



Douglas Partners

Geotechnics | Environment | Groundwater

Report on
Supplementary (Contamination) Site Investigation

Proposed Commercial Development
8-10 Lee Street, Haymarket

Prepared for
Atlassian Pty Ltd

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Integrated Practical Solutions



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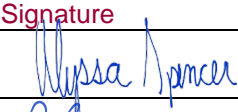
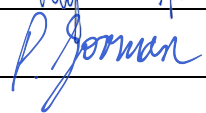
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The undersigned, on behalf of Douglas Partners Pty Ltd, confirm that this document and all attached drawings, logs and test results have been checked and reviewed for errors, omissions and inaccuracies.

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Report on Supplementary (Contamination) Site Investigation Proposed Commercial Development 8-10 Lee Street, Haymarket

1. Introduction

1.1 General

Douglas Partners Pty Ltd (DP) has been commissioned by Atlassian (the Applicant) to prepare this Supplementary (Contamination) Site Investigation (SSI) report in accordance with the technical requirements of the Secretary's Environmental Assessment Requirements (SEARs), and in support of the SSD-10405 for a commercial and hotel development above the Former Inwards Parcel Shed (Parcels Shed) at 8-10 Lee Street, Haymarket.

Specifically, this report addresses the following SEARs:

SEARs	Report Reference
18. Contamination and Remediation: <i>'...A Preliminary Site Investigation Study if needed, and/or further information as required by SEPP55 including an Acid Sulphate Soils Management Plan.'</i>	Section 4.2 and Section 9.3 (Reference to Acid Sulphate Soil) Section 4 (Reference to Preliminary Site Investigation) Section 5-10 (Further information as required)
Plans and Documents: <i>'soil and contamination report'</i>	To include this SSI as part of the Environmental Impact Statement (EIS)

In addition to the above table, the SEARs require an environmental risk analysis be included in the environmental impact statement (EIS) to identify potential environmental impacts associated with the Project. The environmental risk analysis associated with soil and groundwater contamination is attached in Appendix J.

The investigation was undertaken in accordance with the Douglas Partners Pty Ltd (DP) proposal SYD190190.P.003 dated 4 February 2020.

This report follows previous geotechnical and contamination investigations by DP at the Site (the findings of the contamination investigation are summarised in Section 4). The investigation was undertaken concurrently with a DP hazardous materials (HAZMAT) survey and a supplementary geotechnical site investigation. The resultant reports are summarised in Table 1.

Table 1: Report Sequence

Report Title	Date	DP Report
Report on Geotechnical Investigation	August 2019	86767.00.R.001
Report on Detailed Site (Contamination) Investigation	August 2019	86767.01.R.001
Reports on Groundwater Monitoring and Permeability Assessment	September 2019 to May 2020	86767.00.R.002 to 86767.00.R.005
Hazardous Building Materials (HBM) Register	July 2019	86767.02.R.001
Report on Hazardous Building Material Survey	June 2020	86767.05.R.001
Report on Supplementary Site (Geotechnical) Investigation	June 2020	86767.05
Report on Supplementary Site (Contamination) Investigation (this current report)	June 2020	86767.03.R.001
Remediation Action Plan - Proposed Commercial Development	June 2020	86767.03.R.002

It is understood that the proposed development at the Site is to be divided into a 'Developer Works zone' and a 'State Works - Link Zone'. The Developer Works are proposed to include excavation for a two-level basement on the western side of Central followed by construction of a multi-storey mixed-use tower, whereas the State Works to the west of the tower include a two-level basement with a north-south connection to proposed future, adjoining basements. The approximate outlines of the zones are shown on Drawing 1, Appendix A. Further information about the development is provided in Section 1.4.

The objectives of the SSI are to:

- Assess the contamination status of the subsurface soil and groundwater at parts of the Site that were not investigated in the Detailed Site (Contamination) Investigation (DP, 2019);
- Assess the suitability of the Site, from a contamination perspective, for the proposed commercial development; and
- Make recommendations for further investigations and / or remediation (if required) to render the Site suitable for the intended commercial development.

The assessment process, including approval of this SSI, is subject to a Site Audit by a NSW Environment Protection Authority (EPA) accredited Site Auditor, Mr Rod Harwood of Harwood Environmental Consultants Pty Ltd, under part 4 of the *Contaminated Land Management (CLM) Act 1997*.

This SSI has been conducted with reference to guidelines made or endorsed by the NSW Environment Protection Authority under the *Contaminated Land Management Act 1997* (NSW EPA, 1997) including in particular the National Environment Protection Council *National Environment Protection (Assessment of Site Contamination) Measure 1999* (amended 2013, NEPC 2013).

1.2 Description of the Site

The Site is known as 8-10 Lee Street, Haymarket. It is an irregular-shaped allotment (refer Figure 1 below). The allotment has a small street frontage to Lee Street, however, this frontage is limited to the width of the access handle.

The Site comprises multiple parcels of land which exist at various stratum levels. All the lots are in the freehold ownership of Transport for NSW (TfNSW), with different leasing arrangements:

- Lot 116 in DP 1078271: YHA is currently the long-term leaseholder of the Site;
- Lot 117 in DP 1078271: This is currently in the ownership of TfNSW and the applicant is seeking the transfer of the leasehold on this land to provide for an optimised basement and servicing outcome for the Site;
- Lot 118 in DP 1078271: This is currently in the ownership of TfNSW and the applicant is seeking the transfer of the leasehold for part of the air-rights above part of this allotment to allow for an optimised building envelope for the Project. The proposal also uses a part of Lot 118 in DP 1078271 within Ambulance Avenue for Day 1 bike access, secondary pedestrian access and fire service vehicle access; and
- Lot 13 in DP 1062447: This is currently in the ownership of TfNSW, however, TOGA (who hold the lease for the Adina Hotel) have a long-term lease of this space in the lower ground area.

The Site has an area of approximately 3,764 sqm which includes 277 sqm of air rights that apply from RL40.

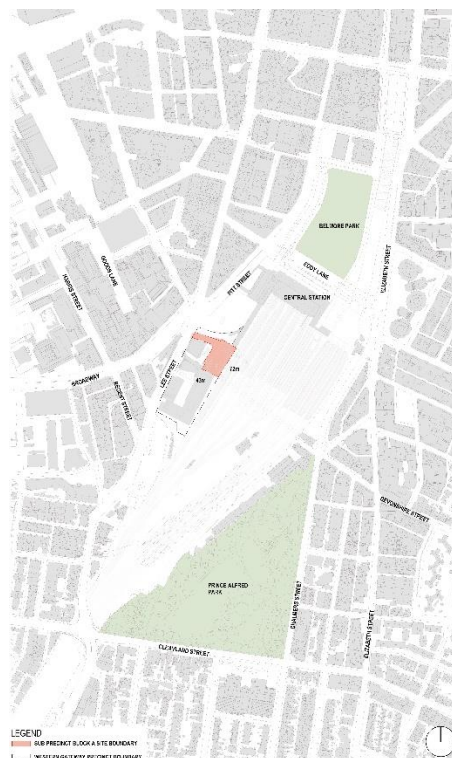


Figure 1: Site Location and Dimensions

Image Source: BVN / SHoP

1.3 Site and Surrounding Context

The Site is directly adjacent to the Western Wing Extension of Central Station, and forms part of the 'Western Gateway Sub-precinct' of the Central Railway Station lands. It is situated between the existing 'CountryLink' and 'Intercity' railway platforms to the east and the Adina Hotel (former Parcel Post Office) to the west.

Existing vehicle access to the Site is via Lee Street, however, the Lee Street frontage of the Site is only the width of the access handle.

Current improvements on the Site include the Parcels Shed, which operated in association with the former Parcels Post Office (now the Adina Hotel). The Site is currently used as the Sydney Railway Square Youth Hostel (YHA). The Site also includes the western entryway to the Devonshire Tunnel, which runs east-west through Central Station under the existing railway lines.

As part of the SEARS requirements, SHoP BVN and Urbis Pty Ltd has requested DP to incorporate the following information:

The Site is situated in a well-connected location in Sydney, directly adjacent to Central Station Railway which provides rail connections across metropolitan Sydney, as well as regional and interstate connections and a direct rail link to Sydney Airport. The Site is also within close proximity to several educational institutions and is a city fringe location which provides access to key support services.

Central Railway Station is currently undergoing rapid transformation to allow for integration of rail, metro and light rail transport infrastructure. This will elevate the role of Central Station not only for transport but also enhance opportunities for urban renewal and revitalisation of the surrounding precinct. This is one of the key drivers for the identification of the Central Station State Significant Precinct (Central SSP) and the Western Gateway Sub-precinct, to accommodate a new innovation and technology precinct.

The proximity of the Western Gateway Sub-precinct to the city, while still being located outside the core Sydney CBD, provides opportunity for it to evolve to attract technology and innovation companies. It has access to all required services while being sufficiently separate to the CBD to establish a distinct technology industry ecosystem. Its CBD fringe location will likely provide affordable commercial rents which will support 'Startups' and entrepreneurs, which are a key component of an innovation precinct.

1.4 Project Description

As part of the SEARS requirements, SHoP BVN and Urbis Pty Ltd has requested DP to incorporate the following information. In DP's opinion, the non-italicised paragraphs below are relevant for the purposes of this SSI.

The proposed state significant development application will facilitate the development of a new mixed use development comprising 'tourist and visitor accommodation' (in the form of a 'backpackers') and commercial office space within the tower form. Retail, lobby and food and drink premises at the Lower Ground level and Upper Ground level.

Atlassian Central at 8-10 Lee Street will be the new gateway development at Central Station which will anchor the new 'Technology Precinct' proposed by the NSW Government. The new building will be purpose-built to accommodate the Atlassian Headquarters, a new TfNSW Pedestrian Link Zone, and the new Railway Square YHA backpacker's accommodation, in addition to commercial floorspace to support technology 'start-ups'.

The new development is to be built over the existing heritage Parcels Shed located on the western boundary of Central Station with the Adina hotel to the west. The works includes a 38-storey mixed-use tower with basement loading dock facilities accessed off Lee Street, 2 storey lobby utilising the Parcels Shed building, lower ground and upper ground retail, YHA hostel and commercial tower with staff amenities to the mid-level and roof top areas and a pedestrian Link Zone works for TfNSW.

The building design has been conceived to support the delivery of a site plan designed to connect with future developments to both the south and east, and integrate with a cohesive public realm for the broader Sydney community in accordance with NSW government strategic planning.

The tower design is a 'demonstration project' for Atlassian, representing their commitment to environmental sustainability and contemporary workplace settings through tower form and construction systems along with a set of emblematic outdoor workplaces stacked in the tower form.

The existing Parcels Shed will be adaptively re-used in accordance with current best practice heritage process and will form the upper level of a 2-storey entry volume that connects visually with the 2 level Link Zone. Over the roof of the Parcels Shed, a new privately owned but publicly assessable landscaped area will be created as the first part of a new upper level public realm that may extend to connect to a future Central Station concourse or future Over Station Development.

The proposed mixed-use tower directly adjoins a live rail environment to the east and public domain to the north, west and south. These works will consider these rail environments and have been designed to ensure that all TfNSW external development standards are achieved. This ensures there is no impact to the operation or safety of these TfNSW assets.

Interfaces from the overall site and especially the State works Link Zone have been designed in consultation with the adjoining stakeholders. These stakeholders include TfNSW to the north and south, Toga and the Adina Hotel operator to the west and the Dexu Fraser's site to the south. Connections via the Link Zone, through the basements and off the proposed new Link Zone dive ramp, will be designed to enable existing and future developments to function in both the 'Day 1 scenario' and 'end state', when all developers have completed their works.

The overall project aspiration is to create a world class tech precinct with effective pedestrian links through the Atlassian site to the Central Station western forecourt to Central Walk west and adjoining stakeholder's sites.

2. Scope of Works

The scope of works for the SSI comprised the following:

- Preparation of Safe Work Method Statements (SWMS) and Field Work Safety Environmental Plan (FWSEP);
- Completion of a Dial-Before-You-Dig (DBYD) underground services records search and scanning for underground services at sample locations;
- Drilling of 24 boreholes using a combination of drilling techniques depending on access, depth and purpose (diacore, hand auger / solid flight auger / push tube, wash bore and HQ coring / NMLC coring) to a depth of up to 20 m bgl. 19 of the boreholes were used for contamination sampling (soil, groundwater or both) and five of the boreholes for geotechnical purposes only. All borehole logs have been included in this report for reference and discussion of sub-surface conditions;
- Collection of soil samples from 17 contamination boreholes at regular intervals, changes in strata and where signs of contamination were observed;
- Screening of all samples collected with a photo-ionisation detector (PID) to assess the likely presence or absence of volatile organic compounds (VOC);
- Laboratory analysis on 37 selected soil samples at a NATA accredited laboratory for a combination the following common potential contaminants of concern:
 - o Heavy metals (arsenic, cadmium, chromium, copper, lead, mercury, nickel and zinc) - 34 samples;
 - o Polycyclic aromatic hydrocarbons (PAH) - 37 samples;
 - o BTEX (benzene, toluene, ethyl benzene, xylenes) - 34 samples;
 - o Total recoverable hydrocarbons (TRH) - 34 samples;
 - o Phenols - 16 samples;
 - o Organochlorine pesticides (OCP) - 16 samples;
 - o Organophosphorus pesticides (OPP) - 16 samples;
 - o Polychlorinated biphenyl (PCB) - 16 samples; and
 - o Asbestos - 25 samples.
- Installation of seven groundwater monitoring wells;
- Development of groundwater wells by removing a minimum of three bore volumes or until all standing water was removed from the well. Purged water was collected in drums for disposal to a licenced waste water facility;
- Allowing the wells to stabilise for at least five days prior to sampling;
- Collection of groundwater samples from each monitoring well using a low-flow sampling pump. Physical parameters were measured and recorded prior to sampling;
- Laboratory analysis on seven groundwater samples for a combination of the following potential contaminants of concern:
 - o Heavy metals - 7 samples;
 - o TRH - 7 samples;
 - o BTEX - 7 samples;
 - o PAH (low level) - 7 samples;

- o OCP (trace level) - 7 samples;
- o OPP (trace level) - 7 samples;
- o PCB - 7 samples;
- o Phenols - 4 samples;
- o Volatile Organic Compounds (VOC) - 5 samples; and
- o Cyanide - 3 samples.
- Quality Assurance / Quality Control (QA / QC) sampling analysis, including inter-laboratory replicates, intra-laboratory replicates, trip spikes and trip blanks; and
- Provision of this SSI report.

3. Site Identification and Description

A summary of the site identification details is provided below.

Site Address	8-10 Lee Street, Haymarket
Legal Description	Lot 116 in DP1078271 Lot 117 in DP1078271 Lot 118 in DP 1078271 Part of Lot 13 in DP1062447
Geographic Co-ordinates	NE: Latitude: -33.88358, Longitude: 151.20496 NW: Latitude: -33.88333, Longitude: 151.20415 SE: Latitude: -33.884174, Longitude: 151.204638 SW: Latitude: -33.884016, Longitude: 151.204308
Area	Overall Site (inclusive of both the 'State Works' and 'Developer Works' zones): 3,764 m ² Proposed Basement (within the 'Developer Works' zone): 1800 m ²
Zoning	Zone B8 Metropolitan Centre
Local Government	City of Sydney Council
Site Surroundings	North - Ambulance Avenue East - Central Station West - Adina Apartment Hotel South - Multi-storey government office building

The overall Site is an irregular, 'L' shape. The Site has a small street frontage to Lee Street, however, this frontage is limited to the width of the access handle. The Site boundary and different areas within the Site are shown on Drawing 1, Appendix B.

The Site is located within the Sydney Central Business District area and is surrounded by different existing structures and infrastructure including multi-storey buildings, Central Station facilities and rail corridors. the Devonshire Street pedestrian tunnel passes below the southern part of the Site and shares its southern boundary with an existing multi-storey government office building.

At the time of field investigation, the Site was divided into three main components. Detailed descriptions of the three components together with photographs are included in DP (2019). The components comprise:

1. Developers Works - the YHA (RLs between 20.1 m AHD and 21.2 m AHD)

A two-storey hostel, redeveloped from the former Inwards Parcel building in 2004 (see Section 4.1). The Site contains four plywood rail carriages along the eastern boundary which are used for accommodation.

Boreholes drilled as part of the SSI (BH101, BH102, BH103, BH104 and BH105) are included in the YHA component of the Site.

2. Developer Works - Gate Gourmet Rail Pty Ltd (or lower level of the YHA) with RL 15.5 m AHD)

Gate Gourmet Rail is located on Ambulance Lane, a narrow street between the Western Forecourt retaining wall and Railway Colonnade Drive. It is used as a catering warehouse and is situated below the YHA. It is also connected to tunnels which consist of electrical switchboards, plant rooms, a chemical storage room and waste collection rooms.

Boreholes drilled as part of the SSI (BH106, BH113, BH114, and BH115) are included in the Gate Gourmet component of the Site.

3. State Works - Link Zone with RLs between 15.3 m AHD and 18.7 m AHD

The 'Link Zone' predominately comprises the Upper Carriage Lane and a commercial storage area on the lower ground level.

The Upper Carriage Lane is an asphalt-surfaced access ramp that connects Lee Street to the YHA and the adjacent Adina hotel. The ramp is also a carpark for the adjacent Adina hotel. On the top of the ramp is the carpark for the YHA.

The ramp and the YHA carpark are on bitumen-paved surface, and the YHA carpark is located on a suspended level with a commercial storage situated below. The commercial storage area is partitioned with metal wire mesh enclosures on concrete paved floor.

Boreholes drilled as part of the SSI (BH107A, BH107B, BH108, BH109A, BH109B, BH110, BH111, BH112A, BH112B, BH116 and BH117) are included in the State Works or Link Zone part of the Site.

4. Review of DP (2019)

4.1 Site History

Historical information for the Site and nearby Sites was sourced from Rappoport (2014)¹, WP (2019)², the National Library of Australia website, historical title deeds and historical aerial imagery.

The land title information provided suggested that the Site was initially granted for use as a cemetery between 1878 and 1937. Since 1964, the Site has been owned by State Rail. Information provided in the WP (2019) and the National Library of Australia indicated that the Site was used as part of the former Sydney Benevolent Asylum (The Asylum) between c. 1820 and 1896. The Asylum served as a refuge place for the poor, abandoned, destitute and sick. The Asylum and associated outbuildings were demolished from 1901 to provide room for the Central railway station.

The Devonshire Street Cemetery (or the Old Sydney Burial Ground) was constructed in 1820 and located to the east of the subject Site (shown on Figure 2). The subject Site had been granted for use as a cemetery in the late 1870s and mid-1900s. Information from the National Library of Australia indicated that the cemetery was later moved to allow for the development of Central railway station and the remains of deceased persons were removed and relocated elsewhere.

The historical aerial photography indicated land use of the Site and the adjoining properties has been commercial / industrial since at least 1943. The Site owner and Rappoport (2014) indicated that the subject Site was previously used as the Inwards Parcel Shed for the storage of the post office's parcels transported by train. The Parcel Shed was redeveloped into a two-storey backpacker hostel (the YHA) in 2004.

A Preliminary Site (Contamination) Investigation (PSI) undertaken by Aargus (2017)³ noted that a backfilled former swimming pool was situated in the southern corner of the YHA. The potential use of uncontrolled fill to backfill the former swimming pool was identified in DP (2019), making the former swimming pool an area of potential concern. It was subsequently determined that the former swimming pool was situated on a suspended platform and was not backfilled as previously suggested. The former swimming pool was determined to no longer be an area of potential concern and further investigation of the area was not deemed necessary.

The major function of the western yard (to the south-west of the Site, depicted on Figure 3) constructed c. 1904, revolved around rail shunting, which became obsolete by the late 20th Century. The shed was also used for the cleaning of carriages and storage of coal and water for steam locomotives. The western shed was demolished in 1998 to allow for the construction of the Henry Deane Plaza. It is presumed that the redevelopment of the parcel shed into a two-storey backpacker hostel on the subject Site occurred concurrently.

¹ Rappoport Pty Ltd, *Statement of Heritage Impact on Lee Street Substation, Central Station, Sydney*, May 2014 (Project Number 2043 - D7) (Rappoport 2014)

² Weir Phillips Heritage and Planning Pty Ltd, *Letter Report on Heritage Impact Statement: Standard Exemption s57(2) - Former Inwards Parcels Shed - No. 8-10 Lee Street, Sydney*, April 2019 (WP 2019)

³ Aargus Pty Ltd, *Preliminary Site Investigation: 8-10 Lee Street, Haymarket NSW*, November 2017, Aargus (2017)

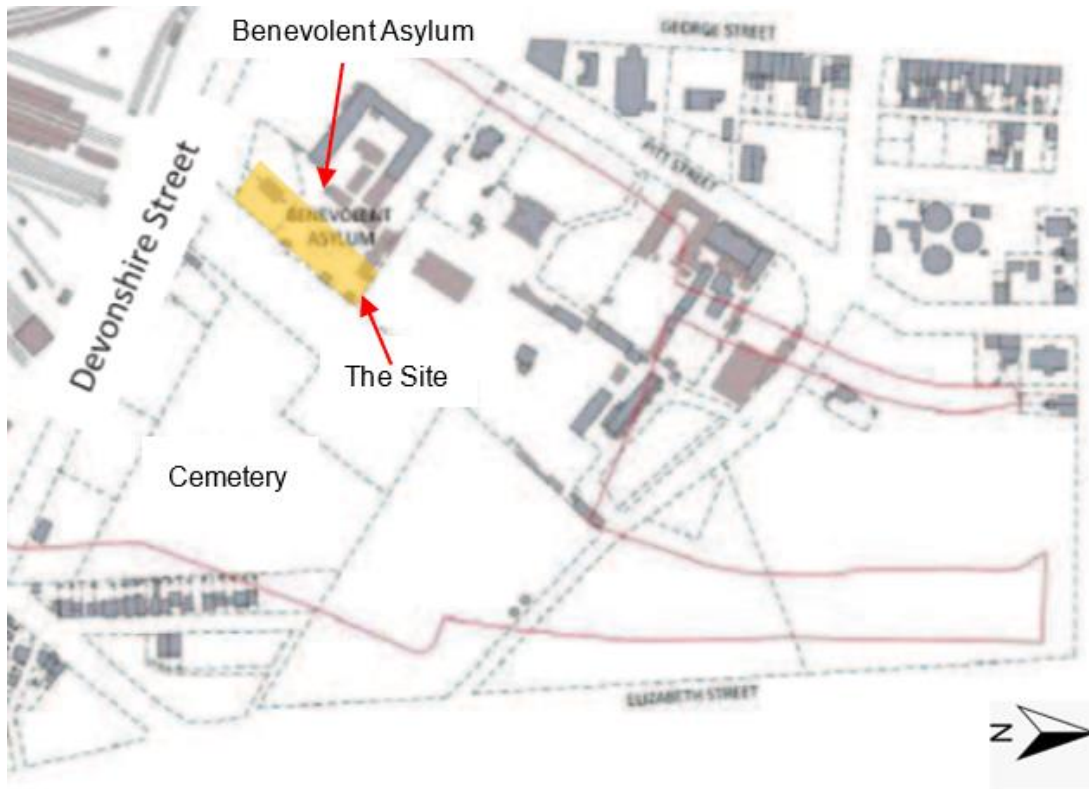


Figure 2: A Locality Map dated c. 1887, Showing Location of the Site, the Asylum and the Old Cemetery, Sourced from Rappoport (2014)

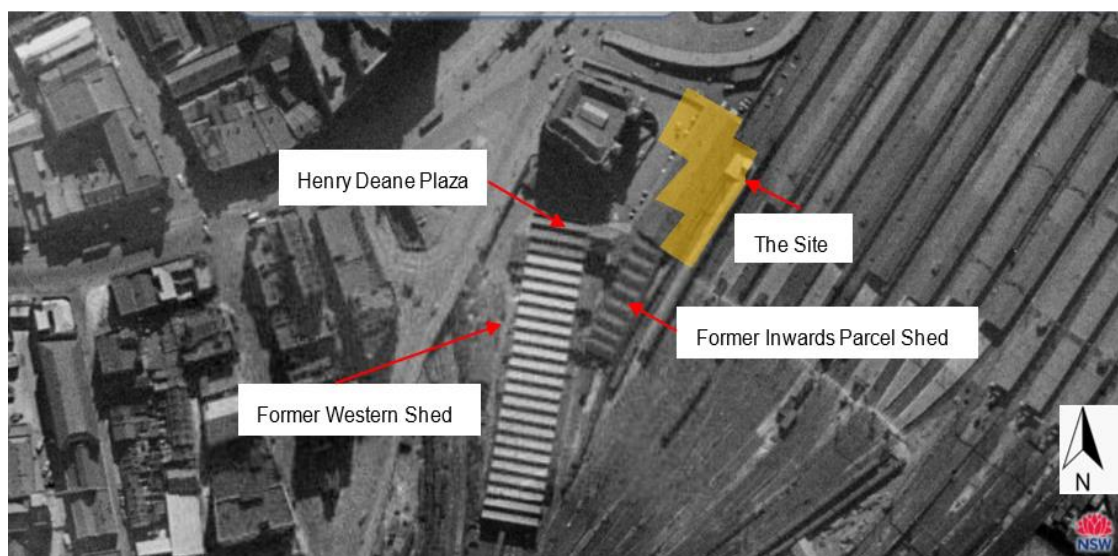


Figure 3: Aerial View of the Site, 1943, Showing the Site, Former Inwards Parcel Shed and Western Shed, Sourced from SIX Maps

4.2 Environmental Setting

Regional Topography	Sloping downwards towards the northwest.
Site Topography	RL 21.2 m to RL 15.5 m; sloping downwards towards the northwest.
Soil Landscape ⁴	Blacktown residual soils, characterised by shallow to moderately deep red and brown podzolic soils on crests, slopes and well drained areas and deep yellow podzolic soils and soloths on lower slopes and in areas of poor drainage.
Geology ⁵	Ashfield Shale overlying Hawkesbury Sandstone.
Acid Sulfate Soils ⁶	The Site is in an area of low probability of Acid Sulfate Soils (ASS) occurrence.
Surface Water	No surface water was observed to be present on Site; surface water is expected to drain in the same direction as the regional topography.
Groundwater	Groundwater is expected to flow in a north-westerly direction towards Darling Harbour which is located approximately 1.1 km northwest of the Site. Inferred groundwater flow direction is shown on Drawings 3 and 4, Appendix B.

4.3 Field Work Results and Conclusions

The fieldwork for the DSI (DP, 2019) comprised the following:

- Drilling of nine boreholes (BH1-9) up to depth of 20 m bgl for environmental and geotechnical purposes;
- Soil sampling at regular intervals and analysis of samples for the contaminants of concern identified in the conceptual site model (see Section 5);
- Construction of three groundwater monitoring wells (BH1, BH5 and BH8); and
- Development and sampling from BH5 and BH8 for analysis of the contaminants of concern identified in the conceptual site model. BH1 was dry at the time of sampling and during subsequent site visits and therefore was not sampled.

Locations of the boreholes and monitoring wells installed for the DSI are shown in Drawing 1, Appendix B. Borehole logs for BH1-BH9 are included in Appendix C.

Borehole logs, included in Appendix C of this report, indicated that inclusions of ash, coal and slag were present in the fill at BH1, BH2, BH3, BH4 and BH6. It was considered that the ash, coal and slag could be associated with historic land use of adjacent sites (such as storage of coal in the western shed as discussed in section 4.1) or with the nature of the fill material that is present across the Site. The ash, coal and slag are considered likely to be the source of the elevated concentrations of B(a)P and PAH in the soil. A full discussion of sub-surface conditions at the Site is presented in DP (2019), Section 11.

⁴ Sydney 1:100 000 Soils Landscape Sheet

⁵ Sydney 1:100,000 Geological Series Sheet

⁶ NSW Acid Sulfate Soils Risk mapping data from NSW Department of Environment and Climate Change

The adopted assessment criteria for the comparison of soil and groundwater test results were based on a commercial / industrial land use scenario and are presented in detail in DP (2019), Section 12.

Analytical results for the 16 soil samples selected for analysis were within the adopted Site Assessment Criteria (SAC) for commercial land use except for benzo(a)pyrene TEQ [B(a)P TEQ] in sample BH3/0.2-0.3 (42 mg/kg), which marginally exceeded the HIL of 40 mg/kg. The recorded exceedance was, however, noted to be statistically insignificant. Furthermore, the immediate underlying fill sample, BH3/0.7-0.8, contained a much lower concentration of B(a)P TEQ of 6.3 mg/kg, which was well within the HIL, indicating that the vertical extent of B(a)P TEQ was likely limited to the overlying, near-surface fill material.

Analytical results for the two groundwater samples were within the adopted groundwater investigation levels (GIL) with the exception of copper and zinc in BH8, BH5 and its replicate sample, BD1/20190730. The elevated concentrations of metals were considered to be within the normal range of background concentrations in heavily urbanised areas of Sydney, and therefore, no further assessment of metals in groundwater in BH5 and BH8 was considered necessary.

All contaminant concentrations for the analysed fill / soil samples were within the contaminant thresholds (CT1s) for General Solid Waste (GSW), under the NSW EPA (2014) Waste Classification Guidelines, except for total PAH in BH3/0.2-0.3 and BH6/0.2-0.3, which were classified as Restricted Solid Waste (RSW) and B(a)P in soil samples BH3/0.2-0.3 which was classified as Hazardous Waste. B(a)P leachability results for all samples with exceedances was below the RSW (TCLP2) thresholds and the laboratory's practical quantitation limits, indicating low potential for leachability at those locations.

All contaminant concentrations for the analysed natural soil samples were within the published background ranges for Australian soils except for the concentrations of B(a)P and PAH in BH6/0.2-0.3, which were above the RSW thresholds (i.e., both CT2 and SCC2). Therefore, the natural material in BH6/0.2-0.3 represented RSW and should be disposed as such.

The DSI concluded that the Site could be made suitable for the proposed development subject to the following recommendations:

- Conduct additional soil sampling and testing, either using *in situ* or *ex situ* sampling methods to further characterise the Site in areas not yet tested (i.e., the Link Zone) and to confirm the waste classification for surplus soils requiring off-site disposal. This additional sampling and testing was undertaken as part of the current investigation;
- Soil investigation of the building footprints following demolition. Care should be undertaken during demolition to prevent cross-contaminating the subsurface soils with hazardous building material such as asbestos; and
- Prepare an unexpected finds procedure as part of the civil and construction site management plan, such that unexpected finds of contamination (e.g., asbestos, odorous soils or seepage water) are managed appropriately.

It was noted that If other land uses are applicable for the Site or part of the Site, particularly for a more sensitive land use, then the current and any future results will need to be evaluated in accordance with the specific type of land use.

5. 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 contaminants of potential concern (COPC) either in the present or the future i.e., it enables an assessment of the potential source - pathway - receptor linkages (complete pathways). A CSM was developed for DP (2019) and is summarised in Table 2, below.

Table 2: Summary of CSM

Source / COPC	Transport Pathway	Receptor	Risk Management Action Recommended
S1 - Uncontrolled fill and building rubble associated with demolition of former building COPC include: metals, TRH, BTEX, PAH, PCB, OCP, OPP, phenols, SMF, VOC and asbestos.	P1 - Ingestion and dermal contact P2 - Inhalation of dust and / or vapours	R1 - Maintenance and construction workers R2 - Current and future users	The potential for contamination is considered to be low to moderate. Intrusive investigation (as undertaken for this report) along with a Remediation Action Plan (see Section 1) is recommended
	P2 - Inhalation of dust and / or vapours	R3 - Adjacent users (residential and commercial)	
	S2 - Current and historical site uses such as parcel shed and railway COPC include: metals, TRH, BTEX, PAH, OCP, OPP, PCB, phenols, SMF, VOC, asbestos and cyanide.	P3 - Leaching of contaminants and vertical mitigation into groundwater	
P4 - Surface water run-off P5 - Lateral migration of groundwater.			
S3 - Degradation of building material from existing buildings and underground tunnel structures. COPC include: metals, PCB, SMF and asbestos.			

It is noted that SMF presence was analysed in the HAZMAT survey and the results have been documented separately (see Section 1).

6. Field Rationale and Methods

6.1 Data Quality Objectives

This SSI has been devised in general accordance with the seven-step Data Quality Objective (DQO) process which is provided in Appendix B, Schedule B2 of NEPC (2013). The DQO process is outlined as follows:

- State the problem;
- Identify the decision;
- Identify inputs into the decision;
- Define the boundary of the assessment;
- Develop a decision rule;
- Specify acceptable limits on decision errors; and
- Optimise the design for obtaining data.

Referenced sections for the respective DQOs listed above are provided in Appendix I.

6.2 Data Quality Indicators

The performance of the assessment in achieving the DQO was assessed through the application of Data Quality Indicators (DQI) as defined by:

Precision:	A quantitative measure of the variability (reproducibility) of data;
Accuracy:	A quantitative measure of the closeness of reported data to the “true” value;
Representativeness:	The confidence (expressed qualitatively) that data are representative of each media present on the site;
Completeness:	A measure of the useable data from a data collection activity; and
Comparability:	The confidence (expressed qualitatively) that data can be considered equivalent for each sampling and analytical event.

Further comments on the DQIs are presented in Appendix I.

6.3 Sampling Locations and Rationale

Field work was undertaken between 7 April and 26 May 2020.

The test locations were positioned to supplement the locations sampled in DP (2019), in parts of the Site that were currently accessible, and were spaced sufficiently to gain reasonable coverage of the soil profile and contamination status across the Site. Targeted sampling was also undertaken in parts of the Site that were known to contain elevated levels of contaminants based on the findings of DP (2019) (i.e., the north-east portion of the ‘Developer Works’ zone). Fifteen (15) of the boreholes were located in the ‘State Works’ zone and nine of the boreholes were located in the ‘Developer Works’ zone.

Environmental sampling was undertaken at 19 of the 24 boreholes, with two boreholes used for groundwater sampling only and the remaining boreholes being used for geotechnical objectives. The 19 sampling locations together with the nine sampling locations used for DP (2019) were considered adequate to characterise the contamination status of the Site, based on NSW EPA sampling guidelines and Site data obtained from previous investigations. Borehole locations are shown on Drawing 1, Appendix B.

The groundwater monitoring well network at the Site involved two hydraulically up-gradient wells (BH103 and BH104), two down-gradient wells (BH112A and BH112B) along with three mid-gradient wells (BH107A, BH107B, 109B). The up-gradient wells are most likely to be indicative of the groundwater condition in the greater surrounding area, while the down-gradient wells are most likely to pick up any contaminants leached from on-site sources. The seven groundwater monitoring well locations together with the two sampling locations used for DP (2019) were considered adequate to characterise the groundwater contamination status beneath the Site at the time of sampling. Monitoring well locations are shown on Drawing 1, Appendix B.

6.4 Drilling and Soil Sampling Procedure

Concrete coring was undertaken at all locations, followed by drilling. BH101, BH102, BH106, BH110, BH113, BH114 and BH115 were drilled using hand tools due to limited access for a drilling rig. A track-mounted rig with either 150 mm diameter solid flight auger or 50 mm diameter pushtube was used for the remaining boreholes. NMLC coring was used to reach the targeted depth for BH103, BH104, BH105, BH107B, BH109B and BH112B, predominantly for geotechnical objectives.

Environmental sampling was performed with reference to standard operating procedures outlined in the DP *Field Procedures Manual*. All sampling data was recorded on borehole logs (Appendix C) and samples selected for laboratory analysis were recorded on DP chain-of-custody (COC) sheets (Appendix G). The general soil sampling procedure comprised:

- Decontamination of re-useable sampling equipment using a 2% concentrated critical-cleaning liquid detergent (D90) and demineralised water prior to collecting each sample;
- Collection of soil samples directly from auger / push tube returns;
- Use of disposable sampling equipment including disposable nitrile gloves;
- Transfer of samples into laboratory-prepared glass jars and capping immediately with Teflon lined lids;
- Labelling of sampling containers with individual and unique identification, including project number, sample location and sample depth;
- Field screening of replicate soil samples collected in sealed plastic bags for VOC using a calibrated PID; and
- Placement of sample containers and bags into a cooled, insulated and sealed container for transport to the laboratory under chain-of-custody (COC) documentation.

Soil samples were collected from 17 boreholes, including replicates of six primary samples.

Selected samples of fill and natural soils were analysed for the chemicals of concern identified in the CSM (section 5). Samples were selected based on site observations (odour, composition, etc.) and field results.

A rinsate sample was collected from the hand auger by running demineralised water over the auger to detect any cross contamination between hand tools and samples.

Envirolab Services Pty Ltd, accredited by NATA, was employed to conduct the primary sample analysis. Eurofins, accredited by NATA, was employed to conduct the inter-laboratory analysis.

6.5 Groundwater Well Installation and Sampling

Groundwater monitoring wells were installed in BH103, BH104, BH107A, BH107B, 109B, BH112A and BH112B to enable monitoring of groundwater quality and water levels. Groundwater monitoring wells were installed to depths of between 3.9 m and 20 m bgl. The rationale behind the well placement and well depth was to evaluate the quality of groundwater from both the Mittagong and Hawksbury formations and to gain an understanding of the groundwater contamination status across the Site (i.e., at up-gradient and down-gradient parts of the Site).

The wells were constructed using 50 mm diameter, acid washed, class 18 uPVC casing and machine slotted well screens. A gravel filter pack was placed to approximately 0.5 m above the screened section of the wells followed by a hydrated bentonite seal and then concrete to the surface. The wells were topped with a cast iron gatic cover. Well details are provided in the borehole logs (Appendix C).

The standpipes were screened as follows:

- Within very low or low strength, fine to medium grained sandstone (interpreted to be the Mittagong Formation): Boreholes BH103, BH107A, and BH112A; and
- Within the underlying medium to high strength, fine to coarse grained sandstone (interpreted to be the Hawkesbury Sandstone): Boreholes BH104, BH107B, BH109B and BH112B.

Environmental sampling was performed with reference to standard operating procedures outlined in the DP *Field Procedures Manual*. All sampling data was recorded groundwater field sheets (Appendix D) and samples selected for laboratory analysis were recorded on DP COC sheets (Appendix G). The remaining samples not required for laboratory analysis were recorded on the Record of Samples register. The general soil sampling procedure comprised:

Groundwater sampling was performed in accordance with standard operating procedures outlined in the DP *Field Procedures Manual*. All sampling data was recorded on groundwater field sheets (Appendix D) and samples selected for laboratory analysis were recorded on DP chain-of-custody (COC) sheets (Appendix G). The general groundwater sampling procedure comprised:

- Decontamination of re-useable sampling equipment using a 2% concentrated critical-cleaning liquid detergent (D90) and demineralised water prior to use;
- Use of disposable sampling equipment including disposable tubing and filters;
- Measurement of the groundwater level using an interface meter;

- Development of groundwater wells by removing a minimum of three bore volumes or until all standing water was removed from the well. Purged water was collected in drums for disposal to a licenced waste water facility;
- Allowing the wells to stabilise for at least five days prior to sampling;
- Re-measurement of groundwater level including the measurement of phase separated hydrocarbons (PSH);
- Micro-purging of wells using a low-flow sampling pump until physical parameter (temperature, dissolved oxygen, electrical conductivity, turbidity, pH and oxidation / reduction potential) had stabilised;
- Collection of groundwater samples directly into appropriate sampling bottles, some of which contained preservatives, using the low-flow sampling pump;
- Labelling of sampling bottles with individual and unique identification, including project number and sample location; and
- Placement of sample bottles into a cooled, insulated and sealed container for transport to the laboratory under COC documentation.

Groundwater samples from each well were analysed for the chemicals of concern listed in the CSM (Section 5) including two replicate samples. Envirolab Services Pty Ltd, accredited by NATA, was employed to conduct the primary sample analysis.

7. Site Assessment Criteria

The Site Assessment Criteria (SAC) applied in the current investigation is informed by the CSM (Section 5) which identified human and water receptors as the primary potential receptor to potential contamination on the Site. Analytical results were assessed (as a Tier 1 assessment) against the SAC comprising the investigation and screening levels of Schedule B1, NEPC (2013).

The following guidelines were adopted for evaluation of the soil analysis results:

- NEPC (2013); and
- CRC CARE (2011) Health Screening Levels for petroleum hydrocarbons in soil and groundwater, Technical report series No. 10.

The investigation and screening levels are applicable to generic land use settings and include consideration of, where relevant, the soil type and the depth of contamination. The investigation and screening levels are not intended to be used as clean up levels. Rather, they establish concentrations above which further appropriate investigation (e.g., Tier 2 assessment) should be undertaken. They are intentionally conservative and are based on a reasonable worst-case scenario.

The SAC comprises health-based investigation levels (HIL), health screening levels (HSL), management limits (ML) and groundwater investigation levels (GIL). Given the Sites current land use and proposed development, it is considered unlikely that soil contamination poses a risk to ecological receptors (see Section 7.3). Therefore, environmental investigation levels (EIL) and environmental screening levels (ESL) have not been considered in the current assessment.

Given the known details of the proposed development, the adopted SAC is for a continued commercial / industrial land use. It is noted that if the final development design includes different land uses on portions of the Site (such as a public open space, extensive landscaping, child care) then a different and more conservative set of criteria would apply to those portions of the Site.

7.1 Health Investigation and Screening Levels

The Health Investigation Levels (HIL) and Health Screening Levels (HSL) are scientifically-based, generic assessment criteria designed to be used in the first stage (Tier 1) of an assessment of potential human health risk from chronic exposure to contaminants.

HIL are applicable to assessing health risk arising via all relevant pathways of exposure for a range of metals and organic substances. The HIL are generic to all soil types and apply generally to a depth of 3 m below the surface.

HSL are applicable to selected petroleum compounds and fractions to assess the risk to human health via the inhalation pathway. HSL have been developed for different land uses, soil types and depths to contamination.

The generic HIL and HSL are considered to be appropriate for the assessment of contamination at the Site. Given the proposed commercial land use the adopted HIL and HSL are:

- **HIL-D:** Commercial / Industrial;
- **HSL-D for vapour intrusion and direct contact:** Commercial / Industrial; and
- **HSL - Intrusive Maintenance Worker.**

The HSL adopted are predicted on the inputs summarised in Table 3, below.

Table 3: Inputs to the Derivation of HSL

Variable	Input	Rationale
Potential exposure pathway	Soil vapour intrusion (inhalation) / Direct contact*	With the potential for vapour intrusion into the new building, and direct contact with soils during construction and in public areas, both pathways are considered viable.
Soil Type	Sand	In the absence of laboratory particle analysis sand HSL have been adopted as an initial conservative screen; based on the variable fill and sandy soils present.
Depth to contamination	0 m to <1 m; associated with contaminated fill; and 2 m to < 4 m & 4 m+; associated with deeper fill	0 to <1 m for shallow fill soil; 2 to <4 m for fill soils; and 4 m+ for deep fill and natural soils.

* Developed by CRC CARE (2011)

The adopted soil HIL and HSL are shown on the following Tables 4 and 5.

Table 4: Adopted HIL and HSL (mg/kg)

Contaminants		HIL - D	HSL-D Direct Contact	HSL-D ⁴ Vapour Intrusion
Metals	Arsenic	3,000	-	-
	Cadmium	900	-	-
	Chromium (VI)	3,600	-	-
	Copper	240,000	-	-
	Lead	1,500	-	-
	Mercury (inorganic)	730	-	-
	Nickel	6,000	-	-
	Zinc	400,000	-	-
PAH	Benzo(a)pyrene TEQ ¹	40	-	-
	Naphthalene	-	11,000	NL
	Total PAH	4,000	-	-
TRH	C6 – C10 (less BTEX) [F1]	-	26,000	260
	>C10-C16 (less Naphthalene) [F2]	-	20,000	NL
	>C16-C34 [F3]	-	27,000	-
	>C34-C40 [F4]	-	38,000	-
BTEX	Benzene	-	430	3
	Toluene	-	99,000	NL
	Ethylbenzene	-	27,000	NL
	Xylenes	-	81,000	230
Phenol	Phenol	240,000	-	-
OCP	Aldrin + Dieldrin	45	-	-
	Chlordane	530	-	-
	DDT+DDE+DDD	3,600	-	-
	Endosulfan	2,000	-	-
	Endrin	100	-	-
	Heptachlor	50	-	-
	HCB	80	-	-
	Methoxychlor	2,500	-	-
OPP	Chlorpyrifos	2,000	-	-
PCB ²		7	-	-

Notes to Table 4:

1. sum of carcinogenic PAH
2. non dioxin-like PCBs only
3. NL – not limiting
4. HSL-D for vapour intrusion, 0 m to <1 m, the most conservative values, has been adopted as an initial HSL for 2 to <4 m & 4 m+

Table 5: Adopted HSL for Intrusive Maintenance Worker (mg/kg unless otherwise indicated)

Contaminants		HSL-Intrusive Maintenance Worker, (Direct Contact)	HSL-Intrusive Maintenance Worker, (Vapour Intrusion)
TRH	C6 – C10 (less BTEX) [F1]	82,000	NL
	>C10-C16 (less Naphthalene) [F2]	62,000	NL
	>C16-C34 [F3]	85,000	-
	>C34-C40 [F4]	120,000	-
BTEX	Benzene	1,100	77
	Toluene	120,000	NL
	Ethylbenzene	85,000	NL
	Xylenes	130,000	NL

Notes to Table 5:

3. NL – not limiting
4. HSL-D for vapour intrusion, 0 m to <1 m, the most conservative values, has been adopted as an initial HSL for 2 to <4 m & 4 m+

7.2 Management Limits - Petroleum Hydrocarbons

In addition to appropriate consideration and application of the HSL, 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.

Management Limits (ML) to avoid or minimise these potential effects have been adopted in NEPC (2013) as interim Tier 1 guidance. Management Limits have been derived in NEPC (2013) for the same four petroleum fractions as the HSL (F1 to F4). The adopted ML, from Table 1B (7), Schedule B1 of NEPC (2013) are shown in the following Table 6. The following site-specific data and assumptions have been used to determine the Management Limits:

- The ML will apply to any depth within the soil profile;
- The ML for commercial land use applies; and
- A “coarse” soil texture has been adopted as a conservative parameter, based on the variable soil types encountered.

Table 6: Adopted ML (mg/kg)

Analyte		Management Limit
TRH	C ₆ – C ₁₀ (F1) #	700
	>C ₁₀ -C ₁₆ (F2) #	1,000
	>C ₁₆ -C ₃₄ (F3)	3,500
	>C ₃₄ -C ₄₀ (F4)	10,000

Separate management limits for BTEX and naphthalene are not available hence these have not been subtracted from the relevant fractions to obtain F1 and F2

Management limits are applied after consideration of relevant HSL.

7.3 Ecological Investigation Levels and Ecological Screening Levels

Schedule B5A of NEPC (2013) states that the aim of the EILs is that varying levels of protection will be provided to the following ecological receptors at all sites:

- Biota supporting ecological processes, including microorganisms and soil invertebrates;
- Native flora and fauna;
- Introduced flora and fauna; and
- Transitory or permanent wildlife.

Furthermore, Schedule B5A of NEPC (2013) states that *Commercial and industrial land, particularly in long-established industrial areas, is often heavily contaminated by past activities or fill materials used to level the area. In these cases, jurisdictions may determine that HILs are the most appropriate soil quality criteria and that EILs are not applicable.*

In determining the relevance of EILs and ESLs the presence or absence of sensitive ecological receptors must be considered. In this regard both the potential ecological receptors on and off-site must be considered and the current / proposed development.

The Site is located in a commercial / retail precinct. The following potential ecological receptors were identified:

- Darling Harbour and Blackwattle Bay - 1 km NNW to NW of the Site;
- Belmore Park - 300 m north east of the Site; and
- Victoria Park - 1,000 m west of the Site.

Based on the inferred assessment of the direction of groundwater flow (NNW) it is considered unlikely that these potential receptors would be impacted by soil contamination at the site.

The Site is currently occupied by commercial buildings with the surfaces covered with concrete or bitumen pavements. Furthermore, the proposed development will include excavation of basement levels across most of the Site footprint with minimal landscaping. Therefore, the value of the Site for soil organisms and the risk of exposure of soil contamination to transitory wildlife are very low.

Therefore, it is considered that human health risk screening levels are more appropriate and EIL and ESL are not relevant to the current assessment.

7.4 Asbestos

Bonded asbestos containing material (ACM) is the most common form of asbestos contamination across Australia, generally arising from:

- Inadequate removal and disposal practices during demolition of buildings containing asbestos products;
- Widespread dumping of asbestos products and asbestos containing fill on vacant land and development sites; and
- Historical fill containing unsorted demolition materials.

Mining, manufacturing or distribution of asbestos products may result in sites being contaminated by friable asbestos including free fibres. Severe weathering or damage to bonded ACM may also result in the formation of friable asbestos comprising fibrous asbestos (FA) and / or asbestos fines (AF).

Asbestos only poses a risk to human health when asbestos fibres are made airborne and inhaled. If asbestos is bound in a matrix such as cement or resin, it is not readily made airborne except through substantial physical damage. Bonded ACM in sound condition represents a low human health risk, whilst both FA and AF materials have the potential to generate, or be associated with, free asbestos fibres. Consequently, FA and AF must be carefully managed to prevent the release of asbestos fibres into the air.

Based on the CSM 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.

In addition, there is the potential presence of asbestos-cement service pits and underground pipes / conduits within or in proximity of the proposed development area. Uncontrolled disturbance of such items (e.g., during bulk excavation) could potentially cross-contaminate surrounding soil / fill, resulting in unnecessary waste (e.g., asbestos-contaminated soil / fill) and additional disposal costs for the project. DP has undertaken a HAZMAT Survey and a non-intrusive assessment for asbestos-cement service pits and underground pipes / conduits within the footprint of the proposed development. The results of this survey will be reported in due course as a separate document.

7.5 Waste Classification Criteria

To assess the waste classification of the material for off-site disposal purposes a preliminary waste classification assessment was undertaken in accordance with the six step process outlined in the NSW EPA *Waste Classification Guidelines, Part 1: Classifying Waste* (EPA, 2014). The soil results are assessed against the general solid waste (GSW) criteria outlined in Tables 1 and 2 of the guidelines.

With respect to the natural materials at the Site, these are also assessed for their potential classification as Virgin Excavated Natural Material (VENM). In this regard the NSW EPA defines VENM as:

- *"natural material (such as clay, gravel, sand, soil or rock fines);*
- *that has been excavated or quarried from areas that are not contaminated with manufactured chemicals, or process residues, as a result of industrial, commercial, mining or agricultural activities;*
- *that does not contain any sulfidic ores or soils or any other waste; and*
- *includes excavated natural material that meets such criteria for virgin excavated natural material as may be approved from time to time by a notice published in the NSW Government Gazette."*

For the purpose of providing screening criteria to compare laboratory results against for assessing VENM, DP have compared the results for concentrations of metals in the natural soils to the published concentrations in NSW EPA *The Excavated Natural Material Order 2014*. The concentrations of all other contaminants in natural soils have been compared against the laboratory limit of reporting (LOR).

7.6 Groundwater Investigation Levels

The Groundwater Investigation Levels (GIL) used for interpretation of the groundwater data are based on risk posed by contaminated groundwater, at or down-gradient of the Site.

The potential risk posed by contaminated groundwater, as noted in the CSM, at or down-gradient of the Site is exposure to VOC (including TRH and BTEX) via the vapour intrusion pathway, and groundwater potentially discharging to Darling Harbour.

Therefore, the concentrations of contaminants in groundwater were assessed against GIL adopted from:

- NEPC (2013) for the vapour intrusion pathway; and
- ANZG (2018) Australian and New Zealand Guidelines for Fresh & Marine Water Quality.

Given that the likely receiving water body is Darling Harbour, approximately 1.1 km NW (down-gradient) of the Site, GIL for a slightly to moderately disturbed freshwater ecosystems (95% species protection) have been adopted. Although Darling Harbour is a marine water ecosystem, given the distance between the Site and Darling Harbour, there is potential for water to intercept freshwater stygian ecosystems (GWDEs). Accordingly, GIL for freshwater ecosystems have been adopted.

GIL for cadmium, chromium, lead, nickel and zinc were corrected based on hardness of the water in each well. Hardness ranged from 71-240 mg CaCO₃/L. GIL were derived using the algorithm in ANZECC (2000). GIL are shown on Table 7a and Table 7b, below.

Table 7a: Adopted GIL (ug/L)

Analyte		GIL – Fresh Waters	Comments
PAH	Naphthalene	16	-
	Anthracene	0.4	
	Fluoranthene	1.4	
	Benzo(a)pyrene	0.2	
	Phenanthrene	2.0	
BTEX	Benzene	950	
	Toluene	180	
	Ethylbenzene	80	
	Xylene (o)	350	
	Xylene (p)	200	
	Xylene (m)	75	
OCP	Aldrin	0.001*	
	Dieldrin	0.01*	
	Chlordane (gamma and alpha)	0.08	
	DDT	0.01	
	Endosulfan (I and II)	0.02	
	Endrin	0.02	
	Heptachlor	0.09	
	Methoxychlor	0.005	
	Mirex	0.04*	
OPP	Azinphos-methyl	0.02	
	Chlorpyrifos	0.01	
	Diazinon	0.01	
	Dimethoate	0.15	
	Fenitrothion	0.2	
	Malathion	0.05	
	Parathion	0.004	
PCB	Arochlor 1242	0.6	
	Arochlor 1254	0.03	
VOC	Chloroform	770*	Laboratory reporting limits used as initial screening levels for those VOC not listed. Reference to national or international standards adopted if concentrations exceed the reporting limits.
Phenols	Phenol	320	-
Other	Cyanide	7	-

Notes:

^a Note: In cases where no high reliability trigger values are provided, the moderate or low reliability trigger values provided in ANZECC & ARMCANZ (2000) have been used as screening levels

* Insufficient data for reliable trigger value. Interim working value or low reliability value used for screening purposes

Table 7b: Adopted GIL for Metals with Hardness Modified Values (ug/L)

Monitoring Well	Hardness (mg CaCO ₃ /L)	Cadmium	Chromium (III)	Lead	Nickel	Zinc
BH103	86	0.51	7.83	12.96	26.93	19.58
BH104	110	0.64	9.58	17.71	33.19	24.14
BH107A	180	0.99	14.34	33.09	50.45	36.69
BH107B	170	0.94	13.6	30.78	48.055	34.95
BH109B	240	1.28	18.16	47.69	64.42	46.85
BH112A	71	0.43	6.69	10.15	22.88	16.64
BH112B	71	0.43	6.69	10.15	22.88	16.64

7.6.1 Health Screening Levels - Petroleum Hydrocarbons

The proposed development will continue to be used for commercial purposes as the 'Tech Central Development' with two to three levels of basement. Therefore, as noted in the footnotes to Table 1A (4) of NEPC (2013), the relevant and adopted HSLs for groundwater are HSL D, commercial / industrial.

In addition, the HSL adopted are predicted on the following inputs prescribed in Table 8.

Table 8: Inputs to the Derivation of HSL

Variable	Input	Comment
Potential exposure pathway	Groundwater vapour intrusion	Exposure pathway via groundwater vapour intrusion affects the adopted HSL.
Soil type	Sand	Soil properties including soil saturation porosity affect risk of exposure and are therefore factored into HSL. In the absence of laboratory particle analysis sand HSL have been adopted as an initial conservative screen; based on the variable fill and sandy soils present. A conservative soil type should be selected where the soil profile is not uniform (NEPC, 2013).
Depth to contamination	2 m to <4 m	Groundwater occurs at depths between 2.1 m and 8.2 m depth below current surface levels. A depth of 2 m to <4 m has been used for the HSL as a conservative value.*

NOTE: * The proposed basement excavation may intercept the groundwater in part, at which point the adopted HSLs are no longer applicable. If TRH, BTEX or PAH are present in the groundwater a site specific risk assessment may be required to determine site specific threshold levels for such contaminants in groundwater.

The adopted groundwater HSL for vapour intrusion based on the inputs listed in Table 8, from Table 1A (4), Schedule B1 of NEPC (2013) are shown in the following Table 9.

Table 9: Groundwater Health Screening Levels (HSL) for Vapour Intrusion (ug/L)

Analyte		HSL D - 2 m to <8 m (Sand)	Comments
TRH	C6 – C10 (less BTEX) [F1]	3000	Sand profile depth to contamination 2 m to <4 m
	>C10 – C16 (less naphthalene) [F2]	NL	
BTEX	Benzene	NL	
	Toluene	NL	
	Ethylbenzene	NL	
	Xylene	NL	
PAH	Naphthalene	NL	

Note:

NL – 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 which 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 a given scenario. For these scenarios no HSL is presented for these chemicals. These are denoted as 'NL'.

8. Field Work Results

8.1 Soil

The conditions encountered in the boreholes drilled as part of the current assessment are summarised in Table 10 below. The borehole logs are provided in Appendix.

Table 10: Subsurface Conditions

CONCRETE	Single or multiple concrete slabs, with or without a brick pavement, asphalt layer, or surface ballast layer (0.15-6.3 m thick).
FILL	Gravel, sand or clay fill (including silty gravel, sandy gravel, gravelly sand, clayey sand, silty sand, silty clay and sandy clay), low to high plasticity clay fines, moist to wet, to depths ranging between 4.7 m and 6.3 m on the eastern side of the YHA (8 m depth in Borehole BH2), or 0.0-2.2 m depth within the access corridor and Gate Gourmet (i.e. the Lower Ground Floor level). The fill materials were generally in a soft/very loose to medium dense condition. Anthropogenic inclusions were encountered to 0.5 m depth in four of the boreholes drilled in Gate Gourmet (i.e., coal and ceramic tile fragments: BH106, BH113, BH114 and BH115), and were also encountered in three of the boreholes drilled on the eastern part of the Site to a depth of 3.2 m below the current ground surface or rail access tunnel levels (i.e., ash, slag, glass, brick and ceramic tile fragments: Boreholes BH1, BH2 and BH4).

ALLUVIAL SAND	Loose to medium dense, fine to medium, pale grey or pale orange alluvial sand, 0.4-1.2 m thick, moist (Boreholes BH111, BH112A and BH112B only). The alluvial sand encountered during previous investigations (BH1 and BH8 only) was yellow or orange-brown, with or without trace gravel, and up to 2 m thick.
RESIDUAL SILTY CLAY	Soft to hard, orange, red, pale grey, grey or orange mottled red or yellow residual silty clay, with fine to medium grained sand and ironstone gravel, with or without relict rock texture (0.75-2.2 m thick, absent in Borehole BH102, BH105, BH107A).
RESIDUAL SANDY CLAY	Very stiff to hard, pale grey or grey mottled red residual sandy clay, fine to medium grained sand, with or without trace gravel (0.2-0.6 m thick, present in Borehole BH102, BH107A, BH107B, BH112A and BH112). The residual sandy clay encountered during previous investigations (BH2 and BH5 only) was up to 0.8 m thick.
SANDSTONE (FINE TO MEDIUM)	Very low to low strength (with bands of medium or high strength, iron-cemented sandstone), fine to medium grained, highly or moderately weathered, fractured sandstone (0.65-1.8 m thick: absent in Borehole BH109B). Numerous clay seams (up to 250 mm thick) or zones of core loss (up to 1090 mm thick: inferred to be seams of clay or extremely low or very low strength rock) were encountered.
SANDSTONE (FINE TO COARSE)	Medium or high strength, fine to coarse grained, moderately weathered to fresh, slightly fractured to unbroken, with widely spaced, thin (i.e., 2-5 mm) clay seams.

The fill was deepest in BH103 and BH104 on the hostel railway platform and BH111. It is noted that these wells also have the highest surface level. The shallowest fill was in BH108, BH109A, BH109B, BH116 and BH117. It is noted that the deeper fill was generally correlated with a higher surface level.

PID readings were all below 10 ppm, suggesting a general absence of gross VOC / petroleum hydrocarbon contamination in samples recovered across the Site. Results of PID screening are shown on the borehole logs, Appendix C.

A hydrocarbon odour was detected in BH106, BH114 and BH117, all within the shallow fill material at depths below 0.5 m bgl, as noted on the relevant borehole logs in Appendix C.

The conditions encountered are generally consistent with those encountered in DP (2019). Both investigations found gravel, sand or clay fill with similar anthropogenic inclusions (ash, slag, glass and brick fragments). Borehole logs from locations investigated for DP (2019) are included in Appendix C.

8.2 Groundwater

Groundwater levels were measured at the time of micro-purging and sampling. Groundwater levels and other parameters recorded during sampling are summarised in Table 11. Groundwater field sheets and an internal calibration record of groundwater equipment is presented in Appendix D and Appendix E, respectively.

Table 11: Stabilised Groundwater Field Parameters

Well ID	Well depth (m bgl)	SWL (m bgl)	SWL (m AHD)	pH	Electrical Conductivity (µS/cm)	Redox (mV)	Temperature (°C)	Dissolved Oxygen (ppm)	Turbidity (NTU)
BH103	9.4	7.5	13.7	5.99	434	110	21.3	0.78	39.5
BH104	20.3	7.6	13.6	5.22	438	138	20.8	0.71	23.5
BH107A	3.9	2.1	13.4	6.78	125	67	22.1	1.68	127.1
BH107B	11.2	2.6	12.9	7.24	472	-76	22.5	0.14	16.8
BH109B	12.0	8.2	7.1	7.31	731	-42	23.1	0.55	91.0
BH112A	4.3	3.1	13.6	8.32	358	79	24.4	3.37	5.2
BH112B	10.9	5.2	11.6	5.65	279	120	24.5	1.10	626

No phase separated hydrocarbons (PSH) were detected during sampling. Groundwater was observed to be grey (BH107A, BH107B), brown and silty (BH103, BH109B, BH112) and clear (all other wells) during sampling. No odour was detected in any of the groundwater samples.

It is noted that samples were taken from well BH107A prior to stabilisation of parameters due to the low well volume and slow recharge. It is considered likely that the stabilised temperature would be higher while dissolved oxygen and electrical conductivity would be lower than the values recorded for these parameters.

The groundwater results are comparable to those in DP (2019). The monitoring wells sampled for DP (2019), BH5 and BH8, had a standing water level of 13.1 and 13.2 m AHD respectively. The temperature of the water was slightly lower (19.2 °C and 19.3 °C respectively) and pH slightly lower than all monitoring wells except BH104 (5.5 and 5.4 respectively).

Measured groundwater levels and inferred flow direction are shown on Drawings 3 and 4, Appendix B.

9. Laboratory Results

The results of laboratory testing are provided in Appendix F as follows. The results from previous investigations are also included on the tables:

Table F1 - Summary of Laboratory Soil Results;

Table F2 - Summary of Laboratory Groundwater Results; and

Table F3 - Summary of Laboratory Waste Classification Results.

9.1 Soil

Soil samples were analysed for the contaminants of concern identified by the CSM including heavy metals, TRH, PAH, BTEX, OCP, OPP, PCB, phenols and asbestos. The results of analysis are presented in Table F1 of Appendix F with the adopted SAC.

Analytical results for soil samples were within the adopted SAC for commercial land use with the following exceptions:

- TRH F3 (>C16-C34) in samples BH106/0.3-0.4 (3600 mg/kg) which marginally exceeded the management limit (ML) of 3500 mg/kg; and
- B(a)P TEQ in samples BH106/0.3-0.4 (160 mg/kg), BH114/0.15-0.2 (81 mg/kg), BH114/0.2-0.3 (43 mg/kg) and BH117/0.2-0.25 (71 mg/kg) which exceeded the HIL of 40 mg/kg.

Leachability testing, undertaken for waste classification purposes, indicated that the B(a)P in those samples with B(a)P TEQ concentrations above the HIL has low leachability potential. It is therefore considered likely that the B(a)P TEQ concentration is limited to the fill materials.

Although B(a)P TEQ concentrations above the HIL were only detected in BH106, BH114 and BH117, elevated concentrations of PAH (below the HIL) were also detected in BH113 and BH115. Therefore, it is considered likely that the significant PAH contamination is concentrated in the northwest portion of the Site, which is with the approximate outline of the proposed basement. BH106, BH114 and BH117 are within the approximate outline of the proposed basement and will likely be removed from Site under an appropriate waste classification for the final development.

It is considered likely that the B(a)P TEQ and TRH F3 (>C16-C34) contamination is from the coal observed in the fill. This is further supported by the chromatograms ordered for seven samples with elevated concentrations of TRH, provided in Appendix H.

A silica gel-clean-up was not ordered for sample BH106/0.3-0.4, as silica gel analysis is only applicable to semi-volatile fractions and would not likely result in a significant drop in TRH levels.

The source of these contaminants on site could be associated with historic land use of adjacent sites (such as storage of coal in the western shed as discussed in Section 4.1) or with the nature of the fill material that is present across the Site.

It is noted that whilst asbestos was not found in the analysed soil samples, the presence of anthropogenic materials in the fill such as brick and concrete suggests that there may be Asbestos Containing Materials (ACM) in the fill in areas not sampled. There is generally a low probability to detecting ACM in soil through small diameter bores, such as that adopted for the current investigation.

With regards to results from DP (2019), analytical results for the 16 soil samples selected for analysis were within the adopted site assessment criteria (SAC) for commercial land use except for B(a)P TEQ in sample BH3/0.2-0.3 (42 mg/kg), which marginally exceeded the HIL of 40 mg/kg. The recorded exceedance was, however, noted to be statistically insignificant. Furthermore, the immediate underlying fill sample, BH3/0.7-0.8, contained a much lower concentration of B(a)P TEQ of 6.3 mg/kg, which was

well within the HIL, indicating that the vertical extent of B(a)P TEQ was likely limited to the overlying, near-surface fill material.

The locations of boreholes with soil samples that exceeded the SAC are shown on Drawing 2, Appendix B.

9.2 Groundwater

Analytical results for groundwater were within the adopted GIL with the following exceptions:

- Copper in BH103 (3 µg/L), its replicate sample BD1/20200424 (26 µg/L) and BH104 (2 µg/L) which exceeded the GIL of 1.4 µg/L; and
- Zinc in BH107A (140 µg/L), BH107B (64 µg/L), BH112B (21 µg/L) and its replicate sample BD1/160520 (20 µg/L) which exceeded the hardness modified GILs of 36.69 µg/L, 34.94 µg/L and 16.64 respectively.

The concentrations of copper and zinc in BH103, BH104, BH107A, BH107B and 112B are considered to be within the normal range of background level in heavily urbanised areas of Sydney.

Based on the Site topography and recorded RL's, BH103 and BH104 can be considered 'up-gradient' wells which are most likely to be indicative of the groundwater condition in the greater surrounding area. PAH was detected in BH112A and BH112B, and TRH was detected in BH112A, which are considered to be 'down-gradient' wells. Furthermore, PAH and TRH were not detected in the up-gradient wells or any other wells on the Site. However, given the low concentrations of PAH in the groundwater and the low potential for leaching of contaminants, as determined by toxicity characteristic leaching procedure (TCLP) testing, it is considered unlikely that the source of PAH and TRH in the groundwater at BH112A and BH112B is from leaching of on-site fill contamination.

With regards to results from DP (2019), analytical results for the two groundwater samples were within the adopted groundwater investigation levels (GIL) with the exception of copper and zinc in BH8, BH5 and its replicate sample, BD1/20190730. Like the metals detected in the groundwater sampled for the current investigation, the elevated concentrations of metals were considered to be within the normal range of background concentrations in heavily urbanised areas of Sydney, and therefore, no further assessment of metals in groundwater in BH5 and BH8 was considered necessary.

The locations of monitoring wells with groundwater samples that exceeded the GIL are shown on Drawing 2, Appendix B.

9.3 Preliminary Waste Classification

EPA (2014) contains a six-step procedure for determining the type of waste and the waste classification of materials. The preliminary waste classification was conducted during the current investigation with reference to this procedure as detailed in Table 12.

Table 12: 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. Asbestos was not detected by the analytical laboratory ^b .
2. Is the waste liquid waste?	No	Material comprised a soil matrix.
3. Is the waste "pre-classified"?	No	The fill soil is not pre-classified with reference to EPA (2014).
4. Does the waste possess hazardous waste characteristics?	No	The waste 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 F3 (attached).
6. Is the waste putrescible or non-putrescible?	No	The fill and natural soil 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 (EPA, 2014).

^b As noted in Section 9.1, there is a potential for ACM to be present in the fill and such finds will alter the waste classification.

Concentrations of contaminants for the analysed fill / soil samples were within the contaminant thresholds (CT1) and SCC1 (specific contaminant concentration) / TCLP1 (leachable concentration) for General Solid Waste (GSW) except for B(a)P and total PAH in some samples.

The following samples exceeded the CT1 and SCC1/TCLP1 for GSW and are classifiable as **Restricted Solid Waste (RSW)**:

- B(a)P in BH113/0.15-0.25 (12 mg/kg); and
- Total PAH in BH106/0.2-0.3 (320 mg/kg), BH114/0.2-0.3 (470 mg/kg), BH115/0.23-0.3 (440 mg/kg) and BH117/0.2-0.25 (770 mg/kg).

The following samples exceeded the CT2 and SCC2/TCLP2 for RSW and are classifiable as **Hazardous Waste**:

- B(a)P in the blind duplicate for BH104/1.4-1.5 (14 mg/kg), BH106/0.2-0.3 (28 mg/kg), BH106/0.3-0.4 (120 mg/kg), BH114/0.15-0.2 (67 mg/kg), BH114/0.2-0.3 (31 mg/kg), BH115/0.23-0.3 (27 mg/kg) and BH117/0.2-0.25 (39 mg/kg); and

- Total PAH in BH106/0.3-0.4 (1400 mg/kg) and BH114/0.15-0.2 (860 mg/kg).

Samples classified as RSW and Hazardous Waste are contaminated with B(a)P and PAH. Ash and coal were encountered across the Site, including in the boreholes with elevated concentrations of B(a)P and PAH, and are considered likely to be the source of the elevated concentrations of B(a)P and PAH in the soil.

With regards to results from DP (2019), the following fill / soil samples exceeded the CT1 and SCC1/TCLP1 for GSW and are classifiable as **Restricted Solid Waste** (RSW):

- Total PAH in BH3/0.2-0.3 (370 mg/kg) and BH6/0.2-0.3 (640 mg/kg).

The following samples exceeded the CT2 and SCC2/TCLP2 for RSW and are classifiable as **Hazardous Waste**:

- B(a)P in BH3/0.2-0.3 (29 mg/kg).

B(a)P leachability results for all samples with exceedances was below the RSW (TCLP2) thresholds and the laboratory's practical quantitation limits, indicating low potential for leachability at those locations.

The NSW EPA *Immobilisation of Contaminants in Waste 1999/05* is a general immobilisation approval for ash / coal-contaminated materials, which allows waste classification for such materials based on their leachability concentration (TCLP) value alone. Given the low leachability of B(a)P and PAH in the samples analysed, it is considered the immobilisation approval could be applied to the samples containing concentrations of B(a)P and PAH which exceeded the GSW and RSW criteria. Therefore, the fill in the vicinity of BH104, BH106, BH113, BH114 and BH115 where coal and ash were observed may be classifiable as GSW under the *Immobilisation of Contaminants in Waste 1999/05*.

It is noted that the information provided in this section does not constitute a final waste classification for off-site disposal purposes. Should excavated soils require off-site disposal during development further testing and a final waste classification assessment, which takes into consideration the information in this report, must be undertaken.

9.3.1 Classification of Natural Soils

Seven natural soil samples were selected for laboratory analysis. The following Table 13 presents the results of the assessment of natural soils at the Site with reference to the VENM definition and EPA advice outlined in section 7.4.

Table 13: VENM Classification Procedure

Item	Comments	Rationale
1. Is the material natural?	Yes	Natural materials were logged during the investigation.
2. Is the material impacted by manufactured chemicals or process residues?	Possibly	Elevated levels of B(a)P and PAH were detected in sample BH108/0.23-0.25. Low concentrations of B(a)P and PAH were detected in other natural samples.

Item	Comments	Rationale
3. Are the materials acid sulphate soils?	No	The Site is in an area of no known occurrences of ASS material.
4. Are there current or previous land uses that have (or may have) contaminated the materials?	Possibly	Previous land use is likely the cause of B(a)P and PAH detections in the natural material, although leachability testing indicates that the leaching potential of the contaminants is low.

Concentration of metals for the analysed natural soil samples were within the published concentrations in NSW EPA *The Excavated Natural Material Order 2014*. Concentrations of B(a)P and total PAH were above the LOR but within the published concentrations in NSW EPA *The Excavated Natural Material Order 2014* with the exception of BH108/0.23-0.25 which recorded a B(a)P concentration of 2.7 mg/kg. This sample has been given a preliminary waste classification of GSW based on TCLP results. It is noted that this sample was taken 0.03 m below a concrete slab, directly beneath a very thin layer of fill material. It is considered likely that the elevated concentration of B(a)P is limited to the near-surface material.

With regards to results from DP (2019), all contaminant concentrations for the analysed natural soil samples were within the published background ranges for Australian soils except for the concentrations of B(a)P and PAH in BH6/0.2-0.3, which were above the RSW thresholds (i.e., both CT2 and SCC2). Therefore, the natural material in BH6/0.2-0.3 represented RSW and should be disposed as such.

10. Recommendations and Conclusion

Based on the Site history the potential sources of contamination include uncontrolled fill, current and historical site uses and degradation of building material from existing buildings and underground tunnel structures. The COPC from these sources include metals, TRH, BTEX, PAH, PCB, OCP, OPP, phenols, VOC, asbestos and cyanide.

Laboratory testing results from the current investigation and DP (2019) confirms the presence of some of the COPC in the soil and groundwater. TRH and PAH were detected at concentrations above the soil SAC, while metals were detected at levels below the SAC. In groundwater, copper and zinc were detected at concentrations above the groundwater SAC, while PAH, TRH and other metals were detected at levels below the SAC. PAH was only detected in the two down-gradient wells (BH112A and BH112B), indicating that the source of the PAH could be from the fill on site. However, soil leachability (TCLP) testing results do not indicate that PAH is likely to leach from the fill into groundwater.

The elevated levels of copper and zinc in groundwater are common in heavily urbanised areas such as Haymarket. The source of copper and zinc is uncertain but could be linked to the copper and zinc concentrations in the fill layer on site, or to the services network at the Site or in proximity to the Site, as elevated levels of copper and zinc were identified in both the upgradient and downgradient groundwater wells. Considering that elevated levels of copper and zinc were not evident in the fill, the copper and zinc levels identified in the groundwater wells at the Site are likely to represent regional background levels rather than site-specific levels.

Active remediation to reduce the level of PAH detected in down-gradient groundwater wells is not considered to be necessary. The principal groundwater remediation strategy proposed for the Site is the removal of contamination source i.e., PAH exceedances / hotspot in fill at the Site. Given the concentration of PAH and TRH contamination in groundwater is marginal, the potential for off-site migration of PAH in groundwater is low.

Given dewatering is required at the Site, further groundwater sampling is likely to be requested by the City of Sydney Council to assess for the quality and suitability of groundwater prior to stormwater discharge. Alternatively, groundwater can be discharged into sewer subject to approval from Sydney Water or disposal of groundwater to a licensed liquid waste facility.

Results from the current and previous investigation (DP, 2019) indicate that fill is present across the Site at depths of between 0.22 m and 6.3 m bgl. The fill was deepest in BH103 and BH104 on the hostel railway platform and BH111. The shallowest fill was in BH108, BH109A, BH109B, BH116 and BH117. It is noted that the deeper fill was generally correlated with a higher surface level. This is likely due to fill being used across the Site historically for levelling purposes. The fill was underlain by alluvial sand, residual clay and Hawkesbury sandstone. Anthropogenic materials (typically traces of) were encountered sporadically in the fill at the majority of test locations. The anthropogenic material included brick fragments, plastic, coal, ash and ballast.

Based on the results of this SSI together with DP (2019), it is considered that the Site can be made suitable for the proposed commercial development as outlined in Section 1 subject to the following recommendations:

- Delineation of the PAH contamination in the northeast portion of the Site for waste classification purposes, particularly within the 'State Works' zone around BH106, BH114 and BH117 to the extent practical;
- Further investigation of groundwater on site, particularly to assess the presence of TRH and PAH in groundwater across the Site prior to and during dewatering. It is likely that a groundwater management plan will be required as part of the application for a dewatering license;
- Drilling of three (3) additional boreholes to 0.5 m into natural soils across the footprint of the existing cool rooms (in the vicinity of BH7 and BH5) following vacancy of the area;
- Intrusive investigation of the footprints of the existing buildings following demolition. Care should be undertaken during demolition to prevent cross-contaminating the subsurface soils with hazardous building material such as asbestos. The correct handling and removal procedures for hazardous building materials are detailed in the hazardous material building report (see Section 1);
- Preparation of a remediation action plan including an unexpected finds procedure as part of the civil and construction site management plan, such that existing contamination and unexpected finds of contamination (e.g., asbestos, odorous soils or seepage water) are managed appropriately; and
- Additional soil sampling and testing, either using *in situ* or *ex situ* sampling methods, to provide a final waste classification for surplus soils requiring off-site disposal.

Further information on additional sampling recommendations, including sampling locations and rationale, is provided in Section 8 of the Remediation Action Plan (86767.03.R.002).

