane	mg/kg	1	Org-023	<1	16	<1	<1	0	[NT]	[NT]
1,2-dichloroethane	mg/kg	1	Org-023	<1	16	<1	<1	0	108	[NT]
1,1,1-trichloroethane	mg/kg	1	Org-023	<1	16	<1	<1	0	125	[NT]
1,1-dichloropropene	mg/kg	1	Org-023	<1	16	<1	<1	0	[NT]	[NT]
Cyclohexane	mg/kg	1	Org-023	<1	16	<1	<1	0	[NT]	[NT]
carbon tetrachloride	mg/kg	1	Org-023	<1	16	<1	<1	0	[NT]	[NT]
Benzene	mg/kg	0.2	Org-023	<0.2	16	<0.2	<0.2	0	[NT]	[NT]
dibromomethane	mg/kg	1	Org-023	<1	16	<1	<1	0	[NT]	[NT]
1,2-dichloropropane	mg/kg	1	Org-023	<1	16	<1	<1	0	[NT]	[NT]
trichloroethene	mg/kg	1	Org-023	<1	16	<1	<1	0	126	[NT]
bromodichloromethane	mg/kg	1	Org-023	<1	16	<1	<1	0	116	[NT]
trans-1,3-dichloropropene	mg/kg	1	Org-023	<1	16	<1	<1	0	[NT]	[NT]
cis-1,3-dichloropropene	mg/kg	1	Org-023	<1	16	<1	<1	0	[NT]	[NT]
1,1,2-trichloroethane	mg/kg	1	Org-023	<1	16	<1	<1	0	[NT]	[NT]
Toluene	mg/kg	0.5	Org-023	<0.5	16	<0.5	<0.5	0	[NT]	[NT]
1,3-dichloropropane	mg/kg	1	Org-023	<1	16	<1	<1	0	[NT]	[NT]
dibromochloromethane	mg/kg	1	Org-023	<1	16	<1	<1	0	111	[NT]
1,2-dibromoethane	mg/kg	1	Org-023	<1	16	<1	<1	0	[NT]	[NT]
tetrachloroethene	mg/kg	1	Org-023	<1	16	<1	<1	0	117	[NT]
1,1,1,2-tetrachloroethane	mg/kg	1	Org-023	<1	16	<1	<1	0	[NT]	[NT]
chlorobenzene	mg/kg	1	Org-023	<1	16	<1	<1	0	[NT]	[NT]
Ethylbenzene	mg/kg	1	Org-023	<1	16	<1	<1	0	[NT]	[NT]
bromoform	mg/kg	1	Org-023	<1	16	<1	<1	0	[NT]	[NT]
m+p-xylene	mg/kg	2	Org-023	<2	16	<2	<2	0	[NT]	[NT]
styrene	mg/kg	1	Org-023	<1	16	<1	<1	0	[NT]	[NT]
1,1,2,2-tetrachloroethane	mg/kg	1	Org-023	<1	16	<1	<1	0	[NT]	[NT]

QUALITY CONTROL: VOCs in soil						Duplicate			Spike Recovery %	
Test Description	Units	PQL	Method	Blank	#	Base	Dup.	RPD	LCS-6	[NT]
o-Xylene	mg/kg	1	Org-023	<1	16	<1	<1	0	[NT]	[NT]
1,2,3-trichloropropane	mg/kg	1	Org-023	<1	16	<1	<1	0	[NT]	[NT]
isopropylbenzene	mg/kg	1	Org-023	<1	16	<1	<1	0	[NT]	[NT]
bromobenzene	mg/kg	1	Org-023	<1	16	<1	<1	0	[NT]	[NT]
n-propyl benzene	mg/kg	1	Org-023	<1	16	<1	<1	0	[NT]	[NT]
2-chlorotoluene	mg/kg	1	Org-023	<1	16	<1	<1	0	[NT]	[NT]
4-chlorotoluene	mg/kg	1	Org-023	<1	16	<1	<1	0	[NT]	[NT]
1,3,5-trimethyl benzene	mg/kg	1	Org-023	<1	16	<1	<1	0	[NT]	[NT]
tert-butyl benzene	mg/kg	1	Org-023	<1	16	<1	<1	0	[NT]	[NT]
1,2,4-trimethyl benzene	mg/kg	1	Org-023	<1	16	<1	<1	0	[NT]	[NT]
1,3-dichlorobenzene	mg/kg	1	Org-023	<1	16	<1	<1	0	[NT]	[NT]
sec-butyl benzene	mg/kg	1	Org-023	<1	16	<1	<1	0	[NT]	[NT]
1,4-dichlorobenzene	mg/kg	1	Org-023	<1	16	<1	<1	0	[NT]	[NT]
4-isopropyl toluene	mg/kg	1	Org-023	<1	16	<1	<1	0	[NT]	[NT]
1,2-dichlorobenzene	mg/kg	1	Org-023	<1	16	<1	<1	0	[NT]	[NT]
n-butyl benzene	mg/kg	1	Org-023	<1	16	<1	<1	0	[NT]	[NT]
1,2-dibromo-3-chloropropane	mg/kg	1	Org-023	<1	16	<1	<1	0	[NT]	[NT]
1,2,4-trichlorobenzene	mg/kg	1	Org-023	<1	16	<1	<1	0	[NT]	[NT]
hexachlorobutadiene	mg/kg	1	Org-023	<1	16	<1	<1	0	[NT]	[NT]
1,2,3-trichlorobenzene	mg/kg	1	Org-023	<1	16	<1	<1	0	[NT]	[NT]
Surrogate Dibromofluorometha	%		Org-023	103	16	104	102	2	104	[NT]
Surrogate aaa-Trifluorotoluene	%		Org-023	115	16	106	106	0	125	[NT]
Surrogate Toluene-d_8	%		Org-023	101	16	100	100	0	105	[NT]
Surrogate 4-Bromofluorobenzene	%		Org-023	109	16	109	110	1	109	[NT]

QUALITY CONTROL: vTRH(C6-C10)/BTEXN in Soil						Duplicate			Spike Recovery %	
Test Description	Units	PQL	Method	Blank	#	Base	Dup.	RPD	LCS-6	274103-6
Date extracted	-			15/07/2021	1	15/07/2021	15/07/2021		15/07/2021	15/07/2021
Date analysed	-			15/07/2021	1	15/07/2021	15/07/2021		15/07/2021	15/07/2021
TRH C_6 - C_9	mg/kg	25	Org-023	<25	1	<25	<25	0	117	127
TRH C_6 - C_{10}	mg/kg	25	Org-023	<25	1	<25	<25	0	117	127
Benzene	mg/kg	0.2	Org-023	<0.2	1	<0.2	<0.2	0	122	133
Toluene	mg/kg	0.5	Org-023	<0.5	1	<0.5	<0.5	0	120	132
Ethylbenzene	mg/kg	1	Org-023	<1	1	<1	<1	0	115	125
m+p-xylene	mg/kg	2	Org-023	<2	1	<2	<2	0	113	123
o-Xylene	mg/kg	1	Org-023	<1	1	<1	<1	0	118	127
naphthalene	mg/kg	1	Org-023	<1	1	<1	<1	0	[NT]	[NT]
Surrogate aaa-Trifluorotoluene	%		Org-023	115	1	110	113	3	125	128

QUALITY CONTROL: svTRH (C10-C40) in Soil						Duplicate			Spike Recovery %	
Test Description	Units	PQL	Method	Blank	#	Base	Dup.	RPD	LCS-6	274103-6
Date extracted	-			15/07/2021	1	15/07/2021	15/07/2021		15/07/2021	15/07/2021
Date analysed	-			17/07/2021	1	17/07/2021	17/07/2021		17/07/2021	17/07/2021
TRH C_{10} - C_{14}	mg/kg	50	Org-020	<50	1	<50	<50	0	89	85
TRH C_{15} - C_{28}	mg/kg	100	Org-020	<100	1	<100	<100	0	97	98
TRH C_{29} - C_{36}	mg/kg	100	Org-020	<100	1	<100	<100	0	71	65
TRH >C_{10} -C_{16}	mg/kg	50	Org-020	<50	1	<50	<50	0	89	85
TRH >C_{16} -C_{34}	mg/kg	100	Org-020	<100	1	<100	<100	0	97	98
TRH >C_{34} -C_{40}	mg/kg	100	Org-020	<100	1	<100	<100	0	71	65
Surrogate o-Terphenyl	%		Org-020	81	1	84	82	2	91	70

QUALITY CONTROL: svTRH (C10-C40) in Soil						Duplicate			Spike Recovery %	
Test Description	Units	PQL	Method	Blank	#	Base	Dup.	RPD	[NT]	[NT]
Date extracted	-			[NT]	16	15/07/2021	15/07/2021		[NT]	[NT]
Date analysed	-			[NT]	16	17/07/2021	17/07/2021		[NT]	[NT]
TRH C_{10} - C_{14}	mg/kg	50	Org-020	[NT]	16	<50	<50	0	[NT]	[NT]
TRH C_{15} - C_{28}	mg/kg	100	Org-020	[NT]	16	<100	<100	0	[NT]	[NT]
TRH C_{29} - C_{36}	mg/kg	100	Org-020	[NT]	16	<100	<100	0	[NT]	[NT]
TRH >C_{10} -C_{16}	mg/kg	50	Org-020	[NT]	16	<50	<50	0	[NT]	[NT]
TRH >C_{16} -C_{34}	mg/kg	100	Org-020	[NT]	16	<100	<100	0	[NT]	[NT]
TRH >C_{34} -C_{40}	mg/kg	100	Org-020	[NT]	16	<100	<100	0	[NT]	[NT]
Surrogate o-Terphenyl	%		Org-020	[NT]	16	82	73	12	[NT]	[NT]

QUALITY CONTROL: PAHs in Soil						Duplicate			Spike Recovery %	
Test Description	Units	PQL	Method	Blank	#	Base	Dup.	RPD	LCS-6	274103-6
Date extracted	-			15/07/2021	1	15/07/2021	15/07/2021		15/07/2021	15/07/2021
Date analysed	-			19/07/2021	1	19/07/2021	19/07/2021		19/07/2021	19/07/2021
Naphthalene	mg/kg	0.1	Org-022/025	<0.1	1	<0.1	<0.1	0	108	116
Acenaphthylene	mg/kg	0.1	Org-022/025	<0.1	1	<0.1	<0.1	0	[NT]	[NT]
Acenaphthene	mg/kg	0.1	Org-022/025	<0.1	1	<0.1	<0.1	0	91	86
Fluorene	mg/kg	0.1	Org-022/025	<0.1	1	<0.1	<0.1	0	104	95
Phenanthrene	mg/kg	0.1	Org-022/025	<0.1	1	<0.1	<0.1	0	121	109
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	102	95
Pyrene	mg/kg	0.1	Org-022/025	<0.1	1	<0.1	<0.1	0	102	95
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	76	69
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	102	88
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	118	1	116	117	1	113	104

QUALITY CONTROL: PAHs in Soil						Duplicate			Spike Recovery %	
Test Description	Units	PQL	Method	Blank	#	Base	Dup.	RPD	[NT]	[NT]
Date extracted	-			[NT]	16	15/07/2021	15/07/2021		[NT]	[NT]
Date analysed	-			[NT]	16	19/07/2021	19/07/2021		[NT]	[NT]
Naphthalene	mg/kg	0.1	Org-022/025	[NT]	16	<0.1	<0.1	0	[NT]	[NT]
Acenaphthylene	mg/kg	0.1	Org-022/025	[NT]	16	<0.1	<0.1	0	[NT]	[NT]
Acenaphthene	mg/kg	0.1	Org-022/025	[NT]	16	<0.1	<0.1	0	[NT]	[NT]
Fluorene	mg/kg	0.1	Org-022/025	[NT]	16	<0.1	<0.1	0	[NT]	[NT]
Phenanthrene	mg/kg	0.1	Org-022/025	[NT]	16	<0.1	<0.1	0	[NT]	[NT]
Anthracene	mg/kg	0.1	Org-022/025	[NT]	16	<0.1	<0.1	0	[NT]	[NT]
Fluoranthene	mg/kg	0.1	Org-022/025	[NT]	16	<0.1	<0.1	0	[NT]	[NT]
Pyrene	mg/kg	0.1	Org-022/025	[NT]	16	<0.1	<0.1	0	[NT]	[NT]
Benzo(a)anthracene	mg/kg	0.1	Org-022/025	[NT]	16	<0.1	<0.1	0	[NT]	[NT]
Chrysene	mg/kg	0.1	Org-022/025	[NT]	16	<0.1	<0.1	0	[NT]	[NT]
Benzo(b,j+k)fluoranthene	mg/kg	0.2	Org-022/025	[NT]	16	<0.2	<0.2	0	[NT]	[NT]
Benzo(a)pyrene	mg/kg	0.05	Org-022/025	[NT]	16	<0.05	<0.05	0	[NT]	[NT]
Indeno(1,2,3-c,d)pyrene	mg/kg	0.1	Org-022/025	[NT]	16	<0.1	<0.1	0	[NT]	[NT]
Dibenzo(a,h)anthracene	mg/kg	0.1	Org-022/025	[NT]	16	<0.1	<0.1	0	[NT]	[NT]
Benzo(g,h,i)perylene	mg/kg	0.1	Org-022/025	[NT]	16	<0.1	<0.1	0	[NT]	[NT]
Surrogate p-Terphenyl-d14	%		Org-022/025	[NT]	16	130	127	2	[NT]	[NT]

QUALITY CONTROL: Organochlorine Pesticides in soil						Duplicate			Spike Recovery %	
Test Description	Units	PQL	Method	Blank	#	Base	Dup.	RPD	LCS-6	274103-6
Date extracted	-			15/07/2021	1	15/07/2021	15/07/2021		15/07/2021	15/07/2021
Date analysed	-			19/07/2021	1	19/07/2021	19/07/2021		19/07/2021	19/07/2021
alpha-BHC	mg/kg	0.1	Org-022/025	<0.1	1	<0.1	<0.1	0	104	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	96	89
gamma-BHC	mg/kg	0.1	Org-022/025	<0.1	1	<0.1	<0.1	0	[NT]	[NT]
Heptachlor	mg/kg	0.1	Org-022/025	<0.1	1	<0.1	<0.1	0	91	89
delta-BHC	mg/kg	0.1	Org-022/025	<0.1	1	<0.1	<0.1	0	[NT]	[NT]
Aldrin	mg/kg	0.1	Org-022/025	<0.1	1	<0.1	<0.1	0	110	106
Heptachlor Epoxide	mg/kg	0.1	Org-022/025	<0.1	1	<0.1	<0.1	0	109	97
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	111	99
Dieldrin	mg/kg	0.1	Org-022/025	<0.1	1	<0.1	<0.1	0	109	116
Endrin	mg/kg	0.1	Org-022/025	<0.1	1	<0.1	<0.1	0	100	93
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	92	83
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	99	78
Methoxychlor	mg/kg	0.1	Org-022/025	<0.1	1	<0.1	<0.1	0	[NT]	[NT]
Surrogate TCMX	%		Org-022/025	106	1	127	135	6	111	101

QUALITY CONTROL: Organochlorine Pesticides in soil					Duplicate				Spike Recovery %	
Test Description	Units	PQL	Method	Blank	#	Base	Dup.	RPD	[NT]	[NT]
Date extracted	-			[NT]	16	15/07/2021	15/07/2021		[NT]	[NT]
Date analysed	-			[NT]	16	19/07/2021	19/07/2021		[NT]	[NT]
alpha-BHC	mg/kg	0.1	Org-022/025	[NT]	16	<0.1	<0.1	0	[NT]	[NT]
HCB	mg/kg	0.1	Org-022/025	[NT]	16	<0.1	<0.1	0	[NT]	[NT]
beta-BHC	mg/kg	0.1	Org-022/025	[NT]	16	<0.1	<0.1	0	[NT]	[NT]
gamma-BHC	mg/kg	0.1	Org-022/025	[NT]	16	<0.1	<0.1	0	[NT]	[NT]
Heptachlor	mg/kg	0.1	Org-022/025	[NT]	16	<0.1	<0.1	0	[NT]	[NT]
delta-BHC	mg/kg	0.1	Org-022/025	[NT]	16	<0.1	<0.1	0	[NT]	[NT]
Aldrin	mg/kg	0.1	Org-022/025	[NT]	16	<0.1	<0.1	0	[NT]	[NT]
Heptachlor Epoxide	mg/kg	0.1	Org-022/025	[NT]	16	<0.1	<0.1	0	[NT]	[NT]
gamma-Chlordane	mg/kg	0.1	Org-022/025	[NT]	16	<0.1	<0.1	0	[NT]	[NT]
alpha-chlordane	mg/kg	0.1	Org-022/025	[NT]	16	<0.1	<0.1	0	[NT]	[NT]
Endosulfan I	mg/kg	0.1	Org-022/025	[NT]	16	<0.1	<0.1	0	[NT]	[NT]
pp-DDE	mg/kg	0.1	Org-022/025	[NT]	16	<0.1	<0.1	0	[NT]	[NT]
Dieldrin	mg/kg	0.1	Org-022/025	[NT]	16	<0.1	<0.1	0	[NT]	[NT]
Endrin	mg/kg	0.1	Org-022/025	[NT]	16	<0.1	<0.1	0	[NT]	[NT]
Endosulfan II	mg/kg	0.1	Org-022/025	[NT]	16	<0.1	<0.1	0	[NT]	[NT]
pp-DDD	mg/kg	0.1	Org-022/025	[NT]	16	<0.1	<0.1	0	[NT]	[NT]
Endrin Aldehyde	mg/kg	0.1	Org-022/025	[NT]	16	<0.1	<0.1	0	[NT]	[NT]
pp-DDT	mg/kg	0.1	Org-022/025	[NT]	16	<0.1	<0.1	0	[NT]	[NT]
Endosulfan Sulphate	mg/kg	0.1	Org-022/025	[NT]	16	<0.1	<0.1	0	[NT]	[NT]
Methoxychlor	mg/kg	0.1	Org-022/025	[NT]	16	<0.1	<0.1	0	[NT]	[NT]
Surrogate TCMX	%		Org-022/025	[NT]	16	137	126	8	[NT]	[NT]

QUALITY CONTROL: Organophosphorus Pesticides in Soil						Duplicate			Spike Recovery %	
Test Description	Units	PQL	Method	Blank	#	Base	Dup.	RPD	LCS-6	274103-6
Date extracted	-			15/07/2021	1	15/07/2021	15/07/2021		15/07/2021	15/07/2021
Date analysed	-			19/07/2021	1	19/07/2021	19/07/2021		19/07/2021	19/07/2021
Dichlorvos	mg/kg	0.1	Org-022/025	<0.1	1	<0.1	<0.1	0	80	67
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	102	89
Fenitrothion	mg/kg	0.1	Org-022/025	<0.1	1	<0.1	<0.1	0	77	81
Malathion	mg/kg	0.1	Org-022/025	<0.1	1	<0.1	<0.1	0	108	69
Chlorpyriphos	mg/kg	0.1	Org-022/025	<0.1	1	<0.1	<0.1	0	115	109
Parathion	mg/kg	0.1	Org-022/025	<0.1	1	<0.1	<0.1	0	80	65
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	93	80
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	111	1	127	135	6	111	101

QUALITY CONTROL: Organophosphorus Pesticides in Soil						Duplicate			Spike Recovery %	
Test Description	Units	PQL	Method	Blank	#	Base	Dup.	RPD	[NT]	[NT]
Date extracted	-			[NT]	16	15/07/2021	15/07/2021		[NT]	[NT]
Date analysed	-			[NT]	16	19/07/2021	19/07/2021		[NT]	[NT]
Dichlorvos	mg/kg	0.1	Org-022/025	[NT]	16	<0.1	<0.1	0	[NT]	[NT]
Dimethoate	mg/kg	0.1	Org-022/025	[NT]	16	<0.1	<0.1	0	[NT]	[NT]
Diazinon	mg/kg	0.1	Org-022/025	[NT]	16	<0.1	<0.1	0	[NT]	[NT]
Chlorpyriphos-methyl	mg/kg	0.1	Org-022/025	[NT]	16	<0.1	<0.1	0	[NT]	[NT]
Ronnel	mg/kg	0.1	Org-022/025	[NT]	16	<0.1	<0.1	0	[NT]	[NT]
Fenitrothion	mg/kg	0.1	Org-022/025	[NT]	16	<0.1	<0.1	0	[NT]	[NT]
Malathion	mg/kg	0.1	Org-022/025	[NT]	16	<0.1	<0.1	0	[NT]	[NT]
Chlorpyriphos	mg/kg	0.1	Org-022/025	[NT]	16	<0.1	<0.1	0	[NT]	[NT]
Parathion	mg/kg	0.1	Org-022/025	[NT]	16	<0.1	<0.1	0	[NT]	[NT]
Bromophos-ethyl	mg/kg	0.1	Org-022	[NT]	16	<0.1	<0.1	0	[NT]	[NT]
Ethion	mg/kg	0.1	Org-022/025	[NT]	16	<0.1	<0.1	0	[NT]	[NT]
Azinphos-methyl (Guthion)	mg/kg	0.1	Org-022/025	[NT]	16	<0.1	<0.1	0	[NT]	[NT]
Surrogate TCMX	%		Org-022/025	[NT]	16	137	126	8	[NT]	[NT]

QUALITY CONTROL: PCBs in Soil						Duplicate			Spike Recovery %	
Test Description	Units	PQL	Method	Blank	#	Base	Dup.	RPD	LCS-6	274103-6
Date extracted	-			15/07/2021	1	15/07/2021	15/07/2021		15/07/2021	15/07/2021
Date analysed	-			19/07/2021	1	19/07/2021	19/07/2021		19/07/2021	19/07/2021
Aroclor 1016	mg/kg	0.1	Org-021	<0.1	1	<0.1	<0.1	0	[NT]	[NT]
Aroclor 1221	mg/kg	0.1	Org-021	<0.1	1	<0.1	<0.1	0	[NT]	[NT]
Aroclor 1232	mg/kg	0.1	Org-021	<0.1	1	<0.1	<0.1	0	[NT]	[NT]
Aroclor 1242	mg/kg	0.1	Org-021	<0.1	1	<0.1	<0.1	0	[NT]	[NT]
Aroclor 1248	mg/kg	0.1	Org-021	<0.1	1	<0.1	<0.1	0	[NT]	[NT]
Aroclor 1254	mg/kg	0.1	Org-021	<0.1	1	<0.1	<0.1	0	114	102
Aroclor 1260	mg/kg	0.1	Org-021	<0.1	1	<0.1	<0.1	0	[NT]	[NT]
Surrogate TCMX	%		Org-021	111	1	127	135	6	111	101

QUALITY CONTROL: PCBs in Soil						Duplicate			Spike Recovery %	
Test Description	Units	PQL	Method	Blank	#	Base	Dup.	RPD	[NT]	[NT]
Date extracted	-			[NT]	16	15/07/2021	15/07/2021		[NT]	[NT]
Date analysed	-			[NT]	16	19/07/2021	19/07/2021		[NT]	[NT]
Aroclor 1016	mg/kg	0.1	Org-021	[NT]	16	<0.1	<0.1	0	[NT]	[NT]
Aroclor 1221	mg/kg	0.1	Org-021	[NT]	16	<0.1	<0.1	0	[NT]	[NT]
Aroclor 1232	mg/kg	0.1	Org-021	[NT]	16	<0.1	<0.1	0	[NT]	[NT]
Aroclor 1242	mg/kg	0.1	Org-021	[NT]	16	<0.1	<0.1	0	[NT]	[NT]
Aroclor 1248	mg/kg	0.1	Org-021	[NT]	16	<0.1	<0.1	0	[NT]	[NT]
Aroclor 1254	mg/kg	0.1	Org-021	[NT]	16	<0.1	<0.1	0	[NT]	[NT]
Aroclor 1260	mg/kg	0.1	Org-021	[NT]	16	<0.1	<0.1	0	[NT]	[NT]
Surrogate TCMX	%		Org-021	[NT]	16	137	126	8	[NT]	[NT]

QUALITY CONTROL: Acid Extractable metals in soil						Duplicate			Spike Recovery %	
Test Description	Units	PQL	Method	Blank	#	Base	Dup.	RPD	LCS-5	274103-6
Date prepared	-			19/07/2021	1	19/07/2021	19/07/2021		19/07/2021	19/07/2021
Date analysed	-			19/07/2021	1	19/07/2021	19/07/2021		19/07/2021	19/07/2021
Arsenic	mg/kg	4	Metals-020	<4	1	<4	<4	0	92	94
Cadmium	mg/kg	0.4	Metals-020	<0.4	1	<0.4	<0.4	0	97	102
Chromium	mg/kg	1	Metals-020	<1	1	3	3	0	100	112
Copper	mg/kg	1	Metals-020	<1	1	<1	<1	0	104	97
Lead	mg/kg	1	Metals-020	<1	1	3	3	0	99	95
Mercury	mg/kg	0.1	Metals-021	<0.1	1	<0.1	<0.1	0	89	108
Nickel	mg/kg	1	Metals-020	<1	1	<1	<1	0	99	102
Zinc	mg/kg	1	Metals-020	<1	1	2	2	0	97	95

QUALITY CONTROL: Acid Extractable metals in soil						Duplicate			Spike Recovery %	
Test Description	Units	PQL	Method	Blank	#	Base	Dup.	RPD	[NT]	[NT]
Date prepared	-			[NT]	16	19/07/2021	19/07/2021		[NT]	[NT]
Date analysed	-			[NT]	16	19/07/2021	19/07/2021		[NT]	[NT]
Arsenic	mg/kg	4	Metals-020	[NT]	16	17	18	6	[NT]	[NT]
Cadmium	mg/kg	0.4	Metals-020	[NT]	16	<0.4	<0.4	0	[NT]	[NT]
Chromium	mg/kg	1	Metals-020	[NT]	16	20	23	14	[NT]	[NT]
Copper	mg/kg	1	Metals-020	[NT]	16	6	9	40	[NT]	[NT]
Lead	mg/kg	1	Metals-020	[NT]	16	15	21	33	[NT]	[NT]
Mercury	mg/kg	0.1	Metals-021	[NT]	16	<0.1	0.2	67	[NT]	[NT]
Nickel	mg/kg	1	Metals-020	[NT]	16	6	7	15	[NT]	[NT]
Zinc	mg/kg	1	Metals-020	[NT]	16	35	31	12	[NT]	[NT]

QUALITY CONTROL: Misc Inorg - Soil						Duplicate			Spike Recovery %	
Test Description	Units	PQL	Method	Blank	#	Base	Dup.	RPD	LCS-6	[NT]
Date prepared	-			19/07/2021	1	15/07/2021	15/07/2021		19/07/2021	[NT]
Date analysed	-			19/07/2021	1	19/07/2021	19/07/2021		19/07/2021	[NT]
pH 1:5 soil:water	pH Units		Inorg-001	[NT]	1	3.5	3.6	3	99	[NT]
Total Organic Carbon (Walkley Black)	mg/kg	1000	Inorg-036	<1000	25	61000	55000	10	97	[NT]

QUALITY CONTROL: Misc Inorg - Soil						Duplicate			Spike Recovery %	
Test Description	Units	PQL	Method	Blank	#	Base	Dup.	RPD	[NT]	[NT]
Date prepared	-			[NT]	25	15/07/2021	15/07/2021		[NT]	[NT]
Date analysed	-			[NT]	25	19/07/2021	19/07/2021		[NT]	[NT]
pH 1:5 soil:water	pH Units		Inorg-001	[NT]	25	8.4	[NT]		[NT]	[NT]

QUALITY CONTROL: Misc Inorg - Soil						Duplicate			Spike Recovery %	
Test Description	Units	PQL	Method	Blank	#	Base	Dup.	RPD	[NT]	[NT]
Date prepared	-			[NT]	27	15/07/2021	15/07/2021		[NT]	[NT]
Date analysed	-			[NT]	27	19/07/2021	19/07/2021		[NT]	[NT]
pH 1:5 soil:water	pH Units		Inorg-001	[NT]	27	8.8	8.9	1	[NT]	[NT]

QUALITY CONTROL: CEC						Duplicate			Spike Recovery %	
Test Description	Units	PQL	Method	Blank	#	Base	Dup.	RPD	LCS-W1	274103-15
Date prepared	-			19/07/2021	[NT]	[NT]	[NT]	[NT]	19/07/2021	19/07/2021
Date analysed	-			19/07/2021	[NT]	[NT]	[NT]	[NT]	19/07/2021	19/07/2021
Exchangeable Ca	meq/100g	0.1	Metals-020	<0.1	[NT]	[NT]	[NT]	[NT]	111	#
Exchangeable K	meq/100g	0.1	Metals-020	<0.1	[NT]	[NT]	[NT]	[NT]	118	107
Exchangeable Mg	meq/100g	0.1	Metals-020	<0.1	[NT]	[NT]	[NT]	[NT]	103	109
Exchangeable Na	meq/100g	0.1	Metals-020	<0.1	[NT]	[NT]	[NT]	[NT]	110	92

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

CEC - # Percent recovery is not applicable due to the high concentration of the element/s in the sample/s. However an acceptable recovery was obtained for the LCS.

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

Tests/Analytes PH have exceeded the recommended technical holding times for samples #15,16,18,24,25 and 27, Envirolab Group form 347 "Recommended Preservation and Holding Times" can be provided on request (available on the Envirolab website)

COC received: 1700

Douglas Partners
Geotechnics / Environment / Groundwater

CHAIN OF CUSTODY DESPATCH SHEET

Project No:	202546.00	**Suburb:**	Cockle Bay	**To:**	*Envirolab Services*
Project Manager:	Rhys McMillan	**Order Number:**		**Sampler:**	*12 Ashley St, Chatswood NSW 2067*
Email:	Rhys.McMillan@douglaspartners.com.au / 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, 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: Metals, TRH, BTEX, PAH, OCP, OPP, PCB, Asbestos	Metals, TRH, BTEX, PAH, Asbestos	Metals, PAH, Asbestos	VOC	pH	TOC	CEC	BTEX	Phenols	Cresole / coal tar cresotes	TBT, Tin	Notes/ Preservation/ Additional Requirements
1	CW1	12	12.45	12/07/21			X				X							Please contact DP before discarding any samples
2	CW1	13	13.45	12/07/21														
3	CW1	14.5	14.95	12/07/21					X		X							
4	CW1	16	16.45	12/07/21														
5	BD07/120721			12/07/21					X									
6	CW2	2.8	3.2	12/07/21			X				X							
7	CW2	4	4.45	12/07/21														
8	CW2	5.5	5.95	12/07/21														
9	CW2	7	7.45	12/07/21				X			X							
10	CW2	9.9	10.35	12/07/21														
11	CW3	0.1		8/07/21														
12	CW3	0.5		8/07/21				X			X							
13	CW3	1		8/07/21														
14	BD06/080721			8/07/21														

ENVIROLAB

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

Job No: 274103
Date Received: 14/7/2021
Time Received: 17:00
Received By: [signature]
Temp: Cool/Ambient
Cooling: Ice/Icepack
Security: Intact/Broken/None

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	**Date:** 14/07/2021	**Signed:** [signature]

LAB RECEIPT

Lab Ref. No:	274103
Received by:	Nancy Zhang
Date & Time:	14/7/21 17:00 COC received
Signed:	[signature]

Douglas Partners
Geotechnics / Environment / Groundwater

CHAIN OF CUSTODY DESPATCH SHEET

Project No:	202546.00	**Suburb:**	Cockle Bay	**To:**	*Envirolab Services*
Project Manager:	Rhys McMillan	**Order Number:**		**Dispatch date:**	**14/07/2021**
					12 Ashley St, Chatswood NSW 2067

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: Metals, TRH, BTEX, PAH, OCP, OPP, PCB	Analytes: Metals, TRH, BTEX, PAH, Asbestos	Analytes: Metals, PAH, Asbestos	Analytes: VOC	Analytes: pH	Analytes: TOC	Analytes: CEC	Analytes: BTEX	Analytes: Phenols	Analytes: Cresole / coal tar cresotes	Analytes: TBT, Tin	Notes/ Preservation/ Additional Requirements
15	CW5	2		7/07/21				X			X		X					
16	CW5	5.5	5.45	7/07/21			X			X	X	X						
17	CW5	7	7.45	7/07/21														
18	CW7	0.5		6/07/21					X	X	X							
19	CW7	1		6/07/21				X										
20	W1	8	8.45	9/07/21				X										
21	W1	10	10.43	9/07/21					X		X							
22	W3	10.75	11.2	4/07/21			X											
23	W3	13	13.45	4/07/21														
24	W3	14	14.45	4/07/21					X		X							
25	W5	8.8	9.23	7/07/21				X		X	X	X						
26	W5	10	10.45	7/07/21														
27	W5	11.5	11.95	7/07/21					X		X							
28	BD05/060721																	
29	BD03/060721								X									
30	BD001/04/0721																	
31	BD//090721																	
32	Spike 2 / Blank 2													X				

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

Job No: 274103
Date Received: 14/7/2021
Time Received: 17:00
Received By:
Temp: Cool/Ambient
Cooling: Ice/Icepack
Security: Intact/Broken/None

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 274103-A

Client Details

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

Sample Details

Your Reference	**202546.00, Cockle Bay**
Number of Samples	additional analysis
Date samples received	14/07/2021
Date completed instructions received	27/07/2021

Analysis Details

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

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

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

Report Details

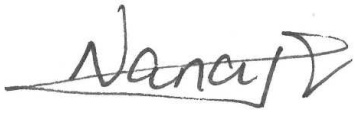
Date results requested by	03/08/2021
Date of Issue	30/07/2021

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Results Approved By
Giovanni Agosti, Group Technical Manager
Steven Luong, Organics Supervisor

Authorised By



Nancy Zhang, Laboratory Manager

TCLP Preparation - Acid						
Our Reference		274103-A-15	274103-A-18	274103-A-20	274103-A-21	274103-A-22
Your Reference	UNITS	CW5	CW7	W1	W1	W3
Depth		2	0.5	8-8.45	10-10.43	10.75-11.2
Date Sampled		7/07/2021	6/07/2021	9/07/2021	9/07/2021	4/07/2021
Type of sample		Soil	Soil	Soil	Soil	Soil
pH of soil for fluid# determ.	pH units	9.2	9.5	9.4	9.6	9.3
pH of soil TCLP (after HCl)	pH units	1.8	1.8	2.0	1.9	1.9
Extraction fluid used	-	1	1	1	1	1
pH of final Leachate	pH units	5.2	5.0	5.7	5.2	6.0

TCLP Preparation - Acid			
Our Reference		274103-A-25	274103-A-29
Your Reference	UNITS	W5	BD03/060721
Depth		8.8-9.23	-
Date Sampled		7/07/2021	6/07/2021
Type of sample		Soil	Soil
pH of soil for fluid# determ.	pH units	9.4	9.6
pH of soil TCLP (after HCl)	pH units	1.8	1.8
Extraction fluid used	-	1	1
pH of final Leachate	pH units	5.5	5.1

Metals from Leaching Fluid pH 2.9 or 5						
Our Reference		274103-A-15	274103-A-18	274103-A-20	274103-A-22	274103-A-25
Your Reference	UNITS	CW5	CW7	W1	W3	W5
Depth		2	0.5	8-8.45	10.75-11.2	8.8-9.23
Date Sampled		7/07/2021	6/07/2021	9/07/2021	4/07/2021	7/07/2021
Type of sample		Soil	Soil	Soil	Soil	Soil
Date extracted	-	29/07/2021	29/07/2021	29/07/2021	29/07/2021	29/07/2021
Date analysed	-	29/07/2021	29/07/2021	29/07/2021	29/07/2021	29/07/2021
Lead	mg/L	<0.03	[NA]	1.1	0.06	0.79
Nickel	mg/L	[NA]	0.06	[NA]	[NA]	[NA]

Metals from Leaching Fluid pH 2.9 or 5		
Our Reference		274103-A-29
Your Reference	UNITS	BD03/060721
Depth		-
Date Sampled		6/07/2021
Type of sample		Soil
Date extracted	-	29/07/2021
Date analysed	-	29/07/2021
Nickel	mg/L	0.06

PAHs in TCLP (USEPA 1311)					
Our Reference		274103-A-15	274103-A-21	274103-A-22	274103-A-25
Your Reference	UNITS	CW5	W1	W3	W5
Depth		2	10-10.43	10.75-11.2	8.8-9.23
Date Sampled		7/07/2021	9/07/2021	4/07/2021	7/07/2021
Type of sample		Soil	Soil	Soil	Soil
Date extracted	-	29/07/2021	29/07/2021	29/07/2021	29/07/2021
Date analysed	-	29/07/2021	29/07/2021	29/07/2021	29/07/2021
Naphthalene in TCLP	mg/L	<0.001	<0.001	<0.001	<0.001
Acenaphthylene in TCLP	mg/L	<0.001	<0.001	<0.001	<0.001
Acenaphthene in TCLP	mg/L	<0.001	<0.001	<0.001	<0.001
Fluorene in TCLP	mg/L	<0.001	<0.001	<0.001	<0.001
Phenanthrene in TCLP	mg/L	<0.001	0.001	<0.001	<0.001
Anthracene in TCLP	mg/L	<0.001	<0.001	<0.001	<0.001
Fluoranthene in TCLP	mg/L	<0.001	<0.001	<0.001	<0.001
Pyrene in TCLP	mg/L	<0.001	<0.001	<0.001	0.002
Benzo(a)anthracene in TCLP	mg/L	<0.001	<0.001	<0.001	<0.001
Chrysene in TCLP	mg/L	<0.001	<0.001	<0.001	<0.001
Benzo(bjk)fluoranthene in TCLP	mg/L	<0.002	<0.002	<0.002	<0.002
Benzo(a)pyrene in TCLP	mg/L	<0.001	<0.001	<0.001	<0.001
Indeno(1,2,3-c,d)pyrene - TCLP	mg/L	<0.001	<0.001	<0.001	<0.001
Dibenzo(a,h)anthracene in TCLP	mg/L	<0.001	<0.001	<0.001	<0.001
Benzo(g,h,i)perylene in TCLP	mg/L	<0.001	<0.001	<0.001	<0.001
Total +ve PAH's	mg/L	NIL (+)VE	0.0014	NIL (+)VE	0.0018
Surrogate p-Terphenyl-d14	%	94	74	97	97

Method ID	Methodology Summary
INORG-004	Toxicity Characteristic Leaching Procedure (TCLP) using Zero Headspace Extraction (zHE) using AS4439 and USEPA 1311.
Inorg-004	Toxicity Characteristic Leaching Procedure (TCLP) using AS 4439 and USEPA 1311. Please note that the mass used may be scaled down from default based on sample mass available. Samples are stored at 2-6oC before and after leachate preparation.
Metals-020	Determination of various metals by ICP-AES following buffer determination as per USEPA 1311 and hence AS 4439.3 2019. Extraction Fluid 1 refers to pH 5.0 buffer and Extraction Fluid 2 is the pH 2.9 buffer.
Org-022/025	Leachates are extracted with Dichloromethane and analysed by GC-MS/GC-MSMS.