11. Glossary of Key Terms

Term	Definition
Adina Hotel	2 Lee Street, Haymarket The Former Parcels Post Office The Adina Apartment Hotel Sydney Central
Atlassian Central	The Atlassian tower building (building only)
Atlassian Central development	The whole Atlassian development within the Atlassian Site including the tower and public domain works.
Atlassian Site	8 - 10 Lee Street, Haymarket
Central Sydney	Land identified as Central Sydney under the Sydney LEP 2012 and includes Sydney's Central Business District (CBD)
Central SSP	Central Station State Significant Precinct
Central Walk West	The future western pedestrian entry to the new 19 metre-wide underground concourse customers to suburban rail and Sydney Metro platforms.
Devonshire Tunnel	The pedestrian and cycle tunnel running between Chalmers Street and Lee Street
"Dexus/Frasers Site"	14-30 Lee Street Haymarket. Adjoining land immediately to the south currently comprising three 8-storey commercial buildings
Habitat Level 1	Flexibly ventilated workspace areas
Link Zone	The publicly accessible land within the Site.
Sub-precinct	Western Gateway Sub-precinct
The Project	Commercial and hotel development above the Former Inwards Parcel Shed at 8-10 Lee Street, Haymarket

12. References

1. NSW Acid Sulfate Soils Risk mapping data from NSW Department of Environment and Climate, Ver 2.1 (1998).
2. Geological Survey of NSW Sydney, 1:100 000 Geology Sheet.
3. NEPC (2013) National Environment Protection (Assessment of Site Contamination) Measure 1999 (as amended 2013).
4. NSW EPA (2017) Guidelines for the NSW Site Auditor Scheme (3rd Edition).
5. NSW OEH (2011) Contaminated Sites: Guidelines for Consultants Reporting on Contaminated Sites.
6. Soil Conservation Service of NSW, Sydney 1:100 000 Sheet.

13. Limitations

Douglas Partners (DP) has prepared this report for the site at 8-10 Lee Street, Haymarket in accordance with DP's proposal SYD190190.P.003 dated 4 February 2020 and acceptance received from Avenor Pty Ltd on behalf of Atlassian Pty Ltd. The work was carried out under agreed terms of engagement between DP and Atlassian Pty Ltd. This report is provided for the exclusive use of Atlassian Pty Ltd for the SSI 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 site accessibility.

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 brick and ceramic tile were, however, observed in the fill profile during the current field investigation, 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 parts of the site being inaccessible and not available for sampling. 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.

The contents of this report do not constitute formal design components such as are required, by the Health and Safety Legislation and Regulations, to be included in a Safety Report specifying the hazards likely to be encountered during construction and the controls required to mitigate risk. This design process requires risk assessment to be undertaken, with such assessment being dependent upon

factors relating to likelihood of occurrence and consequences of damage to property and to life. This, in turn, requires project data and analysis presently beyond the knowledge and project role respectively of DP. DP may be able, however, to assist the client in carrying out a risk assessment of potential hazards contained in the Comments section of this report, as an extension to the current scope of works, if so requested, and provided that suitable additional information is made available to DP. Any such risk assessment would, however, be necessarily restricted to the (geotechnical/environmental/groundwater) components set out in this report and to their application by the project designers to project design, construction, maintenance and demolition.

Douglas Partners Pty Ltd

Appendix A

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.

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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

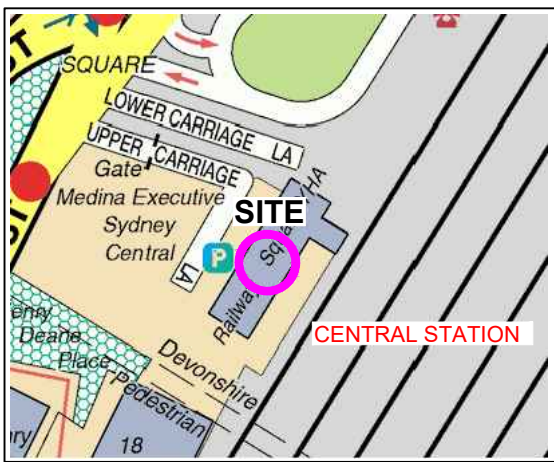
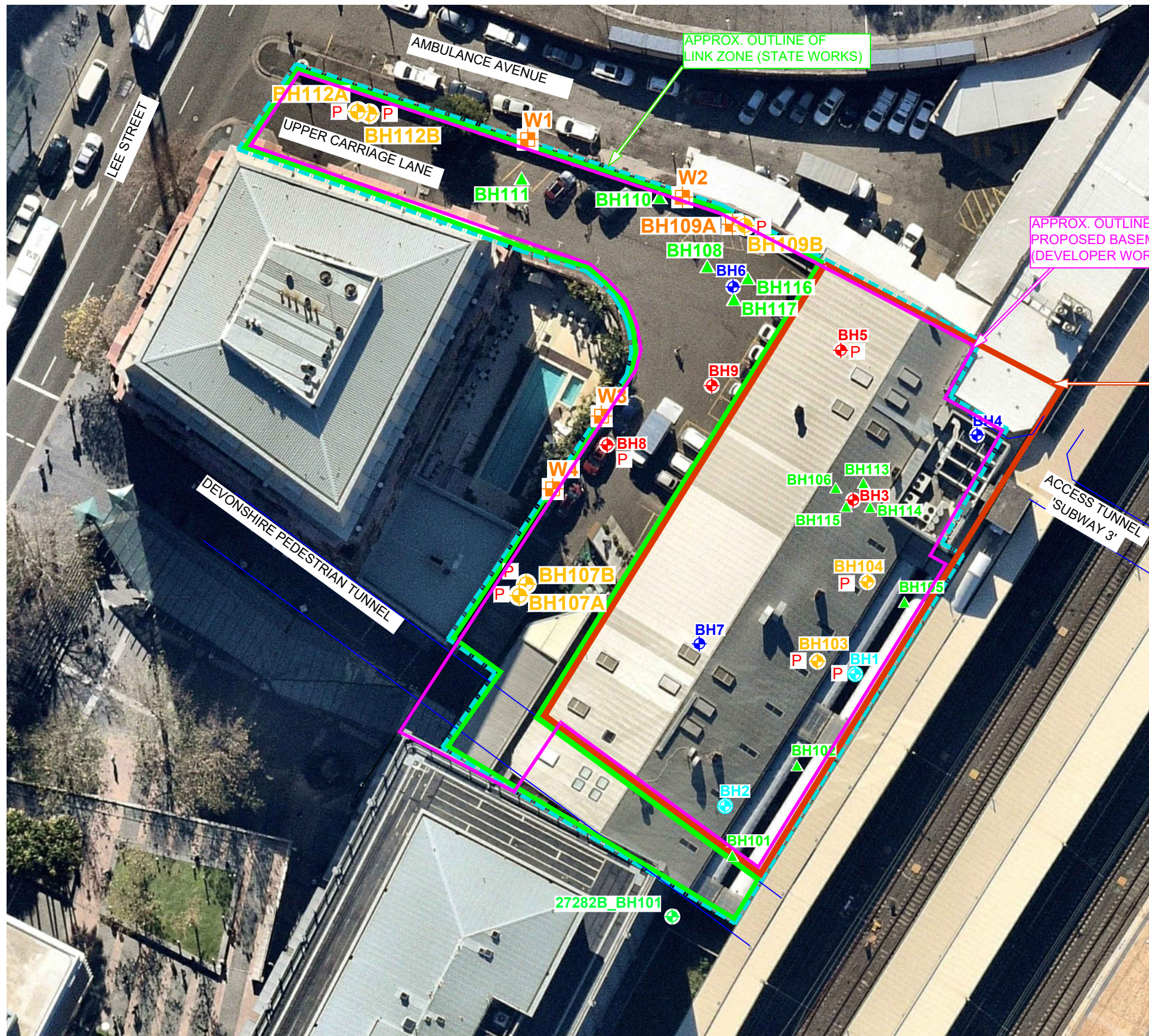
Where information obtained from this report is provided for tendering purposes, it is recommended that all information, including the written report and discussion, be made available. In circumstances where the discussion or comments section is not relevant to the contractual situation, it may be appropriate 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 B

Site Drawing



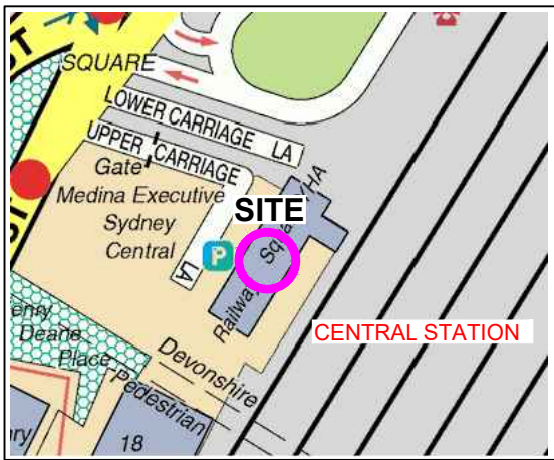
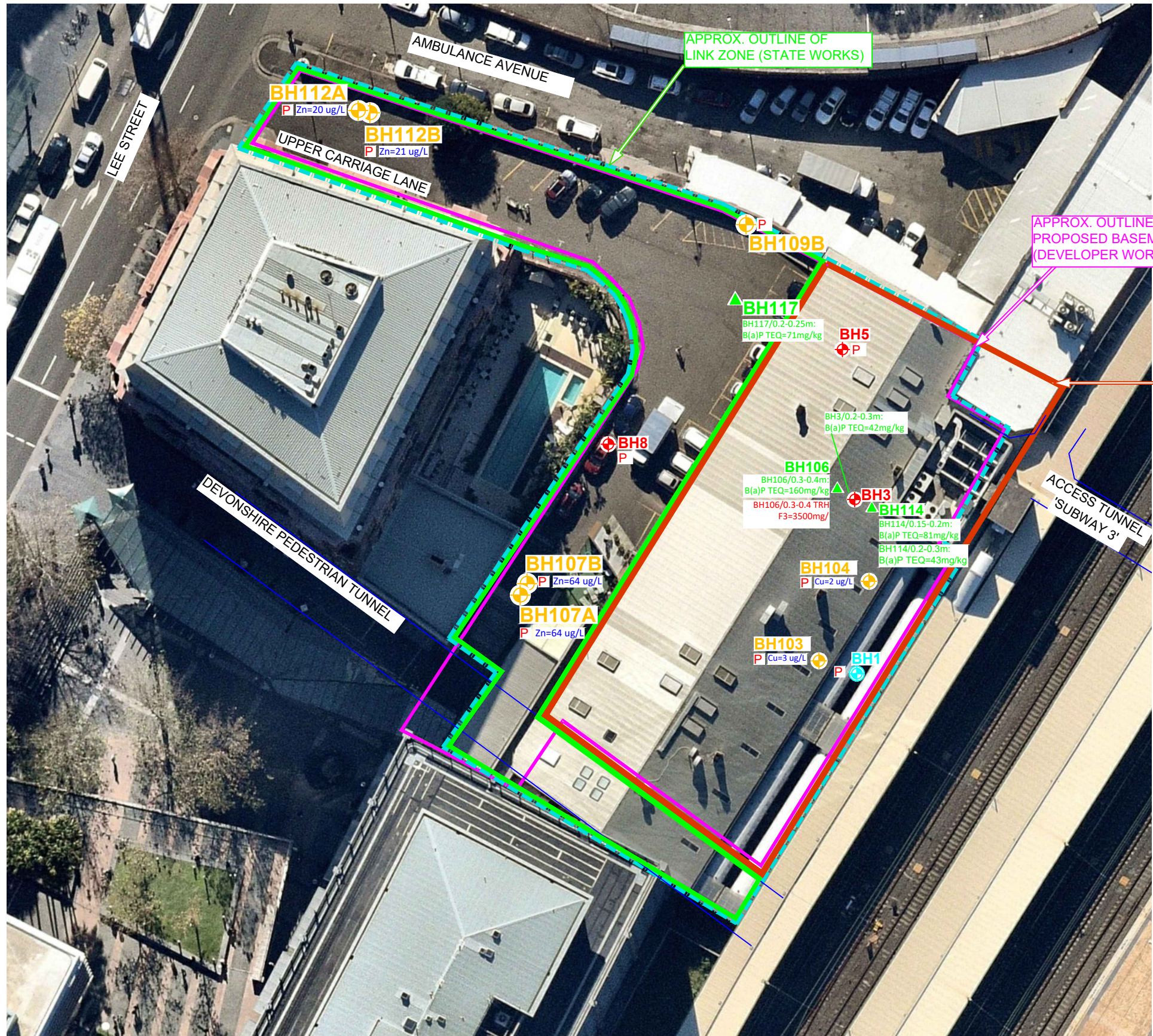
Locality Plan

LEGEND

- Previous geotechnical borehole (DP Project 27282B, dated 1999)
- Environmental borehole - Lower Ground Floor (DP Report 86767.01.R.001.DfB, dated 29 August 2019)
- Geotechnical & environmental borehole - Lower Ground Floor (DP Report 86767.00.R.001.Rev0, dated 26 August 2019)
- Geotechnical & environmental borehole - Upper Ground Floor (DP Report 86767.00.R.001.Rev0, dated 26 August 2019)
- Environmental borehole
- Geotechnical & environmental borehole
- Geotechnical borehole
- Standpipe piezometer
- Approximate site boundary

NOTE:
1: Base image from Nearmap.com
(Dated 1 July 2019)
2: Test locations are approximate only and are shown with reference to existing features.
3: Approximate Development Outlines are as provided by Avenor Pty Ltd on 12 August 2019.





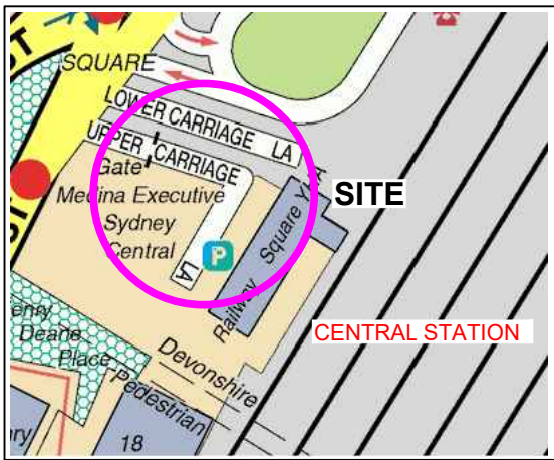
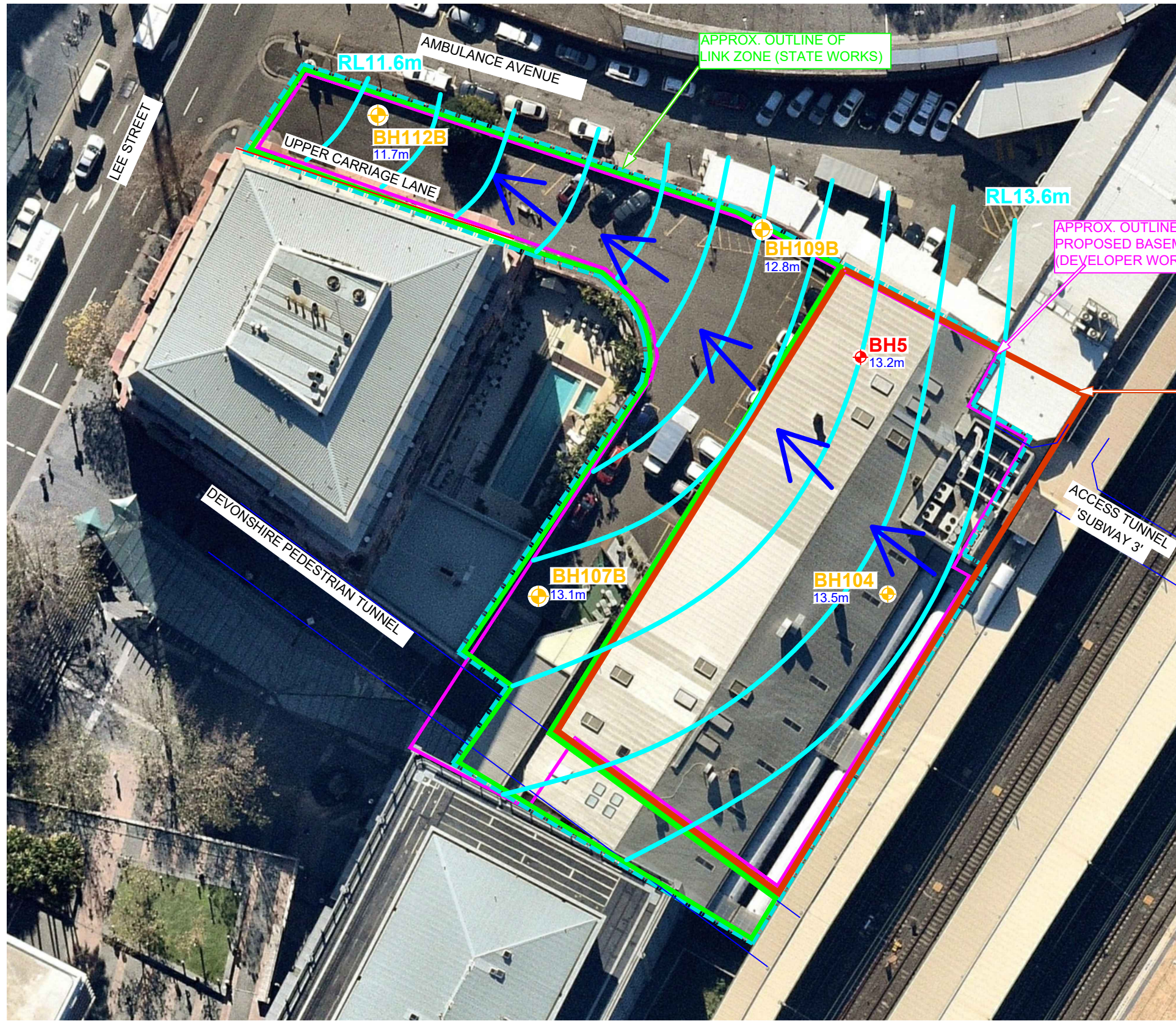
Locality Plan

LEGEND

- Geotechnical & environmental borehole - Lower Ground Floor (DP Report 86767.00.R.001.Rev0, dated 26 August 2019)
- Geotechnical & environmental borehole - Upper Ground Floor
- Environmental borehole
- Geotechnical & environmental borehole
- Standpipe piezometer
- Approximate site boundary
- HIL exceedance marked in green text
- GIL exceedance marked in blue text
- ML exceedance marked in blue text

NOTE:
1: Base image from Nearmap.com
(Dated 1 July 2019)
2: Test locations are approximate only and are shown with reference to existing features.
3: Approximate Development Outlines are as provided by Avenor Pty Ltd on 12 August 2019.

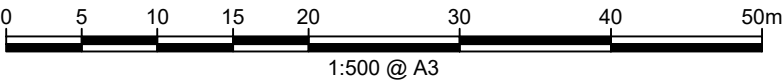




Locality Plan

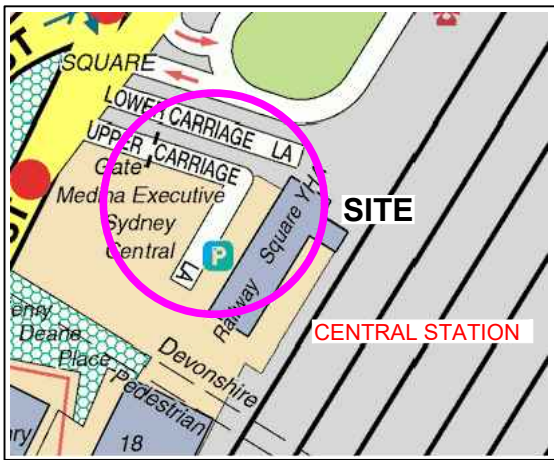
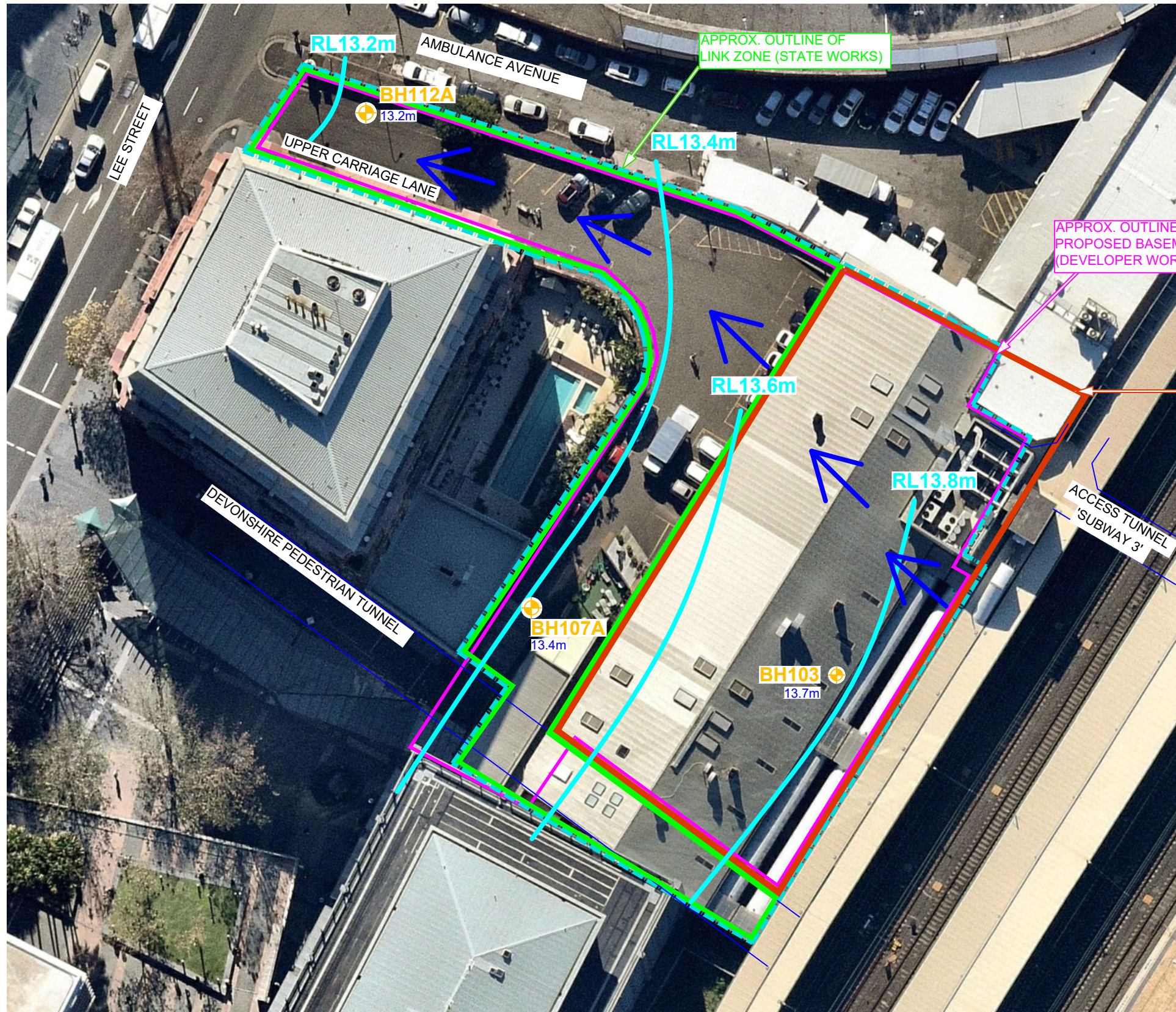
NOTE:

1. Base image from Nearmap.com (Dated 1 July 2019)
2. Test locations are approximate only and are shown with reference to existing features.
3. Approximate Development Outlines are as provided by Avenor Pty Ltd on 12 August 2019.
4. Groundwater level measurements taken on 05.05.2020 (BH5 and BH104) and 07.09.2020 (BH109B, 107B and 112B)
5. Bores not relevant to this drawing have been removed; refer to Drawing 1 or Report for location of all boreholes.
6. Groundwater contours shown for the site extents only.



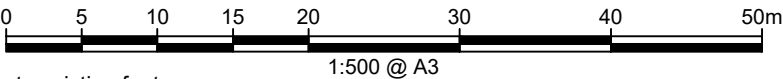
LEGEND

- Geotechnical & environmental borehole - Lower Ground Floor (DP Report 86767.00.R.001.Rev0, dated 26 August 2019)
- Geotechnical & environmental borehole (DP Report 86767.00.R001.Rev0, dated 26 August 2019)
- Inferred groundwater contour (RL(m))
- Direction of flow
- Water elevation
- Contour elevation
- Approximate site boundary





Locality Plan

- NOTE:**
1. Base image from Nearmap.com (Dated 1 July 2019)
 2. Test locations are approximate only and are shown with reference to existing features.
 3. Approximate Development Outlines are as provided by Avenor Pty Ltd on 12 August 2019.
 4. Groundwater level measurements taken on 05.05.2020 (BH5 and BH104) and 07.09.2020 (BH109B, 107B and 112B)
 5. Bores not relevant to this drawing have been removed; refer to Drawing 1 or Report for location of all boreholes.
 6. Groundwater contours shown for the site extents only.



LEGEND

- Geotechnical & environmental borehole - Lower Ground Floor (DP Report 86767.00.R.001.Rev0, dated 26 August 2019)
- Geotechnical & environmental borehole (DP Report 86767.00.R001.Rev0, dated 26 August 2019)
- Inferred groundwater contour (RL(m))
- Direction of flow
- 13.2m Water elevation
- RL13.6m Contour elevation
- Approximate site boundary

 Douglas Partners <i>Geotechnics Environment Groundwater</i>	CLIENT: Vertical First Pty Ltd		TITLE: Groundwater Levels and Flow Direction from Piezometers Screened in Mittagong Formation Proposed Commercial Development, 8-10 Lee Street, HAYMARKET		PROJECT No: 86767.06
	OFFICE: Sydney	DRAWN BY: BZ			DRAWING No: 4
	SCALE: 1:500 @ A3	DATE: 21.09.2020			REVISION: 0

Appendix C

Borehole Logs

BOREHOLE LOG

CLIENT: Atlassian Pty Ltd
PROJECT: Proposed Commercial Development
LOCATION: 8-10 Lee Street, Haymarket

SURFACE LEVEL: 20.1 AHD
EASTING: 333983.4
NORTHING: 6249262.5
DIP/AZIMUTH: 90°/-

BORE No: BH1
PROJECT No: 86767.00
DATE: 10 - 12/7/2019
SHEET 1 OF 3

RL	Depth (m)	Description of Strata	Graphic Log	Sampling & In Situ Testing				Water	Well Construction Details	
				Type	Depth	Sample	Results & Comments			
0.03	0.03	BALLAST (BLUE METAL), PLASTIC							Gatic Cover and cap	
0.075	0.075	CONCRETE							Sand Backfill and Blank PVC pipe	
0.38	0.38	BRICK PAVEMENT								
		CONCRETE								
1		At 1.3m: interface with lower concrete slab								
1.8	1.8	FILL/Sandy CLAY: low plasticity, grey mottled red-brown, fine grained sand, trace ironstone bands, slag and ash, w<PL, apparently in a very soft condition		E	1.8		PID<1			
1.9	1.9				1.9					
2.2	2.2			E	2.2		PID<1		Bentonite Seal	
2.4	2.4				2.4					
2.8	2.8			E	2.8		PID<1			
3.0	3.0				3.0					
3.2	3.2	Below 3.0m: with ash and slag, trace glass, brick and ceramic tile fragments			3.2					
3.3	3.3	FILL/SAND: fine to medium grained sand, dark brown to black, moist, apparently in a very loose condition		E	3.3		PID<1			
3.5	3.5				3.5					
3.8	3.8			E	3.8		PID<1			
4.0	4.0	SAND SP: fine to medium grained sand, orange brown, moist, very loose, alluvial soil			4.0					
4.3	4.3	Below 4.3m: grading to pale yellow-grey		E	4.3		PID<1			
4.5	4.5				4.5					
6.0	6.0	Silty CLAY Cl-CH: medium to high plasticity, orange, red and pale grey, with fine to medium grained sand, with relict rock texture, w<PL, residual soil			6.0				Sand filter Slotted PVC pipe	
6.54	6.54	SANDSTONE: medium grained, orange-red, medium strength with very low strength bands, highly weathered, fractured, Mittagong Formation		C	6.6		PL(A) = 0.97		End Cap	
7.6	7.6				7.6				Bentonite Seal	
7.7	7.7	SANDSTONE: medium grained, brown and pale yellow, medium to high strength, moderately weathered, slightly fractured, Hawkesbury Sandstone			7.74		PL(A) = 0.15			
8.23	8.23	SANDSTONE: medium grained, pale grey, high strength, fresh, slightly fractured, cross bedding 5°-10°, Hawkesbury Sandstone		C	8.4		PL(A) = 0.52			
9.2	9.2			C	9.2					
9.95	9.95				9.95		PL(A) = 1.3			

RIG: Proline

DRILLER: Tightsite

LOGGED: WFFY/NB

CASING: HW to 6.44m

TYPE OF BORING: Diacore 0-1.3m; Hand auger 1.3m-5.0m; NMLC coring 5.0-20.0m

WATER OBSERVATIONS: No groundwater observed during auger drilling

REMARKS: Groundwater well installed: 20-7.2m backfilled with sand, 7.2-6.3m bentonite, 6.3-4.3m screened PVC with sand backfill, 4.3-4.2m blank PVC with sand backfill, 4.2-0.2m blank PVC with bentonite backfill, 0.2-0m sand, gatic cover at surface

SAMPLING & IN SITU TESTING LEGEND

A	Auger sample	G	Gas sample	PID	Photo ionisation detector (ppm)
B	Bulk sample	P	Piston sample	PL(A)	Point load axial test Is(50) (MPa)
BLK	Block sample	U	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	W	Water seep	S	Standard penetration test
E	Environmental sample	W	Water level	V	Shear vane (kPa)

BOREHOLE LOG

CLIENT: Atlassian Pty Ltd
PROJECT: Proposed Commercial Development
LOCATION: 8-10 Lee Street, Haymarket

SURFACE LEVEL: 20.1 AHD
EASTING: 333983.4
NORTHING: 6249262.5
DIP/AZIMUTH: 90°/--

BORE No: BH1
PROJECT No: 86767.00
DATE: 10 - 12/7/2019
SHEET 2 OF 3

RL	Depth (m)	Description of Strata	Graphic Log	Sampling & In Situ Testing				Water	Well Construction Details	
				Type	Depth	Sample	Results & Comments			
10		SANDSTONE: medium grained, pale grey, high strength, fresh, unbroken, cross-bedding 5°-10°, Hawkesbury Sandstone		C						
					10.72					
	11				10.95		PL(A) = 0.89			11
				C						
	12				11.95		PL(A) = 1.6			12
					12.33					
	13	Between 12.4-12.49m: with thin black carbonaceous laminations			12.95		PL(A) = 1.2			13
				C						
	14				13.91		PL(A) = 1.5			14
					13.93					
	15			C						
					14.95		PL(A) = 1.2			15
					15.47					
	16				15.95		PL(A) = 1.6			16
				C						
	17				16.95		PL(A) = 1.9			17
					17.09					
	18	Between 17.35-14.42m: with black carbonaceous laminations			17.95		PL(A) = 1.9			18
				C						
	19				18.71					19
					18.95		PL(A) = 1.9			
				C						
	20.0				19.95		PL(A) = 0.9			

Bore discontinued at 20.0m

RIG: Proline **DRILLER:** Tightsite **LOGGED:** WFY/NB **CASING:** HW to 6.44m

TYPE OF BORING: Diacore 0-1.3m; Hand auger 1.3m-5.0m; NMLC coring 5.0-20.0m

WATER OBSERVATIONS: No groundwater observed during auger drilling

REMARKS: Groundwater well installed: 20-7.2m backfilled with sand, 7.2-6.3m bentonite, 6.3-4.3m screened PVC with sand backfill, 4.3-4.2m blank PVC with sand backfill, 4.2-0.2m blank PVC with bentonite backfill, 0.2-0m sand, gatic cover at surface

SAMPLING & IN SITU TESTING LEGEND

A	Auger sample	G	Gas sample	PID	Photo ionisation detector (ppm)
B	Bulk sample	P	Piston sample	PL(A)	Point load axial test Is(50) (MPa)
BLK	Block sample	U	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	W	Water seep	S	Standard penetration test
E	Environmental sample	W	Water level	V	Shear vane (kPa)

BOREHOLE LOG

CLIENT: Atlassian Pty Ltd
PROJECT: Proposed Commercial Development
LOCATION: 8-10 Lee Street, Haymarket

SURFACE LEVEL: 20.1 AHD
EASTING: 333983.4
NORTHING: 6249262.5
DIP/AZIMUTH: 90°/--

BORE No: BH1
PROJECT No: 86767.00
DATE: 10 - 12/7/2019
SHEET 3 OF 3

RL	Depth (m)	Description of Strata	Graphic Log	Sampling & In Situ Testing				Water	Well Construction Details	
				Type	Depth	Sample	Results & Comments			
0					20.0					
21									21	
22									22	
23									23	
24									24	
25									25	
26									26	
27									27	
28									28	
29									29	

RIG: Proline

DRILLER: Tightsite

LOGGED: WFY/NB

CASING: HW to 6.44m

TYPE OF BORING: Diacore 0-1.3m; Hand auger 1.3m-5.0m; NMLC coring 5.0-20.0m

WATER OBSERVATIONS: No groundwater observed during auger drilling

REMARKS: Groundwater well installed: 20-7.2m backfilled with sand, 7.2-6.3m bentonite, 6.3-4.3m screened PVC with sand backfill, 4.3-4.2m blank PVC with sand backfill, 4.2-0.2m blank PVC with bentonite backfill, 0.2-0m sand, gatic cover at surface

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



BOREHOLE LOG

CLIENT: Atlassian Pty Ltd
PROJECT: Proposed Commercial Development
LOCATION: 8-10 Lee Street, Haymarket

SURFACE LEVEL: 21.2 AHD
EASTING: 333968
NORTHING: 6249250
DIP/AZIMUTH: 90°/--

BORE No: BH2
PROJECT No: 86767.00
DATE: 10 - 11/7/2019
SHEET 1 OF 3

RL	Depth (m)	Description of Strata	Graphic Log	Sampling & In Situ Testing				Water	Well Construction Details	
				Type	Depth	Sample	Results & Comments			
21	0.28	CONCRETE SLAB								
		0.08m: interface with lower concrete slab		A/E*	0.28		PID<1			
		FILL/SAND: fine to medium grained sand, brown, moist, apparently moderately compacted		A/E	0.38		PID<1			
				A/E	0.5					
				A/E	0.6					
1				A/E	1.0		PID<1			
				A/E	1.1					
		1.5m: trace ash and slag		A/E	1.5		PID<1			
				S	1.6		0,0,2 N = 2			
2		2.1m: with clay, trace shale gravel, moderately compacted		A/E	1.95		PID<1			
				A/E	2.0					
				A/E	2.1					
2.5		Fill/Clayey SAND: fine to coarse grained sand, brown, 15% plastic fines, trace gravel 2-5mm, moist, apparently moderately compacted		A/E	2.5		PID<1			
				A/E	2.6					
3				A/E	3.0		PID<1			
				S	3.1		0,0,0 N = 0			
					3.45					
4	4.0	Fill/Silty CLAY: medium plasticity, brown-grey, trace sand, w<PL		A/E	4.5		PID<1			
				S	4.6		2,2,2 N = 4			
		Below 4.8m: with angular shale and ironstone gravel to 20mm			4.95					
5	5.2	Fill/Silty SAND: fine grained sand, grey and dark grey, trace gravel 2-5mm, moist, apparently variably compacted		A/E	6.0		PID<1			
				S	6.1		1,1,1 N = 2			
6	6.2	Fill/SAND: fine grained sand, grey, with silt, wet, apparently variably compacted			6.45					
				A/E	7.5		PID<1			
				S	7.6		0,0,1 N = 1			
					7.95					
8	8.0	Silty CLAY Cl-CH: medium to high plasticity, orange brown, with fine to medium grained sand and ironstone gravel, w<PL, soft, residual soil								
9	9.0	Sandy CLAY CL: low plasticity, pale grey, fine to medium grained sand, w<PL, hard, residual soil								
	9.47	SANDSTONE: refer following page		S	9.35		25/100 refusal			
					9.45					
					9.57					
				C	9.95		PL(A) = 1.4			

RIG: XC **DRILLER:** Terratest **LOGGED:** NB **CASING:** HQ to 8.9m
TYPE OF BORING: Diacore 0-0.28m; solid flight auger (TC Bit) 0.28-7.5m; Wash bore 7.5-9.47m; NMLC coring 9.47-23.27m
WATER OBSERVATIONS: Saturated sand (fill) encountered at 6.2m
REMARKS: *BD1 at 0.28m

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

BOREHOLE LOG

CLIENT: Atlassian Pty Ltd
PROJECT: Proposed Commercial Development
LOCATION: 8-10 Lee Street, Haymarket

SURFACE LEVEL: 21.2 AHD
EASTING: 333968
NORTHING: 6249250
DIP/AZIMUTH: 90°/--

BORE No: BH2
PROJECT No: 86767.00
DATE: 10 - 11/7/2019
SHEET 2 OF 3

RL	Depth (m)	Description of Strata	Graphic Log	Sampling & In Situ Testing				Water	Well Construction Details	
				Type	Depth	Sample	Results & Comments			
11.1		SANDSTONE: medium grained, pale grey and brown, medium strength with some very low strength bands, moderately weathered, slightly fractured, Hawkesbury Sandstone		C	10.92		PL(A) = 1.5			
11.12		SANDSTONE: medium grained, pale grey, high strength, fresh, slightly fractured, cross bedding 5°-10°, Hawkesbury Sandstone			11.17					
12		Below 12m: unbroken			11.93		PL(A) = 1.1			
13				C	12.95		PL(A) = 1.3			
14					13.95		PL(A) = 1.6			
15					14.23					
16					14.96		PL(A) = 1.4			
17				C	15.95		PL(A) = 1.4			
18					16.95		PL(A) = 1.3			
19					17.23					
					17.96		PL(A) = 0.96			
				C	18.96		PL(A) = 1.3			
		19.52m: carbonaceous laminations, dipping 25°			19.95		PL(A) = 2.2			

RIG: XC **DRILLER:** Terratest **LOGGED:** NB **CASING:** HQ to 8.9m
TYPE OF BORING: Diacore 0-0.28m; solid flight auger (TC Bit) 0.28-7.5m; Wash bore 7.5-9.47m; NMLC coring 9.47-23.27m
WATER OBSERVATIONS: Saturated sand (fill) encountered at 6.2m
REMARKS: *BD1 at 0.28m

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 _s	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	W _s	Water seep	S	Standard penetration test
E	Environmental sample	W _L	Water level	V	Shear vane (kPa)

BOREHOLE LOG

CLIENT: Atlassian Pty Ltd
PROJECT: Proposed Commercial Development
LOCATION: 8-10 Lee Street, Haymarket

SURFACE LEVEL: 21.2 AHD
EASTING: 333968
NORTHING: 6249250
DIP/AZIMUTH: 90°/--

BORE No: BH2
PROJECT No: 86767.00
DATE: 10 - 11/7/2019
SHEET 3 OF 3

RL	Depth (m)	Description of Strata	Graphic Log	Sampling & In Situ Testing				Water	Well Construction Details	
				Type	Depth	Sample	Results & Comments			
		SANDSTONE: medium grained, pale grey, high strength, fresh, slightly fractured, cross bedding 5°-10°, Hawkesbury Sandstone (<i>continued</i>)		C	20.24					
	21				20.96		PL(A) = 1.3			
	22			C	21.9		PL(A) = 1.7			
	23				22.95		PL(A) = 1.7			
	23.27	Bore discontinued at 23.27m			23.27					
	24									
	25									
	26									
	27									
	28									
	29									

RIG: XC **DRILLER:** Terratest **LOGGED:** NB **CASING:** HQ to 8.9m
TYPE OF BORING: Diacore 0-0.28m; solid flight auger (TC Bit) 0.28-7.5m; Wash bore 7.5-9.47m; NMLC coring 9.47-23.27m
WATER OBSERVATIONS: Saturated sand (fill) encountered at 6.2m
REMARKS: *BD1 at 0.28m

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 _s	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	W	Water seep	S	Standard penetration test
E	Environmental sample	W	Water level	V	Shear vane (kPa)

BOREHOLE LOG

CLIENT: Atlassian Pty Ltd
PROJECT: Proposed Commercial Development
LOCATION: 8-10 Lee Street, Haymarket

SURFACE LEVEL: 15.5 AHD
EASTING: 333982
NORTHING: 6249281
DIP/AZIMUTH: 90°/-

BORE No: BH3
PROJECT No: 86767.00
DATE: 12 - 13/7/2019
SHEET 1 OF 2

RL	Depth (m)	Description of Strata	Graphic Log	Sampling & In Situ Testing				Water	Well Construction Details	
				Type	Depth	Sample	Results & Comments			
	0.15	CONCRETE SLAB								
	0.2	Fill/SAND: fine to medium grained sand, yellow-grey, moist, apparently poorly to moderately compacted		E	0.2		PID<1			
					0.3					
	0.7	Fill/Silty CLAY: medium plasticity, grey and red-brown, with medium grained sand and angular basalt gravel to 70mm, w<PL		E	0.7		PID<1			
	0.9	Fill/SAND: fine to medium grained sand, yellow, moist, apparently moderately compacted			0.8					
		Silty CLAY CH: high plasticity, grey mottled red, trace ironstone gravel 2-3mm, w<PL, very stiff, residual soil								
	1.8				1.8					
	1.92	SANDSTONE: medium grained, brown and grey, medium strength, highly and moderately weathered, fractured, Hawkesbury Sandstone		C	2.37		PL(A) = 1			
	3.03	SANDSTONE: medium grained, yellow-grey, high strength, moderately weathered, slightly fractured, Hawkesbury Sandstone			3.03					
					3.4		PL(A) = 0.92			
	3.56	SANDSTONE: medium grained, pale grey, high strength, slightly weathered then fresh, unbroken, Hawkesbury Sandstone		C						
					4.56					
					4.95		PL(A) = 1.6			
				C	5.95		PL(A) = 1.4			
					6.95		PL(A) = 1.3			
					7.22					
		7.35 - 7.41m: carbonaceous laminations								
					7.95		PL(A) = 1.1			
				C	8.95		PL(A) = 1.7			
		9.96-10.12m: fine grained sandstone, dark grey			9.95		PL(A) = 2			

RIG: XC

DRILLER: Terratest

LOGGED: NB

CASING: HWT to 2.0m

TYPE OF BORING: Diacore 0-0.15m; Hand auger 0.15-0.9m; Solid flight auger (TC Bit) 0.9-1.8m; NMLC coring 1.8-15.0m

WATER OBSERVATIONS: No groundwater observed during auger drilling

REMARKS:


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

BOREHOLE LOG

CLIENT: Atlassian Pty Ltd
PROJECT: Proposed Commercial Development
LOCATION: 8-10 Lee Street, Haymarket

SURFACE LEVEL: 15.5 AHD
EASTING: 333982
NORTHING: 6249281
DIP/AZIMUTH: 90°/--

BORE No: BH3
PROJECT No: 86767.00
DATE: 12 - 13/7/2019
SHEET 2 OF 2

RL	Depth (m)	Description of Strata	Graphic Log	Sampling & In Situ Testing			Water	Well Construction Details		
				Type	Depth	Sample				Results & Comments
		SANDSTONE: medium grained, pale grey, high strength, slightly weathered then fresh, unbroken, Hawkesbury Sandstone <i>(continued)</i>		C						
					10.3					
5		10.6-10.7m: carbonaceous laminations								
	11					10.95		PL(A) = 1.5		11
4										
	12				C	11.95		PL(A) = 1.2		12
3										
	13				12.95		PL(A) = 1.4		13	
2					13.31					
	14				13.95		PL(A) = 0.92		14	
1				C						
	15				14.95		PL(A) = 0.74		15	
15.0		Bore discontinued at 15.0m			15.0					
0										
	16								16	
-1										
	17								17	
-2										
	18								18	
-3										
	19								19	
-4										

RIG: XC **DRILLER:** Terratest **LOGGED:** NB **CASING:** HWT to 2.0m

TYPE OF BORING: Diacore 0-0.15m; Hand auger 0.15-0.9m; Solid flight auger (TC Bit) 0.9-1.8m; NMLC coring 1.8-15.0m

WATER OBSERVATIONS: No groundwater observed during auger drilling

REMARKS:

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



BOREHOLE LOG

CLIENT: Atlassian Pty Ltd
PROJECT: Proposed Commercial Development
LOCATION: 8-10 Lee Street, Haymarket

SURFACE LEVEL: 15.5 AHD
EASTING: 333994
NORTHING: 6249287
DIP/AZIMUTH: 90°/--

BORE No: BH4
PROJECT No: 86767.00
DATE: 12 - 13/7/2019
SHEET 1 OF 1

[illegible]

RIG: Miniprobe

DRILLER: Terratest

LOGGED: NB/AS

CASING: NA

TYPE OF BORING: Diacore 0-0.16m; hand auger 0.16-1m; Pushtube and solid flight auger (TC Bit) 1.0-2.35m

WATER OBSERVATIONS: No groundwater observed during auger drilling

REMARKS:

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

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



BOREHOLE LOG

CLIENT: Atlassian Pty Ltd
PROJECT: Proposed Commercial Development
LOCATION: 8-10 Lee Street, Haymarket

SURFACE LEVEL: 15.5 AHD
EASTING: 333980
NORTHING: 6249298
DIP/AZIMUTH: 90°/-

BORE No: BH5
PROJECT No: 86767.00
DATE: 13/7/2019
SHEET 1 OF 2

RL	Depth (m)	Description of Strata	Graphic Log	Sampling & In Situ Testing			Water	Well Construction Details
				Type	Depth	Sample	Results & Comments	
	0.3	CONCRETE SLAB						Gatic Cover and cap
	0.4	FILL/Gravelly SAND: medium grained sand, grey, fine to medium 5-15mm sub-rounded to sub-angular gravel, dry		E	0.35		PID<1	
				E	0.5		PID<1	
				E	0.6			
	1.0	Sandy CLAY Cl: medium plasticity, grey mottled red, fine to medium grained sand, with fine gravel, w~PL, residual soil		E	0.9		PID<1	
	1.2			E	1.0		PID<1	
	1.3	SILTY CLAY Cl: medium plasticity, grey mottled red and yellow, trace fine sand, w~PL, residual soil			1.1			
	1.36				1.2			Bentonite Seal
		SANDSTONE: highly weathered, ironstained, Hawkesbury Sandstone			1.3			
	2.0	SANDSTONE: medium grained, pale grey and orange, medium strength with bands of very low strength, highly weathered, fractured, Hawkesbury Sandstone		C	2.1		PL(A) = 0.2	
					2.56			
					2.7		PL(A) = 0.16	
	2.83	SANDSTONE: medium grained, pale grey, medium and high strength, moderately weathered, slightly fractured, Hawkesbury Sandstone		C	3.31		PL(A) = 0.72	
	3.6	SANDSTONE: medium grained, pale grey, high strength, slightly weathered then fresh, unbroken, Hawkesbury Sandstone			4.05			
	4.0				4.95		PL(A) = 1.2	
	5.0			C	5.95		PL(A) = 1	
	6.0	Between 6.60-6.65m: carbonaceous laminations			6.95		PL(A) = 1.2	
					7.16			
	7.0				7.95		PL(A) = 2.1	
	8.0			C	9.0		PL(A) = 1.8	
	9.0				10.0		PL(A) = 1.2	
								Sand filter Slotted PVC pipe

RIG: Hand tools, Miniprobe and XC **DRILLER:** Terratest **LOGGED:** AS/NB/KR **CASING:** HW to 1.1m

TYPE OF BORING: Diacore 0-0.3m; Pushtube and solid flight auger (TC Bit) 0.3-1.3m; NMLC coring 1.3-15.27m

WATER OBSERVATIONS: No groundwater observed during auger drilling

REMARKS: Groundwater well installed: 15.17-2.2m screened PVC with sand backfill, 2.2-1.8m blank PVC with sand backfill, 2.2-0m blank PVC, 1.8-0.8m bentonite backfill, 0.8-0m backfilled, gatic cover at surface. Refusal to TC-bit auger at 1.2m

SAMPLING & IN SITU TESTING LEGEND

A	Auger sample	G	Gas sample	PID	Photo ionisation detector (ppm)
B	Bulk sample	P	Piston sample	PL(A)	Point load axial test Is(50) (MPa)
BLK	Block sample	U	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	W	Water seep	S	Standard penetration test
E	Environmental sample	W	Water level	V	Shear vane (kPa)

BOREHOLE LOG

CLIENT: Atlassian Pty Ltd
PROJECT: Proposed Commercial Development
LOCATION: 8-10 Lee Street, Haymarket

SURFACE LEVEL: 15.5 AHD
EASTING: 333980
NORTHING: 6249298
DIP/AZIMUTH: 90°/--

BORE No: BH5
PROJECT No: 86767.00
DATE: 13/7/2019
SHEET 2 OF 2

RL	Depth (m)	Description of Strata	Graphic Log	Sampling & In Situ Testing				Water	Well Construction Details	
				Type	Depth	Sample	Results & Comments			
		SANDSTONE: medium grained, pale grey, high strength, slightly weathered then fresh, unbroken, Hawkesbury Sandstone (<i>continued</i>)		C	10.2					
	11				11.02		PL(A) = 1.9			
	12			C	12.0		PL(A) = 1.2			
		Between 12.3-12.57m: fine grained sandstone, cross-bedded at base			13.0		PL(A) = 1.5			
	13				13.24					
	14			C	14.0		PL(A) = 1.1			
	15				15.0		PL(A) = 1.4			
	15.27	Bore discontinued at 15.27m			15.27				End Cap	
	16									
	17									
	18									
	19									

RIG: Hand tools, Miniprobe and XC **DRILLER:** Terratest **LOGGED:** AS/NB/KR **CASING:** HW to 1.1m

TYPE OF BORING: Diacore 0-0.3m; Pushtube and solid flight auger (TC Bit) 0.3-1.3m; NMLC coring 1.3-15.27m

WATER OBSERVATIONS: No groundwater observed during auger drilling

REMARKS: Groundwater well installed: 15.17-2.2m screened PVC with sand backfill, 2.2-1.8m blank PVC with sand backfill, 2.2-0m blank PVC, 1.8-0.8m bentonite backfill, 0.8-0m backfilled, gatic cover at surface. Refusal to TC-bit auger at 1.2m

SAMPLING & IN SITU TESTING LEGEND					
A	Auger sample	G	Gas sample	PID	Photo ionisation detector (ppm)
B	Bulk sample	P	Piston sample	PL(A)	Point load axial test Is(50) (MPa)
BLK	Block sample	U	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	W	Water seep	S	Standard penetration test
E	Environmental sample	W	Water level	V	Shear vane (kPa)

BOREHOLE LOG

CLIENT: Atlassian Pty Ltd
PROJECT: Proposed Commercial Development
LOCATION: 8-10 Lee Street, Haymarket

SURFACE LEVEL: 15.5 AHD
EASTING: 333967
NORTHING: 6249305
DIP/AZIMUTH: 90°/--

BORE No: BH6
PROJECT No: 86767.00
DATE: 14/7/2019
SHEET 1 OF 1

[illegible]

RIG: Hand tools

DRILLER: NB

LOGGED: NB

CASING: NA

TYPE OF BORING: Diacore 0-0.2m; hand auger 0.2-1.27m

WATER OBSERVATIONS: No groundwater observed

REMARKS:

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

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



BOREHOLE LOG

CLIENT: Atlassian Pty Ltd
PROJECT: Proposed Commercial Development
LOCATION: 8-10 Lee Street, Haymarket

SURFACE LEVEL: 15.5 AHD
EASTING: 333965
NORTHING: 6249265
DIP/AZIMUTH: 90°/--

BORE No: BH7
PROJECT No: 86767.00
DATE: 12 - 13/7/2019
SHEET 1 OF 1

[illegible]

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

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



BOREHOLE LOG

CLIENT: Atlassian Pty Ltd
PROJECT: Proposed Commercial Development
LOCATION: 8-10 Lee Street, Haymarket

SURFACE LEVEL: 15.5 AHD
EASTING: 333954
NORTHING: 6249289
DIP/AZIMUTH: 90°/-

BORE No: BH8
PROJECT No: 86767.00
DATE: 14/7/2019
SHEET 1 OF 2

RL	Depth (m)	Description of Strata	Graphic Log	Sampling & In Situ Testing				Water	Well Construction Details	
				Type	Depth	Sample	Results & Comments			
15.5	0.28	CONCRETE SLAB: angular to subangular aggregate to 15mm, negligible voids, 10mm diameter steel reinforcement at 0.09m and 0.10m, plastic at lower interface		A/E	0.2 0.3		PID<1		Gatic Cover and cap	
	0.6	Fill/Clayey SAND: fine to coarse grained sand, brown and yellow, 15% plastic fines, with fine gravel, apparently moderately compacted, moist								
		SAND SW: fine to medium grained sand, yellow, with clay, trace gravel, moist, alluvial soil								
	1.9				1.9					
	2.12	SANDSTONE: medium grained, orange-red and grey, low to medium strength, with some very low strength bands, highly weathered, fractured, Mittagong Formation		C	2.47		PL(A) = 1.5			
	3.07	SANDSTONE: medium grained, orange and red, medium strength with some very low strength bands, highly weathered, fractured, Mittagong Formation			3.07					
	3.55			C	3.66		PL(A) = 0.15			
	4.13	SANDSTONE: medium grained, yellow-grey, medium then high strength, moderately weathered, slightly fractured, Hawkesbury Sandstone			4.57 4.66		PL(A) = 0.66			
	4.85	SANDSTONE: medium grained, grey, high strength, fresh, unbroken, Hawkesbury Sandstone								
				C	5.95		PL(A) = 1.2			
					6.95 7.2		PL(A) = 1.3			
					7.89		PL(A) = 1.9			
				C	8.95		PL(A) = 1.2			
					9.95		PL(A) = 1.4			

RIG: XC

DRILLER: Terratest

LOGGED: NB

CASING: HQ to 1.9m

TYPE OF BORING: Diacore 0-0.28m; Hand auger 0.28-1.0m; solid flight auger (TC Bit) 1.0-1.9m; NMLC coring 1.9-15.0m

WATER OBSERVATIONS: No groundwater observed during auger drilling

REMARKS: Groundwater well installed: 15.0-2.9m screened PVC with sand backfill, 2.9-2.4m blank PVC with sand backfill, 2.4-0m blank PVC, 2.4-0m bentonite backfill, gatic cover at surface.

SAMPLING & IN SITU TESTING LEGEND

A	Auger sample	G	Gas sample	PID	Photo ionisation detector (ppm)
B	Bulk sample	P	Piston sample	PL(A)	Point load axial test Is(50) (MPa)
BLK	Block sample	U	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)

BOREHOLE LOG

CLIENT: Atlassian Pty Ltd
PROJECT: Proposed Commercial Development
LOCATION: 8-10 Lee Street, Haymarket

SURFACE LEVEL: 15.5 AHD
EASTING: 333954
NORTHING: 6249289
DIP/AZIMUTH: 90°/--

BORE No: BH8
PROJECT No: 86767.00
DATE: 14/7/2019
SHEET 2 OF 2

RL	Depth (m)	Description of Strata	Graphic Log	Sampling & In Situ Testing				Water	Well Construction Details	
				Type	Depth	Sample	Results & Comments			
		SANDSTONE: medium grained, grey, high strength, fresh, unbroken, Hawkesbury Sandstone (<i>continued</i>)		C	10.22					
		Between 10.2-10.9m: dark grey, fine grained sandstone								
	11				10.95		PL(A) = 2.5		11	
	12			C	11.95		PL(A) = 1.5		12	
		Between 12.4-12.55m: carbonaceous laminations								
	13				12.95		PL(A) = 1.1		13	
					13.25					
	14			C	13.95		PL(A) = 1.3		14	
	15 15.0	Bore discontinued at 15.0m			14.99 15.0		PL(A) = 1.3		15	End Cap
	16								16	
	17								17	
	18								18	
	19								19	

RIG: XC

DRILLER: Terratest

LOGGED: NB

CASING: HQ to 1.9m

TYPE OF BORING: Diacore 0-0.28m; Hand auger 0.28-1.0m; solid flight auger (TC Bit) 1.0-1.9m; NMLC coring 1.9-15.0m

WATER OBSERVATIONS: No groundwater observed during auger drilling

REMARKS: Groundwater well installed: 15.0-2.9m screened PVC with sand backfill, 2.9-2.4m blank PVC with sand backfill, 2.4-0m blank PVC, 2.4-0m bentonite backfill, gatic cover at surface.

SAMPLING & IN SITU TESTING LEGEND

A	Auger sample	G	Gas sample	PID	Photo ionisation detector (ppm)
B	Bulk sample	P	Piston sample	PL(A)	Point load axial test Is(50) (MPa)
BLK	Block sample	U	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	W	Water seep	S	Standard penetration test
E	Environmental sample	W	Water level	V	Shear vane (kPa)

BOREHOLE LOG

CLIENT: Atlassian Pty Ltd
PROJECT: Proposed Commercial Development
LOCATION: 8-10 Lee Street, Haymarket

SURFACE LEVEL: 15.5 AHD
EASTING: 333966
NORTHING: 6249295
DIP/AZIMUTH: 90°/--

BORE No: BH9
PROJECT No: 86767.00
DATE: 11 - 12/7/2019
SHEET 1 OF 2

RL	Depth (m)	Description of Strata	Graphic Log	Sampling & In Situ Testing				Water	Well Construction Details	
				Type	Depth	Sample	Results & Comments			
		CONCRETE SLAB								
	0.33									
		CLAY CL: low to medium plasticity, pale grey and yellow, with fine to medium grained sand, trace fine ironstone gravel, w>PL, residual soil		E/A	0.35		PID<1			
	0.65			E/A	0.45					
		Silty CLAY CL-CI: low to medium plasticity, pale grey and red, with fine grained sand, trace fine ironstone gravel, w<PL, residual soil		E/A	0.65		PID<1			
				E/A	0.75					
				E/A	0.9		PID<1			
				E/A	1.0					
		0.85-1.4m: w~PL								
		1.4m: fine ironstone gravel, w<PL		E/A	1.4		PID<1			
	1.65				1.5					
		SANDSTONE: fine grained, orange-grey, very low to medium strength with extremely low strength bands, highly to moderately weathered, fractured, Mittagong Formation		C	1.65					
					2.43					
					2.62		PL(A) = 0.88			
				C						
					3.38					
					3.55		PL(A) = 0.28			
	3.72									
		SANDSTONE: medium grained, grey, medium to high strength, slightly weathered then fresh, slightly fractured, Hawkesbury Sandstone		C						
					4.94		PL(A) = 0.94			
					4.95					
		Below 5.91m: unbroken			5.95		PL(A) = 1.6			
					6.43					
					6.95		PL(A) = 1.3			
				C						
					7.95		PL(A) = 0.76			
					8.0					
				C						
					8.95		PL(A) = 1.9			
					9.44					
		9.50-9.56m: with carbonaceous laminations		C						
					9.95		PL(A) = 0.97			

RIG: XC

DRILLER: Terratest

LOGGED: KR

CASING: HW to 2.5m

TYPE OF BORING: Diacore to 0.32m; hand auger 0.32-1.0m; Solid flight auger (TC Bit) 1.0-1.6m; NMLC coring 1.6-14.6m

WATER OBSERVATIONS: No groundwater observed during auger drilling

REMARKS:

SAMPLING & IN SITU TESTING LEGEND

A	Auger sample	G	Gas sample	PID	Photo ionisation detector (ppm)
B	Bulk sample	P	Piston sample	PL(A)	Point load axial test Is(50) (MPa)
BLK	Block sample	U	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	W	Water seep	S	Standard penetration test
E	Environmental sample	W	Water level	V	Shear vane (kPa)



Douglas Partners
 Geotechnics | Environment | Groundwater

BOREHOLE LOG

CLIENT: Atlassian Pty Ltd
PROJECT: Proposed Commercial Development
LOCATION: 8-10 Lee Street, Haymarket

SURFACE LEVEL: 15.5 AHD
EASTING: 333966
NORTHING: 6249295
DIP/AZIMUTH: 90°/--

BORE No: BH9
PROJECT No: 86767.00
DATE: 11 - 12/7/2019
SHEET 2 OF 2

RL	Depth (m)	Description of Strata	Graphic Log	Sampling & In Situ Testing				Water	Well Construction Details	
				Type	Depth	Sample	Results & Comments			
		SANDSTONE: medium grained, grey, medium to high strength, slightly weathered then fresh, slightly fractured, Hawkesbury Sandstone (<i>continued</i>)		C						
					10.5					
	11			C	10.95		PL(A) = 1.3			11
		11.17-11.30m: with carbonaceous laminations								
					11.73					
	12				11.95		PL(A) = 1.5			12
				C						
	13				12.95		PL(A) = 3.1			13
					13.33					
	14			C	13.95		PL(A) = 1.3			14
	14.6	Bore discontinued at 14.6m			14.55 14.6		PL(A) = 1			
	15									15
	16									16
	17									17
	18									18
	19									19

RIG: XC **DRILLER:** Terratest **LOGGED:** KR **CASING:** HW to 2.5m
TYPE OF BORING: Diacore to 0.32m; hand auger 0.32-1.0m; Solid flight auger (TC Bit) 1.0-1.6m; NMLC coring 1.6-14.6m
WATER OBSERVATIONS: No groundwater observed during auger drilling
REMARKS:

SAMPLING & IN SITU TESTING LEGEND					
A	Auger sample	G	Gas sample	PID	Photo ionisation detector (ppm)
B	Bulk sample	P	Piston sample	PL(A)	Point load axial test Is(50) (MPa)
BLK	Block sample	U _s	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	W _s	Water seep	S	Standard penetration test
E	Environmental sample	W _L	Water level	V	Shear vane (kPa)

BOREHOLE LOG

CLIENT: Vertical First Pty Ltd
PROJECT: Proposed Commercial Development
LOCATION: 8-10 Lee Street, Haymarket

SURFACE LEVEL: 20.1 AHD
EASTING: 333968
NORTHING: 6249242
DIP/AZIMUTH: 90°/--

BORE No: BH101
PROJECT No: 86767.03
DATE: 8/4/2020
SHEET 1 OF 1

RL	Depth (m)	Description of Strata	Graphic Log	Sampling & In Situ Testing				Water	VWP Construction Details	
				Type	Depth	Sample	Results & Comments			
20 <										

RIG: Hand Tools

DRILLER: Tightsite

LOGGED: NB

CASING: Uncased

TYPE OF BORING: Hand auger and crowbar to 1.8m

WATER OBSERVATIONS: No free groundwater observed

REMARKS:

SAMPLING & IN SITU TESTING LEGEND					
A	Auger sample	G	Gas sample	PID	Photo ionisation detector (ppm)
B	Bulk sample	P	Piston sample	PL(A)	Point load axial test Is(50) (MPa)
BLK	Block sample	U	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)

BOREHOLE LOG

CLIENT: Vertical First Pty Ltd
PROJECT: Proposed Commercial Development
LOCATION: 8-10 Lee Street, Haymarket

SURFACE LEVEL: 20.1 AHD
EASTING: 333976
NORTHING: 6249251
DIP/AZIMUTH: 90°/--

BORE No: BH102
PROJECT No: 86767.03
DATE: 8/4/2020
SHEET 1 OF 1

RL	Depth (m)	Description of Strata	Graphic Log	Sampling & In Situ Testing				Water	VWP Construction Details	
				Type	Depth	Sample	Results & Comments			
20 19 18 17	0.1	FILL/BALLAST		A	0.1		PID=1.1 ppm			
	0.2	FILL/Silty GRAVEL: fine to medium, dark grey, trace sand and clay, moist, generally in a loose condition			0.2					
	0.3	FILL/SAND: fine to medium, pale yellow brown and grey, with silt, trace clay lenses, moist, generally in a loose condition		A	0.5		PID=1.6 ppm			
					0.6					
	1			A	1.0		PID=2 ppm			
					1.1					
				A	1.5		PID=1.1 ppm			
					1.6					
	2			A	2.0		PID=1.7 ppm			
					2.1					
16	2.6	FILL/SAND: fine to medium, pale grey, trace silt, moist, generally in a loose condition		A	2.4		PID=2.4 ppm			
					2.5					
	2.9	FILL/Silty CLAY: medium plasticity, orange, pale yellow and black, trace sand and gravel, with ash, w>PL, generally in a stiff condition		A	3.1		PID=1.4 ppm			
					3.2					
		Below 3.5m: grading to dark grey and black, with fine to medium sand and angular gravel		A	3.5		PID=4.1 ppm			
					3.6					
	4.0	FILL/Sandy GRAVEL: fine to medium gravel, dark grey and black, fine to coarse sand, trace ash, moist, generally in a medium dense condition		A	4.0		PID=3 ppm			
					4.1					
	4.5	FILL/Silty CLAY: high plasticity, orange, pale yellow and pale grey, trace ash, w<PL, generally in a firm condition		A	4.5		PID=2.2 ppm			
					4.6					
	4.7	Sandy CLAY CH: high plasticity, pale grey, w<PL, appears firm, residual		A	4.7		PID=1.7 ppm			
					4.8					
				A	4.9		PID=1.1 ppm			
					5.0					

Bore discontinued at 5.0m

RIG: Hand Tools Target depth reached

DRILLER: NB

LOGGED: NB

CASING: Uncased

TYPE OF BORING: Hand Auger to 5m

WATER OBSERVATIONS: No free groundwater observed

REMARKS:

SAMPLING & IN SITU TESTING LEGEND

A	Auger sample	G	Gas sample	PID	Photo ionisation detector (ppm)
B	Bulk sample	P	Piston sample	PL(A)	Point load axial test Is(50) (MPa)
BLK	Block sample	U	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)

BOREHOLE LOG

CLIENT: Vertical First Pty Ltd
PROJECT: Proposed Commercial Development
LOCATION: 8-10 Lee Street, Haymarket

SURFACE LEVEL: 21.2 AHD
EASTING: 333978
NORTHING: 6249263
DIP/AZIMUTH: 90°/-

BORE No: BH103
PROJECT No: 86767.00
DATE: 15 - 16/4/2020
SHEET 1 OF 2

RL	Depth (m)	Description of Strata	Graphic Log	Sampling & In Situ Testing				Water	Well Construction Details	
				Type	Depth	Sample	Results & Comments			
21.2	0.25	FILL/ CONCRETE							Gatic Cover and cap	
	0.4	FILL/ SAND: fine to medium, pale brown, trace silt, moist, generally in a very loose condition		A			PID=3			
1	1.0			A						
20	1.7			A			PID=1.3			
19	2.0	FILL/ Silty CLAY: low plasticity, pale grey-orange and dark grey, with angular sandstone, shale, ironstone gravel, w>PL, generally in a stiff to very stiff condition		A						
18	2.5			A			PID=2.4			
3	3.0	FILL/ Silty CLAY: low to medium plasticity, red brown, w<PL, generally in a firm condition		A						
17	3.45			S			2,2,2 N = 4			
4	4.5			S			1,0,0 N = 0			
16	4.9	FILL/ Silty SAND: fine to coarse, dark grey and brown, trace fine gravel, moist, generally in a very loose condition		A			PID=0			
15	6.0			S			3,5,7 N = 12			
14	6.3	SAND SP: fine to medium, pale grey, moist, medium dense, alluvial								
8	7.0	Sandy CLAY CI-CH: medium to high plasticity, dark red-orange, w>PL, very stiff, residual		A			2,6,14 N = 20			
13	8.5	SANDSTONE: fine grained, dark brown, pale grey and orange-grey, highly weathered with extremely weathered bands, low strength with very low strength bands, fractured, Mittagong Formation		C						
12	9.15	SANDSTONE: refer following page		C						
10.0										

RIG: XC 100

DRILLER: Terratest

LOGGED: NB

CASING: HQ to 8.5m

TYPE OF BORING: Diatube to 0.25m, Hand tools to 2.6m, SFA (TC-bit) to 8.5m, NMLC to 10.8m

WATER OBSERVATIONS: No free groundwater observed during drilling

REMARKS: Standpipe installed: 0-8.5m Blank PVC pipe, 8.5-9.3m Slotted PVC pipe, End cap at 9.3m, Backfill 0-7.5m, Bentonite 7.5-8.5m, Sand filter 8.5-9.3m, Bentonite 9.3-10.8m, Gatic cover at surface. Hole pre-drilled 8 April 2020 to 2.6m depth

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

BOREHOLE LOG

CLIENT: Vertical First Pty Ltd
PROJECT: Proposed Commercial Development
LOCATION: 8-10 Lee Street, Haymarket

SURFACE LEVEL: 21.2 AHD
EASTING: 333978
NORTHING: 6249263
DIP/AZIMUTH: 90°/--

BORE No: BH103
PROJECT No: 86767.00
DATE: 15 - 16/4/2020
SHEET 2 OF 2

RL	Depth (m)	Description of Strata	Graphic Log	Sampling & In Situ Testing				Water	Well Construction Details
				Type	Depth	Sample	Results & Comments		
10.8	9.96	SANDSTONE: fine to medium grained, pale yellow, moderately then slightly weathered, medium strength, slightly fractured, Hawkesbury Sandstone		C	9.96		PL(A) = 0.65		Bentonite plug
11	10.75	Bore discontinued at 10.8m Target depth reached			10.75		PL(A) = 0.49		
11	10.8				10.8				
12									
13									
14									
15									
16									
17									
18									
19									

RIG: XC 100

DRILLER: Terratest

LOGGED: NB

CASING: HQ to 8.5m

TYPE OF BORING: Diatube to 0.25m, Hand tools to 2.6m, SFA (TC-bit) to 8.5m, NMLC to 10.8m

WATER OBSERVATIONS: No free groundwater observed during drilling

REMARKS: Standpipe installed: 0-8.5m Blank PVC pipe, 8.5-9.3m Slotted PVC pipe, End cap at 9.3m, Backfill 0-7.5m, Bentonite 7.5-8.5m, Sand filter 8.5-9.3m, Bentonite 9.3-10.8m, Gatic cover at surface. Hole pre-drilled 8 April 2020 to 2.6m 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	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)

BOREHOLE LOG

CLIENT: Vertical First Pty Ltd
PROJECT: Proposed Commercial Development
LOCATION: 8-10 Lee Street, Haymarket

SURFACE LEVEL: 21.2 AHD
EASTING: 333983
NORTHING: 6249272
DIP/AZIMUTH: 90°/--

BORE No: BH104
PROJECT No: 86767.00
DATE: 14 - 15/4/2020
SHEET 1 OF 2

RL	Depth (m)	Description of Strata	Graphic Log	Sampling & In Situ Testing				Water	Well Construction Details	
				Type	Depth	Sample	Results & Comments			
21.2	0.25	FILL/ CONCRETE								Gatic Cover and cap
	0.4	FILL/ SAND: fine to medium, pale brown, trace silt, moist, generally in a very loose condition		A			PID=0.8			
	0.8			A			PID=1.2			
1	0.9	FILL/ Silty CLAY: medium plasticity, pale orange, trace fine sand, w>PL, generally in a stiff condition		A			PID=5.7			
	1.0			A						
	1.1	FILL/ Silty CLAY: low plasticity, pale grey-orange and dark grey, with angular sandstone, shale and ironstone gravel, w>PL, generally in a soft to firm condition		A*			PID=0			
	1.4			S			2,2,2 N = 4			
	1.5									
	1.95									
2	2.0	FILL/ Silty CLAY: medium plasticity, red-brown mottled orange, trace fine sand and gravel, w<PL, generally in a soft to firm condition								
	2.8			A			PID=0			
	2.9									
	3.0			S			1,2,2 N = 4			Backfill and Blank PVC pipe
	3.45									
	4.5			S			2,1,2 N = 3			
	4.95	Below 4.8m: trace ash and medium sand								
5	5.0	SAND SP: dark yellow-orange, 10% non plastic fines, moist, medium dense, alluvial								
	6.0			S			3,5,8 N = 13			
	6.45									
	7.63									
8	8.24	SANDSTONE: fine grained, dark brown, pale grey and orange-grey, highly then moderately weathered with extremely weathered bands, high and medium strength with very low strength bands, fractured, Mittagong Formation		C			PL(A) = 0.84			
	8.65									
	8.95									
9	9.42	SANDSTONE: refer following page		C						

RIG: XC 100

DRILLER: Terratest

LOGGED: NB

CASING: HQ to 7.63m

TYPE OF BORING: Diatube to 0.25m, Hand tools to 1.1m, SFA (TC-bit) to 7.63m, NMLC to 20m

WATER OBSERVATIONS: No free groundwater observed during drilling

REMARKS: Standpipe installed: 0-14.0m Blank PVC pipe, 14.0-20m Slotted PVC pipe, End cap at 20m, Backfill 0.1-6.5m, Bentonite 6.5-13.5m, Sand filter 13.5-20m, Gatic cover at surface. Hole pre-drilled 8 April 2020 to 1.1m depth. *BD2/140420 replicate: 1.4-1.5m

SAMPLING & IN SITU TESTING LEGEND

A	Auger sample	G	Gas sample	PID	Photo ionisation detector (ppm)
B	Bulk sample	P	Piston sample	PL(A)	Point load axial test Is(50) (MPa)
BLK	Block sample	U	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: Vertical First Pty Ltd
PROJECT: Proposed Commercial Development
LOCATION: 8-10 Lee Street, Haymarket

SURFACE LEVEL: 21.2 AHD
EASTING: 333983
NORTHING: 6249272
DIP/AZIMUTH: 90°/--

BORE No: BH104
PROJECT No: 86767.00
DATE: 14 - 15/4/2020
SHEET 2 OF 2

RL	Depth (m)	Description of Strata	Graphic Log	Sampling & In Situ Testing				Water	Well Construction Details	
				Type	Depth	Sample	Results & Comments			
11	9.96	SANDSTONE: fine to medium grained, pale grey with grey bands, fresh, medium and high strength, slightly fractured then unbroken, Hawkesbury Sandstone			9.96		PL(A) = 0.77		Bentonite Seal	
	10.1				10.1					
11	10.96			C	10.96		PL(A) = 0.95			
	11.65				11.65					
12	11.96				11.96		PL(A) = 0.94			
	12.96				12.96		PL(A) = 1.2			
	13.2				13.2					
14	13.96			C	13.96		PL(A) = 0.66			
	14.69	Between 14.52m-14.58m: band of dark grey siltstone			14.69					
15	14.96				14.96		PL(A) = 1.5			
	15.96				15.96		PL(A) = 1.2			
	16.23				16.23					
17	16.96			C	16.96		PL(A) = 1.3		Sand filter Slotted PVC pipe	
	17.61				17.61					
18	17.96				17.96		PL(A) = 1.3			
	18.96				18.96		PL(A) = 2.6			
19	19.23				19.23					
	19.9			C	19.9		PL(A) = 1			
20.0		Bore discontinued at 20.0m Target depth reached							End cap	

RIG: XC 100

DRILLER: Terratest

LOGGED: NB

CASING: HQ to 7.63m

TYPE OF BORING: Diatube to 0.25m, Hand tools to 1.1m, SFA (TC-bit) to 7.63m, NMLC to 20m

WATER OBSERVATIONS: No free groundwater observed during drilling

REMARKS: Standpipe installed: 0-14.0m Blank PVC pipe, 14.0-20m Slotted PVC pipe, End cap at 20m, Backfill 0.1-6.5m, Bentonite 6.5-13.5m, Sand filter 13.5-20m, Gatic cover at surface. Hole pre-drilled 8 April 2020 to 1.1m depth. *BD2/140420 replicate: 1.4-1.5m

SAMPLING & IN SITU TESTING LEGEND

A	Auger sample	G	Gas sample	PID	Photo ionisation detector (ppm)
B	Bulk sample	P	Piston sample	PL(A)	Point load axial test Is(50) (MPa)
BLK	Block sample	U _s	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	W _s	Water seep	S	Standard penetration test
E	Environmental sample	W _L	Water level	V	Shear vane (kPa)

BOREHOLE LOG

CLIENT: Vertical First Pty Ltd
PROJECT: Proposed Commercial Development
LOCATION: 8-10 Lee Street, Haymarket

SURFACE LEVEL: 20.1 AHD
EASTING: 333988
NORTHING: 6249270
DIP/AZIMUTH: 90°/--

BORE No: BH105
PROJECT No: 86767.03
DATE: 7/4/2020
SHEET 1 OF 2

RL	Depth (m)	Description of Strata	Graphic Log	Sampling & In Situ Testing				Water	VWP Construction Details	
				Type	Depth	Sample	Results & Comments			
20.05	0.05	FILL/BALLAST		A	0.05		PID=2.5 ppm			
20.1	0.1	FILL/Silty CLAY: medium plasticity, dark grey, with angular gravel and organic matter and fragments of plastic, w~PL, generally in a firm condition			0.1					
20.37	0.37	BRICK PAVEMENT								
		CONCRETE: grey, orange and yellow-brown, with inclusions of sub-angular to sub-rounded, high strength sandstone								
19	1									
18	2									
17	3									
16	4									

RIG: Proline

DRILLER: Tightsite

LOGGED: NB

CASING: HW to 3.1m

TYPE OF BORING: Diatube to 3.1m, NMLC to 6.5m

WATER OBSERVATIONS: No free groundwater observed

REMARKS: * Field replicate BD1/070420 taken from 0.05-0.1m

SAMPLING & IN SITU TESTING LEGEND

A	Auger sample	G	Gas sample	PID	Photo ionisation detector (ppm)
B	Bulk sample	P	Piston sample	PL(A)	Point load axial test Is(50) (MPa)
BLK	Block sample	U	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)

BOREHOLE LOG

CLIENT: Vertical First Pty Ltd
PROJECT: Proposed Commercial Development
LOCATION: 8-10 Lee Street, Haymarket

SURFACE LEVEL: 20.1 AHD
EASTING: 333988
NORTHING: 6249270
DIP/AZIMUTH: 90°/--

BORE No: BH105
PROJECT No: 86767.03
DATE: 7/4/2020
SHEET 2 OF 2

RL	Depth (m)	Description of Strata	Graphic Log	Sampling & In Situ Testing				Water	VWP Construction Details	
				Type	Depth	Sample	Results & Comments			
15		CONCRETE: grey, orange and yellow-brown, with inclusions of sub-angular to sub-rounded, high strength sandstone (<i>continued</i>)								
6										
14										
6.3		SANDSTONE: fine to medium grained, pale yellow, highly weathered, medium to high strength, Mittagong Formation								
6.5		Bore discontinued at 6.5m - Target depth reached								
7										
13										
8										
12										
9										
11										

RIG: Proline

DRILLER: Tightsite

LOGGED: NB

CASING: HW to 3.1m

TYPE OF BORING: Diatube to 3.1m, NMLC to 6.5m

WATER OBSERVATIONS: No free groundwater observed

REMARKS: * Field replicate BD1/070420 taken from 0.05-0.1m

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

BOREHOLE LOG

CLIENT: Vertical First Pty Ltd
PROJECT: Proposed Commercial Development
LOCATION: 8-10 Lee Street, Haymarket

SURFACE LEVEL: 15.5 AHD
EASTING: 333980
NORTHING: 6249282
DIP/AZIMUTH: 90°/--

BORE No: BH106
PROJECT No: 86767.03
DATE: 7/4/2020
SHEET 1 OF 1

RL	Depth (m)	Description of Strata	Graphic Log	Sampling & In Situ Testing				Water	VWP Construction Details	
				Type	Depth	Sample	Results & Comments			
		CONCRETE: grey, 2-10mm igneous aggregate								
	0.16			E	0.16		PID=2 ppm			
	0.2	FILL/SAND: fine to coarse, pale brown, trace seashells, moist		E	0.2					
	0.3			E	0.3		PID=1 ppm			
	0.4	FILL/CLAY: medium plasticity, brown, red and grey, with fine to coarse sand, trace fine to medium gravel, fine to medium igneous rail ballast, seashells and coal, w~PL		E	0.4		PID=1 ppm			
	0.5			E	0.5					
	0.8	FILL/SAND: fine to coarse, dark brown, with igneous rail ballast, trace coal, dry, hydrocarbon odour								
	0.9	FILL/CLAY: medium plasticity, pale grey, red and brown, trace fine to medium gravel, w~PL		E	0.9		PID=1 ppm			
	1.0	Below 0.5m: apparently in a stiff condition			1.0					
	1.15	At 0.6m: tile fragment			1.15					
	1.25	CLAY CI-CH: medium to high plasticity, pale grey mottled red, trace fine to medium ironstone gravel, w<PL to w~PL, apparently very stiff, residual		E	1.25		PID<1 ppm			
		Below 1.1m: w<PL								
		Bore discontinued at 1.25m								
		- Target depth reached								

RIG: Hand Tools

DRILLER: AS/AMS

LOGGED: AS

CASING: Uncased

TYPE OF BORING: Diatube to 0.16m, Hand auger to 1.25m

WATER OBSERVATIONS: No free groundwater observed

REMARKS:

SAMPLING & IN SITU TESTING LEGEND

A	Auger sample	G	Gas sample	PID	Photo ionisation detector (ppm)
B	Bulk sample	P	Piston sample	PL(A)	Point load axial test Is(50) (MPa)
BLK	Block sample	U	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)

BOREHOLE LOG

CLIENT: Vertical First Pty Ltd
PROJECT: Proposed Commercial Development
LOCATION: 8-10 Lee Street, Haymarket

SURFACE LEVEL: 15.5 AHD
EASTING: 333945
NORTHING: 6249270
DIP/AZIMUTH: 90°/--

BORE No: BH107A
PROJECT No: 86767.00
DATE: 17/5/2020
SHEET 1 OF 1

RL	Depth (m)	Description of Strata	Graphic Log	Sampling & In Situ Testing				Water	Well Construction Details	
				Type	Depth	Sample	Results & Comments			
15.5	0.14	CONCRETE: grey, angular to subangular aggregate to 15mm, negligible voids, 9 mm steel reinforcement at 0.08 m depth							Gatic Cover and cap	
1		FILL/ Sandy CLAY: low to medium plasticity, dark red and brown, fine to medium, with angular igneous and sandstone gravel, trace silt, w<PL, generally in a stiff condition							Backfill and Blank PVC pipe	
1.6		Below 1.0m: grading to medium plasticity, dark grey, trace sandstone gravel, w~PL								
2	2.2	FILL/ Silty CLAY: medium to high plasticity, pale grey-yellow, with fine to medium sand, w~PL, generally in a stiff condition						05-06-20	Bentonite Seal	
2.81		Sandy CLAY CL: low to medium plasticity, pale yellow, fine to medium, w~PL, apparently stiff to very stiff, residual								
3		Below 2.6m: yellow-brown								
3.9		SANDSTONE: fine to medium grained, pale grey and red-brown, high strength with very low then low strength bands, highly weathered, fractured, Mittagong Formation							Sand filter	
4		Bore discontinued at 3.9m - Target depth reached							Slotted PVC pipe	
4									End Cap	
5										
6										
7										
8										
9										

RIG: Miniprobe

DRILLER: Terratest

LOGGED: NB

CASING: NA

TYPE OF BORING: SFA (TC-bit) to 3.9m

WATER OBSERVATIONS: No free groundwater observed whilst augering

REMARKS: Standpipe installed: 0-3.4m Blank PVC pipe, 3.4-3.9m Slotted PVC pipe, End cap at 3.9m, Sand backfill 0-1.5m, Bentonite 1.5-3.2m, Sand filter 3.2-3.9m, Gatic cover at surface.

SAMPLING & IN SITU TESTING LEGEND






A	Auger sample	G	Gas sample	PLD	Photo ionisation detector (ppm)
B	Bulk sample	P	Piston sample	PL(A)	Point load axial test Is(50) (MPa)
BLK	Block sample	U	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)

BOREHOLE LOG

CLIENT: Vertical First Pty Ltd
PROJECT: Proposed Commercial Development
LOCATION: 8-10 Lee Street, Haymarket

SURFACE LEVEL: 15.5 AHD
EASTING: 333966
NORTHING: 6249307
DIP/AZIMUTH: 90°/--

BORE No: BH108
PROJECT No: 86767.03
DATE: 17/5/2020
SHEET 1 OF 1

RL	Depth (m)	Description of Strata	Graphic Log	Sampling & In Situ Testing				Water	VWP Construction Details	
				Type	Depth	Sample	Results & Comments			
		CONCRETE: grey, 2-10mm igneous aggregate								
	0.21 0.23	FILL/Sandy CLAY: low plasticity, dark brown, fine to medium sand, w~PL		E	0.23 0.25		PID=2 ppm			
		CLAY Cl: medium plasticity, pale grey mottled pale brown and red, w~PL, residual								
		Below 0.6m: trace fine to medium ironstone gravel		E	0.6 0.8		PID=2 ppm			
	1.05 1.2	SANDSTONE: fine to medium grained, pale grey, highly weathered, very low strength, with clay and ironstone bands, Hawkesbury Sandstone		E	1.05 1.2		PID=2 ppm			
		Bore discontinued at 1.2m - Target depth reached. Auger refusal								

RIG: Miniprobe

DRILLER: Terratest

LOGGED: AS

CASING: Uncased

TYPE OF BORING: Pushtube to 1.2m

WATER OBSERVATIONS: No free groundwater observed

REMARKS:

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

BOREHOLE LOG

CLIENT: Vertical First Pty Ltd
PROJECT: Proposed Commercial Development
LOCATION: 8-10 Lee Street, Haymarket

SURFACE LEVEL: 15.5 AHD
EASTING: 333945
NORTHING: 6249272
DIP/AZIMUTH: 90°/-

BORE No: BH107B
PROJECT No: 86767.00
DATE: 16/5/2020
SHEET 1 OF 2

RL	Depth (m)	Description of Strata	Graphic Log	Sampling & In Situ Testing				Water	Well Construction Details	
				Type	Depth	Sample	Results & Comments			
15.5	0.14	CONCRETE: grey, angular to subangular aggregate to 15mm, negligible voids, 9 mm steel reinforcement at 0.08 m depth		A	0.15		PID=4			<p>Gatic Cover and cap</p>
				A/E*	0.2		PID=5			
					0.4					
					0.5					
		FILL/ Sandy CLAY: low to medium plasticity, dark red and brown, fine to medium, with angular igneous and sandstone gravel, trace silt, w<PL, generally in a stiff condition		A/E	0.9		PID=2			
		Below 1.0m: grading to medium plasticity, dark grey, trace sandstone gravel, w~PL			1.0					
				A/E	1.4		PID=2			
					1.5					
		FILL/ Silty CLAY: medium to high plasticity, pale grey-yellow, with fine to medium sand, w~PL, generally in a stiff condition		A/E	1.9		PID=2			
					2.0					
		Sandy CLAY CL-CI: low to medium plasticity, pale yellow, fine to medium, w~PL, apparently stiff to very stiff, residual		A/E	2.4		PID=1		<p>Backfill and Blank PVC pipe</p>	<p>05-06-20</p>
		Below 2.6m: yellow-brown			2.5		PID=2			
				A/E	2.65					
					2.8					
		SANDSTONE: fine to medium grained, pale grey and red-brown, high strength with very low then low strength bands, highly weathered, fractured, Mittagong Formation		C	2.81		PL(A) = 1.1			
					2.94					
					3.57					
					3.62		PL(A) = 0.1			
					4.25		PL(A) = 0.9			
		SANDSTONE: fine to medium grained, pale grey and red-brown, medium then high strength, moderately weathered, fractured, Hawkesbury Sandstone		C	4.25					
					5.0		PL(A) = 1.5		<p>Bentonite Seal</p>	<p>Sand filter</p>
		SANDSTONE: fine to medium grained, pale grey, high strength, fresh, slightly fractured to unbroken, cross-bedding 5°-10°, Hawkesbury Sandstone			5.12					
				C	6.0		PL(A) = 1.1			
					6.59					
					7.0		PL(A) = 1.3			
				C	8.0		PL(A) = 1.6			
					8.12					
					9.0		PL(A) = 1.1			
					10.0		PL(A) = 1.3			
		Between 7.66m-8.10m: band of fine grained sandstone							<p>Slotted PVC pipe</p>	

RIG: XC

DRILLER: Terratest

LOGGED: KR

CASING: HWT to 2.8m

TYPE OF BORING: Diatube (200 mm) to 0.14m, SFA (TC-bit) to 2.81m, NMLC coring to 15.0m

WATER OBSERVATIONS: No free groundwater observed whilst augering

REMARKS: *BD1/20200516 taken at 0.4-0.5m. Standpipe installed: 0-5.5m Blank PVC pipe, 5.5-11.0m Slotted PVC pipe, End cap at 11.0m, Sand backfill 0-2.3m, Bentonite 2.3-5.0m, Sand filter 5.0-11.0m, Bentonite 11.0-12.0m, Backfill 12.0-15.0m, Gatic cover at surface.

SAMPLING & IN SITU TESTING LEGEND

A	Auger sample	G	Gas sample	PID	Photo ionisation detector (ppm)
B	Bulk sample	P	Piston sample	PL(A)	Point load axial test Is(50) (MPa)
BLK	Block sample	U	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	W	Water seep	S	Standard penetration test
E	Environmental sample	W	Water level	V	Shear vane (kPa)

BOREHOLE LOG

CLIENT: Vertical First Pty Ltd
PROJECT: Proposed Commercial Development
LOCATION: 8-10 Lee Street, Haymarket

SURFACE LEVEL: 15.5 AHD
EASTING: 333945
NORTHING: 6249272
DIP/AZIMUTH: 90°/--

BORE No: BH107B
PROJECT No: 86767.00
DATE: 16/5/2020
SHEET 2 OF 2

RL	Depth (m)	Description of Strata	Graphic Log	Sampling & In Situ Testing				Water	Well Construction Details	
				Type	Depth	Sample	Results & Comments			
		SANDSTONE: fine to medium grained, pale grey, high strength, fresh, slightly fractured to unbroken, cross-bedding 5°-10°, Hawkesbury Sandstone (continued)		C	11.02 11.07		PL(A) = 1.1		11	End Cap
										Bentonite Seal
					12.0		PL(A) = 1.1		12	
		Between 12.60m-13.78m: band of fine grained sandstone		C	13.03		PL(A) = 1		13	
					14.0 14.08		PL(A) = 1.2		14	Sand Back Fill
				C						
	15.0	Bore discontinued at 15.0m - Target depth reached			15.0				15	
									16	
									17	
									18	
									19	

RIG: XC

DRILLER: Terratest

LOGGED: KR

CASING: HWT to 2.8m

TYPE OF BORING: Diatube (200 mm) to 0.14m, SFA (TC-bit) to 2.81m, NMLC coring to 15.0m

WATER OBSERVATIONS: No free groundwater observed whilst augering

REMARKS: *BD1/20200516 taken at 0.4-0.5m. Standpipe installed: 0-5.5m Blank PVC pipe, 5.5-11.0m Slotted PVC pipe, End cap at 11.0m, Sand backfill 0-2.3m, Bentonite 2.3-5.0m, Sand filter 5.0-11.0m, Bentonite 11.0-12.0m, Backfill 12.0-15.0m, Gatic cover at surface.

SAMPLING & IN SITU TESTING LEGEND





A	Auger sample	G	Gas sample	PID	Photo ionisation detector (ppm)
B	Bulk sample	P	Piston sample	PL(A)	Point load axial test Is(50) (MPa)
BLK	Block sample	U	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	W	Water seep	S	Standard penetration test
E	Environmental sample	W	Water level	V	Shear vane (kPa)

BOREHOLE LOG

CLIENT: Vertical First Pty Ltd
PROJECT: Proposed Commercial Development
LOCATION: 8-10 Lee Street, Haymarket

SURFACE LEVEL: 15.3 AHD
EASTING: 333968
NORTHING: 6249312
DIP/AZIMUTH: 90°/--

BORE No: BH109A
PROJECT No: 86767.00
DATE: 19/5/2020
SHEET 1 OF 1

RL	Depth (m)	Description of Strata	Graphic Log	Sampling & In Situ Testing				Water	VWP Construction Details	
				Type	Depth	Sample	Results & Comments			
15.3	0.2	CONCRETE: grey, angular to subangular aggregate to 15mm, negligible voids, no reinforcement steel observed								
	0.3	FILL/ GRAVEL: coarse, black, angular igneous gravel bonded by bitumen, dry, generally in a dense condition								
	1.05	Silty CLAY CI: medium plasticity, pale orange, w<PL, apparently stiff to very stiff, residual (possibly extremely weathered Ashfield Shale)						1		
	1.15	SANDSTONE: fine to medium grained, pale grey and dark orange, highly weathered, medium strength, Hawkesbury Sandstone								
		Bore discontinued at 1.15m - Refusal to TC-bit auger								
	2							2		
	3							3		
	4							4		
	5							5		
	6							6		
	7							7		
	8							8		
	9							9		

RIG: Miniprobe

DRILLER: Terratest

LOGGED: NB

CASING: NA

TYPE OF BORING: SFA (TC-bit) to 1.15m

WATER OBSERVATIONS: No free groundwater observed whilst drilling

REMARKS: Surface level taken from survey drawing provided

SAMPLING & IN SITU TESTING LEGEND

A	Auger sample	G	Gas sample	PLD	Photo ionisation detector (ppm)
B	Bulk sample	P	Piston sample	PL(A)	Point load axial test Is(50) (MPa)
BLK	Block sample	U	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	W	Water seep	S	Standard penetration test
E	Environmental sample	W	Water level	V	Shear vane (kPa)

BOREHOLE LOG

CLIENT: Vertical First Pty Ltd
PROJECT: Proposed Commercial Development
LOCATION: 8-10 Lee Street, Haymarket

SURFACE LEVEL: 15.3 AHD
EASTING: 333970
NORTHING: 6249311
DIP/AZIMUTH: 90°/-

BORE No: BH109B
PROJECT No: 86767.00
DATE: 17/5/2020
SHEET 1 OF 2

RL	Depth (m)	Description of Strata	Graphic Log	Sampling & In Situ Testing				Water	Well Construction Details	
				Type	Depth	Sample	Results & Comments			
15.3	0.2	CONCRETE: grey, angular to subangular aggregate to 15mm, negligible voids, no reinforcement steel observed		A/E	0.4		PID<1			Gatic Cover and cap
	0.3	FILL/ GRAVEL: coarse, black, angular igneous gravel bonded by bitumen, dry, generally in a dense condition			0.5					Backfill and Blank PVC pipe
	1.05	Silty CLAY Cl: medium plasticity, pale orange, w<PL, apparently stiff to very stiff, residual (possibly extremely weathered Mittagong Formation)		A/E	0.9		PID<1			
	1.16				1.05		PL(A) = 1.8			
		SANDSTONE: fine to medium grained, pale grey and dark orange, highly weathered, medium strength, fractured, Hawkesbury Sandstone		C	1.65					
					2.11		PL(A) = 0.7			
	2.93	SANDSTONE: fine to coarse grained, pale grey and pale yellow, moderately weathered then slightly weathered, medium strength, slightly fractured, cross-bedding 5°-10°, Hawkesbury Sandstone		C	3.1		PL(A) = 0.5			
					3.11					
				C	3.92		PL(A) = 0.7			
					4.65					
	4.9	SANDSTONE: fine to coarse grained, pale grey, fresh, medium then high strength, slightly fractured then unbroken, cross-bedding 5°-10°, Hawkesbury Sandstone		C	4.93		PL(A) = 0.9			
					5.04		PL(A) = 1			
				C	6.0		PL(A) = 0.7			
					7.0		PL(A) = 1.2			
				C	7.4					
					7.75					
				C	8.0		PL(A) = 1.8			
					9.0		PL(A) = 1.9			
				C	9.25					
					10.0		PL(A) = 1.4			

RIG: XC

DRILLER: Terratest

LOGGED: NB

CASING: HWT to 1.05m

TYPE OF BORING: Diatube (200mm) to 0.2m, SFA (TC-bit) to 1.05m, NMLC coring to 15m

WATER OBSERVATIONS: No free groundwater observed whilst drilling

REMARKS: Standpipe installed: 0-6.0m Blank PVC pipe, 6.0-11.6m Slotted PVC pipe, End cap at 11.6m, Sand backfill 0-1.05m, Bentonite 1.05-5.2m, Sand filter 5.2-11.6m, Bentonite 11.6-13.0m, Backfill 13.0-15.0m, Gatic cover at surface. Surface level taken from survey

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	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	W	Water seep	SP	Standard penetration test
E	Environmental sample	W	Water level	S	Shear vane (kPa)

BOREHOLE LOG

CLIENT: Vertical First Pty Ltd
PROJECT: Proposed Commercial Development
LOCATION: 8-10 Lee Street, Haymarket

SURFACE LEVEL: 15.3 AHD
EASTING: 333970
NORTHING: 6249311
DIP/AZIMUTH: 90°/--

BORE No: BH109B
PROJECT No: 86767.00
DATE: 17/5/2020
SHEET 2 OF 2

RL	Depth (m)	Description of Strata	Graphic Log	Sampling & In Situ Testing				Water	Well Construction Details	
				Type	Depth	Sample	Results & Comments			
10		SANDSTONE: fine to coarse grained, pale grey, fresh, medium then high strength, slightly fractured then unbroken, cross-bedding 5°-10°, Hawkesbury Sandstone (continued)		C						
					10.73					
11					11.0		PL(A) = 1.8			
				C						
12					12.0		PL(A) = 1.2			
		Bore discontinued at 15.0m - Target depth reached			12.38					
13				C			PL(A) = 1.4			
					13.88					
14					14.0		PL(A) = 1.3			
				C						
15	15.0				15.0					
16										
17										
18										
19										

RIG: XC

DRILLER: Terratest

LOGGED: NB

CASING: HWT to 1.05m

TYPE OF BORING: Diatube (200mm) to 0.2m, SFA (TC-bit) to 1.05m, NMLC coring to 15m

WATER OBSERVATIONS: No free groundwater observed whilst drilling

REMARKS: Standpipe installed: 0-6.0m Blank PVC pipe, 6.0-11.6m Slotted PVC pipe, End cap at 11.6m, Sand backfill 0-1.05m, Bentonite 1.05-5.2m, Sand filter 5.2-11.6m, Bentonite 11.6-13.0m, Backfill 13.0-15.0m, Gatic cover at surface. Surface level taken from survey

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	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	W	Water seep	S	Standard penetration test
E	Environmental sample	W	Water level	V	Shear vane (kPa)

BOREHOLE LOG

CLIENT: Vertical First Pty Ltd
PROJECT: Proposed Commercial Development
LOCATION: 8-10 Lee Street, Haymarket

SURFACE LEVEL: 15.3 AHD
EASTING: 333960
NORTHING: 6249314
DIP/AZIMUTH: 90°/--

BORE No: BH110
PROJECT No: 86767.00
DATE: 20/5/2020
SHEET 1 OF 1

RL	Depth (m)	Description of Strata	Graphic Log	Sampling & In Situ Testing				Water	VWP Construction Details			
				Type	Depth	Sample	Results & Comments					
15	0.2	CONCRETE: grey, angular to subangular aggregate to 15mm, negligible voids, no reinforcement		A	0.2		PID<1					
	0.3	FILL/ SAND: fine to coarse, pale orange, moist, generally in a medium dense condition			0.3							
	0.6	FILL/ Silty CLAY: medium to high plasticity, pale grey mottled orange, with fine to coarse sand and brick, concrete and asphalt fragments, w<PL, generally in a stiff condition		A	0.5	PID<1						
		Bore discontinued at 0.6m - Termination on brick and concrete fragments			0.6							
1								1				
14												
2									2			
13												
3										3		
12												
4										4		
11												

RIG: Hand tools

DRILLER: Nick Ruha/NB

LOGGED: NB

CASING: NA

TYPE OF BORING: Diatube (100mm) to 0.2m, then hand auger

WATER OBSERVATIONS: No free groundwater observed whilst drilling

REMARKS: Surface level taken from survey drawing provided

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	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)

BOREHOLE LOG

CLIENT: Vertical First Pty Ltd
PROJECT: Proposed Commercial Development
LOCATION: 8-10 Lee Street, Haymarket

SURFACE LEVEL: 18.7 AHD
EASTING: 333945
NORTHING: 6249317
DIP/AZIMUTH: 90°/--

BORE No: BH111
PROJECT No: 86767.00
DATE: 19/5/2020
SHEET 1 OF 2

RL	Depth (m)	Description of Strata	Graphic Log	Sampling & In Situ Testing				Water	VWP Construction Details	
				Type	Depth	Sample	Results & Comments			
	0.05	ASPHALTIC CONCRETE								
	0.15	FILL/ ROADBASE: fine to coarse, dark grey, angular igneous gravel, fine to coarse sand, dry, generally in a dense condition								
	0.5	FILL/ SAND: fine to coarse, pale grey and brown, moist, generally in a loose to medium dense condition		U/E	0.4		PID<1			
		FILL/ Silty CLAY: low to medium plasticity, dark grey and brown, w<PL, generally in a stiff condition			0.5					
		Below 0.6m, grading to sandy clay, pale orange and dark orange, fine to medium sand								
	1									
	1.2	FILL/ SAND: fine to medium, dark brown and grey, trace silt, moist, generally in a medium dense to dense condition		U/E	1.1		PID<1			
					1.2					
				U/E	1.3		PID<1			
					1.4					
	1.7									
	2	SAND SP: fine to medium, pale grey, moist, apparently loose, alluvial		U/E	2.0		PID<1			
					2.1					
		Below 2.4m: grading to pale orange								
	3									
	3.2	Silty CLAY Cl: medium plasticity, pale orange mottled dark red, with ironstone gravel, w<PL, apparently stiff to very stiff, residual (possibly extremely weathered Mittagong Formation)		U/E*	3.0		PID<1			
					3.1					
	4									
				U/E	4.0		PID<1			
					4.1					
		Below 4.4m: grading to pale grey								

RIG: Geoprobe

DRILLER: Terratest

LOGGED: NB

CASING: NA

TYPE OF BORING: Push tube to 5.4m

WATER OBSERVATIONS: No free groundwater observed whilst drilling

REMARKS: *BD1/190520NB taken at 3-3.1m. Surface level taken from survey drawing provided

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	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	W	Water seep	S	Standard penetration test
E	Environmental sample	W	Water level	V	Shear vane (kPa)

BOREHOLE LOG

CLIENT: Vertical First Pty Ltd
PROJECT: Proposed Commercial Development
LOCATION: 8-10 Lee Street, Haymarket

SURFACE LEVEL: 18.7 AHD
EASTING: 333945
NORTHING: 6249317
DIP/AZIMUTH: 90°/--

BORE No: BH111
PROJECT No: 86767.00
DATE: 19/5/2020
SHEET 2 OF 2

RL	Depth (m)	Description of Strata	Graphic Log	Sampling & In Situ Testing				Water	VWP Construction Details	
				Type	Depth	Sample	Results & Comments			
	5.4	Silty CLAY Cl: medium plasticity, pale orange mottled dark red, with ironstone gravel, w<PL, apparently stiff to very stiff, residual (possibly extremely weathered Mittagong Formation) <i>(continued)</i>								
		Bore discontinued at 5.4m - Target depth reached								

RIG: Geoprobe

DRILLER: Terratest

LOGGED: NB

CASING: NA

TYPE OF BORING: Push tube to 5.4m

WATER OBSERVATIONS: No free groundwater observed whilst drilling

REMARKS: *BD1/190520NB taken at 3-3.1m. Surface level taken from survey drawing provided

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



BOREHOLE LOG

CLIENT: Vertical First Pty Ltd
PROJECT: Proposed Commercial Development
LOCATION: 8-10 Lee Street, Haymarket

SURFACE LEVEL: 16.7 AHD
EASTING: 333926
NORTHING: 6249325
DIP/AZIMUTH: 90°/-

BORE No: BH112A
PROJECT No: 86767.00
DATE: 19/5/2020
SHEET 1 OF 1

RL	Depth (m)	Description of Strata	Graphic Log	Sampling & In Situ Testing				Water	Well Construction Details	
				Type	Depth	Sample	Results & Comments			
	0.05	ASPHALTIC CONCRETE							Gatic Cover and cap	
	0.25	FILL/ ROADBASE: fine to coarse, dark grey, angular igneous gravel, fine to coarse sand, dry, generally in a dense condition								
	1	FILL/ SAND: fine to medium, dark grey-brown, moist, generally in a loose condition							Backfill and Blank PVC pipe	
	1.4	SAND SP: fine to medium, pale orange, moist, apparently medium dense, alluvial								
	1.8	Sandy CLAY Cl: medium plasticity, pale grey and pale orange, fine sand, w<PL, apparently stiff, alluvial								
	2	Silty CLAY Cl-CH: medium to high plasticity, pale grey mottled dark red-orange and yellow, with ironstone gravel, w<PL, very stiff, residual (possibly extremely weathered Mittagong Formation)							Bentonite Seal	
	3.2	Sandy CLAY CL: low plasticity, dark red and pale grey, fine sand, w<PL, hard, residual (extremely weathered Mittagong Formation)								
	3.4	SANDSTONE: fine grained, dark brown and pale grey orange, highly weathered, medium strength, Mittagong Formation							Sand filter Slotted PVC pipe	
	4.5	Bore discontinued at 4.5m - Target depth reached							End Cap	
	5									
	6									
	7									
	8									
	9									

RIG: Geoprobe

DRILLER: Terratest

LOGGED: NB

CASING: NA

TYPE OF BORING: SFA (TC-bit) to 4.5m

WATER OBSERVATIONS: No free groundwater observed whilst drilling

REMARKS: Standpipe installed: 0-4.0m Blank PVC pipe, 4.0-4.5m Slotted PVC pipe, End cap at 4.5m, Sand backfill 0-2.0m, Bentonite 2.0-3.6m, Sand filter 3.6-4.5m, Gatic cover at surface. Surface level taken from survey drawing provided

SAMPLING & IN SITU TESTING LEGEND

A	Auger sample	G	Gas sample	PLD	Photo ionisation detector (ppm)
B	Bulk sample	P	Piston sample	PL(A)	Point load axial test Is(50) (MPa)
BLK	Block sample	U	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	W	Water seep	S	Standard penetration test
E	Environmental sample	W	Water level	V	Shear vane (kPa)

BOREHOLE LOG

CLIENT: Vertical First Pty Ltd
PROJECT: Proposed Commercial Development
LOCATION: 8-10 Lee Street, Haymarket

SURFACE LEVEL: 16.8 AHD
EASTING: 333928
NORTHING: 6249324
DIP/AZIMUTH: 90°/-

BORE No: BH112B
PROJECT No: 86767.00
DATE: 18/5/2020
SHEET 1 OF 2

RL	Depth (m)	Description of Strata	Graphic Log	Sampling & In Situ Testing			Water	Well Construction Details	
				Type	Depth	Sample			
	0.05	ASPHALTIC CONCRETE							Gatic Cover and cap
	0.25	CONCRETE							
	0.3	ASPHALTIC CONCRETE		A/E	0.3		PID<1		
	0.6	FILL/ SANDSTONE: possible sandstone block		A/E	0.6		PID<1		
	0.7				0.7				
	1	FILL/ SAND: fine to medium, dark grey-brown, moist, generally in a loose condition							
	1.4	SAND SP: fine to medium, pale orange, moist, apparently medium dense, alluvial		A/E	1.4		PID<1		Backfill and Blank PVC pipe
	1.5			A/E	1.5		PID<1		
	1.6				1.6				
	1.7				1.7				
	1.8	Sandy CLAY Cl: medium plasticity, pale grey and pale orange, fine sand, w<PL, apparently stiff, alluvial			2.0		6,9,11 N = 20		
	2.0	Silty CLAY Cl-CH: medium to high plasticity, pale grey mottled dark red-orange and yellow, with ironstone gravel, w<PL, very stiff, residual (possible extremely weathered Ashfield Shale)		S	2.45				
	3				3.0				
	3.2	Sandy CLAY CL: low plasticity, dark red and pale grey, fine sand, w<PL, hard, residual (extremely weathered Mittagong Formation)		S	3.4		2,8,20/140 refusal		
	3.4				3.44				
	3.68	SANDSTONE: fine grained, dark brown and pale grey-orange, highly weathered then moderately weathered, medium and high strength, fractured, Mittagong Formation			4.0		PL(A) = 0.4		
	4						PL(A) = 1.5		Bentonite Seal
	5			C					
	5.14	SANDSTONE: fine to coarse grained, pale orange, highly weathered then moderately weathered, medium strength, fractured to slightly fractured, cross-bedding 10°-20°, Hawkesbury Sandstone			5.35		PL(A) = 0.5		
	6				6.1				
	6.46	SANDSTONE: fine to coarse grained, pale grey, trace dark grey siltstone bands, slightly weathered then fresh, high strength, slightly fractured, cross-bedding 0°-10°, Hawkesbury Sandstone			6.34		PL(A) = 0.3		
	7				7.15		PL(A) = 0.5		
	7.9	Between 8.02m-9.83m, cross-bedding 10°-20°		C	8.09		PL(A) = 1.1		
	8								
	9				9.09		PL(A) = 2.1		Sand filter
	9.1			C	9.1				Slotted PVC pipe

RIG: Geoprobe

DRILLER: Terratest

LOGGED: NB

CASING: HWT to 3.4m

TYPE OF BORING: Diatube (200mm) to 0.6m, Hand Auger to 2m, SFA (TC-bit) to 3.4m, HQ coring to 15m

WATER OBSERVATIONS: No free groundwater observed whilst drilling

REMARKS: Rapid drilling between 4.1-4.9m & 7.5-8.0m. 20% water loss at 9m. Standpipe installed: 0-6.0m Blank PVC pipe, 6.0-12.0m Slotted PVC pipe, End cap 12.0m, Sand backfill 0-2.5m, Bentonite 2.5-5.5m, Sand filter 5.5-12.5m, Bentonite 12.5-13.0m, Backfill 13-15m

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	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	sp	Standard penetration test
E	Environmental sample	≡	Water level	S	Shear vane (kPa)



Douglas Partners
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BOREHOLE LOG

CLIENT: Vertical First Pty Ltd
PROJECT: Proposed Commercial Development
LOCATION: 8-10 Lee Street, Haymarket

SURFACE LEVEL: 16.8 AHD
EASTING: 333928
NORTHING: 6249324
DIP/AZIMUTH: 90°/--

BORE No: BH112B
PROJECT No: 86767.00
DATE: 18/5/2020
SHEET 2 OF 2

RL	Depth (m)	Description of Strata	Graphic Log	Sampling & In Situ Testing				Water	Well Construction Details	
				Type	Depth	Sample	Results & Comments			
		SANDSTONE: as above			10.12		PL(A) = 1.2			
	11			C	11.04		PL(A) = 1.5			
	12				12.1		PL(A) = 1.3		12 End Cap	
									Sand Back Fill	
	13				13.0		PL(A) = 1.3		Bentonite Seal	
	14			C	14.0		PL(A) = 1.5		14 Sand Back Fill	
15	15.0	Bore discontinued at 15.0m - Target depth reached			15.0					
	16									
	17									
	18									
	19									

RIG: Geoprobe **DRILLER:** Terratest **LOGGED:** NB **CASING:** HWT to 3.4m

TYPE OF BORING: Diatube (200mm) to 0.6m, Hand Auger to 2m, SFA (TC-bit) to 3.4m, HQ coring to 15m

WATER OBSERVATIONS: No free groundwater observed whilst drilling

REMARKS: Rapid drilling between 4.1-4.9m & 7.5-8.0m. 20% water loss at 9m. Standpipe installed: 0-6.0m Blank PVC pipe, 6.0-12.0m Slotted PVC pipe, End cap 12.0m, Sand backfill 0-2.5m, Bentonite 2.5-5.5m, Sand filter 5.5-12.5m, Bentonite 12.5-13.0m, Backfill 13-15m

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	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)

BOREHOLE LOG

CLIENT: Vertical First Pty Ltd
PROJECT: Proposed Commercial Development
LOCATION: 8-10 Lee Street, Haymarket

SURFACE LEVEL: 15.5 AHD
EASTING: 333983
NORTHING: 6249283
DIP/AZIMUTH: 90°/--

BORE No: BH113
PROJECT No: 86767.03
DATE: 7/4/2020
SHEET 1 OF 1

RL	Depth (m)	Description of Strata	Graphic Log	Sampling & In Situ Testing			Water	VWP Construction Details	
				Type	Depth	Sample		Results & Comments	
15 1 14 2 13 3 12 4 11	0.15	CONCRETE: grey, 2-10mm igneous aggregate							
		FILL/SAND: fine to coarse, pale brown and brown, trace fine to medium igneous rail ballast, trace coal, moist		E*	0.15 0.25		PID=9 ppm		
	0.4	FILL/CLAY: medium plasticity, red and pale grey, trace medium gravel, w~PL		E	0.4 0.5		PID=1 ppm		
	0.8	CLAY Cl: medium plasticity, pale grey mottled red, trace fine to medium ironstone gravel, w<PL to w~PL, apparently very stiff, residual		E	0.9 1.0		PID=2 ppm	1	
					1.2		PID=8 ppm		
	1.3	Bore discontinued at 1.3m - Target depth reached			1.3				

RIG: Hand Tools

DRILLER: AS/AMS

LOGGED: AS

CASING: Uncased

TYPE OF BORING: Diatube to 0.15m, Hand auger to 1.3m

WATER OBSERVATIONS: No free groundwater observed

REMARKS: * Field replicate BD2/20200407 taken from 0.15-0.25m

SAMPLING & IN SITU TESTING LEGEND			
A	Auger sample	G	Gas sample
B	Bulk sample	P	Piston sample
BLK	Block sample	U _r	Tube sample (x mm dia.)
C	Core drilling	W	Water sample
D	Disturbed sample	W _{sp}	Water seep
E	Environmental sample	W _l	Water level
		PID	Photo ionisation detector (ppm)
		PL(A)	Point load axial test Is(50) (MPa)
		PL(D)	Point load diametral test Is(50) (MPa)
		pp	Pocket penetrometer (kPa)
		S	Standard penetration test
		V	Shear vane (kPa)






BOREHOLE LOG

CLIENT: Vertical First Pty Ltd
PROJECT: Proposed Commercial Development
LOCATION: 8-10 Lee Street, Haymarket

SURFACE LEVEL: 15.5 AHD
EASTING: 333984
NORTHING: 6249280
DIP/AZIMUTH: 90°/--

BORE No: BH114
PROJECT No: 86767.03
DATE: 7/4/2020
SHEET 1 OF 1

RL	Depth (m)	Description of Strata	Graphic Log	Sampling & In Situ Testing				Water	VWP Construction Details	
				Type	Depth	Sample	Results & Comments			
		CONCRETE: grey, 2-10mm igneous aggregate								
	0.15	FILL/SAND: fine to coarse, pale brown and brown, trace fine gravel and coal, moist		F	0.15		PID=10 ppm			
	0.2			F	0.2					
	0.3	FILL/CLAY: medium plasticity, brown, pale grey and red, with fine to coarse sand, trace fine gravel, igneous rail ballast, plastic and coal, w~PL, hydrocarbon odour		F	0.3					
		Bore discontinued at 0.3m - Refusal on ballast								
	1									
	2									
	3									
	4									

RIG: Hand Tools

DRILLER: AS/AMS

LOGGED: AS

CASING: Uncased

TYPE OF BORING: Diatube to 0.15m, Hand auger to 0.3m

WATER OBSERVATIONS: No free groundwater observed

REMARKS:

SAMPLING & IN SITU TESTING LEGEND					
A	Auger sample	G	Gas sample	PID	Photo ionisation detector (ppm)
B	Bulk sample	P	Piston sample	PL(A)	Point load axial test Is(50) (MPa)
BLK	Block sample	U	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)

BOREHOLE LOG

CLIENT: Vertical First Pty Ltd
PROJECT: Proposed Commercial Development
LOCATION: 8-10 Lee Street, Haymarket

SURFACE LEVEL: 15.5 AHD
EASTING: 333981
NORTHING: 6249280
DIP/AZIMUTH: 90°/--

BORE No: BH115
PROJECT No: 86767.03
DATE: 7/4/2020
SHEET 1 OF 1

[illegible]

RIG: Hand Tools

DRILLER: AS/AMS

LOGGED: AS

CASING: Uncased

TYPE OF BORING: Diatube to 0.17m, Hand auger to 1.3m

WATER OBSERVATIONS: No free groundwater observed

REMARKS: * Field replicate BD1/20200407 taken from 0.23-0.3m

SAMPLING & IN SITU TESTING LEGEND			
A	Auger sample	G	Gas sample
B	Bulk sample	P	Piston sample
BLK	Block sample	U _r	Tube sample (x mm dia.)
C	Core drilling	W	Water sample
D	Disturbed sample	W _{sp}	Water seep
E	Environmental sample	W _l	Water level
		PID	Photo ionisation detector (ppm)
		PL(A)	Point load axial test Is(50) (MPa)
		PL(D)	Point load diametral test Is(50) (MPa)
		pp	Pocket penetrometer (kPa)
		S	Standard penetration test
		V	Shear vane (kPa)



BOREHOLE LOG

CLIENT: Vertical First Pty Ltd
PROJECT: Proposed Commercial Development
LOCATION: 8-10 Lee Street, Haymarket

SURFACE LEVEL: 15.5 AHD
EASTING: 333970
NORTHING: 6249305
DIP/AZIMUTH: 90°/--

BORE No: BH116
PROJECT No: 86767.03
DATE: 17/5/2020
SHEET 1 OF 1

[illegible]

RIG: Miniprobe

DRILLER: Terratest

LOGGED: AS

CASING: Uncased

TYPE OF BORING: Pushtube to 1.2m

WATER OBSERVATIONS: No free groundwater observed

REMARKS: * Field replicate BD1/20200517 taken from 0.5-0.7m

SAMPLING & IN SITU TESTING LEGEND			
A	Auger sample	G	Gas sample
B	Bulk sample	P	Piston sample
BLK	Block sample	U _r	Tube sample (x mm dia.)
C	Core drilling	W	Water sample
D	Disturbed sample	W _{sp}	Water seep
E	Environmental sample	W _l	Water level
		PID	Photo ionisation detector (ppm)
		PL(A)	Point load axial test Is(50) (MPa)
		PL(D)	Point load diametral test Is(50) (MPa)
		pp	Pocket penetrometer (kPa)
		S	Standard penetration test
		V	Shear vane (kPa)



BOREHOLE LOG

CLIENT: Vertical First Pty Ltd
PROJECT: Proposed Commercial Development
LOCATION: 8-10 Lee Street, Haymarket

SURFACE LEVEL: 15.5 AHD
EASTING: 333968
NORTHING: 6249303
DIP/AZIMUTH: 90°/--

BORE No: BH117
PROJECT No: 86767.03
DATE: 17/5/2020
SHEET 1 OF 1

[illegible]

RIG: Miniprobe

DRILLER: Terratest

LOGGED: AS

CASING: Uncased

TYPE OF BORING: Pushtube to 1.2m

WATER OBSERVATIONS: No free groundwater observed

REMARKS: * Field replicate BD2/20200517 taken from 0.6-0.8m

SAMPLING & IN SITU TESTING LEGEND			
A	Auger sample	G	Gas sample
B	Bulk sample	P	Piston sample
BLK	Block sample	U _r	Tube sample (x mm dia.)
C	Core drilling	W	Water sample
D	Disturbed sample	W _{sp}	Water seep
E	Environmental sample	W _l	Water level
		PID	Photo ionisation detector (ppm)
		PL(A)	Point load axial test Is(50) (MPa)
		PL(D)	Point load diametral test Is(50) (MPa)
		pp	Pocket penetrometer (kPa)
		S	Standard penetration test
		V	Shear vane (kPa)



BOREHOLE LOG

CLIENT: Vertical First Pty Ltd
PROJECT: Proposed Commercial Development
LOCATION: 8-10 Lee Street, Haymarket

SURFACE LEVEL: 15.6 AHD
EASTING: 333946
NORTHING: 6249321
DIP/AZIMUTH: 90°/--

BORE No: W1
PROJECT No: 86767.00
DATE: 20/5/2020
SHEET 1 OF 1

[illegible]

RIG: Hand Drill

DRILLER: Nick Ruha

LOGGED: NB

CASING: NA

TYPE OF BORING: Diatube (50mm) to 2.46m

WATER OBSERVATIONS: No free groundwater observed whilst drilling

REMARKS: Surface level taken from survey drawing provided

SAMPLING & IN SITU TESTING LEGEND			
A	Auger sample	G	Gas sample
B	Bulk sample	P	Piston sample
BLK	Blank sample	U	Tube sample (x mm dia.)
C	Core drilling	W	Water sample
D	Disturbed sample	W	Water seep
E	Environmental sample	W	Water level
		PID	Photo ionisation detector (ppm)
		PL(A)	Point load axial test ls(50) (MPa)
		PL(D)	Point load diametral test ls(50) (MPa)
		pp	Pocket penetrometer (kPa)
		S	Standard penetration test
		V	Shear vane (kPa)



BOREHOLE LOG

CLIENT: Vertical First Pty Ltd
PROJECT: Proposed Commercial Development
LOCATION: 8-10 Lee Street, Haymarket

SURFACE LEVEL: 15.4 AHD
EASTING: 333963
NORTHING: 6249315
DIP/AZIMUTH: 90°/--

BORE No: W2
PROJECT No: 86767.00
DATE: 20/5/2020
SHEET 1 OF 1

[illegible]

RIG: Hand Drill

DRILLER: Nick Ruha

LOGGED: NB

CASING: NA

TYPE OF BORING: Diatube (50mm) to 1.33m

WATER OBSERVATIONS: No free groundwater observed whilst drilling

REMARKS: Surface level taken from survey drawing provided

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



BOREHOLE LOG

CLIENT: Vertical First Pty Ltd
PROJECT: Proposed Commercial Development
LOCATION: 8-10 Lee Street, Haymarket

SURFACE LEVEL: 13.4 AHD
EASTING: 333954
NORTHING: 6249290
DIP/AZIMUTH: 70°/135°

BORE No: W3
PROJECT No: 86767.00
DATE: 20/5/2020
SHEET 1 OF 1

RL	Depth (m)	Description of Strata	Graphic Log	Sampling & In Situ Testing				Water	Well Construction Details	
				Type	Depth	Sample	Results & Comments			
		SANDSTONE: fine grained, orange-brown and pale grey, iron-cemented and with thin clay bands, highly weathered, medium to high strength, fragmented, Mittagong formation		C	0.0					
				C	0.46					
	1.2	Bore discontinued at 1.2m - Target depth reached			1.2					

RIG: Hand Drill

DRILLER: Nick Ruha

LOGGED: NB

CASING: NA

TYPE OF BORING: Diatube (50mm) to 1.2m

WATER OBSERVATIONS: No free groundwater observed whilst drilling

REMARKS: Surface level taken from architectural drawing provided, Synman Justin Bialek Architects Pty Ltd, Lower Ground Floor plan, Drawing WD05 (Rev E) dated 21 May 1998. Borehole azimuth relative to Grid North

SAMPLING & IN SITU TESTING LEGEND

A	Auger sample	G	Gas sample	PLD	Photo ionisation detector (ppm)
B	Bulk sample	P	Piston sample	PL(A)	Point load axial test Is(50) (MPa)
BLK	Block sample	U	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)

BOREHOLE LOG

CLIENT: Vertical First Pty Ltd
PROJECT: Proposed Commercial Development
LOCATION: 8-10 Lee Street, Haymarket

SURFACE LEVEL: 13.4 AHD
EASTING: 333948
NORTHING: 6249282
DIP/AZIMUTH: 60°/135°

BORE No: W4
PROJECT No: 86767.00
DATE: 20/5/2020
SHEET 1 OF 1

RL	Depth (m)	Description of Strata	Graphic Log	Sampling & In Situ Testing				Water	Well Construction Details	
				Type	Depth	Sample	Results & Comments			
13 1 12 2 2 11 3 10 4		CONCRETE: grey, with fine to coarse sub-rounded and sub-angular fragments of high strength sandstone, trace voids		C	0.0					
				C	0.22		PL(A) = 1.5			
				C	0.4					
				C	0.9					
	0.86	SANDSTONE: fine grained, orange-brown, highly weathered, medium to high strength, fractured, Mittagong formation		C	1.5					
	1.57			C	1.7		PL(A) = 0.29			
	2.12			C	2.0					
	2.19	SANDSTONE: fine to coarse grained, pale orange, highly weathered, medium to high strength, fractured, Hawkesbury sandstone		C	2.2		PL(A) = 0.99			
	2.4	Bore discontinued at 2.4m - Target depth reached			2.4					

RIG: Hand Drill

DRILLER: Nick Ruha

LOGGED: NB

CASING: NA

TYPE OF BORING: Diatube (50mm) to 2.4m

WATER OBSERVATIONS: No free groundwater observed whilst drilling

REMARKS: Surface level taken from architectural drawing provided, Synman Justin Bialek Architects Pty Ltd, Lower Ground Floor plan, Drawing WD05 (Rev E) dated 21 May 1998. Borehole azimuth relative to Grid North

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	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)



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

Sampling Methods

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.
<i>Note: If HW and MW cannot be differentiated use DW (see below)</i>		
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:

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

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

Douglas Partners



Introduction

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

Drilling or Excavation Methods

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

Water

▷	Water seep
▽	Water level

Sampling and Testing

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

Description of Defects in Rock

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

Defect Type

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

Orientation

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

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

Coating or Infilling Term

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

Coating Descriptor

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

Shape

cu	curved
ir	irregular
pl	planar
st	stepped
un	undulating

Roughness

po	polished
ro	rough
sl	slickensided
sm	smooth
vr	very rough

Other

fg	fragmented
bnd	band
qtz	quartz

Symbols & Abbreviations

Graphic Symbols for Soil and Rock

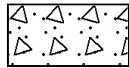
General



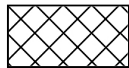
Asphalt



Road base



Concrete



Filling

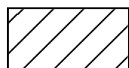
Soils



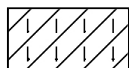
Topsoil



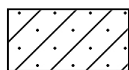
Peat



Clay



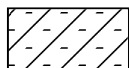
Silty clay



Sandy clay



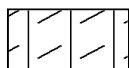
Gravelly clay



Shaly clay



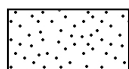
Silt



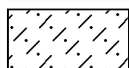
Clayey silt



Sandy silt



Sand



Clayey sand



Silty sand



Gravel



Sandy gravel



Cobbles, boulders



Talus

Sedimentary Rocks



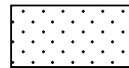
Boulder conglomerate



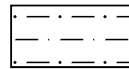
Conglomerate



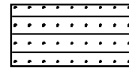
Conglomeratic sandstone



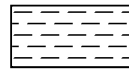
Sandstone



Siltstone



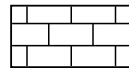
Laminite



Mudstone, claystone, shale

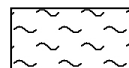


Coal

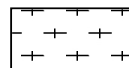


Limestone

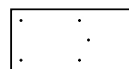
Metamorphic Rocks



Slate, phyllite, schist

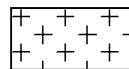


Gneiss

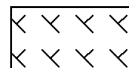


Quartzite

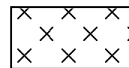
Igneous Rocks



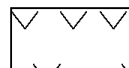
Granite



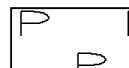
Dolerite, basalt, andesite



Dacite, epidote



Tuff, breccia



Porphyry

Appendix D

Groundwater Field Sheets

Groundwater Field Sheet

Project and Bore Installation Details

Bore / Standpipe ID:	BH103
Project Name:	
Project Number:	86767.03
Site Location:	Haymarket
Bore GPS Co-ord:	
Installation Date:	
GW Level (during drilling):	- m bgl
Well Depth:	m bgl
Screened Interval:	m bgl
Contaminants/Comments:	-

$$\text{Bore Volume} = \text{casing volume} + \text{filter pack volume}$$

$$= \pi h_1 d_1^2 / 4 + n(\pi h_2 d_1^2 / 4 - \pi h_2 d_2^2 / 4)$$

Where: $\pi = 3.14$

n = porosity (0.3 for most filter pack material)

h_1 = height of water column

d_1 = diameter of annulus

h_2 = length of filter pack

d_2 = diameter of casing

Bore Vol Normally: $7.2 * h$

Bore Development Details

Date/Time:	24/04/20
Purged By:	AS
GW Level (pre-purge):	7.5 m bgl
GW Level (post-purge):	8.98 m bgl
PSH observed:	Yes / No (interface / visual). Thickness if observed:
Observed Well Depth:	9.4 m bgl
Estimated Bore Volume:	13.68 L
Total Volume Purged:	(target: no drill mud, min 3 well vol. or dry) ~10L, dry
Equipment:	twister pump, int. meter, bailer

Micropurge and Sampling Details

Date/Time:	24/04/20
Sampled By:	AS
Weather Conditions:	clear, warm
GW Level (pre-purge):	7.5 m bgl
GW Level (post sample):	8.7 m bgl
PSH observed:	Yes / No (interface / visual). Thickness if observed:
Observed Well Depth:	9.4 m bgl
Estimated Bore Volume:	13.68 L
Total Volume Purged:	~15 L
Equipment:	WQM, peripump, int. meter

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
15:43	22.3	5.14	172.9	6.05	334	119
15:44	21.7	1.77	450	5.99	239	116
15:45	21.4	2.64	444	5.99	181	114
15:46	21.3	0.78	439	5.99	123.3	113
15:47	21.3	0.73	439	5.99	100.5	112
15:48	21.3	0.79	435	5.99	84.7	111
15:49	21.3	0.78	434	5.99	64.9	110
					↓	
Additional Readings Following stabilisation:	DO % Sat	SPC	TDS		39.5	

Sample Details

Sampling Depth (rationale):	9.0 m bgl, midpoint
Sample Appearance (e.g. colour, siltiness, odour):	Clear-brown, odourless, slightly silty
Sample ID:	BH103
QA/QC Samples:	BD1/20200424
Sampling Containers and filtration:	see green sheet
Comments / Observations:	-

GW level

* 7.5m bgl at 11:40

8.98m bgl at 16:10

24/04/20 (pre-purge)

(post - purge)

Rev March 2012

Groundwater Field Sheet

Project and Bore Installation Details

Bore / Standpipe ID:	BH104
Project Name:	
Project Number:	86767.03
Site Location:	Haymarket
Bore GPS Co-ord:	
Installation Date:	
GW Level (during drilling):	- m bgl
Well Depth:	m bgl
Screened Interval:	m bgl
Contaminants/Comments:	-

Bore Volume = casing volume + filter pack volume
 $= \pi h_1 d_1^2 / 4 + n(\pi h_2 d_1^2 / 4 - \pi h_2 d_2^2 / 4)$

Where: $\pi = 3.14$

n = porosity (0.3 for most filter pack material)

h_1 = height of water column

d_1 = diameter of annulus

h_2 = length of filter pack

d_2 = diameter of casing

Bore Vol Normally: $7.2 * h$

Bore Development Details

(For data logger purposes)

Date/Time:	24/04/20
Purged By:	AS
GW Level (pre-purge):	7.75 m bgl
GW Level (post-purge):	11.15 m bgl
PSH observed:	Yes / No (interface / visual). Thickness if observed:
Observed Well Depth:	20.35 m bgl
Estimated Bore Volume:	91 L
Total Volume Purged:	(target: no drill mud, min 3 well vol. or dry) ~40L
Equipment:	twister pump, int. meter

Micropurge and Sampling Details

Date/Time:	24/04/20
Sampled By:	AS
Weather Conditions:	warm, clear
GW Level (pre-purge):	7.6 m bgl
GW Level (post sample):	7.75 m bgl
PSH observed:	Yes / No (interface / visual). Thickness if observed:
Observed Well Depth:	20.35 m bgl
Estimated Bore Volume:	92 L
Total Volume Purged:	~15 L
Equipment:	WQM, peripump, int. meter

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
14:57	24.8	6.74	541	5.20	10.3	167
14:58	23.6	1.29	525	5.25	9.6	161
14:59	21.6	1.16	481	5.25	13.2	153
15:00	21.1	0.98	457	5.25	28.5	149
15:01	20.9	0.79	445	5.24	23.6	142
15:02	20.9	0.74	439	5.23	24.9	140
15:03	20.8	0.71	438	5.22	23.5	138
Additional Readings Following stabilisation:	DO % Sat	SPC	TDS			

Sample Details

Sampling Depth (rationale):	15 m bgl, ~midpoint
Sample Appearance (e.g. colour, siltiness, odour):	clear, odourless
Sample ID:	BH104
QA/QC Samples:	-
Sampling Containers and filtration:	see green sheet
Comments / Observations:	-

GW

* 7.6m bgl at 11:37

7.75mbgl at 15:13

11.15mbgl at 15:37

24/04/20 (pre-purge) Sampling
 (post-sampling)
 (post-purge)

Project and Bore Installation Details

Bore / Standpipe ID:	BH1
Project Name:	
Project Number:	86767.03
Site Location:	Haymarket
Bore GPS Co-ord:	
Installation Date:	
GW Level (during drilling):	- m bgl
Well Depth:	m bgl
Screened Interval:	m bgl
Contaminants/Comments:	-

Where: $\pi = 3.14$

n = porosity (0.3 for most filter pack material)

h_1 = height of water column
 d_1 = diameter of annulus
 h_2 = length of filter pack
 d_2 = diameter of casing

Bore Vol Normally: 7.2*h

Bore Development Details

Date/Time:	
Purged By:	
GW Level (pre-purge):	m bgl
GW Level (post-purge):	m bgl
PSH observed:	Yes / No (interface / visual). Thickness if observed:
Observed Well Depth:	m bgl
Estimated Bore Volume:	L
Total Volume Purged:	(target: no drill mud, min 3 well vol. or dry)
Equipment:	

Micropurge and Sampling Details

Date/Time:	
Sampled By:	
Weather Conditions:	
GW Level (pre-purge):	m bgl
GW Level (post sample):	m bgl
PSH observed:	Yes / No (interface / visual). Thickness if observed:
Observed Well Depth:	m bgl
Estimated Bore Volume:	L
Total Volume Purged:	L
Equipment:	

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
14:57	24.8	6.74	541	5.20	10.3	167
14:58	23.6	1.29	525	5.28	9.6	161
14:59	21.6	1.16	491	5.26	13.2	153
15:00						
15:01						
15:02						
15:03						
Additional Readings Following stabilisation:	DO % Sat	SPC	TDS			

Sample Details

Sampling Depth (rationale):	m bgl,
Sample Appearance (e.g. colour, siltiness, odour):	
Sample ID:	
QA/QC Samples:	
Sampling Containers and filtration:	
Comments / Observations:	

* 6.4m bgl (no GW - well depth)

* SHIMAZU

1145 24104120

Groundwater Field Sheet

Project and Bore Installation Details

Bore / Standpipe ID:	BH112B
Project Name:	Haymarket SS1
Project Number:	86767.03
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 Volume = casing volume + filter pack volume
 $= \pi r_b^2 d_c / 4 + \pi (r_b^2 d_f) / 4 - \pi r_c^2 d_f / 4$
 Where: $\pi = 3.14$
 n = porosity (0.3 for most filter pack material)
 h_w = height of water column
 d_c = diameter of casing
 d_f = diameter of filter pack
 d = diameter of casing

Bore Vol Normally: $7.2 \times h$

Bore Development Details

Date/Time:	
Purged By:	
GW Level (pre-purge):	m bgl
GW Level (post-purge):	m bgl
PSH observed:	Yes / No (interface / visual). Thickness if observed:
Observed Well Depth:	m bgl
Estimated Bore Volume:	L
Total Volume Purged:	(target: no drill mud, min 3 well vol. or dry)
Equipment:	

Micropurge and Sampling Details

Date/Time:	26/05/20
Sampled By:	AS
Weather Conditions:	rainy
GW Level (pre-purge):	5.2 m bgl (8:24)
GW Level (post sample):	5.85 m bgl (9:00)
PSH observed:	Yes / No (interface / visual). Thickness if observed:
Observed Well Depth:	10.85 m bgl
Estimated Bore Volume:	40 L
Total Volume Purged:	~15 L
Equipment:	pump, WOM, int. meter

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
10:51	17.2	2.51	377	4.94	114	159
10:52	21.8	1.77	311	5.08	1089	145
10:53	23.8	1.52	285	5.32	966	134
10:54	24.1	1.20	282	5.46	933	130
10:55	24.3	1.14	278	5.54	796	126
10:56	24.5	1.07	279	5.62	680	121
10:57	24.5	1.10	279	5.65	626	120
Additional Readings Following stabilisation:	DO % Sat	SPC	TDS			

Sample Details

Sampling Depth (rationale):	8.0 m bgl.
Sample Appearance (e.g. colour, siltiness, odour):	brown, silty
Sample ID:	BH112B
QA/QC Samples:	BD11 2020 0526
Sampling Containers and filtration:	see COC
Comments / Observations:	—

Groundwater Field Sheet

Project and Bore Installation Details

Bore / Standpipe ID:	BH107a
Project Name:	Hammocket SS1
Project Number:	86767.03
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 Volume = casing volume + filter pack volume
 $= \pi r_c^2 d_c + n(\pi r_b^2 d_f / 4 - \pi r_c^2 d_c / 4)$
 Where: $\pi = 3.14$
 n = porosity (0.3 for most filter pack material)
 h_f = height of water column
 d_c = diameter of casing
 d_f = diameter of filter pack
 d_b = diameter of bore
 Bore Vol Normally: $7.2 * h$

Bore Development Details

Date/Time:	
Purged By:	
GW Level (pre-purge):	m bgl
GW Level (post-purge):	m bgl
PSH observed:	Yes / No (interface / visual). Thickness if observed:
Observed Well Depth:	m bgl
Estimated Bore Volume:	L
Total Volume Purged:	(target: no drill mud, min 3 well vol. or dry)
Equipment:	

Micropurge and Sampling Details

Date/Time:	26/05/20	
Sampled By:	AS	
Weather Conditions:	rainy	
GW Level (pre-purge):	2.1 m bgl	data logger retrieved 10.30am
GW Level (post sample):	3.85 m bgl	data logger put in 11.01am
PSH observed:	Yes / No (interface / visual). Thickness if observed:	
Observed Well Depth:	3.85 m bgl	
Estimated Bore Volume:	12.6 L	
Total Volume Purged:	~ 5 L	
Equipment:	geopump, WQM, int meter	

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
13:07	18.8	3.23	494	7.16	137.3	74
13:08	21.3	2.06	462	6.84	127.1	72
13:09	22.1	1.68	125	6.78	-	67
Additional Readings Following stabilisation:	DO % Sat	SPC	TDS			

Sample Details

Sampling Depth (rationale):	3.2 m bgl
Sample Appearance (e.g. colour, siltiness, odour):	grey; odourless
Sample ID:	BH107A
QA/QC Samples:	-
Sampling Containers and filtration:	see COC
Comments / Observations:	note - samples taken prior to WQM readings due to low vol. slow recharge

well dry after 3 readings

Groundwater Field Sheet

Project and Bore Installation Details

Bore / Standpipe ID:	BH107B
Project Name:	Haymarket SSI
Project Number:	86767.03
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 Volume = casing volume + filter pack volume
 $= \pi r_b^2 d / 4 + \pi (r_b d) / 4 (n h - 4)$
 Where: $\pi = 3.14$
 n = porosity (0.5 for most filter pack material)
 h = height of water column
 d = diameter of annulus
 h = length of filter pack
 d = diameter of casing
 Bore Vol Normally: 7.2*m

Bore Development Details

Date/Time:	
Purged By:	
GW Level (pre-purge):	m bgl
GW Level (post-purge):	m bgl
PSH observed:	Yes / No (interface / visual). Thickness if observed:
Observed Well Depth:	m bgl
Estimated Bore Volume:	L
Total Volume Purged:	(target: no drill mud, min 3 well vol. or dry)
Equipment:	

Micropurge and Sampling Details

Date/Time:	26/05/20
Sampled By:	AS
Weather Conditions:	rainy
GW Level (pre-purge):	2.6 m bgl
GW Level (post sample):	5.3 m bgl
PSH observed:	Yes / (No) (interface / visual). Thickness if observed:
Observed Well Depth:	11.15 m bgl
Estimated Bore Volume:	61 L
Total Volume Purged:	~1.5 L
Equipment:	geopump, w QM, int. meter

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
13:27	19.3	3.47	501	7.04	—	12
13:28	21.3	1.09	499	7.22	—	-28
13:29	22.1	0.62	494	7.19	82.2	-56
13:30	22.3	0.33	492	7.18	35.5	-68
13:31	22.4	0.24	474	7.23	24.0	-75
13:32	22.5	0.18	474	7.27	18.6	-77
13:33	22.5	0.14	472	7.24	16.8	-76
Additional Readings Following stabilisation:	DO % Sat	SPC	TDS			

Sample Details

Sampling Depth (rationale):	8.0 m bgl.
Sample Appearance (e.g. colour, siltiness, odour):	clear - grey, odourless
Sample ID:	BH107B
QA/QC Samples:	—
Sampling Containers and filtration:	see COC
Comments / Observations:	—

Groundwater Field Sheet

Project and Bore Installation Details

Bore / Standpipe ID:	BH109B
Project Name:	Haymarket SSI
Project Number:	86767.03
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 Volume = casing volume + filter pack volume
 $= \pi r_b^2 h_c / 4 + \pi (r_b^2 - r_s^2) h_f / 4$
 Where: $\pi = 3.14$
 n = porosity (0.5 for most filter pack material)
 h_c = height of water column
 d_s = diameter of screen
 h_f = length of filter pack
 d_c = diameter of casing
 Bore Vol Normally: $7.2 \cdot h$

Bore Development Details

Date/Time:	
Purged By:	
GW Level (pre-purge):	m bgl
GW Level (post-purge):	m bgl
PSH observed:	Yes / No (interface / visual). Thickness if observed:
Observed Well Depth:	m bgl
Estimated Bore Volume:	L
Total Volume Purged:	(target: no drill mud, min 3 well vol. or dry)
Equipment:	

Micropurge and Sampling Details

Date/Time:	26/05/20
Sampled By:	AS
Weather Conditions:	cloudy
GW Level (pre-purge):	8.2 m bgl data logger retrieved, 12:17pm
GW Level (post sample):	10.9 m bgl data logger put in (30s), 12:59pm
PSH observed:	Yes / No (interface / visual). Thickness if observed:
Observed Well Depth:	12.0 m bgl
Estimated Bore Volume:	27 L
Total Volume Purged:	~15 L
Equipment:	geopump, int meter, WQM, bailer

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
14:39	19.9	3.16	760	7.42	-	-1
14:40	20.9	2.10	764	7.38	-	-10
14:41	22.2	1.25	735	7.39	3.2	-24
14:41	22.8	0.71	719	7.36	99.2	-33
14:42	23.0	0.53	711	7.42	110.5	-36
14:43	23.1	0.60	735	7.31	114.1	-41
14:44	23.1	0.55	731	7.31	91.0	-42
Additional Readings Following stabilisation:	DO % Sat	SPC	TDS			

Sample Details

Sampling Depth (rationale):	10.5 m bgl
Sample Appearance (e.g. colour, siltiness, odour):	brown - grey, slightly silty, odourless
Sample ID:	BH109B
QA/QC Samples:	
Sampling Containers and filtration:	see COC
Comments / Observations:	—

Appendix E

Calibration Records

Calibration & Service Report Gas Monitor

Company: Active Environmental Solutions Hire
Contact: Aleks Todorovic
Address: 2 Merchant Avenue
Thomastown Vic 3074
Phone: 03 9464 2300 | **Fax:** 03 9464 3421
Email: Hire@aesolutions.com.au

Manufacturer: RAE Systems
Instrument: MiniRAE 3000
Model: PGM 7320
Configuration: VOC
Wireless: -
Network ID: -
Unit ID: -

Serial #: 592-907986
Asset #: -
Part #: -
Sold: -
Last Cal: -
Job #: -
Cal Spec: Std

Item	Test	Pass/Fail	Comments
Battery	Li Ion	✓	
Charger	Charger, Power supply	✓	
	Cradle	✓	
Pump	Flow	✓	>500 mL/min
Filter	Filter, fitting, etc	✓	
Alarms	Audible, visual, vibration	✓	
Display	Operation	✓	
PCB	Operation	✓	
Connectors	Condition	✓	
Firmware	Version	✓	2.16
Datalogger	Operation	✓	
Monitor Housing	Condition	✓	
Case	Condition/Type	✓	
Sensors			
Oxygen		-	
LEL		-	
PID	10.6eV	✓	
Toxic 1		-	
Toxic 2		-	
Toxic 3		-	
Toxic 4		-	
Toxic 5		-	

Engineer's Report

Setup, service and calibration for hire

Calibration Certificate

Sensor	Type	Serial No:	Span Gas	Concentration	Traceability Lot #	CF	Reading	
							Zero	Span
Oxygen								
LEL								
PID	10.6eV	23030160P4	Isobutylene	100 PPM	2440-3-1	1	0	100 PPM
Toxic 1								
Toxic 2								
Toxic 3								
Toxic 4								
Toxic 5								

Calibrated/Repaired by: Milenko Sasic

Date: 06/04/2020

Next due: 06/10/2020

Head Office – Melbourne
2 Merchant Avenue
Thomastown VIC 3074 Australia
T: +61 3 9464 2300

NSW Office – Ashfield
Level 2, Suite 14, 6 - 8 Holden Street
Ashfield NSW 2131 Australia
T: +61 2 9716 5966

WA Office – Malaga
Unit 6, 41 Holder Way
Malaga WA 6090 Australia
T: +61 8 9249 5663

QLD Office – Banyo
Unit 17, 23 Ashtan Place
Banyo QLD 4014 Australia
T: +61 7 3267 1433

sales@aesolutions.com.au



www.aesolutions.com.au

Company: Active Environmental Solutions Hire
Contact: William Pak/Milenko Sasic
Address: Unit 16, 191 Parramatta Road
AUBURN NSW 2144
Phone: 02 9716 5966 | **Fax:** 02 9716 5988
Email: hire@aesolutions.com.au

Manufacturer: RAE Systems
Instrument: MiniRAE 3000
Model: PGM 7320
Configuration: PID (10.6eV)
Wireless: -
Network ID: -

Serial #: 592-915478
Hire #: 1624
Client: Wen-Fei Yuan
Company: Douglas Partners
Project #: 152403
Notes:

Item	Test	Pass/Fail	Comments
Battery	Li Ion	✓	
Charger	Charger, Power supply	✓	
	Cradle	✓	
Pump	Flow	✓	>500 mL/min
Filter	Filter, fitting, etc	✓	
Alarms	Audible, visual, vibration	✓	
Display	Operation	✓	
PCB	Operation	✓	
Connectors	Condition	✓	
Firmware	Version	✓	2.16
Datalogger	Operation	✓	
Monitor Housing	Condition	✓	
Case	Condition/Type	✓	
Sensors			
PID	Lamp	✓	
PID	Sensor	✓	
THP	Sensor	✓	

Engineer's Report

Setup, service and calibration for hire

Calibration Certificate

Sensor	Type	Serial No:	Span Gas	Concentration	Traceability Lot #	CF	Reading	
							Zero	Span
Oxygen								
LEL								
PID	10.6eV	-	Isobutylene	100ppm	A0442963	1.00	0	100ppm
Toxic 1								
Toxic 2								
Toxic 3								
Toxic 4								
Toxic 5								

Calibrated/Repaired by: William Pak

Date: 15.05.2020

Next due: 15.11.2020

Alemir International Pty Ltd t/a Active Environmental Solutions

ABN 14 080 228 708

Head Office – Melbourne
2 Merchant Avenue
Thomastown VIC 3074 Australia
T: +61 3 9464 2300

NSW Office – Auburn
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Banyo QLD 4014 Australia
T: +61 7 3267 1433

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www.aesolutions.com.au

CALIBRATION RECORD

Project: Haymarket, SSI

Project Number: 86767.03

Calibrated Equipment (Hired PID)

Model: MiniRAE 3000

Serial No.: 592-9107986

DP Reference: n/a

Other: AES Hired PID 10.6eV Lamp

Calibration

Date(s): 15/04/2020

Operator(s): WFM

Zero Gas: 0.3 → 0 ambient air

Span Gas: 91 → 100.6 isobutylene

Span Gas Concentration: 100

Response Factor: 1.0

Pre-calibration Reading 91

Post-calibration Reading 100.6

Approved: WFM 

Date: 15/04/2020

Electrochemical Instrument Maintenance Calibration Report

Customer: Douglas Partners Pty Ltd

Address: 96 Hermitage Rd West Ryde NSW

Attention: Matthew Hyde

Make:	TPS	Lab.ID/Asset No.	WQM 02	Calibration Date:	13/05/2019
Model:	90FL-T	Customer O/No.	140461	Next Calibration:	13/05/2020
Serial No:	474853	Location:	As above	Call Number:	SV1904230001

Item	Description	Pass/Fail
General Assessment		
1.	Consult operator regarding performance/problems	See Job
2.	Check general operation and note additional problems	As below
3.	Check electrical safety and earth continuity, if applicable, AS/NZS 3760 (if mains powered)	Adaptor is not tagged.
Check and Adjust		
4.	Probes, leads and connectors	OK
5.	Keypad/user controls	Ok
6.	Power supply/ <u>battery</u> voltage and condition	Replaced
7.	Probe performance (<i>slow, acceptable</i>)	OK
8.	Internal and external cleaning	OK

This equipment has been calibrated to the manufacturer's specifications and instructions, using the traceable standards shown below:

PARAMETER	STANDARD	TRACEABILITY LOT NO.	PRE CALIBRATION READING	POST CALIBRATION READING
TEMPERATURE	22.8° C	s/n: 181088298	22.5°C	22.8 °C
pH	7.00	Lot 488/01	7.36	7.01 @23°C
	4.01	Lot 468/01	4.4	4.0@23°C
CONDUCTIVITY K=10 Range 0-20mS/cm	0 µS/cm	Air	12880µS/cm	mS/cm
	128800uS/cm	Lot 357/01	Uncalibrated	12.80mS/cm@23°C
TDS as SAL is derived form a conductivity calibration.	-	As Above	N/A	0
	-	As above	N/A	0.77%
DISSOLVED OXYGEN	0 % SAT	0% DO Solution	-0.2 % SAT	0 % SAT
	100 % SAT	Air saturated membrane procedure	97 % SAT	100 % SAT
TURBIDITY	0 NTU	RO water	+1.4 NTU	0 NTU
	90 NTU	Lot325326	9.4 NTU	90 NTU
	360 NTU	Lot 330055	300 NTU	360 NTU
ORP	700 mV	3347	702mV	check only: pass Y

COMMENTS/ADDITIONAL REPAIRS/SERVICES PERFORMED

GENERAL COMMENTS ON INSTRUMENT CONDITION AND LOCATION:

Engineer's Name
Sean Gannon

Engineer's Signature
Sean Gannon

Date
14 May 2019

TPS FLT90 CALIBRATION RECORD

Serial Number: 428561

DP Identification No.

DP595

Project: 86767.00

Project Number: Haymarket

PARAMETER	STANDARD	PRE CALIBRATION READING		POST CALIBRATION READING	
Temperature	* 23.0 22.6	22.5	degrees C	22.6	degrees C
pH	10.03	9.83	pH units	10.04	pH units
	7.02	7.30	pH units	7.02	pH units
	4	3.83	pH units	3.99	pH units
Conductivity	0.0** uS/cm	0.5	uS/cm	0.0	uS/cm
	2.76 mS/cm	2.89	mS/cm	2.75	mS/cm
TDS	0.0** ppm	—	ppm	—	ppm
	36.0 ppk	—	ppk	—	ppk
Dissolved Oxygen	0.0% sat	0.03	ppm	0.0	
		—	%	—	%
	100.0**% sat	9.51	ppm		
		—	%	8.56	%
Turbidity	0*** NTU	0.1	NTU	0.0	NTU
	90 NTU	85.7	NTU	89.8	NTU
ORP #	240 mV	240	mV	—	mV

Calibrated by: AS

Date: 24/04/20

* use NATA certified reference thermometer from soils clean lab

** air

*** distilled water

factory calibrated – do a bump test

NOTES:

Form Updated
21Mar2011

TPS FLT90 CALIBRATION RECORD

Serial Number: 428561

DP Identification No.