QUALITY CONTROL: 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	-			29/07/2021	18	29/07/2021	29/07/2021		29/07/2021	[NT]
Date analysed	-			29/07/2021	18	29/07/2021	29/07/2021		29/07/2021	[NT]
Lead	mg/L	0.03	Metals-020	<0.03	[NT]	[NT]	[NT]	[NT]	93	[NT]
Nickel	mg/L	0.02	Metals-020	<0.02	18	0.06	0.07	15	92	[NT]

QUALITY CONTROL: PAHs in TCLP (USEPA 1311)						Duplicate			Spike Recovery %	
Test Description	Units	PQL	Method	Blank	#	Base	Dup.	RPD	LCS-W2	274103-A-21
Date extracted	-			29/07/2021	15	29/07/2021	29/07/2021		29/07/2021	29/07/2021
Date analysed	-			29/07/2021	15	29/07/2021	29/07/2021		29/07/2021	29/07/2021
Naphthalene in TCLP	mg/L	0.001	Org-022/025	<0.001	15	<0.001	<0.001	0	83	103
Acenaphthylene in TCLP	mg/L	0.001	Org-022/025	<0.001	15	<0.001	<0.001	0	[NT]	[NT]
Acenaphthene in TCLP	mg/L	0.001	Org-022/025	<0.001	15	<0.001	<0.001	0	72	84
Fluorene in TCLP	mg/L	0.001	Org-022/025	<0.001	15	<0.001	<0.001	0	91	108
Phenanthrene in TCLP	mg/L	0.001	Org-022/025	<0.001	15	<0.001	<0.001	0	92	85
Anthracene in TCLP	mg/L	0.001	Org-022/025	<0.001	15	<0.001	<0.001	0	[NT]	[NT]
Fluoranthene in TCLP	mg/L	0.001	Org-022/025	<0.001	15	<0.001	<0.001	0	74	92
Pyrene in TCLP	mg/L	0.001	Org-022/025	<0.001	15	<0.001	<0.001	0	79	99
Benzo(a)anthracene in TCLP	mg/L	0.001	Org-022/025	<0.001	15	<0.001	<0.001	0	[NT]	[NT]
Chrysene in TCLP	mg/L	0.001	Org-022/025	<0.001	15	<0.001	<0.001	0	92	75
Benzo(bjk)fluoranthene in TCLP	mg/L	0.002	Org-022/025	<0.002	15	<0.002	<0.002	0	[NT]	[NT]
Benzo(a)pyrene in TCLP	mg/L	0.001	Org-022/025	<0.001	15	<0.001	<0.001	0	90	90
Indeno(1,2,3-c,d)pyrene - TCLP	mg/L	0.001	Org-022/025	<0.001	15	<0.001	<0.001	0	[NT]	[NT]
Dibenzo(a,h)anthracene in TCLP	mg/L	0.001	Org-022/025	<0.001	15	<0.001	<0.001	0	[NT]	[NT]
Benzo(g,h,i)perylene in TCLP	mg/L	0.001	Org-022/025	<0.001	15	<0.001	<0.001	0	[NT]	[NT]
Surrogate p-Terphenyl-d14	%		Org-022/025	82	15	94	90	4	93	96

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 274103 202546.00, Cockle Bay



Ref: 274103-A.
TAT: Standard.
Due: 03/08/2021
MT.

发件人: Kurt Plambeck <kurt.plambeck@douglaspartners.com.au>
发送时间: Tuesday, July 27, 2021 5:04:30 PM
收件人: Nancy Zhang <NZhang@envirolab.com.au>
主题: RE: Results for Registration 274103 202546.00, Cockle Bay

CAUTION: This email originated from outside of the organisation. Do not act on instructions, click links or open attachments unless you recognise the sender and know the content is authentic and safe.

Hi Nancy

Can you please run the following TCLP

15 CW5/2.0 – PAH and lead
18 CW7/0.5 0- nickel
29 BD03 - nickel
20 W1/8-8.45 – lead
21 W1/10-10.45 – PAH
22 W3/10.75-11.2 – PAH and lead
25 W5/8.8-9.23 – PAH and lead

Can you also please report tin if you have the results already for this report, 274471 and 273301 for every sample metals was tested for.

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

If you are not the intended recipient of this email, please notify us immediately and be aware that any disclosure, copying, distribution or use of the contents of this information is prohibited.

From: Nancy Zhang <NZhang@envirolab.com.au>
Sent: Wednesday, 21 July 2021 5:52 PM
To: Rhys McMillan <Rhys.McMillan@douglaspartners.com.au>; Kurt Plambeck <kurt.plambeck@douglaspartners.com.au>
Subject: Results for Registration 274103 202546.00, Cockle Bay

Please refer to attached for:
a copy of the Certificate of Analysis

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	202546.00, Cockle Bay
Envirolab Reference	274103-A
Date Sample Received	14/07/2021
Date Instructions Received	27/07/2021
Date Results Expected to be Reported	03/08/2021

Sample Condition

Samples received in appropriate condition for analysis	Yes
No. of Samples Provided	additional analysis
Turnaround Time Requested	Standard
Temperature on Receipt (°C)	3
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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customerservice@envirolab.com.au
www.envirolab.com.au

Sample ID	TCLP Preparation - Acid	Lead	Nickel	Naphthalene in TCLP	Acenaphthylene in TCLP	Acenaphthene in TCLP	Fluorene in TCLP	Phenanthrene in TCLP	Anthracene in TCLP	Fluoranthene in TCLP	Pyrene in TCLP	Benzo(a)anthracene in TCLP	Chrysene in TCLP	Benzo(bjk)fluoranthene in TCLP	Benzo(a)pyrene in TCLP	Indeno(1,2,3-c,d)pyrene - TCLP	Dibenzo(a,h)anthracene in TCLP	Benzo(g,h,i)perylene in TCLP	Total +vePAH's	Surrogate p-Terphenyl-d14	On Hold
CW1-12-12.45																					✓
CW1-13-13.45																					✓
CW1-14.5-14.95																					✓
CW1-16-16.45																					✓
BD07/120721																					✓
CW2-2.8-3.2																					✓
CW2-4.0-4.45																					✓
CW2-5.5-5.95																					✓
CW2-7-7.45																					✓
CW2-9.9-10.35																					✓
CW3-0.1																					✓
CW3-0.5																					✓
CW3-1																					✓
BD06/080721																					✓
CW5-2	✓	✓		✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	
CW5-5.5-5.45																					✓
CW5-7-7.45																					✓
CW7-0.5	✓		✓																		
CW7-1																					✓
W1-8-8.45	✓	✓																			

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Sample ID	TCLP Preparation - Acid	Lead	Nickel	Naphthalene in TCLP	Acenaphthylene in TCLP	Acenaphthene in TCLP	Fluorene in TCLP	Phenanthrene in TCLP	Anthracene in TCLP	Fluoranthene in TCLP	Pyrene in TCLP	Benzo(a)anthracene in TCLP	Chrysene in TCLP	Benzo(bjk)fluoranthene in TCLP	Benzo(a)pyrene in TCLP	Indeno(1,2,3-c,d)pyrene - TCLP	Dibenzo(a,h)anthracene in TCLP	Benzo(g,h,i)perylene in TCLP	Total +vePAH's	Surrogate p-Terphenyl-d14	On Hold
W1-10-10.43	✓			✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	
W3-10.75-11.2	✓	✓		✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	
W3-13-13.45																					✓
W3-14-14.45																					✓
W5-8.8-9.23	✓	✓		✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	
W5-10-10.45																					✓
W5-11.5-11.95																					✓
BD05/060721																					✓
BD03/060721	✓		✓																		
BD001/04/0721																					✓
BD/090721																					✓
Spike 2																					✓
Blank 2																					✓

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 274103-B

Client Details

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

Sample Details

Your Reference	**202546.00, Cockle Bay**
Number of Samples	additional analysis
Date samples received	14/07/2021
Date completed instructions received	05/08/2021

Analysis Details

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

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

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

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

Report Details

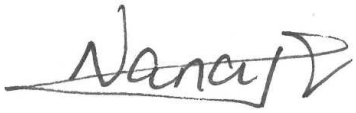
Date results requested by	13/08/2021
Date of Issue	13/08/2021

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

Results Approved By
Greta Petzold, Customer Service
Hannah Nguyen, Senior Chemist
Priya Samarawickrama, Senior Chemist
Steven Luong, Organics Supervisor

Authorised By



Nancy Zhang, Laboratory Manager

Misc Soil - Inorg						
Our Reference		274103-B-1	274103-B-6	274103-B-12	274103-B-15	274103-B-20
Your Reference	UNITS	CW1	CW2	CW3	CW5	W1
Depth		12-12.45	2.8-3.2	0.5	2	8-8.45
Date Sampled		12/07/2021	12/07/2021	8/07/2021	7/07/2021	9/07/2021
Type of sample		Soil	Soil	Soil	Soil	Soil
Date prepared	-	09/08/2021	09/08/2021	09/08/2021	09/08/2021	09/08/2021
Date analysed	-	09/08/2021	09/08/2021	09/08/2021	09/08/2021	09/08/2021
Total Phenolics (as Phenol)	mg/kg	<5	<5	<5	<5	<5

Misc Soil - Inorg			
Our Reference		274103-B-22	274103-B-25
Your Reference	UNITS	W3	W5
Depth		10.75-11.2	8.8-9.23
Date Sampled		4/07/2021	7/07/2021
Type of sample		Soil	Soil
Date prepared	-	09/08/2021	09/08/2021
Date analysed	-	09/08/2021	09/08/2021
Total Phenolics (as Phenol)	mg/kg	<5	<5

Speciated Phenols in Soil					
Our Reference		274103-B-15	274103-B-20	274103-B-22	274103-B-25
Your Reference	UNITS	CW5	W1	W3	W5
Depth		2	8-8.45	10.75-11.2	8.8-9.23
Date Sampled		7/07/2021	9/07/2021	4/07/2021	7/07/2021
Type of sample		Soil	Soil	Soil	Soil
Date extracted	-	10/08/2021	10/08/2021	10/08/2021	10/08/2021
Date analysed	-	10/08/2021	10/08/2021	10/08/2021	10/08/2021
Phenol	mg/kg	<0.2	<0.2	<0.2	<0.2
2-Chlorophenol	mg/kg	<0.2	<0.2	<0.2	<0.2
4-Chloro-3-methylphenol	mg/kg	<1	<1	<1	<1
2-Methylphenol (o-cresol)	mg/kg	<0.2	<0.2	<0.2	<0.2
3/4-Methylphenol (m/p-cresol)	mg/kg	<0.4	<0.4	<0.4	0.5
2-Nitrophenol	mg/kg	<0.2	<0.2	<0.2	<0.2
2,4 -Dimethylphenol	mg/kg	<0.2	<0.2	<0.2	0.5
2,4-Dichlorophenol	mg/kg	<0.2	<0.2	<0.2	<0.2
2,6-Dichlorophenol	mg/kg	<0.2	<0.2	<0.2	<0.2
2,4,5-Trichlorophenol	mg/kg	<0.2	<0.2	<0.2	<0.2
2,4,6-Trichlorophenol	mg/kg	<0.2	<0.2	<0.2	<0.2
2,4-Dinitrophenol	mg/kg	<4	<4	<4	<4
4-Nitrophenol	mg/kg	<4	<4	<4	<4
2346-Tetrachlorophenol	mg/kg	<0.2	<0.2	<0.2	<0.2
2-methyl-4,6-Dinitrophenol	mg/kg	<2	<2	<2	<2
Pentachlorophenol	mg/kg	<1	<1	<1	<1
Surrogate 2-fluorophenol	%	60	78	81	83
Surrogate Phenol-d_6	%	64	89	86	86
Surrogate 2,4,6-Tribromophenol	%	44	49	73	72
Surrogate p-Terphenyl-d_{14}	%	66	85	92	85

Tributyl Tin in Soil						
Our Reference		274103-B-1	274103-B-6	274103-B-15	274103-B-20	274103-B-22
Your Reference	UNITS	CW1	CW2	CW5	W1	W3
Depth		12-12.45	2.8-3.2	2	8-8.45	10.75-11.2
Date Sampled		12/07/2021	12/07/2021	7/07/2021	9/07/2021	4/07/2021
Type of sample		Soil	Soil	Soil	Soil	Soil
Date extracted	-	12/08/2021	12/08/2021	12/08/2021	12/08/2021	12/08/2021
Date analysed	-	13/08/2021	13/08/2021	13/08/2021	13/08/2021	13/08/2021
Tributyltin as Sn	µg/kg	<0.5	<0.5	<2	3.0	83
Surrogate Triphenyltin	%	98	97	97	100	110

Tributyl Tin in Soil		
Our Reference		274103-B-25
Your Reference	UNITS	W5
Depth		8.8-9.23
Date Sampled		7/07/2021
Type of sample		Soil
Date extracted	-	12/08/2021
Date analysed	-	13/08/2021
Tributyltin as Sn	µg/kg	85
Surrogate Triphenyltin	%	86

Metals from Leaching Fluid pH 2.9 or 5		
Our Reference		274103-B-25
Your Reference	UNITS	W5
Depth		8.8-9.23
Date Sampled		7/07/2021
Type of sample		Soil
Date extracted	-	09/08/2021
Date analysed	-	09/08/2021
pH of soil for fluid# determ.	pH units	9.2
pH of soil TCLP (after HCl)	pH units	2.0
Extraction fluid used	-	1
pH of final Leachate	pH units	5.4
Mercury	mg/L	<0.0005

Method ID	Methodology Summary
Ext-054	Analysed by MPL Envirolab
INORG-004	Toxicity Characteristic Leaching Procedure (TCLP) using Zero Headspace Extraction (zHE) using AS4439 and USEPA 1311.
Inorg-004	Toxicity Characteristic Leaching Procedure (TCLP) using AS 4439 and USEPA 1311. Please note that the mass used may be scaled down from default based on sample mass available. Samples are stored at 2-6oC before and after leachate preparation.
Inorg-031	Total Phenolics by segmented flow analyser (in line distillation with colourimetric finish). Solids are extracted in a caustic media prior to analysis.
Metals-021	Determination of Mercury by Cold Vapour AAS following buffer determination as per USEPA 1311 and hence AS 4439.3 2019. Extraction Fluid 1 refers to pH 5.0 buffer and Extraction Fluid 2 is the pH 2.9 buffer.
Org-022/025	Soil samples are extracted with Dichloromethane/Acetone and waters with Dichloromethane and analysed by GC-MS/GC-MSMS.

QUALITY CONTROL: Misc Soil - Inorg						Duplicate			Spike Recovery %	
Test Description	Units	PQL	Method	Blank	#	Base	Dup.	RPD	LCS-1	274103-B-20
Date prepared	-			09/08/2021	15	09/08/2021	09/08/2021		09/08/2021	09/08/2021
Date analysed	-			09/08/2021	15	09/08/2021	09/08/2021		09/08/2021	09/08/2021
Total Phenolics (as Phenol)	mg/kg	5	Inorg-031	<5	15	<5	<5	0	101	96

QUALITY CONTROL: Speciated Phenols in Soil						Duplicate			Spike Recovery %	
Test Description	Units	PQL	Method	Blank	#	Base	Dup.	RPD	LCS-9	274103-B-20
Date extracted	-			10/08/2021	15	10/08/2021	10/08/2021		10/08/2021	10/08/2021
Date analysed	-			10/08/2021	15	10/08/2021	10/08/2021		10/08/2021	10/08/2021
Phenol	mg/kg	0.2	Org-022/025	<0.2	15	<0.2	<0.2	0	78	78
2-Chlorophenol	mg/kg	0.2	Org-022/025	<0.2	15	<0.2	<0.2	0	83	81
4-Chloro-3-methylphenol	mg/kg	1	Org-022/025	<1	15	<1	<1	0	[NT]	[NT]
2-Methylphenol (o-cresol)	mg/kg	0.2	Org-022/025	<0.2	15	<0.2	<0.2	0	42	42
3/4-Methylphenol (m/p-cresol)	mg/kg	0.4	Org-022/025	<0.4	15	<0.4	<0.4	0	[NT]	[NT]
2-Nitrophenol	mg/kg	0.2	Org-022/025	<0.2	15	<0.2	<0.2	0	[NT]	[NT]
2,4 -Dimethylphenol	mg/kg	0.2	Org-022/025	<0.2	15	<0.2	<0.2	0	[NT]	[NT]
2,4-Dichlorophenol	mg/kg	0.2	Org-022/025	<0.2	15	<0.2	<0.2	0	[NT]	[NT]
2,6-Dichlorophenol	mg/kg	0.2	Org-022/025	<0.2	15	<0.2	<0.2	0	100	85
2,4,5-Trichlorophenol	mg/kg	0.2	Org-022/025	<0.2	15	<0.2	<0.2	0	[NT]	[NT]
2,4,6-Trichlorophenol	mg/kg	0.2	Org-022/025	<0.2	15	<0.2	<0.2	0	[NT]	[NT]
2,4-Dinitrophenol	mg/kg	4	Org-022/025	<4	15	<4	<4	0	[NT]	[NT]
4-Nitrophenol	mg/kg	4	Org-022/025	<4	15	<4	<4	0	101	80
2346-Tetrachlorophenol	mg/kg	0.2	Org-022/025	<0.2	15	<0.2	<0.2	0	[NT]	[NT]
2-methyl-4,6-Dinitrophenol	mg/kg	2	Org-022/025	<2	15	<2	<2	0	[NT]	[NT]
Pentachlorophenol	mg/kg	1	Org-022/025	<1	15	<1	<1	0	118	98
Surrogate 2-fluorophenol	%		Org-022/025	80	15	60	79	27	79	77
Surrogate Phenol-d_6	%		Org-022/025	84	15	64	83	26	82	83
Surrogate 2,4,6-Tribromophenol	%		Org-022/025	74	15	44	49	11	71	48
Surrogate p-Terphenyl-d_{14}	%		Org-022/025	74	15	66	83	23	76	112

QUALITY CONTROL: Tributyl Tin in Soil						Duplicate			Spike Recovery %	
Test Description	Units	PQL	Method	Blank	#	Base	Dup.	RPD	LCS-1	[NT]
Date extracted	-			12/08/2021	1	12/08/2021	12/08/2021		12/08/2021	[NT]
Date analysed	-			13/08/2021	1	13/08/2021	13/08/2021		13/08/2021	[NT]
Tributyltin as Sn	µg/kg	0.5	Ext-054	<0.5	1	<0.5	<0.5	0	106	[NT]
Surrogate Triphenyltin	%		Ext-054	100	1	98	95	3	100	[NT]

QUALITY CONTROL: Tributyl Tin in Soil						Duplicate			Spike Recovery %	
Test Description	Units	PQL	Method	Blank	#	Base	Dup.	RPD	[NT]	[NT]
Date extracted	-			[NT]	6	12/08/2021	12/08/2021		[NT]	[NT]
Date analysed	-			[NT]	6	13/08/2021	13/08/2021		[NT]	[NT]
Tributyltin as Sn	µg/kg	0.5	Ext-054	[NT]	6	<0.5	<0.5	0	[NT]	[NT]
Surrogate Triphenyltin	%		Ext-054	[NT]	6	97	100	3	[NT]	[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	-			09/08/2021	[NT]	[NT]	[NT]	[NT]	09/08/2021	[NT]
Date analysed	-			09/08/2021	[NT]	[NT]	[NT]	[NT]	09/08/2021	[NT]
Mercury	mg/L	0.0005	Metals-021	<0.0005	[NT]	[NT]	[NT]	[NT]	103	[NT]

Result Definitions

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

Quality Control Definitions

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

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

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

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

Laboratory Acceptance Criteria

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

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

Spikes for Physical and Aggregate Tests are not applicable.

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

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

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

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

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

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

Measurement Uncertainty estimates are available for most tests upon request.

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

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

Report Comments

Out of recommended holding time

Tributyltin as Sn analysedby MPL Laboratories. Report No. 266847
- Some PQLS have been raised due to decreased internal standard efficiency. This may be due to sample matrix interferences.

Ming To

Subject: FW: Reports 273301, 274103, 274471 Cockle Bay

Ref: 274103-B.
TAT: Standard
Due: 13/08/2021 MT

From: Kurt Plambeck <kurt.plambeck@douglaspartners.com.au>
Sent: Thursday, 5 August 2021 4:42 PM
To: Simon Song <SSong@envirolab.com.au>
Subject: Reports 273301, 274103, 274471 Cockle Bay

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Simon,

Can you please run the below additional analysis

Sample ID	Lab Report	TCLP Hg	TCLP PAH	TBT	Cresols and coal tar	Total Phenols
CW5/0.5-0.6	273301		X			
CW6/0.5-0.6	273301		X			X
W4/10	273301			X		X
CW2/0.4-0.5	273301					X
1. CW1/12-12.45	274103			X		X
6. CW2/2.8-3.2	274103			X		X
15 CW5/2.0	274103			X	X	X
20 W1/8-8.45	274103			X	X	X
22 W3/10.75-11.2	274103			X	X	X
25 W5/8.8-9.23	274103	X		X	X	X
12. CW3/0.5	274103					X
CW4/2.5-2.95	274471			X		X
SS1/0.5	274471					X
SS2/2.5-2.7	274471					X

Also for report 274103 can you report tin for all samples that metals were tested for.

Regards

Ming To

From: Kurt Plambeck <kurt.plambeck@douglaspartners.com.au>
Sent: Thursday, 5 August 2021 5:08 PM
To: Simon Song
Cc: Ming To
Subject: RE: Reports 273301, 274103, 274471 Cockle Bay

274103-B.

Follow Up Flag: Follow up
Flag Status: Flagged

Categories: Additional

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Hi Simon,

That's fine. Client was warned about holding times and still took forever to approve the additional analysis

---

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

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From: Simon Song <SSong@envirolab.com.au>
Sent: Thursday, 5 August 2021 5:06 PM
To: Kurt Plambeck <kurt.plambeck@douglaspartners.com.au>
Cc: Ming To <MTo@envirolab.com.au>
Subject: RE: Reports 273301, 274103, 274471 Cockle Bay

Hi Kurt,
Is that ok they are out of recommended holding time?
For 'Cresols and coal tar', we just test PAH and Speciated Phenols, PAH had been done already, we can run Speciated Phenols only.

Kind Regards,

Simon Song | Senior Customer Service | Envirolab Services

Great Science. Great Service.

12 Ashley Street Chatswood NSW 2067
T 612 9910 6200
E SSong@envirolab.com.au | W www.envirolab.com.au

Envirolab Services Pty Ltd
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SAMPLE RECEIPT ADVICE

Client Details

Client	Douglas Partners Pty Ltd
Attention	Kurt Plambeck

Sample Login Details

Your reference	202546.00, Cockle Bay
Envirolab Reference	274103-B
Date Sample Received	14/07/2021
Date Instructions Received	05/08/2021
Date Results Expected to be Reported	13/08/2021

Sample Condition

Samples received in appropriate condition for analysis	Yes
No. of Samples Provided	additional analysis
Turnaround Time Requested	Standard
Temperature on Receipt (°C)	3
Cooling Method	Ice
Sampling Date Provided	YES

Comments

Out of recommended holding time

Please direct any queries to:

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

Analysis Underway, details on the following page:

Envirolab Services Pty Ltd
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12 Ashley St Chatswood NSW 2067
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Sample ID	Misc Soil - Inorg	Speciated Phenols in Soil	Tributyl Tin in Soil	pH of soil for fluid#determ.	pH of soil TCLP (after HCl)	Extraction fluid used	pH of final Leachate	Mercury	On Hold
CW1-12-12.45	✓		✓						
CW1-13-13.45									✓
CW1-14.5-14.95									✓
CW1-16-16.45									✓
BD07/120721									✓
CW2-2.8-3.2	✓		✓						
CW2-4.0-4.45									✓
CW2-5.5-5.95									✓
CW2-7-7.45									✓
CW2-9.9-10.35									✓
CW3-0.1									✓
CW3-0.5	✓								
CW3-1									✓
BD06/080721									✓
CW5-2	✓	✓	✓						
CW5-5.5-5.45									✓
CW5-7-7.45									✓
CW7-0.5									✓
CW7-1									✓
W1-8-8.45	✓	✓	✓						
W1-10-10.43									✓
W3-10.75-11.2	✓	✓	✓						
W3-13-13.45									✓
W3-14-14.45									✓
W5-8.8-9.23	✓	✓	✓	✓	✓	✓	✓	✓	
W5-10-10.45									✓
W5-11.5-11.95									✓
BD05/060721									✓
BD03/060721									✓
BD001/04/0721									✓
BD/090721									✓
Spike 2									✓

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customerservice@envirolab.com.au
www.envirolab.com.au

Sample ID	Misc Soil - Inorg	Speciated Phenols in Soil	Tributyl Tin in Soil	pH of soil for fluid#determ.	pH of soil TCLP (after HCl)	Extraction fluid used	pH of final Leachate	Mercury	On Hold
Blank 2									✓

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

Additional Info

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

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CERTIFICATE OF ANALYSIS 274471

Client Details

Client	Douglas Partners Pty Ltd
Attention	Rhys McMillan
Address	96 Hermitage Rd, West Ryde, NSW, 2114

Sample Details

Your Reference	**202546.00, Cockle Bay**
Number of Samples	15 Soil
Date samples received	20/07/2021
Date completed instructions received	20/07/2021

Analysis Details

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

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

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

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

Report Details

Date results requested by	27/07/2021
Date of Issue	27/07/2021

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Asbestos Approved By
Analysed by Asbestos Approved Identifier: Ridwan Wijaya
Authorised by Asbestos Approved Signatory: Lucy Zhu

Results Approved By
Dragana Tomas, Senior Chemist
Giovanni Agosti, Group Technical Manager
Lucy Zhu, Asbestos Supervisor
Priya Samarawickrama, Senior Chemist
Steven Luong, Organics Supervisor

Authorised By



Nancy Zhang, Laboratory Manager

VOCs in soil		
Our Reference		274471-7
Your Reference	UNITS	CW6
Depth		3.8-4.25
Type of sample		Soil
Date Sampled		16/07/2021
Date extracted	-	21/07/2021
Date analysed	-	21/07/2021
Dichlorodifluoromethane	mg/kg	<1
Chloromethane	mg/kg	<1
Vinyl Chloride	mg/kg	<1
Bromomethane	mg/kg	<1
Chloroethane	mg/kg	<1
Trichlorofluoromethane	mg/kg	<1
1,1-Dichloroethene	mg/kg	<1
trans-1,2-dichloroethene	mg/kg	<1
1,1-dichloroethane	mg/kg	<1
cis-1,2-dichloroethene	mg/kg	<1
bromochloromethane	mg/kg	<1
chloroform	mg/kg	<1
2,2-dichloropropane	mg/kg	<1
1,2-dichloroethane	mg/kg	<1
1,1,1-trichloroethane	mg/kg	<1
1,1-dichloropropene	mg/kg	<1
Cyclohexane	mg/kg	<1
carbon tetrachloride	mg/kg	<1
Benzene	mg/kg	<0.2
dibromomethane	mg/kg	<1
1,2-dichloropropane	mg/kg	<1
trichloroethene	mg/kg	<1
bromodichloromethane	mg/kg	<1
trans-1,3-dichloropropene	mg/kg	<1
cis-1,3-dichloropropene	mg/kg	<1
1,1,2-trichloroethane	mg/kg	<1
Toluene	mg/kg	<0.5
1,3-dichloropropane	mg/kg	<1
dibromochloromethane	mg/kg	<1
1,2-dibromoethane	mg/kg	<1
tetrachloroethene	mg/kg	<1
1,1,1,2-tetrachloroethane	mg/kg	<1
chlorobenzene	mg/kg	<1

VOCs in soil		
Our Reference		274471-7
Your Reference	UNITS	CW6
Depth		3.8-4.25
Type of sample		Soil
Date Sampled		16/07/2021
Ethylbenzene	mg/kg	<1
bromoform	mg/kg	<1
m+p-xylene	mg/kg	<2
styrene	mg/kg	<1
1,1,2,2-tetrachloroethane	mg/kg	<1
o-Xylene	mg/kg	<1
1,2,3-trichloropropane	mg/kg	<1
isopropylbenzene	mg/kg	<1
bromobenzene	mg/kg	<1
n-propyl benzene	mg/kg	<1
2-chlorotoluene	mg/kg	<1
4-chlorotoluene	mg/kg	<1
1,3,5-trimethyl benzene	mg/kg	<1
tert-butyl benzene	mg/kg	<1
1,2,4-trimethyl benzene	mg/kg	<1
1,3-dichlorobenzene	mg/kg	<1
sec-butyl benzene	mg/kg	<1
1,4-dichlorobenzene	mg/kg	<1
4-isopropyl toluene	mg/kg	<1
1,2-dichlorobenzene	mg/kg	<1
n-butyl benzene	mg/kg	<1
1,2-dibromo-3-chloropropane	mg/kg	<1
1,2,4-trichlorobenzene	mg/kg	<1
hexachlorobutadiene	mg/kg	<1
1,2,3-trichlorobenzene	mg/kg	<1
Surrogate Dibromofluorometha	%	100
Surrogate aaa-Trifluorotoluene	%	106
Surrogate Toluene-d_8	%	99
Surrogate 4-Bromofluorobenzene	%	100

vTRH(C6-C10)/BTEXN in Soil				
Our Reference		274471-5	274471-10	274471-12
Your Reference	UNITS	CW4	SS1	SS2
Depth		5.5-5.95	0.5	0.3
Type of sample		Soil	Soil	Soil
Date Sampled		19/07/2021	14/07/2021	14/07/2021
Date extracted	-	21/07/2021	21/07/2021	21/07/2021
Date analysed	-	21/07/2021	21/07/2021	21/07/2021
TRH C_6 - C_9	mg/kg	<25	<25	<25
TRH C_6 - C_{10}	mg/kg	<25	<25	<25
vTPH C_6 - C_{10} less BTEX (F1)	mg/kg	<25	<25	<25
Benzene	mg/kg	<0.2	<0.2	<0.2
Toluene	mg/kg	<0.5	<0.5	<0.5
Ethylbenzene	mg/kg	<1	<1	<1
m+p-xylene	mg/kg	<2	<2	<2
o-Xylene	mg/kg	<1	<1	<1
naphthalene	mg/kg	<1	<1	<1
Total +ve Xylenes	mg/kg	<3	<3	<3
Surrogate aaa-Trifluorotoluene	%	102	104	110

svTRH (C10-C40) in Soil				
Our Reference		274471-5	274471-10	274471-12
Your Reference	UNITS	CW4	SS1	SS2
Depth		5.5-5.95	0.5	0.3
Type of sample		Soil	Soil	Soil
Date Sampled		19/07/2021	14/07/2021	14/07/2021
Date extracted	-	21/07/2021	21/07/2021	21/07/2021
Date analysed	-	22/07/2021	22/07/2021	22/07/2021
TRH C_{10} - C_{14}	mg/kg	<50	<50	<50
TRH C_{15} - C_{28}	mg/kg	<100	<100	<100
TRH C_{29} - C_{36}	mg/kg	<100	<100	<100
TRH >C_{10} -C_{16}	mg/kg	<50	<50	<50
TRH >C_{10} - C_{16} less Naphthalene (F2)	mg/kg	<50	<50	<50
TRH >C_{16} -C_{34}	mg/kg	<100	<100	<100
TRH >C_{34} -C_{40}	mg/kg	<100	<100	<100
Total +ve TRH (>C10-C40)	mg/kg	<50	<50	<50
Surrogate o-Terphenyl	%	92	82	85

PAHs in Soil						
Our Reference		274471-4	274471-5	274471-7	274471-10	274471-12
Your Reference	UNITS	CW4	CW4	CW6	SS1	SS2
Depth		2.5-2.95	5.5-5.95	3.8-4.25	0.5	0.3
Type of sample		Soil	Soil	Soil	Soil	Soil
Date Sampled		19/07/2021	19/07/2021	16/07/2021	14/07/2021	14/07/2021
Date extracted	-	21/07/2021	21/07/2021	21/07/2021	21/07/2021	21/07/2021
Date analysed	-	21/07/2021	21/07/2021	21/07/2021	21/07/2021	21/07/2021
Naphthalene	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Acenaphthylene	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Acenaphthene	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Fluorene	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Phenanthrene	mg/kg	0.2	<0.1	0.5	<0.1	<0.1
Anthracene	mg/kg	<0.1	<0.1	0.2	<0.1	<0.1
Fluoranthene	mg/kg	0.4	<0.1	0.7	<0.1	0.1
Pyrene	mg/kg	0.3	<0.1	0.6	<0.1	0.1
Benzo(a)anthracene	mg/kg	0.2	<0.1	0.3	<0.1	<0.1
Chrysene	mg/kg	0.2	<0.1	0.2	<0.1	<0.1
Benzo(b,j+k)fluoranthene	mg/kg	0.3	<0.2	0.3	<0.2	<0.2
Benzo(a)pyrene	mg/kg	0.2	<0.05	0.2	<0.05	0.08
Indeno(1,2,3-c,d)pyrene	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Dibenzo(a,h)anthracene	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Benzo(g,h,i)perylene	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Total +ve PAH's	mg/kg	1.8	<0.05	3.0	<0.05	0.3
Benzo(a)pyrene TEQ calc (zero)	mg/kg	<0.5	<0.5	<0.5	<0.5	<0.5
Benzo(a)pyrene TEQ calc(half)	mg/kg	<0.5	<0.5	<0.5	<0.5	<0.5
Benzo(a)pyrene TEQ calc(PQL)	mg/kg	<0.5	<0.5	<0.5	<0.5	<0.5
Surrogate p-Terphenyl-d14	%	104	106	103	106	103

PAHs in Soil		
Our Reference		274471-13
Your Reference	UNITS	SS2
Depth		2.522.7
Type of sample		Soil
Date Sampled		14/07/2021
Date extracted	-	21/07/2021
Date analysed	-	21/07/2021
Naphthalene	mg/kg	<0.1
Acenaphthylene	mg/kg	<0.1
Acenaphthene	mg/kg	<0.1
Fluorene	mg/kg	<0.1
Phenanthrene	mg/kg	<0.1
Anthracene	mg/kg	<0.1
Fluoranthene	mg/kg	<0.1
Pyrene	mg/kg	<0.1
Benzo(a)anthracene	mg/kg	<0.1
Chrysene	mg/kg	<0.1
Benzo(b,j+k)fluoranthene	mg/kg	<0.2
Benzo(a)pyrene	mg/kg	<0.05
Indeno(1,2,3-c,d)pyrene	mg/kg	<0.1
Dibenzo(a,h)anthracene	mg/kg	<0.1
Benzo(g,h,i)perylene	mg/kg	<0.1
Total +ve PAH's	mg/kg	<0.05
Benzo(a)pyrene TEQ calc (zero)	mg/kg	<0.5
Benzo(a)pyrene TEQ calc(half)	mg/kg	<0.5
Benzo(a)pyrene TEQ calc(PQL)	mg/kg	<0.5
Surrogate p-Terphenyl-d14	%	106

Organochlorine Pesticides in soil		
Our Reference		274471-12
Your Reference	UNITS	SS2
Depth		0.3
Type of sample		Soil
Date Sampled		14/07/2021
Date extracted	-	21/07/2021
Date analysed	-	22/07/2021
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	%	94

Organophosphorus Pesticides in Soil		
Our Reference		274471-12
Your Reference	UNITS	SS2
Depth		0.3
Type of sample		Soil
Date Sampled		14/07/2021
Date extracted	-	21/07/2021
Date analysed	-	22/07/2021
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	%	94

PCBs in Soil		
Our Reference		274471-12
Your Reference	UNITS	SS2
Depth		0.3
Type of sample		Soil
Date Sampled		14/07/2021
Date extracted	-	21/07/2021
Date analysed	-	22/07/2021
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	%	94

Acid Extractable metals in soil						
Our Reference		274471-4	274471-5	274471-7	274471-10	274471-12
Your Reference	UNITS	CW4	CW4	CW6	SS1	SS2
Depth		2.5-2.95	5.5-5.95	3.8-4.25	0.5	0.3
Type of sample		Soil	Soil	Soil	Soil	Soil
Date Sampled		19/07/2021	19/07/2021	16/07/2021	14/07/2021	14/07/2021
Date prepared	-	21/07/2021	21/07/2021	21/07/2021	21/07/2021	21/07/2021
Date analysed	-	21/07/2021	21/07/2021	21/07/2021	21/07/2021	21/07/2021
Arsenic	mg/kg	13	11	<4	<4	<4
Cadmium	mg/kg	<0.4	<0.4	<0.4	<0.4	<0.4
Chromium	mg/kg	20	18	7	12	8
Copper	mg/kg	440	7	320	6	9
Lead	mg/kg	85	10	3	17	25
Mercury	mg/kg	0.2	<0.1	<0.1	<0.1	<0.1
Nickel	mg/kg	7	5	2	7	6
Zinc	mg/kg	120	15	10	24	32

Acid Extractable metals in soil		
Our Reference		274471-13
Your Reference	UNITS	SS2
Depth		2.522.7
Type of sample		Soil
Date Sampled		14/07/2021
Date prepared	-	21/07/2021
Date analysed	-	21/07/2021
Arsenic	mg/kg	6
Cadmium	mg/kg	<0.4
Chromium	mg/kg	46
Copper	mg/kg	30
Lead	mg/kg	11
Mercury	mg/kg	<0.1
Nickel	mg/kg	1
Zinc	mg/kg	12

Moisture						
Our Reference		274471-4	274471-5	274471-7	274471-10	274471-12
Your Reference	UNITS	CW4	CW4	CW6	SS1	SS2
Depth		2.5-2.95	5.5-5.95	3.8-4.25	0.5	0.3
Type of sample		Soil	Soil	Soil	Soil	Soil
Date Sampled		19/07/2021	19/07/2021	16/07/2021	14/07/2021	14/07/2021
Date prepared	-	21/07/2021	21/07/2021	21/07/2021	21/07/2021	21/07/2021
Date analysed	-	22/07/2021	22/07/2021	22/07/2021	22/07/2021	22/07/2021
Moisture	%	14	29	22	13	11

Moisture		
Our Reference		274471-13
Your Reference	UNITS	SS2
Depth		2.522.7
Type of sample		Soil
Date Sampled		14/07/2021
Date prepared	-	21/07/2021
Date analysed	-	22/07/2021
Moisture	%	14

Asbestos ID - soils						
Our Reference		274471-4	274471-5	274471-7	274471-10	274471-12
Your Reference	UNITS	CW4	CW4	CW6	SS1	SS2
Depth		2.5-2.95	5.5-5.95	3.8-4.25	0.5	0.3
Type of sample		Soil	Soil	Soil	Soil	Soil
Date Sampled		19/07/2021	19/07/2021	16/07/2021	14/07/2021	14/07/2021
Date analysed	-	26/07/2021	26/07/2021	26/07/2021	26/07/2021	26/07/2021
Sample mass tested	g	Approx. 55g	Approx. 35g	Approx. 40g	Approx. 50g	Approx. 45g
Sample Description	-	Brown coarse-grained soil & rocks	Grey coarse-grained soil & rocks	Grey coarse-grained soil & rocks	Grey coarse-grained soil & rocks	Grey coarse-grained soil & rocks
Asbestos ID in soil	-	No asbestos detected at reporting limit of 0.1g/kg Organic fibres detected	No asbestos detected at reporting limit of 0.1g/kg Organic fibres detected	No asbestos detected at reporting limit of 0.1g/kg Organic fibres detected	No asbestos detected at reporting limit of 0.1g/kg Organic fibres detected	No asbestos detected at reporting limit of 0.1g/kg Organic fibres detected
Asbestos comments	-	NO	NO	NO	NO	NO
Trace Analysis	-	No asbestos detected	No asbestos detected	No asbestos detected	No asbestos detected	No asbestos detected

Asbestos ID - soils		
Our Reference		274471-13
Your Reference	UNITS	SS2
Depth		2.522.7
Type of sample		Soil
Date Sampled		14/07/2021
Date analysed	-	26/07/2021
Sample mass tested	g	Approx. 45g
Sample Description	-	Beige coarse-grained soil & rocks
Asbestos ID in soil	-	No asbestos detected at reporting limit of 0.1g/kg Organic fibres detected
Asbestos comments	-	NO
Trace Analysis	-	No asbestos detected

Misc Inorg - Soil						
Our Reference		274471-5	274471-7	274471-10	274471-12	274471-13
Your Reference	UNITS	CW4	CW6	SS1	SS2	SS2
Depth		5.5-5.95	3.8-4.25	0.5	0.3	2.522.7
Type of sample		Soil	Soil	Soil	Soil	Soil
Date Sampled		19/07/2021	16/07/2021	14/07/2021	14/07/2021	14/07/2021
Date prepared	-	22/07/2021	22/07/2021	22/07/2021	22/07/2021	22/07/2021
Date analysed	-	22/07/2021	22/07/2021	22/07/2021	22/07/2021	22/07/2021
pH 1:5 soil:water	pH Units	8.5	9.6	10.6	9.3	7.9
Total Organic Carbon (Walkley Black)	mg/kg	57,000	[NA]	[NA]	[NA]	[NA]

CEC		
Our Reference		274471-12
Your Reference	UNITS	SS2
Depth		0.3
Type of sample		Soil
Date Sampled		14/07/2021
Date prepared	-	23/07/2021
Date analysed	-	23/07/2021
Exchangeable Ca	meq/100g	9.9
Exchangeable K	meq/100g	0.1
Exchangeable Mg	meq/100g	1.2
Exchangeable Na	meq/100g	<0.1
Cation Exchange Capacity	meq/100g	11

Method ID	Methodology Summary
ASB-001	Asbestos ID - Qualitative identification of asbestos in bulk samples using Polarised Light Microscopy and Dispersion Staining Techniques including Synthetic Mineral Fibre and Organic Fibre as per Australian Standard 4964-2004.
Inorg-001	pH - Measured using pH meter and electrode in accordance with APHA latest edition, 4500-H+. Please note that the results for water analyses are indicative only, as analysis outside of the APHA storage times.
Inorg-008	Moisture content determined by heating at 105+/-5 °C for a minimum of 12 hours.
Inorg-036	Total Organic Carbon or Matter - A titrimetric method that measures the oxidisable organic content of soils.
Metals-020	Determination of various metals by ICP-AES.
Metals-020	Determination of exchangeable cations and cation exchange capacity in soils using 1M Ammonium Chloride exchange and ICP-AES analytical finish.
Metals-021	Determination of Mercury by Cold Vapour AAS.
Org-020	Soil samples are extracted with Dichloromethane/Acetone and waters with Dichloromethane and analysed by GC-FID. F2 = (>C10-C16)-Naphthalene as per NEPM B1 Guideline on Investigation Levels for Soil and Groundwater (HSLs Tables 1A (3, 4)). Note Naphthalene is determined from the VOC analysis.
Org-020	Soil samples are extracted with Dichloromethane/Acetone and waters with Dichloromethane and analysed by GC-FID. F2 = (>C10-C16)-Naphthalene as per NEPM B1 Guideline on Investigation Levels for Soil and Groundwater (HSLs Tables 1A (3, 4)). Note Naphthalene is determined from the VOC analysis. Note, the Total +ve TRH PQL is reflective of the lowest individual PQL and is therefore "Total +ve TRH" is simply a sum of the positive individual TRH fractions (>C10-C40).
Org-021	Soil samples are extracted with dichloromethane/acetone and waters with dichloromethane and analysed by GC-ECD.
Org-021	Soil samples are extracted with dichloromethane/acetone and waters with dichloromethane and analysed by GC-ECD. Note, the Total +ve PCBs PQL is reflective of the lowest individual PQL and is therefore" Total +ve PCBs" is simply a sum of the positive individual PCBs.
Org-022	Determination of VOCs sampled onto coconut shell charcoal sorbent tubes, that can be desorbed using carbon disulphide, and analysed by GC-MS.
Org-022/025	Soil samples are extracted with Dichloromethane/Acetone and waters with Dichloromethane and analysed by GC-MS/GC-MSMS.
Org-022/025	Soil samples are extracted with dichloromethane/acetone and waters with dichloromethane and analysed by GC-MS/GC-MSMS. Note, the Total +ve reported DDD+DDE+DDT PQL is reflective of the lowest individual PQL and is therefore simply a sum of the positive individually report DDD+DDE+DDT.

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

QUALITY CONTROL: VOCs in soil					Duplicate				Spike Recovery %	
Test Description	Units	PQL	Method	Blank	#	Base	Dup.	RPD	LCS-1	[NT]
Date extracted	-			21/07/2021	[NT]	[NT]	[NT]	[NT]	21/07/2021	[NT]
Date analysed	-			21/07/2021	[NT]	[NT]	[NT]	[NT]	21/07/2021	[NT]
Dichlorodifluoromethane	mg/kg	1	Org-023	<1	[NT]	[NT]	[NT]	[NT]	[NT]	[NT]
Chloromethane	mg/kg	1	Org-023	<1	[NT]	[NT]	[NT]	[NT]	[NT]	[NT]
Vinyl Chloride	mg/kg	1	Org-023	<1	[NT]	[NT]	[NT]	[NT]	[NT]	[NT]
Bromomethane	mg/kg	1	Org-023	<1	[NT]	[NT]	[NT]	[NT]	[NT]	[NT]
Chloroethane	mg/kg	1	Org-023	<1	[NT]	[NT]	[NT]	[NT]	[NT]	[NT]
Trichlorofluoromethane	mg/kg	1	Org-023	<1	[NT]	[NT]	[NT]	[NT]	[NT]	[NT]
1,1-Dichloroethene	mg/kg	1	Org-023	<1	[NT]	[NT]	[NT]	[NT]	[NT]	[NT]
trans-1,2-dichloroethene	mg/kg	1	Org-023	<1	[NT]	[NT]	[NT]	[NT]	[NT]	[NT]
1,1-dichloroethane	mg/kg	1	Org-023	<1	[NT]	[NT]	[NT]	[NT]	98	[NT]
cis-1,2-dichloroethene	mg/kg	1	Org-023	<1	[NT]	[NT]	[NT]	[NT]	[NT]	[NT]
bromochloromethane	mg/kg	1	Org-023	<1	[NT]	[NT]	[NT]	[NT]	[NT]	[NT]
chloroform	mg/kg	1	Org-023	<1	[NT]	[NT]	[NT]	[NT]	90	[NT]
2,2-dichloropropane	mg/kg	1	Org-023	<1	[NT]	[NT]	[NT]	[NT]	[NT]	[NT]
1,2-dichloroethane	mg/kg	1	Org-023	<1	[NT]	[NT]	[NT]	[NT]	95	[NT]
1,1,1-trichloroethane	mg/kg	1	Org-023	<1	[NT]	[NT]	[NT]	[NT]	102	[NT]
1,1-dichloropropene	mg/kg	1	Org-023	<1	[NT]	[NT]	[NT]	[NT]	[NT]	[NT]
Cyclohexane	mg/kg	1	Org-023	<1	[NT]	[NT]	[NT]	[NT]	[NT]	[NT]
carbon tetrachloride	mg/kg	1	Org-023	<1	[NT]	[NT]	[NT]	[NT]	[NT]	[NT]
Benzene	mg/kg	0.2	Org-023	<0.2	[NT]	[NT]	[NT]	[NT]	[NT]	[NT]
dibromomethane	mg/kg	1	Org-023	<1	[NT]	[NT]	[NT]	[NT]	[NT]	[NT]
1,2-dichloropropane	mg/kg	1	Org-023	<1	[NT]	[NT]	[NT]	[NT]	[NT]	[NT]
trichloroethene	mg/kg	1	Org-023	<1	[NT]	[NT]	[NT]	[NT]	97	[NT]
bromodichloromethane	mg/kg	1	Org-023	<1	[NT]	[NT]	[NT]	[NT]	105	[NT]
trans-1,3-dichloropropene	mg/kg	1	Org-023	<1	[NT]	[NT]	[NT]	[NT]	[NT]	[NT]
cis-1,3-dichloropropene	mg/kg	1	Org-023	<1	[NT]	[NT]	[NT]	[NT]	[NT]	[NT]
1,1,2-trichloroethane	mg/kg	1	Org-023	<1	[NT]	[NT]	[NT]	[NT]	[NT]	[NT]
Toluene	mg/kg	0.5	Org-023	<0.5	[NT]	[NT]	[NT]	[NT]	[NT]	[NT]
1,3-dichloropropane	mg/kg	1	Org-023	<1	[NT]	[NT]	[NT]	[NT]	[NT]	[NT]
dibromochloromethane	mg/kg	1	Org-023	<1	[NT]	[NT]	[NT]	[NT]	99	[NT]
1,2-dibromoethane	mg/kg	1	Org-023	<1	[NT]	[NT]	[NT]	[NT]	[NT]	[NT]
tetrachloroethene	mg/kg	1	Org-023	<1	[NT]	[NT]	[NT]	[NT]	98	[NT]
1,1,1,2-tetrachloroethane	mg/kg	1	Org-023	<1	[NT]	[NT]	[NT]	[NT]	[NT]	[NT]
chlorobenzene	mg/kg	1	Org-023	<1	[NT]	[NT]	[NT]	[NT]	[NT]	[NT]
Ethylbenzene	mg/kg	1	Org-023	<1	[NT]	[NT]	[NT]	[NT]	[NT]	[NT]
bromoform	mg/kg	1	Org-023	<1	[NT]	[NT]	[NT]	[NT]	[NT]	[NT]
m+p-xylene	mg/kg	2	Org-023	<2	[NT]	[NT]	[NT]	[NT]	[NT]	[NT]
styrene	mg/kg	1	Org-023	<1	[NT]	[NT]	[NT]	[NT]	[NT]	[NT]
1,1,2,2-tetrachloroethane	mg/kg	1	Org-023	<1	[NT]	[NT]	[NT]	[NT]	[NT]	[NT]

QUALITY CONTROL: VOCs in soil					Duplicate				Spike Recovery %	
Test Description	Units	PQL	Method	Blank	#	Base	Dup.	RPD	LCS-1	[NT]
o-Xylene	mg/kg	1	Org-023	<1	[NT]	[NT]	[NT]	[NT]	[NT]	[NT]
1,2,3-trichloropropane	mg/kg	1	Org-023	<1	[NT]	[NT]	[NT]	[NT]	[NT]	[NT]
isopropylbenzene	mg/kg	1	Org-023	<1	[NT]	[NT]	[NT]	[NT]	[NT]	[NT]
bromobenzene	mg/kg	1	Org-023	<1	[NT]	[NT]	[NT]	[NT]	[NT]	[NT]
n-propyl benzene	mg/kg	1	Org-023	<1	[NT]	[NT]	[NT]	[NT]	[NT]	[NT]
2-chlorotoluene	mg/kg	1	Org-023	<1	[NT]	[NT]	[NT]	[NT]	[NT]	[NT]
4-chlorotoluene	mg/kg	1	Org-023	<1	[NT]	[NT]	[NT]	[NT]	[NT]	[NT]
1,3,5-trimethyl benzene	mg/kg	1	Org-023	<1	[NT]	[NT]	[NT]	[NT]	[NT]	[NT]
tert-butyl benzene	mg/kg	1	Org-023	<1	[NT]	[NT]	[NT]	[NT]	[NT]	[NT]
1,2,4-trimethyl benzene	mg/kg	1	Org-023	<1	[NT]	[NT]	[NT]	[NT]	[NT]	[NT]
1,3-dichlorobenzene	mg/kg	1	Org-023	<1	[NT]	[NT]	[NT]	[NT]	[NT]	[NT]
sec-butyl benzene	mg/kg	1	Org-023	<1	[NT]	[NT]	[NT]	[NT]	[NT]	[NT]
1,4-dichlorobenzene	mg/kg	1	Org-023	<1	[NT]	[NT]	[NT]	[NT]	[NT]	[NT]
4-isopropyl toluene	mg/kg	1	Org-023	<1	[NT]	[NT]	[NT]	[NT]	[NT]	[NT]
1,2-dichlorobenzene	mg/kg	1	Org-023	<1	[NT]	[NT]	[NT]	[NT]	[NT]	[NT]
n-butyl benzene	mg/kg	1	Org-023	<1	[NT]	[NT]	[NT]	[NT]	[NT]	[NT]
1,2-dibromo-3-chloropropane	mg/kg	1	Org-023	<1	[NT]	[NT]	[NT]	[NT]	[NT]	[NT]
1,2,4-trichlorobenzene	mg/kg	1	Org-023	<1	[NT]	[NT]	[NT]	[NT]	[NT]	[NT]
hexachlorobutadiene	mg/kg	1	Org-023	<1	[NT]	[NT]	[NT]	[NT]	[NT]	[NT]
1,2,3-trichlorobenzene	mg/kg	1	Org-023	<1	[NT]	[NT]	[NT]	[NT]	[NT]	[NT]
Surrogate Dibromofluorometha	%		Org-023	101	[NT]	[NT]	[NT]	[NT]	99	[NT]
Surrogate aaa-Trifluorotoluene	%		Org-023	109	[NT]	[NT]	[NT]	[NT]	107	[NT]
Surrogate Toluene-d_8	%		Org-023	100	[NT]	[NT]	[NT]	[NT]	99	[NT]
Surrogate 4-Bromofluorobenzene	%		Org-023	98	[NT]	[NT]	[NT]	[NT]	101	[NT]

QUALITY CONTROL: vTRH(C6-C10)/BTEXN in Soil						Duplicate			Spike Recovery %	
Test Description	Units	PQL	Method	Blank	#	Base	Dup.	RPD	LCS-1	[NT]
Date extracted	-			21/07/2021	[NT]	[NT]	[NT]	[NT]	21/07/2021	[NT]
Date analysed	-			21/07/2021	[NT]	[NT]	[NT]	[NT]	21/07/2021	[NT]
TRH C_6 - C_9	mg/kg	25	Org-023	<25	[NT]	[NT]	[NT]	[NT]	92	[NT]
TRH C_6 - C_{10}	mg/kg	25	Org-023	<25	[NT]	[NT]	[NT]	[NT]	92	[NT]
Benzene	mg/kg	0.2	Org-023	<0.2	[NT]	[NT]	[NT]	[NT]	91	[NT]
Toluene	mg/kg	0.5	Org-023	<0.5	[NT]	[NT]	[NT]	[NT]	86	[NT]
Ethylbenzene	mg/kg	1	Org-023	<1	[NT]	[NT]	[NT]	[NT]	95	[NT]
m+p-xylene	mg/kg	2	Org-023	<2	[NT]	[NT]	[NT]	[NT]	93	[NT]
o-Xylene	mg/kg	1	Org-023	<1	[NT]	[NT]	[NT]	[NT]	106	[NT]
naphthalene	mg/kg	1	Org-023	<1	[NT]	[NT]	[NT]	[NT]	[NT]	[NT]
Surrogate aaa-Trifluorotoluene	%		Org-023	109	[NT]	[NT]	[NT]	[NT]	107	[NT]

QUALITY CONTROL: svTRH (C10-C40) in Soil						Duplicate			Spike Recovery %	
Test Description	Units	PQL	Method	Blank	#	Base	Dup.	RPD	LCS-1	[NT]
Date extracted	-			21/07/2021	[NT]	[NT]	[NT]	[NT]	21/07/2021	[NT]
Date analysed	-			21/07/2021	[NT]	[NT]	[NT]	[NT]	21/07/2021	[NT]
TRH C_{10} - C_{14}	mg/kg	50	Org-020	<50	[NT]	[NT]	[NT]	[NT]	110	[NT]
TRH C_{15} - C_{28}	mg/kg	100	Org-020	<100	[NT]	[NT]	[NT]	[NT]	111	[NT]
TRH C_{29} - C_{36}	mg/kg	100	Org-020	<100	[NT]	[NT]	[NT]	[NT]	80	[NT]
TRH >C_{10} -C_{16}	mg/kg	50	Org-020	<50	[NT]	[NT]	[NT]	[NT]	110	[NT]
TRH >C_{16} -C_{34}	mg/kg	100	Org-020	<100	[NT]	[NT]	[NT]	[NT]	111	[NT]
TRH >C_{34} -C_{40}	mg/kg	100	Org-020	<100	[NT]	[NT]	[NT]	[NT]	80	[NT]
Surrogate o-Terphenyl	%		Org-020	91	[NT]	[NT]	[NT]	[NT]	114	[NT]

QUALITY CONTROL: PAHs in Soil						Duplicate			Spike Recovery %	
Test Description	Units	PQL	Method	Blank	#	Base	Dup.	RPD	LCS-1	[NT]
Date extracted	-			21/07/2021	[NT]	[NT]	[NT]	[NT]	21/07/2021	[NT]
Date analysed	-			21/07/2021	[NT]	[NT]	[NT]	[NT]	21/07/2021	[NT]
Naphthalene	mg/kg	0.1	Org-022/025	<0.1	[NT]	[NT]	[NT]	[NT]	101	[NT]
Acenaphthylene	mg/kg	0.1	Org-022/025	<0.1	[NT]	[NT]	[NT]	[NT]	[NT]	[NT]
Acenaphthene	mg/kg	0.1	Org-022/025	<0.1	[NT]	[NT]	[NT]	[NT]	84	[NT]
Fluorene	mg/kg	0.1	Org-022/025	<0.1	[NT]	[NT]	[NT]	[NT]	93	[NT]
Phenanthrene	mg/kg	0.1	Org-022/025	<0.1	[NT]	[NT]	[NT]	[NT]	111	[NT]
Anthracene	mg/kg	0.1	Org-022/025	<0.1	[NT]	[NT]	[NT]	[NT]	[NT]	[NT]
Fluoranthene	mg/kg	0.1	Org-022/025	<0.1	[NT]	[NT]	[NT]	[NT]	96	[NT]
Pyrene	mg/kg	0.1	Org-022/025	<0.1	[NT]	[NT]	[NT]	[NT]	100	[NT]
Benzo(a)anthracene	mg/kg	0.1	Org-022/025	<0.1	[NT]	[NT]	[NT]	[NT]	[NT]	[NT]
Chrysene	mg/kg	0.1	Org-022/025	<0.1	[NT]	[NT]	[NT]	[NT]	78	[NT]
Benzo(b,j+k)fluoranthene	mg/kg	0.2	Org-022/025	<0.2	[NT]	[NT]	[NT]	[NT]	[NT]	[NT]
Benzo(a)pyrene	mg/kg	0.05	Org-022/025	<0.05	[NT]	[NT]	[NT]	[NT]	92	[NT]
Indeno(1,2,3-c,d)pyrene	mg/kg	0.1	Org-022/025	<0.1	[NT]	[NT]	[NT]	[NT]	[NT]	[NT]
Dibenzo(a,h)anthracene	mg/kg	0.1	Org-022/025	<0.1	[NT]	[NT]	[NT]	[NT]	[NT]	[NT]
Benzo(g,h,i)perylene	mg/kg	0.1	Org-022/025	<0.1	[NT]	[NT]	[NT]	[NT]	[NT]	[NT]
Surrogate p-Terphenyl-d14	%		Org-022/025	105	[NT]	[NT]	[NT]	[NT]	104	[NT]

QUALITY CONTROL: Organochlorine Pesticides in soil						Duplicate			Spike Recovery %	
Test Description	Units	PQL	Method	Blank	#	Base	Dup.	RPD	LCS-1	[NT]
Date extracted	-			21/07/2021	[NT]	[NT]	[NT]	[NT]	21/07/2021	[NT]
Date analysed	-			22/07/2021	[NT]	[NT]	[NT]	[NT]	22/07/2021	[NT]
alpha-BHC	mg/kg	0.1	Org-022/025	<0.1	[NT]	[NT]	[NT]	[NT]	111	[NT]
HCB	mg/kg	0.1	Org-022/025	<0.1	[NT]	[NT]	[NT]	[NT]	[NT]	[NT]
beta-BHC	mg/kg	0.1	Org-022/025	<0.1	[NT]	[NT]	[NT]	[NT]	100	[NT]
gamma-BHC	mg/kg	0.1	Org-022/025	<0.1	[NT]	[NT]	[NT]	[NT]	[NT]	[NT]
Heptachlor	mg/kg	0.1	Org-022/025	<0.1	[NT]	[NT]	[NT]	[NT]	111	[NT]
delta-BHC	mg/kg	0.1	Org-022/025	<0.1	[NT]	[NT]	[NT]	[NT]	[NT]	[NT]
Aldrin	mg/kg	0.1	Org-022/025	<0.1	[NT]	[NT]	[NT]	[NT]	97	[NT]
Heptachlor Epoxide	mg/kg	0.1	Org-022/025	<0.1	[NT]	[NT]	[NT]	[NT]	99	[NT]
gamma-Chlordane	mg/kg	0.1	Org-022/025	<0.1	[NT]	[NT]	[NT]	[NT]	[NT]	[NT]
alpha-chlordane	mg/kg	0.1	Org-022/025	<0.1	[NT]	[NT]	[NT]	[NT]	[NT]	[NT]
Endosulfan I	mg/kg	0.1	Org-022/025	<0.1	[NT]	[NT]	[NT]	[NT]	[NT]	[NT]
pp-DDE	mg/kg	0.1	Org-022/025	<0.1	[NT]	[NT]	[NT]	[NT]	104	[NT]
Dieldrin	mg/kg	0.1	Org-022/025	<0.1	[NT]	[NT]	[NT]	[NT]	115	[NT]
Endrin	mg/kg	0.1	Org-022/025	<0.1	[NT]	[NT]	[NT]	[NT]	95	[NT]
Endosulfan II	mg/kg	0.1	Org-022/025	<0.1	[NT]	[NT]	[NT]	[NT]	[NT]	[NT]
pp-DDD	mg/kg	0.1	Org-022/025	<0.1	[NT]	[NT]	[NT]	[NT]	103	[NT]
Endrin Aldehyde	mg/kg	0.1	Org-022/025	<0.1	[NT]	[NT]	[NT]	[NT]	[NT]	[NT]
pp-DDT	mg/kg	0.1	Org-022/025	<0.1	[NT]	[NT]	[NT]	[NT]	[NT]	[NT]
Endosulfan Sulphate	mg/kg	0.1	Org-022/025	<0.1	[NT]	[NT]	[NT]	[NT]	65	[NT]
Methoxychlor	mg/kg	0.1	Org-022/025	<0.1	[NT]	[NT]	[NT]	[NT]	[NT]	[NT]
Surrogate TCMX	%		Org-022/025	96	[NT]	[NT]	[NT]	[NT]	98	[NT]

QUALITY CONTROL: Organophosphorus Pesticides in Soil						Duplicate			Spike Recovery %	
Test Description	Units	PQL	Method	Blank	#	Base	Dup.	RPD	LCS-1	[NT]
Date extracted	-			21/07/2021	[NT]	[NT]	[NT]	[NT]	21/07/2021	[NT]
Date analysed	-			22/07/2021	[NT]	[NT]	[NT]	[NT]	22/07/2021	[NT]
Dichlorvos	mg/kg	0.1	Org-022/025	<0.1	[NT]	[NT]	[NT]	[NT]	86	[NT]
Dimethoate	mg/kg	0.1	Org-022/025	<0.1	[NT]	[NT]	[NT]	[NT]	[NT]	[NT]
Diazinon	mg/kg	0.1	Org-022/025	<0.1	[NT]	[NT]	[NT]	[NT]	[NT]	[NT]
Chlorpyriphos-methyl	mg/kg	0.1	Org-022/025	<0.1	[NT]	[NT]	[NT]	[NT]	[NT]	[NT]
Ronnel	mg/kg	0.1	Org-022/025	<0.1	[NT]	[NT]	[NT]	[NT]	109	[NT]
Fenitrothion	mg/kg	0.1	Org-022/025	<0.1	[NT]	[NT]	[NT]	[NT]	91	[NT]
Malathion	mg/kg	0.1	Org-022/025	<0.1	[NT]	[NT]	[NT]	[NT]	71	[NT]
Chlorpyriphos	mg/kg	0.1	Org-022/025	<0.1	[NT]	[NT]	[NT]	[NT]	117	[NT]
Parathion	mg/kg	0.1	Org-022/025	<0.1	[NT]	[NT]	[NT]	[NT]	100	[NT]
Bromophos-ethyl	mg/kg	0.1	Org-022	<0.1	[NT]	[NT]	[NT]	[NT]	[NT]	[NT]
Ethion	mg/kg	0.1	Org-022/025	<0.1	[NT]	[NT]	[NT]	[NT]	83	[NT]
Azinphos-methyl (Guthion)	mg/kg	0.1	Org-022/025	<0.1	[NT]	[NT]	[NT]	[NT]	[NT]	[NT]
Surrogate TCMX	%		Org-022/025	96	[NT]	[NT]	[NT]	[NT]	98	[NT]

QUALITY CONTROL: PCBs in Soil						Duplicate			Spike Recovery %	
Test Description	Units	PQL	Method	Blank	#	Base	Dup.	RPD	LCS-1	[NT]
Date extracted	-			21/07/2021	[NT]	[NT]	[NT]	[NT]	21/07/2021	[NT]
Date analysed	-			22/07/2021	[NT]	[NT]	[NT]	[NT]	22/07/2021	[NT]
Aroclor 1016	mg/kg	0.1	Org-021	<0.1	[NT]	[NT]	[NT]	[NT]	[NT]	[NT]
Aroclor 1221	mg/kg	0.1	Org-021	<0.1	[NT]	[NT]	[NT]	[NT]	[NT]	[NT]
Aroclor 1232	mg/kg	0.1	Org-021	<0.1	[NT]	[NT]	[NT]	[NT]	[NT]	[NT]
Aroclor 1242	mg/kg	0.1	Org-021	<0.1	[NT]	[NT]	[NT]	[NT]	[NT]	[NT]
Aroclor 1248	mg/kg	0.1	Org-021	<0.1	[NT]	[NT]	[NT]	[NT]	[NT]	[NT]
Aroclor 1254	mg/kg	0.1	Org-021	<0.1	[NT]	[NT]	[NT]	[NT]	100	[NT]
Aroclor 1260	mg/kg	0.1	Org-021	<0.1	[NT]	[NT]	[NT]	[NT]	[NT]	[NT]
Surrogate TCMX	%		Org-021	96	[NT]	[NT]	[NT]	[NT]	98	[NT]

QUALITY CONTROL: Acid Extractable metals in soil						Duplicate			Spike Recovery %	
Test Description	Units	PQL	Method	Blank	#	Base	Dup.	RPD	LCS-1	[NT]
Date prepared	-			21/07/2021	[NT]	[NT]	[NT]	[NT]	21/07/2021	[NT]
Date analysed	-			21/07/2021	[NT]	[NT]	[NT]	[NT]	21/07/2021	[NT]
Arsenic	mg/kg	4	Metals-020	<4	[NT]	[NT]	[NT]	[NT]	99	[NT]
Cadmium	mg/kg	0.4	Metals-020	<0.4	[NT]	[NT]	[NT]	[NT]	94	[NT]
Chromium	mg/kg	1	Metals-020	<1	[NT]	[NT]	[NT]	[NT]	107	[NT]
Copper	mg/kg	1	Metals-020	<1	[NT]	[NT]	[NT]	[NT]	107	[NT]
Lead	mg/kg	1	Metals-020	<1	[NT]	[NT]	[NT]	[NT]	101	[NT]
Mercury	mg/kg	0.1	Metals-021	<0.1	[NT]	[NT]	[NT]	[NT]	94	[NT]
Nickel	mg/kg	1	Metals-020	<1	[NT]	[NT]	[NT]	[NT]	105	[NT]
Zinc	mg/kg	1	Metals-020	<1	[NT]	[NT]	[NT]	[NT]	107	[NT]

QUALITY CONTROL: Misc Inorg - Soil						Duplicate			Spike Recovery %	
Test Description	Units	PQL	Method	Blank	#	Base	Dup.	RPD	LCS-1	[NT]
Date prepared	-			22/07/2021	5	22/07/2021	22/07/2021		22/07/2021	[NT]
Date analysed	-			22/07/2021	5	22/07/2021	22/07/2021		22/07/2021	[NT]
pH 1:5 soil:water	pH Units		Inorg-001	[NT]	5	8.5	[NT]		102	[NT]
Total Organic Carbon (Walkley Black)	mg/kg	1000	Inorg-036	<1000	5	57000	61000	7	90	[NT]

QUALITY CONTROL: Misc Inorg - Soil						Duplicate			Spike Recovery %	
Test Description	Units	PQL	Method	Blank	#	Base	Dup.	RPD	[NT]	[NT]
Date prepared	-			[NT]	13	22/07/2021	22/07/2021		[NT]	[NT]
Date analysed	-			[NT]	13	22/07/2021	22/07/2021		[NT]	[NT]
pH 1:5 soil:water	pH Units		Inorg-001	[NT]	13	7.9	7.8	1	[NT]	[NT]

QUALITY CONTROL: CEC						Duplicate			Spike Recovery %	
Test Description	Units	PQL	Method	Blank	#	Base	Dup.	RPD	LCS-1	[NT]
Date prepared	-			23/07/2021	[NT]	[NT]	[NT]	[NT]	23/07/2021	[NT]
Date analysed	-			23/07/2021	[NT]	[NT]	[NT]	[NT]	23/07/2021	[NT]
Exchangeable Ca	meq/100g	0.1	Metals-020	<0.1	[NT]	[NT]	[NT]	[NT]	113	[NT]
Exchangeable K	meq/100g	0.1	Metals-020	<0.1	[NT]	[NT]	[NT]	[NT]	122	[NT]
Exchangeable Mg	meq/100g	0.1	Metals-020	<0.1	[NT]	[NT]	[NT]	[NT]	113	[NT]
Exchangeable Na	meq/100g	0.1	Metals-020	<0.1	[NT]	[NT]	[NT]	[NT]	126	[NT]

Result Definitions

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

Quality Control Definitions

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

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

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

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

Laboratory Acceptance Criteria

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

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

Spikes for Physical and Aggregate Tests are not applicable.

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

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

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

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

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

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

Measurement Uncertainty estimates are available for most tests upon request.

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

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

Report Comments

Asbestos: A portion of the supplied sample was sub-sampled for asbestos analysis according to Envirolab procedures.
We cannot guarantee that this sub-sample is indicative of the entire sample. Envirolab recommends supplying 40-50g of sample in its own container.
Note: Samples 274471-4,5,7,10,12,13 were sub-sampled from jars provided by the client.