DP595

Project: Haymarket SSI

Project Number: 86767.03

PARAMETER	STANDARD	PRE CALIBRATION READING		POST CALIBRATION READING	
Temperature	* 23.0	19.7	degrees C	22.4	degrees C
pH	10.03	9.77	pH units	10.03	pH units
	7.01	6.97	pH units	7.02	pH units
	4	3.87	pH units	3.99	pH units
Conductivity	0.0** uS/cm	8.6	uS/cm	0.1	uS/cm
	2.76 mS/cm	3.33	mS/cm	2.74	mS/cm
TDS	0.0** ppm	/	ppm	/	ppm
	36.0 ppk	/	ppk	/	ppk
Dissolved Oxygen	0.0% sat	WINDY	ppm	WINDY	
		0.13	%	-0.01	%
	100.0***% sat	7.86	ppm	8.31	
		-	%	-	%
Turbidity	0*** NTU	-0.5	NTU	-0.1	NTU
	90 NTU	67.7	NTU	90.4	NTU
ORP #	240 mV	239	mV	-	mV

 Calibrated by: Alyssa Spencer

 Date: 25 / 05 / 20

* use NATA certified reference thermometer from soils clean lab

** air

*** distilled water

factory calibrated – do a bump test

NOTES:

 Form Updated
 21Mar2011

Appendix F

Results Tables

Table F1: Summary of Laboratory Results – Metals, TRH, BTEX, PAH

			Metals										TRH						BTEX				PAH			
			Arsenic	Cadmium	Total Chromium	Copper	Lead	Mercury (inorganic)	Nickel	Zinc	TRH Ox. C-10	TRH-C10-C16	F1 (C10-C16; BTEX)	F2 (C10-C16 Naphthalene)	F3 (C10-C14)	F4 (C10-C10)	Benzene	Toluene	Ethylbenzene	Total Xylenes	Naphthalene	Benzo[a]pyrene (BaP)	Benzo[a]pyrene TEQ	Total PAHs		
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			
DP (2020)																										
BH101	0.1 - 0.2 m	08/04/2020	4	<0.4	10	89	150	0.3	6	96	<25	<50	<25	<50	210	<100	<0.2	<0.5	<1	<3	<1	0.73	1.2	8.6		
BH1010.1-0.2 (TRIPPLICATE)			<4	<0.4	8	56	160	0.3	6	120	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT		
BH101	0.9 - 1.0 m	08/04/2020	5	0.4	9	93	250	0.3	9	210	<25	<50	<25	<50	870	280	<0.2	<0.5	<1	<3	<1	2.5	3.5	20		
BH102	1.5 - 1.6 m	07/04/2020	<4	<0.4	4	62	68	0.1	4	100	<25	<50	<25	<50	<100	<100	<0.2	<0.5	<1	<3	<1	0.1	<0.5	1.2		
BH102	3.1 - 3.2 m	07/04/2020	5	1	10	180	160	0.4	6	160	<25	<50	<25	<50	<100	<100	<0.2	<0.5	<1	<3	<1	0.1	<0.5	1.8		
BH102	4.0 - 4.1 m	07/04/2020	6	<0.4	16	86	170	1.3	23	540	<25	<50	<25	<50	<100	<100	<0.2	<0.5	<1	<3	<1	0.05	<0.5	0.05		
BH102	4.9 - 5.0 m	07/04/2020	<4	<0.4	8	7	20	0.4	4	26	<25	<50	<25	<50	<100	<100	<0.2	<0.5	<1	<3	<1	0.08	<0.5	0.3		
BH103	1.0 - 1.1 m	08/04/2020	<4	<0.4	2	5	57	<0.1	1	14	<25	<50	<25	<50	<100	<100	<0.2	<0.5	<1	<3	<1	0.08	<0.5	0.3		
BH103	2.0 - 2.1 m	08/04/2020	9	<0.4	8	37	28	<0.1	6	39	<25	<50	<25	<50	<100	<100	<0.2	<0.5	<1	<3	<1	<0.05	<0.5	<0.05		
BH103	2.9 - 3 m	16/04/2020	12	<0.4	8	31	19	<0.1	2	16	<25	<50	<25	<50	<100	<100	<0.2	<0.5	<1	<3	<1	<0.05	<0.5	<0.05		
BH103	5.1 - 5.2 m	16/04/2020	<4	<0.4	5	13	43	0.4	2	17	<25	<50	<25	<50	<100	<100	<0.2	<0.5	<1	<3	<1	0.2	<0.5	2.2		
BH103	6.3 - 6.46 m	16/04/2020	<4	<0.4	1	<1	<1	<0.1	<1	<1	<25	<50	<25	<50	<100	<100	<0.2	<0.5	<1	<3	<1	<0.05	<0.5	<0.05		
BH104	1.0 - 1.1 m	08/04/2020	5	<0.4	7	33	45	<0.1	11	61	<25	<50	<25	<50	<100	<100	<0.2	<0.5	<1	<3	<1	<0.05	<0.5	0.52		
BH104	1.4 - 1.5 m	14/04/2020	<4	<0.4	6	28	14	<0.1	7	42	<25	<50	<25	<50	<100	<100	<0.2	<0.5	<1	<3	<1	0.53	0.7	6.1		
BD21140420	1.4 - 1.5 m	14/04/2020	11	<0.4	7	27	17	<0.1	3	21	<25	<50	<25	<50	<100	<100	<0.2	<0.5	<1	<3	<1	0.09	<0.5	0.56		
BH104	2.8 - 2.9 m	14/04/2020	11	<0.4	7	27	17	<0.1	3	21	<25	<50	<25	<50	<100	<100	<0.2	<0.5	<1	<3	<1	0.09	<0.5	0.56		
BH105	0.05 - 0.1 m	08/04/2020	8	0.6	13	93	280	1	14	240	<25	<50	<25	<50	330	<100	<0.2	<0.5	<1	<3	<1	2	2.9	17		
BD11070420	0.23 - 0.3 m	08/04/2020	9	0.7	14	99	300	0.8	11	260	<25	<50	<25	<50	170	<100	<0.2	<0.5	<1	<3	<1	1.8	2.5	17		
BD11070420b	0.23 - 0.3 m	08/04/2020	10	0.8	20	110	460	1.3	17	400	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT		
BH106	0.2 - 0.3 m	07/04/2020	25	<0.4	14	74	100	0.2	4	760	<25	87	<25	87	1600	380	<0.2	<0.5	<1	<3	<1	28	40	320		
BH106	0.3 - 0.4 m	07/04/2020	6	<0.4	43	43	610	0.7	10	74	<25	340	<25	340	790	300	<0.2	<0.5	<1	<3	<1	2	120	1400		
BH1060.3-04 (TRIPPLICATE)			7	<0.4	24	32	360	0.7	8	110	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT		
BH106	0.9 - 1.0 m	07/04/2020	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	<1	0.1	<0.5	0.88		
BH107B	0.4 - 0.5 m	16/05/2020	<4	<0.4	8	25	54	0.2	4	49	<25	<50	<25	<50	<100	<100	<0.2	<0.5	<1	<3	<1	1.3	2	14		
BD12020516	0.4 - 0.5 m	16/05/2020	<4	<0.4	12	48	52	0.2	7	81	<25	<50	<25	<50	<100	<100	<0.2	<0.5	<1	<3	<1	1.8	2.7	18		
BH107B	1.4 - 1.5 m	16/05/2020	<4	<0.4	7	11	11	<0.1	6	15	<25	<50	<25	<50	<100	<100	<0.2	<0.5	<1	<3	<1	0.3	<0.5	2.8		
BH108	0.23 - 0.25 m	17/05/2020	5	<0.4	14	11	15	<0.1	<1	4	<25	<50	<25	<50	<100	<100	<0.2	<0.5	<1	<3	<1	2.7	3.8	23		
BH108B	0.4 - 0.5 m	17/05/2020	<4	<0.4	9	9	19	<0.1	<1	2	<25	<50	<25	<50	<100	<100	<0.2	<0.5	<1	<3	<1	0.4	<0.5	4.9		
BH110	0.5 - 0.5 m	5/21/2020	43	<0.4	10	9	30	<0.1	3	19	<25	<50	<25	<50	<100	<100	<0.2	<0.5	<1	<3	<1	1.1	2.1	13		
BH111	0.4 - 0.5 m	5/19/2020	<4	<0.4	5	6	10	<0.1	3	12	<25	<50	<25	<50	<100	<100	<0.2	<0.5	<1	<3	<1	0.2	<0.5	<0.5		
BH111	1.3 - 1.4 m	5/19/2020	<4	<0.4	16	60	330	1	16	180	<25	<50	<25	<50	220	<100	<0.2	<0.5	<1	<3	<1	5.7	8.4	8.4		
BH112B	0.6 - 0.7 m	18/05/2020	<4	<0.4	11	15	21	0.3	3	12	<25	<50	<25	<50	650	310	<0.2	<0.5	<1	<3	<1	5.1	7.5	85		
BH112B	1.2 - 1.4 m	13/05/2020	<4	<0.4	3	16	5	<0.1	3	11	<25	<50	<25	<50	<100	<100	<0.2	<0.5	<1	<3	<1	2.5	3.5	36		
BH113	0.15 - 0.25 m	07/04/2020	26	<0.4	6	40	44	<0.1	4	310	<25	<50	<25	<50	790	220	<0.2	<0.5	<1	<3	<1	12	17	150		
BD21070420	0.05 - 0.1 m	07/04/2020	10	<0.4	9	43	69	0.1	4	500	<25	<50	<25	<50	780	180	<0.2	<0.5	<1	<3	<1	14	20	180		
BH113	0.4 - 0.5 m	07/04/2020	6	<0.4	16	16	23	<0.1	<1	6	<25	<50	<25	<50	<100	<100	<0.2	<0.5	<1	<3	<1	1.2	1.7	15		
BH113	0.9 - 1.0 m	07/04/2020	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	0.3	<0.5	3.8		
BH114	0.15 - 0.2 m	07/04/2020	14	<0.4	11	59	93	<0.1	14	510	<25	<220	<25	220	1900	330	<0.2	<0.5	<1	<3	<1	67	81	870		
BH114	0.2 - 0.3 m	07/04/2020	52	<0.4	21	120	260	0.1	5	1800	<25	<120	<25	120	1400	310	<0.2	<0.5	<1	<3	<1	31	43	470		
BH115	0.23 - 0.3 m	07/04/2020	6	<0.4	12	14	24	<0.1	1	21	<25	<50	<25	<50	110	1300	280	<0.2	<0.5	<1	<3	<1	27	38	440	
BH1150.23-0.3 (TRIPPLICATE)			100	<0.4	14	85	38	<0.1	3	110	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT		
BH115	0.5 - 0.6 m	07/04/2020	11	<0.4	21	16	20	<0.1	2	11	<25	<50	<25	<50	<100	<100	<0.2	<0.5	<1	<3	<1	1.8	2.5	22		
BH115	0.9 - 1.0 m	07/04/2020	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	0.05	<0.5	0.4		
BH116	0.5 - 0.7 m	17/05/2020	<4	<0.4	6	5	12	<0.1	<1	1	<25	<50	<25	<50	<100	<100	<0.2	<0.5	<1	<3	<1	<0.05	<0.5	<0.05		
BD112020517	0.5 - 0.7 m	17/05/2020	3.8	<0.4	8.2	9.9	16	<0.1	<5	<5	<20	<50	<25	<50	<100	<100	<0.1	<0.1	<0.1	<0.3	<0.5	<0.5	<0.5	<0.5		
BH117	0.2 - 0.25 m	17/05/2020	300	8-0.4	20	15	16	<0.1	2	16	<25	140	<25	120	1100	240	<0.2	<0.5	<1	<3	<1	46	73	770		

			Metals								TRH					BTEx				PAH				
			Arsenic	Cadmium	Total Chromium	Copper	Lead	Mercury (inorganic)	Nickel	Zinc	TRH C15-C19	TRH C19-C21	F1 (C10-C19-BTEX)	F2 (C10-C19-Naphthalene)	F3 (C14-C19)	F4 (C24-C29)	Benzene	Toluene	Ethylbenzene	Total Xylenes	Naphthalene ^a	Benzopyrene (BaP)	Benzopyrene TEF	Total PAHs
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
DP (2019)																								
BH1	3 - 3.5 m	10/07/2019	<4	<0.4	2	8	90	0.9	3	140	<25	<50	<25	NL	<50	<100	<0.2	<0.5	<1	<1	<1	<0.05	<0.5	<0.05
BH1	3.8 - 4 m	10/07/2019	<4	<0.4	<1	<1	<1	<0.1	<1	23	<25	<50	<25	NL	<50	<100	<0.2	<0.5	<1	<1	<1	<0.05	<0.5	<0.05
BH2	1.5 - 1.6 m	10/07/2019	<4	<0.4	5	3	24	<0.1	1	4	<25	<50	<25	NL	<50	<100	<0.2	<0.5	<1	<1	<1	0.1	<0.5	1.6
BH2	4.5 - 4.6 m	10/07/2019	12	<0.4	8	29	24	<0.1	2	29	<25	<50	<25	NL	<50	<100	<0.2	<0.5	<1	<1	<1	0.2	<0.5	1.6
BH3	0.2 - 0.3 m	12/07/2019	6	<0.4	10	11	48	0.1	2	55	<25	75	<25	75	1200	220	<0.2	<0.5	<1	<1	1.2	29	42	370
BH3	0.7 - 0.8 m	12/07/2019	9	<0.4	9	9	45	<0.1	2	35	<25	<50	<25	9	290	290	<0.2	<0.5	<1	<1	<1	4.5	6.9	53
BHQD F.O.B. - [TRIPPLICATE]	0.7 - 0.8 m	12/07/2019	3000	900	3000	240000	1500	730	3000	400000	NC	NC	260	NC	NC	NC	3	NL	NL	230	NL	NC	30	4000
BH4	0.3 - 0.4 m	12/07/2019	8	<0.4	4	9	33	<0.1	1	29	<25	<50	<25	NL	<50	<100	<0.2	<0.5	<1	<1	<1	9.1	<0.5	0.57
BH4	1.0 - 1.1 m	12/07/2019	10	<0.4	9	12	49	0.1	1	8	<25	<50	<25	NL	<50	<100	<0.2	<0.5	<1	<1	<1	9.06	<0.5	0.06
BH5	0.35 - 0.4 m	13/07/2019	<4	<0.4	5	78	8	0.1	4	35	<25	<50	<25	NL	<50	1200	<0.2	<0.5	<1	<1	<1	NC	10	100
BH6	0.2 - 0.3 m	14/07/2019	7	<0.4	17	17	30	0.2	2	15	<25	360	<25	360	280	1400	<0.2	<0.5	<1	<1	87	23	34	640
BH7	1.0 - 1.1 m	12/07/2019	<4	<0.4	2	2	4	<0.1	1	30	<25	<50	<25	NL	<50	<100	<0.2	<0.5	<1	<1	<1	<0.05	<0.5	0.1
BH7	1.4 - 1.5 m	13/07/2019	<4	<0.4	3	2	2	<0.1	1	11	<25	<50	<25	NL	<50	<100	<0.2	<0.5	<1	<1	<1	<0.05	<0.5	<0.05
BD120719	1.4 - 1.5 m	12/07/2019	<4	<0.4	8	13	21	<0.1	5	21	<25	<50	<25	NL	<50	<100	<0.2	<0.5	<1	<1	<1	1.6	2.3	16
BT1/2080713	1.4 - 1.5 m	12/07/2019	<2	<0.4	5.5	<5	5.1	<0.1	<5	30	<20	<50	<20	<50	<100	<100	<0.1	<0.1	<0.1	<0.3	<0.5	<0.5	<0.5	<0.5
BH7	2.0 - 2.1 m	13/07/2019	<4	<0.4	8	7	7	<0.1	3	16	<25	<50	<25	NL	<50	<100	<0.2	<0.5	<1	<1	<1	<0.05	<0.5	<0.05
BH8	0.2 - 0.3 m	14/07/2019	4	<0.4	9	55	33	0.1	12	33	<25	<50	<25	NL	<50	<100	<0.2	<0.5	<1	<1	<1	1.2	1.7	11
BH9	0.35 - 0.45 m	12/07/2019	<4	<0.4	8	3	8	<0.1	2	8	<25	<50	<25	NL	<50	<100	<0.2	<0.5	<1	<1	<1	0.2	<0.5	2.8
BH9	0.65 - 0.75 m	12/07/2019	18	<0.4	23	9	15	0.2	1	7	<25	<50	<25	NL	<50	<100	<0.2	<0.5	<1	<1	<1	<0.05	<0.5	<0.05

Lab result	
HL/HSL value	EL/ESL value

■ HL/HSL exceedance ■ EL/ESL exceedance ■ HL/HSL and EL/ESL exceedance ■ MLC exceedance ■
■ Indicates that asbestos has been detected by the lab below the PQL, refer to the lab report ■ Blue = DC excen
Bold = Lab detections NT = Not tested NL = Non limiting NC = No criteria NA = Not applicable NAD = No asbestos detected

Notes:
HL/HSL/DC NEPC, Schedule B1 - HL D, HSL D, DC HSL D
ML NEPC, Schedule B1 - ML C/nd
a QA/QC replicate of sample listed directly below the primary sample
b reported naphthalene laboratory result obtained from BTExN suite

Table F1: Summary of Laboratory Results – Phenol, OCP, OPP, PCB, Asbestos

[illegible]

			Phenol	Phenol	DDT+DDE+DDD c	DDD	DDE	DDT	Aro & Dieldrin	OCPP Total Chlordane	Total Endosulfan	Endrin	Heptachlor	Heachloroben zone	Methoxychlor	OPP Chlorpyrifos	PCB Total PCB	Asbestos Asbestos (D in soil >10g)	Asbestos Trace Analysis	Asbestos (50g)
		POL	5	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	-	-	-
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	-	-	-
DP (2019)																				
BH1	3 - 3.5 m	10/07/2019	850	<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
BH1	3.8 - 4 m	10/07/2019	850	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NAD	NAD	NAD
BH2	1.5 - 1.6 m	10/07/2019	850	<5	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	NAD	NAD
BH2	4.5 - 4.6 m	10/07/2019	850	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NAD	NAD	NAD
BH3	0.2 - 0.3 m	12/07/2019	850	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NAD	NAD	NAD
BH3	0.7 - 0.8 m	12/07/2019	850	<5	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.5	NAD	NAD
BH3B.7.0.8 - (TRIPPLICATE)	0.7 - 0.8 m	12/07/2019	850	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT
BH4	0.3 - 0.4 m	12/07/2019	850	<5	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	NAD	NAD
BH4	1.0 - 1.1 m	12/07/2019	850	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NAD	NAD	NAD
BH5	0.35 - 0.4 m	13/07/2019	850	<5	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.5	NAD	NAD
BH6	0.2 - 0.3 m	14/07/2019	850	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NAD	NAD	NAD
BH7	1.0 - 1.1 m	12/07/2019	850	<5	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	NAD	NAD
BH7	1.4 - 1.5 m	13/07/2019	850	<5	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	NAD	NAD
BD120719	1.4 - 1.5 m	12/07/2019	850	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NAD	NAD	NAD
BT12090713	1.4 - 1.5 m	12/07/2019	850	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT
BH7	2.0 - 2.1 m	13/07/2019	850	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NAD	NAD	NAD
BH8	0.2 - 0.3 m	14/07/2019	850	<5	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	NAD	NAD
BH9	0.35 - 0.45 m	12/07/2019	850	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NAD	NAD	NAD
BH9	0.65 - 0.75 m	12/07/2019	850	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NAD	NAD	NAD
Lab result			■ HLHLSL exceedance ■ EL/ESL exceedance ■ HLHLSL and EL/ESL exceedance ■ ML exceedance ■ ML and HLHLSL or EL/ESL exceedance																	
HLHLSL value EL/ESL value			■ Indicates that asbestos has been detected by the lab below the POL, refer to the lab report Blue = DC exceedance																	
Bold = Lab detection			NT = Not tested NL = Non limiting NC = No criteria NA = No asbestos detected NA = No asbestos detected																	

Lab result
HL/HSL value EL/ESL value

■ HL/HSL exceedance ■ EL/ESL exceedance ■ HL/HSL and EL/ESL exceedance ■ ML exceedance ■ ML and HL/HSL or EL/ESL exceedance
■ Indicates that asbestos has been detected by the lab below the PQL, refer to the lab report ■ DC exceedance
Bold = Lab detections NT = Not tested NL = Non limiting NC = No criteria NA = Not applicable NAD = No asbestos detected

Notes:
 HL/HSL/DC NEPC, Schedule B1 - HIL D, HSL D, DC HSL D
 ML NEPC, Schedule B1 - ML C/nd
 a QA/QC replicate of sample listed directly below the primary sample
 b reported naphthalene laboratory result obtained from BTEXN suite

Table E3: Summary of Laboratory Results – VOC

Lab result

HLA-B*57:01 value E*57:01 value

■ HLA-B*57:01 excellence ■ E*57:01 excellence ■ HLA-B*57:01 and E*57:01 excellence ■ ML excellence ■ ML and HLA-B*57:01 or E*57:01 excellence

■ Indicates that abastest has been detected by the lab below the PQL, refer to the lab report ■ Blue = DC excellence

Legend: **Red** = Lab detection **NT** = Not tested **NA** = Non limiting **NC** = No criteria **NA** = Not applicable **NAD** = No abastest detected

Notes:

HEALSLOC

ML

Only samples analysed for VOC included in table
NEPC, Schedule B1 - H/L D, HSL D, DC HSL D
NEPC, Schedule B1 - M/L C/nd
QA/QC replicate of sample listed directly below it
reported naphthalene laboratory result obtained from

Table F2: Summary of Results of Groundwater Analysis (All results in µg/L)

[illegible]

Notes:

PQL	Practical Quantitation Limit
NL	Not Limiting
BOLD	Exceeds DGV

Table F2: Summary of Results of Groundwater Analysis (All results in µg/L)

[illegible]

Notes:

PQL Practical Quantitation Limit

NL Not Limiting

BOLD Exceeds DGV

- not defined/not analysed/not applicable

Table F3: Summary of Laboratory Results – Metals, TRH, BTEX, PAH, Phenol, OCP, OPP, PCB, Asbestos, VOC

Sample ID	Depth	POL	Metals										TRH		BTEX										PAH												
			Asbestos	TCU Asbestos	Calcium	Total Chromium	Lead	TCU Lead	Mercury (ppm-gal)	Nickel	TRH G-19	COP-CBS	Benzenes	Toluene	Enthalpene	Xylene (mpt)	Xylene (b)	Benzo(a)pyrene (mpt)	TCU Benzo(a)pyrene (mpt)	Benzo(a)pyrene	TCU Benzo(a)pyrene	TCU Benzo(a)pyrene	TCU Benzo(a)pyrene	TCU Benzo(a)pyrene	TCU Benzo(a)pyrene	TCU Benzo(a)pyrene	TCU Benzo(a)pyrene	TCU Benzo(a)pyrene	TCU Benzo(a)pyrene	TCU Benzo(a)pyrene	TCU Benzo(a)pyrene	TCU Benzo(a)pyrene	TCU Benzo(a)pyrene	TCU Benzo(a)pyrene			
Sample ID	Depth	POL	4	0.06	0.4	1	1	0.03	0.1	1	25	50	0.2	0.5	1	3	1	0.05	0.001	0.1	0.001	0.1	0.001	0.1	0.001	0.1	0.001	0.1	0.001	0.1	0.001	0.1	0.001	0.1			
Waste Classification Criteria ¹																																					
C11																																					
BSC1																																					
CT2																																					
SCC1																																					
TC2																																					
NEPC (1999) ¹																																					
EMF Maximum Average Concentration ¹																																					
EMF Absolute Maximum Concentration ¹																																					
DP (2020)																																					
BH01	0.1 - 0.2 m	08/04/2020	4	NT	<0.4	10	150	0.1	0.3	6	<25	230	<0.2	<0.5	<1	<3	<1	0.73	NT	<0.1	NT	0.1	NT	0.3	NT	0.6	NT	1	NT	0.7	NT	0.8	NT	0.2	NT	1.3	NT
BH01(G-19) (TRIPPLICATE)	0.1 - 0.2 m	08/04/2020	<4	NT	<0.4	8	150	NT	0.3	6	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	
BH01	0.9 - 1.0 m	08/04/2020	5	NT	0.4	9	250	0.34	0.3	9	<25	970	<0.2	<0.5	<1	<3	<1	2.5	<0.001	<0.1	<0.001	0.4	<0.001	0.1	<0.001	1.9	<0.001	3.6	<0.002	1.7	<0.001	1.2	<0.001	0.3	<0.001	2.8	<0.001
BH02	1.5 - 1.6 m	07/04/2020	<4	NT	<0.4	4	80	NT	0.1	4	<25	<50	<0.2	<0.5	<1	<3	<1	0.1	NT	<0.1	NT	<0.1	NT	<0.1	NT	0.1	NT	0.2	NT	0.1	NT	0.1	NT	<0.1	NT	0.2	NT
BH02	3.1 - 3.2 m	07/04/2020	5	NT	1	10	180	0.04	0.4	6	<25	<50	<0.2	<0.5	<1	<3	<1	0.1	NT	<0.1	NT	<0.1	NT	<0.1	NT	0.2	NT	0.3	NT	<0.1	NT	0.2	NT	<0.1	NT	0.3	NT
BH02	4.0 - 4.1 m	07/04/2020	5	NT	<0.4	16	170	<0.03	1.3	23	<25	<50	<0.2	<0.5	<1	<3	<1	0.05	NT	<0.1	NT	<0.1	NT	<0.1	NT	0.1	NT	<0.2	NT	<0.1	NT	<0.1	NT	<0.1	NT	0.2	NT
BH02	4.9 - 5.0 m	07/04/2020	<4	NT	<0.4	8	20	NT	0.4	4	<25	<50	<0.2	<0.5	<1	<3	<1	0.08	NT	<0.1	NT	<0.1	NT	<0.1	NT	<0.1	NT	<0.2	NT	<0.1	NT	<0.1	NT	<0.1	NT	0.1	NT
BH03	1.0 - 1.1 m	08/04/2020	<4	NT	<0.4	2	57	NT	<0.1	1	<25	<50	<0.2	<0.5	<1	<3	<1	0.08	NT	<0.1	NT	<0.1	NT	<0.1	NT	<0.1	NT	<0.2	NT	<0.1	NT	<0.1	NT	<0.1	NT	0.1	NT
BH03	2.0 - 2.1 m	08/04/2020	9	NT	<0.4	8	38	NT	<0.1	6	<25	<50	<0.2	<0.5	<1	<3	<1	<0.05	NT	<0.1	NT	<0.1	NT	<0.1	NT	<0.1	NT	<0.2	NT	<0.1	NT	<0.1	NT	<0.1	NT	<0.1	NT
BH03	2.9 - 3 m	16/04/2020	12	NT	<0.4	8	19	0.2	<0.1	2	<25	<50	<0.2	<0.5	<1	<3	<1	<0.05	NT	<0.1	NT	<0.1	NT	<0.1	NT	<0.1	NT	<0.2	NT	<0.1	NT	<0.1	NT	<0.1	NT	<0.1	NT
BH03	5.1 - 5.2 m	16/04/2020	<4	NT	<0.4	5	43	NT	0.4	2	<25	<50	<0.2	<0.5	<1	<3	<1	0.2	NT	<0.1	NT	<0.1	NT	<0.1	NT	0.2	NT	0.3	NT	0.1	NT	0.2	NT	<0.1	NT	0.4	NT
BH03	6.3 - 6.45 m	16/04/2020	<4	NT	<0.4	1	<1	NT	<0.1	<1	<25	<50	<0.2	<0.5	<1	<3	<1	<0.05	NT	<0.1	NT	<0.1	NT	<0.1	NT	<0.1	NT	<0.2	NT	<0.1	NT	<0.1	NT	<0.1	NT	<0.1	NT
BH04	1.0 - 1.1 m	08/04/2020	5	NT	<0.4	7	46	NT	<0.1	11	<25	<50	<0.2	<0.5	<1	<3	<1	<0.05	NT	<0.1	NT	<0.1	NT	<0.1	NT	0.1	NT	<0.2	NT	<0.1	NT	<0.1	NT	<0.1	NT	0.1	NT
BH04	1.4 - 1.5 m	14/04/2020	<4	NT	<0.4	6	14	NT	<0.1	7	<25	<50	<0.2	<0.5	<1	<3	<1	0.53	NT	<0.1	NT	0.1	NT	0.2	NT	0.6	NT	0.5	NT	0.3	NT	0.6	NT	<0.1	NT	1.1	NT
BD1740420	1.4 - 1.5 m	14/04/2020	10	NT	<0.4	9	80	NT	0.1	4	<25	880	<0.2	<0.5	<1	<3	<1	1.4	NT	0.5	NT	5.1	NT	6.7	NT	14	NT	19	NT	6.2	NT	13	NT	1.6	NT	31	NT
BH04	2.8 - 2.9 m	14/04/2020	11	NT	<0.4	7	77	NT	<0.1	3	<25	<50	<0.2	<0.5	<1	<3	<1	0.09	NT	<0.1	NT	<0.1	NT	<0.1	NT	0.1	NT	<0.2	NT	<0.1	NT	<0.1	NT	<0.1	NT	0.2	NT
BH05	0.05 - 0.1 m	08/04/2020	8	NT	0.6	13	280	0.1	1	14	<25	360	<0.2	<0.5	<1	<3	<1	2	<0.001	<0.1	<0.001	0.3	<0.001	0.5	<0.001	1.6	<0.001	3.2	<0.002	<0.1	<0.001	1.3	<0.001	0.2	<0.001	2.6	<0.001
BD1070420	0.05 - 0.1 m	08/04/2020	9	NT	0.7	14	300	NT	0.8	11	<25	120	<0.2	<0.5	<1	<3	<1	1.8	NT	<0.1	NT	0.3	NT	0.5	NT	1.4	NT	2.7	NT	1.3	NT	1.1	NT	0.2	NT	2.6	NT
BD1070420	0.05 - 0.1 m	08/04/2020	10	NT	0.8	20	400	NT	1.3	17	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	
BH06	0.2 - 0.3 m	07/04/2020	25	NT	<0.4	14	190	0.04	0.2	4	<25	1780	<0.2	<0.5	<1	<3	<1	28	<0.001	0.5	<0.001	6.5	0.002	9.5	<0.001	27	<0.001	38	<0.002	17	<0.001	24	<0.001	3.6	<0.001	53	<0.001
BH06	0.3 - 0.4 m	07/04/2020	6	NT	<0.4	43	610	0.74	0.7	10	<25	4980	<0.2	<0.5	<1	<3	<1	130	<0.001	2.1	0.006	13	0.003	50	0.002	180	<0.001	110	<0.002	41	<0.001	120	<0.001	9.1	<0.001	280	0.003
BH06(3-04) (TRIPPLICATE)	0.3 - 0.4 m	07/04/2020	7	NT	<0.4	24	350	NT	0.7	8	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT
BH06	0.9 - 1.0 m	07/04/2020	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	0.1	NT	<0.1	NT	<0.1	NT	<0.1	NT	0.1	NT	<0.2	NT	<0.1	NT	0.1	NT	<0.1	NT	0.2	NT
BH07	0.4 - 0.5 m	16/05/2020	<4	NT	<0.4	8	54	NT	0.2	4	<25	<50	<0.2	<0.5	<1	<3	<1	1.3	NT	<0.1	NT	0.3	NT	0.4	NT	1.4	NT	2	NT	0.8	NT	1.3	NT	0.2	NT	2.2	NT
BD120200516	0.4 - 0.5 m	16/05/2020	<4	NT	<0.4	12	52	NT	0.2	7	<25	<50	<0.2	<0.5	<1	<3	<1	1.8	<0.001	<0.1	<0.001	0.4	<0.001	0.5	<0.001	1.7	<0.001	2.7	<0.002	1.2	<0.001	1.7	<0.001	0.3	<0.001	2.6	<0.001
BH07	1.4 - 1.5 m	16/05/2020	<4	NT	<0.4	7	11	NT	<0.1	6	<25	<50	<0.2	<0.5	<1	<3	<1	0.3	NT	<0.1	NT	<0.1	NT	<0.1	NT	0.3	NT	0.4	NT	0.2	NT	0.3	NT	<0.1	NT	0.5	NT
BH08	0.23 - 0.25 m	17/05/2020	5	NT	<0.4																																

DP (2019)																															
BH1	3 - 3.5 m	10/07/2019	<4	NT	<0.4	2	30	NT	0.9	3	<25	<50	<0.2	<0.5	<1	<3	<1	<0.05	NT	<0.1	NT	<0.1	NT	<0.1	NT	<0.1	NT	<0.1	NT	<0.1	NT
BH1	3.5 - 4 m	10/07/2019	<4	NT	<0.4	<1	1	NT	<0.1	<1	<25	<50	<0.2	<0.5	<1	<3	<1	<0.05	NT	<0.1	NT	<0.1	NT	<0.1	NT	<0.1	NT	<0.1	NT	<0.1	NT
BH2	1.5 - 1.6 m	10/07/2019	<4	NT	<0.4	5	24	NT	<0.1	1	<25	<50	<0.2	<0.5	<1	<3	<1	0.1	NT	<0.1	NT	<0.1	NT	<0.1	NT	0.2	NT	0.2	NT	<0.1	NT
BH2	4.5 - 4.6 m	10/07/2019	12	NT	<0.4	8	24	NT	<0.1	2	<25	<50	<0.2	<0.5	<1	<3	<1	0.2	NT	<0.1	NT	<0.1	NT	<0.1	NT	0.1	NT	0.3	NT	0.2	NT
BH3	0.2 - 0.3 m	12/07/2019	6	NT	<0.4	10	40	NT	0.1	2	<25	1300	<0.2	<0.5	<1	<3	<1	39	<0.001	1.6	NT	11	NT	11	NT	29	NT	36	NT	17	NT
BH3	0.7 - 0.8 m	12/07/2019	9	NT	<0.4	9	40	NT	<0.1	2	<25	140	<0.2	<0.5	<1	<3	<1	4.5	<0.001	<0.1	NT	1.2	NT	1.7	NT	4.2	NT	6	NT	2.6	NT
BH3/0.7-0.8 [TRIPLE-DATE]	0.7 - 0.8 m	12/07/2019	10	NT	<0.4	10	16	NT	<0.1	2	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT
BH4	0.3 - 0.4 m	12/07/2019	8	NT	<0.4	4	33	NT	<0.1	1	<25	<50	<0.2	<0.5	<1	<3	<1	0.1	NT	<0.1	NT	<0.1	NT	<0.1	NT	0.1	NT	<0.2	NT	<0.1	NT
BH4	1.0 - 1.1 m	12/07/2019	10	NT	<0.4	9	40	NT	0.1	1	<25	<50	<0.2	<0.5	<1	<3	<1	0.06	NT	<0.1	NT	<0.1	NT	<0.1	NT	<0.1	NT	<0.2	NT	<0.1	NT
BH5	0.35 - 0.4 m	13/07/2019	<4	NT	<0.4	5	8	NT	0.1	4	<25	1370	<0.2	<0.5	<1	<3	<1	10	<0.001	0.1	NT	1.4	NT	1.6	NT	0.2	NT	13	NT	6	NT
BH6	0.2 - 0.3 m	14/07/2019	7	NT	<0.4	17	30	NT	0.2	2	<25	1840	<0.2	<0.5	<1	<3	<1	23	<0.001	4.2	NT	36	NT	23	NT	28	NT	32	NT	14	NT
BH7	1.0 - 1.1 m	12/07/2019	<4	NT	<0.4	2	4	NT	<0.1	1	<25	<50	<0.2	<0.5	<1	<3	<1	<0.05	NT	<0.1	NT	<0.1	NT	<0.1	NT	<0.1	NT	<0.2	NT	<0.1	NT
BH7	1.4 - 1.5 m	13/07/2019	<4	NT	<0.4	3	2	NT	<0.1	1	<25	<50	<0.2	<0.5	<1	<3	<1	<0.05	NT	<0.1	NT	<0.1	NT	<0.1	NT	<0.1	NT	<0.2	NT	<0.1	NT
BD120719	1.4 - 1.5 m	12/07/2019	<4	NT	<0.4	8	21	NT	<0.1	5	<25	<50	<0.2	<0.5	<1	<3	<1	1.6	<0.001	<0.1	NT	0.3	NT	0.3	NT	1.4	NT	2.4	NT	1	NT
BT1/200713	1.4 - 1.5 m	12/07/2019	<2	NT	<0.4	5.5	5.1	NT	<0.1	<1	<20	<50	<0.1	<0.1	<0.1	<0.3	<0.1	<0.5	<0.5	<0.5	NT	<0.5	NT	<0.5	NT	<0.5	NT	<0.5	NT	<0.5	NT
BH7	2.0 - 2.1 m	13/07/2019	<4	NT	<0.4	8	7	NT	<0.1	3	<25	<50	<0.2	<0.5	<1	<3	<1	<0.05	NT	<0.1	NT	<0.1	NT	<0.1	NT	<0.2	NT	<0.1	NT	<0.1	NT
BH8	0.2 - 0.3 m	14/07/2019	4	NT	<0.4	9	33	NT	0.1	12	<25	<50	<0.2	<0.5	<1	<3	<1	3.2	<0.001	<0.1	NT	0.1	NT	0.2	NT	1	NT	2	NT	0.8	NT
BH9	0.35 - 0.45 m	12/07/2019	<4	NT	<0.4	8	8	NT	<0.1	2	<25	<50	<0.2	<0.5	<1	<3	<1	0.2	NT	<0.1	NT	<0.1	NT	<0.1	NT	0.2	NT	0.3	NT	0.1	NT
BH9	0.65 - 0.75 m	12/07/2019	10	NT	<0.4	23	10	NT	0.2	1	<25	<50	<0.2	<0.5	<1	<3	<1	<0.05	NT	<0.1	NT	<0.1	NT	<0.1	NT	<0.1	NT	<0.2	NT	<0.1	NT

■ CT1 exceedance ■ TCLP1 and/or SCC1 exceedance ■ CT2 exceedance ■ TCLP2 and/or SCC2 exceedance ■ Asbestos detection
 NT = Not tested NC = No criteria AD = Asbestos detected NAD = No asbestos detected

Notes:

- a QACOC 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 Chlorophylls used as initial screen
- f All criteria are in the same units as the reported results
- g Published background levels
- h Excavated Natural Material Order (2014) Criteria
- PSL 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

			Fluorine	PCBs										Phenol		OPP		PCB		Asterisks										VOC																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																													
				TCDF	TCDF	TCDF	TCDF	TCDF	TCDF	TCDF	TCDF	TCDF	TCDF	TCDF	TCDF	TCDF	TCDF	TCDF	TCDF	TCDF	TCDF	TCDF	TCDF	TCDF	TCDF	TCDF	TCDF	TCDF	TCDF	TCDF	TCDF	TCDF	TCDF	TCDF	TCDF	TCDF	TCDF	TCDF	TCDF	TCDF	TCDF	TCDF	TCDF	TCDF	TCDF	TCDF	TCDF	TCDF	TCDF	TCDF	TCDF	TCDF	TCDF	TCDF	TCDF	TCDF	TCDF	TCDF	TCDF	TCDF	TCDF	TCDF	TCDF	TCDF	TCDF	TCDF	TCDF	TCDF	TCDF	TCDF	TCDF	TCDF	TCDF	TCDF	TCDF	TCDF	TCDF	TCDF	TCDF	TCDF	TCDF	TCDF	TCDF	TCDF	TCDF	TCDF	TCDF	TCDF	TCDF	TCDF	TCDF	TCDF	TCDF	TCDF	TCDF	TCDF	TCDF	TCDF	TCDF	TCDF	TCDF	TCDF	TCDF	TCDF	TCDF	TCDF	TCDF	TCDF	TCDF	TCDF	TCDF	TCDF	TCDF	TCDF	TCDF	TCDF	TCDF	TCDF	TCDF	TCDF	TCDF	TCDF	TCDF	TCDF	TCDF	TCDF	TCDF	TCDF	TCDF	TCDF	TCDF	TCDF	TCDF	TCDF	TCDF	TCDF	TCDF	TCDF	TCDF	TCDF	TCDF	TCDF	TCDF	TCDF	TCDF	TCDF	TCDF	TCDF	TCDF	TCDF	TCDF	TCDF	TCDF	TCDF	TCDF	TCDF	TCDF	TCDF	TCDF	TCDF	TCDF	TCDF	TCDF	TCDF	TCDF	TCDF	TCDF	TCDF	TCDF	TCDF	TCDF	TCDF	TCDF	TCDF	TCDF	TCDF	TCDF	TCDF	TCDF	TCDF	TCDF	TCDF	TCDF	TCDF	TCDF	TCDF	TCDF	TCDF	TCDF	TCDF	TCDF	TCDF	TCDF	TCDF	TCDF	TCDF	TCDF	TCDF	TCDF	TCDF	TCDF	TCDF	TCDF	TCDF	TCDF	TCDF	TCDF	TCDF	TCDF	TCDF	TCDF	TCDF	TCDF	TCDF	TCDF	TCDF	TCDF	TCDF	TCDF	TCDF	TCDF	TCDF	TCDF	TCDF	TCDF	TCDF	TCDF	TCDF	TCDF	TCDF	TCDF	TCDF	TCDF	TCDF	TCDF	TCDF	TCDF	TCDF	TCDF	TCDF	TCDF	TCDF	TCDF	TCDF	TCDF	TCDF	TCDF	TCDF	TCDF	TCDF	TCDF	TCDF	TCDF	TCDF	TCDF	TCDF	TCDF	TCDF	TCDF	TCDF	TCDF	TCDF	TCDF	TCDF	TCDF	TCDF	TCDF	TCDF	TCDF	TCDF	TCDF	TCDF	TCDF	TCDF	TCDF	TCDF	TCDF	TCDF	TCDF	TCDF	TCDF	TCDF	TCDF	TCDF	TCDF	TCDF	TCDF	TCDF	TCDF	TCDF	TCDF	TCDF	TCDF	TCDF	TCDF	TCDF	TCDF	TCDF	TCDF	TCDF	TCDF	TCDF	TCDF	TCDF	TCDF	TCDF	TCDF	TCDF	TCDF	TCDF	TCDF	TCDF	TCDF	TCDF	TCDF	TCDF	TCDF	TCDF	TCDF	TCDF	TCDF	TCDF	TCDF	TCDF	TCDF	TCDF	TCDF	TCDF	TCDF	TCDF	TCDF	TCDF	TCDF	TCDF	TCDF	TCDF	TCDF	TCDF	TCDF	TCDF	TCDF	TCDF	TCDF	TCDF	TCDF	TCDF	TCDF	TCDF	TCDF	TCDF	TCDF	TCDF	TCDF	TCDF	TCDF	TCDF	TCDF	TCDF	TCDF	TCDF	TCDF	TCDF	TCDF	TCDF	TCDF	TCDF	TCDF	TCDF	TCDF	TCDF	TCDF	TCDF	TCDF	TCDF	TCDF	TCDF	TCDF	TCDF	TCDF	TCDF	TCDF	TCDF	TCDF	TCDF	TCDF	TCDF	TCDF	TCDF	TCDF	TCDF	TCDF	TCDF	TCDF	TCDF	TCDF	TCDF	TCDF	TCDF	TCDF	TCDF	TCDF	TCDF	TCDF	TCDF	TCDF	TCDF	TCDF	TCDF	TCDF	TCDF	TCDF	TCDF	TCDF	TCDF	TCDF	TCDF	TCDF	TCDF	TCDF	TCDF	TCDF	TCDF	TCDF	TCDF	TCDF	TCDF	TCDF	TCDF	TCDF	TCDF	TCDF	TCDF	TCDF	TCDF	TCDF	TCDF	TCDF	TCDF	TCDF	TCDF	TCDF	TCDF	TCDF	TCDF	TCDF	TCDF	TCDF	TCDF	TCDF	TCDF	TCDF	TCDF	TCDF	TCDF	TCDF	TCDF	TCDF	TCDF	TCDF	TCDF	TCDF	TCDF	TCDF	TCDF	TCDF	TCDF	TCDF	TCDF	TCDF	TCDF	TCDF	TCDF	TCDF	TCDF	TCDF	TCDF	TCDF	TCDF	TCDF	TCDF	TCDF	TCDF	TCDF	TCDF	TCDF	TCDF	TCDF	TCDF	TCDF	TCDF	TCDF	TCDF	TCDF	TCDF	TCDF	TCDF	TCDF	TCDF	TCDF	TCDF	TCDF	TCDF	TCDF	TCDF	TCDF	TCDF	TCDF	TCDF	TCDF	TCDF	TCDF	TCDF	TCDF	TCDF	TCDF	TCDF	TCDF	TCDF	TCDF	TCDF	TCDF	TCDF	TCDF	TCDF	TCDF	TCDF	TCDF	TCDF	TCDF	TCDF	TCDF	TCDF	TCDF	TCDF	TCDF	TCDF	TCDF	TCDF	TCDF	TCDF	TCDF	TCDF	TCDF	TCDF	TCDF	TCDF	TCDF	TCDF	TCDF	TCDF	TCDF	TCDF	TCDF	TCDF	TCDF	TCDF	TCDF	TCDF	TCDF	TCDF	TCDF	TCDF	TCDF	TCDF	TCDF	TCDF	TCDF	TCDF	TCDF	TCDF	TCDF	TCDF	TCDF	TCDF	TCDF	TCDF	TCDF	TCDF	TCDF	TCDF	TCDF	TCDF	TCDF	TCDF	TCDF	TCDF	TCDF	TCDF	TCDF	TCDF	TCDF	TCDF	TCDF	TCDF	TCDF	TCDF	TCDF	TCDF	TCDF	TCDF	TCDF	TCDF	TCDF	TCDF	TCDF	TCDF	TCDF	TCDF	TCDF	TCDF	TCDF	TCDF	TCDF	TCDF	TCDF	TCDF	TCDF	TCDF	TCDF	TCDF	TCDF	TCDF	TCDF	TCDF	TCDF	TCDF	TCDF	TCDF	TCDF	TCDF	TCDF	TCDF	TCDF	TCDF	TCDF	TCDF	TCDF	TCDF	TCDF	TCDF	TCDF	TCDF	TCDF	TCDF	TCDF	TCDF	TCDF	TCDF	TCDF	TCDF	TCDF	TCDF	TCDF	TCDF	TCDF	TCDF	TCDF	TCDF	TCDF	TCDF	TCDF	TCDF	TCDF	TCDF	TCDF	TCDF	TCDF	TCDF	TCDF	TCDF	TCDF	TCDF	TCDF	TCDF	TCDF	TCDF	TCDF	TCDF	TCDF	TCDF	TCDF	TCDF	TCDF	TCDF	TCDF	TCDF	TCDF	TCDF	TCDF	TCDF	TCDF	TCDF	TCDF	TCDF	TCDF	TCDF	TCDF	TCDF	TCDF	TCDF	TCDF	TCDF	TCDF	TCDF	TCDF	TCDF	TCDF	TCDF	TCDF	TCDF	TCDF	TCDF	TCDF	TCDF	TCDF	TCDF	TCDF	TCDF	TCDF	TCDF	TCDF	TCDF	TCDF	TCDF	TCDF	TCDF	TCDF	TCDF	TCDF	TCDF	TCDF	TCDF	TCDF	TCDF	TCDF	TCDF	TCDF	TCDF	TCDF	TCDF	TCDF	TCDF	TCDF	TCDF	TCDF	TCDF	TCDF	TCDF	TCDF	TCDF	TCDF	TCDF	TCDF	TCDF	TCDF	TCDF	TCDF	TCDF	TCDF	TCDF	TCDF	TCDF	TCDF	TCDF	TCDF	TCDF	TCDF	TCDF	TCDF	TCDF	TCDF	TCDF	TCDF	TCDF	TCDF	TCDF	TCDF	TCDF	TCDF	TCDF	TCDF	TCDF	TCDF	TCDF	TCDF	TCDF	TCDF	TCDF	TCDF	TCDF	TCDF	TCDF	TCDF	TCDF	TCDF	TCDF	TCDF	TCDF	TCDF	TCDF	TCDF	TCDF	TCDF	TCDF	TCDF	TCDF	TCDF	TCDF	TCDF	TCDF	TCDF	TCDF	TCDF	TCDF	TCDF	TCDF	TCDF	TCDF	TCDF	TCDF	TCDF	TCDF	TCDF	TCDF	TCDF	TCDF	TCDF	TCDF	TCDF	TCDF	TCDF	TCDF	TCDF	TCDF	TCDF	TCDF	TCDF	TCDF	TCDF	TCDF	TCDF	TCDF	TCDF	TCDF	TCDF	TCDF	TCDF	TCDF	TCDF	TCDF	TCDF	TCDF	TCDF	TCDF	TCDF	TCDF	TCDF	TCDF	TCDF	TCDF	TCDF	TCDF	TCDF	TCDF	TCDF	TCDF	TCDF	TCDF	TCDF	TCDF	TCDF	TCDF	TCDF	TCDF	TCDF	TCDF	TCDF	TCDF	TCDF	TCDF	TCDF	TCDF	TCDF	TCDF	TCDF	TCDF	TCDF	TCDF	TCDF	TCDF	TCDF	TCDF	TCDF	TCDF	TCDF	TCDF	TCDF	TCDF	TCDF	TCDF	TCDF	TCDF	TCDF	TCDF	TCDF	TCDF	TCDF	TCDF	TCDF	TCDF	TCDF	TCDF	TCDF	TCDF	TCDF	TCDF	TCDF	TCDF	TCDF	TCDF	TCDF	TCDF	TCDF	TCDF	TCDF	TCDF	TCDF	TCDF	TCDF	TCDF	TCDF	TCDF	TCDF	TCDF	TCDF	TCDF	TCDF	TCDF	TCDF

NT = Not tested NC = No c NT = Not tested NC = No criteria AD = Asbestos detected NAD = No asbestos detected

a	QA/QC replicates 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 Chloryfluor used as initial screen
f	All criteria are in the same units as the reported results
g	Enriched background levels
h	Published National Material Order (2014) Criteria
i	Practical quantitation limit
PCL	
TCFL	NSW EPA, 2014, Waste Classification Guidelines Part 1: Classifying Waste, Maximum values of specific contaminant concentration (SCC) for classification without TCLP. General solid waste
SCFL1	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
SCFL2	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
SCFL3	NSW EPA, 2014, Waste Classification Guidelines Part 1: Classifying Waste, Maximum values of specific contaminant concentration (SCC) for classification without TCLP. Restricted solid waste
SCFL4	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
SCFL5	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

Appendix G

Chain of Custody, Sample Receipt Advice
and Certificate of Analysis Documentation

Project No: 86767.03		Suburb: Haymarket		To: Eurofins Mgt	
Project Name: HAYMARKET, SSI		Order Number: 152065			
Project Manager: WFY		Sampler: WFY		Attn:	
Emails: wenfei.yuan@douglaspartners.com.au				Phone:	
Date Required: Same day <input type="checkbox"/> 24 hours <input type="checkbox"/> 48 hours <input type="checkbox"/> 72 hours <input type="checkbox"/> Standard <input type="checkbox"/>				Email:	
Prior Storage: <input type="checkbox"/> Esky <input type="checkbox"/> Fridge <input type="checkbox"/> Shelved		Do samples contain 'potential' HBM? Yes <input type="checkbox"/> No <input type="checkbox"/> (If YES, then handle, transport and store in accordance with FPM HAZID)			

Sample ID	Lab ID	Date Sampled	Sample Type		Container Type		Analytes				Notes
			S - soil W - water	G - glass P - plastic	HM						
BD1/070420		08/04/20	S	G	X						
PQL (S) mg/kg											ANZECC PQLs req'd for all water analytes
PQL = practical quantitation limit. If none given, default to Laboratory Method Detection Limit											Lab Report/Reference No:
Metals to Analyse: 8HM unless specified here:											
Total number of samples in container:			Relinquished by: WFY		Transported to laboratory by:						
Send Results to: Douglas Partners Pty Ltd			Address: 96 Hermitage Road, West Ryde		Phone: 9809 0999						
Signed:			Received by: Anson Lee					Date & Time: 3/6/20 1:05 PM			

Relinquished by EM 590
C. marenz
3/6/20 1100
cm

3.90°C #723460

Login

From: Andrew (Fitzy) Fitzsimons
Sent: Tuesday, 2 June 2020 6:25 PM
To: Login
Subject: FW: Extra Soil Sample
Attachments: Chain of Custody Despatch Sheet_YHA_inter-lab.xlsm

Can we send sample 240692-11 to Eurofins with this COC please.

Cheers,

Kind Regards,

Andrew (Fitzy) Fitzsimons | Customer Service | Envirolab Services Pty Ltd

Celebrating 15 years of Great Science. Great Service.

12 Ashley Street Chatswood NSW 2067

T 612 9910 6200 F 612 9910 6201

E afitzsimons@envirolab.com.au | W www.envirolab.com.au

[View reduced sampling bottle provision for PFAS in water](#) | [COVID-19 Update](#)

Please note that all samples submitted to the Envirolab Group laboratories will be analysed under the Envirolab Group Terms and Conditions. The Terms and Conditions are accessible by clicking this link

From: Wen-Fei Yuan <WenFei.Yuan@douglaspartners.com.au>
Sent: Tuesday, 2 June 2020 3:44 PM
To: Andrew (Fitzy) Fitzsimons <AFitzsimons@envirolab.com.au>; Nancy Zhang <NZhang@envirolab.com.au>
Cc: Alyssa Spencer <Alyssa.Spencer@douglaspartners.com.au>; Customer Service <customerservice@envirolab.com.au>
Subject: RE: Extra Soil Sample

Hi Andrew,

In that case, please submit soil sample BD1/070420 to Eurofins Mgt for analysis of heavy metals. An electronic copy of the COC is attached.

Regards

Wen-Fei Yuan | 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 8878 0693 | M: 0448 280 782 | E: WenFei.Yuan@douglaspartners.com.au



**CLIENT CHOICE
2020 WINNER**

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

Sample Receipt Advice

Company name: **Douglas Partners (Syd)**
Contact name: **Wen-Fei Yuan**
Project name: **HAYMARKET SSI**
Project ID: **86767.03**
COC number: **Not provided**
Turn around time: **5 Day**
Date/Time received: **Jun 3, 2020 1:05 PM**
Eurofins reference: **723460**

Sample information

- ☒ A detailed list of analytes logged into our LIMS, is included in the attached summary table.
- ☒ All samples have been received as described on the above COC.
- ☒ COC has been completed correctly.
- ☒ Attempt to chill was evident.
- ☒ Appropriately preserved sample containers have been used.
- ☒ All samples were received in good condition.
- ☒ Samples have been provided with adequate time to commence analysis in accordance with the relevant holding times.
- ☒ Appropriate sample containers have been used.
- ☐ Split sample sent to requested external lab.
- ☐ Some samples have been subcontracted.
- N/A Custody Seals intact (if used).

Contact notes

If you have any questions with respect to these samples please contact:

Ursula Long on Phone : or by e.mail: UrsulaLong@eurofins.com

Results will be delivered electronically via e.mail to Wen-Fei Yuan - wenfei.yuan@douglaspartners.com.au.

Douglas Partners (Syd)
96 Hermitage Road
West Ryde
NSW 2114



NATA Accredited
Accreditation Number 1261
Site Number 18217

Accredited for compliance with ISO/IEC 17025 – Testing
 The results of the tests, calibrations and/or
 measurements included in this document are traceable
 to Australian/national standards.

Attention: **Wen-Fei Yuan**

Report **723460-S**
 Project name **HAYMARKET SSI**
 Project ID **86767.03**
 Received Date **Jun 03, 2020**

Client Sample ID			BD1/070420
Sample Matrix			Soil
Eurofins Sample No.			S20-Jn05470
Date Sampled			Apr 08, 2020
Test/Reference	LOR	Unit	
Heavy Metals			
Arsenic	2	mg/kg	10
Cadmium	0.4	mg/kg	0.8
Chromium	5	mg/kg	20
Copper	5	mg/kg	110
Lead	5	mg/kg	460
Mercury	0.1	mg/kg	1.3
Nickel	5	mg/kg	17
Zinc	5	mg/kg	400
% Moisture	1	%	10

Sample History

Where samples are submitted/analysed over several days, the last date of extraction and analysis is reported.

A recent review of our LIMS has resulted in the correction or clarification of some method identifications. Due to this, some of the method reference information on reports has changed. However, no substantive change has been made to our laboratory methods, and as such there is no change in the validity of current or previous results.

If the date and time of sampling are not provided, the Laboratory will not be responsible for compromised results should testing be performed outside the recommended holding time.

Description	Testing Site	Extracted	Holding Time
Metals M8	Sydney	Jun 04, 2020	180 Days
- Method: LTM-MET-3040 Metals in Waters, Soils & Sediments by ICP-MS			
% Moisture	Sydney	Jun 03, 2020	14 Days
- Method: LTM-GEN-7080 Moisture			

Australia

Melbourne
6 Monterey Road
Dandenong South VIC 3175
Phone : +61 3 8564 5000
NATA # 1261
Site # 1254 & 14271

Sydney
Unit F3, Building F
16 Mars Road
Lane Cove West NSW 2066
Phone : +61 2 9900 8400
NATA # 1261 Site # 18217

Brisbane
1/21 Smallwood Place
Murarrie QLD 4172
Phone : +61 7 3902 4600
NATA # 1261 Site # 20794

Perth
2/91 Leach Highway
Kewdale WA 6105
Phone : +61 8 9251 9600
NATA # 1261
Site # 23736

New Zealand

Auckland
35 O'Rorke Road
Penrose, Auckland 1061
Phone : +64 9 526 45 51
IANZ # 1327

Christchurch
43 Detroit Drive
Rolleston, Christchurch 7675
Phone : 0800 856 450
IANZ # 1290

ABN – 50 005 085 521

web : www.eurofins.com.au

e.mail : EnviroSales@eurofins.com

Company Name: Douglas Partners (Syd)
Address: 96 Hermitage Road
West Ryde
NSW 2114

Project Name: HAYMARKET SSI
Project ID: 86767.03

Order No.: 152065
Report #: 723460
Phone: 02 9809 0666
Fax:

Received: Jun 3, 2020 1:05 PM
Due: Jun 11, 2020
Priority: 5 Day
Contact Name: Wen-Fei Yuan

Eurofins Analytical Services Manager : Ursula Long

Sample Detail

Metals M8

Moisture Set

Melbourne Laboratory - NATA Site # 1254 & 14271

Sydney Laboratory - NATA Site # 18217

Brisbane Laboratory - NATA Site # 20794

Perth Laboratory - NATA Site # 23736

External Laboratory

No	Sample ID	Sample Date	Sampling Time	Matrix	LAB ID		
1	BD1/070420	Apr 08, 2020		Soil	S20-Jn05470	X	X
Test Counts						1	1

Internal Quality Control Review and Glossary

General

1. Laboratory QC results for Method Blanks, Duplicates, Matrix Spikes, and Laboratory Control Samples follows guidelines delineated in the National Environment Protection (Assessment of Site Contamination) Measure 1999, as amended May 2013 and are included in this QC report where applicable. Additional QC data may be available on request.
2. All soil/sediment/solid results are reported on a dry basis, unless otherwise stated.
3. All biota/food results are reported on a wet weight basis on the edible portion, unless otherwise stated.
4. Actual LORs are matrix dependant. Quoted LORs may be raised where sample extracts are diluted due to interferences.
5. Results are uncorrected for matrix spikes or surrogate recoveries except for PFAS compounds.
6. SVOC analysis on waters are performed on homogenised, unfiltered samples, unless noted otherwise.
7. Samples were analysed on an 'as received' basis.
8. Information identified on this report with blue colour, indicates data provided by customer, that may have an impact on the results.
9. This report replaces any interim results previously issued.

Holding Times

Please refer to 'Sample Preservation and Container Guide' for holding times (QS3001).

For samples received on the last day of holding time, notification of testing requirements should have been received at least 6 hours prior to sample receipt deadlines as stated on the SRA.

If the Laboratory did not receive the information in the required timeframe, and regardless of any other integrity issues, suitably qualified results may still be reported.

Holding times apply from the date of sampling, therefore compliance to these may be outside the laboratory's control.

For VOCs containing vinyl chloride, styrene and 2-chloroethyl vinyl ether the holding time is 7 days however for all other VOCs such as BTEX or C6-10 TRH then the holding time is 14 days.

****NOTE:** pH duplicates are reported as a range NOT as RPD

Units

mg/kg: milligrams per kilogram

mg/L: milligrams per litre

ug/L: micrograms per litre

ppm: Parts per million

ppb: Parts per billion

%: Percentage

org/100mL: Organisms per 100 millilitres

NTU: Nephelometric Turbidity Units

MPN/100mL: Most Probable Number of organisms per 100 millilitres

Terms

Dry	Where a moisture has been determined on a solid sample the result is expressed on a dry basis.
LOR	Limit of Reporting.
SPIKE	Addition of the analyte to the sample and reported as percentage recovery.
RPD	Relative Percent Difference between two Duplicate pieces of analysis.
LCS	Laboratory Control Sample - reported as percent recovery.
CRM	Certified Reference Material - reported as percent recovery.
Method Blank	In the case of solid samples these are performed on laboratory certified clean sands and in the case of water samples these are performed on de-ionised water.
Surr - Surrogate	The addition of a like compound to the analyte target and reported as percentage recovery.
Duplicate	A second piece of analysis from the same sample and reported in the same units as the result to show comparison.
USEPA	United States Environmental Protection Agency
APHA	American Public Health Association
TCLP	Toxicity Characteristic Leaching Procedure
COC	Chain of Custody
SRA	Sample Receipt Advice
QSM	US Department of Defense Quality Systems Manual Version 5.3
CP	Client Parent - QC was performed on samples pertaining to this report
NC	Non-Client Parent - QC performed on samples not pertaining to this report, QC is representative of the sequence or batch that client samples were analysed within.
TEQ	Toxic Equivalency Quotient

QC - Acceptance Criteria

RPD Duplicates: Global RPD Duplicates Acceptance Criteria is 30% however the following acceptance guidelines are equally applicable:

Results <10 times the LOR : No Limit

Results between 10-20 times the LOR : RPD must lie between 0-50%

Results >20 times the LOR : RPD must lie between 0-30%

Surrogate Recoveries: Recoveries must lie between 20-130% Phenols & 50-150% PFASs

PFAS field samples that contain surrogate recoveries in excess of the QC limit designated in QSM 5.3 where no positive PFAS results have been reported have been reviewed and no data was affected.

WA DWER (n=10): PFBA, PFPeA, PFHxA, PFHpA, PFOA, PFBS, PFHxS, PFOS, 6:2 FTSA, 8:2 FTSA

QC Data General Comments

1. Where a result is reported as a less than (<), higher than the nominated LOR, this is due to either matrix interference, extract dilution required due to interferences or contaminant levels within the sample, high moisture content or insufficient sample provided.
2. Duplicate data shown within this report that states the word "BATCH" is a Batch Duplicate from outside of your sample batch, but within the laboratory sample batch at a 1:10 ratio. The Parent and Duplicate data shown is not data from your samples.
3. Organochlorine Pesticide analysis - where reporting LCS data, Toxaphene & Chlordane are not added to the LCS.
4. Organochlorine Pesticide analysis - where reporting Spike data, Toxaphene is not added to the Spike.
5. Total Recoverable Hydrocarbons - where reporting Spike & LCS data, a single spike of commercial Hydrocarbon products in the range of C12-C30 is added and it's Total Recovery is reported in the C10-C14 cell of the Report.
6. pH and Free Chlorine analysed in the laboratory - Analysis on this test must begin within 30 minutes of sampling. Therefore laboratory analysis is unlikely to be completed within holding time. Analysis will begin as soon as possible after sample receipt.
7. Recovery Data (Spikes & Surrogates) - where chromatographic interference does not allow the determination of Recovery the term "INT" appears against that analyte.
8. Polychlorinated Biphenyls are spiked only using Aroclor 1260 in Matrix Spikes and LCS.
9. For Matrix Spikes and LCS results a dash " - " in the report means that the specific analyte was not added to the QC sample.
10. Duplicate RPDs are calculated from raw analytical data thus it is possible to have two sets of data.

Quality Control Results

Test			Units	Result 1			Acceptance Limits	Pass Limits	Qualifying Code
Method Blank									
Heavy Metals									
Arsenic			mg/kg	< 2			2	Pass	
Cadmium			mg/kg	< 0.4			0.4	Pass	
Chromium			mg/kg	< 5			5	Pass	
Copper			mg/kg	< 5			5	Pass	
Lead			mg/kg	< 5			5	Pass	
Mercury			mg/kg	< 0.1			0.1	Pass	
Nickel			mg/kg	< 5			5	Pass	
Zinc			mg/kg	< 5			5	Pass	
LCS - % Recovery									
Heavy Metals									
Arsenic			%	100			70-130	Pass	
Cadmium			%	103			70-130	Pass	
Chromium			%	106			70-130	Pass	
Copper			%	106			70-130	Pass	
Lead			%	109			70-130	Pass	
Mercury			%	97			70-130	Pass	
Nickel			%	106			70-130	Pass	
Zinc			%	102			70-130	Pass	
Test	Lab Sample ID	QA Source	Units	Result 1			Acceptance Limits	Pass Limits	Qualifying Code
Spike - % Recovery									
Heavy Metals									
				Result 1					
Arsenic	N20-Jn05338	NCP	%	105			70-130	Pass	
Cadmium	N20-Jn05338	NCP	%	108			70-130	Pass	
Chromium	N20-Jn05338	NCP	%	109			70-130	Pass	
Copper	N20-Jn05338	NCP	%	103			70-130	Pass	
Lead	N20-Jn05338	NCP	%	107			70-130	Pass	
Mercury	N20-Jn05338	NCP	%	106			70-130	Pass	
Nickel	N20-Jn05338	NCP	%	107			70-130	Pass	
Zinc	N20-Jn05338	NCP	%	101			70-130	Pass	
Test	Lab Sample ID	QA Source	Units	Result 1			Acceptance Limits	Pass Limits	Qualifying Code
Duplicate									
Heavy Metals									
				Result 1	Result 2	RPD			
Arsenic	S20-Jn06217	NCP	mg/kg	3.3	6.2	61	30%	Fail	Q15
Cadmium	S20-Jn06217	NCP	mg/kg	< 0.4	< 0.4	<1	30%	Pass	
Chromium	S20-Jn06217	NCP	mg/kg	9.9	13	29	30%	Pass	
Copper	S20-Jn06217	NCP	mg/kg	130	120	6.0	30%	Pass	
Lead	S20-Jn06217	NCP	mg/kg	16	17	11	30%	Pass	
Mercury	S20-Jn06217	NCP	mg/kg	< 0.1	< 0.1	<1	30%	Pass	
Nickel	S20-Jn06217	NCP	mg/kg	10	8.9	15	30%	Pass	
Zinc	S20-Jn06217	NCP	mg/kg	42	40	6.0	30%	Pass	
Duplicate									
				Result 1	Result 2	RPD			
% Moisture	B20-Jn05522	NCP	%	< 1	< 1	<1	30%	Pass	

Comments

Sample Integrity

Custody Seals Intact (if used)	N/A
Attempt to Chill was evident	Yes
Sample correctly preserved	Yes
Appropriate sample containers have been used	Yes
Sample containers for volatile analysis received with minimal headspace	Yes
Samples received within HoldingTime	Yes
Some samples have been subcontracted	No

Qualifier Codes/Comments

Code	Description
Q15	The RPD reported passes Eurofins Environment Testing's QC - Acceptance Criteria as defined in the Internal Quality Control Review and Glossary page of this report.

Authorised By

Ursula Long	Analytical Services Manager
Gabriele Cordero	Senior Analyst-Metal (NSW)



Glenn Jackson

General Manager

Final report - this Report replaces any previously issued Report

- Indicates Not Requested

* Indicates NATA accreditation does not cover the performance of this service

Measurement uncertainty of test data is available on request or please [click here](#).

Eurofins shall not be liable for loss, cost, damages or expenses incurred by the client, or any other person or company, resulting from the use of any information or interpretation given in this report. In no case shall Eurofins be liable for consequential damages including, but not limited to, lost profits, damages for failure to meet deadlines and lost production arising from this report. This document shall not be reproduced except in full and relates only to the items tested. Unless indicated otherwise, the tests were performed on the samples as received.

Sample Receipt Advice

Company name: **Douglas Partners (Syd)**
Contact name: **Wen-Fei Yuan**
Project name: **HAYMARKET 810 LEE STREET SSI**
Project ID: **86767.03**
COC number: **Not provided**
Turn around time: **5 Day**
Date/Time received: **May 21, 2020 1:25 PM**
Eurofins reference: **720825**

Sample information

- ☒ A detailed list of analytes logged into our LIMS, is included in the attached summary table.
- ☒ All samples have been received as described on the above COC.
- ☒ COC has been completed correctly.
- ☒ Attempt to chill was evident.
- ☒ Appropriately preserved sample containers have been used.
- ☒ All samples were received in good condition.
- ☒ Samples have been provided with adequate time to commence analysis in accordance with the relevant holding times.
- ☒ Appropriate sample containers have been used.
- ☐ Split sample sent to requested external lab.
- ☐ Some samples have been subcontracted.
- N/A Custody Seals intact (if used).

Contact notes

If you have any questions with respect to these samples please contact:

Ursula Long on Phone : or by e.mail: UrsulaLong@eurofins.com

Results will be delivered electronically via e.mail to Wen-Fei Yuan - wenfei.yuan@douglaspartners.com.au.

Australia

Melbourne
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Phone : +61 2 9900 8400
NATA # 1261 Site # 18217

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1/21 Smallwood Place
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NATA # 1261 Site # 20794

Perth
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Kewdale WA 6105
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Site # 23736

New Zealand

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Rolleston, Christchurch 7675
Phone : 0800 856 450
IANZ # 1290

ABN – 50 005 085 521

web : www.eurofins.com.au

e.mail : EnviroSales@eurofins.com

Company Name: Douglas Partners (Syd)
Address: 96 Hermitage Road
West Ryde
NSW 2114

Project Name: HAYMARKET 810 LEE STREET SSI
Project ID: 86767.03

Order No.:
Report #: 720825
Phone: 02 9809 0666
Fax:

Received: May 21, 2020 1:25 PM
Due: May 28, 2020
Priority: 5 Day
Contact Name: Wen-Fei Yuan

Eurofins Analytical Services Manager : Ursula Long

Sample Detail

Moisture Set

Eurofins | mgt Suite B7

Melbourne Laboratory - NATA Site # 1254 & 14271

Sydney Laboratory - NATA Site # 18217

Brisbane Laboratory - NATA Site # 20794

Perth Laboratory - NATA Site # 23736

External Laboratory

No	Sample ID	Sample Date	Sampling Time	Matrix	LAB ID		
1	BD1/20200517	May 17, 2020		Soil	S20-My30275	X	X

Test Counts

1 1

Douglas Partners (Syd)
96 Hermitage Road
West Ryde
NSW 2114



NATA Accredited
Accreditation Number 1261
Site Number 18217

Accredited for compliance with ISO/IEC 17025 – Testing
 The results of the tests, calibrations and/or
 measurements included in this document are traceable
 to Australian/national standards.

Attention: **Wen-Fei Yuan**

Report **720825-S**
Project name **HAYMARKET 810 LEE STREET SSI**
Project ID **86767.03**
Received Date **May 21, 2020**

Client Sample ID			BD1/20200517
Sample Matrix			Soil
Eurofins Sample No.			S20-My30275
Date Sampled			May 17, 2020
Test/Reference	LOR	Unit	
Total Recoverable Hydrocarbons - 1999 NEPM Fractions			
TRH C6-C9	20	mg/kg	< 20
TRH C10-C14	20	mg/kg	< 20
TRH C15-C28	50	mg/kg	< 50
TRH C29-C36	50	mg/kg	< 50
TRH C10-C36 (Total)	50	mg/kg	< 50
BTEX			
Benzene	0.1	mg/kg	< 0.1
Toluene	0.1	mg/kg	< 0.1
Ethylbenzene	0.1	mg/kg	< 0.1
m&p-Xylenes	0.2	mg/kg	< 0.2
o-Xylene	0.1	mg/kg	< 0.1
Xylenes - Total*	0.3	mg/kg	< 0.3
4-Bromofluorobenzene (surr.)	1	%	104
Total Recoverable Hydrocarbons - 2013 NEPM Fractions			
Naphthalene ^{N02}	0.5	mg/kg	< 0.5
TRH C6-C10	20	mg/kg	< 20
TRH C6-C10 less BTEX (F1) ^{N04}	20	mg/kg	< 20
TRH >C10-C16	50	mg/kg	< 50
TRH >C10-C16 less Naphthalene (F2) ^{N01}	50	mg/kg	< 50
TRH >C16-C34	100	mg/kg	< 100
TRH >C34-C40	100	mg/kg	< 100
TRH >C10-C40 (total)*	100	mg/kg	< 100
Polycyclic Aromatic Hydrocarbons			
Benzo(a)pyrene TEQ (lower bound) *	0.5	mg/kg	< 0.5
Benzo(a)pyrene TEQ (medium bound) *	0.5	mg/kg	0.6
Benzo(a)pyrene TEQ (upper bound) *	0.5	mg/kg	1.2
Acenaphthene	0.5	mg/kg	< 0.5
Acenaphthylene	0.5	mg/kg	< 0.5
Anthracene	0.5	mg/kg	< 0.5
Benz(a)anthracene	0.5	mg/kg	< 0.5
Benzo(a)pyrene	0.5	mg/kg	< 0.5
Benzo(b&j)fluoranthene ^{N07}	0.5	mg/kg	< 0.5
Benzo(g,h,i)perylene	0.5	mg/kg	< 0.5
Benzo(k)fluoranthene	0.5	mg/kg	< 0.5
Chrysene	0.5	mg/kg	< 0.5

Client Sample ID			BD1/20200517
Sample Matrix			Soil
Eurofins Sample No.			S20-My30275
Date Sampled			May 17, 2020
Test/Reference	LOR	Unit	
Polycyclic Aromatic Hydrocarbons			
Dibenz(a,h)anthracene	0.5	mg/kg	< 0.5
Fluoranthene	0.5	mg/kg	< 0.5
Fluorene	0.5	mg/kg	< 0.5
Indeno(1.2.3-cd)pyrene	0.5	mg/kg	< 0.5
Naphthalene	0.5	mg/kg	< 0.5
Phenanthrene	0.5	mg/kg	< 0.5
Pyrene	0.5	mg/kg	< 0.5
Total PAH*	0.5	mg/kg	< 0.5
2-Fluorobiphenyl (surr.)	1	%	93
p-Terphenyl-d14 (surr.)	1	%	102
Heavy Metals			
Arsenic	2	mg/kg	3.6
Cadmium	0.4	mg/kg	< 0.4
Chromium	5	mg/kg	8.2
Copper	5	mg/kg	9.9
Lead	5	mg/kg	16
Mercury	0.1	mg/kg	< 0.1
Nickel	5	mg/kg	< 5
Zinc	5	mg/kg	< 5
% Moisture	1	%	16

Sample History

Where samples are submitted/analysed over several days, the last date of extraction and analysis is reported.
A recent review of our LIMS has resulted in the correction or clarification of some method identifications. Due to this, some of the method reference information on reports has changed. However, no substantive change has been made to our laboratory methods, and as such there is no change in the validity of current or previous results.

If the date and time of sampling are not provided, the Laboratory will not be responsible for compromised results should testing be performed outside the recommended holding time.

Description	Testing Site	Extracted	Holding Time
Total Recoverable Hydrocarbons - 1999 NEPM Fractions - Method: LTM-ORG-2010 TRH C6-C40	Sydney	May 25, 2020	14 Days
BTEX - Method: LTM-ORG-2010 TRH C6-C40	Sydney	May 25, 2020	14 Days
Total Recoverable Hydrocarbons - 2013 NEPM Fractions - Method: LTM-ORG-2010 TRH C6-C40	Sydney	May 25, 2020	14 Days
Total Recoverable Hydrocarbons - 2013 NEPM Fractions - Method: LTM-ORG-2010 TRH C6-C40	Sydney	May 25, 2020	
Polycyclic Aromatic Hydrocarbons - Method: LTM-ORG-2130 PAH and Phenols in Soil and Water	Sydney	May 25, 2020	14 Days
Metals M8 - Method: LTM-MET-3040 Metals in Waters, Soils & Sediments by ICP-MS	Sydney	May 25, 2020	180 Days
% Moisture - Method: LTM-GEN-7080 Moisture	Sydney	May 21, 2020	14 Days

Australia

Melbourne
6 Monterey Road
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Phone : +61 3 8564 5000
NATA # 1261
Site # 1254 & 14271

Sydney
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Phone : +61 2 9900 8400
NATA # 1261 Site # 18217

Brisbane
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Phone : +61 7 3902 4600
NATA # 1261 Site # 20794

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Penrose, Auckland 1061
Phone : +64 9 526 45 51
IANZ # 1327

Christchurch
43 Detroit Drive
Rolleston, Christchurch 7675
Phone : 0800 856 450
IANZ # 1290

Company Name: Douglas Partners (Syd)
Address: 96 Hermitage Road
West Ryde
NSW 2114

Project Name: HAYMARKET 810 LEE STREET SSI
Project ID: 86767.03

Order No.:
Report #: 720825
Phone: 02 9809 0666
Fax:

Received: May 21, 2020 1:25 PM
Due: May 28, 2020
Priority: 5 Day
Contact Name: Wen-Fei Yuan

Eurofins Analytical Services Manager : Ursula Long

Sample Detail

Moisture Set

Eurofins | mgt Suite B7

Melbourne Laboratory - NATA Site # 1254 & 14271

Sydney Laboratory - NATA Site # 18217

Brisbane Laboratory - NATA Site # 20794

Perth Laboratory - NATA Site # 23736

External Laboratory

No	Sample ID	Sample Date	Sampling Time	Matrix	LAB ID		
1	BD1/20200517	May 17, 2020		Soil	S20-My30275	X	X

Test Counts

1 1

Internal Quality Control Review and Glossary

General

- Laboratory QC results for Method Blanks, Duplicates, Matrix Spikes, and Laboratory Control Samples follows guidelines delineated in the National Environment Protection (Assessment of Site Contamination) Measure 1999, as amended May 2013 and are included in this QC report where applicable. Additional QC data may be available on request.
- All soil/sediment/solid results are reported on a dry basis, unless otherwise stated.
- All biota/food results are reported on a wet weight basis on the edible portion, unless otherwise stated.
- Actual LORs are matrix dependant. Quoted LORs may be raised where sample extracts are diluted due to interferences.
- Results are uncorrected for matrix spikes or surrogate recoveries except for PFAS compounds.
- SVOC analysis on waters are performed on homogenised, unfiltered samples, unless noted otherwise.
- Samples were analysed on an 'as received' basis.
- Information identified on this report with blue colour, indicates data provided by customer, that may have an impact on the results.
- This report replaces any interim results previously issued.

Holding Times

Please refer to 'Sample Preservation and Container Guide' for holding times (QS3001).

For samples received on the last day of holding time, notification of testing requirements should have been received at least 6 hours prior to sample receipt deadlines as stated on the SRA.

If the Laboratory did not receive the information in the required timeframe, and regardless of any other integrity issues, suitably qualified results may still be reported.