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CERTIFICATE OF ANALYSIS 274471

Client Details

Client	Douglas Partners Pty Ltd
Attention	Rhys McMillan
Address	96 Hermitage Rd, West Ryde, NSW, 2114

Sample Details

Your Reference	**202546.00, Cockle Bay**
Number of Samples	15 Soil
Date samples received	20/07/2021
Date completed instructions received	20/07/2021

Analysis Details

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

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

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

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

Report Details

Date results requested by	27/07/2021
Date of Issue	28/07/2021
Reissue Details	This report replaces R00 due to the addition of Sn results.

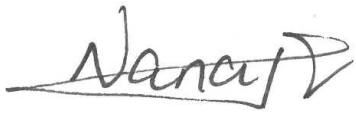
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Asbestos Approved By
Analysed by Asbestos Approved Identifier: Ridwan Wijaya
Authorised by Asbestos Approved Signatory: Lucy Zhu

Results Approved By
Dragana Tomas, Senior Chemist
Giovanni Agosti, Group Technical Manager
Hannah Nguyen, Senior Chemist
Lucy Zhu, Asbestos Supervisor
Priya Samarawickrama, Senior Chemist
Steven Luong, Organics Supervisor

Authorised By



Nancy Zhang, Laboratory Manager

VOCs in soil		
Our Reference		274471-7
Your Reference	UNITS	CW6
Depth		3.8-4.25
Type of sample		Soil
Date Sampled		16/07/2021
Date extracted	-	21/07/2021
Date analysed	-	21/07/2021
Dichlorodifluoromethane	mg/kg	<1
Chloromethane	mg/kg	<1
Vinyl Chloride	mg/kg	<1
Bromomethane	mg/kg	<1
Chloroethane	mg/kg	<1
Trichlorofluoromethane	mg/kg	<1
1,1-Dichloroethene	mg/kg	<1
trans-1,2-dichloroethene	mg/kg	<1
1,1-dichloroethane	mg/kg	<1
cis-1,2-dichloroethene	mg/kg	<1
bromochloromethane	mg/kg	<1
chloroform	mg/kg	<1
2,2-dichloropropane	mg/kg	<1
1,2-dichloroethane	mg/kg	<1
1,1,1-trichloroethane	mg/kg	<1
1,1-dichloropropene	mg/kg	<1
Cyclohexane	mg/kg	<1
carbon tetrachloride	mg/kg	<1
Benzene	mg/kg	<0.2
dibromomethane	mg/kg	<1
1,2-dichloropropane	mg/kg	<1
trichloroethene	mg/kg	<1
bromodichloromethane	mg/kg	<1
trans-1,3-dichloropropene	mg/kg	<1
cis-1,3-dichloropropene	mg/kg	<1
1,1,2-trichloroethane	mg/kg	<1
Toluene	mg/kg	<0.5
1,3-dichloropropane	mg/kg	<1
dibromochloromethane	mg/kg	<1
1,2-dibromoethane	mg/kg	<1
tetrachloroethene	mg/kg	<1
1,1,1,2-tetrachloroethane	mg/kg	<1
chlorobenzene	mg/kg	<1

VOCs in soil		
Our Reference		274471-7
Your Reference	UNITS	CW6
Depth		3.8-4.25
Type of sample		Soil
Date Sampled		16/07/2021
Ethylbenzene	mg/kg	<1
bromoform	mg/kg	<1
m+p-xylene	mg/kg	<2
styrene	mg/kg	<1
1,1,2,2-tetrachloroethane	mg/kg	<1
o-Xylene	mg/kg	<1
1,2,3-trichloropropane	mg/kg	<1
isopropylbenzene	mg/kg	<1
bromobenzene	mg/kg	<1
n-propyl benzene	mg/kg	<1
2-chlorotoluene	mg/kg	<1
4-chlorotoluene	mg/kg	<1
1,3,5-trimethyl benzene	mg/kg	<1
tert-butyl benzene	mg/kg	<1
1,2,4-trimethyl benzene	mg/kg	<1
1,3-dichlorobenzene	mg/kg	<1
sec-butyl benzene	mg/kg	<1
1,4-dichlorobenzene	mg/kg	<1
4-isopropyl toluene	mg/kg	<1
1,2-dichlorobenzene	mg/kg	<1
n-butyl benzene	mg/kg	<1
1,2-dibromo-3-chloropropane	mg/kg	<1
1,2,4-trichlorobenzene	mg/kg	<1
hexachlorobutadiene	mg/kg	<1
1,2,3-trichlorobenzene	mg/kg	<1
Surrogate Dibromofluorometha	%	100
Surrogate aaa-Trifluorotoluene	%	106
Surrogate Toluene-d_8	%	99
Surrogate 4-Bromofluorobenzene	%	100

vTRH(C6-C10)/BTEXN in Soil				
Our Reference		274471-5	274471-10	274471-12
Your Reference	UNITS	CW4	SS1	SS2
Depth		5.5-5.95	0.5	0.3
Type of sample		Soil	Soil	Soil
Date Sampled		19/07/2021	14/07/2021	14/07/2021
Date extracted	-	21/07/2021	21/07/2021	21/07/2021
Date analysed	-	21/07/2021	21/07/2021	21/07/2021
TRH C_6 - C_9	mg/kg	<25	<25	<25
TRH C_6 - C_{10}	mg/kg	<25	<25	<25
vTPH C_6 - C_{10} less BTEX (F1)	mg/kg	<25	<25	<25
Benzene	mg/kg	<0.2	<0.2	<0.2
Toluene	mg/kg	<0.5	<0.5	<0.5
Ethylbenzene	mg/kg	<1	<1	<1
m+p-xylene	mg/kg	<2	<2	<2
o-Xylene	mg/kg	<1	<1	<1
naphthalene	mg/kg	<1	<1	<1
Total +ve Xylenes	mg/kg	<3	<3	<3
Surrogate aaa-Trifluorotoluene	%	102	104	110

svTRH (C10-C40) in Soil				
Our Reference		274471-5	274471-10	274471-12
Your Reference	UNITS	CW4	SS1	SS2
Depth		5.5-5.95	0.5	0.3
Type of sample		Soil	Soil	Soil
Date Sampled		19/07/2021	14/07/2021	14/07/2021
Date extracted	-	21/07/2021	21/07/2021	21/07/2021
Date analysed	-	22/07/2021	22/07/2021	22/07/2021
TRH C_{10} - C_{14}	mg/kg	<50	<50	<50
TRH C_{15} - C_{28}	mg/kg	<100	<100	<100
TRH C_{29} - C_{36}	mg/kg	<100	<100	<100
TRH >C_{10} -C_{16}	mg/kg	<50	<50	<50
TRH >C_{10} - C_{16} less Naphthalene (F2)	mg/kg	<50	<50	<50
TRH >C_{16} -C_{34}	mg/kg	<100	<100	<100
TRH >C_{34} -C_{40}	mg/kg	<100	<100	<100
Total +ve TRH (>C10-C40)	mg/kg	<50	<50	<50
Surrogate o-Terphenyl	%	92	82	85

PAHs in Soil						
Our Reference		274471-4	274471-5	274471-7	274471-10	274471-12
Your Reference	UNITS	CW4	CW4	CW6	SS1	SS2
Depth		2.5-2.95	5.5-5.95	3.8-4.25	0.5	0.3
Type of sample		Soil	Soil	Soil	Soil	Soil
Date Sampled		19/07/2021	19/07/2021	16/07/2021	14/07/2021	14/07/2021
Date extracted	-	21/07/2021	21/07/2021	21/07/2021	21/07/2021	21/07/2021
Date analysed	-	21/07/2021	21/07/2021	21/07/2021	21/07/2021	21/07/2021
Naphthalene	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Acenaphthylene	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Acenaphthene	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Fluorene	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Phenanthrene	mg/kg	0.2	<0.1	0.5	<0.1	<0.1
Anthracene	mg/kg	<0.1	<0.1	0.2	<0.1	<0.1
Fluoranthene	mg/kg	0.4	<0.1	0.7	<0.1	0.1
Pyrene	mg/kg	0.3	<0.1	0.6	<0.1	0.1
Benzo(a)anthracene	mg/kg	0.2	<0.1	0.3	<0.1	<0.1
Chrysene	mg/kg	0.2	<0.1	0.2	<0.1	<0.1
Benzo(b,j+k)fluoranthene	mg/kg	0.3	<0.2	0.3	<0.2	<0.2
Benzo(a)pyrene	mg/kg	0.2	<0.05	0.2	<0.05	0.08
Indeno(1,2,3-c,d)pyrene	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Dibenzo(a,h)anthracene	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Benzo(g,h,i)perylene	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Total +ve PAH's	mg/kg	1.8	<0.05	3.0	<0.05	0.3
Benzo(a)pyrene TEQ calc (zero)	mg/kg	<0.5	<0.5	<0.5	<0.5	<0.5
Benzo(a)pyrene TEQ calc(half)	mg/kg	<0.5	<0.5	<0.5	<0.5	<0.5
Benzo(a)pyrene TEQ calc(PQL)	mg/kg	<0.5	<0.5	<0.5	<0.5	<0.5
Surrogate p-Terphenyl-d14	%	104	106	103	106	103

PAHs in Soil		
Our Reference		274471-13
Your Reference	UNITS	SS2
Depth		2.522.7
Type of sample		Soil
Date Sampled		14/07/2021
Date extracted	-	21/07/2021
Date analysed	-	21/07/2021
Naphthalene	mg/kg	<0.1
Acenaphthylene	mg/kg	<0.1
Acenaphthene	mg/kg	<0.1
Fluorene	mg/kg	<0.1
Phenanthrene	mg/kg	<0.1
Anthracene	mg/kg	<0.1
Fluoranthene	mg/kg	<0.1
Pyrene	mg/kg	<0.1
Benzo(a)anthracene	mg/kg	<0.1
Chrysene	mg/kg	<0.1
Benzo(b,j+k)fluoranthene	mg/kg	<0.2
Benzo(a)pyrene	mg/kg	<0.05
Indeno(1,2,3-c,d)pyrene	mg/kg	<0.1
Dibenzo(a,h)anthracene	mg/kg	<0.1
Benzo(g,h,i)perylene	mg/kg	<0.1
Total +ve PAH's	mg/kg	<0.05
Benzo(a)pyrene TEQ calc (zero)	mg/kg	<0.5
Benzo(a)pyrene TEQ calc(half)	mg/kg	<0.5
Benzo(a)pyrene TEQ calc(PQL)	mg/kg	<0.5
Surrogate p-Terphenyl-d14	%	106

Organochlorine Pesticides in soil		
Our Reference		274471-12
Your Reference	UNITS	SS2
Depth		0.3
Type of sample		Soil
Date Sampled		14/07/2021
Date extracted	-	21/07/2021
Date analysed	-	22/07/2021
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	%	94

Organophosphorus Pesticides in Soil		
Our Reference		274471-12
Your Reference	UNITS	SS2
Depth		0.3
Type of sample		Soil
Date Sampled		14/07/2021
Date extracted	-	21/07/2021
Date analysed	-	22/07/2021
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	%	94

PCBs in Soil		
Our Reference		274471-12
Your Reference	UNITS	SS2
Depth		0.3
Type of sample		Soil
Date Sampled		14/07/2021
Date extracted	-	21/07/2021
Date analysed	-	22/07/2021
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	%	94

Acid Extractable metals in soil						
Our Reference		274471-4	274471-5	274471-7	274471-10	274471-12
Your Reference	UNITS	CW4	CW4	CW6	SS1	SS2
Depth		2.5-2.95	5.5-5.95	3.8-4.25	0.5	0.3
Type of sample		Soil	Soil	Soil	Soil	Soil
Date Sampled		19/07/2021	19/07/2021	16/07/2021	14/07/2021	14/07/2021
Date prepared	-	21/07/2021	21/07/2021	21/07/2021	21/07/2021	21/07/2021
Date analysed	-	21/07/2021	21/07/2021	21/07/2021	21/07/2021	21/07/2021
Arsenic	mg/kg	13	11	<4	<4	<4
Cadmium	mg/kg	<0.4	<0.4	<0.4	<0.4	<0.4
Chromium	mg/kg	20	18	7	12	8
Copper	mg/kg	440	7	320	6	9
Lead	mg/kg	85	10	3	17	25
Mercury	mg/kg	0.2	<0.1	<0.1	<0.1	<0.1
Nickel	mg/kg	7	5	2	7	6
Zinc	mg/kg	120	15	10	24	32
Tin	mg/kg	31	<1	<1	1	<1

Acid Extractable metals in soil		
Our Reference		274471-13
Your Reference	UNITS	SS2
Depth		2.522.7
Type of sample		Soil
Date Sampled		14/07/2021
Date prepared	-	21/07/2021
Date analysed	-	21/07/2021
Arsenic	mg/kg	6
Cadmium	mg/kg	<0.4
Chromium	mg/kg	46
Copper	mg/kg	30
Lead	mg/kg	11
Mercury	mg/kg	<0.1
Nickel	mg/kg	1
Zinc	mg/kg	12
Tin	mg/kg	<1

Moisture						
Our Reference		274471-4	274471-5	274471-7	274471-10	274471-12
Your Reference	UNITS	CW4	CW4	CW6	SS1	SS2
Depth		2.5-2.95	5.5-5.95	3.8-4.25	0.5	0.3
Type of sample		Soil	Soil	Soil	Soil	Soil
Date Sampled		19/07/2021	19/07/2021	16/07/2021	14/07/2021	14/07/2021
Date prepared	-	21/07/2021	21/07/2021	21/07/2021	21/07/2021	21/07/2021
Date analysed	-	22/07/2021	22/07/2021	22/07/2021	22/07/2021	22/07/2021
Moisture	%	14	29	22	13	11

Moisture		
Our Reference		274471-13
Your Reference	UNITS	SS2
Depth		2.522.7
Type of sample		Soil
Date Sampled		14/07/2021
Date prepared	-	21/07/2021
Date analysed	-	22/07/2021
Moisture	%	14

Asbestos ID - soils						
Our Reference		274471-4	274471-5	274471-7	274471-10	274471-12
Your Reference	UNITS	CW4	CW4	CW6	SS1	SS2
Depth		2.5-2.95	5.5-5.95	3.8-4.25	0.5	0.3
Type of sample		Soil	Soil	Soil	Soil	Soil
Date Sampled		19/07/2021	19/07/2021	16/07/2021	14/07/2021	14/07/2021
Date analysed	-	26/07/2021	26/07/2021	26/07/2021	26/07/2021	26/07/2021
Sample mass tested	g	Approx. 55g	Approx. 35g	Approx. 40g	Approx. 50g	Approx. 45g
Sample Description	-	Brown coarse-grained soil & rocks	Grey coarse-grained soil & rocks	Grey coarse-grained soil & rocks	Grey coarse-grained soil & rocks	Grey coarse-grained soil & rocks
Asbestos ID in soil	-	No asbestos detected at reporting limit of 0.1g/kg Organic fibres detected	No asbestos detected at reporting limit of 0.1g/kg Organic fibres detected	No asbestos detected at reporting limit of 0.1g/kg Organic fibres detected	No asbestos detected at reporting limit of 0.1g/kg Organic fibres detected	No asbestos detected at reporting limit of 0.1g/kg Organic fibres detected
Asbestos comments	-	NO	NO	NO	NO	NO
Trace Analysis	-	No asbestos detected	No asbestos detected	No asbestos detected	No asbestos detected	No asbestos detected

Asbestos ID - soils		
Our Reference		274471-13
Your Reference	UNITS	SS2
Depth		2.522.7
Type of sample		Soil
Date Sampled		14/07/2021
Date analysed	-	26/07/2021
Sample mass tested	g	Approx. 45g
Sample Description	-	Beige coarse-grained soil & rocks
Asbestos ID in soil	-	No asbestos detected at reporting limit of 0.1g/kg Organic fibres detected
Asbestos comments	-	NO
Trace Analysis	-	No asbestos detected

Misc Inorg - Soil						
Our Reference		274471-5	274471-7	274471-10	274471-12	274471-13
Your Reference	UNITS	CW4	CW6	SS1	SS2	SS2
Depth		5.5-5.95	3.8-4.25	0.5	0.3	2.522.7
Type of sample		Soil	Soil	Soil	Soil	Soil
Date Sampled		19/07/2021	16/07/2021	14/07/2021	14/07/2021	14/07/2021
Date prepared	-	22/07/2021	22/07/2021	22/07/2021	22/07/2021	22/07/2021
Date analysed	-	22/07/2021	22/07/2021	22/07/2021	22/07/2021	22/07/2021
pH 1:5 soil:water	pH Units	8.5	9.6	10.6	9.3	7.9
Total Organic Carbon (Walkley Black)	mg/kg	57,000	[NA]	[NA]	[NA]	[NA]

CEC		
Our Reference		274471-12
Your Reference	UNITS	SS2
Depth		0.3
Type of sample		Soil
Date Sampled		14/07/2021
Date prepared	-	23/07/2021
Date analysed	-	23/07/2021
Exchangeable Ca	meq/100g	9.9
Exchangeable K	meq/100g	0.1
Exchangeable Mg	meq/100g	1.2
Exchangeable Na	meq/100g	<0.1
Cation Exchange Capacity	meq/100g	11

Method ID	Methodology Summary
ASB-001	Asbestos ID - Qualitative identification of asbestos in bulk samples using Polarised Light Microscopy and Dispersion Staining Techniques including Synthetic Mineral Fibre and Organic Fibre as per Australian Standard 4964-2004.
Inorg-001	pH - Measured using pH meter and electrode in accordance with APHA latest edition, 4500-H+. Please note that the results for water analyses are indicative only, as analysis outside of the APHA storage times.
Inorg-008	Moisture content determined by heating at 105+/-5 °C for a minimum of 12 hours.
Inorg-036	Total Organic Carbon or Matter - A titrimetric method that measures the oxidisable organic content of soils.
Metals-020	Determination of various metals by ICP-AES.
Metals-020	Determination of exchangeable cations and cation exchange capacity in soils using 1M Ammonium Chloride exchange and ICP-AES analytical finish.
Metals-021	Determination of Mercury by Cold Vapour AAS.
Org-020	Soil samples are extracted with Dichloromethane/Acetone and waters with Dichloromethane and analysed by GC-FID. F2 = (>C10-C16)-Naphthalene as per NEPM B1 Guideline on Investigation Levels for Soil and Groundwater (HSLs Tables 1A (3, 4)). Note Naphthalene is determined from the VOC analysis.
Org-020	Soil samples are extracted with Dichloromethane/Acetone and waters with Dichloromethane and analysed by GC-FID. F2 = (>C10-C16)-Naphthalene as per NEPM B1 Guideline on Investigation Levels for Soil and Groundwater (HSLs Tables 1A (3, 4)). Note Naphthalene is determined from the VOC analysis. Note, the Total +ve TRH PQL is reflective of the lowest individual PQL and is therefore "Total +ve TRH" is simply a sum of the positive individual TRH fractions (>C10-C40).
Org-021	Soil samples are extracted with dichloromethane/acetone and waters with dichloromethane and analysed by GC-ECD.
Org-021	Soil samples are extracted with dichloromethane/acetone and waters with dichloromethane and analysed by GC-ECD. Note, the Total +ve PCBs PQL is reflective of the lowest individual PQL and is therefore" Total +ve PCBs" is simply a sum of the positive individual PCBs.
Org-022	Determination of VOCs sampled onto coconut shell charcoal sorbent tubes, that can be desorbed using carbon disulphide, and analysed by GC-MS.
Org-022/025	Soil samples are extracted with Dichloromethane/Acetone and waters with Dichloromethane and analysed by GC-MS/GC-MSMS.
Org-022/025	Soil samples are extracted with dichloromethane/acetone and waters with dichloromethane and analysed by GC-MS/GC-MSMS. Note, the Total +ve reported DDD+DDE+DDT PQL is reflective of the lowest individual PQL and is therefore simply a sum of the positive individually report DDD+DDE+DDT.

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

QUALITY CONTROL: VOCs in soil					Duplicate				Spike Recovery %	
Test Description	Units	PQL	Method	Blank	#	Base	Dup.	RPD	LCS-1	[NT]
Date extracted	-			21/07/2021	[NT]	[NT]	[NT]	[NT]	21/07/2021	[NT]
Date analysed	-			21/07/2021	[NT]	[NT]	[NT]	[NT]	21/07/2021	[NT]
Dichlorodifluoromethane	mg/kg	1	Org-023	<1	[NT]	[NT]	[NT]	[NT]	[NT]	[NT]
Chloromethane	mg/kg	1	Org-023	<1	[NT]	[NT]	[NT]	[NT]	[NT]	[NT]
Vinyl Chloride	mg/kg	1	Org-023	<1	[NT]	[NT]	[NT]	[NT]	[NT]	[NT]
Bromomethane	mg/kg	1	Org-023	<1	[NT]	[NT]	[NT]	[NT]	[NT]	[NT]
Chloroethane	mg/kg	1	Org-023	<1	[NT]	[NT]	[NT]	[NT]	[NT]	[NT]
Trichlorofluoromethane	mg/kg	1	Org-023	<1	[NT]	[NT]	[NT]	[NT]	[NT]	[NT]
1,1-Dichloroethene	mg/kg	1	Org-023	<1	[NT]	[NT]	[NT]	[NT]	[NT]	[NT]
trans-1,2-dichloroethene	mg/kg	1	Org-023	<1	[NT]	[NT]	[NT]	[NT]	[NT]	[NT]
1,1-dichloroethane	mg/kg	1	Org-023	<1	[NT]	[NT]	[NT]	[NT]	98	[NT]
cis-1,2-dichloroethene	mg/kg	1	Org-023	<1	[NT]	[NT]	[NT]	[NT]	[NT]	[NT]
bromochloromethane	mg/kg	1	Org-023	<1	[NT]	[NT]	[NT]	[NT]	[NT]	[NT]
chloroform	mg/kg	1	Org-023	<1	[NT]	[NT]	[NT]	[NT]	90	[NT]
2,2-dichloropropane	mg/kg	1	Org-023	<1	[NT]	[NT]	[NT]	[NT]	[NT]	[NT]
1,2-dichloroethane	mg/kg	1	Org-023	<1	[NT]	[NT]	[NT]	[NT]	95	[NT]
1,1,1-trichloroethane	mg/kg	1	Org-023	<1	[NT]	[NT]	[NT]	[NT]	102	[NT]
1,1-dichloropropene	mg/kg	1	Org-023	<1	[NT]	[NT]	[NT]	[NT]	[NT]	[NT]
Cyclohexane	mg/kg	1	Org-023	<1	[NT]	[NT]	[NT]	[NT]	[NT]	[NT]
carbon tetrachloride	mg/kg	1	Org-023	<1	[NT]	[NT]	[NT]	[NT]	[NT]	[NT]
Benzene	mg/kg	0.2	Org-023	<0.2	[NT]	[NT]	[NT]	[NT]	[NT]	[NT]
dibromomethane	mg/kg	1	Org-023	<1	[NT]	[NT]	[NT]	[NT]	[NT]	[NT]
1,2-dichloropropane	mg/kg	1	Org-023	<1	[NT]	[NT]	[NT]	[NT]	[NT]	[NT]
trichloroethene	mg/kg	1	Org-023	<1	[NT]	[NT]	[NT]	[NT]	97	[NT]
bromodichloromethane	mg/kg	1	Org-023	<1	[NT]	[NT]	[NT]	[NT]	105	[NT]
trans-1,3-dichloropropene	mg/kg	1	Org-023	<1	[NT]	[NT]	[NT]	[NT]	[NT]	[NT]
cis-1,3-dichloropropene	mg/kg	1	Org-023	<1	[NT]	[NT]	[NT]	[NT]	[NT]	[NT]
1,1,2-trichloroethane	mg/kg	1	Org-023	<1	[NT]	[NT]	[NT]	[NT]	[NT]	[NT]
Toluene	mg/kg	0.5	Org-023	<0.5	[NT]	[NT]	[NT]	[NT]	[NT]	[NT]
1,3-dichloropropane	mg/kg	1	Org-023	<1	[NT]	[NT]	[NT]	[NT]	[NT]	[NT]
dibromochloromethane	mg/kg	1	Org-023	<1	[NT]	[NT]	[NT]	[NT]	99	[NT]
1,2-dibromoethane	mg/kg	1	Org-023	<1	[NT]	[NT]	[NT]	[NT]	[NT]	[NT]
tetrachloroethene	mg/kg	1	Org-023	<1	[NT]	[NT]	[NT]	[NT]	98	[NT]
1,1,1,2-tetrachloroethane	mg/kg	1	Org-023	<1	[NT]	[NT]	[NT]	[NT]	[NT]	[NT]
chlorobenzene	mg/kg	1	Org-023	<1	[NT]	[NT]	[NT]	[NT]	[NT]	[NT]
Ethylbenzene	mg/kg	1	Org-023	<1	[NT]	[NT]	[NT]	[NT]	[NT]	[NT]
bromoform	mg/kg	1	Org-023	<1	[NT]	[NT]	[NT]	[NT]	[NT]	[NT]
m+p-xylene	mg/kg	2	Org-023	<2	[NT]	[NT]	[NT]	[NT]	[NT]	[NT]
styrene	mg/kg	1	Org-023	<1	[NT]	[NT]	[NT]	[NT]	[NT]	[NT]
1,1,2,2-tetrachloroethane	mg/kg	1	Org-023	<1	[NT]	[NT]	[NT]	[NT]	[NT]	[NT]

QUALITY CONTROL: VOCs in soil					Duplicate				Spike Recovery %	
Test Description	Units	PQL	Method	Blank	#	Base	Dup.	RPD	LCS-1	[NT]
o-Xylene	mg/kg	1	Org-023	<1	[NT]	[NT]	[NT]	[NT]	[NT]	[NT]
1,2,3-trichloropropane	mg/kg	1	Org-023	<1	[NT]	[NT]	[NT]	[NT]	[NT]	[NT]
isopropylbenzene	mg/kg	1	Org-023	<1	[NT]	[NT]	[NT]	[NT]	[NT]	[NT]
bromobenzene	mg/kg	1	Org-023	<1	[NT]	[NT]	[NT]	[NT]	[NT]	[NT]
n-propyl benzene	mg/kg	1	Org-023	<1	[NT]	[NT]	[NT]	[NT]	[NT]	[NT]
2-chlorotoluene	mg/kg	1	Org-023	<1	[NT]	[NT]	[NT]	[NT]	[NT]	[NT]
4-chlorotoluene	mg/kg	1	Org-023	<1	[NT]	[NT]	[NT]	[NT]	[NT]	[NT]
1,3,5-trimethyl benzene	mg/kg	1	Org-023	<1	[NT]	[NT]	[NT]	[NT]	[NT]	[NT]
tert-butyl benzene	mg/kg	1	Org-023	<1	[NT]	[NT]	[NT]	[NT]	[NT]	[NT]
1,2,4-trimethyl benzene	mg/kg	1	Org-023	<1	[NT]	[NT]	[NT]	[NT]	[NT]	[NT]
1,3-dichlorobenzene	mg/kg	1	Org-023	<1	[NT]	[NT]	[NT]	[NT]	[NT]	[NT]
sec-butyl benzene	mg/kg	1	Org-023	<1	[NT]	[NT]	[NT]	[NT]	[NT]	[NT]
1,4-dichlorobenzene	mg/kg	1	Org-023	<1	[NT]	[NT]	[NT]	[NT]	[NT]	[NT]
4-isopropyl toluene	mg/kg	1	Org-023	<1	[NT]	[NT]	[NT]	[NT]	[NT]	[NT]
1,2-dichlorobenzene	mg/kg	1	Org-023	<1	[NT]	[NT]	[NT]	[NT]	[NT]	[NT]
n-butyl benzene	mg/kg	1	Org-023	<1	[NT]	[NT]	[NT]	[NT]	[NT]	[NT]
1,2-dibromo-3-chloropropane	mg/kg	1	Org-023	<1	[NT]	[NT]	[NT]	[NT]	[NT]	[NT]
1,2,4-trichlorobenzene	mg/kg	1	Org-023	<1	[NT]	[NT]	[NT]	[NT]	[NT]	[NT]
hexachlorobutadiene	mg/kg	1	Org-023	<1	[NT]	[NT]	[NT]	[NT]	[NT]	[NT]
1,2,3-trichlorobenzene	mg/kg	1	Org-023	<1	[NT]	[NT]	[NT]	[NT]	[NT]	[NT]
Surrogate Dibromofluorometha	%		Org-023	101	[NT]	[NT]	[NT]	[NT]	99	[NT]
Surrogate aaa-Trifluorotoluene	%		Org-023	109	[NT]	[NT]	[NT]	[NT]	107	[NT]
Surrogate Toluene-d_8	%		Org-023	100	[NT]	[NT]	[NT]	[NT]	99	[NT]
Surrogate 4-Bromofluorobenzene	%		Org-023	98	[NT]	[NT]	[NT]	[NT]	101	[NT]

QUALITY CONTROL: vTRH(C6-C10)/BTEXN in Soil						Duplicate			Spike Recovery %	
Test Description	Units	PQL	Method	Blank	#	Base	Dup.	RPD	LCS-1	[NT]
Date extracted	-			21/07/2021	[NT]	[NT]	[NT]	[NT]	21/07/2021	[NT]
Date analysed	-			21/07/2021	[NT]	[NT]	[NT]	[NT]	21/07/2021	[NT]
TRH C_6 - C_9	mg/kg	25	Org-023	<25	[NT]	[NT]	[NT]	[NT]	92	[NT]
TRH C_6 - C_{10}	mg/kg	25	Org-023	<25	[NT]	[NT]	[NT]	[NT]	92	[NT]
Benzene	mg/kg	0.2	Org-023	<0.2	[NT]	[NT]	[NT]	[NT]	91	[NT]
Toluene	mg/kg	0.5	Org-023	<0.5	[NT]	[NT]	[NT]	[NT]	86	[NT]
Ethylbenzene	mg/kg	1	Org-023	<1	[NT]	[NT]	[NT]	[NT]	95	[NT]
m+p-xylene	mg/kg	2	Org-023	<2	[NT]	[NT]	[NT]	[NT]	93	[NT]
o-Xylene	mg/kg	1	Org-023	<1	[NT]	[NT]	[NT]	[NT]	106	[NT]
naphthalene	mg/kg	1	Org-023	<1	[NT]	[NT]	[NT]	[NT]	[NT]	[NT]
Surrogate aaa-Trifluorotoluene	%		Org-023	109	[NT]	[NT]	[NT]	[NT]	107	[NT]

QUALITY CONTROL: svTRH (C10-C40) in Soil						Duplicate			Spike Recovery %	
Test Description	Units	PQL	Method	Blank	#	Base	Dup.	RPD	LCS-1	[NT]
Date extracted	-			21/07/2021	[NT]	[NT]	[NT]	[NT]	21/07/2021	[NT]
Date analysed	-			21/07/2021	[NT]	[NT]	[NT]	[NT]	21/07/2021	[NT]
TRH C_{10} - C_{14}	mg/kg	50	Org-020	<50	[NT]	[NT]	[NT]	[NT]	110	[NT]
TRH C_{15} - C_{28}	mg/kg	100	Org-020	<100	[NT]	[NT]	[NT]	[NT]	111	[NT]
TRH C_{29} - C_{36}	mg/kg	100	Org-020	<100	[NT]	[NT]	[NT]	[NT]	80	[NT]
TRH >C_{10} -C_{16}	mg/kg	50	Org-020	<50	[NT]	[NT]	[NT]	[NT]	110	[NT]
TRH >C_{16} -C_{34}	mg/kg	100	Org-020	<100	[NT]	[NT]	[NT]	[NT]	111	[NT]
TRH >C_{34} -C_{40}	mg/kg	100	Org-020	<100	[NT]	[NT]	[NT]	[NT]	80	[NT]
Surrogate o-Terphenyl	%		Org-020	91	[NT]	[NT]	[NT]	[NT]	114	[NT]

QUALITY CONTROL: PAHs in Soil						Duplicate			Spike Recovery %	
Test Description	Units	PQL	Method	Blank	#	Base	Dup.	RPD	LCS-1	[NT]
Date extracted	-			21/07/2021	[NT]	[NT]	[NT]	[NT]	21/07/2021	[NT]
Date analysed	-			21/07/2021	[NT]	[NT]	[NT]	[NT]	21/07/2021	[NT]
Naphthalene	mg/kg	0.1	Org-022/025	<0.1	[NT]	[NT]	[NT]	[NT]	101	[NT]
Acenaphthylene	mg/kg	0.1	Org-022/025	<0.1	[NT]	[NT]	[NT]	[NT]	[NT]	[NT]
Acenaphthene	mg/kg	0.1	Org-022/025	<0.1	[NT]	[NT]	[NT]	[NT]	84	[NT]
Fluorene	mg/kg	0.1	Org-022/025	<0.1	[NT]	[NT]	[NT]	[NT]	93	[NT]
Phenanthrene	mg/kg	0.1	Org-022/025	<0.1	[NT]	[NT]	[NT]	[NT]	111	[NT]
Anthracene	mg/kg	0.1	Org-022/025	<0.1	[NT]	[NT]	[NT]	[NT]	[NT]	[NT]
Fluoranthene	mg/kg	0.1	Org-022/025	<0.1	[NT]	[NT]	[NT]	[NT]	96	[NT]
Pyrene	mg/kg	0.1	Org-022/025	<0.1	[NT]	[NT]	[NT]	[NT]	100	[NT]
Benzo(a)anthracene	mg/kg	0.1	Org-022/025	<0.1	[NT]	[NT]	[NT]	[NT]	[NT]	[NT]
Chrysene	mg/kg	0.1	Org-022/025	<0.1	[NT]	[NT]	[NT]	[NT]	78	[NT]
Benzo(b,j+k)fluoranthene	mg/kg	0.2	Org-022/025	<0.2	[NT]	[NT]	[NT]	[NT]	[NT]	[NT]
Benzo(a)pyrene	mg/kg	0.05	Org-022/025	<0.05	[NT]	[NT]	[NT]	[NT]	92	[NT]
Indeno(1,2,3-c,d)pyrene	mg/kg	0.1	Org-022/025	<0.1	[NT]	[NT]	[NT]	[NT]	[NT]	[NT]
Dibenzo(a,h)anthracene	mg/kg	0.1	Org-022/025	<0.1	[NT]	[NT]	[NT]	[NT]	[NT]	[NT]
Benzo(g,h,i)perylene	mg/kg	0.1	Org-022/025	<0.1	[NT]	[NT]	[NT]	[NT]	[NT]	[NT]
Surrogate p-Terphenyl-d14	%		Org-022/025	105	[NT]	[NT]	[NT]	[NT]	104	[NT]

QUALITY CONTROL: Organochlorine Pesticides in soil					Duplicate				Spike Recovery %	
Test Description	Units	PQL	Method	Blank	#	Base	Dup.	RPD	LCS-1	[NT]
Date extracted	-			21/07/2021	[NT]	[NT]	[NT]	[NT]	21/07/2021	[NT]
Date analysed	-			22/07/2021	[NT]	[NT]	[NT]	[NT]	22/07/2021	[NT]
alpha-BHC	mg/kg	0.1	Org-022/025	<0.1	[NT]	[NT]	[NT]	[NT]	111	[NT]
HCB	mg/kg	0.1	Org-022/025	<0.1	[NT]	[NT]	[NT]	[NT]	[NT]	[NT]
beta-BHC	mg/kg	0.1	Org-022/025	<0.1	[NT]	[NT]	[NT]	[NT]	100	[NT]
gamma-BHC	mg/kg	0.1	Org-022/025	<0.1	[NT]	[NT]	[NT]	[NT]	[NT]	[NT]
Heptachlor	mg/kg	0.1	Org-022/025	<0.1	[NT]	[NT]	[NT]	[NT]	111	[NT]
delta-BHC	mg/kg	0.1	Org-022/025	<0.1	[NT]	[NT]	[NT]	[NT]	[NT]	[NT]
Aldrin	mg/kg	0.1	Org-022/025	<0.1	[NT]	[NT]	[NT]	[NT]	97	[NT]
Heptachlor Epoxide	mg/kg	0.1	Org-022/025	<0.1	[NT]	[NT]	[NT]	[NT]	99	[NT]
gamma-Chlordane	mg/kg	0.1	Org-022/025	<0.1	[NT]	[NT]	[NT]	[NT]	[NT]	[NT]
alpha-chlordane	mg/kg	0.1	Org-022/025	<0.1	[NT]	[NT]	[NT]	[NT]	[NT]	[NT]
Endosulfan I	mg/kg	0.1	Org-022/025	<0.1	[NT]	[NT]	[NT]	[NT]	[NT]	[NT]
pp-DDE	mg/kg	0.1	Org-022/025	<0.1	[NT]	[NT]	[NT]	[NT]	104	[NT]
Dieldrin	mg/kg	0.1	Org-022/025	<0.1	[NT]	[NT]	[NT]	[NT]	115	[NT]
Endrin	mg/kg	0.1	Org-022/025	<0.1	[NT]	[NT]	[NT]	[NT]	95	[NT]
Endosulfan II	mg/kg	0.1	Org-022/025	<0.1	[NT]	[NT]	[NT]	[NT]	[NT]	[NT]
pp-DDD	mg/kg	0.1	Org-022/025	<0.1	[NT]	[NT]	[NT]	[NT]	103	[NT]
Endrin Aldehyde	mg/kg	0.1	Org-022/025	<0.1	[NT]	[NT]	[NT]	[NT]	[NT]	[NT]
pp-DDT	mg/kg	0.1	Org-022/025	<0.1	[NT]	[NT]	[NT]	[NT]	[NT]	[NT]
Endosulfan Sulphate	mg/kg	0.1	Org-022/025	<0.1	[NT]	[NT]	[NT]	[NT]	65	[NT]
Methoxychlor	mg/kg	0.1	Org-022/025	<0.1	[NT]	[NT]	[NT]	[NT]	[NT]	[NT]
Surrogate TCMX	%		Org-022/025	96	[NT]	[NT]	[NT]	[NT]	98	[NT]

QUALITY CONTROL: Organophosphorus Pesticides in Soil					Duplicate				Spike Recovery %	
Test Description	Units	PQL	Method	Blank	#	Base	Dup.	RPD	LCS-1	[NT]
Date extracted	-			21/07/2021	[NT]	[NT]	[NT]	[NT]	21/07/2021	[NT]
Date analysed	-			22/07/2021	[NT]	[NT]	[NT]	[NT]	22/07/2021	[NT]
Dichlorvos	mg/kg	0.1	Org-022/025	<0.1	[NT]	[NT]	[NT]	[NT]	86	[NT]
Dimethoate	mg/kg	0.1	Org-022/025	<0.1	[NT]	[NT]	[NT]	[NT]	[NT]	[NT]
Diazinon	mg/kg	0.1	Org-022/025	<0.1	[NT]	[NT]	[NT]	[NT]	[NT]	[NT]
Chlorpyriphos-methyl	mg/kg	0.1	Org-022/025	<0.1	[NT]	[NT]	[NT]	[NT]	[NT]	[NT]
Ronnel	mg/kg	0.1	Org-022/025	<0.1	[NT]	[NT]	[NT]	[NT]	109	[NT]
Fenitrothion	mg/kg	0.1	Org-022/025	<0.1	[NT]	[NT]	[NT]	[NT]	91	[NT]
Malathion	mg/kg	0.1	Org-022/025	<0.1	[NT]	[NT]	[NT]	[NT]	71	[NT]
Chlorpyriphos	mg/kg	0.1	Org-022/025	<0.1	[NT]	[NT]	[NT]	[NT]	117	[NT]
Parathion	mg/kg	0.1	Org-022/025	<0.1	[NT]	[NT]	[NT]	[NT]	100	[NT]
Bromophos-ethyl	mg/kg	0.1	Org-022	<0.1	[NT]	[NT]	[NT]	[NT]	[NT]	[NT]
Ethion	mg/kg	0.1	Org-022/025	<0.1	[NT]	[NT]	[NT]	[NT]	83	[NT]
Azinphos-methyl (Guthion)	mg/kg	0.1	Org-022/025	<0.1	[NT]	[NT]	[NT]	[NT]	[NT]	[NT]
Surrogate TCMX	%		Org-022/025	96	[NT]	[NT]	[NT]	[NT]	98	[NT]

QUALITY CONTROL: PCBs in Soil						Duplicate			Spike Recovery %	
Test Description	Units	PQL	Method	Blank	#	Base	Dup.	RPD	LCS-1	[NT]
Date extracted	-			21/07/2021	[NT]	[NT]	[NT]	[NT]	21/07/2021	[NT]
Date analysed	-			22/07/2021	[NT]	[NT]	[NT]	[NT]	22/07/2021	[NT]
Aroclor 1016	mg/kg	0.1	Org-021	<0.1	[NT]	[NT]	[NT]	[NT]	[NT]	[NT]
Aroclor 1221	mg/kg	0.1	Org-021	<0.1	[NT]	[NT]	[NT]	[NT]	[NT]	[NT]
Aroclor 1232	mg/kg	0.1	Org-021	<0.1	[NT]	[NT]	[NT]	[NT]	[NT]	[NT]
Aroclor 1242	mg/kg	0.1	Org-021	<0.1	[NT]	[NT]	[NT]	[NT]	[NT]	[NT]
Aroclor 1248	mg/kg	0.1	Org-021	<0.1	[NT]	[NT]	[NT]	[NT]	[NT]	[NT]
Aroclor 1254	mg/kg	0.1	Org-021	<0.1	[NT]	[NT]	[NT]	[NT]	100	[NT]
Aroclor 1260	mg/kg	0.1	Org-021	<0.1	[NT]	[NT]	[NT]	[NT]	[NT]	[NT]
Surrogate TCMX	%		Org-021	96	[NT]	[NT]	[NT]	[NT]	98	[NT]

QUALITY CONTROL: Acid Extractable metals in soil						Duplicate			Spike Recovery %	
Test Description	Units	PQL	Method	Blank	#	Base	Dup.	RPD	LCS-1	[NT]
Date prepared	-			21/07/2021	[NT]	[NT]	[NT]	[NT]	21/07/2021	[NT]
Date analysed	-			21/07/2021	[NT]	[NT]	[NT]	[NT]	21/07/2021	[NT]
Arsenic	mg/kg	4	Metals-020	<4	[NT]	[NT]	[NT]	[NT]	99	[NT]
Cadmium	mg/kg	0.4	Metals-020	<0.4	[NT]	[NT]	[NT]	[NT]	94	[NT]
Chromium	mg/kg	1	Metals-020	<1	[NT]	[NT]	[NT]	[NT]	107	[NT]
Copper	mg/kg	1	Metals-020	<1	[NT]	[NT]	[NT]	[NT]	107	[NT]
Lead	mg/kg	1	Metals-020	<1	[NT]	[NT]	[NT]	[NT]	101	[NT]
Mercury	mg/kg	0.1	Metals-021	<0.1	[NT]	[NT]	[NT]	[NT]	94	[NT]
Nickel	mg/kg	1	Metals-020	<1	[NT]	[NT]	[NT]	[NT]	105	[NT]
Zinc	mg/kg	1	Metals-020	<1	[NT]	[NT]	[NT]	[NT]	107	[NT]
Tin	mg/kg	1	Metals-020	<1	[NT]	[NT]	[NT]	[NT]	99	[NT]

QUALITY CONTROL: Misc Inorg - Soil						Duplicate			Spike Recovery %	
Test Description	Units	PQL	Method	Blank	#	Base	Dup.	RPD	LCS-1	[NT]
Date prepared	-			22/07/2021	5	22/07/2021	22/07/2021		22/07/2021	[NT]
Date analysed	-			22/07/2021	5	22/07/2021	22/07/2021		22/07/2021	[NT]
pH 1:5 soil:water	pH Units		Inorg-001	[NT]	5	8.5	[NT]		102	[NT]
Total Organic Carbon (Walkley Black)	mg/kg	1000	Inorg-036	<1000	5	57000	61000	7	90	[NT]

QUALITY CONTROL: Misc Inorg - Soil						Duplicate			Spike Recovery %	
Test Description	Units	PQL	Method	Blank	#	Base	Dup.	RPD	[NT]	[NT]
Date prepared	-			[NT]	13	22/07/2021	22/07/2021		[NT]	[NT]
Date analysed	-			[NT]	13	22/07/2021	22/07/2021		[NT]	[NT]
pH 1:5 soil:water	pH Units		Inorg-001	[NT]	13	7.9	7.8	1	[NT]	[NT]

QUALITY CONTROL: CEC						Duplicate			Spike Recovery %	
Test Description	Units	PQL	Method	Blank	#	Base	Dup.	RPD	LCS-1	[NT]
Date prepared	-			23/07/2021	[NT]	[NT]	[NT]	[NT]	23/07/2021	[NT]
Date analysed	-			23/07/2021	[NT]	[NT]	[NT]	[NT]	23/07/2021	[NT]
Exchangeable Ca	meq/100g	0.1	Metals-020	<0.1	[NT]	[NT]	[NT]	[NT]	113	[NT]
Exchangeable K	meq/100g	0.1	Metals-020	<0.1	[NT]	[NT]	[NT]	[NT]	122	[NT]
Exchangeable Mg	meq/100g	0.1	Metals-020	<0.1	[NT]	[NT]	[NT]	[NT]	113	[NT]
Exchangeable Na	meq/100g	0.1	Metals-020	<0.1	[NT]	[NT]	[NT]	[NT]	126	[NT]

Result Definitions

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

Quality Control Definitions

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

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

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

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

Laboratory Acceptance Criteria

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

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

Spikes for Physical and Aggregate Tests are not applicable.

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

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

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

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

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

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

Measurement Uncertainty estimates are available for most tests upon request.

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

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

Report Comments

Asbestos: A portion of the supplied sample was sub-sampled for asbestos analysis according to Envirolab procedures.
We cannot guarantee that this sub-sample is indicative of the entire sample. Envirolab recommends supplying 40-50g of sample in its own container.
Note: Samples 274471-4,5,7,10,12,13 were sub-sampled from jars provided by the client.

Douglas Partners
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CHAIN OF CUSTODY DESPATCH SHEET

Project No:	202546.00	**Suburb:**	Cockle Bay	**To:**	*Envirolab Services*
Project Manager:	Rhys McMillan	**Order Number:**		**Sampler:**	*12 Ashley St, Chatswood NSW 2067*
Email:	Rhys.McMillan@douglaspartners.com.au / 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, 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: Metals, TRH, BTEX, PAH, OCP, OPP, PCB, Asbestos	Metals, TRH, BTEX, PAH, Asbestos	Metals, PAH, Asbestos	VOC	pH	TOC	CEC	BTEX	Phenols	Cresole / coal tar cresotes	TBT, Tin	Notes/ Preservation/ Additional Requirements
1	CW1	19	19.45	13/07/21	S													
2	CW1	20	20.95	13/07/21	S													
3	CW4	1.9	2	19/07/21	S													
4	CW4	2.5	2.95	19/07/21	S				X									
5	CW4	5.5	5.95	19/07/21	S			X			X	X						
6	CW6	2.7	3.5	16/07/21	S													
7	CW6	3.8	4.25	16/07/21	S				X	X	X							
8	CW6	5.9	6.15	16/07/21	S													
9	CW6	6.85	7.3	16/07/21	S													
10	SS1	0.5		14/07/21	S			X			X							
11	SS2	0.1		14/07/21	S													
12	SS2	(0.5) 0.3		14/07/21	S		X				X		X					
13	SS2	2.5	(2.67) 2.7		S				X		X							
14	BD1/14.07.21				S													

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

Job No: 274471
Date Received: 20/7/2021
Time Received:
Received By: 1340
Temp: ~~Cool~~/Ambient
Cooling: Ice/Icepack
Security: ~~Intact~~/Broken/None

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	**Date:** 20/07/2021	**Signed:**

LAB RECEIPT

Lab Ref. No:	274471
Received by:	RM
Date & Time:	20/7/2021 1340
Signed:	

Douglas Partners
Geotechnics | Environment | Groundwater

CHAIN OF CUSTODY DESPATCH SHEET

Project No:	202546.00	**Suburb:**	Cockle Bay	**To:**	*Envirolab Services*
Project Manager:	Rhys McMillan	**Order Number:**		**Dispatch date:**	**20/07/2021**
					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	Metals, TRH, BTEX, PAH, OCP, OPP, PCB	Metals, TRH, BTEX, PAH, Asbestos	Metals, PAH, Asbestos	VOC	pH	TOC	CEC	BTEX	Phenols	Cresole / coal tar cresotes	TBT, Tin	
15	BD08/130721																	

274471
20/7/2021 1340

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	Rhys McMillan

Sample Login Details

Your reference	202546.00, Cockle Bay
Envirolab Reference	274471
Date Sample Received	20/07/2021
Date Instructions Received	20/07/2021
Date Results Expected to be Reported	27/07/2021

Sample Condition

Samples received in appropriate condition for analysis	Yes
No. of Samples Provided	15 Soil
Turnaround Time Requested	Standard
Temperature on Receipt (°C)	4
Cooling Method	Ice Pack
Sampling Date Provided	YES

Comments

Nil

Please direct any queries to:

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

Analysis Underway, details on the following page:

Envirolab Services Pty Ltd
ABN 37 112 535 645
12 Ashley St Chatswood NSW 2067
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customerservice@envirolab.com.au
www.envirolab.com.au

Sample ID	VOCs in soil	vTRH(C6-C10)/BTEXN in Soil	svTRH (C10-C40) in Soil	PAHs in Soil	Organochlorine Pesticides in soil	Organophosphorus Pesticides in Soil	PCBsin Soil	Acid Extractable metalsin soil	Asbestos ID - soils	Misc Inorg - Soil	CEC	On Hold
CW1-19-19.45												✓
CW1-20-20.95												✓
CW4-1.9-2												✓
CW4-2.5-2.95				✓				✓	✓			
CW4-5.5-5.95		✓	✓	✓				✓	✓	✓		
CW6-2.7-3.5												✓
CW6-3.8-4.25	✓			✓				✓	✓	✓		
CW6-5.9-6.1												✓
CW6-6.85-7.3												✓
SS1-0.5		✓	✓	✓				✓	✓	✓		
SS2-1												✓
SS2-0.3		✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	
SS2-2.522.7				✓				✓	✓	✓		
BD1/14.07.21												✓
BD08/130721												✓

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

Additional Info

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

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

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

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

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customerservice@envirolab.com.au
www.envirolab.com.au

CERTIFICATE OF ANALYSIS 274471-A

Client Details

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

Sample Details

Your Reference	**202546.00, Cockle Bay**
Number of Samples	additional analysis
Date samples received	20/07/2021
Date completed instructions received	05/08/2021

Analysis Details

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

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

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

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

Report Details

Date results requested by	13/08/2021
Date of Issue	13/08/2021

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Results Approved By
Greta Petzold, Customer Service
Priya Samarawickrama, Senior Chemist

Authorised By

Nancy Zhang, Laboratory Manager

Misc Soil - Inorg				
Our Reference		274471-A-4	274471-A-10	274471-A-13
Your Reference	UNITS	CW4	SS1	SS2
Depth		2.5-2.95	0.5	2.5-2.7
Type of sample		Soil	Soil	Soil
Date Sampled		19/07/2021	14/07/2021	14/07/2021
Date prepared	-	09/08/2021	09/08/2021	09/08/2021
Date analysed	-	09/08/2021	09/08/2021	09/08/2021
Total Phenolics (as Phenol)	mg/kg	<5	<5	<5

Tributyl Tin in Soil		
Our Reference		274471-A-4
Your Reference	UNITS	CW4
Depth		2.5-2.95
Type of sample		Soil
Date Sampled		19/07/2021
Date extracted	-	12/08/2021
Date analysed	-	13/08/2021
Tributyltin as Sn	µg/kg	<0.5
Surrogate Triphenyltin	%	100

Method ID	Methodology Summary
Ext-054	Analysed by MPL Envirolab
Inorg-031	Total Phenolics by segmented flow analyser (in line distillation with colourimetric finish). Solids are extracted in a caustic media prior to analysis.

QUALITY CONTROL: Misc Soil - Inorg					Duplicate				Spike Recovery %	
Test Description	Units	PQL	Method	Blank	#	Base	Dup.	RPD	LCS-1	[NT]
Date prepared	-			09/08/2021	[NT]	[NT]	[NT]	[NT]	09/08/2021	[NT]
Date analysed	-			09/08/2021	[NT]	[NT]	[NT]	[NT]	09/08/2021	[NT]
Total Phenolics (as Phenol)	mg/kg	5	Inorg-031	<5	[NT]	[NT]	[NT]	[NT]	101	[NT]

QUALITY CONTROL: Tributyl Tin in Soil						Duplicate			Spike Recovery %	
Test Description	Units	PQL	Method	Blank	#	Base	Dup.	RPD	LCS-1	[NT]
Date extracted	-			12/08/2021	[NT]	[NT]	[NT]	[NT]	12/08/2021	[NT]
Date analysed	-			13/08/2021	[NT]	[NT]	[NT]	[NT]	13/08/2021	[NT]
Tributyltin as Sn	µg/kg	0.5	Ext-054	<0.5	[NT]	[NT]	[NT]	[NT]	106	[NT]
Surrogate Triphenyltin	%		Ext-054	100	[NT]	[NT]	[NT]	[NT]	100	[NT]

Result Definitions

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

Quality Control Definitions

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

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

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

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

Laboratory Acceptance Criteria

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

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

Spikes for Physical and Aggregate Tests are not applicable.

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

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

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

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

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

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

Measurement Uncertainty estimates are available for most tests upon request.

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

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

Report Comments

Out of recommended holding time

Tributyltin as Sn analysed by MPL Laboratories. Report No. 266847

Ming To

Subject: FW: Reports 273301, 274103, 274471 Cockle Bay

Ref: 274471-A.
TAT: Standard
Due: 13/08/2021 MT

From: Kurt Plambeck <kurt.plambeck@douglaspartners.com.au>
Sent: Thursday, 5 August 2021 4:42 PM
To: Simon Song <SSong@envirolab.com.au>
Subject: Reports 273301, 274103, 274471 Cockle Bay

CAUTION: This email originated from outside of the organisation. Do not act on instructions, click links or open attachments unless you recognise the sender and know the content is authentic and safe.

Simon,

Can you please run the below additional analysis

Sample ID	Lab Report	TCLP Hg	TCLP PAH	TBT	Cresols and coal tar	Total Phenols
CW5/0.5-0.6	273301		X			
CW6/0.5-0.6	273301		X			X
W4/10	273301			X		X
CW2/0.4-0.5	273301					X
CW1/12-12.45	274103			X		X
CW2/2.8-3.2	274103			X		X
CW5/2.0	274103			X	X	X
W1/8-8.45	274103			X	X	X
W3/10.75-11.2	274103			X	X	X
W5/8.8-9.23	274103	X		X	X	X
CW3/0.5	274103					X
4. CW4/2.5-2.95	274471			X		X
10. SS1/0.5	274471					X
13. SS2/2.5-2.7	274471					X

Also for report 274103 can you report tin for all samples that metals were tested for.

Regards

Ming To

From: Kurt Plambeck <kurt.plambeck@douglaspartners.com.au>
Sent: Thursday, 5 August 2021 5:08 PM
To: Simon Song
Cc: Ming To
Subject: RE: Reports 273301, 274103, 274471 Cockle Bay

274471-A.

Follow Up Flag: Follow up
Flag Status: Flagged

Categories: Additional

CAUTION: This email originated from outside of the organisation. Do not act on instructions, click links or open attachments unless you recognise the sender and know the content is authentic and safe.

Hi Simon,

That's fine. Client was warned about holding times and still took forever to approve the additional analysis

---

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

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From: Simon Song <SSong@envirolab.com.au>
Sent: Thursday, 5 August 2021 5:06 PM
To: Kurt Plambeck <kurt.plambeck@douglaspartners.com.au>
Cc: Ming To <MTo@envirolab.com.au>
Subject: RE: Reports 273301, 274103, 274471 Cockle Bay

Hi Kurt,
Is that ok they are out of recommended holding time?
For 'Cresols and coal tar', we just test PAH and Speciated Phenols, PAH had been done already, we can run Speciated Phenols only.

Kind Regards,

Simon Song | Senior Customer Service | Envirolab Services

Great Science. Great Service.

12 Ashley Street Chatswood NSW 2067
T 612 9910 6200
E SSong@envirolab.com.au | W www.envirolab.com.au

Envirolab Services Pty Ltd
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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	202546.00, Cockle Bay
Envirolab Reference	274471-A
Date Sample Received	20/07/2021
Date Instructions Received	05/08/2021
Date Results Expected to be Reported	13/08/2021

Sample Condition

Samples received in appropriate condition for analysis	Yes
No. of Samples Provided	additional analysis
Turnaround Time Requested	Standard
Temperature on Receipt (°C)	4
Cooling Method	Ice Pack
Sampling Date Provided	YES

Comments

Out of recommended holding time

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	Misc Soil - Inorg	Tributyl Tin in Soil	On Hold
CW1-19-19.45			✓
CW1-20-20.95			✓
CW4-1.9-2			✓
CW4-2.5-2.95	✓	✓	
CW4-5.5-5.95			✓
CW6-2.7-3.5			✓
CW6-3.8-4.25			✓
CW6-5.9-6.1			✓
CW6-6.85-7.3			✓
SS1-0.5	✓		
SS2-1			✓
SS2-0.3			✓
SS2-2.5-2.7	✓		
BD1/14.07.21			✓
BD08/130721			✓

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

Additional Info

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

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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 276326

Client Details

Client	Douglas Partners Pty Ltd
Attention	Rhys McMillan
Address	96 Hermitage Rd, West Ryde, NSW, 2114

Sample Details

Your Reference	**202546.00, Cockle Bay**
Number of Samples	8 Soil
Date samples received	20/08/2021
Date completed instructions received	20/08/2021

Analysis Details

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

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

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

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

Report Details

Date results requested by	27/08/2021
Date of Issue	27/08/2021

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

Results Approved By
Diego Bigolin, Inorganics Supervisor
Dragana Tomas, Senior Chemist
Hannah Nguyen, Metals Supervisor
Lucy Zhu, Asbestos Supervisor
Nick Sarlamis, Assistant Operation Manager
Steven Luong, Organics Supervisor

Authorised By



Nancy Zhang, Laboratory Manager

VOCs in soil		
Our Reference		276326-3
Your Reference	UNITS	CW7
Depth		2-2.1
Type of sample		Soil
Date extracted	-	23/08/2021
Date analysed	-	24/08/2021
Dichlorodifluoromethane	mg/kg	<1
Chloromethane	mg/kg	<1
Vinyl Chloride	mg/kg	<1
Bromomethane	mg/kg	<1
Chloroethane	mg/kg	<1
Trichlorofluoromethane	mg/kg	<1
1,1-Dichloroethene	mg/kg	<1
trans-1,2-dichloroethene	mg/kg	<1
1,1-dichloroethane	mg/kg	<1
cis-1,2-dichloroethene	mg/kg	<1
bromochloromethane	mg/kg	<1
chloroform	mg/kg	<1
2,2-dichloropropane	mg/kg	<1
1,2-dichloroethane	mg/kg	<1
1,1,1-trichloroethane	mg/kg	<1
1,1-dichloropropene	mg/kg	<1
Cyclohexane	mg/kg	<1
carbon tetrachloride	mg/kg	<1
Benzene	mg/kg	<0.2
dibromomethane	mg/kg	<1
1,2-dichloropropane	mg/kg	<1
trichloroethene	mg/kg	<1
bromodichloromethane	mg/kg	<1
trans-1,3-dichloropropene	mg/kg	<1
cis-1,3-dichloropropene	mg/kg	<1
1,1,2-trichloroethane	mg/kg	<1
Toluene	mg/kg	<0.5
1,3-dichloropropane	mg/kg	<1
dibromochloromethane	mg/kg	<1
1,2-dibromoethane	mg/kg	<1
tetrachloroethene	mg/kg	<1
1,1,1,2-tetrachloroethane	mg/kg	<1
chlorobenzene	mg/kg	<1
Ethylbenzene	mg/kg	<1

VOCs in soil		
Our Reference		276326-3
Your Reference	UNITS	CW7
Depth		2-2.1
Type of sample		Soil
bromoform	mg/kg	<1
m+p-xylene	mg/kg	<2
styrene	mg/kg	<1
1,1,2,2-tetrachloroethane	mg/kg	<1
o-Xylene	mg/kg	<1
1,2,3-trichloropropane	mg/kg	<1
isopropylbenzene	mg/kg	<1
bromobenzene	mg/kg	<1
n-propyl benzene	mg/kg	<1
2-chlorotoluene	mg/kg	<1
4-chlorotoluene	mg/kg	<1
1,3,5-trimethyl benzene	mg/kg	<1
tert-butyl benzene	mg/kg	<1
1,2,4-trimethyl benzene	mg/kg	<1
1,3-dichlorobenzene	mg/kg	<1
sec-butyl benzene	mg/kg	<1
1,4-dichlorobenzene	mg/kg	<1
4-isopropyl toluene	mg/kg	<1
1,2-dichlorobenzene	mg/kg	<1
n-butyl benzene	mg/kg	<1
1,2-dibromo-3-chloropropane	mg/kg	<1
1,2,4-trichlorobenzene	mg/kg	<1
hexachlorobutadiene	mg/kg	<1
1,2,3-trichlorobenzene	mg/kg	<1
Surrogate Dibromofluorometha	%	98
Surrogate aaa-Trifluorotoluene	%	96
Surrogate Toluene-d_8	%	97
Surrogate 4-Bromofluorobenzene	%	97

vTRH(C6-C10)/BTEXN in Soil						
Our Reference		276326-1	276326-3	276326-4	276326-7	276326-8
Your Reference	UNITS	CW3	CW7	CW7	Spike 3	Blank 3
Depth		4-4.45	2-2.1	4-4.1	-	-
Type of sample		Soil	Soil	Soil	Soil	Soil
Date extracted	-	23/08/2021	23/08/2021	23/08/2021	23/08/2021	23/08/2021
Date analysed	-	24/08/2021	24/08/2021	24/08/2021	24/08/2021	24/08/2021
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	94%	<0.2
Toluene	mg/kg	<0.5	<0.5	<0.5	95%	<0.5
Ethylbenzene	mg/kg	<1	<1	<1	94%	<1
m+p-xylene	mg/kg	<2	<2	<2	96%	<2
o-Xylene	mg/kg	<1	<1	<1	93%	<1
naphthalene	mg/kg	<1	<1	<1	[NA]	<1
Total +ve Xylenes	mg/kg	<3	<3	<3	[NA]	<3
Surrogate aaa-Trifluorotoluene	%	97	96	102	87	99

svTRH (C10-C40) in Soil				
Our Reference		276326-1	276326-3	276326-4
Your Reference	UNITS	CW3	CW7	CW7
Depth		4-4.45	2-2.1	4-4.1
Type of sample		Soil	Soil	Soil
Date extracted	-	23/08/2021	23/08/2021	23/08/2021
Date analysed	-	24/08/2021	24/08/2021	24/08/2021
TRH C_{10} - C_{14}	mg/kg	<50	<50	<50
TRH C_{15} - C_{28}	mg/kg	<100	<100	<100
TRH C_{29} - C_{36}	mg/kg	<100	<100	<100
Total +ve TRH (C10-C36)	mg/kg	<50	<50	<50
TRH >C_{10} -C_{16}	mg/kg	<50	<50	<50
TRH >C_{10} - C_{16} less Naphthalene (F2)	mg/kg	<50	<50	<50
TRH >C_{16} -C_{34}	mg/kg	<100	<100	<100
TRH >C_{34} -C_{40}	mg/kg	<100	<100	<100
Total +ve TRH (>C10-C40)	mg/kg	<50	<50	<50
Surrogate o-Terphenyl	%	91	84	85

PAHs in Soil				
Our Reference		276326-1	276326-3	276326-4
Your Reference	UNITS	CW3	CW7	CW7
Depth		4-4.45	2-2.1	4-4.1
Type of sample		Soil	Soil	Soil
Date extracted	-	23/08/2021	23/08/2021	23/08/2021
Date analysed	-	23/08/2021	23/08/2021	23/08/2021
Naphthalene	mg/kg	<0.1	<0.1	<0.1
Acenaphthylene	mg/kg	<0.1	<0.1	<0.1
Acenaphthene	mg/kg	<0.1	<0.1	<0.1
Fluorene	mg/kg	<0.1	<0.1	<0.1
Phenanthrene	mg/kg	<0.1	0.1	<0.1
Anthracene	mg/kg	<0.1	<0.1	<0.1
Fluoranthene	mg/kg	<0.1	0.3	<0.1
Pyrene	mg/kg	<0.1	0.3	<0.1
Benzo(a)anthracene	mg/kg	<0.1	0.2	<0.1
Chrysene	mg/kg	<0.1	0.2	<0.1
Benzo(b,j+k)fluoranthene	mg/kg	<0.2	0.3	<0.2
Benzo(a)pyrene	mg/kg	<0.05	0.2	<0.05
Indeno(1,2,3-c,d)pyrene	mg/kg	<0.1	<0.1	<0.1
Dibenzo(a,h)anthracene	mg/kg	<0.1	<0.1	<0.1
Benzo(g,h,i)perylene	mg/kg	<0.1	0.1	<0.1
Total +ve PAH's	mg/kg	<0.05	1.8	<0.05
Benzo(a)pyrene TEQ calc (zero)	mg/kg	<0.5	<0.5	<0.5
Benzo(a)pyrene TEQ calc(half)	mg/kg	<0.5	<0.5	<0.5
Benzo(a)pyrene TEQ calc(PQL)	mg/kg	<0.5	<0.5	<0.5
Surrogate p-Terphenyl-d14	%	98	103	91

Organochlorine Pesticides in soil		
Our Reference		276326-3
Your Reference	UNITS	CW7
Depth		2-2.1
Type of sample		Soil
Date extracted	-	23/08/2021
Date analysed	-	23/08/2021
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	%	94

Organophosphorus Pesticides in Soil		
Our Reference		276326-3
Your Reference	UNITS	CW7
Depth		2-2.1
Type of sample		Soil
Date extracted	-	23/08/2021
Date analysed	-	23/08/2021
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	%	94

PCBs in Soil		
Our Reference		276326-3
Your Reference	UNITS	CW7
Depth		2-2.1
Type of sample		Soil
Date extracted	-	23/08/2021
Date analysed	-	23/08/2021
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	%	94

Speciated Phenols in Soil		
Our Reference		276326-3
Your Reference	UNITS	CW7
Depth		2-2.1
Type of sample		Soil
Date extracted	-	23/08/2021
Date analysed	-	26/08/2021
Phenol	mg/kg	<0.2
2-Chlorophenol	mg/kg	<0.2
4-Chloro-3-methylphenol	mg/kg	<1
2-Methylphenol (o-cresol)	mg/kg	<0.2
3/4-Methylphenol (m/p-cresol)	mg/kg	<0.4
2-Nitrophenol	mg/kg	<0.2
2,4 -Dimethylphenol	mg/kg	<0.2
2,4-Dichlorophenol	mg/kg	<0.2
2,6-Dichlorophenol	mg/kg	<0.2
2,4,5-Trichlorophenol	mg/kg	<0.2
2,4,6-Trichlorophenol	mg/kg	<0.2
2,4-Dinitrophenol	mg/kg	<4
4-Nitrophenol	mg/kg	<4
2346-Tetrachlorophenol	mg/kg	<0.2
2-methyl-4,6-Dinitrophenol	mg/kg	<2
Pentachlorophenol	mg/kg	<1
Surrogate 2-fluorophenol	%	97
Surrogate Phenol-d_6	%	47
Surrogate 2,4,6-Tribromophenol	%	66
Surrogate p-Terphenyl-d_{14}	%	108

Acid Extractable metals in soil					
Our Reference		276326-1	276326-3	276326-4	276326-9
Your Reference	UNITS	CW3	CW7	CW7	CW7 - [TRIPLICATE]
Depth		4-4.45	2-2.1	4-4.1	2-2.1
Type of sample		Soil	Soil	Soil	Soil
Date prepared	-	23/08/2021	23/08/2021	23/08/2021	23/08/2021
Date analysed	-	23/08/2021	23/08/2021	23/08/2021	23/08/2021
Arsenic	mg/kg	<4	<4	<4	<4
Cadmium	mg/kg	<0.4	<0.4	<0.4	<0.4
Chromium	mg/kg	44	11	9	12
Copper	mg/kg	29	37	58	47
Lead	mg/kg	9	93	590	110
Mercury	mg/kg	<0.1	0.3	0.3	0.3
Nickel	mg/kg	17	19	9	15
Zinc	mg/kg	25	43	30	51
Tin	mg/kg	[NA]	64	[NA]	46

Moisture				
Our Reference		276326-1	276326-3	276326-4
Your Reference	UNITS	CW3	CW7	CW7
Depth		4-4.45	2-2.1	4-4.1
Type of sample		Soil	Soil	Soil
Date prepared	-	23/08/2021	23/08/2021	23/08/2021
Date analysed	-	24/08/2021	24/08/2021	24/08/2021
Moisture	%	13	14	22

Asbestos ID - soils				
Our Reference		276326-1	276326-3	276326-4
Your Reference	UNITS	CW3	CW7	CW7
Depth		4-4.45	2-2.1	4-4.1
Type of sample		Soil	Soil	Soil
Date analysed	-	26/08/2021	26/08/2021	26/08/2021
Sample mass tested	g	Approx. 35g	Approx. 30g	Approx. 35g
Sample Description	-	Grey rocks & aggregate	Brown coarse-grained soil & rocks	Brown coarse-grained soil & rocks
Asbestos ID in soil	-	No asbestos detected at reporting limit of 0.1g/kg Organic fibres detected	No asbestos detected at reporting limit of 0.1g/kg Organic fibres detected	No asbestos detected at reporting limit of 0.1g/kg Organic fibres detected
Trace Analysis	-	No asbestos detected	No asbestos detected	No asbestos detected

Misc Inorg - Soil		
Our Reference		276326-3
Your Reference	UNITS	CW7
Depth		2-2.1
Type of sample		Soil
Date prepared	-	24/08/2021
Date analysed	-	24/08/2021
pH 1:5 soil:water	pH Units	8.9

CEC		
Our Reference		276326-3
Your Reference	UNITS	CW7
Depth		2-2.1
Type of sample		Soil
Date prepared	-	26/08/2021
Date analysed	-	26/08/2021
Exchangeable Ca	meq/100g	13
Exchangeable K	meq/100g	0.2
Exchangeable Mg	meq/100g	1.4
Exchangeable Na	meq/100g	0.16
Cation Exchange Capacity	meq/100g	15

Misc Soil - Inorg		
Our Reference		276326-3
Your Reference	UNITS	CW7
Depth		2-2.1
Type of sample		Soil
Date prepared	-	24/08/2021
Date analysed	-	24/08/2021
Total Phenolics (as Phenol)	mg/kg	<5

Tributyl Tin in Soil		
Our Reference		276326-3
Your Reference	UNITS	CW7
Depth		2-2.1
Type of sample		Soil
Date extracted	-	26/08/2021
Date analysed	-	27/08/2021
Tributyltin as Sn	µg/kg	<0.5
Surrogate Triphenyltin	%	98

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.
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.
Metals-020	Determination of various metals by ICP-AES.
Metals-020	Determination of exchangeable cations and cation exchange capacity in soils using 1M Ammonium Chloride exchange and ICP-AES analytical finish.
Metals-021	Determination of Mercury by Cold Vapour AAS.
Org-020	Soil samples are extracted with Dichloromethane/Acetone and waters with Dichloromethane and analysed by GC-FID. F2 = (>C10-C16)-Naphthalene as per NEPM B1 Guideline on Investigation Levels for Soil and Groundwater (HSLs Tables 1A (3, 4)). Note Naphthalene is determined from the VOC analysis.
Org-020	Soil samples are extracted with Dichloromethane/Acetone and waters with Dichloromethane and analysed by GC-FID. F2 = (>C10-C16)-Naphthalene as per NEPM B1 Guideline on Investigation Levels for Soil and Groundwater (HSLs Tables 1A (3, 4)). Note Naphthalene is determined from the VOC analysis. Note, the Total +ve TRH PQL is reflective of the lowest individual PQL and is therefore "Total +ve TRH" is simply a sum of the positive individual TRH fractions (>C10-C40).
Org-021	Soil samples are extracted with dichloromethane/acetone and waters with dichloromethane and analysed by GC-ECD.
Org-021	Soil samples are extracted with dichloromethane/acetone and waters with dichloromethane and analysed by GC-ECD. Note, the Total +ve PCBs PQL is reflective of the lowest individual PQL and is therefore" Total +ve PCBs" is simply a sum of the positive individual PCBs.
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.