Holding times apply from the date of sampling, therefore compliance to these may be outside the laboratory's control.

For VOCs containing vinyl chloride, styrene and 2-chloroethyl vinyl ether the holding time is 7 days however for all other VOCs such as BTEX or C6-10 TRH then the holding time is 14 days.

****NOTE:** pH duplicates are reported as a range NOT as RPD

Units

mg/kg: milligrams per kilogram

mg/L: milligrams per litre

ug/L: micrograms per litre

ppm: Parts per million

ppb: Parts per billion

%: Percentage

org/100mL: Organisms per 100 millilitres

NTU: Nephelometric Turbidity Units

MPN/100mL: Most Probable Number of organisms per 100 millilitres

Terms

Dry	Where a moisture has been determined on a solid sample the result is expressed on a dry basis.
LOR	Limit of Reporting.
SPIKE	Addition of the analyte to the sample and reported as percentage recovery.
RPD	Relative Percent Difference between two Duplicate pieces of analysis.
LCS	Laboratory Control Sample - reported as percent recovery.
CRM	Certified Reference Material - reported as percent recovery.
Method Blank	In the case of solid samples these are performed on laboratory certified clean sands and in the case of water samples these are performed on de-ionised water.
Surr - Surrogate	The addition of a like compound to the analyte target and reported as percentage recovery.
Duplicate	A second piece of analysis from the same sample and reported in the same units as the result to show comparison.
USEPA	United States Environmental Protection Agency
APHA	American Public Health Association
TCLP	Toxicity Characteristic Leaching Procedure
COC	Chain of Custody
SRA	Sample Receipt Advice
QSM	US Department of Defense Quality Systems Manual Version 5.3
CP	Client Parent - QC was performed on samples pertaining to this report
NC	Non-Client Parent - QC performed on samples not pertaining to this report, QC is representative of the sequence or batch that client samples were analysed within.
TEQ	Toxic Equivalency Quotient

QC - Acceptance Criteria

RPD Duplicates: Global RPD Duplicates Acceptance Criteria is 30% however the following acceptance guidelines are equally applicable:

Results <10 times the LOR : No Limit

Results between 10-20 times the LOR : RPD must lie between 0-50%

Results >20 times the LOR : RPD must lie between 0-30%

Surrogate Recoveries: Recoveries must lie between 20-130% Phenols & 50-150% PFASs

PFAS field samples that contain surrogate recoveries in excess of the QC limit designated in QSM 5.3 where no positive PFAS results have been reported have been reviewed and no data was affected.

WA DWER (n=10): PFBA, PFPeA, PFHxA, PFHpA, PFOA, PFBS, PFHxS, PFOS, 6:2 FTSA, 8:2 FTSA

QC Data General Comments

- Where a result is reported as a less than (<), higher than the nominated LOR, this is due to either matrix interference, extract dilution required due to interferences or contaminant levels within the sample, high moisture content or insufficient sample provided.
- Duplicate data shown within this report that states the word "BATCH" is a Batch Duplicate from outside of your sample batch, but within the laboratory sample batch at a 1:10 ratio. The Parent and Duplicate data shown is not data from your samples.
- Organochlorine Pesticide analysis - where reporting LCS data, Toxaphene & Chlordane are not added to the LCS.
- Organochlorine Pesticide analysis - where reporting Spike data, Toxaphene is not added to the Spike.
- Total Recoverable Hydrocarbons - where reporting Spike & LCS data, a single spike of commercial Hydrocarbon products in the range of C12-C30 is added and it's Total Recovery is reported in the C10-C14 cell of the Report.
- pH and Free Chlorine analysed in the laboratory - Analysis on this test must begin within 30 minutes of sampling. Therefore laboratory analysis is unlikely to be completed within holding time. Analysis will begin as soon as possible after sample receipt.
- Recovery Data (Spikes & Surrogates) - where chromatographic interference does not allow the determination of Recovery the term "INT" appears against that analyte.
- Polychlorinated Biphenyls are spiked only using Aroclor 1260 in Matrix Spikes and LCS.
- For Matrix Spikes and LCS results a dash " - " in the report means that the specific analyte was not added to the QC sample.
- Duplicate RPDs are calculated from raw analytical data thus it is possible to have two sets of data.

Quality Control Results

Test	Units	Result 1			Acceptance Limits	Pass Limits	Qualifying Code
Method Blank							
Total Recoverable Hydrocarbons - 1999 NEPM Fractions							
TRH C6-C9	mg/kg	< 20			20	Pass	
TRH C10-C14	mg/kg	< 20			20	Pass	
TRH C15-C28	mg/kg	< 50			50	Pass	
TRH C29-C36	mg/kg	< 50			50	Pass	
Method Blank							
BTEX							
Benzene	mg/kg	< 0.1			0.1	Pass	
Toluene	mg/kg	< 0.1			0.1	Pass	
Ethylbenzene	mg/kg	< 0.1			0.1	Pass	
m&p-Xylenes	mg/kg	< 0.2			0.2	Pass	
o-Xylene	mg/kg	< 0.1			0.1	Pass	
Xylenes - Total*	mg/kg	< 0.3			0.3	Pass	
Method Blank							
Total Recoverable Hydrocarbons - 2013 NEPM Fractions							
Naphthalene	mg/kg	< 0.5			0.5	Pass	
TRH C6-C10	mg/kg	< 20			20	Pass	
TRH >C10-C16	mg/kg	< 50			50	Pass	
TRH >C16-C34	mg/kg	< 100			100	Pass	
TRH >C34-C40	mg/kg	< 100			100	Pass	
Method Blank							
Polycyclic Aromatic Hydrocarbons							
Acenaphthene	mg/kg	< 0.5			0.5	Pass	
Acenaphthylene	mg/kg	< 0.5			0.5	Pass	
Anthracene	mg/kg	< 0.5			0.5	Pass	
Benz(a)anthracene	mg/kg	< 0.5			0.5	Pass	
Benzo(a)pyrene	mg/kg	< 0.5			0.5	Pass	
Benzo(b&j)fluoranthene	mg/kg	< 0.5			0.5	Pass	
Benzo(g,h,i)perylene	mg/kg	< 0.5			0.5	Pass	
Benzo(k)fluoranthene	mg/kg	< 0.5			0.5	Pass	
Chrysene	mg/kg	< 0.5			0.5	Pass	
Dibenz(a,h)anthracene	mg/kg	< 0.5			0.5	Pass	
Fluoranthene	mg/kg	< 0.5			0.5	Pass	
Fluorene	mg/kg	< 0.5			0.5	Pass	
Indeno(1,2,3-cd)pyrene	mg/kg	< 0.5			0.5	Pass	
Naphthalene	mg/kg	< 0.5			0.5	Pass	
Phenanthrene	mg/kg	< 0.5			0.5	Pass	
Pyrene	mg/kg	< 0.5			0.5	Pass	
Method Blank							
Heavy Metals							
Arsenic	mg/kg	< 2			2	Pass	
Cadmium	mg/kg	< 0.4			0.4	Pass	
Chromium	mg/kg	< 5			5	Pass	
Copper	mg/kg	< 5			5	Pass	
Lead	mg/kg	< 5			5	Pass	
Mercury	mg/kg	< 0.1			0.1	Pass	
Nickel	mg/kg	< 5			5	Pass	
Zinc	mg/kg	< 5			5	Pass	
LCS - % Recovery							
Heavy Metals							
Arsenic	%	96			70-130	Pass	

Test			Units	Result 1			Acceptance Limits	Pass Limits	Qualifying Code
Cadmium			%	97			70-130	Pass	
Chromium			%	100			70-130	Pass	
Copper			%	103			70-130	Pass	
Lead			%	101			70-130	Pass	
Mercury			%	98			70-130	Pass	
Nickel			%	102			70-130	Pass	
Zinc			%	98			70-130	Pass	
Test	Lab Sample ID	QA Source	Units	Result 1			Acceptance Limits	Pass Limits	Qualifying Code
Spike - % Recovery									
Total Recoverable Hydrocarbons - 1999 NEPM Fractions				Result 1					
TRH C6-C9	S20-My35836	NCP	%	78			70-130	Pass	
TRH C10-C14	S20-My38776	NCP	%	126			70-130	Pass	
Spike - % Recovery									
BTEX				Result 1					
Benzene	S20-My32603	NCP	%	88			70-130	Pass	
Toluene	S20-My32603	NCP	%	91			70-130	Pass	
Ethylbenzene	S20-My32603	NCP	%	97			70-130	Pass	
m&p-Xylenes	S20-My32603	NCP	%	102			70-130	Pass	
o-Xylene	S20-My32603	NCP	%	106			70-130	Pass	
Xylenes - Total*	S20-My32603	NCP	%	103			70-130	Pass	
Spike - % Recovery									
Total Recoverable Hydrocarbons - 2013 NEPM Fractions				Result 1					
Naphthalene	S20-My32603	NCP	%	95			70-130	Pass	
TRH C6-C10	S20-My35836	NCP	%	84			70-130	Pass	
TRH >C10-C16	S20-My38776	NCP	%	130			70-130	Pass	
Spike - % Recovery									
Polycyclic Aromatic Hydrocarbons				Result 1					
Acenaphthene	S20-My29854	NCP	%	98			70-130	Pass	
Acenaphthylene	S20-My29854	NCP	%	98			70-130	Pass	
Anthracene	S20-My29854	NCP	%	96			70-130	Pass	
Benz(a)anthracene	S20-My29854	NCP	%	101			70-130	Pass	
Benzo(a)pyrene	S20-My29854	NCP	%	96			70-130	Pass	
Benzo(b&j)fluoranthene	S20-My29854	NCP	%	97			70-130	Pass	
Benzo(g,h,i)perylene	S20-My29854	NCP	%	103			70-130	Pass	
Benzo(k)fluoranthene	S20-My29854	NCP	%	95			70-130	Pass	
Chrysene	S20-My29854	NCP	%	103			70-130	Pass	
Dibenz(a,h)anthracene	S20-My29854	NCP	%	99			70-130	Pass	
Fluoranthene	S20-My29854	NCP	%	106			70-130	Pass	
Fluorene	S20-My29854	NCP	%	98			70-130	Pass	
Indeno(1,2,3-cd)pyrene	S20-My29854	NCP	%	95			70-130	Pass	
Naphthalene	S20-My29854	NCP	%	95			70-130	Pass	
Phenanthrene	S20-My29854	NCP	%	98			70-130	Pass	
Pyrene	S20-My29854	NCP	%	106			70-130	Pass	
Spike - % Recovery									
Heavy Metals				Result 1					
Arsenic	S20-My30399	NCP	%	103			70-130	Pass	
Cadmium	S20-My30399	NCP	%	103			70-130	Pass	
Chromium	S20-My30399	NCP	%	106			70-130	Pass	
Copper	S20-My30399	NCP	%	107			70-130	Pass	
Lead	S20-My30399	NCP	%	102			70-130	Pass	
Mercury	S20-My30399	NCP	%	107			70-130	Pass	
Nickel	S20-My30399	NCP	%	109			70-130	Pass	
Zinc	S20-My30399	NCP	%	96			70-130	Pass	

Test	Lab Sample ID	QA Source	Units	Result 1	Result 2	RPD	Acceptance Limits	Pass Limits	Qualifying Code
Duplicate									
Total Recoverable Hydrocarbons - 1999 NEPM Fractions				Result 1	Result 2	RPD			
TRH C6-C9	S20-My30098	NCP	mg/kg	< 20	< 20	<1	30%	Pass	
TRH C10-C14	S20-My33188	NCP	mg/kg	< 20	< 20	<1	30%	Pass	
TRH C15-C28	S20-My33188	NCP	mg/kg	77	74	5.0	30%	Pass	
TRH C29-C36	S20-My33188	NCP	mg/kg	77	60	24	30%	Pass	
Duplicate									
BTEX				Result 1	Result 2	RPD			
Benzene	S20-My30098	NCP	mg/kg	< 0.1	< 0.1	<1	30%	Pass	
Toluene	S20-My30098	NCP	mg/kg	< 0.1	< 0.1	<1	30%	Pass	
Ethylbenzene	S20-My30098	NCP	mg/kg	< 0.1	< 0.1	<1	30%	Pass	
m&p-Xylenes	S20-My30098	NCP	mg/kg	< 0.2	< 0.2	<1	30%	Pass	
o-Xylene	S20-My30098	NCP	mg/kg	< 0.1	< 0.1	<1	30%	Pass	
Xylenes - Total*	S20-My30098	NCP	mg/kg	< 0.3	< 0.3	<1	30%	Pass	
Duplicate									
Total Recoverable Hydrocarbons - 2013 NEPM Fractions				Result 1	Result 2	RPD			
Naphthalene	S20-My30098	NCP	mg/kg	< 0.5	< 0.5	<1	30%	Pass	
TRH C6-C10	S20-My30098	NCP	mg/kg	< 20	< 20	<1	30%	Pass	
TRH >C10-C16	S20-My33188	NCP	mg/kg	< 50	< 50	<1	30%	Pass	
TRH >C16-C34	S20-My33188	NCP	mg/kg	110	< 100	13	30%	Pass	
TRH >C34-C40	S20-My33188	NCP	mg/kg	< 100	< 100	<1	30%	Pass	
Duplicate									
Polycyclic Aromatic Hydrocarbons				Result 1	Result 2	RPD			
Acenaphthene	S20-My34573	NCP	mg/kg	< 0.5	< 0.5	<1	30%	Pass	
Acenaphthylene	S20-My34573	NCP	mg/kg	< 0.5	< 0.5	<1	30%	Pass	
Anthracene	S20-My34573	NCP	mg/kg	< 0.5	< 0.5	<1	30%	Pass	
Benz(a)anthracene	S20-My34573	NCP	mg/kg	< 0.5	< 0.5	<1	30%	Pass	
Benzo(a)pyrene	S20-My34573	NCP	mg/kg	< 0.5	< 0.5	<1	30%	Pass	
Benzo(b&j)fluoranthene	S20-My34573	NCP	mg/kg	< 0.5	< 0.5	<1	30%	Pass	
Benzo(g,h,i)perylene	S20-My34573	NCP	mg/kg	< 0.5	< 0.5	<1	30%	Pass	
Benzo(k)fluoranthene	S20-My34573	NCP	mg/kg	< 0.5	< 0.5	<1	30%	Pass	
Chrysene	S20-My34573	NCP	mg/kg	< 0.5	< 0.5	<1	30%	Pass	
Dibenz(a,h)anthracene	S20-My34573	NCP	mg/kg	< 0.5	< 0.5	<1	30%	Pass	
Fluoranthene	S20-My34573	NCP	mg/kg	< 0.5	< 0.5	<1	30%	Pass	
Fluorene	S20-My34573	NCP	mg/kg	< 0.5	< 0.5	<1	30%	Pass	
Indeno(1,2,3-cd)pyrene	S20-My34573	NCP	mg/kg	< 0.5	< 0.5	<1	30%	Pass	
Naphthalene	S20-My34573	NCP	mg/kg	< 0.5	< 0.5	<1	30%	Pass	
Phenanthrene	S20-My34573	NCP	mg/kg	< 0.5	< 0.5	<1	30%	Pass	
Pyrene	S20-My34573	NCP	mg/kg	< 0.5	< 0.5	<1	30%	Pass	
Duplicate									
Heavy Metals				Result 1	Result 2	RPD			
Arsenic	S20-My30425	NCP	mg/kg	3.0	2.7	11	30%	Pass	
Cadmium	S20-My30425	NCP	mg/kg	< 0.4	< 0.4	<1	30%	Pass	
Chromium	S20-My30425	NCP	mg/kg	9.6	8.2	16	30%	Pass	
Copper	S20-My30425	NCP	mg/kg	6.3	5.4	16	30%	Pass	
Lead	S20-My30425	NCP	mg/kg	11	12	9.0	30%	Pass	
Mercury	S20-My30425	NCP	mg/kg	< 0.1	< 0.1	<1	30%	Pass	
Nickel	S20-My30425	NCP	mg/kg	11	9.5	18	30%	Pass	
Zinc	S20-My30425	NCP	mg/kg	56	51	8.0	30%	Pass	
Duplicate									
				Result 1	Result 2	RPD			
% Moisture	S20-My30258	NCP	%	7.0	7.6	9.0	30%	Pass	

Comments

Sample Integrity

Custody Seals Intact (if used)	N/A
Attempt to Chill was evident	Yes
Sample correctly preserved	Yes
Appropriate sample containers have been used	Yes
Sample containers for volatile analysis received with minimal headspace	Yes
Samples received within HoldingTime	Yes
Some samples have been subcontracted	No

Qualifier Codes/Comments

Code	Description
N01	F2 is determined by arithmetically subtracting the "naphthalene" value from the ">C10-C16" value. The naphthalene value used in this calculation is obtained from volatiles (Purge & Trap analysis).
N02	Where we have reported both volatile (P&T GCMS) and semivolatile (GCMS) naphthalene data, results may not be identical. Provided correct sample handling protocols have been followed, any observed differences in results are likely to be due to procedural differences within each methodology. Results determined by both techniques have passed all QAQC acceptance criteria, and are entirely technically valid.
N04	F1 is determined by arithmetically subtracting the "Total BTEX" value from the "C6-C10" value. The "Total BTEX" value is obtained by summing the concentrations of BTEX analytes. The "C6-C10" value is obtained by quantitating against a standard of mixed aromatic/aliphatic analytes.
N07	Please note:- These two PAH isomers closely co-elute using the most contemporary analytical methods and both the reported concentration (and the TEQ) apply specifically to the total of the two co-eluting PAHs

Authorised By

Ursula Long	Analytical Services Manager
Andrew Sullivan	Senior Analyst-Organic (NSW)
Gabriele Cordero	Senior Analyst-Metal (NSW)



Glenn Jackson General Manager

Final report - this Report replaces any previously issued Report

- Indicates Not Requested

* Indicates NATA accreditation does not cover the performance of this service

Measurement uncertainty of test data is available on request or please [click here](#).

Eurofins shall not be liable for loss, cost, damages or expenses incurred by the client, or any other person or company, resulting from the use of any information or interpretation given in this report. In no case shall Eurofins be liable for consequential damages including, but not limited to, lost profits, damages for failure to meet deadlines and lost production arising from this report. This document shall not be reproduced except in full and relates only to the items tested. Unless indicated otherwise, the tests were performed on the samples as received.

Sample Receipt Advice

Company name: **Douglas Partners (Syd)**
Contact name: **Wen-Fei Yuan**
Project name: **HAYMARKET SSI**
Project ID: **86767.03**
COC number: **Not provided**
Turn around time: **5 Day**
Date/Time received: **Apr 21, 2020 11:15 AM**
Eurofins reference: **714766**

Sample information

- ☒ A detailed list of analytes logged into our LIMS, is included in the attached summary table.
- ☒ All samples have been received as described on the above COC.
- ☒ COC has been completed correctly.
- ☒ Attempt to chill was evident.
- ☒ Appropriately preserved sample containers have been used.
- ☒ All samples were received in good condition.
- ☒ Samples have been provided with adequate time to commence analysis in accordance with the relevant holding times.
- ☒ Appropriate sample containers have been used.
- ☐ Split sample sent to requested external lab.
- ☐ Some samples have been subcontracted.
- N/A Custody Seals intact (if used).

Contact notes

If you have any questions with respect to these samples please contact:

Ursula Long on Phone : or by e.mail: UrsulaLong@eurofins.com

Results will be delivered electronically via e.mail to Wen-Fei Yuan - wenfei.yuan@douglaspartners.com.au.

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Site # 1254 & 14271

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NATA # 1261 Site # 18217

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NATA # 1261 Site # 20794

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IANZ # 1327

Christchurch
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Phone : 0800 856 450
IANZ # 1290

Company Name: Douglas Partners (Syd)
Address: 96 Hermitage Road
West Ryde
NSW 2114

Project Name: HAYMARKET SSI
Project ID: 86767.03

Order No.:
Report #: 714766
Phone: 02 9809 0666
Fax:

Received: Apr 21, 2020 11:15 AM
Due: Apr 28, 2020
Priority: 5 Day
Contact Name: Wen-Fei Yuan

Eurofins Analytical Services Manager : Ursula Long

Sample Detail

Moisture Set

Eurofins | mgt Suite B7

Melbourne Laboratory - NATA Site # 1254 & 14271

Sydney Laboratory - NATA Site # 18217

Brisbane Laboratory - NATA Site # 20794

Perth Laboratory - NATA Site # 23736

External Laboratory

No	Sample ID	Sample Date	Sampling Time	Matrix	LAB ID		
1	BD2/140420	Apr 14, 2020		Soil	S20-Ap28975	X	X

Test Counts

1 1

Douglas Partners (Syd)
96 Hermitage Road
West Ryde
NSW 2114



NATA Accredited
Accreditation Number 1261
Site Number 18217

Accredited for compliance with ISO/IEC 17025 – Testing
 The results of the tests, calibrations and/or
 measurements included in this document are traceable
 to Australian/national standards.

Attention: **Wen-Fei Yuan**

Report **714766-S**
Project name **HAYMARKET SSI**
Project ID **86767.03**
Received Date **Apr 21, 2020**

Client Sample ID			BD2/140420
Sample Matrix			Soil
Eurofins Sample No.			S20-Ap28975
Date Sampled			Apr 14, 2020
Test/Reference	LOR	Unit	
Total Recoverable Hydrocarbons - 1999 NEPM Fractions			
TRH C6-C9	20	mg/kg	< 20
TRH C10-C14	20	mg/kg	< 20
TRH C15-C28	50	mg/kg	< 50
TRH C29-C36	50	mg/kg	< 50
TRH C10-C36 (Total)	50	mg/kg	< 50
BTEX			
Benzene	0.1	mg/kg	< 0.1
Toluene	0.1	mg/kg	< 0.1
Ethylbenzene	0.1	mg/kg	< 0.1
m&p-Xylenes	0.2	mg/kg	< 0.2
o-Xylene	0.1	mg/kg	< 0.1
Xylenes - Total*	0.3	mg/kg	< 0.3
4-Bromofluorobenzene (surr.)	1	%	120
Total Recoverable Hydrocarbons - 2013 NEPM Fractions			
Naphthalene ^{N02}	0.5	mg/kg	< 0.5
TRH C6-C10	20	mg/kg	< 20
TRH C6-C10 less BTEX (F1) ^{N04}	20	mg/kg	< 20
TRH >C10-C16	50	mg/kg	< 50
TRH >C10-C16 less Naphthalene (F2) ^{N01}	50	mg/kg	< 50
TRH >C16-C34	100	mg/kg	< 100
TRH >C34-C40	100	mg/kg	< 100
TRH >C10-C40 (total)*	100	mg/kg	< 100
Polycyclic Aromatic Hydrocarbons			
Benzo(a)pyrene TEQ (lower bound) *	0.5	mg/kg	< 0.5
Benzo(a)pyrene TEQ (medium bound) *	0.5	mg/kg	0.7
Benzo(a)pyrene TEQ (upper bound) *	0.5	mg/kg	1.2
Acenaphthene	0.5	mg/kg	< 0.5
Acenaphthylene	0.5	mg/kg	< 0.5
Anthracene	0.5	mg/kg	< 0.5
Benz(a)anthracene	0.5	mg/kg	0.6
Benzo(a)pyrene	0.5	mg/kg	< 0.5
Benzo(b&j)fluoranthene ^{N07}	0.5	mg/kg	< 0.5
Benzo(g,h,i)perylene	0.5	mg/kg	< 0.5
Benzo(k)fluoranthene	0.5	mg/kg	0.6
Chrysene	0.5	mg/kg	< 0.5

Client Sample ID			BD2/140420
Sample Matrix			Soil
Eurofins Sample No.			S20-Ap28975
Date Sampled			Apr 14, 2020
Test/Reference	LOR	Unit	
Polycyclic Aromatic Hydrocarbons			
Dibenz(a,h)anthracene	0.5	mg/kg	< 0.5
Fluoranthene	0.5	mg/kg	0.9
Fluorene	0.5	mg/kg	< 0.5
Indeno(1.2.3-cd)pyrene	0.5	mg/kg	< 0.5
Naphthalene	0.5	mg/kg	< 0.5
Phenanthrene	0.5	mg/kg	< 0.5
Pyrene	0.5	mg/kg	0.9
Total PAH*	0.5	mg/kg	3
2-Fluorobiphenyl (surr.)	1	%	100
p-Terphenyl-d14 (surr.)	1	%	114
Heavy Metals			
Arsenic	2	mg/kg	8.3
Cadmium	0.4	mg/kg	< 0.4
Chromium	5	mg/kg	11
Copper	5	mg/kg	32
Lead	5	mg/kg	23
Mercury	0.1	mg/kg	< 0.1
Nickel	5	mg/kg	9.9
Zinc	5	mg/kg	56
% Moisture	1	%	13

Sample History

Where samples are submitted/analysed over several days, the last date of extraction and analysis is reported.

A recent review of our LIMS has resulted in the correction or clarification of some method identifications. Due to this, some of the method reference information on reports has changed. However, no substantive change has been made to our laboratory methods, and as such there is no change in the validity of current or previous results.

If the date and time of sampling are not provided, the Laboratory will not be responsible for compromised results should testing be performed outside the recommended holding time.

Description	Testing Site	Extracted	Holding Time
Total Recoverable Hydrocarbons - 1999 NEPM Fractions - Method: LTM-ORG-2010 TRH C6-C40	Sydney	Apr 27, 2020	14 Days
BTEX - Method: LTM-ORG-2010 TRH C6-C40	Sydney	Apr 27, 2020	14 Days
Total Recoverable Hydrocarbons - 2013 NEPM Fractions - Method: LTM-ORG-2010 TRH C6-C40	Sydney	Apr 27, 2020	14 Days
Total Recoverable Hydrocarbons - 2013 NEPM Fractions - Method: LTM-ORG-2010 TRH C6-C40	Sydney	Apr 27, 2020	
Polycyclic Aromatic Hydrocarbons - Method: LTM-ORG-2130 PAH and Phenols in Soil and Water	Sydney	Apr 27, 2020	14 Days
Metals M8 - Method: LTM-MET-3040 Metals in Waters, Soils & Sediments by ICP-MS	Sydney	Apr 27, 2020	180 Days
% Moisture - Method: LTM-GEN-7080 Moisture	Sydney	Apr 21, 2020	14 Days

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Phone : 0800 856 450
IANZ # 1290

Company Name: Douglas Partners (Syd)
Address: 96 Hermitage Road
West Ryde
NSW 2114

Project Name: HAYMARKET SSI
Project ID: 86767.03

Order No.:
Report #: 714766
Phone: 02 9809 0666
Fax:

Received: Apr 21, 2020 11:15 AM
Due: Apr 28, 2020
Priority: 5 Day
Contact Name: Wen-Fei Yuan

Eurofins Analytical Services Manager : Ursula Long

Sample Detail

Moisture Set

Eurofins | mgt Suite B7

Melbourne Laboratory - NATA Site # 1254 & 14271

Sydney Laboratory - NATA Site # 18217

Brisbane Laboratory - NATA Site # 20794

Perth Laboratory - NATA Site # 23736

External Laboratory

No	Sample ID	Sample Date	Sampling Time	Matrix	LAB ID		
1	BD2/140420	Apr 14, 2020		Soil	S20-Ap28975	X	X

Test Counts

1 1

Internal Quality Control Review and Glossary

General

1. Laboratory QC results for Method Blanks, Duplicates, Matrix Spikes, and Laboratory Control Samples follows guidelines delineated in the National Environment Protection (Assessment of Site Contamination) Measure 1999, as amended May 2013 and are included in this QC report where applicable. Additional QC data may be available on request.
2. All soil/sediment/solid results are reported on a dry basis, unless otherwise stated.
3. All biota/food results are reported on a wet weight basis on the edible portion, unless otherwise stated.
4. Actual LORs are matrix dependant. Quoted LORs may be raised where sample extracts are diluted due to interferences.
5. Results are uncorrected for matrix spikes or surrogate recoveries except for PFAS compounds.
6. SVOC analysis on waters are performed on homogenised, unfiltered samples, unless noted otherwise.
7. Samples were analysed on an 'as received' basis.
8. Information identified on this report with blue colour, indicates data provided by customer, that may have an impact on the results.
9. This report replaces any interim results previously issued.

Holding Times

Please refer to 'Sample Preservation and Container Guide' for holding times (QS3001).

For samples received on the last day of holding time, notification of testing requirements should have been received at least 6 hours prior to sample receipt deadlines as stated on the SRA.

If the Laboratory did not receive the information in the required timeframe, and regardless of any other integrity issues, suitably qualified results may still be reported.

Holding times apply from the date of sampling, therefore compliance to these may be outside the laboratory's control.

For VOCs containing vinyl chloride, styrene and 2-chloroethyl vinyl ether the holding time is 7 days however for all other VOCs such as BTEX or C6-10 TRH then the holding time is 14 days.

****NOTE:** pH duplicates are reported as a range NOT as RPD

Units

mg/kg: milligrams per kilogram

mg/L: milligrams per litre

ug/L: micrograms per litre

ppm: Parts per million

ppb: Parts per billion

%: Percentage

org/100mL: Organisms per 100 millilitres

NTU: Nephelometric Turbidity Units

MPN/100mL: Most Probable Number of organisms per 100 millilitres

Terms

Dry	Where a moisture has been determined on a solid sample the result is expressed on a dry basis.
LOR	Limit of Reporting.
SPIKE	Addition of the analyte to the sample and reported as percentage recovery.
RPD	Relative Percent Difference between two Duplicate pieces of analysis.
LCS	Laboratory Control Sample - reported as percent recovery.
CRM	Certified Reference Material - reported as percent recovery.
Method Blank	In the case of solid samples these are performed on laboratory certified clean sands and in the case of water samples these are performed on de-ionised water.
Surr - Surrogate	The addition of a like compound to the analyte target and reported as percentage recovery.
Duplicate	A second piece of analysis from the same sample and reported in the same units as the result to show comparison.
USEPA	United States Environmental Protection Agency
APHA	American Public Health Association
TCLP	Toxicity Characteristic Leaching Procedure
COC	Chain of Custody
SRA	Sample Receipt Advice
QSM	US Department of Defense Quality Systems Manual Version 5.3
CP	Client Parent - QC was performed on samples pertaining to this report
NC	Non-Client Parent - QC performed on samples not pertaining to this report, QC is representative of the sequence or batch that client samples were analysed within.
TEQ	Toxic Equivalency Quotient

QC - Acceptance Criteria

RPD Duplicates: Global RPD Duplicates Acceptance Criteria is 30% however the following acceptance guidelines are equally applicable:

Results <10 times the LOR : No Limit

Results between 10-20 times the LOR : RPD must lie between 0-50%

Results >20 times the LOR : RPD must lie between 0-30%

Surrogate Recoveries: Recoveries must lie between 20-130% Phenols & 50-150% PFASs

PFAS field samples that contain surrogate recoveries in excess of the QC limit designated in QSM 5.3 where no positive PFAS results have been reported have been reviewed and no data was affected.

WA DWER (n=10): PFBA, PFPeA, PFHxA, PFHpA, PFOA, PFBS, PFHxS, PFOS, 6:2 FTSA, 8:2 FTSA

QC Data General Comments

1. Where a result is reported as a less than (<), higher than the nominated LOR, this is due to either matrix interference, extract dilution required due to interferences or contaminant levels within the sample, high moisture content or insufficient sample provided.
2. Duplicate data shown within this report that states the word "BATCH" is a Batch Duplicate from outside of your sample batch, but within the laboratory sample batch at a 1:10 ratio. The Parent and Duplicate data shown is not data from your samples.
3. Organochlorine Pesticide analysis - where reporting LCS data, Toxaphene & Chlordane are not added to the LCS.
4. Organochlorine Pesticide analysis - where reporting Spike data, Toxaphene is not added to the Spike.
5. Total Recoverable Hydrocarbons - where reporting Spike & LCS data, a single spike of commercial Hydrocarbon products in the range of C12-C30 is added and it's Total Recovery is reported in the C10-C14 cell of the Report.
6. pH and Free Chlorine analysed in the laboratory - Analysis on this test must begin within 30 minutes of sampling. Therefore laboratory analysis is unlikely to be completed within holding time. Analysis will begin as soon as possible after sample receipt.
7. Recovery Data (Spikes & Surrogates) - where chromatographic interference does not allow the determination of Recovery the term "INT" appears against that analyte.
8. Polychlorinated Biphenyls are spiked only using Aroclor 1260 in Matrix Spikes and LCS.
9. For Matrix Spikes and LCS results a dash " - " in the report means that the specific analyte was not added to the QC sample.
10. Duplicate RPDs are calculated from raw analytical data thus it is possible to have two sets of data.

Quality Control Results

Test	Units	Result 1			Acceptance Limits	Pass Limits	Qualifying Code
Method Blank							
Total Recoverable Hydrocarbons - 1999 NEPM Fractions							
TRH C6-C9	mg/kg	< 20			20	Pass	
TRH C10-C14	mg/kg	< 20			20	Pass	
TRH C15-C28	mg/kg	< 50			50	Pass	
TRH C29-C36	mg/kg	< 50			50	Pass	
Method Blank							
BTEX							
Benzene	mg/kg	< 0.1			0.1	Pass	
Toluene	mg/kg	< 0.1			0.1	Pass	
Ethylbenzene	mg/kg	< 0.1			0.1	Pass	
m&p-Xylenes	mg/kg	< 0.2			0.2	Pass	
o-Xylene	mg/kg	< 0.1			0.1	Pass	
Xylenes - Total*	mg/kg	< 0.3			0.3	Pass	
Method Blank							
Total Recoverable Hydrocarbons - 2013 NEPM Fractions							
Naphthalene	mg/kg	< 0.5			0.5	Pass	
TRH C6-C10	mg/kg	< 20			20	Pass	
TRH >C10-C16	mg/kg	< 50			50	Pass	
TRH >C16-C34	mg/kg	< 100			100	Pass	
TRH >C34-C40	mg/kg	< 100			100	Pass	
Method Blank							
Polycyclic Aromatic Hydrocarbons							
Acenaphthene	mg/kg	< 0.5			0.5	Pass	
Acenaphthylene	mg/kg	< 0.5			0.5	Pass	
Anthracene	mg/kg	< 0.5			0.5	Pass	
Benz(a)anthracene	mg/kg	< 0.5			0.5	Pass	
Benzo(a)pyrene	mg/kg	< 0.5			0.5	Pass	
Benzo(b&j)fluoranthene	mg/kg	< 0.5			0.5	Pass	
Benzo(g,h,i)perylene	mg/kg	< 0.5			0.5	Pass	
Benzo(k)fluoranthene	mg/kg	< 0.5			0.5	Pass	
Chrysene	mg/kg	< 0.5			0.5	Pass	
Dibenz(a,h)anthracene	mg/kg	< 0.5			0.5	Pass	
Fluoranthene	mg/kg	< 0.5			0.5	Pass	
Fluorene	mg/kg	< 0.5			0.5	Pass	
Indeno(1,2,3-cd)pyrene	mg/kg	< 0.5			0.5	Pass	
Naphthalene	mg/kg	< 0.5			0.5	Pass	
Phenanthrene	mg/kg	< 0.5			0.5	Pass	
Pyrene	mg/kg	< 0.5			0.5	Pass	
Method Blank							
Heavy Metals							
Arsenic	mg/kg	< 2			2	Pass	
Cadmium	mg/kg	< 0.4			0.4	Pass	
Chromium	mg/kg	< 5			5	Pass	
Copper	mg/kg	< 5			5	Pass	
Lead	mg/kg	< 5			5	Pass	
Mercury	mg/kg	< 0.1			0.1	Pass	
Nickel	mg/kg	< 5			5	Pass	
Zinc	mg/kg	< 5			5	Pass	
LCS - % Recovery							
Total Recoverable Hydrocarbons - 1999 NEPM Fractions							
TRH C6-C9	%	107			70-130	Pass	

Test			Units	Result 1			Acceptance Limits	Pass Limits	Qualifying Code
TRH C10-C14			%	98			70-130	Pass	
LCS - % Recovery									
BTEX									
Benzene			%	109			70-130	Pass	
Toluene			%	109			70-130	Pass	
Ethylbenzene			%	116			70-130	Pass	
m&p-Xylenes			%	123			70-130	Pass	
o-Xylene			%	127			70-130	Pass	
Xylenes - Total*			%	124			70-130	Pass	
LCS - % Recovery									
Total Recoverable Hydrocarbons - 2013 NEPM Fractions									
Naphthalene			%	122			70-130	Pass	
TRH C6-C10			%	112			70-130	Pass	
TRH >C10-C16			%	95			70-130	Pass	
LCS - % Recovery									
Polycyclic Aromatic Hydrocarbons									
Acenaphthene			%	100			70-130	Pass	
Acenaphthylene			%	93			70-130	Pass	
Anthracene			%	91			70-130	Pass	
Benz(a)anthracene			%	95			70-130	Pass	
Benzo(a)pyrene			%	94			70-130	Pass	
Benzo(b&j)fluoranthene			%	95			70-130	Pass	
Benzo(g,h,i)perylene			%	89			70-130	Pass	
Benzo(k)fluoranthene			%	108			70-130	Pass	
Chrysene			%	103			70-130	Pass	
Dibenz(a,h)anthracene			%	96			70-130	Pass	
Fluoranthene			%	88			70-130	Pass	
Fluorene			%	102			70-130	Pass	
Indeno(1.2.3-cd)pyrene			%	86			70-130	Pass	
Naphthalene			%	105			70-130	Pass	
Phenanthrene			%	100			70-130	Pass	
Pyrene			%	88			70-130	Pass	
LCS - % Recovery									
Heavy Metals									
Arsenic			%	97			70-130	Pass	
Cadmium			%	95			70-130	Pass	
Chromium			%	93			70-130	Pass	
Copper			%	93			70-130	Pass	
Lead			%	94			70-130	Pass	
Mercury			%	96			70-130	Pass	
Nickel			%	93			70-130	Pass	
Zinc			%	91			70-130	Pass	
Test	Lab Sample ID	QA Source	Units	Result 1			Acceptance Limits	Pass Limits	Qualifying Code
Spike - % Recovery									
Total Recoverable Hydrocarbons - 1999 NEPM Fractions				Result 1					
TRH C6-C9	S20-Ap29035	NCP	%	99			70-130	Pass	
TRH C10-C14	S20-Ap29035	NCP	%	80			70-130	Pass	
Spike - % Recovery									
BTEX				Result 1					
Benzene	S20-Ap29035	NCP	%	113			70-130	Pass	
Toluene	S20-Ap29035	NCP	%	114			70-130	Pass	
Ethylbenzene	S20-Ap29035	NCP	%	118			70-130	Pass	
m&p-Xylenes	S20-Ap29035	NCP	%	122			70-130	Pass	
o-Xylene	S20-Ap29035	NCP	%	124			70-130	Pass	

Test	Lab Sample ID	QA Source	Units	Result 1			Acceptance Limits	Pass Limits	Qualifying Code
Xylenes - Total*	S20-Ap29035	NCP	%	123			70-130	Pass	
Spike - % Recovery									
Total Recoverable Hydrocarbons - 2013 NEPM Fractions				Result 1					
Naphthalene	S20-Ap29035	NCP	%	114			70-130	Pass	
TRH C6-C10	S20-Ap29035	NCP	%	102			70-130	Pass	
TRH >C10-C16	S20-Ap29035	NCP	%	83			70-130	Pass	
Spike - % Recovery									
Heavy Metals				Result 1					
Arsenic	S20-Ap29035	NCP	%	97			70-130	Pass	
Cadmium	S20-Ap29035	NCP	%	99			70-130	Pass	
Chromium	S20-Ap29035	NCP	%	108			70-130	Pass	
Copper	S20-Ap29035	NCP	%	87			70-130	Pass	
Lead	S20-Ap29965	NCP	%	97			70-130	Pass	
Mercury	S20-Ap29035	NCP	%	104			70-130	Pass	
Nickel	S20-Ap29035	NCP	%	97			70-130	Pass	
Zinc	S20-Ap29279	NCP	%	120			70-130	Pass	
Test	Lab Sample ID	QA Source	Units	Result 1			Acceptance Limits	Pass Limits	Qualifying Code
Duplicate									
Total Recoverable Hydrocarbons - 1999 NEPM Fractions				Result 1	Result 2	RPD			
TRH C6-C9	S20-Ap28975	CP	mg/kg	< 20	< 20	<1	30%	Pass	
TRH C10-C14	S20-Ap30188	NCP	mg/kg	< 20	< 20	<1	30%	Pass	
TRH C15-C28	S20-Ap30188	NCP	mg/kg	< 50	< 50	<1	30%	Pass	
TRH C29-C36	S20-Ap30188	NCP	mg/kg	< 50	< 50	<1	30%	Pass	
Duplicate									
BTEX				Result 1	Result 2	RPD			
Benzene	S20-Ap28975	CP	mg/kg	< 0.1	< 0.1	<1	30%	Pass	
Toluene	S20-Ap28975	CP	mg/kg	< 0.1	< 0.1	<1	30%	Pass	
Ethylbenzene	S20-Ap28975	CP	mg/kg	< 0.1	< 0.1	<1	30%	Pass	
m&p-Xylenes	S20-Ap28975	CP	mg/kg	< 0.2	< 0.2	<1	30%	Pass	
o-Xylene	S20-Ap28975	CP	mg/kg	< 0.1	< 0.1	<1	30%	Pass	
Xylenes - Total*	S20-Ap28975	CP	mg/kg	< 0.3	< 0.3	<1	30%	Pass	
Duplicate									
Total Recoverable Hydrocarbons - 2013 NEPM Fractions				Result 1	Result 2	RPD			
Naphthalene	S20-Ap28975	CP	mg/kg	< 0.5	< 0.5	<1	30%	Pass	
TRH C6-C10	S20-Ap28975	CP	mg/kg	< 20	< 20	<1	30%	Pass	
TRH >C10-C16	S20-Ap30188	NCP	mg/kg	< 50	< 50	<1	30%	Pass	
Duplicate									
Polycyclic Aromatic Hydrocarbons				Result 1	Result 2	RPD			
Acenaphthene	S20-Ap28975	CP	mg/kg	< 0.5	< 0.5	<1	30%	Pass	
Acenaphthylene	S20-Ap28975	CP	mg/kg	< 0.5	< 0.5	<1	30%	Pass	
Anthracene	S20-Ap28975	CP	mg/kg	< 0.5	< 0.5	<1	30%	Pass	
Benz(a)anthracene	S20-Ap28975	CP	mg/kg	0.6	< 0.5	15	30%	Pass	
Benzo(a)pyrene	S20-Ap28975	CP	mg/kg	< 0.5	< 0.5	<1	30%	Pass	
Benzo(b&i)fluoranthene	S20-Ap28975	CP	mg/kg	< 0.5	< 0.5	<1	30%	Pass	
Benzo(g,h,i)perylene	S20-Ap28975	CP	mg/kg	< 0.5	< 0.5	<1	30%	Pass	
Benzo(k)fluoranthene	S20-Ap28975	CP	mg/kg	0.6	< 0.5	20	30%	Pass	
Chrysene	S20-Ap28975	CP	mg/kg	< 0.5	< 0.5	<1	30%	Pass	
Dibenz(a,h)anthracene	S20-Ap28975	CP	mg/kg	< 0.5	< 0.5	<1	30%	Pass	
Fluoranthene	S20-Ap28975	CP	mg/kg	0.9	0.8	19	30%	Pass	
Fluorene	S20-Ap28975	CP	mg/kg	< 0.5	< 0.5	<1	30%	Pass	
Indeno(1,2,3-cd)pyrene	S20-Ap28975	CP	mg/kg	< 0.5	< 0.5	<1	30%	Pass	
Naphthalene	S20-Ap28975	CP	mg/kg	< 0.5	< 0.5	<1	30%	Pass	
Phenanthrene	S20-Ap28975	CP	mg/kg	< 0.5	< 0.5	<1	30%	Pass	
Pyrene	S20-Ap28975	CP	mg/kg	0.9	0.8	19	30%	Pass	

Duplicate								
Heavy Metals				Result 1	Result 2	RPD		
Arsenic	S20-Ap30039	NCP	mg/kg	16	14	13	30%	Pass
Cadmium	S20-Ap30039	NCP	mg/kg	< 0.4	< 0.4	<1	30%	Pass
Chromium	S20-Ap30039	NCP	mg/kg	21	21	<1	30%	Pass
Copper	S20-Ap30039	NCP	mg/kg	35	35	1.0	30%	Pass
Lead	S20-Ap30039	NCP	mg/kg	20	19	5.0	30%	Pass
Mercury	S20-Ap30039	NCP	mg/kg	< 0.1	< 0.1	<1	30%	Pass
Nickel	S20-Ap30039	NCP	mg/kg	27	25	8.0	30%	Pass
Zinc	S20-Ap30039	NCP	mg/kg	110	100	11	30%	Pass
Duplicate								
				Result 1	Result 2	RPD		
% Moisture	S20-Ap28975	CP	%	13	11	16	30%	Pass

Comments

Sample Integrity

Custody Seals Intact (if used)	N/A
Attempt to Chill was evident	Yes
Sample correctly preserved	Yes
Appropriate sample containers have been used	Yes
Sample containers for volatile analysis received with minimal headspace	Yes
Samples received within HoldingTime	Yes
Some samples have been subcontracted	No

Qualifier Codes/Comments

Code	Description
N01	F2 is determined by arithmetically subtracting the "naphthalene" value from the ">C10-C16" value. The naphthalene value used in this calculation is obtained from volatiles (Purge & Trap analysis).
N02	Where we have reported both volatile (P&T GCMS) and semivolatile (GCMS) naphthalene data, results may not be identical. Provided correct sample handling protocols have been followed, any observed differences in results are likely to be due to procedural differences within each methodology. Results determined by both techniques have passed all QAQC acceptance criteria, and are entirely technically valid.
N04	F1 is determined by arithmetically subtracting the "Total BTEX" value from the "C6-C10" value. The "Total BTEX" value is obtained by summing the concentrations of BTEX analytes. The "C6-C10" value is obtained by quantitating against a standard of mixed aromatic/aliphatic analytes.
N07	Please note:- These two PAH isomers closely co-elute using the most contemporary analytical methods and both the reported concentration (and the TEQ) apply specifically to the total of the two co-eluting PAHs

Authorised By

Ursula Long	Analytical Services Manager
Andrew Sullivan	Senior Analyst-Organic (NSW)
Gabriele Cordero	Senior Analyst-Metal (NSW)



Glenn Jackson

General Manager

Final report - this Report replaces any previously issued Report

- Indicates Not Requested

* Indicates NATA accreditation does not cover the performance of this service

Measurement uncertainty of test data is available on request or please [click here](#).

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CERTIFICATE OF ANALYSIS 240692

Client Details

Client	Douglas Partners Pty Ltd
Attention	Wen-Fei Yuan
Address	96 Hermitage Rd, West Ryde, NSW, 2114

Sample Details

Your Reference	86767.03, Haymarket, SSI
Number of Samples	11 Soil, 1 Water
Date samples received	08/04/2020
Date completed instructions received	09/04/2020

Analysis Details

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

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

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

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

Report Details

Date results requested by	20/04/2020
Date of Issue	20/04/2020
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Asbestos Approved By

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

Results Approved By

Diego Bigolin, Team Leader, Inorganics
 Hannah Nguyen, Senior Chemist
 Josh Williams, Senior Chemist
 Loren Bardwell, Senior Chemist
 Lucy Zhu, Asbestos Supervisor
 Ridwan Wijaya, Lab Team Leader

Authorised By



Nancy Zhang, Laboratory Manager

vTRH(C6-C10)/BTEXN in Soil

Our Reference		240692-1	240692-2	240692-3	240692-4	240692-5
Your Reference	UNITS	BH101/0.1-0.2	BH101/0.9-1.0	BH102/1.5-1.6	BH102/3.1-3.2	BH102/4-4.1
Date Sampled		08/04/2020	08/04/2020	07/04/2020	07/04/2020	07/04/2020
Type of sample		Soil	Soil	Soil	Soil	Soil
Date extracted	-	14/04/2020	14/04/2020	14/04/2020	14/04/2020	14/04/2020
Date analysed	-	15/04/2020	15/04/2020	15/04/2020	15/04/2020	15/04/2020
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	%	98	98	106	101	96

vTRH(C6-C10)/BTEXN in Soil

Our Reference		240692-6	240692-7	240692-8	240692-9	240692-10
Your Reference	UNITS	BH102/4.9-5.0	BH103/1-1.1	BH103/2-2.1	BH104/1-1.1	BH105/0.05-0.1
Date Sampled		07/04/2020	08/04/2020	08/04/2020	08/04/2020	08/04/2020
Type of sample		Soil	Soil	Soil	Soil	Soil
Date extracted	-	14/04/2020	14/04/2020	14/04/2020	14/04/2020	14/04/2020
Date analysed	-	15/04/2020	15/04/2020	15/04/2020	15/04/2020	15/04/2020
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	%	101	103	102	103	95

vTRH(C6-C10)/BTEXN in Soil		
Our Reference		240692-11
Your Reference	UNITS	BD1/070420
Date Sampled		08/04/2020
Type of sample		Soil
Date extracted	-	14/04/2020
Date analysed	-	15/04/2020
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	%	95

svTRH (C10-C40) in Soil						
Our Reference		240692-1	240692-2	240692-3	240692-4	240692-5
Your Reference	UNITS	BH101/0.1-0.2	BH101/0.9-1.0	BH102/1.5-1.6	BH102/3.1-3.2	BH102/4-4.1
Date Sampled		08/04/2020	08/04/2020	07/04/2020	07/04/2020	07/04/2020
Type of sample		Soil	Soil	Soil	Soil	Soil
Date extracted	-	14/04/2020	14/04/2020	14/04/2020	14/04/2020	14/04/2020
Date analysed	-	14/04/2020	14/04/2020	14/04/2020	14/04/2020	14/04/2020
TRH C ₁₀ - C ₁₄	mg/kg	<50	<50	<50	<50	<50
TRH C ₁₅ - C ₂₈	mg/kg	110	330	<100	<100	<100
TRH C ₂₉ - C ₃₆	mg/kg	120	640	<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	210	870	<100	<100	<100
TRH >C ₃₄ -C ₄₀	mg/kg	<100	280	<100	<100	<100
Total +ve TRH (>C10-C40)	mg/kg	210	1,100	<50	<50	<50
Surrogate o-Terphenyl	%	71	70	104	98	110

svTRH (C10-C40) in Soil						
Our Reference		240692-6	240692-7	240692-8	240692-9	240692-10
Your Reference	UNITS	BH102/4.9-5.0	BH103/1-1.1	BH103/2-2.1	BH104/1-1.1	BH105/0.05-0.1
Date Sampled		07/04/2020	08/04/2020	08/04/2020	08/04/2020	08/04/2020
Type of sample		Soil	Soil	Soil	Soil	Soil
Date extracted	-	14/04/2020	14/04/2020	14/04/2020	14/04/2020	14/04/2020
Date analysed	-	14/04/2020	14/04/2020	14/04/2020	14/04/2020	14/04/2020
TRH C ₁₀ - C ₁₄	mg/kg	<50	<50	<50	<50	<50
TRH C ₁₅ - C ₂₈	mg/kg	<100	<100	<100	<100	110
TRH C ₂₉ - C ₃₆	mg/kg	<100	<100	<100	<100	250
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	330
TRH >C ₃₄ -C ₄₀	mg/kg	<100	<100	<100	<100	<100
Total +ve TRH (>C10-C40)	mg/kg	<50	<50	<50	<50	330
Surrogate o-Terphenyl	%	102	104	100	94	108

svTRH (C10-C40) in Soil		
Our Reference		240692-11
Your Reference	UNITS	BD1/070420
Date Sampled		08/04/2020
Type of sample		Soil
Date extracted	-	14/04/2020
Date analysed	-	14/04/2020
TRH C ₁₀ - C ₁₄	mg/kg	<50
TRH C ₁₅ - C ₂₈	mg/kg	<100
TRH C ₂₉ - C ₃₆	mg/kg	120
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	170
TRH >C ₃₄ -C ₄₀	mg/kg	<100
Total +ve TRH (>C10-C40)	mg/kg	170
Surrogate o-Terphenyl	%	100

PAHs in Soil						
Our Reference		240692-1	240692-2	240692-3	240692-4	240692-5
Your Reference	UNITS	BH101/0.1-0.2	BH101/0.9-1.0	BH102/1.5-1.6	BH102/3.1-3.2	BH102/4-4.1
Date Sampled		08/04/2020	08/04/2020	07/04/2020	07/04/2020	07/04/2020
Type of sample		Soil	Soil	Soil	Soil	Soil
Date extracted	-	14/04/2020	14/04/2020	14/04/2020	14/04/2020	14/04/2020
Date analysed	-	14/04/2020	14/04/2020	14/04/2020	14/04/2020	14/04/2020
Naphthalene	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Acenaphthylene	mg/kg	0.1	0.4	<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	0.5	1.4	0.1	0.2	0.2
Anthracene	mg/kg	0.3	0.1	<0.1	<0.1	<0.1
Fluoranthene	mg/kg	1.3	2.8	0.2	0.3	0.2
Pyrene	mg/kg	1.5	3.0	0.2	0.4	0.2
Benzo(a)anthracene	mg/kg	0.6	1.9	0.1	0.2	0.1
Chrysene	mg/kg	0.8	1.2	0.1	0.2	0.1
Benzo(b,j+k)fluoranthene	mg/kg	1	3.6	0.2	0.3	<0.2
Benzo(a)pyrene	mg/kg	0.73	2.5	0.1	0.1	0.05
Indeno(1,2,3-c,d)pyrene	mg/kg	0.5	1.3	0.1	0.2	0.1
Dibenzo(a,h)anthracene	mg/kg	0.2	0.3	<0.1	<0.1	<0.1
Benzo(g,h,i)perylene	mg/kg	0.7	1.7	0.1	<0.1	<0.1
Total +ve PAH's	mg/kg	8.6	20	1.2	1.8	1.0
Benzo(a)pyrene TEQ calc (zero)	mg/kg	1.2	3.5	<0.5	<0.5	<0.5
Benzo(a)pyrene TEQ calc(half)	mg/kg	1.2	3.5	<0.5	<0.5	<0.5
Benzo(a)pyrene TEQ calc(PQL)	mg/kg	1.2	3.5	<0.5	<0.5	<0.5
Surrogate <i>p</i> -Terphenyl-d14	%	78	84	88	80	92

PAHs in Soil						
Our Reference		240692-6	240692-7	240692-8	240692-9	240692-10
Your Reference	UNITS	BH102/4.9-5.0	BH103/1-1.1	BH103/2-2.1	BH104/1-1.1	BH105/0.05-0.1
Date Sampled		07/04/2020	08/04/2020	08/04/2020	08/04/2020	08/04/2020
Type of sample		Soil	Soil	Soil	Soil	Soil
Date extracted	-	14/04/2020	14/04/2020	14/04/2020	14/04/2020	14/04/2020
Date analysed	-	14/04/2020	14/04/2020	14/04/2020	14/04/2020	14/04/2020
Naphthalene	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Acenaphthylene	mg/kg	<0.1	<0.1	<0.1	<0.1	0.3
Acenaphthene	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Fluorene	mg/kg	<0.1	<0.1	<0.1	<0.1	0.1
Phenanthrene	mg/kg	<0.1	<0.1	<0.1	0.1	1.3
Anthracene	mg/kg	<0.1	<0.1	<0.1	<0.1	0.5
Fluoranthene	mg/kg	0.1	0.1	<0.1	0.1	2.6
Pyrene	mg/kg	0.1	0.1	<0.1	0.2	2.9
Benzo(a)anthracene	mg/kg	<0.1	<0.1	<0.1	0.1	1.6
Chrysene	mg/kg	<0.1	<0.1	<0.1	<0.1	1.3
Benzo(b,j+k)fluoranthene	mg/kg	<0.2	<0.2	<0.2	<0.2	3.2
Benzo(a)pyrene	mg/kg	0.08	0.08	<0.05	<0.05	2.0
Indeno(1,2,3-c,d)pyrene	mg/kg	<0.1	<0.1	<0.1	<0.1	1
Dibenzo(a,h)anthracene	mg/kg	<0.1	<0.1	<0.1	<0.1	0.2
Benzo(g,h,i)perylene	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Total +ve PAH's	mg/kg	0.3	0.3	<0.05	0.52	17
Benzo(a)pyrene TEQ calc (zero)	mg/kg	<0.5	<0.5	<0.5	<0.5	2.9
Benzo(a)pyrene TEQ calc(half)	mg/kg	<0.5	<0.5	<0.5	<0.5	2.9
Benzo(a)pyrene TEQ calc(PQL)	mg/kg	<0.5	<0.5	<0.5	<0.5	2.9
Surrogate p-Terphenyl-d14	%	84	77	94	87	84

PAHs in Soil		
Our Reference		240692-11
Your Reference	UNITS	BD1/070420
Date Sampled		08/04/2020
Type of sample		Soil
Date extracted	-	14/04/2020
Date analysed	-	14/04/2020
Naphthalene	mg/kg	<0.1
Acenaphthylene	mg/kg	0.3
Acenaphthene	mg/kg	<0.1
Fluorene	mg/kg	<0.1
Phenanthrene	mg/kg	1.2
Anthracene	mg/kg	0.5
Fluoranthene	mg/kg	2.6
Pyrene	mg/kg	2.7
Benzo(a)anthracene	mg/kg	1.4
Chrysene	mg/kg	1.1
Benzo(b,j+k)fluoranthene	mg/kg	2.7
Benzo(a)pyrene	mg/kg	1.8
Indeno(1,2,3-c,d)pyrene	mg/kg	0.8
Dibenzo(a,h)anthracene	mg/kg	0.2
Benzo(g,h,i)perylene	mg/kg	1.3
Total +ve PAH's	mg/kg	17
Benzo(a)pyrene TEQ calc (zero)	mg/kg	2.5
Benzo(a)pyrene TEQ calc(half)	mg/kg	2.5
Benzo(a)pyrene TEQ calc(PQL)	mg/kg	2.5
Surrogate <i>p</i> -Terphenyl-d14	%	101

Organochlorine Pesticides in soil						
Our Reference		240692-1	240692-2	240692-3	240692-7	240692-9
Your Reference	UNITS	BH101/0.1-0.2	BH101/0.9-1.0	BH102/1.5-1.6	BH103/1-1.1	BH104/1-1.1
Date Sampled		08/04/2020	08/04/2020	07/04/2020	08/04/2020	08/04/2020
Type of sample		Soil	Soil	Soil	Soil	Soil
Date extracted	-	14/04/2020	14/04/2020	14/04/2020	14/04/2020	14/04/2020
Date analysed	-	14/04/2020	14/04/2020	14/04/2020	14/04/2020	14/04/2020
alpha-BHC	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
HCB	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
beta-BHC	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
gamma-BHC	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Heptachlor	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
delta-BHC	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Aldrin	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Heptachlor Epoxide	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
gamma-Chlordane	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
alpha-chlordane	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Endosulfan I	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
pp-DDE	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Dieldrin	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Endrin	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Endosulfan II	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
pp-DDD	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Endrin Aldehyde	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
pp-DDT	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Endosulfan Sulphate	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Methoxychlor	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Total +ve DDT+DDD+DDE	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Surrogate TCMX	%	84	92	80	83	82

Organophosphorus Pesticides in Soil						
Our Reference		240692-1	240692-2	240692-3	240692-7	240692-9
Your Reference	UNITS	BH101/0.1-0.2	BH101/0.9-1.0	BH102/1.5-1.6	BH103/1-1.1	BH104/1-1.1
Date Sampled		08/04/2020	08/04/2020	07/04/2020	08/04/2020	08/04/2020
Type of sample		Soil	Soil	Soil	Soil	Soil
Date extracted	-	14/04/2020	14/04/2020	14/04/2020	14/04/2020	14/04/2020
Date analysed	-	14/04/2020	14/04/2020	14/04/2020	14/04/2020	14/04/2020
Dichlorvos	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Dimethoate	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Diazinon	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Chlorpyrifos-methyl	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Ronnel	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Fenitrothion	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Malathion	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Chlorpyrifos	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Parathion	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Bromophos-ethyl	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Ethion	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Azinphos-methyl (Guthion)	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Surrogate TCMX	%	84	92	80	83	82

PCBs in Soil						
Our Reference		240692-1	240692-2	240692-3	240692-7	240692-9
Your Reference	UNITS	BH101/0.1-0.2	BH101/0.9-1.0	BH102/1.5-1.6	BH103/1-1.1	BH104/1-1.1
Date Sampled		08/04/2020	08/04/2020	07/04/2020	08/04/2020	08/04/2020
Type of sample		Soil	Soil	Soil	Soil	Soil
Date extracted	-	14/04/2020	14/04/2020	14/04/2020	14/04/2020	14/04/2020
Date analysed	-	14/04/2020	14/04/2020	14/04/2020	14/04/2020	14/04/2020
Aroclor 1016	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Aroclor 1221	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Aroclor 1232	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Aroclor 1242	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Aroclor 1248	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Aroclor 1254	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Aroclor 1260	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Total +ve PCBs (1016-1260)	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Surrogate TCMX	%	84	92	80	83	82

Acid Extractable metals in soil

Our Reference		240692-1	240692-2	240692-3	240692-4	240692-5
Your Reference	UNITS	BH101/0.1-0.2	BH101/0.9-1.0	BH102/1.5-1.6	BH102/3.1-3.2	BH102/4-4.1
Date Sampled		08/04/2020	08/04/2020	07/04/2020	07/04/2020	07/04/2020
Type of sample		Soil	Soil	Soil	Soil	Soil
Date prepared	-	14/04/2020	14/04/2020	14/04/2020	14/04/2020	14/04/2020
Date analysed	-	15/04/2020	15/04/2020	15/04/2020	15/04/2020	15/04/2020
Arsenic	mg/kg	4	5	<4	5	5
Cadmium	mg/kg	<0.4	0.4	<0.4	1	<0.4
Chromium	mg/kg	10	9	4	10	16
Copper	mg/kg	89	93	62	180	86
Lead	mg/kg	150	250	68	160	170
Mercury	mg/kg	0.3	0.3	0.1	0.4	1.3
Nickel	mg/kg	6	9	4	6	23
Zinc	mg/kg	96	210	100	160	540

Acid Extractable metals in soil

Our Reference		240692-6	240692-7	240692-8	240692-9	240692-10
Your Reference	UNITS	BH102/4.9-5.0	BH103/1-1.1	BH103/2-2.1	BH104/1-1.1	BH105/0.05-0.1
Date Sampled		07/04/2020	08/04/2020	08/04/2020	08/04/2020	08/04/2020
Type of sample		Soil	Soil	Soil	Soil	Soil
Date prepared	-	14/04/2020	14/04/2020	14/04/2020	14/04/2020	14/04/2020
Date analysed	-	15/04/2020	15/04/2020	15/04/2020	15/04/2020	15/04/2020
Arsenic	mg/kg	<4	<4	9	5	8
Cadmium	mg/kg	<0.4	<0.4	<0.4	<0.4	0.6
Chromium	mg/kg	8	2	8	7	13
Copper	mg/kg	7	5	37	33	93
Lead	mg/kg	20	57	28	45	280
Mercury	mg/kg	0.4	<0.1	<0.1	<0.1	1
Nickel	mg/kg	4	1	6	11	14
Zinc	mg/kg	26	14	39	61	240

Acid Extractable metals in soil			
Our Reference		240692-11	240692-13
Your Reference	UNITS	BD1/070420	BH101/0.1-0.2 - [TRIPLICATE]
Date Sampled		08/04/2020	08/04/2020
Type of sample		Soil	Soil
Date prepared	-	14/04/2020	14/04/2020
Date analysed	-	15/04/2020	15/04/2020
Arsenic	mg/kg	9	<4
Cadmium	mg/kg	0.7	<0.4
Chromium	mg/kg	14	8
Copper	mg/kg	99	56
Lead	mg/kg	300	160
Mercury	mg/kg	0.8	0.3
Nickel	mg/kg	11	6
Zinc	mg/kg	260	120

Misc Soil - Inorg						
Our Reference		240692-1	240692-2	240692-3	240692-7	240692-9
Your Reference	UNITS	BH101/0.1-0.2	BH101/0.9-1.0	BH102/1.5-1.6	BH103/1-1.1	BH104/1-1.1
Date Sampled		08/04/2020	08/04/2020	07/04/2020	08/04/2020	08/04/2020
Type of sample		Soil	Soil	Soil	Soil	Soil
Date prepared	-	14/04/2020	14/04/2020	14/04/2020	14/04/2020	14/04/2020
Date analysed	-	14/04/2020	14/04/2020	14/04/2020	14/04/2020	14/04/2020
Total Phenolics (as Phenol)	mg/kg	<5	<5	<5	<5	<5

Moisture						
Our Reference		240692-1	240692-2	240692-3	240692-4	240692-5
Your Reference	UNITS	BH101/0.1-0.2	BH101/0.9-1.0	BH102/1.5-1.6	BH102/3.1-3.2	BH102/4-4.1
Date Sampled		08/04/2020	08/04/2020	07/04/2020	07/04/2020	07/04/2020
Type of sample		Soil	Soil	Soil	Soil	Soil
Date prepared	-	14/04/2020	14/04/2020	14/04/2020	14/04/2020	14/04/2020
Date analysed	-	15/04/2020	15/04/2020	15/04/2020	15/04/2020	15/04/2020
Moisture	%	12	13	8.7	17	31

Moisture						
Our Reference		240692-6	240692-7	240692-8	240692-9	240692-10
Your Reference	UNITS	BH102/4.9-5.0	BH103/1-1.1	BH103/2-2.1	BH104/1-1.1	BH105/0.05-0.1
Date Sampled		07/04/2020	08/04/2020	08/04/2020	08/04/2020	08/04/2020
Type of sample		Soil	Soil	Soil	Soil	Soil
Date prepared	-	14/04/2020	14/04/2020	14/04/2020	14/04/2020	14/04/2020
Date analysed	-	15/04/2020	15/04/2020	15/04/2020	15/04/2020	15/04/2020
Moisture	%	12	5.2	12	5.6	11

Moisture		
Our Reference		240692-11
Your Reference	UNITS	BD1/070420
Date Sampled		08/04/2020
Type of sample		Soil
Date prepared	-	14/04/2020
Date analysed	-	15/04/2020
Moisture	%	11

Asbestos ID - soils						
Our Reference	UNITS	240692-1	240692-2	240692-3	240692-4	240692-5
Your Reference		BH101/0.1-0.2	BH101/0.9-1.0	BH102/1.5-1.6	BH102/3.1-3.2	BH102/4-4.1
Date Sampled		08/04/2020	08/04/2020	07/04/2020	07/04/2020	07/04/2020
Type of sample		Soil	Soil	Soil	Soil	Soil
Date analysed	-	16/04/2020	16/04/2020	16/04/2020	16/04/2020	16/04/2020
Sample mass tested	g	Approx. 35g	Approx. 30g	Approx. 30g	Approx. 30g	Approx. 20g
Sample Description	-	Brown coarse-grained soil & rocks	Brown coarse-grained soil & rocks	Brown sandy soil & rocks	Brown clayey 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		240692-7	240692-8	240692-9	240692-10
Your Reference	UNITS	BH103/1-1.1	BH103/2-2.1	BH104/1-1.1	BH105/0.05-0.1
Date Sampled		08/04/2020	08/04/2020	08/04/2020	08/04/2020
Type of sample		Soil	Soil	Soil	Soil
Date analysed	-	16/04/2020	16/04/2020	16/04/2020	16/04/2020
Sample mass tested	g	Approx. 30g	Approx. 30g	Approx. 25g	Approx. 30g
Sample Description	-	Brown sandy soil & rocks	Brown sandy soil & rocks	Brown sandy 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
Asbestos comments	-	NO	NO	NO	NO
Trace Analysis	-	No asbestos detected	No asbestos detected	No asbestos detected	No asbestos detected

vTRH(C6-C10)/BTEXN in Water		
Our Reference		240692-12
Your Reference	UNITS	Rinsate
Date Sampled		08/04/2020
Type of sample		Water
Date extracted	-	17/04/2020
Date analysed	-	17/04/2020
TRH C ₆ - C ₉	µg/L	<10
TRH C ₆ - C ₁₀	µg/L	<10
TRH C ₆ - C ₁₀ less BTEX (F1)	µg/L	<10
Benzene	µg/L	<1
Toluene	µg/L	<1
Ethylbenzene	µg/L	<1
m+p-xylene	µg/L	<2
o-xylene	µg/L	<1
Naphthalene	µg/L	<1
Surrogate Dibromofluoromethane	%	96
Surrogate toluene-d8	%	99
Surrogate 4-BFB	%	92

svTRH (C10-C40) in Water		
Our Reference		240692-12
Your Reference	UNITS	Rinsate
Date Sampled		08/04/2020
Type of sample		Water
Date extracted	-	14/04/2020
Date analysed	-	15/04/2020
TRH C ₁₀ - C ₁₄	µg/L	<50
TRH C ₁₅ - C ₂₈	µg/L	<100
TRH C ₂₉ - C ₃₆	µg/L	<100
TRH >C ₁₀ - C ₁₆	µg/L	<50
TRH >C ₁₀ - C ₁₆ less Naphthalene (F2)	µg/L	<50
TRH >C ₁₆ - C ₃₄	µg/L	<100
TRH >C ₃₄ - C ₄₀	µg/L	<100
Surrogate o-Terphenyl	%	127

PAHs in Water		
Our Reference		240692-12
Your Reference	UNITS	Rinsate
Date Sampled		08/04/2020
Type of sample		Water
Date extracted	-	14/04/2020
Date analysed	-	14/04/2020
Naphthalene	µg/L	<1
Acenaphthylene	µg/L	<1
Acenaphthene	µg/L	<1
Fluorene	µg/L	<1
Phenanthrene	µg/L	<1
Anthracene	µg/L	<1
Fluoranthene	µg/L	<1
Pyrene	µg/L	<1
Benzo(a)anthracene	µg/L	<1
Chrysene	µg/L	<1
Benzo(b,j+k)fluoranthene	µg/L	<2
Benzo(a)pyrene	µg/L	<1
Indeno(1,2,3-c,d)pyrene	µg/L	<1
Dibenzo(a,h)anthracene	µg/L	<1
Benzo(g,h,i)perylene	µg/L	<1
Benzo(a)pyrene TEQ	µg/L	<5
Total +ve PAH's	µg/L	NIL (+)VE
Surrogate <i>p</i> -Terphenyl-d14	%	99

Metals in Water - Dissolved		
Our Reference		240692-12
Your Reference	UNITS	Rinsate
Date Sampled		08/04/2020
Type of sample		Water
Date digested	-	15/04/2020
Date analysed	-	15/04/2020
Arsenic - Dissolved	mg/L	<0.05
Cadmium - Dissolved	mg/L	<0.01
Chromium - Dissolved	mg/L	<0.01
Copper - Dissolved	mg/L	<0.01
Lead - Dissolved	mg/L	<0.03
Mercury - Dissolved	mg/L	<0.0005
Nickel - Dissolved	mg/L	<0.02
Zinc - Dissolved	mg/L	<0.02

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.
AT-008	Determination of VOCs sampled onto coconut shell charcoal sorbent tubes, that can be desorbed using carbon disulphide, and analysed by GC-MS.
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-003	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-003	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-006	Soil samples are extracted with dichloromethane/acetone and waters with dichloromethane and analysed by GC-ECD.
Org-006	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-012/017	Soil samples are extracted with Dichloromethane/Acetone and waters with Dichloromethane and analysed by GC-MS and/or GC-MS/MS.
Org-012/017	Soil samples are extracted with dichloromethane/acetone and waters with dichloromethane and analysed by GC-MS and/or GC-MS/MS. 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-012/017	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.