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

QUALITY CONTROL: VOCs in soil						Duplicate			Spike Recovery %	
Test Description	Units	PQL	Method	Blank	#	Base	Dup.	RPD	LCS-10	276326-3
Date extracted	-			23/08/2021	3	23/08/2021	23/08/2021		23/08/2021	23/08/2021
Date analysed	-			24/08/2021	3	24/08/2021	24/08/2021		24/08/2021	24/08/2021
Dichlorodifluoromethane	mg/kg	1	Org-023	<1	3	<1	<1	0	[NT]	[NT]
Chloromethane	mg/kg	1	Org-023	<1	3	<1	<1	0	[NT]	[NT]
Vinyl Chloride	mg/kg	1	Org-023	<1	3	<1	<1	0	[NT]	[NT]
Bromomethane	mg/kg	1	Org-023	<1	3	<1	<1	0	[NT]	[NT]
Chloroethane	mg/kg	1	Org-023	<1	3	<1	<1	0	[NT]	[NT]
Trichlorofluoromethane	mg/kg	1	Org-023	<1	3	<1	<1	0	[NT]	[NT]
1,1-Dichloroethene	mg/kg	1	Org-023	<1	3	<1	<1	0	[NT]	[NT]
trans-1,2-dichloroethene	mg/kg	1	Org-023	<1	3	<1	<1	0	[NT]	[NT]
1,1-dichloroethane	mg/kg	1	Org-023	<1	3	<1	<1	0	109	107
cis-1,2-dichloroethene	mg/kg	1	Org-023	<1	3	<1	<1	0	[NT]	[NT]
bromochloromethane	mg/kg	1	Org-023	<1	3	<1	<1	0	[NT]	[NT]
chloroform	mg/kg	1	Org-023	<1	3	<1	<1	0	108	107
2,2-dichloropropane	mg/kg	1	Org-023	<1	3	<1	<1	0	[NT]	[NT]
1,2-dichloroethane	mg/kg	1	Org-023	<1	3	<1	<1	0	112	110
1,1,1-trichloroethane	mg/kg	1	Org-023	<1	3	<1	<1	0	108	105
1,1-dichloropropene	mg/kg	1	Org-023	<1	3	<1	<1	0	[NT]	[NT]
Cyclohexane	mg/kg	1	Org-023	<1	3	<1	<1	0	[NT]	[NT]
carbon tetrachloride	mg/kg	1	Org-023	<1	3	<1	<1	0	[NT]	[NT]
Benzene	mg/kg	0.2	Org-023	<0.2	3	<0.2	<0.2	0	[NT]	[NT]
dibromomethane	mg/kg	1	Org-023	<1	3	<1	<1	0	[NT]	[NT]
1,2-dichloropropane	mg/kg	1	Org-023	<1	3	<1	<1	0	[NT]	[NT]
trichloroethene	mg/kg	1	Org-023	<1	3	<1	<1	0	88	86
bromodichloromethane	mg/kg	1	Org-023	<1	3	<1	<1	0	105	103
trans-1,3-dichloropropene	mg/kg	1	Org-023	<1	3	<1	<1	0	[NT]	[NT]
cis-1,3-dichloropropene	mg/kg	1	Org-023	<1	3	<1	<1	0	[NT]	[NT]
1,1,2-trichloroethane	mg/kg	1	Org-023	<1	3	<1	<1	0	[NT]	[NT]
Toluene	mg/kg	0.5	Org-023	<0.5	3	<0.5	<0.5	0	[NT]	[NT]
1,3-dichloropropane	mg/kg	1	Org-023	<1	3	<1	<1	0	[NT]	[NT]
dibromochloromethane	mg/kg	1	Org-023	<1	3	<1	<1	0	89	87
1,2-dibromoethane	mg/kg	1	Org-023	<1	3	<1	<1	0	[NT]	[NT]
tetrachloroethene	mg/kg	1	Org-023	<1	3	<1	<1	0	94	92
1,1,1,2-tetrachloroethane	mg/kg	1	Org-023	<1	3	<1	<1	0	[NT]	[NT]
chlorobenzene	mg/kg	1	Org-023	<1	3	<1	<1	0	[NT]	[NT]
Ethylbenzene	mg/kg	1	Org-023	<1	3	<1	<1	0	[NT]	[NT]
bromoform	mg/kg	1	Org-023	<1	3	<1	<1	0	[NT]	[NT]
m+p-xylene	mg/kg	2	Org-023	<2	3	<2	<2	0	[NT]	[NT]
styrene	mg/kg	1	Org-023	<1	3	<1	<1	0	[NT]	[NT]
1,1,2,2-tetrachloroethane	mg/kg	1	Org-023	<1	3	<1	<1	0	[NT]	[NT]

QUALITY CONTROL: VOCs in soil						Duplicate			Spike Recovery %	
Test Description	Units	PQL	Method	Blank	#	Base	Dup.	RPD	LCS-10	276326-3
o-Xylene	mg/kg	1	Org-023	<1	3	<1	<1	0	[NT]	[NT]
1,2,3-trichloropropane	mg/kg	1	Org-023	<1	3	<1	<1	0	[NT]	[NT]
isopropylbenzene	mg/kg	1	Org-023	<1	3	<1	<1	0	[NT]	[NT]
bromobenzene	mg/kg	1	Org-023	<1	3	<1	<1	0	[NT]	[NT]
n-propyl benzene	mg/kg	1	Org-023	<1	3	<1	<1	0	[NT]	[NT]
2-chlorotoluene	mg/kg	1	Org-023	<1	3	<1	<1	0	[NT]	[NT]
4-chlorotoluene	mg/kg	1	Org-023	<1	3	<1	<1	0	[NT]	[NT]
1,3,5-trimethyl benzene	mg/kg	1	Org-023	<1	3	<1	<1	0	[NT]	[NT]
tert-butyl benzene	mg/kg	1	Org-023	<1	3	<1	<1	0	[NT]	[NT]
1,2,4-trimethyl benzene	mg/kg	1	Org-023	<1	3	<1	<1	0	[NT]	[NT]
1,3-dichlorobenzene	mg/kg	1	Org-023	<1	3	<1	<1	0	[NT]	[NT]
sec-butyl benzene	mg/kg	1	Org-023	<1	3	<1	<1	0	[NT]	[NT]
1,4-dichlorobenzene	mg/kg	1	Org-023	<1	3	<1	<1	0	[NT]	[NT]
4-isopropyl toluene	mg/kg	1	Org-023	<1	3	<1	<1	0	[NT]	[NT]
1,2-dichlorobenzene	mg/kg	1	Org-023	<1	3	<1	<1	0	[NT]	[NT]
n-butyl benzene	mg/kg	1	Org-023	<1	3	<1	<1	0	[NT]	[NT]
1,2-dibromo-3-chloropropane	mg/kg	1	Org-023	<1	3	<1	<1	0	[NT]	[NT]
1,2,4-trichlorobenzene	mg/kg	1	Org-023	<1	3	<1	<1	0	[NT]	[NT]
hexachlorobutadiene	mg/kg	1	Org-023	<1	3	<1	<1	0	[NT]	[NT]
1,2,3-trichlorobenzene	mg/kg	1	Org-023	<1	3	<1	<1	0	[NT]	[NT]
Surrogate Dibromofluorometha	%		Org-023	98	3	98	98	0	100	100
Surrogate aaa-Trifluorotoluene	%		Org-023	100	3	96	93	3	100	97
Surrogate Toluene-d_8	%		Org-023	97	3	97	97	0	99	100
Surrogate 4-Bromofluorobenzene	%		Org-023	95	3	97	96	1	94	94

QUALITY CONTROL: vTRH(C6-C10)/BTEXN in Soil						Duplicate			Spike Recovery %	
Test Description	Units	PQL	Method	Blank	#	Base	Dup.	RPD	LCS-10	276326-3
Date extracted	-			24/08/2021	3	23/08/2021	23/08/2021		23/08/2021	23/08/2021
Date analysed	-			24/08/2021	3	24/08/2021	24/08/2021		24/08/2021	24/08/2021
TRH C_6 - C_9	mg/kg	25	Org-023	<25	3	<25	<25	0	108	105
TRH C_6 - C_{10}	mg/kg	25	Org-023	<25	3	<25	<25	0	108	105
Benzene	mg/kg	0.2	Org-023	<0.2	3	<0.2	<0.2	0	108	105
Toluene	mg/kg	0.5	Org-023	<0.5	3	<0.5	<0.5	0	105	103
Ethylbenzene	mg/kg	1	Org-023	<1	3	<1	<1	0	111	107
m+p-xylene	mg/kg	2	Org-023	<2	3	<2	<2	0	109	105
o-Xylene	mg/kg	1	Org-023	<1	3	<1	<1	0	106	102
naphthalene	mg/kg	1	Org-023	<1	3	<1	<1	0	[NT]	[NT]
Surrogate aaa-Trifluorotoluene	%		Org-023	122	3	96	93	3	100	97

QUALITY CONTROL: svTRH (C10-C40) in Soil						Duplicate			Spike Recovery %	
Test Description	Units	PQL	Method	Blank	#	Base	Dup.	RPD	LCS-10	276326-3
Date extracted	-			23/08/2021	3	23/08/2021	23/08/2021		23/08/2021	23/08/2021
Date analysed	-			24/08/2021	3	24/08/2021	24/08/2021		24/08/2021	24/08/2021
TRH C_{10} - C_{14}	mg/kg	50	Org-020	<50	3	<50	<50	0	117	106
TRH C_{15} - C_{28}	mg/kg	100	Org-020	<100	3	<100	<100	0	117	99
TRH C_{29} - C_{36}	mg/kg	100	Org-020	<100	3	<100	<100	0	102	93
TRH >C_{10} -C_{16}	mg/kg	50	Org-020	<50	3	<50	<50	0	117	106
TRH >C_{16} -C_{34}	mg/kg	100	Org-020	<100	3	<100	<100	0	117	99
TRH >C_{34} -C_{40}	mg/kg	100	Org-020	<100	3	<100	<100	0	102	93
Surrogate o-Terphenyl	%		Org-020	89	3	84	88	5	120	113

QUALITY CONTROL: PAHs in Soil						Duplicate			Spike Recovery %	
Test Description	Units	PQL	Method	Blank	#	Base	Dup.	RPD	LCS-10	276326-3
Date extracted	-			23/08/2021	3	23/08/2021	23/08/2021		23/08/2021	23/08/2021
Date analysed	-			23/08/2021	3	23/08/2021	23/08/2021		23/08/2021	23/08/2021
Naphthalene	mg/kg	0.1	Org-022/025	<0.1	3	<0.1	<0.1	0	105	88
Acenaphthylene	mg/kg	0.1	Org-022/025	<0.1	3	<0.1	<0.1	0	[NT]	[NT]
Acenaphthene	mg/kg	0.1	Org-022/025	<0.1	3	<0.1	<0.1	0	72	66
Fluorene	mg/kg	0.1	Org-022/025	<0.1	3	<0.1	<0.1	0	91	82
Phenanthrene	mg/kg	0.1	Org-022/025	<0.1	3	0.1	0.2	67	111	96
Anthracene	mg/kg	0.1	Org-022/025	<0.1	3	<0.1	<0.1	0	[NT]	[NT]
Fluoranthene	mg/kg	0.1	Org-022/025	<0.1	3	0.3	0.3	0	98	86
Pyrene	mg/kg	0.1	Org-022/025	<0.1	3	0.3	0.4	29	95	86
Benzo(a)anthracene	mg/kg	0.1	Org-022/025	<0.1	3	0.2	0.3	40	[NT]	[NT]
Chrysene	mg/kg	0.1	Org-022/025	<0.1	3	0.2	0.2	0	90	84
Benzo(b,j+k)fluoranthene	mg/kg	0.2	Org-022/025	<0.2	3	0.3	0.3	0	[NT]	[NT]
Benzo(a)pyrene	mg/kg	0.05	Org-022/025	<0.05	3	0.2	0.2	0	93	90
Indeno(1,2,3-c,d)pyrene	mg/kg	0.1	Org-022/025	<0.1	3	<0.1	<0.1	0	[NT]	[NT]
Dibenzo(a,h)anthracene	mg/kg	0.1	Org-022/025	<0.1	3	<0.1	<0.1	0	[NT]	[NT]
Benzo(g,h,i)perylene	mg/kg	0.1	Org-022/025	<0.1	3	0.1	<0.1	0	[NT]	[NT]
Surrogate p-Terphenyl-d14	%		Org-022/025	82	3	103	100	3	81	77

QUALITY CONTROL: Organochlorine Pesticides in soil						Duplicate			Spike Recovery %	
Test Description	Units	PQL	Method	Blank	#	Base	Dup.	RPD	LCS-10	276326-3
Date extracted	-			23/08/2021	3	23/08/2021	23/08/2021		23/08/2021	23/08/2021
Date analysed	-			23/08/2021	3	23/08/2021	23/08/2021		23/08/2021	23/08/2021
alpha-BHC	mg/kg	0.1	Org-022/025	<0.1	3	<0.1	<0.1	0	101	90
HCB	mg/kg	0.1	Org-022/025	<0.1	3	<0.1	<0.1	0	[NT]	[NT]
beta-BHC	mg/kg	0.1	Org-022/025	<0.1	3	<0.1	<0.1	0	100	91
gamma-BHC	mg/kg	0.1	Org-022/025	<0.1	3	<0.1	<0.1	0	[NT]	[NT]
Heptachlor	mg/kg	0.1	Org-022/025	<0.1	3	<0.1	<0.1	0	93	83
delta-BHC	mg/kg	0.1	Org-022/025	<0.1	3	<0.1	<0.1	0	[NT]	[NT]
Aldrin	mg/kg	0.1	Org-022/025	<0.1	3	<0.1	<0.1	0	94	85
Heptachlor Epoxide	mg/kg	0.1	Org-022/025	<0.1	3	<0.1	<0.1	0	101	95
gamma-Chlordane	mg/kg	0.1	Org-022/025	<0.1	3	<0.1	<0.1	0	[NT]	[NT]
alpha-chlordane	mg/kg	0.1	Org-022/025	<0.1	3	<0.1	<0.1	0	[NT]	[NT]
Endosulfan I	mg/kg	0.1	Org-022/025	<0.1	3	<0.1	<0.1	0	[NT]	[NT]
pp-DDE	mg/kg	0.1	Org-022/025	<0.1	3	<0.1	<0.1	0	92	91
Dieldrin	mg/kg	0.1	Org-022/025	<0.1	3	<0.1	<0.1	0	101	95
Endrin	mg/kg	0.1	Org-022/025	<0.1	3	<0.1	<0.1	0	91	93
Endosulfan II	mg/kg	0.1	Org-022/025	<0.1	3	<0.1	<0.1	0	[NT]	[NT]
pp-DDD	mg/kg	0.1	Org-022/025	<0.1	3	<0.1	<0.1	0	83	81
Endrin Aldehyde	mg/kg	0.1	Org-022/025	<0.1	3	<0.1	<0.1	0	[NT]	[NT]
pp-DDT	mg/kg	0.1	Org-022/025	<0.1	3	<0.1	<0.1	0	[NT]	[NT]
Endosulfan Sulphate	mg/kg	0.1	Org-022/025	<0.1	3	<0.1	<0.1	0	91	88
Methoxychlor	mg/kg	0.1	Org-022/025	<0.1	3	<0.1	<0.1	0	[NT]	[NT]
Surrogate TCMX	%		Org-022/025	82	3	94	95	1	87	79

QUALITY CONTROL: Organophosphorus Pesticides in Soil						Duplicate			Spike Recovery %	
Test Description	Units	PQL	Method	Blank	#	Base	Dup.	RPD	LCS-10	276326-3
Date extracted	-			23/08/2021	3	23/08/2021	23/08/2021		23/08/2021	23/08/2021
Date analysed	-			23/08/2021	3	23/08/2021	23/08/2021		23/08/2021	23/08/2021
Dichlorvos	mg/kg	0.1	Org-022/025	<0.1	3	<0.1	<0.1	0	98	83
Dimethoate	mg/kg	0.1	Org-022/025	<0.1	3	<0.1	<0.1	0	[NT]	[NT]
Diazinon	mg/kg	0.1	Org-022/025	<0.1	3	<0.1	<0.1	0	[NT]	[NT]
Chlorpyriphos-methyl	mg/kg	0.1	Org-022/025	<0.1	3	<0.1	<0.1	0	[NT]	[NT]
Ronnel	mg/kg	0.1	Org-022/025	<0.1	3	<0.1	<0.1	0	89	82
Fenitrothion	mg/kg	0.1	Org-022/025	<0.1	3	<0.1	<0.1	0	81	91
Malathion	mg/kg	0.1	Org-022/025	<0.1	3	<0.1	<0.1	0	96	92
Chlorpyriphos	mg/kg	0.1	Org-022/025	<0.1	3	<0.1	<0.1	0	103	92
Parathion	mg/kg	0.1	Org-022/025	<0.1	3	<0.1	<0.1	0	78	82
Bromophos-ethyl	mg/kg	0.1	Org-022	<0.1	3	<0.1	<0.1	0	[NT]	[NT]
Ethion	mg/kg	0.1	Org-022/025	<0.1	3	<0.1	<0.1	0	93	77
Azinphos-methyl (Guthion)	mg/kg	0.1	Org-022/025	<0.1	3	<0.1	<0.1	0	[NT]	[NT]
Surrogate TCMX	%		Org-022/025	82	3	94	95	1	87	79

QUALITY CONTROL: PCBs in Soil						Duplicate			Spike Recovery %	
Test Description	Units	PQL	Method	Blank	#	Base	Dup.	RPD	LCS-10	276326-3
Date extracted	-			23/08/2021	3	23/08/2021	23/08/2021		23/08/2021	23/08/2021
Date analysed	-			23/08/2021	3	23/08/2021	23/08/2021		23/08/2021	23/08/2021
Aroclor 1016	mg/kg	0.1	Org-021	<0.1	3	<0.1	<0.1	0	[NT]	[NT]
Aroclor 1221	mg/kg	0.1	Org-021	<0.1	3	<0.1	<0.1	0	[NT]	[NT]
Aroclor 1232	mg/kg	0.1	Org-021	<0.1	3	<0.1	<0.1	0	[NT]	[NT]
Aroclor 1242	mg/kg	0.1	Org-021	<0.1	3	<0.1	<0.1	0	[NT]	[NT]
Aroclor 1248	mg/kg	0.1	Org-021	<0.1	3	<0.1	<0.1	0	[NT]	[NT]
Aroclor 1254	mg/kg	0.1	Org-021	<0.1	3	<0.1	<0.1	0	98	102
Aroclor 1260	mg/kg	0.1	Org-021	<0.1	3	<0.1	<0.1	0	[NT]	[NT]
Surrogate TCMX	%		Org-021	82	3	94	95	1	87	79

QUALITY CONTROL: Speciated Phenols in Soil						Duplicate			Spike Recovery %	
Test Description	Units	PQL	Method	Blank	#	Base	Dup.	RPD	LCS-10	276326-3
Date extracted	-			23/08/2021	3	23/08/2021	23/08/2021		23/08/2021	23/08/2021
Date analysed	-			26/08/2021	3	26/08/2021	26/08/2021		26/08/2021	26/08/2021
Phenol	mg/kg	0.2	Org-022/025	<0.2	3	<0.2	<0.2	0	94	88
2-Chlorophenol	mg/kg	0.2	Org-022/025	<0.2	3	<0.2	<0.2	0	100	96
4-Chloro-3-methylphenol	mg/kg	1	Org-022/025	<1	3	<1	<1	0	[NT]	[NT]
2-Methylphenol (o-cresol)	mg/kg	0.2	Org-022/025	<0.2	3	<0.2	<0.2	0	92	88
3/4-Methylphenol (m/p-cresol)	mg/kg	0.4	Org-022/025	<0.4	3	<0.4	<0.4	0	[NT]	[NT]
2-Nitrophenol	mg/kg	0.2	Org-022/025	<0.2	3	<0.2	<0.2	0	[NT]	[NT]
2,4 -Dimethylphenol	mg/kg	0.2	Org-022/025	<0.2	3	<0.2	<0.2	0	[NT]	[NT]
2,4-Dichlorophenol	mg/kg	0.2	Org-022/025	<0.2	3	<0.2	<0.2	0	[NT]	[NT]
2,6-Dichlorophenol	mg/kg	0.2	Org-022/025	<0.2	3	<0.2	<0.2	0	90	78
2,4,5-Trichlorophenol	mg/kg	0.2	Org-022/025	<0.2	3	<0.2	<0.2	0	[NT]	[NT]
2,4,6-Trichlorophenol	mg/kg	0.2	Org-022/025	<0.2	3	<0.2	<0.2	0	[NT]	[NT]
2,4-Dinitrophenol	mg/kg	4	Org-022/025	<4	3	<4	<4	0	[NT]	[NT]
4-Nitrophenol	mg/kg	4	Org-022/025	<4	3	<4	<4	0	122	114
2346-Tetrachlorophenol	mg/kg	0.2	Org-022/025	<0.2	3	<0.2	<0.2	0	[NT]	[NT]
2-methyl-4,6-Dinitrophenol	mg/kg	2	Org-022/025	<2	3	<2	<2	0	[NT]	[NT]
Pentachlorophenol	mg/kg	1	Org-022/025	<1	3	<1	<1	0	62	96
Surrogate 2-fluorophenol	%		Org-022/025	91	3	97	98	1	90	86
Surrogate Phenol-d_6	%		Org-022/025	98	3	47	97	69	97	89
Surrogate 2,4,6-Tribromophenol	%		Org-022/025	65	3	66	57	15	72	63
Surrogate p-Terphenyl-d_{14}	%		Org-022/025	102	3	108	102	6	98	93

QUALITY CONTROL: Acid Extractable metals in soil						Duplicate			Spike Recovery %	
Test Description	Units	PQL	Method	Blank	#	Base	Dup.	RPD	LCS-1	276326-3
Date prepared	-			23/08/2021	3	23/08/2021	23/08/2021		23/08/2021	23/08/2021
Date analysed	-			23/08/2021	3	23/08/2021	23/08/2021		23/08/2021	23/08/2021
Arsenic	mg/kg	4	Metals-020	<4	3	<4	<4	0	110	91
Cadmium	mg/kg	0.4	Metals-020	<0.4	3	<0.4	<0.4	0	111	92
Chromium	mg/kg	1	Metals-020	<1	3	11	12	9	108	99
Copper	mg/kg	1	Metals-020	<1	3	37	34	8	109	100
Lead	mg/kg	1	Metals-020	<1	3	93	85	9	104	#
Mercury	mg/kg	0.1	Metals-021	<0.1	3	0.3	0.3	0	103	92
Nickel	mg/kg	1	Metals-020	<1	3	19	18	5	108	113
Zinc	mg/kg	1	Metals-020	<1	3	43	41	5	108	#
Tin	mg/kg	1	Metals-020	<1	3	64	37	53	91	#

QUALITY CONTROL: Misc Inorg - Soil						Duplicate			Spike Recovery %	
Test Description	Units	PQL	Method	Blank	#	Base	Dup.	RPD	LCS-10	[NT]
Date prepared	-			23/08/2021	[NT]	[NT]	[NT]	[NT]	23/08/2021	[NT]
Date analysed	-			23/08/2021	[NT]	[NT]	[NT]	[NT]	23/08/2021	[NT]
pH 1:5 soil:water	pH Units		Inorg-001	[NT]	[NT]	[NT]	[NT]	[NT]	100	[NT]

QUALITY CONTROL: CEC						Duplicate			Spike Recovery %	
Test Description	Units	PQL	Method	Blank	#	Base	Dup.	RPD	LCS-10	[NT]
Date prepared	-			26/08/2021	3	26/08/2021	26/08/2021		26/08/2021	[NT]
Date analysed	-			26/08/2021	3	26/08/2021	26/08/2021		26/08/2021	[NT]
Exchangeable Ca	meq/100g	0.1	Metals-020	<0.1	3	13	15	14	105	[NT]
Exchangeable K	meq/100g	0.1	Metals-020	<0.1	3	0.2	0.2	0	105	[NT]
Exchangeable Mg	meq/100g	0.1	Metals-020	<0.1	3	1.4	1.5	7	103	[NT]
Exchangeable Na	meq/100g	0.1	Metals-020	<0.1	3	0.16	0.17	6	112	[NT]

QUALITY CONTROL: Misc Soil - Inorg						Duplicate			Spike Recovery %	
Test Description	Units	PQL	Method	Blank	#	Base	Dup.	RPD	LCS-10	[NT]
Date prepared	-			24/08/2021	3	24/08/2021	24/08/2021		24/08/2021	[NT]
Date analysed	-			24/08/2021	3	24/08/2021	24/08/2021		24/08/2021	[NT]
Total Phenolics (as Phenol)	mg/kg	5	Inorg-031	<5	3	<5	<5	0	101	[NT]

QUALITY CONTROL: Tributyl Tin in Soil						Duplicate			Spike Recovery %	
Test Description	Units	PQL	Method	Blank	#	Base	Dup.	RPD	LCS-10	[NT]
Date extracted	-			26/08/2021	3	26/08/2021	26/08/2021		26/08/2021	[NT]
Date analysed	-			27/08/2021	3	27/08/2021	27/08/2021		27/08/2021	[NT]
Tributyltin as Sn	µg/kg	0.5	Ext-054	<0.5	3	<0.5	<0.5	0	89	[NT]
Surrogate Triphenyltin	%		Ext-054	110	3	98	97	1	97	[NT]

Result Definitions

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

Quality Control Definitions

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

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

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

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

Laboratory Acceptance Criteria

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

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

Spikes for Physical and Aggregate Tests are not applicable.

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

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

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

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

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

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

Measurement Uncertainty estimates are available for most tests upon request.

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

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

Report Comments

8 metals in soil:
- # Percent recovery is not possible to report due to the inhomogeneous nature of the elements in the sample. However an acceptable recovery was obtained for the LCS.
- The laboratory RPD acceptance criteria has been exceeded for 276326-3 for Sn. Therefore a triplicate result has been issued as laboratory sample number 276326-9.

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

TBT_S analysed by MPL report#267669

Douglas Partners
Geotechnics | Environment | Groundwater

CHAIN OF CUSTODY DESPATCH SHEET

Project No:	202546.00	**Suburb:**	Cockle Bay	**To:**	*Envirolab Services*
Project Manager:	Rhys McMillan	**Order Number:**		**Sampler:**	*12 Ashley St, Chatswood NSW 2067*
Email:	Rhys.McMillan@douglaspartners.com.au / 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: Metals, TRH, PAH, OCP, OPP, PCB, Asbestos	Metals, TRH, PAH, Asbestos	Metals, PAH, Asbestos	VOC	pH	TOC	CEC	BTEX	Phenols	Cresole / coal tar cresotes	TBT, Tin	Notes/ Preservation/ Additional Requirements
1	CW3	4	4.45					X										
2	CW3	5.7	6.15															
3	CW7	2	2.1				X			X	X		X		X	X	X	
4	CW7	4	4.1					X										
5	BD1/040821							X										intra-lab dup
6	BD1/040821													X				
7	Spike 3													X				
8	Blank 3																	

ENVIROLAB GROUP

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

Job No: 276326
Date Received: 20/08/21
Time Received: 1545
Received By: CH
Temp: Cool/Ambient
Cooling: Ice/Icepack 4°C
Security: Intact/Broken/None

Metals to analyse:		**LAB RECEIPT**	
Number of samples in container:	**Transported to laboratory by:**	**Lab Ref. No:**	
Send results to:	Douglas Partners Pty Ltd	**Received by:**	Christine
Address:	96 Hermitage Road, West Ryde NSW 2114 **Phone:** (02) 9809 0666	**Date & Time:**	20/08/21 1545
Relinquished by:	RP 20/8/21 **Date:** **Signed:**	**Signed:**	
Project Manager:	Rhys McMillan **Order Number:** **Dispatch date:**		*12 Ashley St, Chatswood NSW 2067*

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	Rhys McMillan

Sample Login Details

Your reference	202546.00, Cockle Bay
Envirolab Reference	276326
Date Sample Received	20/08/2021
Date Instructions Received	20/08/2021
Date Results Expected to be Reported	27/08/2021

Sample Condition

Samples received in appropriate condition for analysis	Yes
No. of Samples Provided	8 Soil
Turnaround Time Requested	Standard
Temperature on Receipt (°C)	4
Cooling Method	Ice
Sampling Date Provided	Not Provided on the COC

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	VOCs in soil	vTRH(C6-C10)/BTEXN in Soil	svTRH (C10-C40) in Soil	PAHs in Soil	Organochlorine Pesticides in soil	Organophosphorus Pesticides in Soil	PCBsin Soil	Speciated Phenols in Soil	Acid Extractable metalsin soil	Asbestos ID - soils	Misc Inorg - Soil	CEC	Misc Soil - Inorg	Tributyl Tin in Soil	On Hold
CW3-4-4.45		✓	✓	✓					✓	✓					
CW3-3.7-6.15															✓
CW7-2-2.1	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	
CW7-4-4.1		✓	✓	✓					✓	✓					
BD1/040821															✓
BD1/090821															✓
Spike 3		✓													
Blank 3		✓													

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

Additional Info

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

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CERTIFICATE OF ANALYSIS 276326-A

Client Details

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

Sample Details

Your Reference	**202546.00, Cockle Bay**
Number of Samples	additional analysis
Date samples received	20/08/2021
Date completed instructions received	30/08/2021

Analysis Details

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

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

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

Report Details

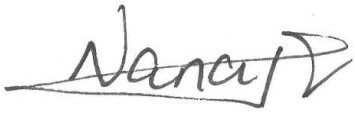
Date results requested by	06/09/2021
Date of Issue	06/09/2021

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Results Approved By
Jaimie Loa-Kum-Cheung, Senior Chemist

Authorised By



Nancy Zhang, Laboratory Manager

Metals from Leaching Fluid pH 2.9 or 5		
Our Reference		276326-A-4
Your Reference	UNITS	CW7
Depth		4-4.1
Type of sample		Soil
Date extracted	-	06/09/2021
Date analysed	-	06/09/2021
pH of soil for fluid# determ.	pH units	8.7
pH of soil TCLP (after HCl)	pH units	1.8
Extraction fluid used	-	1
pH of final Leachate	pH units	5.2
Lead	mg/L	3.2

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

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	-			06/09/2021	[NT]	[NT]	[NT]	[NT]	06/09/2021	[NT]
Date analysed	-			06/09/2021	[NT]	[NT]	[NT]	[NT]	06/09/2021	[NT]
Lead	mg/L	0.03	Metals-020	<0.03	[NT]	[NT]	[NT]	[NT]	101	[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 276326 202546.00, Cockle Bay

Ref: 276326-A.
TAT: Standard
Due: 06/09/2021
MT

From: Kurt Plambeck <kurt.plambeck@douglaspartners.com.au>
Sent: Monday, 30 August 2021 12:40 PM
To: Nick Sarlamis <NSarlamis@envirolab.com.au>
Subject: RE: Results for Registration 276326 202546.00, Cockle Bay

CAUTION: This email originated from outside of the organisation. Do not act on instructions, click links or open attachments unless you recognise the sender and know the content is authentic and safe.

Hi Nick,

Can you please run sample CW7/4-4.1 (4) for TCLP on lead

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

If you are not the intended recipient of this email, please notify us immediately and be aware that any disclosure, copying, distribution or use of the contents of this information is prohibited.

From: Nick Sarlamis <NSarlamis@envirolab.com.au>
Sent: Friday, 27 August 2021 7:09 PM
To: Rhys McMillan <Rhys.McMillan@douglaspartners.com.au>; Kurt Plambeck <kurt.plambeck@douglaspartners.com.au>
Subject: Results for Registration 276326 202546.00, Cockle Bay

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

Please note that a hard copy will not be posted.