Method ID	Methodology Summary
Org-012/017	<p>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.</p> <p>For soil results:-</p> <ol style="list-style-type: none"> 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. <p>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.</p>
Org-013	Water samples are analysed directly by purge and trap GC-MS.
Org-014	Soil samples are extracted with methanol and spiked into water prior to analysing by purge and trap GC-MS.
Org-016	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)-BTX as per NEPM B1 Guideline on Investigation Levels for Soil and Groundwater.
Org-016	<p>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)-BTX as per NEPM B1 Guideline on Investigation Levels for Soil and Groundwater.</p> <p>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.</p>

QUALITY CONTROL: vTRH(C6-C10)/BTEXN in Soil						Duplicate			Spike Recovery %	
Test Description	Units	PQL	Method	Blank	#	Base	Dup.	RPD	LCS-5	240692-2
Date extracted	-			14/04/2020	1	14/04/2020	14/04/2020		14/04/2020	14/04/2020
Date analysed	-			15/04/2020	1	15/04/2020	15/04/2020		15/04/2020	15/04/2020
TRH C ₆ - C ₉	mg/kg	25	Org-016	<25	1	<25	<25	0	83	82
TRH C ₆ - C ₁₀	mg/kg	25	Org-016	<25	1	<25	<25	0	83	82
Benzene	mg/kg	0.2	Org-016	<0.2	1	<0.2	<0.2	0	70	70
Toluene	mg/kg	0.5	Org-016	<0.5	1	<0.5	<0.5	0	83	82
Ethylbenzene	mg/kg	1	Org-016	<1	1	<1	<1	0	89	89
m+p-xylene	mg/kg	2	Org-016	<2	1	<2	<2	0	86	85
o-Xylene	mg/kg	1	Org-016	<1	1	<1	<1	0	82	81
naphthalene	mg/kg	1	Org-014	<1	1	<1	<1	0	[NT]	[NT]
Surrogate aaa-Trifluorotoluene	%		Org-016	98	1	98	100	2	101	97

QUALITY CONTROL: vTRH(C6-C10)/BTEXN in Soil						Duplicate		Spike Recovery %		
Test Description	Units	PQL	Method	Blank	#	Base	Dup.	RPD	[NT]	[NT]
Date extracted	-			[NT]	11	14/04/2020	14/04/2020		[NT]	[NT]
Date analysed	-			[NT]	11	15/04/2020	15/04/2020		[NT]	[NT]
TRH C ₆ - C ₉	mg/kg	25	Org-016	[NT]	11	<25	<25	0	[NT]	[NT]
TRH C ₆ - C ₁₀	mg/kg	25	Org-016	[NT]	11	<25	<25	0	[NT]	[NT]
Benzene	mg/kg	0.2	Org-016	[NT]	11	<0.2	<0.2	0	[NT]	[NT]
Toluene	mg/kg	0.5	Org-016	[NT]	11	<0.5	<0.5	0	[NT]	[NT]
Ethylbenzene	mg/kg	1	Org-016	[NT]	11	<1	<1	0	[NT]	[NT]
m+p-xylene	mg/kg	2	Org-016	[NT]	11	<2	<2	0	[NT]	[NT]
o-Xylene	mg/kg	1	Org-016	[NT]	11	<1	<1	0	[NT]	[NT]
naphthalene	mg/kg	1	Org-014	[NT]	11	<1	<1	0	[NT]	[NT]
Surrogate aaa-Trifluorotoluene	%		Org-016	[NT]	11	95	97	2	[NT]	[NT]

QUALITY CONTROL: svTRH (C10-C40) in Soil					Duplicate			Spike Recovery %		
Test Description	Units	PQL	Method	Blank	#	Base	Dup.	RPD	LCS-5	240692-2
Date extracted	-			14/04/2020	1	14/04/2020	14/04/2020		14/04/2020	14/04/2020
Date analysed	-			14/04/2020	1	14/04/2020	14/04/2020		14/04/2020	14/04/2020
TRH C ₁₀ - C ₁₄	mg/kg	50	Org-003	<50	1	<50	<50	0	115	103
TRH C ₁₅ - C ₂₈	mg/kg	100	Org-003	<100	1	110	<100	10	83	109
TRH C ₂₉ - C ₃₆	mg/kg	100	Org-003	<100	1	120	<100	18	92	#
TRH >C ₁₀ -C ₁₆	mg/kg	50	Org-003	<50	1	<50	<50	0	115	103
TRH >C ₁₆ -C ₃₄	mg/kg	100	Org-003	<100	1	210	110	62	83	109
TRH >C ₃₄ -C ₄₀	mg/kg	100	Org-003	<100	1	<100	<100	0	92	#
Surrogate o-Terphenyl	%		Org-003	100	1	71	115	47	101	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]	11	14/04/2020	14/04/2020		[NT]	[NT]
Date analysed	-			[NT]	11	14/04/2020	14/04/2020		[NT]	[NT]
TRH C ₁₀ - C ₁₄	mg/kg	50	Org-003	[NT]	11	<50	<50	0	[NT]	[NT]
TRH C ₁₅ - C ₂₈	mg/kg	100	Org-003	[NT]	11	<100	<100	0	[NT]	[NT]
TRH C ₂₉ - C ₃₆	mg/kg	100	Org-003	[NT]	11	120	120	0	[NT]	[NT]
TRH >C ₁₀ -C ₁₆	mg/kg	50	Org-003	[NT]	11	<50	<50	0	[NT]	[NT]
TRH >C ₁₆ -C ₃₄	mg/kg	100	Org-003	[NT]	11	170	160	6	[NT]	[NT]
TRH >C ₃₄ -C ₄₀	mg/kg	100	Org-003	[NT]	11	<100	<100	0	[NT]	[NT]
Surrogate o-Terphenyl	%		Org-003	[NT]	11	100	100	0	[NT]	[NT]

QUALITY CONTROL: PAHs in Soil					Duplicate			Spike Recovery %		
Test Description	Units	PQL	Method	Blank	#	Base	Dup.	RPD	LCS-5	240692-2
Date extracted	-			14/04/2020	1	14/04/2020	14/04/2020		14/04/2020	14/04/2020
Date analysed	-			14/04/2020	1	14/04/2020	14/04/2020		14/04/2020	14/04/2020
Naphthalene	mg/kg	0.1	Org-012/017	<0.1	1	<0.1	<0.1	0	78	79
Acenaphthylene	mg/kg	0.1	Org-012/017	<0.1	1	0.1	0.1	0	[NT]	[NT]
Acenaphthene	mg/kg	0.1	Org-012/017	<0.1	1	<0.1	<0.1	0	[NT]	[NT]
Fluorene	mg/kg	0.1	Org-012/017	<0.1	1	<0.1	<0.1	0	72	84
Phenanthrene	mg/kg	0.1	Org-012/017	<0.1	1	0.5	0.4	22	114	113
Anthracene	mg/kg	0.1	Org-012/017	<0.1	1	0.3	0.2	40	[NT]	[NT]
Fluoranthene	mg/kg	0.1	Org-012/017	<0.1	1	1.3	0.9	36	114	73
Pyrene	mg/kg	0.1	Org-012/017	<0.1	1	1.5	1.0	40	108	76
Benzo(a)anthracene	mg/kg	0.1	Org-012/017	<0.1	1	0.6	0.6	0	[NT]	[NT]
Chrysene	mg/kg	0.1	Org-012/017	<0.1	1	0.8	0.5	46	86	117
Benzo(b,j,k)fluoranthene	mg/kg	0.2	Org-012/017	<0.2	1	1	1	0	[NT]	[NT]
Benzo(a)pyrene	mg/kg	0.05	Org-012/017	<0.05	1	0.73	0.5	37	70	79
Indeno(1,2,3-c,d)pyrene	mg/kg	0.1	Org-012/017	<0.1	1	0.5	0.4	22	[NT]	[NT]
Dibenzo(a,h)anthracene	mg/kg	0.1	Org-012/017	<0.1	1	0.2	<0.1	67	[NT]	[NT]
Benzo(g,h,i)perylene	mg/kg	0.1	Org-012/017	<0.1	1	0.7	0.5	33	[NT]	[NT]
Surrogate p-Terphenyl-d14	%		Org-012/017	118	1	78	82	5	95	79

QUALITY CONTROL: PAHs in Soil					Duplicate			Spike Recovery %		
Test Description	Units	PQL	Method	Blank	#	Base	Dup.	RPD	[NT]	[NT]
Date extracted	-			[NT]	11	14/04/2020	14/04/2020		[NT]	[NT]
Date analysed	-			[NT]	11	14/04/2020	14/04/2020		[NT]	[NT]
Naphthalene	mg/kg	0.1	Org-012/017	[NT]	11	<0.1	<0.1	0	[NT]	[NT]
Acenaphthylene	mg/kg	0.1	Org-012/017	[NT]	11	0.3	0.3	0	[NT]	[NT]
Acenaphthene	mg/kg	0.1	Org-012/017	[NT]	11	<0.1	<0.1	0	[NT]	[NT]
Fluorene	mg/kg	0.1	Org-012/017	[NT]	11	<0.1	<0.1	0	[NT]	[NT]
Phenanthrene	mg/kg	0.1	Org-012/017	[NT]	11	1.2	1.1	9	[NT]	[NT]
Anthracene	mg/kg	0.1	Org-012/017	[NT]	11	0.5	0.4	22	[NT]	[NT]
Fluoranthene	mg/kg	0.1	Org-012/017	[NT]	11	2.6	2.2	17	[NT]	[NT]
Pyrene	mg/kg	0.1	Org-012/017	[NT]	11	2.7	1.9	35	[NT]	[NT]
Benzo(a)anthracene	mg/kg	0.1	Org-012/017	[NT]	11	1.4	1.3	7	[NT]	[NT]
Chrysene	mg/kg	0.1	Org-012/017	[NT]	11	1.1	1.5	31	[NT]	[NT]
Benzo(b,j,k)fluoranthene	mg/kg	0.2	Org-012/017	[NT]	11	2.7	2.6	4	[NT]	[NT]
Benzo(a)pyrene	mg/kg	0.05	Org-012/017	[NT]	11	1.8	1.7	6	[NT]	[NT]
Indeno(1,2,3-c,d)pyrene	mg/kg	0.1	Org-012/017	[NT]	11	0.8	0.9	12	[NT]	[NT]
Dibenzo(a,h)anthracene	mg/kg	0.1	Org-012/017	[NT]	11	0.2	<0.1	67	[NT]	[NT]
Benzo(g,h,i)perylene	mg/kg	0.1	Org-012/017	[NT]	11	1.3	<0.1	171	[NT]	[NT]
Surrogate p-Terphenyl-d14	%		Org-012/017	[NT]	11	101	87	15	[NT]	[NT]

QUALITY CONTROL: Organochlorine Pesticides in soil						Duplicate			Spike Recovery %	
Test Description	Units	PQL	Method	Blank	#	Base	Dup.	RPD	LCS-5	240692-2
Date extracted	-			14/04/2020	1	14/04/2020	14/04/2020		14/04/2020	14/04/2020
Date analysed	-			14/04/2020	1	14/04/2020	14/04/2020		14/04/2020	14/04/2020
alpha-BHC	mg/kg	0.1	Org-012/017	<0.1	1	<0.1	<0.1	0	90	82
HCB	mg/kg	0.1	Org-012/017	<0.1	1	<0.1	<0.1	0	[NT]	[NT]
beta-BHC	mg/kg	0.1	Org-012/017	<0.1	1	<0.1	<0.1	0	86	92
gamma-BHC	mg/kg	0.1	Org-012/017	<0.1	1	<0.1	<0.1	0	[NT]	[NT]
Heptachlor	mg/kg	0.1	Org-012/017	<0.1	1	<0.1	<0.1	0	124	64
delta-BHC	mg/kg	0.1	Org-012/017	<0.1	1	<0.1	<0.1	0	[NT]	[NT]
Aldrin	mg/kg	0.1	Org-012/017	<0.1	1	<0.1	<0.1	0	92	92
Heptachlor Epoxide	mg/kg	0.1	Org-012/017	<0.1	1	<0.1	<0.1	0	76	68
gamma-Chlordane	mg/kg	0.1	Org-012/017	<0.1	1	<0.1	<0.1	0	[NT]	[NT]
alpha-chlordane	mg/kg	0.1	Org-012/017	<0.1	1	<0.1	<0.1	0	[NT]	[NT]
Endosulfan I	mg/kg	0.1	Org-012/017	<0.1	1	<0.1	<0.1	0	[NT]	[NT]
pp-DDE	mg/kg	0.1	Org-012/017	<0.1	1	<0.1	<0.1	0	120	82
Dieldrin	mg/kg	0.1	Org-012/017	<0.1	1	<0.1	<0.1	0	110	82
Endrin	mg/kg	0.1	Org-012/017	<0.1	1	<0.1	<0.1	0	68	102
Endosulfan II	mg/kg	0.1	Org-012/017	<0.1	1	<0.1	<0.1	0	[NT]	[NT]
pp-DDD	mg/kg	0.1	Org-012/017	<0.1	1	<0.1	<0.1	0	114	77
Endrin Aldehyde	mg/kg	0.1	Org-012/017	<0.1	1	<0.1	<0.1	0	[NT]	[NT]
pp-DDT	mg/kg	0.1	Org-012/017	<0.1	1	<0.1	<0.1	0	[NT]	[NT]
Endosulfan Sulphate	mg/kg	0.1	Org-012/017	<0.1	1	<0.1	<0.1	0	120	72
Methoxychlor	mg/kg	0.1	Org-012/017	<0.1	1	<0.1	<0.1	0	[NT]	[NT]
Surrogate TCMX	%		Org-012/017	81	1	84	83	1	80	74

QUALITY CONTROL: Organophosphorus Pesticides in Soil						Duplicate		Spike Recovery %		
Test Description	Units	PQL	Method	Blank	#	Base	Dup.	RPD	LCS-5	240692-2
Date extracted	-			14/04/2020	1	14/04/2020	14/04/2020		14/04/2020	14/04/2020
Date analysed	-			14/04/2020	1	14/04/2020	14/04/2020		14/04/2020	14/04/2020
Dichlorvos	mg/kg	0.1	Org-012/017	<0.1	1	<0.1	<0.1	0	80	118
Dimethoate	mg/kg	0.1	Org-012/017	<0.1	1	<0.1	<0.1	0	[NT]	[NT]
Diazinon	mg/kg	0.1	Org-012/017	<0.1	1	<0.1	<0.1	0	[NT]	[NT]
Chlorpyrifos-methyl	mg/kg	0.1	Org-012/017	<0.1	1	<0.1	<0.1	0	[NT]	[NT]
Ronnel	mg/kg	0.1	Org-012/017	<0.1	1	<0.1	<0.1	0	108	104
Fenitrothion	mg/kg	0.1	Org-012/017	<0.1	1	<0.1	<0.1	0	114	98
Malathion	mg/kg	0.1	Org-012/017	<0.1	1	<0.1	<0.1	0	116	114
Chlorpyrifos	mg/kg	0.1	Org-012/017	<0.1	1	<0.1	<0.1	0	112	104
Parathion	mg/kg	0.1	Org-012/017	<0.1	1	<0.1	<0.1	0	94	93
Bromophos-ethyl	mg/kg	0.1	AT-008	<0.1	1	<0.1	<0.1	0	[NT]	[NT]
Ethion	mg/kg	0.1	Org-012/017	<0.1	1	<0.1	<0.1	0	104	87
Azinphos-methyl (Guthion)	mg/kg	0.1	Org-012/017	<0.1	1	<0.1	<0.1	0	[NT]	[NT]
Surrogate TCMX	%		Org-012/017	81	1	84	83	1	80	74

QUALITY CONTROL: PCBs in Soil					Duplicate			Spike Recovery %		
Test Description	Units	PQL	Method	Blank	#	Base	Dup.	RPD	LCS-5	240692-2
Date extracted	-			14/04/2020	1	14/04/2020	14/04/2020		14/04/2020	14/04/2020
Date analysed	-			14/04/2020	1	14/04/2020	14/04/2020		14/04/2020	14/04/2020
Aroclor 1016	mg/kg	0.1	Org-006	<0.1	1	<0.1	<0.1	0	[NT]	[NT]
Aroclor 1221	mg/kg	0.1	Org-006	<0.1	1	<0.1	<0.1	0	[NT]	[NT]
Aroclor 1232	mg/kg	0.1	Org-006	<0.1	1	<0.1	<0.1	0	[NT]	[NT]
Aroclor 1242	mg/kg	0.1	Org-006	<0.1	1	<0.1	<0.1	0	[NT]	[NT]
Aroclor 1248	mg/kg	0.1	Org-006	<0.1	1	<0.1	<0.1	0	[NT]	[NT]
Aroclor 1254	mg/kg	0.1	Org-006	<0.1	1	<0.1	<0.1	0	89	97
Aroclor 1260	mg/kg	0.1	Org-006	<0.1	1	<0.1	<0.1	0	[NT]	[NT]
Surrogate TCMX	%		Org-006	81	1	84	83	1	80	74

QUALITY CONTROL: Acid Extractable metals in soil					Duplicate			Spike Recovery %		
Test Description	Units	PQL	Method	Blank	#	Base	Dup.	RPD	LCS-5	240692-2
Date prepared	-			14/04/2020	1	14/04/2020	14/04/2020		14/04/2020	14/04/2020
Date analysed	-			15/04/2020	1	15/04/2020	15/04/2020		15/04/2020	15/04/2020
Arsenic	mg/kg	4	Metals-020	<4	1	4	4	0	102	100
Cadmium	mg/kg	0.4	Metals-020	<0.4	1	<0.4	<0.4	0	96	89
Chromium	mg/kg	1	Metals-020	<1	1	10	8	22	107	96
Copper	mg/kg	1	Metals-020	<1	1	89	61	37	101	127
Lead	mg/kg	1	Metals-020	<1	1	150	180	18	111	##
Mercury	mg/kg	0.1	Metals-021	<0.1	1	0.3	0.3	0	92	#
Nickel	mg/kg	1	Metals-020	<1	1	6	7	15	101	93
Zinc	mg/kg	1	Metals-020	<1	1	96	150	44	107	99

QUALITY CONTROL: Acid Extractable metals in soil					Duplicate			Spike Recovery %		
Test Description	Units	PQL	Method	Blank	#	Base	Dup.	RPD	[NT]	[NT]
Date prepared	-			[NT]	11	14/04/2020	14/04/2020		[NT]	[NT]
Date analysed	-			[NT]	11	15/04/2020	15/04/2020		[NT]	[NT]
Arsenic	mg/kg	4	Metals-020	[NT]	11	9	9	0	[NT]	[NT]
Cadmium	mg/kg	0.4	Metals-020	[NT]	11	0.7	0.9	25	[NT]	[NT]
Chromium	mg/kg	1	Metals-020	[NT]	11	14	16	13	[NT]	[NT]
Copper	mg/kg	1	Metals-020	[NT]	11	99	110	11	[NT]	[NT]
Lead	mg/kg	1	Metals-020	[NT]	11	300	300	0	[NT]	[NT]
Mercury	mg/kg	0.1	Metals-021	[NT]	11	0.8	1	22	[NT]	[NT]
Nickel	mg/kg	1	Metals-020	[NT]	11	11	14	24	[NT]	[NT]
Zinc	mg/kg	1	Metals-020	[NT]	11	260	300	14	[NT]	[NT]

QUALITY CONTROL: Misc Soil - Inorg						Duplicate			Spike Recovery %	
Test Description	Units	PQL	Method	Blank	#	Base	Dup.	RPD	LCS-5	240692-2
Date prepared	-			14/04/2020	1	14/04/2020	14/04/2020		14/04/2020	14/04/2020
Date analysed	-			14/04/2020	1	14/04/2020	14/04/2020		14/04/2020	14/04/2020
Total Phenolics (as Phenol)	mg/kg	5	Inorg-031	<5	1	<5	<5	0	100	101

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	-			17/04/2020	[NT]	[NT]	[NT]	[NT]	17/04/2020	[NT]
Date analysed	-			17/04/2020	[NT]	[NT]	[NT]	[NT]	17/04/2020	[NT]
TRH C ₆ - C ₉	µg/L	10	Org-016	<10	[NT]	[NT]	[NT]	[NT]	103	[NT]
TRH C ₆ - C ₁₀	µg/L	10	Org-016	<10	[NT]	[NT]	[NT]	[NT]	103	[NT]
Benzene	µg/L	1	Org-016	<1	[NT]	[NT]	[NT]	[NT]	97	[NT]
Toluene	µg/L	1	Org-016	<1	[NT]	[NT]	[NT]	[NT]	106	[NT]
Ethylbenzene	µg/L	1	Org-016	<1	[NT]	[NT]	[NT]	[NT]	107	[NT]
m+p-xylene	µg/L	2	Org-016	<2	[NT]	[NT]	[NT]	[NT]	102	[NT]
o-xylene	µg/L	1	Org-016	<1	[NT]	[NT]	[NT]	[NT]	103	[NT]
Naphthalene	µg/L	1	Org-013	<1	[NT]	[NT]	[NT]	[NT]	[NT]	[NT]
Surrogate Dibromofluoromethane	%		Org-016	97	[NT]	[NT]	[NT]	[NT]	120	[NT]
Surrogate toluene-d8	%		Org-016	99	[NT]	[NT]	[NT]	[NT]	116	[NT]
Surrogate 4-BFB	%		Org-016	96	[NT]	[NT]	[NT]	[NT]	109	[NT]

QUALITY CONTROL: svTRH (C10-C40) in Water					Duplicate			Spike Recovery %		
Test Description	Units	PQL	Method	Blank	#	Base	Dup.	RPD	LCS-W4	[NT]
Date extracted	-			14/04/2020	[NT]	[NT]	[NT]	[NT]	14/04/2020	[NT]
Date analysed	-			15/04/2020	[NT]	[NT]	[NT]	[NT]	15/04/2020	[NT]
TRH C ₁₀ - C ₁₄	µg/L	50	Org-003	<50	[NT]	[NT]	[NT]	[NT]	129	[NT]
TRH C ₁₅ - C ₂₈	µg/L	100	Org-003	<100	[NT]	[NT]	[NT]	[NT]	108	[NT]
TRH C ₂₉ - C ₃₆	µg/L	100	Org-003	<100	[NT]	[NT]	[NT]	[NT]	103	[NT]
TRH >C ₁₀ - C ₁₆	µg/L	50	Org-003	<50	[NT]	[NT]	[NT]	[NT]	129	[NT]
TRH >C ₁₆ - C ₃₄	µg/L	100	Org-003	<100	[NT]	[NT]	[NT]	[NT]	108	[NT]
TRH >C ₃₄ - C ₄₀	µg/L	100	Org-003	<100	[NT]	[NT]	[NT]	[NT]	103	[NT]
Surrogate o-Terphenyl	%		Org-003	109	[NT]	[NT]	[NT]	[NT]	81	[NT]

QUALITY CONTROL: PAHs in Water					Duplicate			Spike Recovery %		
Test Description	Units	PQL	Method	Blank	#	Base	Dup.	RPD	LCS-W4	[NT]
Date extracted	-			14/04/2020	[NT]	[NT]	[NT]	[NT]	14/04/2020	[NT]
Date analysed	-			14/04/2020	[NT]	[NT]	[NT]	[NT]	14/04/2020	[NT]
Naphthalene	µg/L	1	Org-012/017	<1	[NT]	[NT]	[NT]	[NT]	82	[NT]
Acenaphthylene	µg/L	1	Org-012/017	<1	[NT]	[NT]	[NT]	[NT]	[NT]	[NT]
Acenaphthene	µg/L	1	Org-012/017	<1	[NT]	[NT]	[NT]	[NT]	[NT]	[NT]
Fluorene	µg/L	1	Org-012/017	<1	[NT]	[NT]	[NT]	[NT]	86	[NT]
Phenanthrene	µg/L	1	Org-012/017	<1	[NT]	[NT]	[NT]	[NT]	80	[NT]
Anthracene	µg/L	1	Org-012/017	<1	[NT]	[NT]	[NT]	[NT]	[NT]	[NT]
Fluoranthene	µg/L	1	Org-012/017	<1	[NT]	[NT]	[NT]	[NT]	76	[NT]
Pyrene	µg/L	1	Org-012/017	<1	[NT]	[NT]	[NT]	[NT]	82	[NT]
Benzo(a)anthracene	µg/L	1	Org-012/017	<1	[NT]	[NT]	[NT]	[NT]	[NT]	[NT]
Chrysene	µg/L	1	Org-012/017	<1	[NT]	[NT]	[NT]	[NT]	92	[NT]
Benzo(b,j+k)fluoranthene	µg/L	2	Org-012/017	<2	[NT]	[NT]	[NT]	[NT]	[NT]	[NT]
Benzo(a)pyrene	µg/L	1	Org-012/017	<1	[NT]	[NT]	[NT]	[NT]	86	[NT]
Indeno(1,2,3-c,d)pyrene	µg/L	1	Org-012/017	<1	[NT]	[NT]	[NT]	[NT]	[NT]	[NT]
Dibenzo(a,h)anthracene	µg/L	1	Org-012/017	<1	[NT]	[NT]	[NT]	[NT]	[NT]	[NT]
Benzo(g,h,i)perylene	µg/L	1	Org-012/017	<1	[NT]	[NT]	[NT]	[NT]	[NT]	[NT]
Surrogate p-Terphenyl-d14	%		Org-012/017	91	[NT]	[NT]	[NT]	[NT]	80	[NT]

QUALITY CONTROL: Metals in Water - Dissolved						Duplicate		Spike Recovery %		
Test Description	Units	PQL	Method	Blank	#	Base	Dup.	RPD	LCS-W1	[NT]
Date digested	-			15/04/2020	[NT]	[NT]	[NT]	[NT]	15/04/2020	[NT]
Date analysed	-			15/04/2020	[NT]	[NT]	[NT]	[NT]	15/04/2020	[NT]
Arsenic - Dissolved	mg/L	0.05	Metals-020	<0.05	[NT]	[NT]	[NT]	[NT]	96	[NT]
Cadmium - Dissolved	mg/L	0.01	Metals-020	<0.01	[NT]	[NT]	[NT]	[NT]	100	[NT]
Chromium - Dissolved	mg/L	0.01	Metals-020	<0.01	[NT]	[NT]	[NT]	[NT]	98	[NT]
Copper - Dissolved	mg/L	0.01	Metals-020	<0.01	[NT]	[NT]	[NT]	[NT]	96	[NT]
Lead - Dissolved	mg/L	0.03	Metals-020	<0.03	[NT]	[NT]	[NT]	[NT]	98	[NT]
Mercury - Dissolved	mg/L	0.0005	Metals-021	<0.0005	[NT]	[NT]	[NT]	[NT]	99	[NT]
Nickel - Dissolved	mg/L	0.02	Metals-020	<0.02	[NT]	[NT]	[NT]	[NT]	102	[NT]
Zinc - Dissolved	mg/L	0.02	Metals-020	<0.02	[NT]	[NT]	[NT]	[NT]	106	[NT]

Result Definitions

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

Quality Control Definitions

Blank	This is the component of the analytical signal which is not derived from the sample but from reagents, glassware etc, can be determined by processing solvents and reagents in exactly the same manner as for samples.
Duplicate	This is the complete duplicate analysis of a sample from the process batch. If possible, the sample selected should be one where the analyte concentration is easily measurable.
Matrix Spike	A portion of the sample is spiked with a known concentration of target analyte. The purpose of the matrix spike is to monitor the performance of the analytical method used and to determine whether matrix interferences exist.
LCS (Laboratory Control Sample)	This comprises either a standard reference material or a control matrix (such as a blank sand or water) fortified with analytes representative of the analyte class. It is simply a check sample.
Surrogate Spike	Surrogates are known additions to each sample, blank, matrix spike and LCS in a batch, of compounds which are similar to the analyte of interest, however are not expected to be found in real samples.
Australian Drinking Water Guidelines recommend that Thermotolerant Coliform, Faecal Enterococci, & E.Coli levels are less than 1cfu/100mL. The recommended maximums are taken from "Australian Drinking Water Guidelines", published by NHMRC & ARMC 2011.	
The recommended maximums for analytes in urine are taken from "2018 TLVs and BEIs", as published by ACGIH (where available). Limit provided for Nickel is a precautionary guideline as per Position Paper prepared by AIOH Exposure Standards Committee, 2016.	
Guideline limits for Rinse Water Quality reported as per analytical requirements and specifications of AS 4187, Amdt 2 2019, Table 7.2	

Laboratory Acceptance Criteria

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

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

Spikes for Physical and Aggregate Tests are not applicable.

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

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

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

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

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

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

Measurement Uncertainty estimates are available for most tests upon request.

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

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

Report Comments

Dissolved Metals: no filtered, preserved sample was received, therefore the unpreserved sample was filtered through 0.45µm filter at the lab. Note: there is a possibility some elements may be underestimated.

Acid Extractable Metals in Soil:

-The laboratory RPD acceptance criteria has been exceeded for 240692-1 for Zn. Therefore a triplicate result has been issued as laboratory sample number 240692-13.

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

-## Percent recovery is not possible to report 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.

TRH Soil C10-C40 NEPM - # Percent recovery for the matrix spike is not possible to report due to interference from analytes (other than those being tested) in sample 240692-2ms.

Project No: 86767.03				Suburb: Haymarket				To: Envirolab Services			
Project Name: HAYMARKET, SSI				Order Number: 152065							
Project Manager: WFY				Sampler: WFY				Attn: Simon Song			
Emails: wenfei.yuan@douglaspartners.com.au								Phone:			
Date Required: Same day <input type="checkbox"/> 24 hours <input type="checkbox"/> 48 hours <input type="checkbox"/> 72 hours <input type="checkbox"/> Standard <input type="checkbox"/>								Email:			
Prior Storage: <input type="checkbox"/> Esky <input type="checkbox"/> Fridge <input type="checkbox"/> Shelved								Do samples contain 'potential' HBM? Yes <input type="checkbox"/> No <input type="checkbox"/> (If YES, then handle, transport and store in accordance with FPM HAZID)			

Sample ID	Lab ID	Date Sampled	Sample Type	Container Type	Analytes				Notes
			S - soil W - water	G - glass P - plastic	Combo ₁	Combo _{3A}	Combo ₃		
BH101/0.1-0.2	1	08/04/20	S	G/P	X				Please store extra samples until further notice. The bag samples will be despatched on 14/04/2020 <div style="text-align: center;">  Envirolab Services 12 Ashley St Chatswood NSW 2067 Ph: (02) 9910 6200 Job No: 240892 Date Received: 8/4/20 Time Received: 1700 Received By: SP Temp: Cool/Ambient Cooling: Ice/Icepack Security: Intact/Broken/None </div>
BH101/0.9-1.0	2	08/04/20	S	G/P	X				
BH102/1.5-1.6	3	7-8/04/2020	S	G/P	X				
BH102/3.1-3.2	4	7-8/04/2020	S	G/P		X			
BH102/4-4.1	5	7-8/04/2020	S	G/P		X			
BH102/4.9-5.0	6	7-8/04/2020	S	G/P			X		
BH103/1-1.1	7	08/04/20	S	G/P	X				
BH103/2-2.1	8	08/04/20	S	G/P		X			
BH104/1-1.1	9	08/04/20	S	G/P	X				
BH105/0.05-0.1	10	08/04/20	S	G/P		X			
BD1/070420	11	08/04/20	S	G			X		
Rinsate	12	08/04/20	W	G/P			X		
									* Please filter HM for rinsate.
PQL (S) mg/kg									ANZECC PQLs req'd for all water analytes <input type="checkbox"/>
PQL = practical quantitation limit. If none given, default to Laboratory Method Detection Limit									Lab Report/Reference No: 240892
Metals to Analyse: 8HM unless specified here:									
Total number of samples in container:				Relinquished by: WFY		Transported to laboratory by:			
Send Results to: Douglas Partners Pty Ltd				Address: 96 Hermitage Road, West Ryde				Phone: 9809 0999	
Signed:				Received by: Jason Day BKS S/D				Date & Time: 8/4/20 1700	

COL rec'd: 9/4/20 1545 JAD

CERTIFICATE OF ANALYSIS 240692-A

Client Details

Client	Douglas Partners Pty Ltd
Attention	Wen-Fei Yuan
Address	96 Hermitage Rd, West Ryde, NSW, 2114

Sample Details

Your Reference	<u>86767.03, Haymarket, SSI</u>
Number of Samples	11 Soil, 1 Water
Date samples received	08/04/2020
Date completed instructions received	20/04/2020

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	27/04/2020
Date of Issue	27/04/2020
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

Loren Bardwell, Senior Chemist
Steven Luong, Organics Supervisor

Authorised By



Nancy Zhang, Laboratory Manager

Metals in TCLP USEPA1311

Our Reference		240692-A-1	240692-A-2	240692-A-4	240692-A-5	240692-A-10
Your Reference	UNITS	BH101/0.1-0.2	BH101/0.9-1.0	BH102/3.1-3.2	BH102/4-4.1	BH105/0.05-0.1
Date Sampled		08/04/2020	08/04/2020	07/04/2020	07/04/2020	08/04/2020
Type of sample		Soil	Soil	Soil	Soil	Soil
Date extracted	-	23/04/2020	23/04/2020	23/04/2020	23/04/2020	23/04/2020
Date analysed	-	23/04/2020	23/04/2020	23/04/2020	23/04/2020	23/04/2020
pH of soil for fluid# determ.	pH units	9.1	9.2	6.2	6.0	9.3
pH of soil TCLP (after HCl)	pH units	1.7	1.7	1.7	1.7	1.7
Extraction fluid used	-	1	1	1	1	1
pH of final Leachate	pH units	5.1	5.0	4.9	4.9	5.1
Lead in TCLP	mg/L	0.1	0.34	0.04	<0.03	0.1

Metals in TCLP USEPA1311

Our Reference		240692-A-11
Your Reference	UNITS	BD1/070420
Date Sampled		08/04/2020
Type of sample		Soil
Date extracted	-	23/04/2020
Date analysed	-	23/04/2020
pH of soil for fluid# determ.	pH units	9.4
pH of soil TCLP (after HCl)	pH units	1.8
Extraction fluid used	-	1
pH of final Leachate	pH units	5.1
Lead in TCLP	mg/L	0.2

PAHs in TCLP (USEPA 1311)			
Our Reference		240692-A-2	240692-A-10
Your Reference	UNITS	BH101/0.9-1.0	BH105/0.05-0.1
Date Sampled		08/04/2020	08/04/2020
Type of sample		Soil	Soil
Date extracted	-	23/04/2020	23/04/2020
Date analysed	-	23/04/2020	23/04/2020
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(b,j,k)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 <i>p</i> -Terphenyl-d14	%	92	100

Method ID	Methodology Summary
EXTRACT.7	Toxicity Characteristic Leaching Procedure (TCLP) using Zero Headspace Extraction (zHE) using AS4439 and USEPA 1311.
Inorg-001	pH - Measured using pH meter and electrode in accordance with APHA latest edition, 4500-H+. Please note that the results for water analyses are indicative only, as analysis outside of the APHA storage times.
Inorg-004	Toxicity Characteristic Leaching Procedure (TCLP) using in house method INORG-004. Please note that the mass used may be scaled down from the default based on sample mass available.
Metals-020 ICP-AES	Determination of various metals by ICP-AES.
Org-022/025	Leachates are extracted with Dichloromethane and analysed by GC-MS/GC-MSMS.

QUALITY CONTROL: Metals in TCLP USEPA1311						Duplicate		Spike Recovery %		
Test Description	Units	PQL	Method	Blank	#	Base	Dup.	RPD	LCS-W1	[NT]
Date extracted	-			23/04/2020	[NT]	[NT]	[NT]	[NT]	23/04/2020	[NT]
Date analysed	-			23/04/2020	[NT]	[NT]	[NT]	[NT]	23/04/2020	[NT]
Lead in TCLP	mg/L	0.03	Metals-020 ICP-AES	<0.03	[NT]	[NT]	[NT]	[NT]	89	[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	-			23/04/2020	[NT]	[NT]	[NT]	[NT]	23/04/2020	[NT]
Date analysed	-			23/04/2020	[NT]	[NT]	[NT]	[NT]	23/04/2020	[NT]
Naphthalene in TCLP	mg/L	0.001	Org-022/025	<0.001	[NT]	[NT]	[NT]	[NT]	128	[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]	[NT]	[NT]
Fluorene in TCLP	mg/L	0.001	Org-022/025	<0.001	[NT]	[NT]	[NT]	[NT]	122	[NT]
Phenanthrene in TCLP	mg/L	0.001	Org-022/025	<0.001	[NT]	[NT]	[NT]	[NT]	108	[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]	124	[NT]
Pyrene in TCLP	mg/L	0.001	Org-022/025	<0.001	[NT]	[NT]	[NT]	[NT]	126	[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]	116	[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]	94	[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	77	[NT]	[NT]	[NT]	[NT]	103	[NT]

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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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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.

CERTIFICATE OF ANALYSIS 241179

Client Details

Client	Douglas Partners Pty Ltd
Attention	Wen-Fei Yuan
Address	96 Hermitage Rd, West Ryde, NSW, 2114

Sample Details

Your Reference	<u>86767.03, Haymarket</u>
Number of Samples	7 SOIL
Date samples received	16/04/2020
Date completed instructions received	20/04/2020

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	27/04/2020
Date of Issue	27/04/2020
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Asbestos Approved By

Analysed by Asbestos Approved Identifier: Lucy Zhu
 Authorised by Asbestos Approved Signatory: Lucy Zhu

Results Approved By

Diego Bigolin, Team Leader, Inorganics
 Hannah Nguyen, Senior Chemist
 Josh Williams, Senior Chemist
 Lucy Zhu, Asbestos Supervisor

Authorised By



Nancy Zhang, Laboratory Manager

vTRH(C6-C10)/BTEXN in Soil

Our Reference		241179-1	241179-2	241179-3	241179-4	241179-5
Your Reference	UNITS	BH103	BH103	BH103	BH104	BH104
Depth		2.9-3.0	5.1-5.2	6.3-6.45	1.4-1.5	2.8-2.9
Date Sampled		16/04/2020	16/04/2020	16/04/2020	14/04/2020	14/04/2020
Type of sample		SOIL	SOIL	SOIL	SOIL	SOIL
Date extracted	-	21/04/2020	21/04/2020	21/04/2020	21/04/2020	21/04/2020
Date analysed	-	23/04/2020	23/04/2020	23/04/2020	23/04/2020	23/04/2020
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	%	102	105	105	104	105

vTRH(C6-C10)/BTEXN in Soil

Our Reference		241179-6	241179-7
Your Reference	UNITS	TB	TS
Depth		-	-
Date Sampled		14/04/2020	14/04/2020
Type of sample		SOIL	SOIL
Date extracted	-	21/04/2020	21/04/2020
Date analysed	-	23/04/2020	23/04/2020
TRH C ₆ - C ₉	mg/kg	<25	[NA]
TRH C ₆ - C ₁₀	mg/kg	<25	[NA]
vTPH C ₆ - C ₁₀ less BTEX (F1)	mg/kg	<25	[NA]
Benzene	mg/kg	<0.2	97%
Toluene	mg/kg	<0.5	98%
Ethylbenzene	mg/kg	<1	94%
m+p-xylene	mg/kg	<2	95%
o-Xylene	mg/kg	<1	93%
naphthalene	mg/kg	<1	[NA]
Total +ve Xylenes	mg/kg	<3	[NA]
Surrogate aaa-Trifluorotoluene	%	109	95

svTRH (C10-C40) in Soil						
Our Reference		241179-1	241179-2	241179-3	241179-4	241179-5
Your Reference	UNITS	BH103	BH103	BH103	BH104	BH104
Depth		2.9-3.0	5.1-5.2	6.3-6.45	1.4-1.5	2.8-2.9
Date Sampled		16/04/2020	16/04/2020	16/04/2020	14/04/2020	14/04/2020
Type of sample		SOIL	SOIL	SOIL	SOIL	SOIL
Date extracted	-	21/04/2020	21/04/2020	21/04/2020	21/04/2020	21/04/2020
Date analysed	-	22/04/2020	22/04/2020	22/04/2020	22/04/2020	22/04/2020
TRH C ₁₀ - C ₁₄	mg/kg	<50	<50	<50	<50	<50
TRH C ₁₅ - C ₂₈	mg/kg	<100	<100	<100	<100	<100
TRH C ₂₉ - C ₃₆	mg/kg	<100	<100	<100	<100	<100
TRH >C ₁₀ -C ₁₆	mg/kg	<50	<50	<50	<50	<50
TRH >C ₁₀ - C ₁₆ less Naphthalene (F2)	mg/kg	<50	<50	<50	<50	<50
TRH >C ₁₆ -C ₃₄	mg/kg	<100	<100	<100	<100	<100
TRH >C ₃₄ -C ₄₀	mg/kg	<100	<100	<100	<100	<100
Total +ve TRH (>C10-C40)	mg/kg	<50	<50	<50	<50	<50
Surrogate o-Terphenyl	%	83	70	74	76	73

PAHs in Soil						
Our Reference		241179-1	241179-2	241179-3	241179-4	241179-5
Your Reference	UNITS	BH103	BH103	BH103	BH104	BH104
Depth		2.9-3.0	5.1-5.2	6.3-6.45	1.4-1.5	2.8-2.9
Date Sampled		16/04/2020	16/04/2020	16/04/2020	14/04/2020	14/04/2020
Type of sample		SOIL	SOIL	SOIL	SOIL	SOIL
Date extracted	-	21/04/2020	21/04/2020	21/04/2020	21/04/2020	21/04/2020
Date analysed	-	21/04/2020	21/04/2020	21/04/2020	21/04/2020	21/04/2020
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	0.5	<0.1
Anthracene	mg/kg	<0.1	<0.1	<0.1	0.2	<0.1
Fluoranthene	mg/kg	<0.1	0.4	<0.1	1.1	0.2
Pyrene	mg/kg	<0.1	0.4	<0.1	1.1	0.2
Benzo(a)anthracene	mg/kg	<0.1	0.2	<0.1	0.6	0.1
Chrysene	mg/kg	<0.1	0.2	<0.1	0.6	<0.1
Benzo(b,j+k)fluoranthene	mg/kg	<0.2	0.3	<0.2	0.9	<0.2
Benzo(a)pyrene	mg/kg	<0.05	0.2	<0.05	0.53	0.09
Indeno(1,2,3-c,d)pyrene	mg/kg	<0.1	0.1	<0.1	0.3	<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	0.3	<0.1
Total +ve PAH's	mg/kg	<0.05	2.2	<0.05	6.1	0.56
Benzo(a)pyrene TEQ calc (zero)	mg/kg	<0.5	<0.5	<0.5	0.7	<0.5
Benzo(a)pyrene TEQ calc(half)	mg/kg	<0.5	<0.5	<0.5	0.8	<0.5
Benzo(a)pyrene TEQ calc(PQL)	mg/kg	<0.5	<0.5	<0.5	0.8	<0.5
Surrogate <i>p</i> -Terphenyl-d14	%	102	101	104	103	102

Organochlorine Pesticides in soil			
Our Reference		241179-1	241179-5
Your Reference	UNITS	BH103	BH104
Depth		2.9-3.0	2.8-2.9
Date Sampled		16/04/2020	14/04/2020
Type of sample		SOIL	SOIL
Date extracted	-	21/04/2020	21/04/2020
Date analysed	-	21/04/2020	21/04/2020
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	%	91	98

Organophosphorus Pesticides in Soil			
Our Reference		241179-1	241179-5
Your Reference	UNITS	BH103	BH104
Depth		2.9-3.0	2.8-2.9
Date Sampled		16/04/2020	14/04/2020
Type of sample		SOIL	SOIL
Date extracted	-	21/04/2020	21/04/2020
Date analysed	-	21/04/2020	21/04/2020
Dichlorvos	mg/kg	<0.1	<0.1
Dimethoate	mg/kg	<0.1	<0.1
Diazinon	mg/kg	<0.1	<0.1
Chlorpyrifos-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
Chlorpyrifos	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	%	91	98

PCBs in Soil			
Our Reference		241179-1	241179-5
Your Reference	UNITS	BH103	BH104
Depth		2.9-3.0	2.8-2.9
Date Sampled		16/04/2020	14/04/2020
Type of sample		SOIL	SOIL
Date extracted	-	21/04/2020	21/04/2020
Date analysed	-	21/04/2020	21/04/2020
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	%	91	98

Acid Extractable metals in soil						
Our Reference		241179-1	241179-2	241179-3	241179-4	241179-5
Your Reference	UNITS	BH103	BH103	BH103	BH104	BH104
Depth		2.9-3.0	5.1-5.2	6.3-6.45	1.4-1.5	2.8-2.9
Date Sampled		16/04/2020	16/04/2020	16/04/2020	14/04/2020	14/04/2020
Type of sample		SOIL	SOIL	SOIL	SOIL	SOIL
Date prepared	-	21/04/2020	21/04/2020	21/04/2020	21/04/2020	21/04/2020
Date analysed	-	21/04/2020	21/04/2020	21/04/2020	21/04/2020	21/04/2020
Arsenic	mg/kg	12	<4	<4	<4	11
Cadmium	mg/kg	<0.4	<0.4	<0.4	<0.4	<0.4
Chromium	mg/kg	8	5	1	6	7
Copper	mg/kg	31	13	<1	28	27
Lead	mg/kg	19	43	<1	14	17
Mercury	mg/kg	<0.1	0.4	<0.1	<0.1	<0.1
Nickel	mg/kg	2	2	<1	7	3
Zinc	mg/kg	16	17	<1	42	21

Misc Soil - Inorg			
Our Reference		241179-1	241179-5
Your Reference	UNITS	BH103	BH104
Depth		2.9-3.0	2.8-2.9
Date Sampled		16/04/2020	14/04/2020
Type of sample		SOIL	SOIL
Date prepared	-	21/04/2020	21/04/2020
Date analysed	-	21/04/2020	21/04/2020
Total Phenolics (as Phenol)	mg/kg	<5	<5

Moisture						
Our Reference		241179-1	241179-2	241179-3	241179-4	241179-5
Your Reference	UNITS	BH103	BH103	BH103	BH104	BH104
Depth		2.9-3.0	5.1-5.2	6.3-6.45	1.4-1.5	2.8-2.9
Date Sampled		16/04/2020	16/04/2020	16/04/2020	14/04/2020	14/04/2020
Type of sample		SOIL	SOIL	SOIL	SOIL	SOIL
Date prepared	-	21/04/2020	21/04/2020	21/04/2020	21/04/2020	21/04/2020
Date analysed	-	22/04/2020	22/04/2020	22/04/2020	22/04/2020	22/04/2020
Moisture	%	16	11	4.7	31	12

Asbestos ID - soils					
Our Reference	UNITS	241179-1	241179-2	241179-4	241179-5
Your Reference		BH103	BH103	BH104	BH104
Depth		2.9-3.0	5.1-5.2	1.4-1.5	2.8-2.9
Date Sampled		16/04/2020	16/04/2020	14/04/2020	14/04/2020
Type of sample		SOIL	SOIL	SOIL	SOIL
Date analysed	-	22/04/2020	22/04/2020	22/04/2020	22/04/2020
Sample mass tested	g	Approx. 35g	Approx. 35g	Approx. 40g	Approx. 35g
Sample Description	-	Beige clay soil & rocks	Beige clay soil & rocks	Beige clay soil & rocks	Beige clay soil & rocks
Asbestos ID in soil	-	No asbestos detected at reporting limit of 0.1g/kg Organic fibres detected	No asbestos detected at reporting limit of 0.1g/kg Organic fibres detected	No asbestos detected at reporting limit of 0.1g/kg Organic fibres detected	No asbestos detected at reporting limit of 0.1g/kg Organic fibres detected
Trace Analysis	-	No asbestos detected	No asbestos detected	No asbestos detected	No asbestos detected

Method ID	Methodology Summary
ASB-001	Asbestos ID - Qualitative identification of asbestos in bulk samples using Polarised Light Microscopy and Dispersion Staining Techniques including Synthetic Mineral Fibre and Organic Fibre as per Australian Standard 4964-2004.
Inorg-008	Moisture content determined by heating at 105+/-5 °C for a minimum of 12 hours.
Inorg-031	Total Phenolics by segmented flow analyser (in line distillation with colourimetric finish). Solids are extracted in a caustic media prior to analysis.
Metals-020	Determination of various metals by ICP-AES.
Metals-021	Determination of Mercury by Cold Vapour AAS.
Org-020	Soil samples are extracted with Dichloromethane/Acetone and waters with Dichloromethane and analysed by GC-FID. F2 = (>C10-C16)-Naphthalene as per NEPM B1 Guideline on Investigation Levels for Soil and Groundwater (HSLs Tables 1A (3, 4)). Note Naphthalene is determined from the VOC analysis.
Org-020	Soil samples are extracted with Dichloromethane/Acetone and waters with Dichloromethane and analysed by GC-FID. F2 = (>C10-C16)-Naphthalene as per NEPM B1 Guideline on Investigation Levels for Soil and Groundwater (HSLs Tables 1A (3, 4)). Note Naphthalene is determined from the VOC analysis. Note, the Total +ve TRH PQL is reflective of the lowest individual PQL and is therefore "Total +ve TRH" is simply a sum of the positive individual TRH fractions (>C10-C40).
Org-021	Soil samples are extracted with dichloromethane/acetone and waters with dichloromethane and analysed by GC-ECD.
Org-021	Soil samples are extracted with dichloromethane/acetone and waters with dichloromethane and analysed by GC-ECD. Note, the Total +ve PCBs PQL is reflective of the lowest individual PQL and is therefore "Total +ve PCBs" is simply a sum of the positive individual PCBs.
Org-022	Determination of VOCs sampled onto coconut shell charcoal sorbent tubes, that can be desorbed using carbon disulphide, and analysed by GC-MS.
Org-022/025	Soil samples are extracted with Dichloromethane/Acetone and waters with Dichloromethane and analysed by GC-MS/GC-MSMS.
Org-022/025	Soil samples are extracted with dichloromethane/acetone and waters with dichloromethane and analysed by GC-MS/GC-MSMS. Note, the Total +ve reported DDD+DDE+DDT PQL is reflective of the lowest individual PQL and is therefore simply a sum of the positive individually report DDD+DDE+DDT.

Method ID	Methodology Summary
Org-022/025	<p>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.</p> <p>For soil results:-</p> <ol style="list-style-type: none"> 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. <p>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.</p>
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)-BTX as per NEPM B1 Guideline on Investigation Levels for Soil and Groundwater.
Org-023	<p>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)-BTX as per NEPM B1 Guideline on Investigation Levels for Soil and Groundwater.</p> <p>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.</p>

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	-			21/04/2020	[NT]	[NT]	[NT]	[NT]	21/04/2020	[NT]
Date analysed	-			23/04/2020	[NT]	[NT]	[NT]	[NT]	23/04/2020	[NT]
TRH C ₆ - C ₉	mg/kg	25	Org-023	<25	[NT]	[NT]	[NT]	[NT]	101	[NT]
TRH C ₆ - C ₁₀	mg/kg	25	Org-023	<25	[NT]	[NT]	[NT]	[NT]	101	[NT]
Benzene	mg/kg	0.2	Org-023	<0.2	[NT]	[NT]	[NT]	[NT]	88	[NT]
Toluene	mg/kg	0.5	Org-023	<0.5	[NT]	[NT]	[NT]	[NT]	98	[NT]
Ethylbenzene	mg/kg	1	Org-023	<1	[NT]	[NT]	[NT]	[NT]	110	[NT]
m+p-xylene	mg/kg	2	Org-023	<2	[NT]	[NT]	[NT]	[NT]	104	[NT]
o-Xylene	mg/kg	1	Org-023	<1	[NT]	[NT]	[NT]	[NT]	101	[NT]
naphthalene	mg/kg	1	Org-023	<1	[NT]	[NT]	[NT]	[NT]	[NT]	[NT]
Surrogate aaa-Trifluorotoluene	%		Org-023	110	[NT]	[NT]	[NT]	[NT]	114	[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	-			21/04/2020	[NT]	[NT]	[NT]	[NT]	21/04/2020	[NT]
Date analysed	-			21/04/2020	[NT]	[NT]	[NT]	[NT]	21/04/2020	[NT]
TRH C ₁₀ - C ₁₄	mg/kg	50	Org-020	<50	[NT]	[NT]	[NT]	[NT]	92	[NT]
TRH C ₁₅ - C ₂₈	mg/kg	100	Org-020	<100	[NT]	[NT]	[NT]	[NT]	87	[NT]
TRH C ₂₉ - C ₃₆	mg/kg	100	Org-020	<100	[NT]	[NT]	[NT]	[NT]	119	[NT]
TRH >C ₁₀ -C ₁₆	mg/kg	50	Org-020	<50	[NT]	[NT]	[NT]	[NT]	92	[NT]
TRH >C ₁₆ -C ₃₄	mg/kg	100	Org-020	<100	[NT]	[NT]	[NT]	[NT]	87	[NT]
TRH >C ₃₄ -C ₄₀	mg/kg	100	Org-020	<100	[NT]	[NT]	[NT]	[NT]	119	[NT]
Surrogate o-Terphenyl	%		Org-020	77	[NT]	[NT]	[NT]	[NT]	117	[NT]

QUALITY CONTROL: PAHs in Soil					Duplicate				Spike Recovery %	
Test Description	Units	PQL	Method	Blank	#	Base	Dup.	RPD	LCS-4	[NT]
Date extracted	-			21/04/2020	[NT]	[NT]	[NT]	[NT]	21/04/2020	[NT]
Date analysed	-			21/04/2020	[NT]	[NT]	[NT]	[NT]	21/04/2020	[NT]
Naphthalene	mg/kg	0.1	Org-022/025	<0.1	[NT]	[NT]	[NT]	[NT]	106	[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]	[NT]	[NT]
Fluorene	mg/kg	0.1	Org-022/025	<0.1	[NT]	[NT]	[NT]	[NT]	104	[NT]
Phenanthrene	mg/kg	0.1	Org-022/025	<0.1	[NT]	[NT]	[NT]	[NT]	112	[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]	110	[NT]
Pyrene	mg/kg	0.1	Org-022/025	<0.1	[NT]	[NT]	[NT]	[NT]	112	[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]	122	[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]	102	[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	98	[NT]	[NT]	[NT]	[NT]	112	[NT]

QUALITY CONTROL: Organochlorine Pesticides in soil					Duplicate				Spike Recovery %	
Test Description	Units	PQL	Method	Blank	#	Base	Dup.	RPD	LCS-4	[NT]
Date extracted	-			21/04/2020	[NT]	[NT]	[NT]	[NT]	21/04/2020	[NT]
Date analysed	-			21/04/2020	[NT]	[NT]	[NT]	[NT]	21/04/2020	[NT]
alpha-BHC	mg/kg	0.1	Org-022/025	<0.1	[NT]	[NT]	[NT]	[NT]	100	[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]	92	[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]	76	[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]	112	[NT]
Heptachlor Epoxide	mg/kg	0.1	Org-022/025	<0.1	[NT]	[NT]	[NT]	[NT]	106	[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]	106	[NT]
Dieldrin	mg/kg	0.1	Org-022/025	<0.1	[NT]	[NT]	[NT]	[NT]	112	[NT]
Endrin	mg/kg	0.1	Org-022/025	<0.1	[NT]	[NT]	[NT]	[NT]	76	[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]	98	[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]	86	[NT]
Methoxychlor	mg/kg	0.1	Org-022/025	<0.1	[NT]	[NT]	[NT]	[NT]	[NT]	[NT]
Surrogate TCMX	%		Org-022/025	114	[NT]	[NT]	[NT]	[NT]	100	[NT]

QUALITY CONTROL: Organophosphorus Pesticides in Soil						Duplicate		Spike Recovery %		
Test Description	Units	PQL	Method	Blank	#	Base	Dup.	RPD	LCS-4	[NT]
Date extracted	-			21/04/2020	[NT]	[NT]	[NT]	[NT]	21/04/2020	[NT]
Date analysed	-			21/04/2020	[NT]	[NT]	[NT]	[NT]	21/04/2020	[NT]
Dichlorvos	mg/kg	0.1	Org-022/025	<0.1	[NT]	[NT]	[NT]	[NT]	92	[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]
Chlorpyrifos-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]	98	[NT]
Fenitrothion	mg/kg	0.1	Org-022/025	<0.1	[NT]	[NT]	[NT]	[NT]	76	[NT]
Malathion	mg/kg	0.1	Org-022/025	<0.1	[NT]	[NT]	[NT]	[NT]	90	[NT]
Chlorpyrifos	mg/kg	0.1	Org-022/025	<0.1	[NT]	[NT]	[NT]	[NT]	108	[NT]
Parathion	mg/kg	0.1	Org-022/025	<0.1	[NT]	[NT]	[NT]	[NT]	76	[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]	78	[NT]
Azinphos-methyl (Guthion)	mg/kg	0.1	Org-022/025	<0.1	[NT]	[NT]	[NT]	[NT]	[NT]	[NT]
Surrogate TCMX	%		Org-022/025	114	[NT]	[NT]	[NT]	[NT]	100	[NT]

QUALITY CONTROL: PCBs in Soil					Duplicate			Spike Recovery %		
Test Description	Units	PQL	Method	Blank	#	Base	Dup.	RPD	LCS-4	[NT]
Date extracted	-			21/04/2020	[NT]	[NT]	[NT]	[NT]	21/04/2020	[NT]
Date analysed	-			21/04/2020	[NT]	[NT]	[NT]	[NT]	21/04/2020	[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]	84	[NT]
Aroclor 1260	mg/kg	0.1	Org-021	<0.1	[NT]	[NT]	[NT]	[NT]	[NT]	[NT]
Surrogate TCMX	%		Org-021	114	[NT]	[NT]	[NT]	[NT]	100	[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	-			21/04/2020	[NT]	[NT]	[NT]	[NT]	21/04/2020	[NT]
Date analysed	-			21/04/2020	[NT]	[NT]	[NT]	[NT]	21/04/2020	[NT]
Arsenic	mg/kg	4	Metals-020	<4	[NT]	[NT]	[NT]	[NT]	103	[NT]
Cadmium	mg/kg	0.4	Metals-020	<0.4	[NT]	[NT]	[NT]	[NT]	97	[NT]
Chromium	mg/kg	1	Metals-020	<1	[NT]	[NT]	[NT]	[NT]	110	[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]	108	[NT]
Mercury	mg/kg	0.1	Metals-021	<0.1	[NT]	[NT]	[NT]	[NT]	95	[NT]
Nickel	mg/kg	1	Metals-020	<1	[NT]	[NT]	[NT]	[NT]	99	[NT]
Zinc	mg/kg	1	Metals-020	<1	[NT]	[NT]	[NT]	[NT]	104	[NT]

QUALITY CONTROL: Misc Soil - Inorg						Duplicate		Spike Recovery %		
Test Description	Units	PQL	Method	Blank	#	Base	Dup.	RPD	LCS-4	241179-5
Date prepared	-			21/04/2020	1	21/04/2020	21/04/2020		21/04/2020	21/04/2020
Date analysed	-			21/04/2020	1	21/04/2020	21/04/2020		21/04/2020	21/04/2020
Total Phenolics (as Phenol)	mg/kg	5	Inorg-031	<5	1	<5	<5	0	101	100

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.

CERTIFICATE OF ANALYSIS 240556

Client Details

Client	Douglas Partners Pty Ltd
Attention	Wen-Fei Yuan
Address	96 Hermitage Rd, West Ryde, NSW, 2114

Sample Details

Your Reference	86767.03, Haymarket, SSI
Number of Samples	14 Soil, 1 Water
Date samples received	07/04/2020
Date completed instructions received	08/04/2020

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	17/04/2020
Date of Issue	17/04/2020
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Asbestos Approved By

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

Results Approved By

Hannah Nguyen, Senior Chemist
 Josh Williams, Senior Chemist
 Lucy Zhu, Asbestos Supervisor
 Priya Samarawickrama, Senior Chemist
 Ridwan Wijaya, Lab Team Leader
 Steven Luong, Organics Supervisor

Authorised By



Nancy Zhang, Laboratory Manager

vTRH(C6-C10)/BTEXN in Soil

Our Reference		240556-1	240556-2	240556-4	240556-5	240556-7
Your Reference	UNITS	BH106/0.2-0.3	BH106/0.3-.04	BH113/0.15-0.25	BH113/0.4-0.5	BH114/0.15-0.2
Date Sampled		07/04/20	07/04/20	07/04/20	07/04/20	07/04/20
Type of sample		Soil	Soil	Soil	Soil	Soil
Date extracted	-	09/04/2020	09/04/2020	09/04/2020	09/04/2020	09/04/2020
Date analysed	-	11/04/2020	11/04/2020	11/04/2020	11/04/2020	11/04/2020
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	2	<1	<1	1
Total +ve Xylenes	mg/kg	<3	<3	<3	<3	<3
Surrogate aaa-Trifluorotoluene	%	103	92	103	95	102

vTRH(C6-C10)/BTEXN in Soil

Our Reference		240556-8	240556-9	240556-10	240556-12	240556-14
Your Reference	UNITS	BH114/0.2-0.3	BH115/0.23-0.3	BH115/0.5-0.6	BD2	TS
Date Sampled		07/04/20	07/04/20	07/04/20	07/04/20	07/04/20
Type of sample		Soil	Soil	Soil	Soil	Soil
Date extracted	-	09/04/2020	09/04/2020	09/04/2020	09/04/2020	09/04/2020
Date analysed	-	11/04/2020	11/04/2020	11/04/2020	11/04/2020	11/04/2020
TRH C ₆ - C ₉	mg/kg	<25	<25	<25	<25	[NA]
TRH C ₆ - C ₁₀	mg/kg	<25	<25	<25	<25	[NA]
vTPH C ₆ - C ₁₀ less BTEX (F1)	mg/kg	<25	<25	<25	<25	[NA]
Benzene	mg/kg	<0.2	<0.2	<0.2	<0.2	117%
Toluene	mg/kg	<0.5	<0.5	<0.5	<0.5	123%
Ethylbenzene	mg/kg	<1	<1	<1	<1	119%
m+p-xylene	mg/kg	<2	<2	<2	<2	120%
o-Xylene	mg/kg	<1	<1	<1	<1	122%
naphthalene	mg/kg	<1	<1	<1	<1	[NA]
Total +ve Xylenes	mg/kg	<3	<3	<3	<3	[NA]
Surrogate aaa-Trifluorotoluene	%	103	99	101	101	103

vTRH(C6-C10)/BTEXN in Soil		
Our Reference		240556-15
Your Reference	UNITS	TB
Date Sampled		07/04/20
Type of sample		Soil
Date extracted	-	09/04/2020
Date analysed	-	11/04/2020
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	%	106

svTRH (C10-C40) in Soil						
Our Reference		240556-1	240556-2	240556-4	240556-5	240556-7
Your Reference	UNITS	BH106/0.2-0.3	BH106/0.3-.04	BH113/0.15-0.25	BH113/0.4-0.5	BH114/0.15-0.2
Date Sampled		07/04/20	07/04/20	07/04/20	07/04/20	07/04/20
Type of sample		Soil	Soil	Soil	Soil	Soil
Date extracted	-	09/04/2020	09/04/2020	09/04/2020	09/04/2020	09/04/2020
Date analysed	-	09/04/2020	09/04/2020	09/04/2020	09/04/2020	09/04/2020
TRH C ₁₀ - C ₁₄	mg/kg	<50	90	<50	<50	69
TRH C ₁₅ - C ₂₈	mg/kg	1,100	2,500	540	<100	1,500
TRH C ₂₉ - C ₃₆	mg/kg	680	1,500	340	<100	630
TRH >C ₁₀ -C ₁₆	mg/kg	87	240	<50	<50	220
TRH >C ₁₀ - C ₁₆ less Naphthalene (F2)	mg/kg	87	230	<50	<50	220
TRH >C ₁₆ -C ₃₄	mg/kg	1,600	3,600	790	<100	1,900
TRH >C ₃₄ -C ₄₀	mg/kg	380	790	220	<100	330
Total +ve TRH (>C10-C40)	mg/kg	2,000	4,600	1,000	<50	2,500
Surrogate o-Terphenyl	%	#	#	136	103	#

svTRH (C10-C40) in Soil					
Our Reference		240556-8	240556-9	240556-10	240556-12
Your Reference	UNITS	BH114/0.2-0.3	BH115/0.23-0.3	BH115/0.5-0.6	BD2
Date Sampled		07/04/20	07/04/20	07/04/20	07/04/20
Type of sample		Soil	Soil	Soil	Soil
Date extracted	-	09/04/2020	09/04/2020	09/04/2020	09/04/2020
Date analysed	-	09/04/2020	10/04/2020	10/04/2020	10/04/2020
TRH C ₁₀ - C ₁₄	mg/kg	<50	<50	<50	<50
TRH C ₁₅ - C ₂₈	mg/kg	1,000	1,000	<100	540
TRH C ₂₉ - C ₃₆	mg/kg	540	500	<100	320
TRH >C ₁₀ -C ₁₆	mg/kg	120	110	<50	<50
TRH >C ₁₀ - C ₁₆ less Naphthalene (F2)	mg/kg	120	110	<50	<50
TRH >C ₁₆ -C ₃₄	mg/kg	1,400	1,300	<100	760
TRH >C ₃₄ -C ₄₀	mg/kg	310	280	<100	180
Total +ve TRH (>C10-C40)	mg/kg	1,800	1,700	<50	940
Surrogate o-Terphenyl	%	135	134	97	124

PAHs in Soil						
Our Reference		240556-1	240556-2	240556-3	240556-4	240556-5
Your Reference	UNITS	BH106/0.2-0.3	BH106/0.3-.04	BH106/0.9-1.0	BH113/0.15-0.25	BH113/0.4-0.5
Date Sampled		07/04/20	07/04/20	07/04/20	07/04/20	07/04/20
Type of sample		Soil	Soil	Soil	Soil	Soil
Date extracted	-	09/04/2020	09/04/2020	09/04/2020	09/04/2020	09/04/2020
Date analysed	-	09/04/2020	09/04/2020	09/04/2020	09/04/2020	09/04/2020
Naphthalene	mg/kg	0.8	1.1	<0.1	0.5	<0.1
Acenaphthylene	mg/kg	8.5	13	<0.1	4.9	<0.1
Acenaphthene	mg/kg	0.9	2.1	<0.1	0.4	<0.1
Fluorene	mg/kg	2.8	15	<0.1	1	0.1
Phenanthrene	mg/kg	41	150	0.2	21	2.2
Anthracene	mg/kg	9.5	50	<0.1	4.6	0.6
Fluoranthene	mg/kg	53	280	0.2	26	2.7
Pyrene	mg/kg	54	280	0.2	26	2.7
Benzo(a)anthracene	mg/kg	27	160	0.1	12	1.2
Chrysene	mg/kg	24	120	0.1	11	1
Benzo(b,j+k)fluoranthene	mg/kg	39	110	<0.2	17	2
Benzo(a)pyrene	mg/kg	28	120	0.1	12	1.2
Indeno(1,2,3-c,d)pyrene	mg/kg	13	27	<0.1	5.6	0.6
Dibenzo(a,h)anthracene	mg/kg	3.6	9.1	<0.1	1.4	0.1
Benzo(g,h,i)perylene	mg/kg	17	41	<0.1	7.5	0.7
Total +ve PAH's	mg/kg	320	1,400	0.88	150	15
Benzo(a)pyrene TEQ calc (zero)	mg/kg	40	160	<0.5	17	1.7
Benzo(a)pyrene TEQ calc(half)	mg/kg	40	160	<0.5	17	1.7
Benzo(a)pyrene TEQ calc(PQL)	mg/kg	40	160	<0.5	17	1.7
Surrogate <i>p</i> -Terphenyl-d14	%	84	97	80	78	78

PAHs in Soil						
Our Reference		240556-6	240556-7	240556-8	240556-9	240556-10
Your Reference	UNITS	BH113.0.9-1.0	BH114/0.15-0.2	BH114/0.2-0.3	BH115/0.23-0.3	BH115/0.5-0.6
Date Sampled		07/04/20	07/04/20	07/04/20	07/04/20	07/04/20
Type of sample		Soil	Soil	Soil	Soil	Soil
Date extracted	-	09/04/2020	09/04/2020	09/04/2020	09/04/2020	09/04/2020
Date analysed	-	09/04/2020	09/04/2020	09/04/2020	09/04/2020	09/04/2020
Naphthalene	mg/kg	<0.1	8.0	1.6	0.8	<0.1
Acenaphthylene	mg/kg	<0.1	36	16	16	0.6
Acenaphthene	mg/kg	<0.1	2.4	1.3	0.8	<0.1
Fluorene	mg/kg	<0.1	13	6.6	4.7	0.2
Phenanthrene	mg/kg	0.5	160	70	75	2.6
Anthracene	mg/kg	0.4	44	18	19	0.6
Fluoranthene	mg/kg	0.7	190	94	85	4.0
Pyrene	mg/kg	0.7	170	96	88	4.0
Benzo(a)anthracene	mg/kg	0.3	40	45	37	1.8
Chrysene	mg/kg	0.3	34	34	32	1.5
Benzo(b,j+k)fluoranthene	mg/kg	0.4	52	32	30	2.6
Benzo(a)pyrene	mg/kg	0.3	67	31	27	1.8
Indeno(1,2,3-c,d)pyrene	mg/kg	0.1	16	11	9.4	0.9
Dibenzo(a,h)anthracene	mg/kg	<0.1	3.1	3.0	2.8	0.2
Benzo(g,h,i)perylene	mg/kg	0.2	20	14	10	1.1
Total +ve PAH's	mg/kg	3.8	860	470	440	22
Benzo(a)pyrene TEQ calc (zero)	mg/kg	<0.5	81	43	38	2.5
Benzo(a)pyrene TEQ calc(half)	mg/kg	<0.5	81	43	38	2.5
Benzo(a)pyrene TEQ calc(PQL)	mg/kg	<0.5	81	43	38	2.5
Surrogate p-Terphenyl-d14	%	80	85	82	86	79

PAHs in Soil			
Our Reference		240556-11	240556-12
Your Reference	UNITS	BH115/0.9-1.0	BD2
Date Sampled		07/04/20	07/04/20
Type of sample		Soil	Soil
Date extracted	-	09/04/2020	09/04/2020
Date analysed	-	09/04/2020	09/04/2020
Naphthalene	mg/kg	<0.1	0.4
Acenaphthylene	mg/kg	<0.1	5.1
Acenaphthene	mg/kg	<0.1	0.5
Fluorene	mg/kg	<0.1	1.5
Phenanthrene	mg/kg	0.1	27
Anthracene	mg/kg	<0.1	6.7
Fluoranthene	mg/kg	0.1	31
Pyrene	mg/kg	0.1	31
Benzo(a)anthracene	mg/kg	<0.1	14
Chrysene	mg/kg	<0.1	13
Benzo(b,j+k)fluoranthene	mg/kg	<0.2	19
Benzo(a)pyrene	mg/kg	0.05	14
Indeno(1,2,3-c,d)pyrene	mg/kg	<0.1	6.4
Dibenzo(a,h)anthracene	mg/kg	<0.1	1.6
Benzo(g,h,i)perylene	mg/kg	<0.1	8.2
Total +ve PAH's	mg/kg	0.4	180
Benzo(a)pyrene TEQ calc (zero)	mg/kg	<0.5	20
Benzo(a)pyrene TEQ calc(half)	mg/kg	<0.5	20
Benzo(a)pyrene TEQ calc(PQL)	mg/kg	<0.5	20
Surrogate <i>p</i> -Terphenyl-d14	%	84	82

Organochlorine Pesticides in soil					
Our Reference		240556-2	240556-5	240556-8	240556-9
Your Reference	UNITS	BH106/0.3-.04	BH113/0.4-0.5	BH114/0.2-0.3	BH115/0.23-0.3
Date Sampled		07/04/20	07/04/20	07/04/20	07/04/20
Type of sample		Soil	Soil	Soil	Soil
Date extracted	-	09/04/2020	09/04/2020	09/04/2020	09/04/2020
Date analysed	-	09/04/2020	09/04/2020	09/04/2020	09/04/2020
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	%	81	89	90	80

Organophosphorus Pesticides in Soil					
Our Reference		240556-2	240556-5	240556-8	240556-9
Your Reference	UNITS	BH106/0.3-.04	BH113/0.4-0.5	BH114/0.2-0.3	BH115/0.23-0.3
Date Sampled		07/04/20	07/04/20	07/04/20	07/04/20
Type of sample		Soil	Soil	Soil	Soil
Date extracted	-	09/04/2020	09/04/2020	09/04/2020	09/04/2020
Date analysed	-	09/04/2020	09/04/2020	09/04/2020	09/04/2020
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
Chlorpyrifos-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
Chlorpyrifos	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	%	81	89	90	80

PCBs in Soil					
Our Reference		240556-2	240556-5	240556-8	240556-9
Your Reference	UNITS	BH106/0.3-.04	BH113/0.4-0.5	BH114/0.2-0.3	BH115/0.23-0.3
Date Sampled		07/04/20	07/04/20	07/04/20	07/04/20
Type of sample		Soil	Soil	Soil	Soil
Date extracted	-	09/04/2020	09/04/2020	09/04/2020	09/04/2020
Date analysed	-	09/04/2020	09/04/2020	09/04/2020	09/04/2020
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	%	81	89	90	80

Acid Extractable metals in soil

Our Reference		240556-1	240556-2	240556-4	240556-5	240556-7
Your Reference	UNITS	BH106/0.2-0.3	BH106/0.3-.04	BH113/0.15-0.25	BH113/0.4-0.5	BH114/0.15-0.2
Date Sampled		07/04/20	07/04/20	07/04/20	07/04/20	07/04/20
Type of sample		Soil	Soil	Soil	Soil	Soil
Date prepared	-	09/04/2020	09/04/2020	09/04/2020	09/04/2020	09/04/2020
Date analysed	-	14/04/2020	14/04/2020	14/04/2020	14/04/2020	14/04/2020
Arsenic	mg/kg	25	6	26	6	14
Cadmium	mg/kg	<0.4	<0.4	<0.4	<0.4	<0.4
Chromium	mg/kg	14	43	6	18	11
Copper	mg/kg	74	43	40	19	59
Lead	mg/kg	100	610	44	23	93
Mercury	mg/kg	0.2	0.7	<0.1	<0.1	<0.1
Nickel	mg/kg	4	10	4	<1	14
Zinc	mg/kg	780	74	310	8	510

Acid Extractable metals in soil

Our Reference		240556-8	240556-9	240556-10	240556-12	240556-16
Your Reference	UNITS	BH114/0.2-0.3	BH115/0.23-0.3	BH115/0.5-0.6	BD2	BH106/0.3-.04 - [TRIPLICATE]
Date Sampled		07/04/20	07/04/20	07/04/20	07/04/20	07/04/20
Type of sample		Soil	Soil	Soil	Soil	Soil
Date prepared	-	09/04/2020	09/04/2020	09/04/2020	09/04/2020	09/04/2020
Date analysed	-	14/04/2020	14/04/2020	14/04/2020	14/04/2020	14/04/2020
Arsenic	mg/kg	52	6	11	10	7
Cadmium	mg/kg	<0.4	<0.4	<0.4	<0.4	<0.4
Chromium	mg/kg	21	12	21	9	24
Copper	mg/kg	120	14	16	43	23
Lead	mg/kg	260	24	20	69	350
Mercury	mg/kg	0.1	<0.1	<0.1	0.1	0.7
Nickel	mg/kg	5	1	2	4	8
Zinc	mg/kg	1,800	21	11	500	110

Acid Extractable metals in soil		
Our Reference		240556-17
Your Reference	UNITS	BH115/0.23-0.3 - [TRIPLICATE]
Date Sampled		07/04/20
Type of sample		Soil
Date prepared	-	09/04/2020
Date analysed	-	14/04/2020
Arsenic	mg/kg	100
Cadmium	mg/kg	<0.4
Chromium	mg/kg	14
Copper	mg/kg	85
Lead	mg/kg	38
Mercury	mg/kg	<0.1
Nickel	mg/kg	3
Zinc	mg/kg	110

Misc Soil - Inorg					
Our Reference		240556-2	240556-5	240556-8	240556-9
Your Reference	UNITS	BH106/0.3-.04	BH113/0.4-0.5	BH114/0.2-0.3	BH115/0.23-0.3
Date Sampled		07/04/20	07/04/20	07/04/20	07/04/20
Type of sample		Soil	Soil	Soil	Soil
Date prepared	-	9/04/2020	9/04/2020	9/04/2020	9/04/2020
Date analysed	-	9/04/2020	9/04/2020	9/04/2020	9/04/2020
Total Phenolics (as Phenol)	mg/kg	<5	<5	<5	<5

Moisture						
Our Reference		240556-1	240556-2	240556-3	240556-4	240556-5
Your Reference	UNITS	BH106/0.2-0.3	BH106/0.3-.04	BH106/0.9-1.0	BH113/0.15-0.25	BH113/0.4-0.5
Date Sampled		07/04/20	07/04/20	07/04/20	07/04/20	07/04/20
Type of sample		Soil	Soil	Soil	Soil	Soil
Date prepared	-	09/04/2020	09/04/2020	09/04/2020	09/04/2020	09/04/2020
Date analysed	-	13/04/2020	13/04/2020	13/04/2020	13/04/2020	13/04/2020
Moisture	%	12	7.6	18	5.5	24

Moisture						
Our Reference		240556-6	240556-7	240556-8	240556-9	240556-10
Your Reference	UNITS	BH113.0.9-1.0	BH114/0.15-0.2	BH114/0.2-0.3	BH115/0.23-0.3	BH115/0.5-0.6
Date Sampled		07/04/20	07/04/20	07/04/20	07/04/20	07/04/20
Type of sample		Soil	Soil	Soil	Soil	Soil
Date prepared	-	09/04/2020	09/04/2020	09/04/2020	09/04/2020	09/04/2020
Date analysed	-	13/04/2020	13/04/2020	13/04/2020	13/04/2020	13/04/2020
Moisture	%	16	8.1	13	16	16

Moisture			
Our Reference		240556-11	240556-12
Your Reference	UNITS	BH115/0.9-1.0	BD2
Date Sampled		07/04/20	07/04/20
Type of sample		Soil	Soil
Date prepared	-	09/04/2020	09/04/2020
Date analysed	-	13/04/2020	13/04/2020
Moisture	%	18	5.6

Asbestos ID - soils						
Our Reference		240556-2	240556-4	240556-5	240556-7	240556-8
Your Reference	UNITS	BH106/0.3-.04	BH113/0.15-0.25	BH113/0.4-0.5	BH114/0.15-0.2	BH114/0.2-0.3
Date Sampled		07/04/20	07/04/20	07/04/20	07/04/20	07/04/20
Type of sample		Soil	Soil	Soil	Soil	Soil
Date analysed	-	14/04/2020	14/04/2020	14/04/2020	14/04/2020	14/04/2020
Sample mass tested	g	Approx. 50g	Approx. 50g	Approx. 65g	Approx. 50g	Approx. 110g
Sample Description	-	Brown sandy soil & rocks	Brown sandy soil & rocks	Red clayey soil & rocks	Brown sandy soil & rocks	Grey 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		240556-9	240556-10
Your Reference	UNITS	BH115/0.23-0.3	BH115/0.5-0.6
Date Sampled		07/04/20	07/04/20
Type of sample		Soil	Soil
Date analysed	-	14/04/2020	14/04/2020
Sample mass tested	g	Approx. 50g	Approx. 50g
Sample Description	-	Black clayey soil & rocks	Black clayey soil & rocks
Asbestos ID in soil	-	No asbestos detected at reporting limit of 0.1g/kg	No asbestos detected at reporting limit of 0.1g/kg
		Organic fibres detected	Organic fibres detected
Asbestos comments	-	NO	NO
Trace Analysis	-	No asbestos detected	No asbestos detected

vTRH(C6-C10)/BTEXN in Water		
Our Reference		240556-13
Your Reference	UNITS	Rinsate
Date Sampled		07/04/20
Type of sample		Water
Date extracted	-	09/04/2020
Date analysed	-	09/04/2020
TRH C ₆ - C ₉	µg/L	<10
TRH C ₆ - C ₁₀	µg/L	<10
TRH C ₆ - C ₁₀ less BTEX (F1)	µg/L	<10
Benzene	µg/L	<1
Toluene	µg/L	<1
Ethylbenzene	µg/L	<1
m+p-xylene	µg/L	<2
o-xylene	µg/L	<1
Naphthalene	µg/L	<1
Surrogate Dibromofluoromethane	%	108
Surrogate toluene-d8	%	97
Surrogate 4-BFB	%	106

svTRH (C10-C40) in Water		
Our Reference		240556-13
Your Reference	UNITS	Rinsate
Date Sampled		07/04/20
Type of sample		Water
Date extracted	-	09/04/2020
Date analysed	-	10/04/2020
TRH C ₁₀ - C ₁₄	µg/L	<50
TRH C ₁₅ - C ₂₈	µg/L	<100
TRH C ₂₉ - C ₃₆	µg/L	<100
TRH >C ₁₀ - C ₁₆	µg/L	<50
TRH >C ₁₀ - C ₁₆ less Naphthalene (F2)	µg/L	<50
TRH >C ₁₆ - C ₃₄	µg/L	<100
TRH >C ₃₄ - C ₄₀	µg/L	<100
Surrogate o-Terphenyl	%	113

PAHs in Water		
Our Reference		240556-13
Your Reference	UNITS	Rinsate
Date Sampled		07/04/20
Type of sample		Water
Date extracted	-	09/04/2020
Date analysed	-	09/04/2020
Naphthalene	µg/L	<1
Acenaphthylene	µg/L	<1
Acenaphthene	µg/L	<1
Fluorene	µg/L	<1
Phenanthrene	µg/L	<1
Anthracene	µg/L	<1
Fluoranthene	µg/L	<1
Pyrene	µg/L	<1
Benzo(a)anthracene	µg/L	<1
Chrysene	µg/L	<1
Benzo(b,j+k)fluoranthene	µg/L	<2
Benzo(a)pyrene	µg/L	<1
Indeno(1,2,3-c,d)pyrene	µg/L	<1
Dibenzo(a,h)anthracene	µg/L	<1
Benzo(g,h,i)perylene	µg/L	<1
Benzo(a)pyrene TEQ	µg/L	<5
Total +ve PAH's	µg/L	NIL (+)VE
Surrogate <i>p</i> -Terphenyl-d14	%	86

Metals in Water - Dissolved		
Our Reference		240556-13
Your Reference	UNITS	Rinsate
Date Sampled		07/04/20
Type of sample		Water
Date digested	-	09/04/2020
Date analysed	-	15/04/2020
Arsenic - Dissolved	mg/L	<0.05
Cadmium - Dissolved	mg/L	<0.01
Chromium - Dissolved	mg/L	<0.01
Copper - Dissolved	mg/L	<0.01
Lead - Dissolved	mg/L	<0.03
Mercury - Dissolved	mg/L	<0.0005
Nickel - Dissolved	mg/L	<0.02
Zinc - Dissolved	mg/L	<0.02

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.
AT-008	Determination of VOCs sampled onto coconut shell charcoal sorbent tubes, that can be desorbed using carbon disulphide, and analysed by GC-MS.
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-003	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-003	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-006	Soil samples are extracted with dichloromethane/acetone and waters with dichloromethane and analysed by GC-ECD.
Org-006	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-012/017	Soil samples are extracted with Dichloromethane/Acetone and waters with Dichloromethane and analysed by GC-MS and/or GC-MS/MS.
Org-012/017	Soil samples are extracted with dichloromethane/acetone and waters with dichloromethane and analysed by GC-MS and/or GC-MS/MS. 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-012/017	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.