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

How did we do? Send Feedback

Kind Regards,

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	202546.00, Cockle Bay
Envirolab Reference	276326-A
Date Sample Received	20/08/2021
Date Instructions Received	30/08/2021
Date Results Expected to be Reported	06/09/2021

Sample Condition

Samples received in appropriate condition for analysis	Yes
No. of Samples Provided	additional analysis
Turnaround Time Requested	Standard
Temperature on Receipt (°C)	4
Cooling Method	Ice
Sampling Date Provided	Not Provided on the COC

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	pH of soil for fluid#determ.	pH of soil TCLP (after HCl)	Extraction fluid used	pH of final Leachate	Lead	On Hold
CW3-4-4.45						✓
CW3-3.7-6.15						✓
CW7-2-2.1						✓
CW7-4-4.1	✓	✓	✓	✓	✓	
BD1/040821						✓
BD1/090821						✓
Spike 3						✓
Blank 3						✓
CW7 - [TRIPLICATE]-2-2.1						✓

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

Additional Info

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

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customerservice@envirolab.com.au
www.envirolab.com.au

CERTIFICATE OF ANALYSIS 276703

Client Details

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

Sample Details

Your Reference	**202546.00, Cockle Bay**
Number of Samples	10 Soil
Date samples received	27/08/2021
Date completed instructions received	27/08/2021

Analysis Details

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

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

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

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

Report Details

Date results requested by	03/09/2021
Date of Issue	03/09/2021

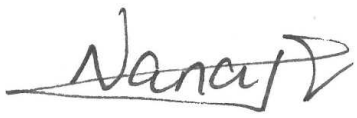
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Asbestos Approved By
Analysed by Asbestos Approved Analyst: Nyovan Moonean
Authorised by Asbestos Approved Signatory: Lucy Zhu

Results Approved By
Diego Bigolin, Inorganics Supervisor
Dragana Tomas, Senior Chemist
Hannah Nguyen, Metals Supervisor
Jenny He, Chemist
Lucy Zhu, Asbestos Supervisor
Manju Dewendrage, Prep Team Leader
Nancy Zhang, Laboratory Manager, Sydney
Steven Luong, Organics Supervisor

Authorised By



Nancy Zhang, Laboratory Manager

VOCs in soil		
Our Reference		276703-1
Your Reference	UNITS	CP2
Depth		0.4-0.5
Date Sampled		20/08/2021
Type of sample		Soil
Date extracted	-	30/08/2021
Date analysed	-	31/08/2021
Dichlorodifluoromethane	mg/kg	<1
Chloromethane	mg/kg	<1
Vinyl Chloride	mg/kg	<1
Bromomethane	mg/kg	<1
Chloroethane	mg/kg	<1
Trichlorofluoromethane	mg/kg	<1
1,1-Dichloroethene	mg/kg	<1
trans-1,2-dichloroethene	mg/kg	<1
1,1-dichloroethane	mg/kg	<1
cis-1,2-dichloroethene	mg/kg	<1
bromochloromethane	mg/kg	<1
chloroform	mg/kg	<1
2,2-dichloropropane	mg/kg	<1
1,2-dichloroethane	mg/kg	<1
1,1,1-trichloroethane	mg/kg	<1
1,1-dichloropropene	mg/kg	<1
Cyclohexane	mg/kg	<1
carbon tetrachloride	mg/kg	<1
Benzene	mg/kg	<0.2
dibromomethane	mg/kg	<1
1,2-dichloropropane	mg/kg	<1
trichloroethene	mg/kg	<1
bromodichloromethane	mg/kg	<1
trans-1,3-dichloropropene	mg/kg	<1
cis-1,3-dichloropropene	mg/kg	<1
1,1,2-trichloroethane	mg/kg	<1
Toluene	mg/kg	<0.5
1,3-dichloropropane	mg/kg	<1
dibromochloromethane	mg/kg	<1
1,2-dibromoethane	mg/kg	<1
tetrachloroethene	mg/kg	<1
1,1,1,2-tetrachloroethane	mg/kg	<1
chlorobenzene	mg/kg	<1

VOCs in soil		
Our Reference		276703-1
Your Reference	UNITS	CP2
Depth		0.4-0.5
Date Sampled		20/08/2021
Type of sample		Soil
Ethylbenzene	mg/kg	<1
bromoform	mg/kg	<1
m+p-xylene	mg/kg	<2
styrene	mg/kg	<1
1,1,2,2-tetrachloroethane	mg/kg	<1
o-Xylene	mg/kg	<1
1,2,3-trichloropropane	mg/kg	<1
isopropylbenzene	mg/kg	<1
bromobenzene	mg/kg	<1
n-propyl benzene	mg/kg	<1
2-chlorotoluene	mg/kg	<1
4-chlorotoluene	mg/kg	<1
1,3,5-trimethyl benzene	mg/kg	<1
tert-butyl benzene	mg/kg	<1
1,2,4-trimethyl benzene	mg/kg	<1
1,3-dichlorobenzene	mg/kg	<1
sec-butyl benzene	mg/kg	<1
1,4-dichlorobenzene	mg/kg	<1
4-isopropyl toluene	mg/kg	<1
1,2-dichlorobenzene	mg/kg	<1
n-butyl benzene	mg/kg	<1
1,2-dibromo-3-chloropropane	mg/kg	<1
1,2,4-trichlorobenzene	mg/kg	<1
hexachlorobutadiene	mg/kg	<1
1,2,3-trichlorobenzene	mg/kg	<1
Surrogate Dibromofluorometha	%	99
Surrogate aaa-Trifluorotoluene	%	78
Surrogate Toluene-d_8	%	99
Surrogate 4-Bromofluorobenzene	%	95

vTRH(C6-C10)/BTEXN in Soil					
Our Reference		276703-1	276703-5	276703-9	276703-10
Your Reference	UNITS	CP2	CP2	Spike	Blank
Depth		0.4-0.5	2.4-2.5	-	-
Date Sampled		20/08/2021	20/08/2021	20/08/2021	20/08/2021
Type of sample		Soil	Soil	Soil	Soil
Date extracted	-	30/08/2021	30/08/2021	30/08/2021	30/08/2021
Date analysed	-	31/08/2021	31/08/2021	31/08/2021	31/08/2021
TRH C_6 - C_9	mg/kg	<25	<25	[NA]	[NA]
TRH C_6 - C_{10}	mg/kg	<25	<25	[NA]	[NA]
Benzene	mg/kg	[NA]	[NA]	87%	<0.2
Toluene	mg/kg	[NA]	[NA]	85%	<0.5
Ethylbenzene	mg/kg	[NA]	[NA]	86%	<1
m+p-xylene	mg/kg	[NA]	[NA]	86%	<2
o-Xylene	mg/kg	[NA]	[NA]	86%	<1
Total +ve Xylenes	mg/kg	[NA]	[NA]	[NA]	<3
Surrogate aaa-Trifluorotoluene	%	78	85	87	85

svTRH (C10-C40) in Soil			
Our Reference		276703-1	276703-5
Your Reference	UNITS	CP2	CP2
Depth		0.4-0.5	2.4-2.5
Date Sampled		20/08/2021	20/08/2021
Type of sample		Soil	Soil
Date extracted	-	30/08/2021	30/08/2021
Date analysed	-	31/08/2021	31/08/2021
TRH C_{10} - C_{14}	mg/kg	<50	<50
TRH C_{15} - C_{28}	mg/kg	<100	<100
TRH C_{29} - C_{36}	mg/kg	<100	<100
Total +ve TRH (C10-C36)	mg/kg	<50	<50
TRH >C_{10} -C_{16}	mg/kg	<50	<50
TRH >C_{10} - C_{16} less Naphthalene (F2)	mg/kg	<50	<50
TRH >C_{16} -C_{34}	mg/kg	<100	<100
TRH >C_{34} -C_{40}	mg/kg	<100	<100
Total +ve TRH (>C10-C40)	mg/kg	<50	<50
Surrogate o-Terphenyl	%	96	91

PAHs in Soil			
Our Reference		276703-1	276703-5
Your Reference	UNITS	CP2	CP2
Depth		0.4-0.5	2.4-2.5
Date Sampled		20/08/2021	20/08/2021
Type of sample		Soil	Soil
Date extracted	-	30/08/2021	30/08/2021
Date analysed	-	01/09/2021	01/09/2021
Naphthalene	mg/kg	<0.1	<0.1
Acenaphthylene	mg/kg	<0.1	<0.1
Acenaphthene	mg/kg	<0.1	<0.1
Fluorene	mg/kg	<0.1	<0.1
Phenanthrene	mg/kg	0.3	<0.1
Anthracene	mg/kg	<0.1	<0.1
Fluoranthene	mg/kg	<0.1	0.1
Pyrene	mg/kg	<0.1	0.1
Benzo(a)anthracene	mg/kg	<0.1	<0.1
Chrysene	mg/kg	0.2	<0.1
Benzo(b,j+k)fluoranthene	mg/kg	<0.2	<0.2
Benzo(a)pyrene	mg/kg	0.05	0.08
Indeno(1,2,3-c,d)pyrene	mg/kg	<0.1	<0.1
Dibenzo(a,h)anthracene	mg/kg	<0.1	<0.1
Benzo(g,h,i)perylene	mg/kg	<0.1	<0.1
Total +ve PAH's	mg/kg	0.5	0.4
Benzo(a)pyrene TEQ calc (zero)	mg/kg	<0.5	<0.5
Benzo(a)pyrene TEQ calc(half)	mg/kg	<0.5	<0.5
Benzo(a)pyrene TEQ calc(PQL)	mg/kg	<0.5	<0.5
Surrogate p-Terphenyl-d14	%	100	96

Organochlorine Pesticides in soil		
Our Reference		276703-1
Your Reference	UNITS	CP2
Depth		0.4-0.5
Date Sampled		20/08/2021
Type of sample		Soil
Date extracted	-	30/08/2021
Date analysed	-	01/09/2021
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	%	99

Organophosphorus Pesticides in Soil		
Our Reference		276703-1
Your Reference	UNITS	CP2
Depth		0.4-0.5
Date Sampled		20/08/2021
Type of sample		Soil
Date extracted	-	30/08/2021
Date analysed	-	01/09/2021
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	%	99

PCBs in Soil		
Our Reference		276703-1
Your Reference	UNITS	CP2
Depth		0.4-0.5
Date Sampled		20/08/2021
Type of sample		Soil
Date extracted	-	30/08/2021
Date analysed	-	01/09/2021
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	%	99

Acid Extractable metals in soil			
Our Reference		276703-1	276703-5
Your Reference	UNITS	CP2	CP2
Depth		0.4-0.5	2.4-2.5
Date Sampled		20/08/2021	20/08/2021
Type of sample		Soil	Soil
Date prepared	-	30/08/2021	30/08/2021
Date analysed	-	30/08/2021	30/08/2021
Arsenic	mg/kg	<4	6
Cadmium	mg/kg	<0.4	<0.4
Chromium	mg/kg	68	12
Copper	mg/kg	39	28
Lead	mg/kg	29	74
Mercury	mg/kg	0.2	0.7
Nickel	mg/kg	69	6
Zinc	mg/kg	61	130
Tin	mg/kg	8	9

Misc Soil - Inorg		
Our Reference		276703-1
Your Reference	UNITS	CP2
Depth		0.4-0.5
Date Sampled		20/08/2021
Type of sample		Soil
Date prepared	-	30/08/2021
Date analysed	-	30/08/2021
Total Phenolics (as Phenol)	mg/kg	<5

Moisture			
Our Reference		276703-1	276703-5
Your Reference	UNITS	CP2	CP2
Depth		0.4-0.5	2.4-2.5
Date Sampled		20/08/2021	20/08/2021
Type of sample		Soil	Soil
Date prepared	-	30/08/2021	30/08/2021
Date analysed	-	31/08/2021	31/08/2021
Moisture	%	7.9	18

Asbestos ID - soils			
Our Reference		276703-1	276703-5
Your Reference	UNITS	CP2	CP2
Depth		0.4-0.5	2.4-2.5
Date Sampled		20/08/2021	20/08/2021
Type of sample		Soil	Soil
Date analysed	-	02/09/2021	02/09/2021
Sample mass tested	g	Approx. 55g	Approx. 20g
Sample Description	-	Brown coarse-grained soil & rocks	Brown coarse-grained soil & rocks
Asbestos ID in soil	-	No asbestos detected at reporting limit of 0.1g/kg Organic fibres detected	No asbestos detected at reporting limit of 0.1g/kg Organic fibres detected
Asbestos comments	-	NO	NO
Trace Analysis	-	No asbestos detected	No asbestos detected

Misc Inorg - Soil			
Our Reference		276703-1	276703-5
Your Reference	UNITS	CP2	CP2
Depth		0.4-0.5	2.4-2.5
Date Sampled		20/08/2021	20/08/2021
Type of sample		Soil	Soil
Date prepared	-	31/08/2021	31/08/2021
Date analysed	-	31/08/2021	31/08/2021
pH 1:5 soil:water	pH Units	8.9	8.3
Total Organic Carbon (Walkley Black)	mg/kg	[NA]	10,000

Coal Tar			
Our Reference		276703-1	276703-5
Your Reference	UNITS	CP2	CP2
Depth		0.4-0.5	2.4-2.5
Date Sampled		20/08/2021	20/08/2021
Type of sample		Soil	Soil
Date prepared	-	30/08/2021	30/08/2021
Date analysed	-	30/08/2021	30/08/2021
Presence of Coal Tar*	-	Absent	Absent

Tributyl Tin in Soil		
Our Reference		276703-5
Your Reference	UNITS	CP2
Depth		2.4-2.5
Date Sampled		20/08/2021
Type of sample		Soil
Date extracted	-	01/09/2021
Date analysed	-	02/09/2021
Tributyltin as Sn	µg/kg	<2
Surrogate Triphenyltin	%	92

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.
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-036	Total Organic Carbon or Matter - A titrimetric method that measures the oxidisable organic content of soils.
Metals-020	Determination of various metals by ICP-AES.
Metals-021	Determination of Mercury by Cold Vapour AAS.
Org-020	Soil samples are extracted with Dichloromethane/Acetone and waters with Dichloromethane and analysed by GC-FID. F2 = (>C10-C16)-Naphthalene as per NEPM B1 Guideline on Investigation Levels for Soil and Groundwater (HSLs Tables 1A (3, 4)). Note Naphthalene is determined from the VOC analysis.
Org-020	Soil samples are extracted with Dichloromethane/Acetone and waters with Dichloromethane and analysed by GC-FID. F2 = (>C10-C16)-Naphthalene as per NEPM B1 Guideline on Investigation Levels for Soil and Groundwater (HSLs Tables 1A (3, 4)). Note Naphthalene is determined from the VOC analysis. Note, the Total +ve TRH PQL is reflective of the lowest individual PQL and is therefore "Total +ve TRH" is simply a sum of the positive individual TRH fractions (>C10-C40).
Org-021	Soil samples are extracted with dichloromethane/acetone and waters with dichloromethane and analysed by GC-ECD.
Org-021	Soil samples are extracted with dichloromethane/acetone and waters with dichloromethane and analysed by GC-ECD. Note, the Total +ve PCBs PQL is reflective of the lowest individual PQL and is therefore" Total +ve PCBs" is simply a sum of the positive individual PCBs.
Org-022	Determination of VOCs sampled onto coconut shell charcoal sorbent tubes, that can be desorbed using carbon disulphide, and analysed by GC-MS.
Org-022/025	Soil samples are extracted with Dichloromethane/Acetone and waters with Dichloromethane and analysed by GC-MS/GC-MSMS.

Method ID	Methodology Summary
Org-022/025	Soil samples are extracted with dichloromethane/acetone and waters with dichloromethane and analysed by GC-MS/GC-MSMS. Note, the Total +ve reported DDD+DDE+DDT PQL is reflective of the lowest individual PQL and is therefore simply a sum of the positive individually report DDD+DDE+DDT.
Org-022/025	Soil samples are extracted with Dichloromethane/Acetone and waters with Dichloromethane and analysed by GC-MS and/or GC-MS/MS. Benzo(a)pyrene TEQ as per NEPM B1 Guideline on Investigation Levels for Soil and Groundwater - 2013. For soil results:- 1. 'EQ PQL'values are assuming all contributing PAHs reported as <PQL are actually at the PQL. This is the most conservative approach and can give false positive TEQs given that PAHs that contribute to the TEQ calculation may not be present. 2. 'EQ zero'values are assuming all contributing PAHs reported as <PQL are zero. This is the least conservative approach and is more susceptible to false negative TEQs when PAHs that contribute to the TEQ calculation are present but below PQL. 3. 'EQ half PQL'values are assuming all contributing PAHs reported as <PQL are half the stipulated PQL. Hence a mid-point between the most and least conservative approaches above. Note, the Total +ve PAHs PQL is reflective of the lowest individual PQL and is therefore "Total +ve PAHs" is simply a sum of the positive individual PAHs.
Org-023	Soil samples are extracted with methanol and spiked into water prior to analysing by purge and trap GC-MS.
Org-023	Soil samples are extracted with methanol and spiked into water prior to analysing by purge and trap GC-MS. Water samples are analysed directly by purge and trap GC-MS. F1 = (C6-C10)-BTEX as per NEPM B1 Guideline on Investigation Levels for Soil and Groundwater.
Org-023	Soil samples are extracted with methanol and spiked into water prior to analysing by purge and trap GC-MS. Water samples are analysed directly by purge and trap GC-MS. F1 = (C6-C10)-BTEX as per NEPM B1 Guideline on Investigation Levels for Soil and Groundwater. Note, the Total +ve Xylene PQL is reflective of the lowest individual PQL and is therefore "Total +ve Xylenes" is simply a sum of the positive individual Xylenes.
RTA T542	Determination of Phenol in core samples as per RTA test method T542. This procedure gives and indication of whether a sample of asphalt has been made with coal tar. The coal tar method gives an approximate result with a high degree of uncertainty.

QUALITY CONTROL: VOCs in soil						Duplicate			Spike Recovery %	
Test Description	Units	PQL	Method	Blank	#	Base	Dup.	RPD	LCS-4	[NT]
Date extracted	-			30/08/2021	1	30/08/2021	30/08/2021		30/08/2021	[NT]
Date analysed	-			31/08/2021	1	31/08/2021	31/08/2021		31/08/2021	[NT]
Dichlorodifluoromethane	mg/kg	1	Org-023	<1	1	<1	<1	0	[NT]	[NT]
Chloromethane	mg/kg	1	Org-023	<1	1	<1	<1	0	[NT]	[NT]
Vinyl Chloride	mg/kg	1	Org-023	<1	1	<1	<1	0	[NT]	[NT]
Bromomethane	mg/kg	1	Org-023	<1	1	<1	<1	0	[NT]	[NT]
Chloroethane	mg/kg	1	Org-023	<1	1	<1	<1	0	[NT]	[NT]
Trichlorofluoromethane	mg/kg	1	Org-023	<1	1	<1	<1	0	[NT]	[NT]
1,1-Dichloroethene	mg/kg	1	Org-023	<1	1	<1	<1	0	[NT]	[NT]
trans-1,2-dichloroethene	mg/kg	1	Org-023	<1	1	<1	<1	0	[NT]	[NT]
1,1-dichloroethane	mg/kg	1	Org-023	<1	1	<1	<1	0	82	[NT]
cis-1,2-dichloroethene	mg/kg	1	Org-023	<1	1	<1	<1	0	[NT]	[NT]
bromochloromethane	mg/kg	1	Org-023	<1	1	<1	<1	0	[NT]	[NT]
chloroform	mg/kg	1	Org-023	<1	1	<1	<1	0	85	[NT]
2,2-dichloropropane	mg/kg	1	Org-023	<1	1	<1	<1	0	[NT]	[NT]
1,2-dichloroethane	mg/kg	1	Org-023	<1	1	<1	<1	0	79	[NT]
1,1,1-trichloroethane	mg/kg	1	Org-023	<1	1	<1	<1	0	84	[NT]
1,1-dichloropropene	mg/kg	1	Org-023	<1	1	<1	<1	0	[NT]	[NT]
Cyclohexane	mg/kg	1	Org-023	<1	1	<1	<1	0	[NT]	[NT]
carbon tetrachloride	mg/kg	1	Org-023	<1	1	<1	<1	0	[NT]	[NT]
Benzene	mg/kg	0.2	Org-023	<0.2	1	<0.2	<0.2	0	[NT]	[NT]
dibromomethane	mg/kg	1	Org-023	<1	1	<1	<1	0	[NT]	[NT]
1,2-dichloropropane	mg/kg	1	Org-023	<1	1	<1	<1	0	[NT]	[NT]
trichloroethene	mg/kg	1	Org-023	<1	1	<1	<1	0	81	[NT]
bromodichloromethane	mg/kg	1	Org-023	<1	1	<1	<1	0	91	[NT]
trans-1,3-dichloropropene	mg/kg	1	Org-023	<1	1	<1	<1	0	[NT]	[NT]
cis-1,3-dichloropropene	mg/kg	1	Org-023	<1	1	<1	<1	0	[NT]	[NT]
1,1,2-trichloroethane	mg/kg	1	Org-023	<1	1	<1	<1	0	[NT]	[NT]
Toluene	mg/kg	0.5	Org-023	<0.5	1	<0.5	<0.5	0	[NT]	[NT]
1,3-dichloropropane	mg/kg	1	Org-023	<1	1	<1	<1	0	[NT]	[NT]
dibromochloromethane	mg/kg	1	Org-023	<1	1	<1	<1	0	84	[NT]
1,2-dibromoethane	mg/kg	1	Org-023	<1	1	<1	<1	0	[NT]	[NT]
tetrachloroethene	mg/kg	1	Org-023	<1	1	<1	<1	0	83	[NT]
1,1,1,2-tetrachloroethane	mg/kg	1	Org-023	<1	1	<1	<1	0	[NT]	[NT]
chlorobenzene	mg/kg	1	Org-023	<1	1	<1	<1	0	[NT]	[NT]
Ethylbenzene	mg/kg	1	Org-023	<1	1	<1	<1	0	[NT]	[NT]
bromoform	mg/kg	1	Org-023	<1	1	<1	<1	0	[NT]	[NT]
m+p-xylene	mg/kg	2	Org-023	<2	1	<2	<2	0	[NT]	[NT]
styrene	mg/kg	1	Org-023	<1	1	<1	<1	0	[NT]	[NT]
1,1,2,2-tetrachloroethane	mg/kg	1	Org-023	<1	1	<1	<1	0	[NT]	[NT]

QUALITY CONTROL: VOCs in soil						Duplicate			Spike Recovery %	
Test Description	Units	PQL	Method	Blank	#	Base	Dup.	RPD	LCS-4	[NT]
o-Xylene	mg/kg	1	Org-023	<1	1	<1	<1	0	[NT]	[NT]
1,2,3-trichloropropane	mg/kg	1	Org-023	<1	1	<1	<1	0	[NT]	[NT]
isopropylbenzene	mg/kg	1	Org-023	<1	1	<1	<1	0	[NT]	[NT]
bromobenzene	mg/kg	1	Org-023	<1	1	<1	<1	0	[NT]	[NT]
n-propyl benzene	mg/kg	1	Org-023	<1	1	<1	<1	0	[NT]	[NT]
2-chlorotoluene	mg/kg	1	Org-023	<1	1	<1	<1	0	[NT]	[NT]
4-chlorotoluene	mg/kg	1	Org-023	<1	1	<1	<1	0	[NT]	[NT]
1,3,5-trimethyl benzene	mg/kg	1	Org-023	<1	1	<1	<1	0	[NT]	[NT]
tert-butyl benzene	mg/kg	1	Org-023	<1	1	<1	<1	0	[NT]	[NT]
1,2,4-trimethyl benzene	mg/kg	1	Org-023	<1	1	<1	<1	0	[NT]	[NT]
1,3-dichlorobenzene	mg/kg	1	Org-023	<1	1	<1	<1	0	[NT]	[NT]
sec-butyl benzene	mg/kg	1	Org-023	<1	1	<1	<1	0	[NT]	[NT]
1,4-dichlorobenzene	mg/kg	1	Org-023	<1	1	<1	<1	0	[NT]	[NT]
4-isopropyl toluene	mg/kg	1	Org-023	<1	1	<1	<1	0	[NT]	[NT]
1,2-dichlorobenzene	mg/kg	1	Org-023	<1	1	<1	<1	0	[NT]	[NT]
n-butyl benzene	mg/kg	1	Org-023	<1	1	<1	<1	0	[NT]	[NT]
1,2-dibromo-3-chloropropane	mg/kg	1	Org-023	<1	1	<1	<1	0	[NT]	[NT]
1,2,4-trichlorobenzene	mg/kg	1	Org-023	<1	1	<1	<1	0	[NT]	[NT]
hexachlorobutadiene	mg/kg	1	Org-023	<1	1	<1	<1	0	[NT]	[NT]
1,2,3-trichlorobenzene	mg/kg	1	Org-023	<1	1	<1	<1	0	[NT]	[NT]
Surrogate Dibromofluorometha	%		Org-023	99	1	99	98	1	99	[NT]
Surrogate aaa-Trifluorotoluene	%		Org-023	102	1	78	79	1	87	[NT]
Surrogate Toluene-d_8	%		Org-023	98	1	99	99	0	99	[NT]
Surrogate 4-Bromofluorobenzene	%		Org-023	96	1	95	95	0	98	[NT]

QUALITY CONTROL: vTRH(C6-C10)/BTEXN in Soil						Duplicate			Spike Recovery %	
Test Description	Units	PQL	Method	Blank	#	Base	Dup.	RPD	LCS-4	[NT]
Date extracted	-			31/08/2021	1	30/08/2021	30/08/2021		30/08/2021	[NT]
Date analysed	-			31/08/2021	1	31/08/2021	31/08/2021		31/08/2021	[NT]
TRH C_6 - C_9	mg/kg	25	Org-023	<25	1	<25	<25	0	92	[NT]
TRH C_6 - C_{10}	mg/kg	25	Org-023	<25	1	<25	<25	0	92	[NT]
Benzene	mg/kg	0.2	Org-023	<0.2	[NT]	[NT]	[NT]	[NT]	87	[NT]
Toluene	mg/kg	0.5	Org-023	<0.5	[NT]	[NT]	[NT]	[NT]	86	[NT]
Ethylbenzene	mg/kg	1	Org-023	<1	[NT]	[NT]	[NT]	[NT]	97	[NT]
m+p-xylene	mg/kg	2	Org-023	<2	[NT]	[NT]	[NT]	[NT]	95	[NT]
o-Xylene	mg/kg	1	Org-023	<1	[NT]	[NT]	[NT]	[NT]	96	[NT]
naphthalene	mg/kg	1	Org-023	<1	[NT]	[NT]	[NT]	[NT]	[NT]	[NT]
Surrogate aaa-Trifluorotoluene	%		Org-023	79	1	78	79	1	87	[NT]

QUALITY CONTROL: svTRH (C10-C40) in Soil						Duplicate			Spike Recovery %	
Test Description	Units	PQL	Method	Blank	#	Base	Dup.	RPD	LCS-4	[NT]
Date extracted	-			30/08/2021	1	30/08/2021	30/08/2021		30/08/2021	[NT]
Date analysed	-			30/08/2021	1	31/08/2021	31/08/2021		30/08/2021	[NT]
TRH C_{10} - C_{14}	mg/kg	50	Org-020	<50	1	<50	<50	0	103	[NT]
TRH C_{15} - C_{28}	mg/kg	100	Org-020	<100	1	<100	<100	0	85	[NT]
TRH C_{29} - C_{36}	mg/kg	100	Org-020	<100	1	<100	<100	0	82	[NT]
TRH >C_{10} -C_{16}	mg/kg	50	Org-020	<50	1	<50	<50	0	103	[NT]
TRH >C_{16} -C_{34}	mg/kg	100	Org-020	<100	1	<100	<100	0	85	[NT]
TRH >C_{34} -C_{40}	mg/kg	100	Org-020	<100	1	<100	<100	0	82	[NT]
Surrogate o-Terphenyl	%		Org-020	91	1	96	97	1	112	[NT]

QUALITY CONTROL: PAHs in Soil						Duplicate			Spike Recovery %	
Test Description	Units	PQL	Method	Blank	#	Base	Dup.	RPD	LCS-4	[NT]
Date extracted	-			30/08/2021	1	30/08/2021	30/08/2021		30/08/2021	[NT]
Date analysed	-			01/09/2021	1	01/09/2021	01/09/2021		01/09/2021	[NT]
Naphthalene	mg/kg	0.1	Org-022/025	<0.1	1	<0.1	<0.1	0	112	[NT]
Acenaphthylene	mg/kg	0.1	Org-022/025	<0.1	1	<0.1	<0.1	0	[NT]	[NT]
Acenaphthene	mg/kg	0.1	Org-022/025	<0.1	1	<0.1	<0.1	0	99	[NT]
Fluorene	mg/kg	0.1	Org-022/025	<0.1	1	<0.1	<0.1	0	111	[NT]
Phenanthrene	mg/kg	0.1	Org-022/025	<0.1	1	0.3	0.2	40	129	[NT]
Anthracene	mg/kg	0.1	Org-022/025	<0.1	1	<0.1	<0.1	0	[NT]	[NT]
Fluoranthene	mg/kg	0.1	Org-022/025	<0.1	1	<0.1	<0.1	0	111	[NT]
Pyrene	mg/kg	0.1	Org-022/025	<0.1	1	<0.1	<0.1	0	113	[NT]
Benzo(a)anthracene	mg/kg	0.1	Org-022/025	<0.1	1	<0.1	<0.1	0	[NT]	[NT]
Chrysene	mg/kg	0.1	Org-022/025	<0.1	1	0.2	0.1	67	90	[NT]
Benzo(b,j+k)fluoranthene	mg/kg	0.2	Org-022/025	<0.2	1	<0.2	<0.2	0	[NT]	[NT]
Benzo(a)pyrene	mg/kg	0.05	Org-022/025	<0.05	1	0.05	<0.05	0	100	[NT]
Indeno(1,2,3-c,d)pyrene	mg/kg	0.1	Org-022/025	<0.1	1	<0.1	<0.1	0	[NT]	[NT]
Dibenzo(a,h)anthracene	mg/kg	0.1	Org-022/025	<0.1	1	<0.1	<0.1	0	[NT]	[NT]
Benzo(g,h,i)perylene	mg/kg	0.1	Org-022/025	<0.1	1	<0.1	<0.1	0	[NT]	[NT]
Surrogate p-Terphenyl-d14	%		Org-022/025	111	1	100	99	1	99	[NT]

QUALITY CONTROL: Organochlorine Pesticides in soil						Duplicate			Spike Recovery %	
Test Description	Units	PQL	Method	Blank	#	Base	Dup.	RPD	LCS-4	[NT]
Date extracted	-			30/08/2021	1	30/08/2021	30/08/2021		30/08/2021	[NT]
Date analysed	-			01/09/2021	1	01/09/2021	01/09/2021		01/09/2021	[NT]
alpha-BHC	mg/kg	0.1	Org-022/025	<0.1	1	<0.1	<0.1	0	113	[NT]
HCB	mg/kg	0.1	Org-022/025	<0.1	1	<0.1	<0.1	0	[NT]	[NT]
beta-BHC	mg/kg	0.1	Org-022/025	<0.1	1	<0.1	<0.1	0	108	[NT]
gamma-BHC	mg/kg	0.1	Org-022/025	<0.1	1	<0.1	<0.1	0	[NT]	[NT]
Heptachlor	mg/kg	0.1	Org-022/025	<0.1	1	<0.1	<0.1	0	103	[NT]
delta-BHC	mg/kg	0.1	Org-022/025	<0.1	1	<0.1	<0.1	0	[NT]	[NT]
Aldrin	mg/kg	0.1	Org-022/025	<0.1	1	<0.1	<0.1	0	110	[NT]
Heptachlor Epoxide	mg/kg	0.1	Org-022/025	<0.1	1	<0.1	<0.1	0	116	[NT]
gamma-Chlordane	mg/kg	0.1	Org-022/025	<0.1	1	<0.1	<0.1	0	[NT]	[NT]
alpha-chlordane	mg/kg	0.1	Org-022/025	<0.1	1	<0.1	<0.1	0	[NT]	[NT]
Endosulfan I	mg/kg	0.1	Org-022/025	<0.1	1	<0.1	<0.1	0	[NT]	[NT]
pp-DDE	mg/kg	0.1	Org-022/025	<0.1	1	<0.1	<0.1	0	116	[NT]
Dieldrin	mg/kg	0.1	Org-022/025	<0.1	1	<0.1	<0.1	0	117	[NT]
Endrin	mg/kg	0.1	Org-022/025	<0.1	1	<0.1	<0.1	0	111	[NT]
Endosulfan II	mg/kg	0.1	Org-022/025	<0.1	1	<0.1	<0.1	0	[NT]	[NT]
pp-DDD	mg/kg	0.1	Org-022/025	<0.1	1	<0.1	<0.1	0	101	[NT]
Endrin Aldehyde	mg/kg	0.1	Org-022/025	<0.1	1	<0.1	<0.1	0	[NT]	[NT]
pp-DDT	mg/kg	0.1	Org-022/025	<0.1	1	<0.1	<0.1	0	[NT]	[NT]
Endosulfan Sulphate	mg/kg	0.1	Org-022/025	<0.1	1	<0.1	<0.1	0	107	[NT]
Methoxychlor	mg/kg	0.1	Org-022/025	<0.1	1	<0.1	<0.1	0	[NT]	[NT]
Surrogate TCMX	%		Org-022/025	106	1	99	100	1	99	[NT]

QUALITY CONTROL: Organophosphorus Pesticides in Soil						Duplicate			Spike Recovery %	
Test Description	Units	PQL	Method	Blank	#	Base	Dup.	RPD	LCS-4	[NT]
Date extracted	-			30/08/2021	1	30/08/2021	30/08/2021		30/08/2021	[NT]
Date analysed	-			01/09/2021	1	01/09/2021	01/09/2021		01/09/2021	[NT]
Dichlorvos	mg/kg	0.1	Org-022/025	<0.1	1	<0.1	<0.1	0	75	[NT]
Dimethoate	mg/kg	0.1	Org-022/025	<0.1	1	<0.1	<0.1	0	[NT]	[NT]
Diazinon	mg/kg	0.1	Org-022/025	<0.1	1	<0.1	<0.1	0	[NT]	[NT]
Chlorpyriphos-methyl	mg/kg	0.1	Org-022/025	<0.1	1	<0.1	<0.1	0	[NT]	[NT]
Ronnel	mg/kg	0.1	Org-022/025	<0.1	1	<0.1	<0.1	0	114	[NT]
Fenitrothion	mg/kg	0.1	Org-022/025	<0.1	1	<0.1	<0.1	0	79	[NT]
Malathion	mg/kg	0.1	Org-022/025	<0.1	1	<0.1	<0.1	0	116	[NT]
Chlorpyriphos	mg/kg	0.1	Org-022/025	<0.1	1	<0.1	<0.1	0	122	[NT]
Parathion	mg/kg	0.1	Org-022/025	<0.1	1	<0.1	<0.1	0	86	[NT]
Bromophos-ethyl	mg/kg	0.1	Org-022	<0.1	1	<0.1	<0.1	0	[NT]	[NT]
Ethion	mg/kg	0.1	Org-022/025	<0.1	1	<0.1	<0.1	0	103	[NT]
Azinphos-methyl (Guthion)	mg/kg	0.1	Org-022/025	<0.1	1	<0.1	<0.1	0	[NT]	[NT]
Surrogate TCMX	%		Org-022/025	106	1	99	100	1	99	[NT]

QUALITY CONTROL: PCBs in Soil						Duplicate			Spike Recovery %	
Test Description	Units	PQL	Method	Blank	#	Base	Dup.	RPD	LCS-4	[NT]
Date extracted	-			30/08/2021	1	30/08/2021	30/08/2021		30/08/2021	[NT]
Date analysed	-			01/09/2021	1	01/09/2021	01/09/2021		01/09/2021	[NT]
Aroclor 1016	mg/kg	0.1	Org-021	<0.1	1	<0.1	<0.1	0	[NT]	[NT]
Aroclor 1221	mg/kg	0.1	Org-021	<0.1	1	<0.1	<0.1	0	[NT]	[NT]
Aroclor 1232	mg/kg	0.1	Org-021	<0.1	1	<0.1	<0.1	0	[NT]	[NT]
Aroclor 1242	mg/kg	0.1	Org-021	<0.1	1	<0.1	<0.1	0	[NT]	[NT]
Aroclor 1248	mg/kg	0.1	Org-021	<0.1	1	<0.1	<0.1	0	[NT]	[NT]
Aroclor 1254	mg/kg	0.1	Org-021	<0.1	1	<0.1	<0.1	0	124	[NT]
Aroclor 1260	mg/kg	0.1	Org-021	<0.1	1	<0.1	<0.1	0	[NT]	[NT]
Surrogate TCMX	%		Org-021	106	1	99	100	1	99	[NT]

QUALITY CONTROL: Acid Extractable metals in soil						Duplicate			Spike Recovery %	
Test Description	Units	PQL	Method	Blank	#	Base	Dup.	RPD	LCS-4	[NT]
Date prepared	-			30/08/2021	1	30/08/2021	30/08/2021		30/08/2021	[NT]
Date analysed	-			30/08/2021	1	30/08/2021	30/08/2021		30/08/2021	[NT]
Arsenic	mg/kg	4	Metals-020	<4	1	<4	<4	0	100	[NT]
Cadmium	mg/kg	0.4	Metals-020	<0.4	1	<0.4	<0.4	0	99	[NT]
Chromium	mg/kg	1	Metals-020	<1	1	68	66	3	106	[NT]
Copper	mg/kg	1	Metals-020	<1	1	39	40	3	97	[NT]
Lead	mg/kg	1	Metals-020	<1	1	29	25	15	104	[NT]
Mercury	mg/kg	0.1	Metals-021	<0.1	1	0.2	0.2	0	108	[NT]
Nickel	mg/kg	1	Metals-020	<1	1	69	66	4	101	[NT]
Zinc	mg/kg	1	Metals-020	<1	1	61	61	0	105	[NT]
Tin	mg/kg	1	Metals-020	<1	1	8	8	0	96	[NT]

QUALITY CONTROL: Misc Soil - Inorg					Duplicate				Spike Recovery %	
Test Description	Units	PQL	Method	Blank	#	Base	Dup.	RPD	LCS-1	[NT]
Date prepared	-			30/08/2021	[NT]	[NT]	[NT]	[NT]	30/08/2021	[NT]
Date analysed	-			30/08/2021	[NT]	[NT]	[NT]	[NT]	30/08/2021	[NT]
Total Phenolics (as Phenol)	mg/kg	5	Inorg-031	<5	[NT]	[NT]	[NT]	[NT]	102	[NT]

QUALITY CONTROL: Misc Inorg - Soil						Duplicate			Spike Recovery %	
Test Description	Units	PQL	Method	Blank	#	Base	Dup.	RPD	LCS-1	[NT]
Date prepared	-			31/08/2021	[NT]	[NT]	[NT]	[NT]	31/08/2021	[NT]
Date analysed	-			31/08/2021	[NT]	[NT]	[NT]	[NT]	31/08/2021	[NT]
pH 1:5 soil:water	pH Units		Inorg-001	[NT]	[NT]	[NT]	[NT]	[NT]	101	[NT]
Total Organic Carbon (Walkley Black)	mg/kg	1000	Inorg-036	<1000	[NT]	[NT]	[NT]	[NT]	89	[NT]

QUALITY CONTROL: Tributyl Tin in Soil						Duplicate			Spike Recovery %	
Test Description	Units	PQL	Method	Blank	#	Base	Dup.	RPD	LCS-1	[NT]
Date extracted	-			01/09/2021	5	01/09/2021	01/09/2021		01/09/2021	[NT]
Date analysed	-			02/09/2021	5	02/09/2021	02/09/2021		02/09/2021	[NT]
Tributyltin as Sn	µg/kg	0.5	Ext-054	<0.5	5	<2	<2	0	90	[NT]
Surrogate Triphenyltin	%		Ext-054	99	5	92	95	3	102	[NT]

Result Definitions

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

Quality Control Definitions

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

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

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

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

Laboratory Acceptance Criteria

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

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

Spikes for Physical and Aggregate Tests are not applicable.

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

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

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

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

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

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

Measurement Uncertainty estimates are available for most tests upon request.

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

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

Report Comments

Organotin Compounds in Soil: Some PQLS have been raised due to decreased internal standard efficiency. This may be due to sample matrix interferences.

TBT analysed by MPL, report no 267962.

Asbestos: A portion of the supplied samples were sub-sampled for asbestos analysis according to Envirolab procedures.
We cannot guarantee that these sub-samples are indicative of the entire sample.
Envirolab recommends supplying 40-50g of sample in its own container.
Note: Samples 276703-1,5 were sub-sampled from jars provided by the client.