Method ID	Methodology Summary
Org-012/017	<p>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.</p> <p>For soil results:-</p> <ol style="list-style-type: none"> 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. <p>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.</p>
Org-013	Water samples are analysed directly by purge and trap GC-MS.
Org-014	Soil samples are extracted with methanol and spiked into water prior to analysing by purge and trap GC-MS.
Org-016	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)-BTX as per NEPM B1 Guideline on Investigation Levels for Soil and Groundwater.
Org-016	<p>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)-BTX as per NEPM B1 Guideline on Investigation Levels for Soil and Groundwater.</p> <p>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.</p>

QUALITY CONTROL: vTRH(C6-C10)/BTEXN in Soil						Duplicate			Spike Recovery %	
Test Description	Units	PQL	Method	Blank	#	Base	Dup.	RPD	LCS-8	240556-5
Date extracted	-			09/04/2020	2	09/04/2020	09/04/2020		09/04/2020	09/04/2020
Date analysed	-			11/04/2020	2	11/04/2020	11/04/2020		11/04/2020	11/04/2020
TRH C ₆ - C ₉	mg/kg	25	Org-016	<25	2	<25	<25	0	85	80
TRH C ₆ - C ₁₀	mg/kg	25	Org-016	<25	2	<25	<25	0	85	80
Benzene	mg/kg	0.2	Org-016	<0.2	2	<0.2	<0.2	0	74	69
Toluene	mg/kg	0.5	Org-016	<0.5	2	<0.5	<0.5	0	85	79
Ethylbenzene	mg/kg	1	Org-016	<1	2	<1	<1	0	90	86
m+p-xylene	mg/kg	2	Org-016	<2	2	<2	<2	0	87	83
o-Xylene	mg/kg	1	Org-016	<1	2	<1	<1	0	83	79
naphthalene	mg/kg	1	Org-014	<1	2	2	1	67	[NT]	[NT]
Surrogate aaa-Trifluorotoluene	%		Org-016	105	2	92	97	5	100	93

QUALITY CONTROL: vTRH(C6-C10)/BTEXN in Soil						Duplicate		Spike Recovery %		
Test Description	Units	PQL	Method	Blank	#	Base	Dup.	RPD	[NT]	[NT]
Date extracted	-			[NT]	9	09/04/2020	09/04/2020		[NT]	[NT]
Date analysed	-			[NT]	9	11/04/2020	11/04/2020		[NT]	[NT]
TRH C ₆ - C ₉	mg/kg	25	Org-016	[NT]	9	<25	<25	0	[NT]	[NT]
TRH C ₆ - C ₁₀	mg/kg	25	Org-016	[NT]	9	<25	<25	0	[NT]	[NT]
Benzene	mg/kg	0.2	Org-016	[NT]	9	<0.2	<0.2	0	[NT]	[NT]
Toluene	mg/kg	0.5	Org-016	[NT]	9	<0.5	<0.5	0	[NT]	[NT]
Ethylbenzene	mg/kg	1	Org-016	[NT]	9	<1	<1	0	[NT]	[NT]
m+p-xylene	mg/kg	2	Org-016	[NT]	9	<2	<2	0	[NT]	[NT]
o-Xylene	mg/kg	1	Org-016	[NT]	9	<1	<1	0	[NT]	[NT]
naphthalene	mg/kg	1	Org-014	[NT]	9	<1	<1	0	[NT]	[NT]
Surrogate aaa-Trifluorotoluene	%		Org-016	[NT]	9	99	97	2	[NT]	[NT]

QUALITY CONTROL: svTRH (C10-C40) in Soil					Duplicate			Spike Recovery %		
Test Description	Units	PQL	Method	Blank	#	Base	Dup.	RPD	LCS-8	240556-5
Date extracted	-			09/04/2020	9	09/04/2020	09/04/2020		09/04/2020	09/04/2020
Date analysed	-			09/04/2020	9	10/04/2020	10/04/2020		09/04/2020	09/04/2020
TRH C ₁₀ - C ₁₄	mg/kg	50	Org-003	<50	9	<50	<50	0	94	72
TRH C ₁₅ - C ₂₈	mg/kg	100	Org-003	<100	9	1000	670	40	86	71
TRH C ₂₉ - C ₃₆	mg/kg	100	Org-003	<100	9	500	380	27	106	98
TRH >C ₁₀ -C ₁₆	mg/kg	50	Org-003	<50	9	110	67	49	94	72
TRH >C ₁₆ -C ₃₄	mg/kg	100	Org-003	<100	9	1300	930	33	86	71
TRH >C ₃₄ -C ₄₀	mg/kg	100	Org-003	<100	9	280	230	20	106	98
Surrogate o-Terphenyl	%		Org-003	109	9	134	121	10	118	98

QUALITY CONTROL: PAHs in Soil						Duplicate			Spike Recovery %	
Test Description	Units	PQL	Method	Blank	#	Base	Dup.	RPD	LCS-8	240556-5
Date extracted	-			09/04/2020	2	09/04/2020	09/04/2020		09/04/2020	14/04/2020
Date analysed	-			09/04/2020	2	09/04/2020	09/04/2020		09/04/2020	14/04/2020
Naphthalene	mg/kg	0.1	Org-012/017	<0.1	2	1.1	1.1	0	74	80
Acenaphthylene	mg/kg	0.1	Org-012/017	<0.1	2	13	14	7	[NT]	[NT]
Acenaphthene	mg/kg	0.1	Org-012/017	<0.1	2	2.1	2.2	5	[NT]	[NT]
Fluorene	mg/kg	0.1	Org-012/017	<0.1	2	15	6.4	80	84	78
Phenanthrene	mg/kg	0.1	Org-012/017	<0.1	2	150	180	18	78	#
Anthracene	mg/kg	0.1	Org-012/017	<0.1	2	50	60	18	[NT]	[NT]
Fluoranthene	mg/kg	0.1	Org-012/017	<0.1	2	280	310	10	78	#
Pyrene	mg/kg	0.1	Org-012/017	<0.1	2	280	300	7	70	#
Benzo(a)anthracene	mg/kg	0.1	Org-012/017	<0.1	2	160	210	27	[NT]	[NT]
Chrysene	mg/kg	0.1	Org-012/017	<0.1	2	120	110	9	92	#
Benzo(b,j+k)fluoranthene	mg/kg	0.2	Org-012/017	<0.2	2	110	140	24	[NT]	[NT]
Benzo(a)pyrene	mg/kg	0.05	Org-012/017	<0.05	2	120	160	29	78	#
Indeno(1,2,3-c,d)pyrene	mg/kg	0.1	Org-012/017	<0.1	2	27	31	14	[NT]	[NT]
Dibenzo(a,h)anthracene	mg/kg	0.1	Org-012/017	<0.1	2	9.1	0.3	187	[NT]	[NT]
Benzo(g,h,i)perylene	mg/kg	0.1	Org-012/017	<0.1	2	41	49	18	[NT]	[NT]
Surrogate p-Terphenyl-d14	%		Org-012/017	83	2	97	91	6	82	82

QUALITY CONTROL: PAHs in Soil						Duplicate		Spike Recovery %		
Test Description	Units	PQL	Method	Blank	#	Base	Dup.	RPD	[NT]	[NT]
Date extracted	-			[NT]	9	09/04/2020	09/04/2020		[NT]	[NT]
Date analysed	-			[NT]	9	09/04/2020	09/04/2020		[NT]	[NT]
Naphthalene	mg/kg	0.1	Org-012/017	[NT]	9	0.8	0.1	156	[NT]	[NT]
Acenaphthylene	mg/kg	0.1	Org-012/017	[NT]	9	16	<0.1	198	[NT]	[NT]
Acenaphthene	mg/kg	0.1	Org-012/017	[NT]	9	0.8	<0.1	156	[NT]	[NT]
Fluorene	mg/kg	0.1	Org-012/017	[NT]	9	4.7	0.8	142	[NT]	[NT]
Phenanthrene	mg/kg	0.1	Org-012/017	[NT]	9	75	9.0	157	[NT]	[NT]
Anthracene	mg/kg	0.1	Org-012/017	[NT]	9	19	2.8	149	[NT]	[NT]
Fluoranthene	mg/kg	0.1	Org-012/017	[NT]	9	85	14	143	[NT]	[NT]
Pyrene	mg/kg	0.1	Org-012/017	[NT]	9	88	14	145	[NT]	[NT]
Benzo(a)anthracene	mg/kg	0.1	Org-012/017	[NT]	9	37	6.9	137	[NT]	[NT]
Chrysene	mg/kg	0.1	Org-012/017	[NT]	9	32	5.8	139	[NT]	[NT]
Benzo(b,j+k)fluoranthene	mg/kg	0.2	Org-012/017	[NT]	9	30	8.9	108	[NT]	[NT]
Benzo(a)pyrene	mg/kg	0.05	Org-012/017	[NT]	9	27	6.5	122	[NT]	[NT]
Indeno(1,2,3-c,d)pyrene	mg/kg	0.1	Org-012/017	[NT]	9	9.4	2.9	106	[NT]	[NT]
Dibenzo(a,h)anthracene	mg/kg	0.1	Org-012/017	[NT]	9	2.8	0.9	103	[NT]	[NT]
Benzo(g,h,i)perylene	mg/kg	0.1	Org-012/017	[NT]	9	10	3.6	94	[NT]	[NT]
Surrogate p-Terphenyl-d14	%		Org-012/017	[NT]	9	86	86	0	[NT]	[NT]

QUALITY CONTROL: Organochlorine Pesticides in soil						Duplicate			Spike Recovery %	
Test Description	Units	PQL	Method	Blank	#	Base	Dup.	RPD	LCS-8	240556-5
Date extracted	-			09/04/2020	2	09/04/2020	09/04/2020		09/04/2020	14/04/2020
Date analysed	-			09/04/2020	2	09/04/2020	09/04/2020		09/04/2020	14/04/2020
alpha-BHC	mg/kg	0.1	Org-012/017	<0.1	2	<0.1	<0.1	0	84	70
HCB	mg/kg	0.1	Org-012/017	<0.1	2	<0.1	<0.1	0	[NT]	[NT]
beta-BHC	mg/kg	0.1	Org-012/017	<0.1	2	<0.1	<0.1	0	88	74
gamma-BHC	mg/kg	0.1	Org-012/017	<0.1	2	<0.1	<0.1	0	[NT]	[NT]
Heptachlor	mg/kg	0.1	Org-012/017	<0.1	2	<0.1	<0.1	0	74	72
delta-BHC	mg/kg	0.1	Org-012/017	<0.1	2	<0.1	<0.1	0	[NT]	[NT]
Aldrin	mg/kg	0.1	Org-012/017	<0.1	2	<0.1	<0.1	0	88	74
Heptachlor Epoxide	mg/kg	0.1	Org-012/017	<0.1	2	<0.1	<0.1	0	92	76
gamma-Chlordane	mg/kg	0.1	Org-012/017	<0.1	2	<0.1	<0.1	0	[NT]	[NT]
alpha-chlordane	mg/kg	0.1	Org-012/017	<0.1	2	<0.1	<0.1	0	[NT]	[NT]
Endosulfan I	mg/kg	0.1	Org-012/017	<0.1	2	<0.1	<0.1	0	[NT]	[NT]
pp-DDE	mg/kg	0.1	Org-012/017	<0.1	2	<0.1	<0.1	0	86	72
Dieldrin	mg/kg	0.1	Org-012/017	<0.1	2	<0.1	<0.1	0	94	76
Endrin	mg/kg	0.1	Org-012/017	<0.1	2	<0.1	<0.1	0	81	87
Endosulfan II	mg/kg	0.1	Org-012/017	<0.1	2	<0.1	<0.1	0	[NT]	[NT]
pp-DDD	mg/kg	0.1	Org-012/017	<0.1	2	<0.1	<0.1	0	68	70
Endrin Aldehyde	mg/kg	0.1	Org-012/017	<0.1	2	<0.1	<0.1	0	[NT]	[NT]
pp-DDT	mg/kg	0.1	Org-012/017	<0.1	2	<0.1	<0.1	0	[NT]	[NT]
Endosulfan Sulphate	mg/kg	0.1	Org-012/017	<0.1	2	<0.1	<0.1	0	64	68
Methoxychlor	mg/kg	0.1	Org-012/017	<0.1	2	<0.1	<0.1	0	[NT]	[NT]
Surrogate TCMX	%		Org-012/017	83	2	81	82	1	84	91

QUALITY CONTROL: Organochlorine Pesticides in soil						Duplicate			Spike Recovery %	
Test Description	Units	PQL	Method	Blank	#	Base	Dup.	RPD	[NT]	[NT]
Date extracted	-			[NT]	9	09/04/2020	09/04/2020		[NT]	[NT]
Date analysed	-			[NT]	9	09/04/2020	09/04/2020		[NT]	[NT]
alpha-BHC	mg/kg	0.1	Org-012/017	[NT]	9	<0.1	<0.1	0	[NT]	[NT]
HCB	mg/kg	0.1	Org-012/017	[NT]	9	<0.1	<0.1	0	[NT]	[NT]
beta-BHC	mg/kg	0.1	Org-012/017	[NT]	9	<0.1	<0.1	0	[NT]	[NT]
gamma-BHC	mg/kg	0.1	Org-012/017	[NT]	9	<0.1	<0.1	0	[NT]	[NT]
Heptachlor	mg/kg	0.1	Org-012/017	[NT]	9	<0.1	<0.1	0	[NT]	[NT]
delta-BHC	mg/kg	0.1	Org-012/017	[NT]	9	<0.1	<0.1	0	[NT]	[NT]
Aldrin	mg/kg	0.1	Org-012/017	[NT]	9	<0.1	<0.1	0	[NT]	[NT]
Heptachlor Epoxide	mg/kg	0.1	Org-012/017	[NT]	9	<0.1	<0.1	0	[NT]	[NT]
gamma-Chlordane	mg/kg	0.1	Org-012/017	[NT]	9	<0.1	<0.1	0	[NT]	[NT]
alpha-chlordane	mg/kg	0.1	Org-012/017	[NT]	9	<0.1	<0.1	0	[NT]	[NT]
Endosulfan I	mg/kg	0.1	Org-012/017	[NT]	9	<0.1	<0.1	0	[NT]	[NT]
pp-DDE	mg/kg	0.1	Org-012/017	[NT]	9	<0.1	<0.1	0	[NT]	[NT]
Dieldrin	mg/kg	0.1	Org-012/017	[NT]	9	<0.1	<0.1	0	[NT]	[NT]
Endrin	mg/kg	0.1	Org-012/017	[NT]	9	<0.1	<0.1	0	[NT]	[NT]
Endosulfan II	mg/kg	0.1	Org-012/017	[NT]	9	<0.1	<0.1	0	[NT]	[NT]
pp-DDD	mg/kg	0.1	Org-012/017	[NT]	9	<0.1	<0.1	0	[NT]	[NT]
Endrin Aldehyde	mg/kg	0.1	Org-012/017	[NT]	9	<0.1	<0.1	0	[NT]	[NT]
pp-DDT	mg/kg	0.1	Org-012/017	[NT]	9	<0.1	<0.1	0	[NT]	[NT]
Endosulfan Sulphate	mg/kg	0.1	Org-012/017	[NT]	9	<0.1	<0.1	0	[NT]	[NT]
Methoxychlor	mg/kg	0.1	Org-012/017	[NT]	9	<0.1	<0.1	0	[NT]	[NT]
Surrogate TCMX	%		Org-012/017	[NT]	9	80	89	11	[NT]	[NT]

QUALITY CONTROL: Organophosphorus Pesticides in Soil						Duplicate		Spike Recovery %		
Test Description	Units	PQL	Method	Blank	#	Base	Dup.	RPD	LCS-8	240556-5
Date extracted	-			09/04/2020	2	09/04/2020	09/04/2020		09/04/2020	14/04/2020
Date analysed	-			09/04/2020	2	09/04/2020	09/04/2020		09/04/2020	14/04/2020
Dichlorvos	mg/kg	0.1	Org-012/017	<0.1	2	<0.1	<0.1	0	70	74
Dimethoate	mg/kg	0.1	Org-012/017	<0.1	2	<0.1	<0.1	0	[NT]	[NT]
Diazinon	mg/kg	0.1	Org-012/017	<0.1	2	<0.1	<0.1	0	[NT]	[NT]
Chlorpyrifos-methyl	mg/kg	0.1	Org-012/017	<0.1	2	<0.1	<0.1	0	[NT]	[NT]
Ronnel	mg/kg	0.1	Org-012/017	<0.1	2	<0.1	<0.1	0	82	70
Fenitrothion	mg/kg	0.1	Org-012/017	<0.1	2	<0.1	<0.1	0	66	82
Malathion	mg/kg	0.1	Org-012/017	<0.1	2	<0.1	<0.1	0	64	78
Chlorpyrifos	mg/kg	0.1	Org-012/017	<0.1	2	<0.1	<0.1	0	90	78
Parathion	mg/kg	0.1	Org-012/017	<0.1	2	<0.1	<0.1	0	62	72
Bromophos-ethyl	mg/kg	0.1	AT-008	<0.1	2	<0.1	<0.1	0	[NT]	[NT]
Ethion	mg/kg	0.1	Org-012/017	<0.1	2	<0.1	<0.1	0	82	72
Azinphos-methyl (Guthion)	mg/kg	0.1	Org-012/017	<0.1	2	<0.1	<0.1	0	[NT]	[NT]
Surrogate TCMX	%		Org-012/017	83	2	81	82	1	84	91

QUALITY CONTROL: Organophosphorus Pesticides in Soil						Duplicate		Spike Recovery %		
Test Description	Units	PQL	Method	Blank	#	Base	Dup.	RPD	[NT]	[NT]
Date extracted	-			[NT]	9	09/04/2020	09/04/2020		[NT]	[NT]
Date analysed	-			[NT]	9	09/04/2020	09/04/2020		[NT]	[NT]
Dichlorvos	mg/kg	0.1	Org-012/017	[NT]	9	<0.1	<0.1	0	[NT]	[NT]
Dimethoate	mg/kg	0.1	Org-012/017	[NT]	9	<0.1	<0.1	0	[NT]	[NT]
Diazinon	mg/kg	0.1	Org-012/017	[NT]	9	<0.1	<0.1	0	[NT]	[NT]
Chlorpyrifos-methyl	mg/kg	0.1	Org-012/017	[NT]	9	<0.1	<0.1	0	[NT]	[NT]
Ronnel	mg/kg	0.1	Org-012/017	[NT]	9	<0.1	<0.1	0	[NT]	[NT]
Fenitrothion	mg/kg	0.1	Org-012/017	[NT]	9	<0.1	<0.1	0	[NT]	[NT]
Malathion	mg/kg	0.1	Org-012/017	[NT]	9	<0.1	<0.1	0	[NT]	[NT]
Chlorpyrifos	mg/kg	0.1	Org-012/017	[NT]	9	<0.1	<0.1	0	[NT]	[NT]
Parathion	mg/kg	0.1	Org-012/017	[NT]	9	<0.1	<0.1	0	[NT]	[NT]
Bromophos-ethyl	mg/kg	0.1	AT-008	[NT]	9	<0.1	<0.1	0	[NT]	[NT]
Ethion	mg/kg	0.1	Org-012/017	[NT]	9	<0.1	<0.1	0	[NT]	[NT]
Azinphos-methyl (Guthion)	mg/kg	0.1	Org-012/017	[NT]	9	<0.1	<0.1	0	[NT]	[NT]
Surrogate TCMX	%		Org-012/017	[NT]	9	80	89	11	[NT]	[NT]

QUALITY CONTROL: PCBs in Soil					Duplicate			Spike Recovery %		
Test Description	Units	PQL	Method	Blank	#	Base	Dup.	RPD	LCS-8	240556-5
Date extracted	-			09/04/2020	2	09/04/2020	09/04/2020		09/04/2020	09/04/2020
Date analysed	-			09/04/2020	2	09/04/2020	09/04/2020		09/04/2020	09/04/2020
Aroclor 1016	mg/kg	0.1	Org-006	<0.1	2	<0.1	<0.1	0	[NT]	[NT]
Aroclor 1221	mg/kg	0.1	Org-006	<0.1	2	<0.1	<0.1	0	[NT]	[NT]
Aroclor 1232	mg/kg	0.1	Org-006	<0.1	2	<0.1	<0.1	0	[NT]	[NT]
Aroclor 1242	mg/kg	0.1	Org-006	<0.1	2	<0.1	<0.1	0	[NT]	[NT]
Aroclor 1248	mg/kg	0.1	Org-006	<0.1	2	<0.1	<0.1	0	[NT]	[NT]
Aroclor 1254	mg/kg	0.1	Org-006	<0.1	2	<0.1	<0.1	0	110	90
Aroclor 1260	mg/kg	0.1	Org-006	<0.1	2	<0.1	<0.1	0	[NT]	[NT]
Surrogate TCMX	%		Org-006	83	2	81	82	1	84	91

QUALITY CONTROL: PCBs in Soil					Duplicate			Spike Recovery %		
Test Description	Units	PQL	Method	Blank	#	Base	Dup.	RPD	[NT]	[NT]
Date extracted	-			[NT]	9	09/04/2020	09/04/2020		[NT]	[NT]
Date analysed	-			[NT]	9	09/04/2020	09/04/2020		[NT]	[NT]
Aroclor 1016	mg/kg	0.1	Org-006	[NT]	9	<0.1	<0.1	0	[NT]	[NT]
Aroclor 1221	mg/kg	0.1	Org-006	[NT]	9	<0.1	<0.1	0	[NT]	[NT]
Aroclor 1232	mg/kg	0.1	Org-006	[NT]	9	<0.1	<0.1	0	[NT]	[NT]
Aroclor 1242	mg/kg	0.1	Org-006	[NT]	9	<0.1	<0.1	0	[NT]	[NT]
Aroclor 1248	mg/kg	0.1	Org-006	[NT]	9	<0.1	<0.1	0	[NT]	[NT]
Aroclor 1254	mg/kg	0.1	Org-006	[NT]	9	<0.1	<0.1	0	[NT]	[NT]
Aroclor 1260	mg/kg	0.1	Org-006	[NT]	9	<0.1	<0.1	0	[NT]	[NT]
Surrogate TCMX	%		Org-006	[NT]	9	80	89	11	[NT]	[NT]

QUALITY CONTROL: Acid Extractable metals in soil						Duplicate		Spike Recovery %		
Test Description	Units	PQL	Method	Blank	#	Base	Dup.	RPD	LCS-8	240556-5
Date prepared	-			09/04/2020	2	09/04/2020	09/04/2020		09/04/2020	09/04/2020
Date analysed	-			14/04/2020	2	14/04/2020	14/04/2020		14/04/2020	14/04/2020
Arsenic	mg/kg	4	Metals-020	<4	2	6	12	67	109	74
Cadmium	mg/kg	0.4	Metals-020	<0.4	2	<0.4	<0.4	0	103	81
Chromium	mg/kg	1	Metals-020	<1	2	43	60	33	114	78
Copper	mg/kg	1	Metals-020	<1	2	43	26	49	110	89
Lead	mg/kg	1	Metals-020	<1	2	610	440	32	117	67
Mercury	mg/kg	0.1	Metals-021	<0.1	2	0.7	1.4	67	95	102
Nickel	mg/kg	1	Metals-020	<1	2	10	7	35	109	74
Zinc	mg/kg	1	Metals-020	<1	2	74	93	23	111	71

QUALITY CONTROL: Acid Extractable metals in soil						Duplicate		Spike Recovery %		
Test Description	Units	PQL	Method	Blank	#	Base	Dup.	RPD	[NT]	[NT]
Date prepared	-			[NT]	9	09/04/2020	09/04/2020		[NT]	[NT]
Date analysed	-			[NT]	9	14/04/2020	14/04/2020		[NT]	[NT]
Arsenic	mg/kg	4	Metals-020	[NT]	9	6	9	40	[NT]	[NT]
Cadmium	mg/kg	0.4	Metals-020	[NT]	9	<0.4	<0.4	0	[NT]	[NT]
Chromium	mg/kg	1	Metals-020	[NT]	9	12	17	34	[NT]	[NT]
Copper	mg/kg	1	Metals-020	[NT]	9	14	18	25	[NT]	[NT]
Lead	mg/kg	1	Metals-020	[NT]	9	24	33	32	[NT]	[NT]
Mercury	mg/kg	0.1	Metals-021	[NT]	9	<0.1	<0.1	0	[NT]	[NT]
Nickel	mg/kg	1	Metals-020	[NT]	9	1	2	67	[NT]	[NT]
Zinc	mg/kg	1	Metals-020	[NT]	9	21	100	131	[NT]	[NT]

QUALITY CONTROL: Misc Soil - Inorg						Duplicate		Spike Recovery %		
Test Description	Units	PQL	Method	Blank	#	Base	Dup.	RPD	LCS-8	[NT]
Date prepared	-			09/04/2020	[NT]	[NT]	[NT]	[NT]	09/04/2020	[NT]
Date analysed	-			09/04/2020	[NT]	[NT]	[NT]	[NT]	09/04/2020	[NT]
Total Phenolics (as Phenol)	mg/kg	5	Inorg-031	<5	[NT]	[NT]	[NT]	[NT]	103	[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	-			09/04/2020	[NT]	[NT]	[NT]	[NT]	[NT]	[NT]
Date analysed	-			11/04/2020	[NT]	[NT]	[NT]	[NT]	[NT]	[NT]
TRH C ₆ - C ₉	µg/L	10	Org-016	<10	[NT]	[NT]	[NT]	[NT]	[NT]	[NT]
TRH C ₆ - C ₁₀	µg/L	10	Org-016	<10	[NT]	[NT]	[NT]	[NT]	[NT]	[NT]
Benzene	µg/L	1	Org-016	<1	[NT]	[NT]	[NT]	[NT]	[NT]	[NT]
Toluene	µg/L	1	Org-016	<1	[NT]	[NT]	[NT]	[NT]	[NT]	[NT]
Ethylbenzene	µg/L	1	Org-016	<1	[NT]	[NT]	[NT]	[NT]	[NT]	[NT]
m+p-xylene	µg/L	2	Org-016	<2	[NT]	[NT]	[NT]	[NT]	[NT]	[NT]
o-xylene	µg/L	1	Org-016	<1	[NT]	[NT]	[NT]	[NT]	[NT]	[NT]
Naphthalene	µg/L	1	Org-013	<1	[NT]	[NT]	[NT]	[NT]	[NT]	[NT]
Surrogate Dibromofluoromethane	%		Org-016	102	[NT]	[NT]	[NT]	[NT]	[NT]	[NT]
Surrogate toluene-d8	%		Org-016	98	[NT]	[NT]	[NT]	[NT]	[NT]	[NT]
Surrogate 4-BFB	%		Org-016	101	[NT]	[NT]	[NT]	[NT]	[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	-			09/04/2020	[NT]	[NT]	[NT]	[NT]	09/04/2020	[NT]
Date analysed	-			10/04/2020	[NT]	[NT]	[NT]	[NT]	10/04/2020	[NT]
TRH C ₁₀ - C ₁₄	µg/L	50	Org-003	<50	[NT]	[NT]	[NT]	[NT]	126	[NT]
TRH C ₁₅ - C ₂₈	µg/L	100	Org-003	<100	[NT]	[NT]	[NT]	[NT]	106	[NT]
TRH C ₂₉ - C ₃₆	µg/L	100	Org-003	<100	[NT]	[NT]	[NT]	[NT]	108	[NT]
TRH >C ₁₀ - C ₁₆	µg/L	50	Org-003	<50	[NT]	[NT]	[NT]	[NT]	126	[NT]
TRH >C ₁₆ - C ₃₄	µg/L	100	Org-003	<100	[NT]	[NT]	[NT]	[NT]	106	[NT]
TRH >C ₃₄ - C ₄₀	µg/L	100	Org-003	<100	[NT]	[NT]	[NT]	[NT]	108	[NT]
Surrogate o-Terphenyl	%		Org-003	103	[NT]	[NT]	[NT]	[NT]	83	[NT]

QUALITY CONTROL: PAHs in Water					Duplicate			Spike Recovery %		
Test Description	Units	PQL	Method	Blank	#	Base	Dup.	RPD	LCS-W2	[NT]
Date extracted	-			09/04/2020	[NT]	[NT]	[NT]	[NT]	09/04/2020	[NT]
Date analysed	-			09/04/2020	[NT]	[NT]	[NT]	[NT]	09/04/2020	[NT]
Naphthalene	µg/L	1	Org-012/017	<1	[NT]	[NT]	[NT]	[NT]	88	[NT]
Acenaphthylene	µg/L	1	Org-012/017	<1	[NT]	[NT]	[NT]	[NT]	[NT]	[NT]
Acenaphthene	µg/L	1	Org-012/017	<1	[NT]	[NT]	[NT]	[NT]	[NT]	[NT]
Fluorene	µg/L	1	Org-012/017	<1	[NT]	[NT]	[NT]	[NT]	78	[NT]
Phenanthrene	µg/L	1	Org-012/017	<1	[NT]	[NT]	[NT]	[NT]	92	[NT]
Anthracene	µg/L	1	Org-012/017	<1	[NT]	[NT]	[NT]	[NT]	[NT]	[NT]
Fluoranthene	µg/L	1	Org-012/017	<1	[NT]	[NT]	[NT]	[NT]	72	[NT]
Pyrene	µg/L	1	Org-012/017	<1	[NT]	[NT]	[NT]	[NT]	76	[NT]
Benzo(a)anthracene	µg/L	1	Org-012/017	<1	[NT]	[NT]	[NT]	[NT]	[NT]	[NT]
Chrysene	µg/L	1	Org-012/017	<1	[NT]	[NT]	[NT]	[NT]	106	[NT]
Benzo(b,j+k)fluoranthene	µg/L	2	Org-012/017	<2	[NT]	[NT]	[NT]	[NT]	[NT]	[NT]
Benzo(a)pyrene	µg/L	1	Org-012/017	<1	[NT]	[NT]	[NT]	[NT]	84	[NT]
Indeno(1,2,3-c,d)pyrene	µg/L	1	Org-012/017	<1	[NT]	[NT]	[NT]	[NT]	[NT]	[NT]
Dibenzo(a,h)anthracene	µg/L	1	Org-012/017	<1	[NT]	[NT]	[NT]	[NT]	[NT]	[NT]
Benzo(g,h,i)perylene	µg/L	1	Org-012/017	<1	[NT]	[NT]	[NT]	[NT]	[NT]	[NT]
Surrogate p-Terphenyl-d14	%		Org-012/017	70	[NT]	[NT]	[NT]	[NT]	72	[NT]

QUALITY CONTROL: Metals in Water - Dissolved					Duplicate			Spike Recovery %		
Test Description	Units	PQL	Method	Blank	#	Base	Dup.	RPD	LCS-2	[NT]
Date digested	-			09/04/2020	[NT]	[NT]	[NT]	[NT]	09/04/2020	[NT]
Date analysed	-			15/04/2020	[NT]	[NT]	[NT]	[NT]	15/04/2020	[NT]
Arsenic - Dissolved	mg/L	0.05	Metals-020	<0.05	[NT]	[NT]	[NT]	[NT]	105	[NT]
Cadmium - Dissolved	mg/L	0.01	Metals-020	<0.01	[NT]	[NT]	[NT]	[NT]	103	[NT]
Chromium - Dissolved	mg/L	0.01	Metals-020	<0.01	[NT]	[NT]	[NT]	[NT]	102	[NT]
Copper - Dissolved	mg/L	0.01	Metals-020	<0.01	[NT]	[NT]	[NT]	[NT]	100	[NT]
Lead - Dissolved	mg/L	0.03	Metals-020	<0.03	[NT]	[NT]	[NT]	[NT]	104	[NT]
Mercury - Dissolved	mg/L	0.0005	Metals-021	<0.0005	[NT]	[NT]	[NT]	[NT]	94	[NT]
Nickel - Dissolved	mg/L	0.02	Metals-020	<0.02	[NT]	[NT]	[NT]	[NT]	107	[NT]
Zinc - Dissolved	mg/L	0.02	Metals-020	<0.02	[NT]	[NT]	[NT]	[NT]	111	[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

TRH Soil C10-C40 NEPM - # Percent recovery for the surrogate is not possible to report as the high concentration of analytes in samples 240556-1 and 7 have caused interference.

Asbestos: Excessive sample volume was provided for asbestos analysis. A portion of the supplied sample was sub-sampled according to Envirolab procedures. We cannot guarantee that this sub-sample is indicative of the entire sample. Envirolab recommends supplying 40-50g (50mL) of sample in its own container as per AS4964-2004.

Note: Samples were sub-sampled from bags provided by the client.

Acid Extractable Metals in Soil:

-The laboratory RPD acceptance criteria has been exceeded for 240556-2 for Cu and Hg. Therefore a triplicate result has been issued as laboratory sample number 240556-16.

-The laboratory RPD acceptance criteria has been exceeded for 240556-9 for Zn. Therefore a triplicate result has been issued as laboratory sample number 240556-17.


-Spike recovery for Pb in sample 240556-5 at 67% which is outside lab acceptance criteria (70-130%), however, the LCS recovery is acceptable at 117%. Sample heterogeneity suspected.

PAHs in Soil - # Percent recovery for the matrix spike is not possible to report due to interference from analytes (other than those being tested) in sample 240556-5ms.

The RPD for duplicate results is accepted due to the non homogenous nature of samples 240556-2 and 9.

COC received

Project No: 86767.03		Suburb: Haymarket		To: Envirolab Services	
Project Name: HAYMARKET, SSI		Order Number: 152065			
Project Manager: WFY		Sampler: WFY		Attn: Simon Song	
Emails: wenfei.yuan@douglaspartners.com.au				Phone:	
Date Required: Same day <input type="checkbox"/> 24 hours <input type="checkbox"/> 48 hours <input type="checkbox"/> 72 hours <input type="checkbox"/> Standard <input type="checkbox"/>				Email:	
Prior Storage: <input type="checkbox"/> Esky <input type="checkbox"/> Fridge <input type="checkbox"/> Shelved				Do samples contain 'potential' HBM? Yes <input type="checkbox"/> No <input type="checkbox"/> (If YES, then handle, transport and store in accordance with FPM HAZID)	

Sample ID	Lab ID	Date Sampled	Sample Type	Container Type	Analytes				Notes
			S - soil W - water	G - glass P - plastic	Combo 8	Combo 3	Combo 3	PAH	
BH106/0.2-0.3	1	07/04/20	S	G/P			X		 Envirolab Services 12 Ashley St Chatswood NSW 2067 Ph: (02) 9910 6200 Job No: 240556 Date Received: 7-4-20 Time Received: 17:10 Received By: Helen Temp: Cool/Ambient Cooling: Ice/Coolpack Security: Intact/Broken/None
BH106/0.3-0.4	2	07/04/20	S	G/P	X				
BH106/0.9-1.0	3	07/04/20	S	G/P				X	
BH113/0.15-0.25	4	07/04/20	S	G/P		X			
BH113/0.4-0.5	5	07/04/20	S	G/P	X				
BH113/0.9-1.0	6	07/04/20	S	G/P				X	
BH114/0.15-0.2	7	07/04/20	S	G/P		X			
BH114/0.2-0.3	8	07/04/20	S	G/P	X				
BH115/0.23-0.3	9	07/04/20	S	G/P	X				
BH115/0.5-0.6	10	07/04/20	S	G/P		X			
BH115/0.9-1.0	11	07/04/20	S	G/P				X	
BD2	12	07/04/20	S	G			X		
Rinsate (PB 2020 0407)	13	07/04/20	W	G/P			X		Please filter HM for the rinsate sample
PQL (S) mg/kg 2									ANZECC PQLs req'd for all water analytes <input type="checkbox"/>
PQL = practical quantitation limit. If none given, default to Laboratory Method Detection Limit									Lab Report/Reference No:
Metals to Analyse: 8HM unless specified here:									
Total number of samples in container:			Relinquished by: WFY		Transported to laboratory by:				
Send Results to: Douglas Partners Pty Ltd			Address: 96 Hermitage Road, West Ryde			Phone: 9809 0999			
Signed: <i>[Signature]</i>			Received by: Helen			Date & Time: 7-4-20 7-4-20			

TS - 14

TB - 15

extra. R2.

COC 8/4/2020 11:00 A
Samples 7/4/2020 1700 Ph.

17:10

CERTIFICATE OF ANALYSIS 240556-A

Client Details

Client	Douglas Partners Pty Ltd
Attention	Wen-Fei Yuan
Address	96 Hermitage Rd, West Ryde, NSW, 2114

Sample Details

Your Reference	<u>86767.03, Haymarket, SSI</u>
Number of Samples	14 Soil, 1 Water
Date samples received	07/04/2020
Date completed instructions received	20/04/2020

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	27/04/2020
Date of Issue	27/04/2020
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, Senior Chemist
Steven Luong, Organics Supervisor

Authorised By



Nancy Zhang, Laboratory Manager

PAHs in TCLP (USEPA 1311)						
Our Reference		240556-A-1	240556-A-2	240556-A-4	240556-A-5	240556-A-7
Your Reference	UNITS	BH106/0.2-0.3	BH106/0.3-.04	BH113/0.15-0.25	BH113/0.4-0.5	BH114/0.15-0.2
Date Sampled		07/04/20	07/04/20	07/04/20	07/04/20	07/04/20
Type of sample		Soil	Soil	Soil	Soil	Soil
Date extracted	-	22/04/2020	22/04/2020	22/04/2020	22/04/2020	22/04/2020
Date analysed	-	22/04/2020	22/04/2020	22/04/2020	22/04/2020	22/04/2020
Naphthalene in TCLP	mg/L	<0.001	0.003	<0.001	<0.001	0.007
Acenaphthylene in TCLP	mg/L	0.002	0.006	0.008	<0.001	0.025
Acenaphthene in TCLP	mg/L	<0.001	0.003	<0.001	<0.001	0.003
Fluorene in TCLP	mg/L	<0.001	0.003	0.003	<0.001	0.008
Phenanthrene in TCLP	mg/L	0.004	0.015	0.022	0.004	0.033
Anthracene in TCLP	mg/L	<0.001	0.002	0.003	<0.001	0.005
Fluoranthene in TCLP	mg/L	<0.001	0.003	0.005	0.001	0.006
Pyrene in TCLP	mg/L	<0.001	0.002	0.004	<0.001	0.004
Benzo(a)anthracene in TCLP	mg/L	<0.001	<0.001	<0.001	<0.001	<0.001
Chrysene in TCLP	mg/L	<0.001	<0.001	<0.001	<0.001	<0.001
Benzo(bjk)fluoranthene in TCLP	mg/L	<0.002	<0.002	<0.002	<0.002	<0.002
Benzo(a)pyrene in TCLP	mg/L	<0.001	<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	<0.001
Dibenzo(a,h)anthracene in TCLP	mg/L	<0.001	<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	<0.001
Total +ve PAH's	mg/L	0.0061	0.037	0.044	0.0053	0.091
Surrogate p-Terphenyl-d14	%	91	97	94	104	94

PAHs in TCLP (USEPA 1311)				
Our Reference		240556-A-8	240556-A-9	240556-A-10
Your Reference	UNITS	BH114/0.2-0.3	BH115/0.23-0.3	BH115/0.5-0.6
Date Sampled		07/04/20	07/04/20	07/04/20
Type of sample		Soil	Soil	Soil
Date extracted	-	22/04/2020	22/04/2020	22/04/2020
Date analysed	-	22/04/2020	22/04/2020	22/04/2020
Naphthalene in TCLP	mg/L	0.010	0.001	<0.001
Acenaphthylene in TCLP	mg/L	0.039	0.009	0.002
Acenaphthene in TCLP	mg/L	0.002	0.001	<0.001
Fluorene in TCLP	mg/L	0.01	0.006	<0.001
Phenanthrene in TCLP	mg/L	0.056	0.027	0.006
Anthracene in TCLP	mg/L	0.01	0.004	<0.001
Fluoranthene in TCLP	mg/L	0.009	0.006	0.002
Pyrene in TCLP	mg/L	0.008	0.005	0.001
Benzo(a)anthracene in TCLP	mg/L	<0.001	<0.001	<0.001
Chrysene in TCLP	mg/L	<0.001	<0.001	<0.001
Benzo(b,j,k)fluoranthene in TCLP	mg/L	<0.002	<0.002	<0.002
Benzo(a)pyrene in TCLP	mg/L	<0.001	<0.001	<0.001
Indeno(1,2,3-c,d)pyrene - TCLP	mg/L	<0.001	<0.001	<0.001
Dibenzo(a,h)anthracene in TCLP	mg/L	<0.001	<0.001	<0.001
Benzo(g,h,i)perylene in TCLP	mg/L	<0.001	<0.001	<0.001
Total +ve PAH's	mg/L	0.14	0.058	0.011
Surrogate <i>p</i> -Terphenyl-d14	%	100	94	97

Metals in TCLP USEPA1311

Our Reference		240556-A-1	240556-A-2	240556-A-4	240556-A-5	240556-A-7
Your Reference	UNITS	BH106/0.2-0.3	BH106/0.3-.04	BH113/0.15-0.25	BH113/0.4-0.5	BH114/0.15-0.2
Date Sampled		07/04/20	07/04/20	07/04/20	07/04/20	07/04/20
Type of sample		Soil	Soil	Soil	Soil	Soil
Date extracted	-	22/04/2020	22/04/2020	22/04/2020	22/04/2020	22/04/2020
Date analysed	-	22/04/2020	22/04/2020	22/04/2020	22/04/2020	22/04/2020
pH of soil for fluid# determ.	pH units	8.4	9.7	9.7	7.0	9.7
pH of soil TCLP (after HCl)	pH units	1.8	1.8	2.2	1.7	2.0
Extraction fluid used	-	1	1	1	1	1
pH of final Leachate	pH units	5.1	5.4	5.3	5.0	6.2
Lead in TCLP	mg/L	0.04	0.74	[NA]	[NA]	[NA]

Metals in TCLP USEPA1311

Our Reference		240556-A-8	240556-A-9	240556-A-10
Your Reference	UNITS	BH114/0.2-0.3	BH115/0.23-0.3	BH115/0.5-0.6
Date Sampled		07/04/20	07/04/20	07/04/20
Type of sample		Soil	Soil	Soil
Date extracted	-	22/04/2020	22/04/2020	22/04/2020
Date analysed	-	22/04/2020	22/04/2020	22/04/2020
pH of soil for fluid# determ.	pH units	9.5	9.2	9.3
pH of soil TCLP (after HCl)	pH units	1.8	1.8	1.9
Extraction fluid used	-	1	1	1
pH of final Leachate	pH units	5.4	5.1	5.3
Arsenic in TCLP	mg/L	[NA]	<0.05	[NA]
Lead in TCLP	mg/L	0.86	[NA]	[NA]

Method ID	Methodology Summary
EXTRACT.7	Toxicity Characteristic Leaching Procedure (TCLP) using Zero Headspace Extraction (zHE) using AS4439 and USEPA 1311.
Inorg-001	pH - Measured using pH meter and electrode in accordance with APHA latest edition, 4500-H+. Please note that the results for water analyses are indicative only, as analysis outside of the APHA storage times.
Inorg-004	Toxicity Characteristic Leaching Procedure (TCLP) using in house method INORG-004. Please note that the mass used may be scaled down from the default based on sample mass available.
Metals-020 ICP-AES	Determination of various metals by ICP-AES.
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	-			22/04/2020	[NT]	[NT]	[NT]	[NT]	22/04/2020	[NT]
Date analysed	-			22/04/2020	[NT]	[NT]	[NT]	[NT]	22/04/2020	[NT]
Naphthalene in TCLP	mg/L	0.001	Org-022/025	<0.001	[NT]	[NT]	[NT]	[NT]	72	[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]	[NT]	[NT]
Fluorene in TCLP	mg/L	0.001	Org-022/025	<0.001	[NT]	[NT]	[NT]	[NT]	76	[NT]
Phenanthrene in TCLP	mg/L	0.001	Org-022/025	<0.001	[NT]	[NT]	[NT]	[NT]	81	[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]	80	[NT]
Pyrene in TCLP	mg/L	0.001	Org-022/025	<0.001	[NT]	[NT]	[NT]	[NT]	78	[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]	111	[NT]
Benzo(b)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]	71	[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	115	[NT]	[NT]	[NT]	[NT]	110	[NT]

QUALITY CONTROL: Metals in TCLP USEPA1311						Duplicate		Spike Recovery %		
Test Description	Units	PQL	Method	Blank	#	Base	Dup.	RPD	LCS-W1	[NT]
Date extracted	-			22/04/2020	[NT]	[NT]	[NT]	[NT]	22/04/2020	[NT]
Date analysed	-			22/04/2020	[NT]	[NT]	[NT]	[NT]	22/04/2020	[NT]
Arsenic in TCLP	mg/L	0.05	Metals-020 ICP-AES	<0.05	[NT]	[NT]	[NT]	[NT]	102	[NT]
Lead in TCLP	mg/L	0.03	Metals-020 ICP-AES	<0.03	[NT]	[NT]	[NT]	[NT]	92	[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.

CERTIFICATE OF ANALYSIS 243218

Client Details

Client	Douglas Partners Pty Ltd
Attention	Wen-Fei Yuan
Address	96 Hermitage Rd, West Ryde, NSW, 2114

Sample Details

Your Reference	<u>86767.03, Haymarket</u>
Number of Samples	15 SOIL
Date samples received	18/05/2020
Date completed instructions received	18/05/2020

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	27/05/2020
Date of Issue	27/05/2020
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Asbestos Approved By

Analysed by Asbestos Approved Identifier: Lucy Zhu
 Authorised by Asbestos Approved Signatory: Lucy Zhu

Results Approved By

Diego Bigolin, Team Leader, Inorganics
 Dragana Tomas, Senior Chemist
 Hannah Nguyen, Senior Chemist
 Lucy Zhu, Asbestos Supervisor

Authorised By



Nancy Zhang, Laboratory Manager

vTRH(C6-C10)/BTEXN in Soil

Our Reference		243218-1	243218-2	243218-3	243218-4	243218-5
Your Reference	UNITS	BH107B	BD1/20200516	BH107B	BH108	BH109B
Depth		0.4-0.5	-	1.4-1.5	0.23-0.25	0.4-0.5
Date Sampled		16/05/2020	16/05/2020	16/05/2020	17/05/2020	17/05/2020
Type of sample		SOIL	SOIL	SOIL	SOIL	SOIL
Date extracted	-	21/05/2020	21/05/2020	21/05/2020	21/05/2020	21/05/2020
Date analysed	-	22/05/2020	22/05/2020	22/05/2020	22/05/2020	22/05/2020
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	%	88	106	71	100	101

vTRH(C6-C10)/BTEXN in Soil

Our Reference		243218-6	243218-7	243218-8	243218-9	243218-10
Your Reference	UNITS	BH112B	BH116	BH117	Trip Spike	Trip Blank
Depth		0.6-0.7	0.5-0.7	0.2-0.25	-	-
Date Sampled		18/05/2020	17/05/2020	17/05/2020	12/05/2020	12/05/2020
Type of sample		SOIL	SOIL	SOIL	SOIL	SOIL
Date extracted	-	21/05/2020	21/05/2020	21/05/2020	21/05/2020	21/05/2020
Date analysed	-	22/05/2020	22/05/2020	22/05/2020	22/05/2020	22/05/2020
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	100%	<0.2
Toluene	mg/kg	<0.5	<0.5	<0.5	101%	<0.5
Ethylbenzene	mg/kg	<1	<1	<1	102%	<1
m+p-xylene	mg/kg	<2	<2	<2	103%	<2
o-Xylene	mg/kg	<1	<1	<1	103%	<1
naphthalene	mg/kg	1	<1	16	[NA]	<1
Total +ve Xylenes	mg/kg	<3	<3	<3	[NA]	<3
Surrogate aaa-Trifluorotoluene	%	109	123	118	95	101

vTRH(C6-C10)/BTEXN in Soil		
Our Reference		243218-13
Your Reference	UNITS	BH112B
Depth		1.2-1.4
Date Sampled		13/05/2020
Type of sample		SOIL
Date extracted	-	21/05/2020
Date analysed	-	22/05/2020
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	%	93

svTRH (C10-C40) in Soil						
Our Reference		243218-1	243218-2	243218-3	243218-4	243218-5
Your Reference	UNITS	BH107B	BD1/20200516	BH107B	BH108	BH109B
Depth		0.4-0.5	-	1.4-1.5	0.23-0.25	0.4-0.5
Date Sampled		16/05/2020	16/05/2020	16/05/2020	17/05/2020	17/05/2020
Type of sample		SOIL	SOIL	SOIL	SOIL	SOIL
Date extracted	-	21/05/2020	21/05/2020	21/05/2020	21/05/2020	21/05/2020
Date analysed	-	21/05/2020	21/05/2020	21/05/2020	21/05/2020	21/05/2020
TRH C ₁₀ - C ₁₄	mg/kg	<50	<50	<50	<50	<50
TRH C ₁₅ - C ₂₈	mg/kg	<100	<100	<100	<100	<100
TRH C ₂₉ - C ₃₆	mg/kg	<100	<100	<100	<100	<100
TRH >C ₁₀ -C ₁₆	mg/kg	<50	<50	<50	<50	<50
TRH >C ₁₀ - C ₁₆ less Naphthalene (F2)	mg/kg	<50	<50	<50	<50	<50
TRH >C ₁₆ -C ₃₄	mg/kg	<100	<100	<100	<100	<100
TRH >C ₃₄ -C ₄₀	mg/kg	<100	<100	<100	<100	<100
Total +ve TRH (>C10-C40)	mg/kg	<50	<50	<50	<50	<50
Surrogate o-Terphenyl	%	90	91	90	83	90

svTRH (C10-C40) in Soil					
Our Reference		243218-6	243218-7	243218-8	243218-13
Your Reference	UNITS	BH112B	BH116	BH117	BH112B
Depth		0.6-0.7	0.5-0.7	0.2-0.25	1.2-1.4
Date Sampled		18/05/2020	17/05/2020	17/05/2020	13/05/2020
Type of sample		SOIL	SOIL	SOIL	SOIL
Date extracted	-	21/05/2020	21/05/2020	21/05/2020	21/05/2020
Date analysed	-	22/05/2020	21/05/2020	22/05/2020	21/05/2020
TRH C ₁₀ - C ₁₄	mg/kg	<50	<50	51	<50
TRH C ₁₅ - C ₂₈	mg/kg	210	<100	1,300	<100
TRH C ₂₉ - C ₃₆	mg/kg	650	<100	670	<100
TRH >C ₁₀ -C ₁₆	mg/kg	<50	<50	140	<50
TRH >C ₁₀ - C ₁₆ less Naphthalene (F2)	mg/kg	<50	<50	120	<50
TRH >C ₁₆ -C ₃₄	mg/kg	650	<100	1,700	<100
TRH >C ₃₄ -C ₄₀	mg/kg	310	<100	340	<100
Total +ve TRH (>C10-C40)	mg/kg	960	<50	2,200	<50
Surrogate o-Terphenyl	%	102	88	138	82

PAHs in Soil						
Our Reference		243218-1	243218-2	243218-3	243218-4	243218-5
Your Reference	UNITS	BH107B	BD1/20200516	BH107B	BH108	BH109B
Depth		0.4-0.5	-	1.4-1.5	0.23-0.25	0.4-0.5
Date Sampled		16/05/2020	16/05/2020	16/05/2020	17/05/2020	17/05/2020
Type of sample		SOIL	SOIL	SOIL	SOIL	SOIL
Date extracted	-	21/05/2020	21/05/2020	21/05/2020	21/05/2020	21/05/2020
Date analysed	-	21/05/2020	21/05/2020	21/05/2020	21/05/2020	21/05/2020
Naphthalene	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Acenaphthylene	mg/kg	0.3	0.4	<0.1	0.2	0.1
Acenaphthene	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Fluorene	mg/kg	0.1	0.2	<0.1	<0.1	<0.1
Phenanthrene	mg/kg	1.2	1.3	0.2	0.4	0.9
Anthracene	mg/kg	0.4	0.5	<0.1	0.2	0.2
Fluoranthene	mg/kg	2.2	2.6	0.5	3.1	0.8
Pyrene	mg/kg	2.3	2.8	0.5	4.3	0.8
Benzo(a)anthracene	mg/kg	1.4	1.7	0.3	2.7	0.4
Chrysene	mg/kg	1.3	1.7	0.3	2.6	0.4
Benzo(b,j+k)fluoranthene	mg/kg	2.0	2.7	0.4	3.6	0.5
Benzo(a)pyrene	mg/kg	1.3	1.8	0.3	2.7	0.4
Indeno(1,2,3-c,d)pyrene	mg/kg	0.6	0.9	0.1	1.2	0.2
Dibenzo(a,h)anthracene	mg/kg	0.2	0.3	<0.1	0.3	<0.1
Benzo(g,h,i)perylene	mg/kg	0.8	1.2	0.2	1.5	0.2
Total +ve PAH's	mg/kg	14	18	2.8	23	4.9
Benzo(a)pyrene TEQ calc (zero)	mg/kg	2.0	2.7	<0.5	3.8	<0.5
Benzo(a)pyrene TEQ calc(half)	mg/kg	2.0	2.7	<0.5	3.8	0.5
Benzo(a)pyrene TEQ calc(PQL)	mg/kg	2.0	2.7	<0.5	3.8	0.6
Surrogate <i>p</i> -Terphenyl-d14	%	98	100	94	104	97

PAHs in Soil					
Our Reference		243218-6	243218-7	243218-8	243218-13
Your Reference	UNITS	BH112B	BH116	BH117	BH112B
Depth		0.6-0.7	0.5-0.7	0.2-0.25	1.2-1.4
Date Sampled		18/05/2020	17/05/2020	17/05/2020	13/05/2020
Type of sample		SOIL	SOIL	SOIL	SOIL
Date extracted	-	21/05/2020	21/05/2020	21/05/2020	21/05/2020
Date analysed	-	21/05/2020	21/05/2020	21/05/2020	21/05/2020
Naphthalene	mg/kg	2.1	<0.1	13	0.5
Acenaphthylene	mg/kg	0.9	<0.1	24	0.4
Acenaphthene	mg/kg	1.6	<0.1	1.6	0.5
Fluorene	mg/kg	2.4	<0.1	8.3	0.8
Phenanthrene	mg/kg	16	<0.1	95	5.9
Anthracene	mg/kg	3.9	<0.1	32	1.6
Fluoranthene	mg/kg	14	<0.1	130	5.8
Pyrene	mg/kg	14	<0.1	130	6.1
Benzo(a)anthracene	mg/kg	6.0	<0.1	67	2.8
Chrysene	mg/kg	5.9	<0.1	63	2.8
Benzo(b,j+k)fluoranthene	mg/kg	7.2	<0.2	70	3.5
Benzo(a)pyrene	mg/kg	5.1	<0.05	49	2.5
Indeno(1,2,3-c,d)pyrene	mg/kg	2.6	<0.1	22	1.0
Dibenzo(a,h)anthracene	mg/kg	0.7	<0.1	4.2	0.3
Benzo(g,h,i)perylene	mg/kg	2.9	<0.1	59	1.3
Total +ve PAH's	mg/kg	85	<0.05	770	36
Benzo(a)pyrene TEQ calc (zero)	mg/kg	7.5	<0.5	71	3.5
Benzo(a)pyrene TEQ calc(half)	mg/kg	7.5	<0.5	71	3.5
Benzo(a)pyrene TEQ calc(PQL)	mg/kg	7.5	<0.5	71	3.5
Surrogate <i>p</i> -Terphenyl-d14	%	100	101	94	98

Organochlorine Pesticides in soil				
Our Reference		243218-1	243218-5	243218-8
Your Reference	UNITS	BH107B	BH109B	BH117
Depth		0.4-0.5	0.4-0.5	0.2-0.25
Date Sampled		16/05/2020	17/05/2020	17/05/2020
Type of sample		SOIL	SOIL	SOIL
Date extracted	-	21/05/2020	21/05/2020	21/05/2020
Date analysed	-	21/05/2020	21/05/2020	21/05/2020
alpha-BHC	mg/kg	<0.1	<0.1	<0.1
HCB	mg/kg	<0.1	<0.1	<0.1
beta-BHC	mg/kg	<0.1	<0.1	<0.1
gamma-BHC	mg/kg	<0.1	<0.1	<0.1
Heptachlor	mg/kg	<0.1	<0.1	<0.1
delta-BHC	mg/kg	<0.1	<0.1	<0.1
Aldrin	mg/kg	<0.1	<0.1	<0.1
Heptachlor Epoxide	mg/kg	<0.1	<0.1	<0.1
gamma-Chlordane	mg/kg	<0.1	<0.1	<0.1
alpha-chlordane	mg/kg	<0.1	<0.1	<0.1
Endosulfan I	mg/kg	<0.1	<0.1	<0.1
pp-DDE	mg/kg	<0.1	<0.1	<0.1
Dieldrin	mg/kg	<0.1	<0.1	<0.1
Endrin	mg/kg	<0.1	<0.1	<0.1
Endosulfan II	mg/kg	<0.1	<0.1	<0.1
pp-DDD	mg/kg	<0.1	<0.1	<0.1
Endrin Aldehyde	mg/kg	<0.1	<0.1	<0.1
pp-DDT	mg/kg	<0.1	<0.1	<0.1
Endosulfan Sulphate	mg/kg	<0.1	<0.1	<0.1
Methoxychlor	mg/kg	<0.1	<0.1	<0.1
Total +ve DDT+DDD+DDE	mg/kg	<0.1	<0.1	<0.1
Surrogate TCMX	%	93	94	94

Organophosphorus Pesticides in Soil				
Our Reference		243218-1	243218-5	243218-8
Your Reference	UNITS	BH107B	BH109B	BH117
Depth		0.4-0.5	0.4-0.5	0.2-0.25
Date Sampled		16/05/2020	17/05/2020	17/05/2020
Type of sample		SOIL	SOIL	SOIL
Date extracted	-	21/05/2020	21/05/2020	21/05/2020
Date analysed	-	21/05/2020	21/05/2020	21/05/2020
Dichlorvos	mg/kg	<0.1	<0.1	<0.1
Dimethoate	mg/kg	<0.1	<0.1	<0.1
Diazinon	mg/kg	<0.1	<0.1	<0.1
Chlorpyrifos-methyl	mg/kg	<0.1	<0.1	<0.1
Ronnel	mg/kg	<0.1	<0.1	<0.1
Fenitrothion	mg/kg	<0.1	<0.1	<0.1
Malathion	mg/kg	<0.1	<0.1	<0.1
Chlorpyrifos	mg/kg	<0.1	<0.1	<0.1
Parathion	mg/kg	<0.1	<0.1	<0.1
Bromophos-ethyl	mg/kg	<0.1	<0.1	<0.1
Ethion	mg/kg	<0.1	<0.1	<0.1
Azinphos-methyl (Guthion)	mg/kg	<0.1	<0.1	<0.1
Surrogate TCMX	%	93	94	94

PCBs in Soil				
Our Reference		243218-1	243218-5	243218-8
Your Reference	UNITS	BH107B	BH109B	BH117
Depth		0.4-0.5	0.4-0.5	0.2-0.25
Date Sampled		16/05/2020	17/05/2020	17/05/2020
Type of sample		SOIL	SOIL	SOIL
Date extracted	-	21/05/2020	21/05/2020	21/05/2020
Date analysed	-	21/05/2020	21/05/2020	21/05/2020
Aroclor 1016	mg/kg	<0.1	<0.1	<0.1
Aroclor 1221	mg/kg	<0.1	<0.1	<0.1
Aroclor 1232	mg/kg	<0.1	<0.1	<0.1
Aroclor 1242	mg/kg	<0.1	<0.1	<0.1
Aroclor 1248	mg/kg	<0.1	<0.1	<0.1
Aroclor 1254	mg/kg	<0.1	<0.1	<0.1
Aroclor 1260	mg/kg	<0.1	<0.1	<0.1
Total +ve PCBs (1016-1260)	mg/kg	<0.1	<0.1	<0.1
Surrogate TCMX	%	93	94	94

Acid Extractable metals in soil

Our Reference		243218-1	243218-2	243218-3	243218-4	243218-5
Your Reference	UNITS	BH107B	BD1/20200516	BH107B	BH108	BH109B
Depth		0.4-0.5	-	1.4-1.5	0.23-0.25	0.4-0.5
Date Sampled		16/05/2020	16/05/2020	16/05/2020	17/05/2020	17/05/2020
Type of sample		SOIL	SOIL	SOIL	SOIL	SOIL
Date prepared	-	21/05/2020	21/05/2020	21/05/2020	21/05/2020	21/05/2020
Date analysed	-	22/05/2020	22/05/2020	22/05/2020	22/05/2020	22/05/2020
Arsenic	mg/kg	<4	<4	<4	5	<4
Cadmium	mg/kg	<0.4	<0.4	<0.4	<0.4	<0.4
Chromium	mg/kg	8	12	7	14	9
Copper	mg/kg	25	46	11	11	9
Lead	mg/kg	54	52	11	15	19
Mercury	mg/kg	0.2	0.2	<0.1	<0.1	<0.1
Nickel	mg/kg	4	7	6	<1	<1
Zinc	mg/kg	49	81	15	4	2

Acid Extractable metals in soil

Our Reference		243218-6	243218-7	243218-8	243218-13
Your Reference	UNITS	BH112B	BH116	BH117	BH112B
Depth		0.6-0.7	0.5-0.7	0.2-0.25	1.2-1.4
Date Sampled		18/05/2020	17/05/2020	17/05/2020	13/05/2020
Type of sample		SOIL	SOIL	SOIL	SOIL
Date prepared	-	21/05/2020	21/05/2020	21/05/2020	21/05/2020
Date analysed	-	22/05/2020	22/05/2020	22/05/2020	22/05/2020
Arsenic	mg/kg	<4	<4	8	<4
Cadmium	mg/kg	<0.4	<0.4	<0.4	<0.4
Chromium	mg/kg	11	6	20	3
Copper	mg/kg	15	5	15	16
Lead	mg/kg	21	12	16	5
Mercury	mg/kg	0.3	<0.1	<0.1	<0.1
Nickel	mg/kg	3	<1	2	3
Zinc	mg/kg	12	1	7	11

Misc Soil - Inorg				
Our Reference		243218-1	243218-5	243218-8
Your Reference	UNITS	BH107B	BH109B	BH117
Depth		0.4-0.5	0.4-0.5	0.2-0.25
Date Sampled		16/05/2020	17/05/2020	17/05/2020
Type of sample		SOIL	SOIL	SOIL
Date prepared	-	21/05/2020	21/05/2020	21/05/2020
Date analysed	-	21/05/2020	21/05/2020	21/05/2020
Total Phenolics (as Phenol)	mg/kg	<5	<5	<5

Moisture						
Our Reference		243218-1	243218-2	243218-3	243218-4	243218-5
Your Reference	UNITS	BH107B	BD1/20200516	BH107B	BH108	BH109B
Depth		0.4-0.5	-	1.4-1.5	0.23-0.25	0.4-0.5
Date Sampled		16/05/2020	16/05/2020	16/05/2020	17/05/2020	17/05/2020
Type of sample		SOIL	SOIL	SOIL	SOIL	SOIL
Date prepared	-	21/05/2020	21/05/2020	21/05/2020	21/05/2020	21/05/2020
Date analysed	-	22/05/2020	22/05/2020	22/05/2020	22/05/2020	22/05/2020
Moisture	%	9.1	9.8	13	22	16

Moisture					
Our Reference		243218-6	243218-7	243218-8	243218-13
Your Reference	UNITS	BH112B	BH116	BH117	BH112B
Depth		0.6-0.7	0.5-0.7	0.2-0.25	1.2-1.4
Date Sampled		18/05/2020	17/05/2020	17/05/2020	13/05/2020
Type of sample		SOIL	SOIL	SOIL	SOIL
Date prepared	-	21/05/2020	21/05/2020	21/05/2020	21/05/2020
Date analysed	-	22/05/2020	22/05/2020	22/05/2020	22/05/2020
Moisture	%	5.4	14	20	5.0

Asbestos ID - soils						
Our Reference	UNITS	243218-1	243218-3	243218-5	243218-6	243218-8
Your Reference		BH107B	BH107B	BH109B	BH112B	BH117
Depth		0.4-0.5	1.4-1.5	0.4-0.5	0.6-0.7	0.2-0.25
Date Sampled		16/05/2020	16/05/2020	17/05/2020	18/05/2020	17/05/2020
Type of sample		SOIL	SOIL	SOIL	SOIL	SOIL
Date analysed	-	27/05/2020	27/05/2020	27/05/2020	27/05/2020	27/05/2020
Sample mass tested	g	Approx. 40g	Approx. 45g	Approx. 45g	Approx. 40g	Approx. 60g
Sample Description	-	Brown coarse-grained soil & rocks	Brown coarse-grained soil & rocks	Beige clayey soil & rocks	Beige sandy soil & rocks	Brown clayey soil & rocks
Asbestos ID in soil	-	No asbestos detected at reporting limit of 0.1g/kg	No asbestos detected at reporting limit of 0.1g/kg	No asbestos detected at reporting limit of 0.1g/kg	No asbestos detected at reporting limit of 0.1g/kg	No asbestos detected at reporting limit of 0.1g/kg
		Organic fibres detected	Organic fibres detected	Organic fibres detected	Organic fibres detected	Organic fibres detected
Trace Analysis	-	No asbestos detected	No asbestos detected	No asbestos detected	No asbestos detected	No asbestos detected

Method ID	Methodology Summary
ASB-001	Asbestos ID - Qualitative identification of asbestos in bulk samples using Polarised Light Microscopy and Dispersion Staining Techniques including Synthetic Mineral Fibre and Organic Fibre as per Australian Standard 4964-2004.
Inorg-008	Moisture content determined by heating at 105+/-5 °C for a minimum of 12 hours.
Inorg-031	Total Phenolics by segmented flow analyser (in line distillation with colourimetric finish). Solids are extracted in a caustic media prior to analysis.
Metals-020	Determination of various metals by ICP-AES.
Metals-021	Determination of Mercury by Cold Vapour AAS.
Org-020	Soil samples are extracted with Dichloromethane/Acetone and waters with Dichloromethane and analysed by GC-FID. F2 = (>C10-C16)-Naphthalene as per NEPM B1 Guideline on Investigation Levels for Soil and Groundwater (HSLs Tables 1A (3, 4)). Note Naphthalene is determined from the VOC analysis.
Org-020	Soil samples are extracted with Dichloromethane/Acetone and waters with Dichloromethane and analysed by GC-FID. F2 = (>C10-C16)-Naphthalene as per NEPM B1 Guideline on Investigation Levels for Soil and Groundwater (HSLs Tables 1A (3, 4)). Note Naphthalene is determined from the VOC analysis. Note, the Total +ve TRH PQL is reflective of the lowest individual PQL and is therefore "Total +ve TRH" is simply a sum of the positive individual TRH fractions (>C10-C40).
Org-021	Soil samples are extracted with dichloromethane/acetone and waters with dichloromethane and analysed by GC-ECD.
Org-021	Soil samples are extracted with dichloromethane/acetone and waters with dichloromethane and analysed by GC-ECD. Note, the Total +ve PCBs PQL is reflective of the lowest individual PQL and is therefore "Total +ve PCBs" is simply a sum of the positive individual PCBs.
Org-022	Determination of VOCs sampled onto coconut shell charcoal sorbent tubes, that can be desorbed using carbon disulphide, and analysed by GC-MS.
Org-022/025	Soil samples are extracted with Dichloromethane/Acetone and waters with Dichloromethane and analysed by GC-MS/GC-MSMS.
Org-022/025	Soil samples are extracted with dichloromethane/acetone and waters with dichloromethane and analysed by GC-MS/GC-MSMS. Note, the Total +ve reported DDD+DDE+DDT PQL is reflective of the lowest individual PQL and is therefore simply a sum of the positive individually report DDD+DDE+DDT.

Method ID	Methodology Summary
Org-022/025	<p>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.</p> <p>For soil results:-</p> <ol style="list-style-type: none"> 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. <p>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.</p>
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)-BTX as per NEPM B1 Guideline on Investigation Levels for Soil and Groundwater.
Org-023	<p>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)-BTX as per NEPM B1 Guideline on Investigation Levels for Soil and Groundwater.</p> <p>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.</p>

QUALITY CONTROL: vTRH(C6-C10)/BTEXN in Soil						Duplicate			Spike Recovery %	
Test Description	Units	PQL	Method	Blank	#	Base	Dup.	RPD	LCS-6	243218-5
Date extracted	-			21/05/2020	1	21/05/2020	21/05/2020		21/05/2020	21/05/2020
Date analysed	-			22/05/2020	1	22/05/2020	22/05/2020		22/05/2020	22/05/2020
TRH C ₆ - C ₉	mg/kg	25	Org-023	<25	1	<25	<25	0	109	93
TRH C ₆ - C ₁₀	mg/kg	25	Org-023	<25	1	<25	<25	0	109	93
Benzene	mg/kg	0.2	Org-023	<0.2	1	<0.2	<0.2	0	111	98
Toluene	mg/kg	0.5	Org-023	<0.5	1	<0.5	<0.5	0	102	87
Ethylbenzene	mg/kg	1	Org-023	<1	1	<1	<1	0	100	84
m+p-xylene	mg/kg	2	Org-023	<2	1	<2	<2	0	116	97
o-Xylene	mg/kg	1	Org-023	<1	1	<1	<1	0	103	87
naphthalene	mg/kg	1	Org-023	<1	1	<1	<1	0	[NT]	[NT]
Surrogate aaa-Trifluorotoluene	%		Org-023	92	1	88	102	15	102	93

QUALITY CONTROL: svTRH (C10-C40) in Soil					Duplicate			Spike Recovery %		
Test Description	Units	PQL	Method	Blank	#	Base	Dup.	RPD	LCS-6	243218-5
Date extracted	-			21/05/2020	1	21/05/2020	21/05/2020		21/05/2020	21/05/2020
Date analysed	-			21/05/2020	1	21/05/2020	21/05/2020		21/05/2020	21/05/2020
TRH C ₁₀ - C ₁₄	mg/kg	50	Org-020	<50	1	<50	<50	0	85	83
TRH C ₁₅ - C ₂₈	mg/kg	100	Org-020	<100	1	<100	<100	0	74	77
TRH C ₂₉ - C ₃₆	mg/kg	100	Org-020	<100	1	<100	<100	0	92	119
TRH >C ₁₀ -C ₁₆	mg/kg	50	Org-020	<50	1	<50	<50	0	85	83
TRH >C ₁₆ -C ₃₄	mg/kg	100	Org-020	<100	1	<100	<100	0	74	77
TRH >C ₃₄ -C ₄₀	mg/kg	100	Org-020	<100	1	<100	<100	0	92	119
Surrogate o-Terphenyl	%		Org-020	71	1	90	90	0	111	90

QUALITY CONTROL: PAHs in Soil					Duplicate			Spike Recovery %		
Test Description	Units	PQL	Method	Blank	#	Base	Dup.	RPD	LCS-6	243218-5
Date extracted	-			21/05/2020	1	21/05/2020	21/05/2020		21/05/2020	21/05/2020
Date analysed	-			21/05/2020	1	21/05/2020	21/05/2020		21/05/2020	21/05/2020
Naphthalene	mg/kg	0.1	Org-022/025	<0.1	1	<0.1	<0.1	0	98	98
Acenaphthylene	mg/kg	0.1	Org-022/025	<0.1	1	0.3	0.4	29	[NT]	[NT]
Acenaphthene	mg/kg	0.1	Org-022/025	<0.1	1	<0.1	<0.1	0	[NT]	[NT]
Fluorene	mg/kg	0.1	Org-022/025	<0.1	1	0.1	0.2	67	100	104
Phenanthrene	mg/kg	0.1	Org-022/025	<0.1	1	1.2	1.8	40	98	134
Anthracene	mg/kg	0.1	Org-022/025	<0.1	1	0.4	0.5	22	[NT]	[NT]
Fluoranthene	mg/kg	0.1	Org-022/025	<0.1	1	2.2	2.9	27	98	132
Pyrene	mg/kg	0.1	Org-022/025	<0.1	1	2.3	3.0	26	98	137
Benzo(a)anthracene	mg/kg	0.1	Org-022/025	<0.1	1	1.4	1.8	25	[NT]	[NT]
Chrysene	mg/kg	0.1	Org-022/025	<0.1	1	1.3	1.7	27	90	110
Benzo(b,j+k)fluoranthene	mg/kg	0.2	Org-022/025	<0.2	1	2.0	2.5	22	[NT]	[NT]
Benzo(a)pyrene	mg/kg	0.05	Org-022/025	<0.05	1	1.3	1.6	21	104	119
Indeno(1,2,3-c,d)pyrene	mg/kg	0.1	Org-022/025	<0.1	1	0.6	0.7	15	[NT]	[NT]
Dibenzo(a,h)anthracene	mg/kg	0.1	Org-022/025	<0.1	1	0.2	0.2	0	[NT]	[NT]
Benzo(g,h,i)perylene	mg/kg	0.1	Org-022/025	<0.1	1	0.8	0.9	12	[NT]	[NT]
Surrogate p-Terphenyl-d14	%		Org-022/025	93	1	98	96	2	89	95

QUALITY CONTROL: Organochlorine Pesticides in soil						Duplicate			Spike Recovery %	
Test Description	Units	PQL	Method	Blank	#	Base	Dup.	RPD	LCS-6	243218-5
Date extracted	-			21/05/2020	1	21/05/2020	21/05/2020		21/05/2020	21/05/2020
Date analysed	-			21/05/2020	1	21/05/2020	21/05/2020		21/05/2020	21/05/2020
alpha-BHC	mg/kg	0.1	Org-022/025	<0.1	1	<0.1	<0.1	0	102	106
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	116	116
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	90	94
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	118	122
Heptachlor Epoxide	mg/kg	0.1	Org-022/025	<0.1	1	<0.1	<0.1	0	118	118
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	114	120
Dieldrin	mg/kg	0.1	Org-022/025	<0.1	1	<0.1	<0.1	0	98	122
Endrin	mg/kg	0.1	Org-022/025	<0.1	1	<0.1	<0.1	0	108	106
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	106	106
Endrin Aldehyde	mg/kg	0.1	Org-022/025	<0.1	1	<0.1	<0.1	0	[NT]	[NT]
pp-DDT	mg/kg	0.1	Org-022/025	<0.1	1	<0.1	<0.1	0	[NT]	[NT]
Endosulfan Sulphate	mg/kg	0.1	Org-022/025	<0.1	1	<0.1	<0.1	0	84	96
Methoxychlor	mg/kg	0.1	Org-022/025	<0.1	1	<0.1	<0.1	0	[NT]	[NT]
Surrogate TCMX	%		Org-022/025	95	1	93	92	1	91	92

QUALITY CONTROL: Organophosphorus Pesticides in Soil					Duplicate			Spike Recovery %		
Test Description	Units	PQL	Method	Blank	#	Base	Dup.	RPD	LCS-6	243218-5
Date extracted	-			21/05/2020	1	21/05/2020	21/05/2020		21/05/2020	21/05/2020
Date analysed	-			21/05/2020	1	21/05/2020	21/05/2020		21/05/2020	21/05/2020
Dichlorvos	mg/kg	0.1	Org-022/025	<0.1	1	<0.1	<0.1	0	94	70
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]
Chlorpyrifos-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	88	84
Fenitrothion	mg/kg	0.1	Org-022/025	<0.1	1	<0.1	<0.1	0	78	70
Malathion	mg/kg	0.1	Org-022/025	<0.1	1	<0.1	<0.1	0	72	78
Chlorpyrifos	mg/kg	0.1	Org-022/025	<0.1	1	<0.1	<0.1	0	92	94
Parathion	mg/kg	0.1	Org-022/025	<0.1	1	<0.1	<0.1	0	96	90
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	88
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	95	1	93	92	1	91	92

QUALITY CONTROL: PCBs in Soil					Duplicate			Spike Recovery %		
Test Description	Units	PQL	Method	Blank	#	Base	Dup.	RPD	LCS-6	243218-5
Date extracted	-			21/05/2020	1	21/05/2020	21/05/2020		21/05/2020	21/05/2020
Date analysed	-			21/05/2020	1	21/05/2020	21/05/2020		21/05/2020	21/05/2020
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	110	110
Aroclor 1260	mg/kg	0.1	Org-021	<0.1	1	<0.1	<0.1	0	[NT]	[NT]
Surrogate TCMX	%		Org-021	95	1	93	92	1	91	92

QUALITY CONTROL: Acid Extractable metals in soil						Duplicate		Spike Recovery %		
Test Description	Units	PQL	Method	Blank	#	Base	Dup.	RPD	LCS-6	243218-5
Date prepared	-			21/05/2020	1	21/05/2020	21/05/2020		21/05/2020	21/05/2020
Date analysed	-			22/05/2020	1	22/05/2020	22/05/2020		22/05/2020	22/05/2020
Arsenic	mg/kg	4	Metals-020	<4	1	<4	<4	0	120	88
Cadmium	mg/kg	0.4	Metals-020	<0.4	1	<0.4	<0.4	0	116	87
Chromium	mg/kg	1	Metals-020	<1	1	8	10	22	119	88
Copper	mg/kg	1	Metals-020	<1	1	25	19	27	121	92
Lead	mg/kg	1	Metals-020	<1	1	54	62	14	117	87
Mercury	mg/kg	0.1	Metals-021	<0.1	1	0.2	0.3	40	95	83
Nickel	mg/kg	1	Metals-020	<1	1	4	4	0	116	86
Zinc	mg/kg	1	Metals-020	<1	1	49	48	2	120	86

QUALITY CONTROL: Misc Soil - Inorg						Duplicate		Spike Recovery %		
Test Description	Units	PQL	Method	Blank	#	Base	Dup.	RPD	LCS-1	[NT]
Date prepared	-			21/05/2020	[NT]	[NT]	[NT]	[NT]	21/05/2020	[NT]
Date analysed	-			21/05/2020	[NT]	[NT]	[NT]	[NT]	21/05/2020	[NT]
Total Phenolics (as Phenol)	mg/kg	5	Inorg-031	<5	[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

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: Sample 243218-6 was sub-sampled from a jar provided by the client.