Douglas Partners
Geotechnics / Environment / Groundwater

CHAIN OF CUSTODY DESPATCH SHEET

Project No: 202546.00	**Suburb:** Cockle Bay		**To:** *Envirolab Services*
Project Manager: Rhys McMillan	**Order Number:**	**Sampler:**	*12 Ashley St, Chatswood NSW 2067*
Email: Rhys.McMillan@douglaspartners.com.au / 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: Metals, TRH, PAH, OCP, OPP, PCB, Asbestos	Metals, TRH, PAH, Asbestos	Metals, PAH, Asbestos	VOC	pH	TOC	CEC	BTEX	Phenols	Cresole / coal tar: cresotes	TBT, Tin	Notes/ Preservation/ Additional Requirements
1	CP2	0.4	0.5	20/8			X			X	X				X	X		include Sn in metals
2		0.9	1.0															
3		1.4	1.5															
4		1.9	2.0															
5		2.4	2.5					X			X	X				X	X	"
6		2.9	3.0															
7		3.9	4.0															
8		4.9	5.0															
9	Spike/1													X				
10	Blank													X				

ENVIROLAB 12 Ashley St Chatswood NSW 2067 Ph: (02) 9910 6200
Job No: 276703
Date Received: 27/8/21
Time Received: 1440
Received By: KLEE
Temp: Cool/Ambient
Cooling: Ice/Icepack
Security: Intact/Broken/None

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 27/8/21		**Date:**	**Signed:**

LAB RECEIPT

Lab Ref. No:	276703
Received by:	KATIE LEE
Date & Time:	27/8/21 1440
Signed:	KL

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	Rhys McMillan, Kurt Plambeck

Sample Login Details

Your reference	202546.00, Cockle Bay
Envirolab Reference	276703
Date Sample Received	27/08/2021
Date Instructions Received	27/08/2021
Date Results Expected to be Reported	03/09/2021

Sample Condition

Samples received in appropriate condition for analysis	Yes
No. of Samples Provided	10 Soil
Turnaround Time Requested	Standard
Temperature on Receipt (°C)	8
Cooling Method	Ice Pack
Sampling Date Provided	YES

Comments

Nil

Please direct any queries to:

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

Analysis Underway, details on the following page:

Envirolab Services Pty Ltd
ABN 37 112 535 645
12 Ashley St Chatswood NSW 2067
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customerservice@envirolab.com.au
www.envirolab.com.au

Sample ID	VOCs in soil	vTRH(C6-C10)/BTEXN in Soil	svTRH (C10-C40) in Soil	PAHs in Soil	Organochlorine Pesticides in soil	Organophosphorus Pesticides in Soil	PCBsin Soil	Acid Extractable metalsin soil	Misc Soil - Inorg	Asbestos ID - soils	Misc Inorg - Soil	Coal Tar	Tributyl Tin in Soil	On Hold
CP2-0.4-0.5	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓		
CP2-0.9-1.0														✓
CP2-1.4-1.5														✓
CP2-1.9-2.0														✓
CP2-2.4-2.5		✓	✓	✓				✓		✓	✓	✓	✓	
CP2-2.9-3.0														✓
CP2-3.9-4.0														✓
CP2-4.9-5.0														✓
Spike		✓												
Blank		✓												

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

Additional Info

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

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 276703-A

Client Details

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

Sample Details

Your Reference	**202546.00, Cockle Bay**
Number of Samples	additional analysis
Date samples received	27/08/2021
Date completed instructions received	03/09/2021

Analysis Details

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

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

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

Report Details

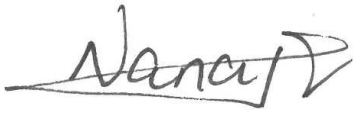
Date results requested by	10/09/2021
Date of Issue	09/09/2021

NATA Accreditation Number 2901. This document shall not be reproduced except in full.

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

Results Approved By
Hannah Nguyen, Metals Supervisor

Authorised By



Nancy Zhang, Laboratory Manager

Metals from Leaching Fluid pH 2.9 or 5		
Our Reference		276703-A-1
Your Reference	UNITS	CP2
Depth		0.4-0.5
Date Sampled		20/08/2021
Type of sample		Soil
Date extracted	-	08/09/2021
Date analysed	-	08/09/2021
pH of soil for fluid# determ.	pH units	9.5
pH of soil TCLP (after HCl)	pH units	1.9
Extraction fluid used	-	1
pH of final Leachate	pH units	5.3
Nickel	mg/L	0.1

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

QUALITY CONTROL: Metals from Leaching Fluid pH 2.9 or 5					Duplicate				Spike Recovery %	
Test Description	Units	PQL	Method	Blank	#	Base	Dup.	RPD	LCS-W2	[NT]
Date extracted	-			08/09/2021	[NT]	[NT]	[NT]	[NT]	08/09/2021	[NT]
Date analysed	-			08/09/2021	[NT]	[NT]	[NT]	[NT]	08/09/2021	[NT]
Nickel	mg/L	0.02	Metals-020	<0.02	[NT]	[NT]	[NT]	[NT]	97	[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
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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.
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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 276703 202546.00, Cockle Bay

Ref: 276703-A.
TAT: Standard.
Due: 10/09/2021.
MT.

From: Kurt Plambeck <kurt.plambeck@douglaspartners.com.au>
Sent: Friday, 3 September 2021 4:39 PM
To: Greta Petzold <GPetzold@envirolab.com.au>
Subject: RE: Results for Registration 276703 202546.00, Cockle Bay

CAUTION: This email originated from outside of the organisation. Do not act on instructions, click links or open attachments unless you recognise the sender and know the content is authentic and safe.

Greta,

(1)

Can you please run sample CP2/0.4-0.5 for TCLP on Ni

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

If you are not the intended recipient of this email, please notify us immediately and be aware that any disclosure, copying, distribution or use of the contents of this information is prohibited.

From: Greta Petzold <GPetzold@envirolab.com.au>
Sent: Friday, 3 September 2021 4:24 PM
To: Rhys McMillan <Rhys.McMillan@douglaspartners.com.au>; Kurt Plambeck <kurt.plambeck@douglaspartners.com.au>
Subject: Results for Registration 276703 202546.00, Cockle Bay

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

Please note that a hard copy will not be posted.

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

How did we do? Send Feedback

Kind Regards,

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	202546.00, Cockle Bay
Envirolab Reference	276703-A
Date Sample Received	27/08/2021
Date Instructions Received	03/09/2021
Date Results Expected to be Reported	10/09/2021

Sample Condition

Samples received in appropriate condition for analysis	Yes
No. of Samples Provided	additional analysis
Turnaround Time Requested	Standard
Temperature on Receipt (°C)	8
Cooling Method	Ice Pack
Sampling Date Provided	YES

Comments

Nil

Please direct any queries to:

Aileen Hie	Jacinta Hurst
Phone: 02 9910 6200	**Phone: 02 9910 6200**
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Analysis Underway, details on the following page:

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Sample ID	pH of soil for fluid#determ.	pH of soil TCLP (after HCl)	Extraction fluid used	pH of final Leachate	Nickel	On Hold
CP2-0.4-0.5	✓	✓	✓	✓	✓	
CP2-0.9-1.0						✓
CP2-1.4-1.5						✓
CP2-1.9-2.0						✓
CP2-2.4-2.5						✓
CP2-2.9-3.0						✓
CP2-3.9-4.0						✓
CP2-4.9-5.0						✓
Spike						✓
Blank						✓

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

Additional Info

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

Appendix I

QA / QC Results

Appendix I
QA / QC Results
241-249 Wheat Road, Sydney

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 filed QC samples are included in at the end of this appendix.

Table 1: Field and Laboratory Quality Control

Item	Evaluation / Acceptance Criteria	Compliance
Analytical laboratories used	NATA accreditation	C
Holding times	Various based on type of analysis	PC
Intra-laboratory replicates	5% of primary samples; <30% RPD	PC
Inter-laboratory replicates	5% of primary samples; <30% RPD	PC
Trip Spikes	1 per sampling event; 60-140% recovery Table QA4	C
Trip Blanks	1 per sampling event; <PQL Table QA3	C
Rinsate	1 rinsate collected during groundwater sampling Trace TRH detected in rinsate sample. ELS report noted that the positive result in the rinsate sample is due to a single peak with no hydrocarbon profile that is consistent with the use of plastic containers. All other contaminants in rinsate sample below detection limits. Therefore TRH in rinsate not considered significant.	PC
Laboratory / Reagent Blanks	1 per batch; <PQL	C
Matrix Spikes	1 per lab batch; 70-130% recovery (inorganics); 60-140% recovery (organics)	C

Item	Evaluation / Acceptance Criteria	Compliance
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

Holding time exceedances exist as noted in the laboratory certificates. Turnaround times and dispatch of samples was impacted by Covid lockdowns and delays in approval for analysis from the client, however it is not considered that the quality of the results was significantly impacted.

Replicate soil analysis included five intra-laboratory replicate pairs (13%) and one inter-laboratory replicate pair (3%) (Table QA1) and one inter-laboratory groundwater replicate (16%) and one intra-laboratory replicate (16%) (Table QA2). At the time that this interim report was prepared the inter-laboratory groundwater duplicate results had not been received. This result will be included in the final report.

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

- The typically low actual differences in the concentrations of the replicate pairs where some RPD exceedances occurred, particularly for groundwater;
- The number of replicate pairs being collected from fill soils which by its nature is heterogeneous;
- Replicates, rather than homogenised duplicates, were used to minimise risk of volatile loss, hence greater variability can be expected;
- Most of the recorded concentrations being relatively close to the PQL;
- The majority of RPDs within a replicate pair being within the acceptable limits; and
- All other QA / QC parameters met the DQIs.

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

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

Data Quality Indicator	Method(s) of Achievement
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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Table QA1: Relative Percentage Difference Results – Soil Replicates

Intra-laboratory

			Metals								TRH					BTEX					
			Arsenic	Cadmium	Total Chromium	Copper	Lead	Mercury (inorganic)	Nickel	Zinc	TRH C6 - C9	TRH C10 - C14	TRH C15 - C28	TRH C29 - C36	C10-C36 recoverable hydrocarbons	Benzene	Toluene	Ethylbenzene	m+p-Xylene	o-Xylene	Xylenes (total)
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
BD1/20210630	0 m	30/06/2021	4	<0.4	9	36	79	0.2	11	90	<25	<50	<100	<100	NT	<0.2	<0.5	<1	<2	<1	<3
CW6	0.5 - 0.6 m	30/06/2021	5	<0.4	11	36	120	0.2	13	180	<25	<50	<100	<100	NT	<0.2	<0.5	<1	<2	<1	<3
		Difference	1	0	2	0	41	0	2	90	0	0	0	0	-	0	0	0	0	0	0
		RPD	22%	0%	20%	0%	**41%**	0%	17%	**67%**	0%	0%	0%	0%	-	0%	0%	0%	0%	0%	0%
BD07/120721	0 m	12/07/2021	<4	<0.4	3	<1	3	<0.1	<1	2	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT
CW1	12 - 12.45 m	12/07/2021	<4	<0.4	3	<1	3	<0.1	<1	2	<25	<50	<100	<100	NT	<0.2	<0.5	<1	<2	<1	<3
		Difference	0	0	0	0	0	0	0	0	-	-	-	-	-	-	-	-	-	-	-
		RPD	0%	0%	0%	0%	0%	0%	0%	0%	-	-	-	-	-	-	-	-	-	-	-
BD03/060721	0 m	6/07/2021	<4	<0.4	18	60	21	<0.1	160	69	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT
CW7	0.5 m	6/07/2021	<4	<0.4	15	56	14	<0.1	150	62	NT	NT	NT	NT	NT	<0.2	<0.5	<1	<2	<1	NT
		Difference	0	0	3	4	7	0	10	7	-	-	-	-	-	-	-	-	-	-	-
		RPD	0%	0%	18%	7%	**40%**	0%	6%	11%	-	-	-	-	-	-	-	-	-	-	-
WD3	4-.4.45	11/09/2021	<4	<0.4	37	30	53	<0.1	9	80	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT
BD03/210911		11/09/2021	<4	<0.4	76	22	44	<0.1	7	47	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT
		Difference	0	0	39	8	9	0	2	33	-	-	-	-	-	-	-	-	-	-	-
		RPD	0%	0%	**69%**	31%	19%	0%	25%	**52%**	-	-	-	-	-	-	-	-	-	-	-
CP1	1-1.1 m	18/09/2021	6	0.8	12	12	3900	1.5	7	1100	<25	<50	<100	<100	NT	<0.2	<0.5	<1	<2	<1	NT
BD01/180921		18/09/2021	<4	<0.4	6	6	450	0.5	4	150	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT
		Difference	2	0.4	6	6	3450	1	3	950	-	-	-	-	-	-	-	-	-	-	-
		RPD	**40%**	**67%**	**67%**	**67%**	**159%**	**100%**	**55%**	**152%**	-	-	-	-	-	-	-	-	-	-	-

Inter-Laboratory

BD1/040821	0 m	04-Aug-21 15:00	<5	<1	6	26	115	0.2	4	28	<10	<50	<100	<100	<50	<0.2	<0.5	<0.5	<0.5	<0.5	<0.5
CW7	2 - 2.1 m		<4	<0.4	11	37	93	0.3	19	43	<25	<50	<100	<100	<50	<0.2	<0.5	<1	<2	<1	<3
		Difference	1	0.6	5	11	22	0.1	15	15	15	0	0	0	0	0	0	0.5	1.5	0.5	2.5
		RPD	0	**0**	**59%**	**35%**	21%	**40%**	**130%**	**42%**	**0**	0%	0%	0%	0%	0%	0%	**0**	**0**	**0**	**0**

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Table QA1: Relative Percentage Difference Results – Soil Replicates

Intra-laboratory

			PAH																Asbestos		
			Benzo(a)pyrene (BaP)	Acenaphthene	Acenaphthylene	Anthracene	Benzo(a)anthracene	Benzo(b,j+k)fluoranthene	Benzo(g,h,i)perylene	Chrysene	Dibenz(a,h)anthracene	Fluoranthene	Fluorene	Indeno(1,2,3-c,d)pyrene	Naphthalene	Phenanthrene	Pyrene	Total PAHs	Asbestos ID in soil >0.1g/kg	Trace Analysis	Total Asbestos
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	-	-	-
BD1/20210630	0 m	30/06/2021	1.9	<0.1	0.2	0.4	2.2	2.6	0.7	1.6	0.2	3.4	<0.1	0.7	<1	1.6	3.4	19	NAD	NAD	NAD
CW6	0.5 - 0.6 m	30/06/2021	1.6	<0.1	0.1	0.3	1.4	2.1	0.7	1.3	0.2	2.4	<0.1	0.6	<1	1	2.3	14	NAD	NAD	NAD
		Difference	0.3	0	0.1	0.1	0.8	0.5	0	0.3	0	1	0	0.1	0	0.6	1.1	5	0	0	0
		RPD	17%	0%	**67%**	29%	**44%**	21%	0%	21%	0%	**34%**	0%	15%	0%	**46%**	**39%**	**30%**	0	0	0
BD07/120721	0 m	12/07/2021	<0.05	<0.1	<0.1	<0.1	<0.1	<0.2	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.05	NAD	NAD	NAD
CW1	12 - 12.45 m	12/07/2021	<0.05	<0.1	<0.1	<0.1	<0.1	<0.2	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<1	<0.1	<0.1	<0.05	NAD	NAD	NAD
		Difference	0	0	0	0	0	0	0	0	0	0	0	0	0.9	0	0	0	0	0	0
		RPD	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	**164%**	0%	0%	0%	0	0	0
BD03/060721	0 m	6/07/2021	0.1	<0.1	<0.1	<0.1	<0.1	<0.2	<0.1	0.1	<0.1	0.2	<0.1	<0.1	<0.1	<0.1	0.2	0.5	NAD	NAD	NAD
CW7	0.5 m	6/07/2021	0.4	<0.1	<0.1	<0.1	0.4	0.5	0.2	0.5	<0.1	0.3	<0.1	0.1	<0.1	<0.1	0.5	3	NAD	NAD	NAD
		Difference	0.3	0	0	0	0.3	0.3	0.1	0.4	0	0.1	0	0	0	0	0.3	2.5	0	0	0
		RPD	**120%**	0%	0%	0%	**120%**	**86%**	**67%**	**133%**	0%	**40%**	0%	0%	0%	0%	**86%**	**143%**	0	0	0
WD3	4-.4.45	11/09/2021	0.5	<0.1	<0.1	0.3	0.3	0.6	0.1	0.2	<0.1	0.3	<0.1	0.2	<0.1	0.2	0.3	2.6	NAD	NAD	NAD
BD03/210911		11/09/2021	1.3	<0.1	<0.1	3	1.6	4	0.8	1.1	0.2	3	0.1	1.2	<0.1	2.5	2.6	19	NAD	NAD	NAD
		Difference	0.8	0	0	2.7	1.3	3.4	0.7	0.9	0.1	2.7	0	1	0	2.3	2.3	16.4	0	0	0
		RPD	**89%**	0%	0%	**163%**	**137%**	**149%**	**156%**	**138%**	**67%**	**163%**	0%	**143%**	0%	**170%**	**159%**	**152%**	0	0	0
CP1	1-1.1 m	18/09/2021	0.1	<0.1	<0.1	<0.1	<0.1	<0.2	0.1	0.1	<0.1	0.1	<0.1	<0.1	<0.1	<0.1	0.2	0.66	NAD	NAD	NAD
BD01/180921		18/09/2021	0.1	<0.1	<0.1	<0.1	<0.1	0.4	0.2	0.1	<0.1	0.2	<0.1	0.1	<0.1	0.1	0.2	1.4	NAD	NAD	NAD
		Difference	0	0	0	0	0	0.2	0.1	0	0	0.1	0	0	0	0	0	0.74	0	0	0
		RPD	0%	0%	0%	0%	0%	**67%**	**67%**	0%	0%	**67%**	0%	0%	0%	0%	0%	**65%**	0	0	0

Inter-Laboratory

BD1/040821	0 m	04-Aug-21 15:00	<0.5	<0.5	<0.5	<0.5	<0.5	NT	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<1	<0.5	<0.5	NT	-	-	-
CW7	2 - 2.1 m		0.2	<0.1	<0.1	<0.1	0.2	0.3	0.1	0.2	<0.1	0.3	<0.1	<0.1	<1	0.1	0.3	1.8	NAD	NAD	NAD
		Difference	0.3	0.4	0.4	0.4	0.3	-	0.4	0.3	0.4	0.2	0.4	0.4	0	0.4	0.2	-	-	-	-
		RPD	**0**	**0**	**0**	**0**	**0**	-	**0**	**0**	**0**	**0**	**0**	**0**	0%	**0**	**0**	-	-	-	-

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Table QA2: Relative Percentage Difference Results – Groundwater Replicates

Intra-laboratory Duplicate					
ChemName	Units	EQL	CW2	BD2	RPD
3/4-Methylphenol (m/p-cresol)	mg/l	0.002	<0.002	<0.002	0
Benzo(b,j+k)fluoranthene	µg/L	2	<2.0	<2.0	0
Arsenic (Filtered)	mg/l	0.001	<0.001	<0.001	0
Cadmium (Filtered)	mg/l	0.0001	<0.0001	<0.0001	0
Chromium (III+VI) (Filtered)	mg/l	0.001	0.001	<0.001	0
Copper (Filtered)	mg/l	0.001	<0.001	<0.001	0
Iron (Filtered)	mg/l	0.01	0.01	0.02	**67**
Lead (Filtered)	mg/l	0.001	<0.001	<0.001	0
Mercury (Filtered)	mg/l	0.00005	<0.0001	<0.0001	0
Nickel (Filtered)	mg/l	0.001	0.002	0.002	0
Tin (Filtered)	mg/l	0.001	<0.001	<0.001	0
Zinc (Filtered)	mg/l	0.001	0.013	0.015	14
C10-C16	mg/l	0.05	<0.05	<0.05	0
C16-C34	mg/l	0.1	<0.1	<0.1	0
C34-C40	mg/l	0.1	<0.1	<0.1	0
F2-NAPHTHALENE	mg/l	0.05	<0.05	<0.05	0
C6 - C9	mg/l	0.01	<0.01	<0.01	0
C10 - C14	mg/l	0.05	<0.05	<0.05	0
C15 - C28	mg/l	0.1	<0.1	<0.1	0
C29-C36	mg/l	0.1	<0.1	<0.1	0
+C10 - C36 (Sum of total)	mg/l	0.05	<0.05	<0.05	0
C10 - C40 (Sum of total)	mg/l	0.05	<0.05	<0.05	0
C6-C10 less BTEX (F1)	mg/l	0.01	<0.01	<0.01	0
C6-C10	mg/l	0.01	<0.01	<0.01	0
Benzene	mg/l	0.001	<0.001	<0.001	0
Benzene	mg/l	0.001	<0.001	<0.001	0
Ethylbenzene	mg/l	0.001	<0.001	<0.001	0
Ethylbenzene	mg/l	0.001	<0.001	<0.001	0
Toluene	mg/l	0.001	<0.001	<0.001	0
Toluene	mg/l	0.001	<0.001	<0.001	0
Xylene (m & p)	mg/l	0.002	<0.002	<0.002	0
Xylene (m & p)	mg/l	0.002	<0.002	<0.002	0
Xylene (o)	mg/l	0.001	<0.001	<0.001	0
Xylene (o)	mg/l	0.001	<0.001	<0.001	0
1,2,4-trimethylbenzene	mg/l	0.001	<0.001	<0.001	0
1,3,5-trimethylbenzene	mg/l	0.001	<0.001	<0.001	0
Isopropylbenzene	mg/l	0.001	<0.001	<0.001	0
n-butylbenzene	mg/l	0.001	<0.001	<0.001	0
n-propylbenzene	mg/l	0.001	<0.001	<0.001	0
p-isopropyltoluene	mg/l	0.001	<0.001	<0.001	0
sec-butylbenzene	mg/l	0.001	<0.001	<0.001	0
Styrene	mg/l	0.001	<0.001	<0.001	0
tert-butylbenzene	mg/l	0.001	<0.001	<0.001	0
1,1,1,2-tetrachloroethane	mg/l	0.001	<0.001	<0.001	0

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Table QA2: Relative Percentage Difference Results – Groundwater Replicates

Intra-laboratory Duplicate					
ChemName	Units	EQL	CW2	BD2	RPD
1,1,1-trichloroethane	mg/l	0.001	<0.001	<0.001	0
1,1,2,2-tetrachloroethane	mg/l	0.001	<0.001	<0.001	0
1,1,2-trichloroethane	mg/l	0.001	<0.001	<0.001	0
1,1-dichloroethane	mg/l	0.001	<0.001	<0.001	0
1,1-dichloroethene	mg/l	0.001	<0.001	<0.001	0
1,1-dichloropropene	mg/l	0.001	<0.001	<0.001	0
1,2,3-trichloropropane	mg/l	0.001	<0.001	<0.001	0
1,2-dibromo-3-chloropropane	mg/l	0.001	<0.001	<0.001	0
1,2-dichloroethane	mg/l	0.001	<0.001	<0.001	0
1,2-dichloropropane	mg/l	0.001	<0.001	<0.001	0
1,3-dichloropropane	mg/l	0.001	<0.001	<0.001	0
2,2-dichloropropane	mg/l	0.001	<0.001	<0.001	0
Bromochloromethane	mg/l	0.001	<0.001	<0.001	0
Bromodichloromethane	mg/l	0.001	<0.001	<0.001	0
Bromoform	mg/l	0.001	<0.001	<0.001	0
Carbon tetrachloride	mg/l	0.001	<0.001	<0.001	0
Chlorodibromomethane	mg/l	0.001	<0.001	<0.001	0
Chloroethane	mg/l	0.01	<0.01	<0.01	0
Chloroform	mg/l	0.001	<0.001	<0.001	0
Chloromethane	mg/l	0.01	<0.01	<0.01	0
cis-1,2-dichloroethene	mg/l	0.001	<0.001	<0.001	0
cis-1,3-dichloropropene	mg/l	0.001	<0.001	<0.001	0
Dibromomethane	mg/l	0.001	<0.001	<0.001	0
Hexachlorobutadiene	mg/l	0.001	<0.001	<0.001	0
Trichloroethene	mg/l	0.001	<0.001	<0.001	0
Tetrachloroethene	mg/l	0.001	<0.001	<0.001	0
trans-1,2-dichloroethene	mg/l	0.001	<0.001	<0.001	0
trans-1,3-dichloropropene	mg/l	0.001	<0.001	<0.001	0
Vinyl chloride	mg/l	0.01	<0.01	<0.01	0
1,2-dibromoethane	mg/l	0.001	<0.001	<0.001	0
Bromomethane	mg/l	0.01	<0.01	<0.01	0
Dichlorodifluoromethane	mg/l	0.01	<0.01	<0.01	0
Trichlorofluoromethane	mg/l	0.01	<0.01	<0.01	0
1,2,3-trichlorobenzene	mg/l	0.001	<0.001	<0.001	0
1,2,4-trichlorobenzene	mg/l	0.001	<0.001	<0.001	0
1,2-dichlorobenzene	mg/l	0.001	<0.001	<0.001	0
1,3-dichlorobenzene	mg/l	0.001	<0.001	<0.001	0
1,4-dichlorobenzene	mg/l	0.001	<0.001	<0.001	0
2-chlorotoluene	mg/l	0.001	<0.001	<0.001	0
4-chlorotoluene	mg/l	0.001	<0.001	<0.001	0
Bromobenzene	mg/l	0.001	<0.001	<0.001	0
Chlorobenzene	mg/l	0.001	<0.001	<0.001	0
Cyclohexane	mg/l	0.001	<0.001	<0.001	0
2,4-dimethylphenol	mg/l	0.001	<0.001	<0.001	0

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Table QA2: Relative Percentage Difference Results – Groundwater Replicates

Intra-laboratory Duplicate					
ChemName	Units	EQL	CW2	BD2	RPD
2,4-dinitrophenol	mg/l	0.02	<0.02	<0.02	0
2-methylphenol	mg/l	0.001	<0.001	<0.001	0
2-nitrophenol	mg/l	0.001	<0.001	<0.001	0
4,6-Dinitro-2-methylphenol	mg/l	0.01	<0.01	<0.01	0
4-chloro-3-methylphenol	mg/l	0.005	<0.005	<0.005	0
4-nitrophenol	mg/l	0.02	<0.02	<0.02	0
Acenaphthene	mg/l	0.001	<0.001	<0.001	0
Acenaphthylene	mg/l	0.001	<0.001	<0.001	0
Anthracene	mg/l	0.001	<0.001	<0.001	0
Benz(a)anthracene	mg/l	0.001	<0.001	<0.001	0
Benzo(a) pyrene	mg/l	0.001	<0.001	<0.001	0
Benzo(g,h,i)perylene	mg/l	0.001	<0.001	<0.001	0
Chrysene	mg/l	0.001	<0.001	<0.001	0
Dibenz(a,h)anthracene	mg/l	0.001	<0.001	<0.001	0
Fluoranthene	mg/l	0.001	<0.001	<0.001	0
Fluorene	mg/l	0.001	<0.001	<0.001	0
Indeno(1,2,3-c,d)pyrene	mg/l	0.001	<0.001	<0.001	0
Naphthalene	mg/l	0.001	<0.001	<0.001	0
Naphthalene	mg/l	0.001	<0.001	<0.001	0
Phenanthrene	mg/l	0.001	<0.001	<0.001	0
Phenol	mg/l	0.001	<0.001	<0.001	0
Pyrene	mg/l	0.001	<0.001	<0.001	0
2,3,4,6-tetrachlorophenol	mg/l	0.001	<0.001	<0.001	0
2,4,5-trichlorophenol	mg/l	0.001	<0.001	<0.001	0
2,4,6-trichlorophenol	mg/l	0.001	<0.001	<0.001	0
2,4-dichlorophenol	mg/l	0.001	<0.001	<0.001	0
2,6-dichlorophenol	mg/l	0.001	<0.001	<0.001	0
2-chlorophenol	mg/l	0.001	<0.001	<0.001	0
Pentachlorophenol	mg/l	0.005	<0.005	<0.005	0

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Table QA3: Trip Blank Results (mg/kg)

Sample ID	Benzene	Toluene	Ethylbenzene	m+p-Xylene	o-Xylene	Xylenes (total)
Blank 1	<0.2	<0.5	<1	<2	<1	<3
Blank 2	<0.2	<0.5	<1	<2	<1	<3
Blank 3	<0.2	<0.5	<1	<2	<1	<3
Blank	<0.2	<0.5	<1	<2	<1	<3
Blank (groundwater µg/L)	<1	<1	<1	<2	<1	<3

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Table QA4: Trip Spike Results (% Recovery)

Sample ID	Benzene	Toluene	Ethylbenzene	m+p-Xylene	o-Xylene
Spike 1	116	87	83	82	81
Spike 2	89	89	72	72	70
Spike 3	94	95	94	96	93
Spike	87	85	86	86	86
Spike groundwater	99	98	110	110	105

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Table QA5: Rinsate Results - Groundwater

Sample ID	Benzene	Toluene	Ethylbenzene	m+p-Xylene	o-Xylene	VOC	PAH	As	Cd	Ch	Cu	Pb	Hg	Ni	Zn	Sn	Fe	C10-C14	C15-C28	C29-C36	C>10-C16	F2	C>16-34	>C34-C40
Rinsate	<1	<1	<1	<2	<3	<1	<1	<1	<0.1	<1	<1	<1	<0.05	<1	<1	<1	10	<50	**270**	<100	**250**	**250**	<100	<100

Inter-laboratory Duplicate				
ChemName	Units	CW3	BD1	RPD
Arsenic (Filtered)	mg/L	<0.001	<0.001	0
Cadmium (Filtered)	mg/L	<0.0001	<0.0001	0
Chromium (III+VI) (Filtered)	mg/L	<0.001	<0.001	0
Copper (Filtered)	mg/L	<0.001	0.004	**120**
Lead (Filtered)	mg/L	<0.001	<0.001	0
Mercury (Filtered)	mg/L	<0.00005	<0.0001	0
Nickel (Filtered)	mg/L	0.009	0.008	6
Tin (Filtered)	mg/L	<0.001	<0.001	0
Zinc (Filtered)	mg/L	0.001	<0.005	0
C10-C16	mg/L	<0.05	<0.02	0
C16-C34	mg/L	<0.1	<0.1	0
C34-C40	mg/L	<0.1	<0.1	0
F2-NAPHTHALENE	mg/L	<0.05	<0.1	0
C6 - C9	mg/L	<0.01	<0.2	0
C10 - C14	mg/L	<0.05	<0.05	0
C15 - C28	mg/L	<0.1	<0.1	0
C29-C36	mg/L	<0.1	<0.1	0
C6-C10 less BTEX (F1)	mg/L	<0.01	<0.02	0
C6-C10	mg/L	<0.01	<0.02	0
Benzene	mg/L	<0.001	<0.001	0
Ethylbenzene	mg/L	<0.001	<0.002	0
Toluene	mg/L	<0.001	<0.002	0
Xylene (m & p)	mg/L	<0.002	<0.002	0
Xylene (o)	mg/L	<0.001	<0.002	0
1,2,4-trimethylbenzene	mg/L	<0.001	<0.005	0
1,3,5-trimethylbenzene	mg/L	<0.001	<0.005	0
Isopropylbenzene	mg/L	<0.001	<0.005	0
n-butylbenzene	mg/L	<0.001	<0.005	0
n-propylbenzene	mg/L	<0.001	<0.005	0
p-isopropyltoluene	mg/L	<0.001	<0.005	0
sec-butylbenzene	mg/L	<0.001	<0.005	0
Styrene	mg/L	<0.001	<0.005	0
tert-butylbenzene	mg/L	<0.001	<0.005	0
1,1,1,2-tetrachloroethane	mg/L	<0.001	<0.005	0
1,1,1-trichloroethane	mg/L	<0.001	<0.005	0
1,1,2,2-tetrachloroethane	mg/L	<0.001	<0.005	0
1,1,2-trichloroethane	mg/L	<0.001	<0.005	0
1,1-dichloroethane	mg/L	<0.001	<0.005	0
1,1-dichloroethene	mg/L	<0.001	<0.005	0
1,1-dichloropropene	mg/L	<0.001	<0.005	0
1,2,3-trichloropropane	mg/L	<0.001	<0.005	0
1,2-dibromo-3-chloropropane	mg/L	<0.001	<0.005	0
1,2-dichloroethane	mg/L	<0.001	<0.005	0
1,2-dichloropropane	mg/L	<0.001	<0.005	0

Inter-laboratory Duplicate				
ChemName	Units	CW3	BD1	RPD
1,3-dichloropropane	mg/L	<0.001	<0.005	0
2,2-dichloropropane	mg/L	<0.001	<0.005	0
Bromochloromethane	mg/L	<0.001	<0.005	0
Bromodichloromethane	mg/L	<0.001	<0.005	0
Bromoform	mg/L	<0.001	<0.005	0
Carbon tetrachloride	mg/L	<0.001	<0.005	0
Chlorodibromomethane	mg/L	<0.001	<0.005	0
Chloroethane	mg/L	<0.01	<0.05	0
Chloroform	mg/L	<0.001	<0.005	0
Chloromethane	mg/L	<0.01	<0.05	0
cis-1,2-dichloroethene	mg/L	<0.001	<0.005	0
cis-1,3-dichloropropene	mg/L	<0.001	<0.005	0
Dibromomethane	mg/L	<0.001	<0.005	0
Hexachlorobutadiene	mg/L	<0.001	<0.005	0
Trichloroethene	mg/L	<0.001	<0.005	0
Tetrachloroethene	mg/L	<0.001	<0.005	0
trans-1,2-dichloroethene	mg/L	<0.001	<0.005	0
trans-1,3-dichloropropene	mg/L	<0.001	<0.005	0
Vinyl chloride	mg/L	<0.01	<0.05	0
1,2-dibromoethane	mg/L	<0.001	<0.005	0
Bromomethane	mg/L	<0.01	<0.05	0
Dichlorodifluoromethane	mg/L	<0.01	<0.05	0
Trichlorofluoromethane	mg/L	<0.01	<0.05	0
1,2,3-trichlorobenzene	mg/L	<0.001	<0.005	0
1,2,4-trichlorobenzene	mg/L	<0.001	<0.005	0
1,2-dichlorobenzene	mg/L	<0.001	<0.005	0
1,3-dichlorobenzene	mg/L	<0.001	<0.005	0
1,4-dichlorobenzene	mg/L	<0.001	<0.005	0
2-chlorotoluene	mg/L	<0.001	<0.005	0
4-chlorotoluene	mg/L	<0.001	<0.005	0
Bromobenzene	mg/L	<0.001	<0.005	0
Chlorobenzene	mg/L	<0.001	<0.005	0
Cyclohexane	mg/L	<0.001	<0.005	0
2,4-dimethylphenol	mg/L	<0.001	<0.001	0
2,4-dinitrophenol	mg/L	<0.02	<0.001	0
2-methylphenol	mg/L	<0.001	<0.001	0
2-nitrophenol	mg/L	<0.001	<0.001	0
4,6-Dinitro-2-methylphenol	mg/L	<0.01	<0.001	0
4-chloro-3-methylphenol	mg/L	<0.005	<0.001	0
4-nitrophenol	mg/L	<0.02	<0.001	0
Acenaphthene	mg/L	<0.001	<0.001	0
Acenaphthylene	mg/L	<0.001	<0.001	0
Anthracene	mg/L	<0.001	<0.001	0
Benzo(b,j+k)fluoranthene	µg/L	<2	<0.001	0

Inter-laboratory Duplicate				
ChemName	Units	CW3	BD1	RPD
Benz(a)anthracene	mg/L	<0.001	<0.001	0
Benzo(a) pyrene	mg/L	<0.001	<0.0005	0
Benzo(g,h,i)perylene	mg/L	<0.001	<0.001	0
Chrysene	mg/L	<0.001	<0.001	0
Dibenz(a,h)anthracene	mg/L	<0.001	<0.001	0
Fluoranthene	mg/L	<0.001	<0.001	0
Fluorene	mg/L	<0.001	<0.001	0
Indeno(1,2,3-c,d)pyrene	mg/L	<0.001	<0.001	0
Naphthalene	mg/L	<0.001	<0.001	0
Phenanthrene	mg/L	<0.001	<0.001	0
Phenol	mg/L	<0.001	<0.001	0
Pyrene	mg/L	<0.001	<0.001	0
2,3,4,6-tetrachlorophenol	mg/L	<0.001	<0.001	0
2,4,5-trichlorophenol	mg/L	<0.001	<0.001	0
2,4,6-trichlorophenol	mg/L	<0.001	<0.001	0
2,4-dichlorophenol	mg/L	<0.001	<0.001	0
2,6-dichlorophenol	mg/L	<0.001	<0.001	0
2-chlorophenol	mg/L	<0.001	<0.001	0
3/4-Methylphenol (m/p-cresol)	mg/L	<0.002	<0.002	0
Pentachlorophenol	mg/L	<0.005	<0.002	0