Project No: 86767.03			Suburb: Haymarket			To: Envirolab Services		
Project Name: HAYMARKET, 810 Lee Street, SSI			Order Number					
Project Manager: WFY			Sampler: AMS/NB/KR			Attn: Aileen Hie		
Emails: wenfei.yuan@douglaspartners.com.au and ayia.sorensen@douglaspartners.com.au						Phone:		
Date Required: Same day <input type="checkbox"/> 24 hours <input type="checkbox"/> 48 hours <input type="checkbox"/> 72 hours <input type="checkbox"/> Standard <input type="checkbox"/>						Email:		
Prior Storage: <input type="checkbox"/> Esky <input type="checkbox"/> Fridge <input type="checkbox"/> Shelved						Do samples contain 'potential' HBM? Yes <input type="checkbox"/> No <input type="checkbox"/> (If YES, then handle, transport and store in accordance with FPM HAZID)		

Sample ID	Lab ID	Date Sampled	Sample Type	Container Type	Analytes									
			S - soil W - water	G - glass P - plastic	Combo8A	Combo3A	Combo3	TRH/BT EX						
BH107B/0.4-0.5	1	16/05/20	S	G/P	X									
BD1/20200516	2	16/05/20	S	G/P				X						
BH107B/1.5-1.6	3	16/05/20	S	G/P			X							
BH108/0.23-0.25	4	17/05/20	S	G/P				X						
BH109B/0.4-0.5	5	17/05/20	S	G/P	X			X						
BH112B/0.6-0.7	6	18/05/20	S	G/P			X							
BH112B/1.4-1.5	NR	18/05/20	S	G/P				X						
BH116/0.5-0.7	7	17/05/20	S	G/P				X						
BD1/20200517	1		S	G				X						
BH117/0.2-0.25	8	17/05/20	S	G/P	X									
Trip Spike	9	12/5/20	S	G					BTEX					
Trip Blank	10	12/5/20	S	G					TRH/BTEX					
Trip Spike	11	13/5/20												
Trip Blank	12	12/5/20												
BH112B 1.2-1.4	13													
BH112B 1.6-1.7	14													
BD1/20200515	15													

PQL (S) mg/kg:

PQL = practical quantitation limit. If none given, default to Laboratory Method Detection Limit

ANZECC PQLs req'd for all water analytes ☐

Lab Report/Reference No:

Metals to Analyse: 8HM unless specified here:

Total number of samples in container:

Send Results to: Douglas Partners Pty Ltd

Signed:

Relinquished by: WFY

Address: 96 Hermitage Road, West Ryde

Received by: [Signature]

Transported to laboratory by:

Phone: 9809 0999

Date & Time: 14/18/5/20 1620

2nd esky received: 19/5/20 1520.

Project No:		86767.03		Suburb:		Haymarket		To:		Envirolab Services						
Project Name:		Haymarket, DSI		Order Number												
Project Manager:		WFY		Sampler:		NB.		Attn:		Aileen Hie						
Emails:		wenfei.yuan@douglaspartners.com.au						Phone:								
Date Required:		Same day <input type="checkbox"/>		24 hours <input type="checkbox"/>		48 hours <input type="checkbox"/>		72 hours <input type="checkbox"/>		Standard <input type="checkbox"/>						
Prior Storage:		<input type="checkbox"/> Esky <input type="checkbox"/> Fridge <input type="checkbox"/> Shelved		Do samples contain 'potential' HBM?		Yes <input type="checkbox"/> No <input type="checkbox"/>		(If YES, then handle, transport and store in accordance with FPM HAZID)								
Sample ID	Lab ID	Date Sampled	Sample Type	Container Type	Analytes											
			S - soil W - water	G - glass P - plastic	Combo1	Combo2										
BH110/0.5-0.6	NL3	21/05/20	S	G/P	X											
BH111/0.4-0.5	1	19/05/20	S	G/P	X											
BH111/1.3-1.4	2	19/05/20	S	G/P		X										
BH110 / 0.25-0.35	extra															
#3 + extra sample rec'd		22/5/2020			1500											
					P.											
												Envirolab Services 12 Ashley St Chatswood NSW 2057 Ph: (02) 9910 6200				
												JOB NO: 243428				
												Date Received: 19/5/2020				
												Time Received: 12.15				
												Received by: [Signature]				
												Temp: Cool/Ambient 10.2				
												Cooling: Ice/Coolpack				
												Integrity: Intact/Broken/Vent				
PQL (S) mg/kg												ANZECC PQLs req'd for all water analytes				
PQL = practical quantitation limit. If none given, default to Laboratory Method Detection Limit												Lab Report/Reference No:				
Metals to Analyse: 8HM unless specified here:																
Total number of samples in container:												Relinquished by: WFY Transported to laboratory by:				
Send Results to: Douglas Partners Pty Ltd												Address: 96 Hermitage Road, West Ryde				
Signed:												Received by:				
												Date & Time:				

CERTIFICATE OF ANALYSIS 243428

Client Details

Client	Douglas Partners Pty Ltd
Attention	Wen-Fei Yuan
Address	96 Hermitage Rd, West Ryde, NSW, 2114

Sample Details

Your Reference	<u>86767.03/Haymarket,DSI</u>
Number of Samples	4 Soil
Date samples received	19/05/2020
Date completed instructions received	22/05/2020

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	29/05/2020
Date of Issue	29/05/2020
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 *	

Asbestos Approved By

Analysed by Asbestos Approved Identifier: Lucy Zhu
 Authorised by Asbestos Approved Signatory: Lucy Zhu

Results Approved By

Diego Bigolin, Team Leader, Inorganics
 Dragana Tomas, Senior Chemist
 Hannah Nguyen, Senior Chemist
 Josh Williams, Senior Chemist
 Lucy Zhu, Asbestos Supervisor

Authorised By



Nancy Zhang, Laboratory Manager

vTRH(C6-C10)/BTEXN in Soil				
Our Reference		243428-1	243428-2	243428-3
Your Reference	UNITS	BH111	BH111	BH110
Depth		0.4-0.5	1.3-1.4	0.5-0.6
Date Sampled		19/05/2020	19/05/2020	21/05/2020
Type of sample		Soil	Soil	Soil
Date extracted	-	25/05/2020	25/05/2020	25/05/2020
Date analysed	-	26/05/2020	26/05/2020	26/05/2020
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	%	110	110	105

svTRH (C10-C40) in Soil				
Our Reference		243428-1	243428-2	243428-3
Your Reference	UNITS	BH111	BH111	BH110
Depth		0.4-0.5	1.3-1.4	0.5-0.6
Date Sampled		19/05/2020	19/05/2020	21/05/2020
Type of sample		Soil	Soil	Soil
Date extracted	-	25/05/2020	25/05/2020	25/05/2020
Date analysed	-	25/05/2020	25/05/2020	25/05/2020
TRH C ₁₀ - C ₁₄	mg/kg	<50	<50	<50
TRH C ₁₅ - C ₂₈	mg/kg	<100	130	<100
TRH C ₂₉ - C ₃₆	mg/kg	<100	110	<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	220	<100
TRH >C ₃₄ -C ₄₀	mg/kg	<100	<100	<100
Total +ve TRH (>C10-C40)	mg/kg	<50	220	<50
Surrogate o-Terphenyl	%	66	83	75

PAHs in Soil				
Our Reference		243428-1	243428-2	243428-3
Your Reference	UNITS	BH111	BH111	BH110
Depth		0.4-0.5	1.3-1.4	0.5-0.6
Date Sampled		19/05/2020	19/05/2020	21/05/2020
Type of sample		Soil	Soil	Soil
Date extracted	-	25/05/2020	25/05/2020	25/05/2020
Date analysed	-	25/05/2020	25/05/2020	25/05/2020
Naphthalene	mg/kg	<0.1	0.2	<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	0.2	0.2
Phenanthrene	mg/kg	0.2	4.0	0.6
Anthracene	mg/kg	<0.1	0.9	0.4
Fluoranthene	mg/kg	0.3	8.0	1.8
Pyrene	mg/kg	0.3	7.8	2.2
Benzo(a)anthracene	mg/kg	0.2	5.0	1.5
Chrysene	mg/kg	0.2	6.9	1.1
Benzo(b,j+k)fluoranthene	mg/kg	0.3	12	2
Benzo(a)pyrene	mg/kg	0.2	5.7	1.1
Indeno(1,2,3-c,d)pyrene	mg/kg	<0.1	2.4	0.5
Dibenzo(a,h)anthracene	mg/kg	<0.1	0.7	0.6
Benzo(g,h,i)perylene	mg/kg	0.1	2.7	0.6
Total +ve PAH's	mg/kg	1.9	57	13
Benzo(a)pyrene TEQ calc (zero)	mg/kg	<0.5	8.4	2.1
Benzo(a)pyrene TEQ calc(half)	mg/kg	<0.5	8.4	2.1
Benzo(a)pyrene TEQ calc(PQL)	mg/kg	<0.5	8.4	2.1
Surrogate <i>p</i> -Terphenyl-d14	%	81	105	87

Organochlorine Pesticides in soil			
Our Reference		243428-1	243428-3
Your Reference	UNITS	BH111	BH110
Depth		0.4-0.5	0.5-0.6
Date Sampled		19/05/2020	21/05/2020
Type of sample		Soil	Soil
Date extracted	-	25/05/2020	25/05/2020
Date analysed	-	25/05/2020	25/05/2020
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	%	98	102

Organophosphorus Pesticides in Soil			
Our Reference		243428-1	243428-3
Your Reference	UNITS	BH111	BH110
Depth		0.4-0.5	0.5-0.6
Date Sampled		19/05/2020	21/05/2020
Type of sample		Soil	Soil
Date extracted	-	25/05/2020	25/05/2020
Date analysed	-	25/05/2020	25/05/2020
Dichlorvos	mg/kg	<0.1	<0.1
Dimethoate	mg/kg	<0.1	<0.1
Diazinon	mg/kg	<0.1	<0.1
Chlorpyrifos-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
Chlorpyrifos	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	%	98	102

PCBs in Soil			
Our Reference		243428-1	243428-3
Your Reference	UNITS	BH111	BH110
Depth		0.4-0.5	0.5-0.6
Date Sampled		19/05/2020	21/05/2020
Type of sample		Soil	Soil
Date extracted	-	25/05/2020	25/05/2020
Date analysed	-	25/05/2020	25/05/2020
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	%	98	102

Acid Extractable metals in soil				
Our Reference		243428-1	243428-2	243428-3
Your Reference	UNITS	BH111	BH111	BH110
Depth		0.4-0.5	1.3-1.4	0.5-0.6
Date Sampled		19/05/2020	19/05/2020	21/05/2020
Type of sample		Soil	Soil	Soil
Date prepared	-	25/05/2020	25/05/2020	25/05/2020
Date analysed	-	26/05/2020	26/05/2020	26/05/2020
Arsenic	mg/kg	<4	<4	43
Cadmium	mg/kg	<0.4	<0.4	<0.4
Chromium	mg/kg	5	16	10
Copper	mg/kg	6	60	9
Lead	mg/kg	10	330	30
Mercury	mg/kg	<0.1	1.0	<0.1
Nickel	mg/kg	3	16	3
Zinc	mg/kg	12	180	19

Misc Soil - Inorg			
Our Reference		243428-1	243428-3
Your Reference	UNITS	BH111	BH110
Depth		0.4-0.5	0.5-0.6
Date Sampled		19/05/2020	21/05/2020
Type of sample		Soil	Soil
Date prepared	-	25/05/2020	25/05/2020
Date analysed	-	25/05/2020	25/05/2020
Total Phenolics (as Phenol)	mg/kg	<5	<5

Moisture				
Our Reference		243428-1	243428-2	243428-3
Your Reference	UNITS	BH111	BH111	BH110
Depth		0.4-0.5	1.3-1.4	0.5-0.6
Date Sampled		19/05/2020	19/05/2020	21/05/2020
Type of sample		Soil	Soil	Soil
Date prepared	-	25/05/2020	25/05/2020	25/05/2020
Date analysed	-	26/05/2020	26/05/2020	26/05/2020
Moisture	%	7.0	13	14

Asbestos ID - soils				
Our Reference		243428-1	243428-2	243428-3
Your Reference	UNITS	BH111	BH111	BH110
Depth		0.4-0.5	1.3-1.4	0.5-0.6
Date Sampled		19/05/2020	19/05/2020	21/05/2020
Type of sample		Soil	Soil	Soil
Date analysed	-	28/05/2020	28/05/2020	28/05/2020
Sample mass tested	g	Approx. 25g	Approx. 35g	Approx. 30g
Sample Description	-	Brown sandy soil & rocks	Brown coarse-grained soil & rocks	Beige clayey 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

Method ID	Methodology Summary
ASB-001	Asbestos ID - Qualitative identification of asbestos in bulk samples using Polarised Light Microscopy and Dispersion Staining Techniques including Synthetic Mineral Fibre and Organic Fibre as per Australian Standard 4964-2004.
Inorg-008	Moisture content determined by heating at 105+/-5 °C for a minimum of 12 hours.
Inorg-031	Total Phenolics by segmented flow analyser (in line distillation with colourimetric finish). Solids are extracted in a caustic media prior to analysis.
Metals-020	Determination of various metals by ICP-AES.
Metals-021	Determination of Mercury by Cold Vapour AAS.
Org-020	Soil samples are extracted with Dichloromethane/Acetone and waters with Dichloromethane and analysed by GC-FID. F2 = (>C10-C16)-Naphthalene as per NEPM B1 Guideline on Investigation Levels for Soil and Groundwater (HSLs Tables 1A (3, 4)). Note Naphthalene is determined from the VOC analysis.
Org-020	Soil samples are extracted with Dichloromethane/Acetone and waters with Dichloromethane and analysed by GC-FID. F2 = (>C10-C16)-Naphthalene as per NEPM B1 Guideline on Investigation Levels for Soil and Groundwater (HSLs Tables 1A (3, 4)). Note Naphthalene is determined from the VOC analysis. Note, the Total +ve TRH PQL is reflective of the lowest individual PQL and is therefore "Total +ve TRH" is simply a sum of the positive individual TRH fractions (>C10-C40).
Org-021	Soil samples are extracted with dichloromethane/acetone and waters with dichloromethane and analysed by GC-ECD.
Org-021	Soil samples are extracted with dichloromethane/acetone and waters with dichloromethane and analysed by GC-ECD. Note, the Total +ve PCBs PQL is reflective of the lowest individual PQL and is therefore "Total +ve PCBs" is simply a sum of the positive individual PCBs.
Org-022	Determination of VOCs sampled onto coconut shell charcoal sorbent tubes, that can be desorbed using carbon disulphide, and analysed by GC-MS.
Org-022/025	Soil samples are extracted with Dichloromethane/Acetone and waters with Dichloromethane and analysed by GC-MS/GC-MSMS.
Org-022/025	Soil samples are extracted with dichloromethane/acetone and waters with dichloromethane and analysed by GC-MS/GC-MSMS. Note, the Total +ve reported DDD+DDE+DDT PQL is reflective of the lowest individual PQL and is therefore simply a sum of the positive individually report DDD+DDE+DDT.

Method ID	Methodology Summary
Org-022/025	<p>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.</p> <p>For soil results:-</p> <ol style="list-style-type: none"> 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. <p>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.</p>
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)-BTX as per NEPM B1 Guideline on Investigation Levels for Soil and Groundwater.
Org-023	<p>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)-BTX as per NEPM B1 Guideline on Investigation Levels for Soil and Groundwater.</p> <p>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.</p>

QUALITY CONTROL: vTRH(C6-C10)/BTEXN in Soil						Duplicate		Spike Recovery %		
Test Description	Units	PQL	Method	Blank	#	Base	Dup.	RPD	LCS-8	[NT]
Date extracted	-			25/05/2020	[NT]	[NT]	[NT]	[NT]	25/05/2020	[NT]
Date analysed	-			26/05/2020	[NT]	[NT]	[NT]	[NT]	26/05/2020	[NT]
TRH C ₆ - C ₉	mg/kg	25	Org-023	<25	[NT]	[NT]	[NT]	[NT]	99	[NT]
TRH C ₆ - C ₁₀	mg/kg	25	Org-023	<25	[NT]	[NT]	[NT]	[NT]	99	[NT]
Benzene	mg/kg	0.2	Org-023	<0.2	[NT]	[NT]	[NT]	[NT]	112	[NT]
Toluene	mg/kg	0.5	Org-023	<0.5	[NT]	[NT]	[NT]	[NT]	93	[NT]
Ethylbenzene	mg/kg	1	Org-023	<1	[NT]	[NT]	[NT]	[NT]	103	[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]	84	[NT]
naphthalene	mg/kg	1	Org-023	<1	[NT]	[NT]	[NT]	[NT]	[NT]	[NT]
Surrogate aaa-Trifluorotoluene	%		Org-023	101	[NT]	[NT]	[NT]	[NT]	101	[NT]

QUALITY CONTROL: svTRH (C10-C40) in Soil					Duplicate				Spike Recovery %	
Test Description	Units	PQL	Method	Blank	#	Base	Dup.	RPD	LCS-8	[NT]
Date extracted	-			25/05/2020	[NT]	[NT]	[NT]	[NT]	25/05/2020	[NT]
Date analysed	-			25/05/2020	[NT]	[NT]	[NT]	[NT]	25/05/2020	[NT]
TRH C ₁₀ - C ₁₄	mg/kg	50	Org-020	<50	[NT]	[NT]	[NT]	[NT]	93	[NT]
TRH C ₁₅ - C ₂₈	mg/kg	100	Org-020	<100	[NT]	[NT]	[NT]	[NT]	84	[NT]
TRH C ₂₉ - C ₃₆	mg/kg	100	Org-020	<100	[NT]	[NT]	[NT]	[NT]	92	[NT]
TRH >C ₁₀ -C ₁₆	mg/kg	50	Org-020	<50	[NT]	[NT]	[NT]	[NT]	93	[NT]
TRH >C ₁₆ -C ₃₄	mg/kg	100	Org-020	<100	[NT]	[NT]	[NT]	[NT]	84	[NT]
TRH >C ₃₄ -C ₄₀	mg/kg	100	Org-020	<100	[NT]	[NT]	[NT]	[NT]	92	[NT]
Surrogate o-Terphenyl	%		Org-020	73	[NT]	[NT]	[NT]	[NT]	94	[NT]

QUALITY CONTROL: PAHs in Soil					Duplicate			Spike Recovery %		
Test Description	Units	PQL	Method	Blank	#	Base	Dup.	RPD	LCS-8	[NT]
Date extracted	-			25/05/2020	[NT]	[NT]	[NT]	[NT]	25/05/2020	[NT]
Date analysed	-			25/05/2020	[NT]	[NT]	[NT]	[NT]	25/05/2020	[NT]
Naphthalene	mg/kg	0.1	Org-022/025	<0.1	[NT]	[NT]	[NT]	[NT]	98	[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]	[NT]	[NT]
Fluorene	mg/kg	0.1	Org-022/025	<0.1	[NT]	[NT]	[NT]	[NT]	102	[NT]
Phenanthrene	mg/kg	0.1	Org-022/025	<0.1	[NT]	[NT]	[NT]	[NT]	122	[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]	98	[NT]
Pyrene	mg/kg	0.1	Org-022/025	<0.1	[NT]	[NT]	[NT]	[NT]	114	[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]	124	[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]	112	[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	111	[NT]	[NT]	[NT]	[NT]	109	[NT]

QUALITY CONTROL: Organochlorine Pesticides in soil						Duplicate		Spike Recovery %		
Test Description	Units	PQL	Method	Blank	#	Base	Dup.	RPD	LCS-8	[NT]
Date extracted	-			25/05/2020	[NT]	[NT]	[NT]	[NT]	25/05/2020	[NT]
Date analysed	-			25/05/2020	[NT]	[NT]	[NT]	[NT]	25/05/2020	[NT]
alpha-BHC	mg/kg	0.1	Org-022/025	<0.1	[NT]	[NT]	[NT]	[NT]	120	[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]	128	[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]	128	[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]	76	[NT]
Heptachlor Epoxide	mg/kg	0.1	Org-022/025	<0.1	[NT]	[NT]	[NT]	[NT]	122	[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]	128	[NT]
Dieldrin	mg/kg	0.1	Org-022/025	<0.1	[NT]	[NT]	[NT]	[NT]	88	[NT]
Endrin	mg/kg	0.1	Org-022/025	<0.1	[NT]	[NT]	[NT]	[NT]	80	[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]	108	[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]	110	[NT]
Methoxychlor	mg/kg	0.1	Org-022/025	<0.1	[NT]	[NT]	[NT]	[NT]	[NT]	[NT]
Surrogate TCMX	%		Org-022/025	109	[NT]	[NT]	[NT]	[NT]	104	[NT]

QUALITY CONTROL: Organophosphorus Pesticides in Soil					Duplicate			Spike Recovery %		
Test Description	Units	PQL	Method	Blank	#	Base	Dup.	RPD	LCS-8	[NT]
Date extracted	-			25/05/2020	[NT]	[NT]	[NT]	[NT]	25/05/2020	[NT]
Date analysed	-			25/05/2020	[NT]	[NT]	[NT]	[NT]	25/05/2020	[NT]
Dichlorvos	mg/kg	0.1	Org-022/025	<0.1	[NT]	[NT]	[NT]	[NT]	102	[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]
Chlorpyrifos-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]	100	[NT]
Fenitrothion	mg/kg	0.1	Org-022/025	<0.1	[NT]	[NT]	[NT]	[NT]	108	[NT]
Malathion	mg/kg	0.1	Org-022/025	<0.1	[NT]	[NT]	[NT]	[NT]	101	[NT]
Chlorpyrifos	mg/kg	0.1	Org-022/025	<0.1	[NT]	[NT]	[NT]	[NT]	120	[NT]
Parathion	mg/kg	0.1	Org-022/025	<0.1	[NT]	[NT]	[NT]	[NT]	86	[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]	108	[NT]
Azinphos-methyl (Guthion)	mg/kg	0.1	Org-022/025	<0.1	[NT]	[NT]	[NT]	[NT]	[NT]	[NT]
Surrogate TCMX	%		Org-022/025	109	[NT]	[NT]	[NT]	[NT]	104	[NT]

QUALITY CONTROL: PCBs in Soil					Duplicate			Spike Recovery %		
Test Description	Units	PQL	Method	Blank	#	Base	Dup.	RPD	LCS-8	[NT]
Date extracted	-			25/05/2020	[NT]	[NT]	[NT]	[NT]	25/05/2020	[NT]
Date analysed	-			25/05/2020	[NT]	[NT]	[NT]	[NT]	25/05/2020	[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]	74	[NT]
Aroclor 1260	mg/kg	0.1	Org-021	<0.1	[NT]	[NT]	[NT]	[NT]	[NT]	[NT]
Surrogate TCMX	%		Org-021	109	[NT]	[NT]	[NT]	[NT]	104	[NT]

QUALITY CONTROL: Acid Extractable metals in soil					Duplicate			Spike Recovery %		
Test Description	Units	PQL	Method	Blank	#	Base	Dup.	RPD	LCS-8	[NT]
Date prepared	-			25/05/2020	[NT]	[NT]	[NT]	[NT]	25/05/2020	[NT]
Date analysed	-			26/05/2020	[NT]	[NT]	[NT]	[NT]	26/05/2020	[NT]
Arsenic	mg/kg	4	Metals-020	<4	[NT]	[NT]	[NT]	[NT]	102	[NT]
Cadmium	mg/kg	0.4	Metals-020	<0.4	[NT]	[NT]	[NT]	[NT]	99	[NT]
Chromium	mg/kg	1	Metals-020	<1	[NT]	[NT]	[NT]	[NT]	98	[NT]
Copper	mg/kg	1	Metals-020	<1	[NT]	[NT]	[NT]	[NT]	98	[NT]
Lead	mg/kg	1	Metals-020	<1	[NT]	[NT]	[NT]	[NT]	98	[NT]
Mercury	mg/kg	0.1	Metals-021	<0.1	[NT]	[NT]	[NT]	[NT]	86	[NT]
Nickel	mg/kg	1	Metals-020	<1	[NT]	[NT]	[NT]	[NT]	104	[NT]
Zinc	mg/kg	1	Metals-020	<1	[NT]	[NT]	[NT]	[NT]	111	[NT]

QUALITY CONTROL: Misc Soil - Inorg						Duplicate			Spike Recovery %	
Test Description	Units	PQL	Method	Blank	#	Base	Dup.	RPD	LCS-1	[NT]
Date prepared	-			25/05/2020	[NT]	[NT]	[NT]	[NT]	25/05/2020	[NT]
Date analysed	-			25/05/2020	[NT]	[NT]	[NT]	[NT]	25/05/2020	[NT]
Total Phenolics (as Phenol)	mg/kg	5	Inorg-031	<5	[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

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 243428-1 to 3 were sub-sampled from jars provided by the client.

CERTIFICATE OF ANALYSIS 241579

Client Details

Client	Douglas Partners Pty Ltd
Attention	Wen-Fei Yuan
Address	96 Hermitage Rd, West Ryde, NSW, 2114

Sample Details

Your Reference	<u>86767.03, Haymarket</u>
Number of Samples	5 water
Date samples received	24/04/2020
Date completed instructions received	24/04/2020

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	01/05/2020
Date of Issue	01/05/2020
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

Diego Bigolin, Team Leader, Inorganics
 Hannah Nguyen, Senior Chemist
 Josh Williams, Senior Chemist

Authorised By



Nancy Zhang, Laboratory Manager

VOCs in water		
Our Reference		241579-2
Your Reference	UNITS	BH104
Date Sampled		24/04/2020
Type of sample		water
Date extracted	-	30/04/2020
Date analysed	-	30/04/2020
Dichlorodifluoromethane	µg/L	<10
Chloromethane	µg/L	<10
Vinyl Chloride	µg/L	<10
Bromomethane	µg/L	<10
Chloroethane	µg/L	<10
Trichlorofluoromethane	µg/L	<10
1,1-Dichloroethene	µg/L	<1
Trans-1,2-dichloroethene	µg/L	<1
1,1-dichloroethane	µg/L	<1
Cis-1,2-dichloroethene	µg/L	<1
Bromochloromethane	µg/L	<1
Chloroform	µg/L	2
2,2-dichloropropane	µg/L	<1
1,2-dichloroethane	µg/L	<1
1,1,1-trichloroethane	µg/L	<1
1,1-dichloropropene	µg/L	<1
Cyclohexane	µg/L	<1
Carbon tetrachloride	µg/L	<1
Benzene	µg/L	<1
Dibromomethane	µg/L	<1
1,2-dichloropropane	µg/L	<1
Trichloroethene	µg/L	<1
Bromodichloromethane	µg/L	<1
trans-1,3-dichloropropene	µg/L	<1
cis-1,3-dichloropropene	µg/L	<1
1,1,2-trichloroethane	µg/L	<1
Toluene	µg/L	<1
1,3-dichloropropane	µg/L	<1
Dibromochloromethane	µg/L	<1
1,2-dibromoethane	µg/L	<1
Tetrachloroethene	µg/L	<1
1,1,1,2-tetrachloroethane	µg/L	<1
Chlorobenzene	µg/L	<1
Ethylbenzene	µg/L	<1

VOCs in water		
Our Reference		241579-2
Your Reference	UNITS	BH104
Date Sampled		24/04/2020
Type of sample		water
Bromoform	µg/L	<1
m+p-xylene	µg/L	<2
Styrene	µg/L	<1
1,1,2,2-tetrachloroethane	µg/L	<1
o-xylene	µg/L	<1
1,2,3-trichloropropane	µg/L	<1
Isopropylbenzene	µg/L	<1
Bromobenzene	µg/L	<1
n-propyl benzene	µg/L	<1
2-chlorotoluene	µg/L	<1
4-chlorotoluene	µg/L	<1
1,3,5-trimethyl benzene	µg/L	<1
Tert-butyl benzene	µg/L	<1
1,2,4-trimethyl benzene	µg/L	<1
1,3-dichlorobenzene	µg/L	<1
Sec-butyl benzene	µg/L	<1
1,4-dichlorobenzene	µg/L	<1
4-isopropyl toluene	µg/L	<1
1,2-dichlorobenzene	µg/L	<1
n-butyl benzene	µg/L	<1
1,2-dibromo-3-chloropropane	µg/L	<1
1,2,4-trichlorobenzene	µg/L	<1
Hexachlorobutadiene	µg/L	<1
1,2,3-trichlorobenzene	µg/L	<1
Surrogate Dibromofluoromethane	%	108
Surrogate toluene-d8	%	98
Surrogate 4-BFB	%	106

vTRH(C6-C10)/BTEXN in Water						
Our Reference		241579-1	241579-2	241579-3	241579-4	241579-5
Your Reference	UNITS	BH103	BH104	BD1/20200424	TS	TB
Date Sampled		24/04/2020	24/04/2020	24/04/2020	24/04/2020	24/04/2020
Type of sample		water	water	water	water	water
Date extracted	-	30/04/2020	30/04/2020	30/04/2020	30/04/2020	30/04/2020
Date analysed	-	30/04/2020	30/04/2020	30/04/2020	30/04/2020	30/04/2020
TRH C ₆ - C ₉	µg/L	<10	<10	<10	[NA]	<10
TRH C ₆ - C ₁₀	µg/L	<10	<10	<10	[NA]	<10
TRH C ₆ - C ₁₀ less BTEX (F1)	µg/L	<10	<10	<10	[NA]	<10
Benzene	µg/L	<1	<1	<1	111%	<1
Toluene	µg/L	<1	<1	<1	108%	<1
Ethylbenzene	µg/L	<1	<1	<1	108%	<1
m+p-xylene	µg/L	<2	<2	<2	99%	<2
o-xylene	µg/L	<1	<1	<1	112%	<1
Naphthalene	µg/L	<1	<1	<1	[NA]	<1
Surrogate Dibromofluoromethane	%	106	108	106	106	106
Surrogate toluene-d8	%	98	98	98	103	99
Surrogate 4-BFB	%	106	106	106	110	109

svTRH (C10-C40) in Water				
Our Reference		241579-1	241579-2	241579-3
Your Reference	UNITS	BH103	BH104	BD1/20200424
Date Sampled		24/04/2020	24/04/2020	24/04/2020
Type of sample		water	water	water
Date extracted	-	28/04/2020	28/04/2020	28/04/2020
Date analysed	-	28/04/2020	28/04/2020	28/04/2020
TRH C ₁₀ - C ₁₄	µg/L	<50	<50	<50
TRH C ₁₅ - C ₂₈	µg/L	<100	<100	<100
TRH C ₂₉ - C ₃₆	µg/L	<100	<100	<100
TRH >C ₁₀ - C ₁₆	µg/L	<50	<50	<50
TRH >C ₁₀ - C ₁₆ less Naphthalene (F2)	µg/L	<50	<50	<50
TRH >C ₁₆ - C ₃₄	µg/L	<100	<100	<100
TRH >C ₃₄ - C ₄₀	µg/L	<100	<100	<100
Surrogate o-Terphenyl	%	93	100	82

PAHs in Water - Low Level			
Our Reference		241579-1	241579-2
Your Reference	UNITS	BH103	BH104
Date Sampled		24/04/2020	24/04/2020
Type of sample		water	water
Date extracted	-	28/04/2020	28/04/2020
Date analysed	-	28/04/2020	28/04/2020
Naphthalene	µg/L	<0.2	<0.2
Acenaphthylene	µg/L	<0.1	<0.1
Acenaphthene	µg/L	<0.1	<0.1
Fluorene	µg/L	<0.1	<0.1
Phenanthrene	µg/L	<0.1	<0.1
Anthracene	µg/L	<0.1	<0.1
Fluoranthene	µg/L	<0.1	<0.1
Pyrene	µg/L	<0.1	<0.1
Benzo(a)anthracene	µg/L	<0.1	<0.1
Chrysene	µg/L	<0.1	<0.1
Benzo(b,j+k)fluoranthene	µg/L	<0.2	<0.2
Benzo(a)pyrene	µg/L	<0.1	<0.1
Indeno(1,2,3-c,d)pyrene	µg/L	<0.1	<0.1
Dibenzo(a,h)anthracene	µg/L	<0.1	<0.1
Benzo(g,h,i)perylene	µg/L	<0.1	<0.1
Benzo(a)pyrene TEQ	µg/L	<0.5	<0.5
Total +ve PAH's	µg/L	<0.1	<0.1
Surrogate <i>p</i> -Terphenyl-d14	%	86	109

PAHs in Water		
Our Reference		241579-3
Your Reference	UNITS	BD1/20200424
Date Sampled		24/04/2020
Type of sample		water
Date extracted	-	28/04/2020
Date analysed	-	28/04/2020
Naphthalene	µg/L	<1
Acenaphthylene	µg/L	<1
Acenaphthene	µg/L	<1
Fluorene	µg/L	<1
Phenanthrene	µg/L	<1
Anthracene	µg/L	<1
Fluoranthene	µg/L	<1
Pyrene	µg/L	<1
Benzo(a)anthracene	µg/L	<1
Chrysene	µg/L	<1
Benzo(b,j+k)fluoranthene	µg/L	<2
Benzo(a)pyrene	µg/L	<1
Indeno(1,2,3-c,d)pyrene	µg/L	<1
Dibenzo(a,h)anthracene	µg/L	<1
Benzo(g,h,i)perylene	µg/L	<1
Benzo(a)pyrene TEQ	µg/L	<5
Total +ve PAH's	µg/L	NIL (+)VE
Surrogate <i>p</i> -Terphenyl-d14	%	93

OCPs in Water - Trace Level			
Our Reference		241579-1	241579-2
Your Reference	UNITS	BH103	BH104
Date Sampled		24/04/2020	24/04/2020
Type of sample		water	water
Date extracted	-	28/04/2020	28/04/2020
Date analysed	-	28/04/2020	28/04/2020
alpha-BHC	µg/L	<0.001	<0.001
HCB	µg/L	<0.001	<0.001
beta-BHC	µg/L	<0.001	<0.001
gamma-BHC	µg/L	<0.001	<0.001
Heptachlor	µg/L	<0.001	<0.001
delta-BHC	µg/L	<0.001	<0.001
Aldrin	µg/L	<0.001	<0.001
Heptachlor Epoxide	µg/L	<0.001	<0.001
gamma-Chlordane	µg/L	<0.001	<0.001
alpha-Chlordane	µg/L	<0.001	<0.001
Endosulfan I	µg/L	<0.002	<0.002
pp-DDE	µg/L	<0.001	<0.001
Dieldrin	µg/L	<0.001	<0.001
Endrin	µg/L	<0.001	<0.001
Endosulfan II	µg/L	<0.002	<0.002
pp-DDD	µg/L	<0.001	<0.001
Endrin Aldehyde	µg/L	<0.001	<0.001
pp-DDT	µg/L	<0.001	<0.001
Endosulfan Sulphate	µg/L	<0.001	<0.001
Methoxychlor	µg/L	<0.001	<0.001
Surrogate TCMX	%	88	109

OP in water Trace ANZECCF/ADWG			
Our Reference		241579-1	241579-2
Your Reference	UNITS	BH103	BH104
Date Sampled		24/04/2020	24/04/2020
Type of sample		water	water
Date extracted	-	28/04/2020	28/04/2020
Date analysed	-	28/04/2020	28/04/2020
Dichlorovos	µg/L	<0.2	<0.2
Dimethoate	µg/L	<0.15	<0.15
Diazinon	µg/L	<0.01	<0.01
Chlorpyrifos-methyl	µg/L	<0.2	<0.2
Methyl Parathion	µg/L	<0.2	<0.2
Ronnel	µg/L	<0.2	<0.2
Fenitrothion	µg/L	<0.2	<0.2
Malathion	µg/L	<0.05	<0.05
Chlorpyrifos	µg/L	<0.009	<0.009
Parathion	µg/L	<0.004	<0.004
Bromophos ethyl	µg/L	<0.2	<0.2
Ethion	µg/L	<0.2	<0.2
Azinphos-methyl (Guthion)	µg/L	<0.02	<0.02
Surrogate TCMX	%	88	109

PCBs in Water - Trace Level			
Our Reference		241579-1	241579-2
Your Reference	UNITS	BH103	BH104
Date Sampled		24/04/2020	24/04/2020
Type of sample		water	water
Date extracted	-	28/04/2020	28/04/2020
Date analysed	-	28/04/2020	28/04/2020
Aroclor 1016	µg/L	<0.01	<0.01
Aroclor 1221	µg/L	<0.01	<0.01
Aroclor 1232	µg/L	<0.01	<0.01
Aroclor 1242	µg/L	<0.01	<0.01
Aroclor 1248	µg/L	<0.01	<0.01
Aroclor 1254	µg/L	<0.01	<0.01
Aroclor 1260	µg/L	<0.01	<0.01
Surrogate TCMX	%	88	109

HM in water - dissolved				
Our Reference		241579-1	241579-2	241579-3
Your Reference	UNITS	BH103	BH104	BD1/20200424
Date Sampled		24/04/2020	24/04/2020	24/04/2020
Type of sample		water	water	water
Date prepared	-	28/04/2020	28/04/2020	28/04/2020
Date analysed	-	28/04/2020	28/04/2020	28/04/2020
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	3	2	26
Lead-Dissolved	µg/L	<1	<1	<1
Mercury-Dissolved	µg/L	<0.05	<0.05	<0.05
Nickel-Dissolved	µg/L	6	7	9
Zinc-Dissolved	µg/L	12	15	21

Cations in water Dissolved			
Our Reference		241579-1	241579-2
Your Reference	UNITS	BH103	BH104
Date Sampled		24/04/2020	24/04/2020
Type of sample		water	water
Date digested	-	29/04/2020	29/04/2020
Date analysed	-	29/04/2020	29/04/2020
Calcium - Dissolved	mg/L	24	34
Magnesium - Dissolved	mg/L	6.3	6.1
Hardness	mgCaCO ₃ /L	86	110

Miscellaneous Inorganics		
Our Reference	UNITS	241579-2
Your Reference		BH104
Date Sampled		24/04/2020
Type of sample		water
Date prepared	-	29/04/2020
Date analysed	-	29/04/2020
Total Cyanide	mg/L	<0.004

Total Phenolics in Water			
Our Reference		241579-1	241579-2
Your Reference	UNITS	BH103	BH104
Date Sampled		24/04/2020	24/04/2020
Type of sample		water	water
Date extracted	-	29/04/2020	29/04/2020
Date analysed	-	29/04/2020	29/04/2020
Total Phenolics (as Phenol)	mg/L	<0.05	<0.05

Method ID	Methodology Summary
Inorg-014	<p>Cyanide - free, total, weak acid dissociable by segmented flow analyser (in line dialysis with colourimetric finish).</p> <p>Solids/Filters and sorbents are extracted in a caustic media prior to analysis. Impingers are pH adjusted as required prior to analysis.</p> <p>Cyanides amenable to Chlorination - samples are analysed untreated and treated with hyperchlorite to assess the potential for chlorination of cyanide forms. Based on APHA latest edition, 4500-CN_G,H.</p>
Inorg-031	<p>Total Phenolics by segmented flow analyser (in line distillation with colourimetric finish).</p> <p>Solids are extracted in a caustic media prior to analysis.</p>
Metals-020	Determination of various metals by ICP-AES.
Metals-021	Determination of Mercury by Cold Vapour AAS.
Metals-022	Determination of various metals by ICP-MS.
Org-020	<p>Soil samples are extracted with Dichloromethane/Acetone and waters with Dichloromethane and analysed by GC-FID.</p> <p>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.</p>
Org-021	Soil samples are extracted with dichloromethane/acetone and waters with dichloromethane and analysed by GC-ECD.
Org-022/025	Soil samples are extracted with Dichloromethane/Acetone and waters with Dichloromethane and analysed by GC-MS/GC-MSMS.
Org-022/025	Soil samples are extracted with Dichloromethane/Acetone and waters with Dichloromethane and analysed by GC-MS/GC-MSMS. Benzo(a)pyrene TEQ as per NEPM B1 Guideline on Investigation Levels for Soil and Groundwater - 2013.
Org-023	Water samples are analysed directly by purge and trap GC-MS.
Org-023	Soil samples are extracted with methanol and spiked into water prior to analysing by purge and trap GC-MS. Water samples are analysed directly by purge and trap GC-MS. F1 = (C6-C10)-BTEX as per NEPM B1 Guideline on Investigation Levels for Soil and Groundwater.

QUALITY CONTROL: VOCs in water					Duplicate			Spike Recovery %		
Test Description	Units	PQL	Method	Blank	#	Base	Dup.	RPD	LCS-W2	[NT]
Date extracted	-			30/04/2020	[NT]	[NT]	[NT]	[NT]	30/04/2020	[NT]
Date analysed	-			30/04/2020	[NT]	[NT]	[NT]	[NT]	30/04/2020	[NT]
Dichlorodifluoromethane	µg/L	10	Org-023	<10	[NT]	[NT]	[NT]	[NT]	[NT]	[NT]
Chloromethane	µg/L	10	Org-023	<10	[NT]	[NT]	[NT]	[NT]	[NT]	[NT]
Vinyl Chloride	µg/L	10	Org-023	<10	[NT]	[NT]	[NT]	[NT]	[NT]	[NT]
Bromomethane	µg/L	10	Org-023	<10	[NT]	[NT]	[NT]	[NT]	[NT]	[NT]
Chloroethane	µg/L	10	Org-023	<10	[NT]	[NT]	[NT]	[NT]	[NT]	[NT]
Trichlorofluoromethane	µg/L	10	Org-023	<10	[NT]	[NT]	[NT]	[NT]	[NT]	[NT]
1,1-Dichloroethene	µg/L	1	Org-023	<1	[NT]	[NT]	[NT]	[NT]	90	[NT]
Trans-1,2-dichloroethene	µg/L	1	Org-023	<1	[NT]	[NT]	[NT]	[NT]	[NT]	[NT]
1,1-dichloroethane	µg/L	1	Org-023	<1	[NT]	[NT]	[NT]	[NT]	[NT]	[NT]
Cis-1,2-dichloroethene	µg/L	1	Org-023	<1	[NT]	[NT]	[NT]	[NT]	[NT]	[NT]
Bromochloromethane	µg/L	1	Org-023	<1	[NT]	[NT]	[NT]	[NT]	[NT]	[NT]
Chloroform	µg/L	1	Org-023	<1	[NT]	[NT]	[NT]	[NT]	92	[NT]
2,2-dichloropropane	µg/L	1	Org-023	<1	[NT]	[NT]	[NT]	[NT]	[NT]	[NT]
1,2-dichloroethane	µg/L	1	Org-023	<1	[NT]	[NT]	[NT]	[NT]	89	[NT]
1,1,1-trichloroethane	µg/L	1	Org-023	<1	[NT]	[NT]	[NT]	[NT]	101	[NT]
1,1-dichloropropene	µg/L	1	Org-023	<1	[NT]	[NT]	[NT]	[NT]	[NT]	[NT]
Cyclohexane	µg/L	1	Org-023	<1	[NT]	[NT]	[NT]	[NT]	[NT]	[NT]
Carbon tetrachloride	µg/L	1	Org-023	<1	[NT]	[NT]	[NT]	[NT]	[NT]	[NT]
Benzene	µg/L	1	Org-023	<1	[NT]	[NT]	[NT]	[NT]	[NT]	[NT]
Dibromomethane	µg/L	1	Org-023	<1	[NT]	[NT]	[NT]	[NT]	[NT]	[NT]
1,2-dichloropropane	µg/L	1	Org-023	<1	[NT]	[NT]	[NT]	[NT]	[NT]	[NT]
Trichloroethene	µg/L	1	Org-023	<1	[NT]	[NT]	[NT]	[NT]	114	[NT]
Bromodichloromethane	µg/L	1	Org-023	<1	[NT]	[NT]	[NT]	[NT]	88	[NT]
trans-1,3-dichloropropene	µg/L	1	Org-023	<1	[NT]	[NT]	[NT]	[NT]	[NT]	[NT]
cis-1,3-dichloropropene	µg/L	1	Org-023	<1	[NT]	[NT]	[NT]	[NT]	[NT]	[NT]
1,1,2-trichloroethane	µg/L	1	Org-023	<1	[NT]	[NT]	[NT]	[NT]	[NT]	[NT]
Toluene	µg/L	1	Org-023	<1	[NT]	[NT]	[NT]	[NT]	[NT]	[NT]
1,3-dichloropropane	µg/L	1	Org-023	<1	[NT]	[NT]	[NT]	[NT]	[NT]	[NT]
Dibromochloromethane	µg/L	1	Org-023	<1	[NT]	[NT]	[NT]	[NT]	105	[NT]
1,2-dibromoethane	µg/L	1	Org-023	<1	[NT]	[NT]	[NT]	[NT]	[NT]	[NT]
Tetrachloroethene	µg/L	1	Org-023	<1	[NT]	[NT]	[NT]	[NT]	110	[NT]
1,1,1,2-tetrachloroethane	µg/L	1	Org-023	<1	[NT]	[NT]	[NT]	[NT]	[NT]	[NT]
Chlorobenzene	µg/L	1	Org-023	<1	[NT]	[NT]	[NT]	[NT]	[NT]	[NT]
Ethylbenzene	µg/L	1	Org-023	<1	[NT]	[NT]	[NT]	[NT]	[NT]	[NT]
Bromoform	µg/L	1	Org-023	<1	[NT]	[NT]	[NT]	[NT]	[NT]	[NT]
m+p-xylene	µg/L	2	Org-023	<2	[NT]	[NT]	[NT]	[NT]	[NT]	[NT]
Styrene	µg/L	1	Org-023	<1	[NT]	[NT]	[NT]	[NT]	[NT]	[NT]
1,1,2,2-tetrachloroethane	µg/L	1	Org-023	<1	[NT]	[NT]	[NT]	[NT]	[NT]	[NT]

QUALITY CONTROL: VOCs in water					Duplicate			Spike Recovery %		
Test Description	Units	PQL	Method	Blank	#	Base	Dup.	RPD	LCS-W2	[NT]
o-xylene	µg/L	1	Org-023	<1	[NT]	[NT]	[NT]	[NT]	[NT]	[NT]
1,2,3-trichloropropane	µg/L	1	Org-023	<1	[NT]	[NT]	[NT]	[NT]	[NT]	[NT]
Isopropylbenzene	µg/L	1	Org-023	<1	[NT]	[NT]	[NT]	[NT]	[NT]	[NT]
Bromobenzene	µg/L	1	Org-023	<1	[NT]	[NT]	[NT]	[NT]	[NT]	[NT]
n-propyl benzene	µg/L	1	Org-023	<1	[NT]	[NT]	[NT]	[NT]	[NT]	[NT]
2-chlorotoluene	µg/L	1	Org-023	<1	[NT]	[NT]	[NT]	[NT]	[NT]	[NT]
4-chlorotoluene	µg/L	1	Org-023	<1	[NT]	[NT]	[NT]	[NT]	[NT]	[NT]
1,3,5-trimethyl benzene	µg/L	1	Org-023	<1	[NT]	[NT]	[NT]	[NT]	[NT]	[NT]
Tert-butyl benzene	µg/L	1	Org-023	<1	[NT]	[NT]	[NT]	[NT]	[NT]	[NT]
1,2,4-trimethyl benzene	µg/L	1	Org-023	<1	[NT]	[NT]	[NT]	[NT]	[NT]	[NT]
1,3-dichlorobenzene	µg/L	1	Org-023	<1	[NT]	[NT]	[NT]	[NT]	[NT]	[NT]
Sec-butyl benzene	µg/L	1	Org-023	<1	[NT]	[NT]	[NT]	[NT]	[NT]	[NT]
1,4-dichlorobenzene	µg/L	1	Org-023	<1	[NT]	[NT]	[NT]	[NT]	[NT]	[NT]
4-isopropyl toluene	µg/L	1	Org-023	<1	[NT]	[NT]	[NT]	[NT]	[NT]	[NT]
1,2-dichlorobenzene	µg/L	1	Org-023	<1	[NT]	[NT]	[NT]	[NT]	[NT]	[NT]
n-butyl benzene	µg/L	1	Org-023	<1	[NT]	[NT]	[NT]	[NT]	[NT]	[NT]
1,2-dibromo-3-chloropropane	µg/L	1	Org-023	<1	[NT]	[NT]	[NT]	[NT]	[NT]	[NT]
1,2,4-trichlorobenzene	µg/L	1	Org-023	<1	[NT]	[NT]	[NT]	[NT]	[NT]	[NT]
Hexachlorobutadiene	µg/L	1	Org-023	<1	[NT]	[NT]	[NT]	[NT]	[NT]	[NT]
1,2,3-trichlorobenzene	µg/L	1	Org-023	<1	[NT]	[NT]	[NT]	[NT]	[NT]	[NT]
Surrogate Dibromofluoromethane	%		Org-023	102	[NT]	[NT]	[NT]	[NT]	116	[NT]
Surrogate toluene-d8	%		Org-023	99	[NT]	[NT]	[NT]	[NT]	113	[NT]
Surrogate 4-BFB	%		Org-023	105	[NT]	[NT]	[NT]	[NT]	115	[NT]

QUALITY CONTROL: vTRH(C6-C10)/BTEXN in Water					Duplicate			Spike Recovery %		
Test Description	Units	PQL	Method	Blank	#	Base	Dup.	RPD	LCS-W2	[NT]
Date extracted	-			30/04/2020	[NT]	[NT]	[NT]	[NT]	30/04/2020	[NT]
Date analysed	-			30/04/2020	[NT]	[NT]	[NT]	[NT]	30/04/2020	[NT]
TRH C ₆ - C ₉	µg/L	10	Org-023	<10	[NT]	[NT]	[NT]	[NT]	94	[NT]
TRH C ₆ - C ₁₀	µg/L	10	Org-023	<10	[NT]	[NT]	[NT]	[NT]	94	[NT]
Benzene	µg/L	1	Org-023	<1	[NT]	[NT]	[NT]	[NT]	80	[NT]
Toluene	µg/L	1	Org-023	<1	[NT]	[NT]	[NT]	[NT]	83	[NT]
Ethylbenzene	µg/L	1	Org-023	<1	[NT]	[NT]	[NT]	[NT]	104	[NT]
m+p-xylene	µg/L	2	Org-023	<2	[NT]	[NT]	[NT]	[NT]	102	[NT]
o-xylene	µg/L	1	Org-023	<1	[NT]	[NT]	[NT]	[NT]	120	[NT]
Naphthalene	µg/L	1	Org-023	<1	[NT]	[NT]	[NT]	[NT]	[NT]	[NT]
Surrogate Dibromofluoromethane	%		Org-023	102	[NT]	[NT]	[NT]	[NT]	102	[NT]
Surrogate toluene-d8	%		Org-023	99	[NT]	[NT]	[NT]	[NT]	100	[NT]
Surrogate 4-BFB	%		Org-023	105	[NT]	[NT]	[NT]	[NT]	101	[NT]

QUALITY CONTROL: svTRH (C10-C40) in Water						Duplicate		Spike Recovery %		
Test Description	Units	PQL	Method	Blank	#	Base	Dup.	RPD	LCS-W1	[NT]
Date extracted	-			28/04/2020	[NT]	[NT]	[NT]	[NT]	28/04/2020	[NT]
Date analysed	-			28/04/2020	[NT]	[NT]	[NT]	[NT]	28/04/2020	[NT]
TRH C ₁₀ - C ₁₄	µg/L	50	Org-020	<50	[NT]	[NT]	[NT]	[NT]	78	[NT]
TRH C ₁₅ - C ₂₈	µg/L	100	Org-020	<100	[NT]	[NT]	[NT]	[NT]	85	[NT]
TRH C ₂₉ - C ₃₆	µg/L	100	Org-020	<100	[NT]	[NT]	[NT]	[NT]	85	[NT]
TRH >C ₁₀ - C ₁₆	µg/L	50	Org-020	<50	[NT]	[NT]	[NT]	[NT]	78	[NT]
TRH >C ₁₆ - C ₃₄	µg/L	100	Org-020	<100	[NT]	[NT]	[NT]	[NT]	85	[NT]
TRH >C ₃₄ - C ₄₀	µg/L	100	Org-020	<100	[NT]	[NT]	[NT]	[NT]	85	[NT]
Surrogate o-Terphenyl	%		Org-020	93	[NT]	[NT]	[NT]	[NT]	87	[NT]

QUALITY CONTROL: PAHs in Water - Low Level					Duplicate			Spike Recovery %		
Test Description	Units	PQL	Method	Blank	#	Base	Dup.	RPD	LCS-W1	[NT]
Date extracted	-			28/04/2020	[NT]	[NT]	[NT]	[NT]	28/04/2020	[NT]
Date analysed	-			28/04/2020	[NT]	[NT]	[NT]	[NT]	28/04/2020	[NT]
Naphthalene	µg/L	0.2	Org-022/025	<0.2	[NT]	[NT]	[NT]	[NT]	75	[NT]
Acenaphthylene	µg/L	0.1	Org-022/025	<0.1	[NT]	[NT]	[NT]	[NT]	[NT]	[NT]
Acenaphthene	µg/L	0.1	Org-022/025	<0.1	[NT]	[NT]	[NT]	[NT]	[NT]	[NT]
Fluorene	µg/L	0.1	Org-022/025	<0.1	[NT]	[NT]	[NT]	[NT]	76	[NT]
Phenanthrene	µg/L	0.1	Org-022/025	<0.1	[NT]	[NT]	[NT]	[NT]	80	[NT]
Anthracene	µg/L	0.1	Org-022/025	<0.1	[NT]	[NT]	[NT]	[NT]	[NT]	[NT]
Fluoranthene	µg/L	0.1	Org-022/025	<0.1	[NT]	[NT]	[NT]	[NT]	75	[NT]
Pyrene	µg/L	0.1	Org-022/025	<0.1	[NT]	[NT]	[NT]	[NT]	79	[NT]
Benzo(a)anthracene	µg/L	0.1	Org-022/025	<0.1	[NT]	[NT]	[NT]	[NT]	[NT]	[NT]
Chrysene	µg/L	0.1	Org-022/025	<0.1	[NT]	[NT]	[NT]	[NT]	111	[NT]
Benzo(b,j+k)fluoranthene	µg/L	0.2	Org-022/025	<0.2	[NT]	[NT]	[NT]	[NT]	[NT]	[NT]
Benzo(a)pyrene	µg/L	0.1	Org-022/025	<0.1	[NT]	[NT]	[NT]	[NT]	72	[NT]
Indeno(1,2,3-c,d)pyrene	µg/L	0.1	Org-022/025	<0.1	[NT]	[NT]	[NT]	[NT]	[NT]	[NT]
Dibenzo(a,h)anthracene	µg/L	0.1	Org-022/025	<0.1	[NT]	[NT]	[NT]	[NT]	[NT]	[NT]
Benzo(g,h,i)perylene	µg/L	0.1	Org-022/025	<0.1	[NT]	[NT]	[NT]	[NT]	[NT]	[NT]
Surrogate p-Terphenyl-d14	%		Org-022/025	103	[NT]	[NT]	[NT]	[NT]	109	[NT]

QUALITY CONTROL: PAHs in Water					Duplicate			Spike Recovery %		
Test Description	Units	PQL	Method	Blank	#	Base	Dup.	RPD	LCS-W2	[NT]
Date extracted	-			28/04/2020	[NT]	[NT]	[NT]	[NT]	28/04/2020	[NT]
Date analysed	-			28/04/2020	[NT]	[NT]	[NT]	[NT]	28/04/2020	[NT]
Naphthalene	µg/L	1	Org-022/025	<1	[NT]	[NT]	[NT]	[NT]	75	[NT]
Acenaphthylene	µg/L	1	Org-022/025	<1	[NT]	[NT]	[NT]	[NT]	[NT]	[NT]
Acenaphthene	µg/L	1	Org-022/025	<1	[NT]	[NT]	[NT]	[NT]	[NT]	[NT]
Fluorene	µg/L	1	Org-022/025	<1	[NT]	[NT]	[NT]	[NT]	76	[NT]
Phenanthrene	µg/L	1	Org-022/025	<1	[NT]	[NT]	[NT]	[NT]	80	[NT]
Anthracene	µg/L	1	Org-022/025	<1	[NT]	[NT]	[NT]	[NT]	[NT]	[NT]
Fluoranthene	µg/L	1	Org-022/025	<1	[NT]	[NT]	[NT]	[NT]	75	[NT]
Pyrene	µg/L	1	Org-022/025	<1	[NT]	[NT]	[NT]	[NT]	79	[NT]
Benzo(a)anthracene	µg/L	1	Org-022/025	<1	[NT]	[NT]	[NT]	[NT]	[NT]	[NT]
Chrysene	µg/L	1	Org-022/025	<1	[NT]	[NT]	[NT]	[NT]	111	[NT]
Benzo(b,j,k)fluoranthene	µg/L	2	Org-022/025	<2	[NT]	[NT]	[NT]	[NT]	[NT]	[NT]
Benzo(a)pyrene	µg/L	1	Org-022/025	<1	[NT]	[NT]	[NT]	[NT]	72	[NT]
Indeno(1,2,3-c,d)pyrene	µg/L	1	Org-022/025	<1	[NT]	[NT]	[NT]	[NT]	[NT]	[NT]
Dibenzo(a,h)anthracene	µg/L	1	Org-022/025	<1	[NT]	[NT]	[NT]	[NT]	[NT]	[NT]
Benzo(g,h,i)perylene	µg/L	1	Org-022/025	<1	[NT]	[NT]	[NT]	[NT]	[NT]	[NT]
Surrogate p-Terphenyl-d14	%		Org-022/025	113	[NT]	[NT]	[NT]	[NT]	95	[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	-			28/04/2020	[NT]	[NT]	[NT]	[NT]	28/04/2020	[NT]
Date analysed	-			28/04/2020	[NT]	[NT]	[NT]	[NT]	28/04/2020	[NT]
alpha-BHC	µg/L	0.001	Org-022/025	<0.001	[NT]	[NT]	[NT]	[NT]	98	[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]	97	[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]	64	[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]	67	[NT]
Heptachlor Epoxide	µg/L	0.001	Org-022/025	<0.001	[NT]	[NT]	[NT]	[NT]	109	[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]	103	[NT]
Dieldrin	µg/L	0.001	Org-022/025	<0.001	[NT]	[NT]	[NT]	[NT]	115	[NT]
Endrin	µg/L	0.001	Org-022/025	<0.001	[NT]	[NT]	[NT]	[NT]	100	[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]	99	[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]	102	[NT]
Methoxychlor	µg/L	0.001	Org-022/025	<0.001	[NT]	[NT]	[NT]	[NT]	[NT]	[NT]
Surrogate TCMX	%		Org-022/025	102	[NT]	[NT]	[NT]	[NT]	104	[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	-			28/04/2020	[NT]	[NT]	[NT]	[NT]	28/04/2020	[NT]
Date analysed	-			28/04/2020	[NT]	[NT]	[NT]	[NT]	28/04/2020	[NT]
Dichlorovos	µg/L	0.2	Org-022/025	<0.2	[NT]	[NT]	[NT]	[NT]	112	[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]
Chlorpyrifos-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]	116	[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]	111	[NT]
Chlorpyrifos	µg/L	0.009	Org-022/025	<0.009	[NT]	[NT]	[NT]	[NT]	118	[NT]
Parathion	µg/L	0.004	Org-022/025	<0.004	[NT]	[NT]	[NT]	[NT]	106	[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]	108	[NT]
Azinphos-methyl (Guthion)	µg/L	0.02	Org-022/025	<0.02	[NT]	[NT]	[NT]	[NT]	[NT]	[NT]
Surrogate TCMX	%		Org-022/025	101	[NT]	[NT]	[NT]	[NT]	103	[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	-			28/04/2020	[NT]	[NT]	[NT]	[NT]	28/04/2020	[NT]
Date analysed	-			28/04/2020	[NT]	[NT]	[NT]	[NT]	28/04/2020	[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]	99	[NT]
Aroclor 1260	µg/L	0.01	Org-021	<0.01	[NT]	[NT]	[NT]	[NT]	[NT]	[NT]
Surrogate TCMX	%		Org-021	114	[NT]	[NT]	[NT]	[NT]	106	[NT]

QUALITY CONTROL: HM in water - dissolved						Duplicate			Spike Recovery %	
Test Description	Units	PQL	Method	Blank	#	Base	Dup.	RPD	LCS-W1	241579-2
Date prepared	-			28/04/2020	1	28/04/2020	28/04/2020		28/04/2020	28/04/2020
Date analysed	-			28/04/2020	1	28/04/2020	28/04/2020		28/04/2020	28/04/2020
Arsenic-Dissolved	µg/L	1	Metals-022	<1	1	<1	<1	0	94	99
Cadmium-Dissolved	µg/L	0.1	Metals-022	<0.1	1	<0.1	<0.1	0	90	96
Chromium-Dissolved	µg/L	1	Metals-022	<1	1	<1	<1	0	107	107
Copper-Dissolved	µg/L	1	Metals-022	<1	1	3	2	40	107	102
Lead-Dissolved	µg/L	1	Metals-022	<1	1	<1	<1	0	100	95
Mercury-Dissolved	µg/L	0.05	Metals-021	<0.05	1	<0.05	<0.05	0	95	95
Nickel-Dissolved	µg/L	1	Metals-022	<1	1	6	5	18	97	94
Zinc-Dissolved	µg/L	1	Metals-022	<1	1	12	11	9	94	95

QUALITY CONTROL: Cations in water Dissolved						Duplicate		Spike Recovery %		
Test Description	Units	PQL	Method	Blank	#	Base	Dup.	RPD	LCS-W1	[NT]
Date digested	-			29/04/2020	[NT]	[NT]	[NT]	[NT]	29/04/2020	[NT]
Date analysed	-			29/04/2020	[NT]	[NT]	[NT]	[NT]	29/04/2020	[NT]
Calcium - Dissolved	mg/L	0.5	Metals-020	<0.5	[NT]	[NT]	[NT]	[NT]	90	[NT]
Magnesium - Dissolved	mg/L	0.5	Metals-020	<0.5	[NT]	[NT]	[NT]	[NT]	95	[NT]

QUALITY CONTROL: Miscellaneous Inorganics						Duplicate		Spike Recovery %		
Test Description	Units	PQL	Method	Blank	#	Base	Dup.	RPD	LCS-W1	[NT]
Date prepared	-			29/04/2020	[NT]	[NT]	[NT]	[NT]	29/04/2020	[NT]
Date analysed	-			29/04/2020	[NT]	[NT]	[NT]	[NT]	29/04/2020	[NT]
Total Cyanide	mg/L	0.004	Inorg-014	<0.004	[NT]	[NT]	[NT]	[NT]	102	[NT]

QUALITY CONTROL: Total Phenolics in Water					Duplicate			Spike Recovery %		
Test Description	Units	PQL	Method	Blank	#	Base	Dup.	RPD	LCS-W1	[NT]
Date extracted	-			29/04/2020	[NT]	[NT]	[NT]	[NT]	29/04/2020	[NT]
Date analysed	-			29/04/2020	[NT]	[NT]	[NT]	[NT]	29/04/2020	[NT]
Total Phenolics (as Phenol)	mg/L	0.05	Inorg-031	<0.05	[NT]	[NT]	[NT]	[NT]	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.

Rev4/October2016

CERTIFICATE OF ANALYSIS 243633

Client Details

Client	Douglas Partners Pty Ltd
Attention	Ayla Sorensen, Wen-Fei Yuan
Address	96 Hermitage Rd, West Ryde, NSW, 2114

Sample Details

Your Reference	<u>86767.03, Haymarket, SSI</u>
Number of Samples	8 Water
Date samples received	26/05/2020
Date completed instructions received	26/05/2020

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	02/06/2020
Date of Issue	01/06/2020
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Results Approved By

Diego Bigolin, Team Leader, Inorganics
 Dragana Tomas, Senior Chemist
 Hannah Nguyen, Senior Chemist
 Ken Nguyen, Reporting Supervisor

Authorised By



Nancy Zhang, Laboratory Manager

VOCs in water			
Our Reference		243633-1	243633-3
Your Reference	UNITS	BH107A	BH109B
Date Sampled		26/05/2020	26/05/2020
Type of sample		Water	Water
Date extracted	-	27/05/2020	27/05/2020
Date analysed	-	28/05/2020	28/05/2020
Dichlorodifluoromethane	µg/L	<10	<10
Chloromethane	µg/L	<10	<10
Vinyl Chloride	µg/L	<10	<10
Bromomethane	µg/L	<10	<10
Chloroethane	µg/L	<10	<10
Trichlorofluoromethane	µg/L	<10	<10
1,1-Dichloroethene	µg/L	<1	<1
Trans-1,2-dichloroethene	µg/L	<1	<1
1,1-dichloroethane	µg/L	<1	<1
Cis-1,2-dichloroethene	µg/L	<1	<1
Bromochloromethane	µg/L	<1	<1
Chloroform	µg/L	<1	3
2,2-dichloropropane	µg/L	<1	<1
1,2-dichloroethane	µg/L	<1	<1
1,1,1-trichloroethane	µg/L	<1	<1
1,1-dichloropropene	µg/L	<1	<1
Cyclohexane	µg/L	<1	<1
Carbon tetrachloride	µg/L	<1	<1
Benzene	µg/L	<1	<1
Dibromomethane	µg/L	<1	<1
1,2-dichloropropane	µg/L	<1	<1
Trichloroethene	µg/L	<1	<1
Bromodichloromethane	µg/L	<1	<1
trans-1,3-dichloropropene	µg/L	<1	<1
cis-1,3-dichloropropene	µg/L	<1	<1
1,1,2-trichloroethane	µg/L	<1	<1
Toluene	µg/L	<1	1
1,3-dichloropropane	µg/L	<1	<1
Dibromochloromethane	µg/L	<1	<1
1,2-dibromoethane	µg/L	<1	<1
Tetrachloroethene	µg/L	<1	<1
1,1,1,2-tetrachloroethane	µg/L	<1	<1
Chlorobenzene	µg/L	<1	<1
Ethylbenzene	µg/L	<1	<1

VOCs in water			
Our Reference		243633-1	243633-3
Your Reference	UNITS	BH107A	BH109B
Date Sampled		26/05/2020	26/05/2020
Type of sample		Water	Water
Bromoform	µg/L	<1	<1
m+p-xylene	µg/L	<2	<2
Styrene	µg/L	<1	<1
1,1,2,2-tetrachloroethane	µg/L	<1	<1
o-xylene	µg/L	<1	<1
1,2,3-trichloropropane	µg/L	<1	<1
Isopropylbenzene	µg/L	<1	<1
Bromobenzene	µg/L	<1	<1
n-propyl benzene	µg/L	<1	<1
2-chlorotoluene	µg/L	<1	<1
4-chlorotoluene	µg/L	<1	<1
1,3,5-trimethyl benzene	µg/L	<1	<1
Tert-butyl benzene	µg/L	<1	<1
1,2,4-trimethyl benzene	µg/L	<1	<1
1,3-dichlorobenzene	µg/L	<1	<1
Sec-butyl benzene	µg/L	<1	<1
1,4-dichlorobenzene	µg/L	<1	<1
4-isopropyl toluene	µg/L	<1	<1
1,2-dichlorobenzene	µg/L	<1	<1
n-butyl benzene	µg/L	<1	<1
1,2-dibromo-3-chloropropane	µg/L	<1	<1
1,2,4-trichlorobenzene	µg/L	<1	<1
Hexachlorobutadiene	µg/L	<1	<1
1,2,3-trichlorobenzene	µg/L	<1	<1
Surrogate Dibromofluoromethane	%	106	107
Surrogate toluene-d8	%	96	97
Surrogate 4-BFB	%	103	102

vTRH(C6-C10)/BTEXN in Water						
Our Reference		243633-1	243633-2	243633-3	243633-4	243633-5
Your Reference	UNITS	BH107A	BH107B	BH109B	BH112A	BH112B
Date Sampled		26/05/2020	26/05/2020	26/05/2020	26/05/2020	26/05/2020
Type of sample		Water	Water	Water	Water	Water
Date extracted	-	27/05/2020	27/05/2020	27/05/2020	27/05/2020	27/05/2020
Date analysed	-	28/05/2020	28/05/2020	28/05/2020	28/05/2020	28/05/2020
TRH C ₆ - C ₉	µg/L	<10	<10	<10	<10	<10
TRH C ₆ - C ₁₀	µg/L	<10	<10	<10	11	<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	2	<1
Surrogate Dibromofluoromethane	%	106	106	107	107	109
Surrogate toluene-d8	%	96	98	97	97	97
Surrogate 4-BFB	%	103	104	102	102	102

vTRH(C6-C10)/BTEXN in Water				
Our Reference		243633-6	243633-7	243633-8
Your Reference	UNITS	BD1/260520	TS	TB
Date Sampled		26/05/2020	26/05/2020	26/05/2020
Type of sample		Water	Water	Water
Date extracted	-	27/05/2020	27/05/2020	27/05/2020
Date analysed	-	28/05/2020	28/05/2020	28/05/2020
TRH C ₆ - C ₉	µg/L	<10	[NA]	<10
TRH C ₆ - C ₁₀	µg/L	<10	[NA]	<10
TRH C ₆ - C ₁₀ less BTEX (F1)	µg/L	<10	[NA]	<10
Benzene	µg/L	<1	116%	<1
Toluene	µg/L	<1	115%	<1
Ethylbenzene	µg/L	<1	105%	<1
m+p-xylene	µg/L	<2	105%	<2
o-xylene	µg/L	<1	108%	<1
Naphthalene	µg/L	<1	[NA]	1
Surrogate Dibromofluoromethane	%	110	108	106
Surrogate toluene-d8	%	96	100	97
Surrogate 4-BFB	%	102	104	100

svTRH (C10-C40) in Water

Our Reference		243633-1	243633-2	243633-3	243633-4	243633-5
Your Reference	UNITS	BH107A	BH107B	BH109B	BH112A	BH112B
Date Sampled		26/05/2020	26/05/2020	26/05/2020	26/05/2020	26/05/2020
Type of sample		Water	Water	Water	Water	Water
Date extracted	-	27/05/2020	27/05/2020	27/05/2020	27/05/2020	27/05/2020
Date analysed	-	28/05/2020	28/05/2020	28/05/2020	28/05/2020	28/05/2020
TRH C ₁₀ - C ₁₄	µg/L	110	210	<50	77	<50
TRH C ₁₅ - C ₂₈	µg/L	660	500	<100	170	<100
TRH C ₂₉ - C ₃₆	µg/L	<100	<100	<100	<100	<100
TRH >C ₁₀ - C ₁₆	µg/L	110	210	<50	110	<50
TRH >C ₁₀ - C ₁₆ less Naphthalene (F2)	µg/L	110	210	<50	110	<50
TRH >C ₁₆ - C ₃₄	µg/L	650	500	<100	140	<100
TRH >C ₃₄ - C ₄₀	µg/L	<100	<100	<100	<100	<100
Surrogate o-Terphenyl	%	96	108	94	104	103

svTRH (C10-C40) in Water

Our Reference		243633-6
Your Reference	UNITS	BD1/260520
Date Sampled		26/05/2020
Type of sample		Water
Date extracted	-	27/05/2020
Date analysed	-	28/05/2020
TRH C ₁₀ - C ₁₄	µg/L	<50
TRH C ₁₅ - C ₂₈	µg/L	<100
TRH C ₂₉ - C ₃₆	µg/L	<100
TRH >C ₁₀ - C ₁₆	µg/L	<50
TRH >C ₁₀ - C ₁₆ less Naphthalene (F2)	µg/L	<50
TRH >C ₁₆ - C ₃₄	µg/L	<100
TRH >C ₃₄ - C ₄₀	µg/L	<100
Surrogate o-Terphenyl	%	102

PAHs in Water - Low Level						
Our Reference		243633-1	243633-2	243633-3	243633-4	243633-5
Your Reference	UNITS	BH107A	BH107B	BH109B	BH112A	BH112B
Date Sampled		26/05/2020	26/05/2020	26/05/2020	26/05/2020	26/05/2020
Type of sample		Water	Water	Water	Water	Water
Date extracted	-	27/05/2020	27/05/2020	27/05/2020	27/05/2020	27/05/2020
Date analysed	-	28/05/2020	28/05/2020	28/05/2020	28/05/2020	28/05/2020
Naphthalene	µg/L	<0.2	<0.2	<0.2	<0.2	<0.2
Acenaphthylene	µg/L	<0.1	<0.1	<0.1	0.1	<0.1
Acenaphthene	µg/L	<0.1	<0.1	<0.1	0.7	<0.1
Fluorene	µg/L	<0.1	<0.1	<0.1	0.7	<0.1
Phenanthrene	µg/L	<0.1	<0.1	<0.1	0.3	0.2
Anthracene	µg/L	<0.1	<0.1	<0.1	0.3	<0.1
Fluoranthene	µg/L	<0.1	<0.1	<0.1	0.7	<0.1
Pyrene	µg/L	<0.1	<0.1	<0.1	0.6	<0.1
Benzo(a)anthracene	µg/L	<0.1	<0.1	<0.1	<0.1	<0.1
Chrysene	µg/L	<0.1	<0.1	<0.1	<0.1	<0.1
Benzo(b,j+k)fluoranthene	µg/L	<0.2	<0.2	<0.2	<0.2	<0.2
Benzo(a)pyrene	µg/L	<0.1	<0.1	<0.1	<0.1	<0.1
Indeno(1,2,3-c,d)pyrene	µg/L	<0.1	<0.1	<0.1	<0.1	<0.1
Dibenzo(a,h)anthracene	µg/L	<0.1	<0.1	<0.1	<0.1	<0.1
Benzo(g,h,i)perylene	µg/L	<0.1	<0.1	<0.1	<0.1	<0.1
Benzo(a)pyrene TEQ	µg/L	<0.5	<0.5	<0.5	<0.5	<0.5
Total +ve PAH's	µg/L	<0.1	<0.1	<0.1	3.5	0.17
Surrogate <i>p</i> -Terphenyl-d14	%	83	75	76	88	90

PAHs in Water - Low Level		
Our Reference		243633-6
Your Reference	UNITS	BD1/260520
Date Sampled		26/05/2020
Type of sample		Water
Date extracted	-	Date extracted
Date analysed	-	Date analysed
Naphthalene	µg/L	<0.2
Acenaphthylene	µg/L	<0.1
Acenaphthene	µg/L	<0.1
Fluorene	µg/L	<0.1
Phenanthrene	µg/L	0.2
Anthracene	µg/L	<0.1
Fluoranthene	µg/L	<0.1
Pyrene	µg/L	<0.1
Benzo(a)anthracene	µg/L	<0.1
Chrysene	µg/L	<0.1
Benzo(b,j+k)fluoranthene	µg/L	<0.2
Benzo(a)pyrene	µg/L	<0.1
Indeno(1,2,3-c,d)pyrene	µg/L	<0.1
Dibenzo(a,h)anthracene	µg/L	<0.1
Benzo(g,h,i)perylene	µg/L	<0.1
Benzo(a)pyrene TEQ	µg/L	<0.5
Total +ve PAH's	µg/L	0.18
Surrogate <i>p</i> -Terphenyl-d14	%	78

OCPs in Water - Trace Level						
Our Reference		243633-1	243633-2	243633-3	243633-4	243633-5
Your Reference	UNITS	BH107A	BH107B	BH109B	BH112A	BH112B
Date Sampled		26/05/2020	26/05/2020	26/05/2020	26/05/2020	26/05/2020
Type of sample		Water	Water	Water	Water	Water
Date extracted	-	27/05/2020	27/05/2020	27/05/2020	27/05/2020	27/05/2020
Date analysed	-	28/05/2020	28/05/2020	28/05/2020	28/05/2020	28/05/2020
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	<0.001	<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	%	74	72	73	77	82

OP in water Trace ANZECCF/ADWG						
Our Reference		243633-1	243633-2	243633-3	243633-4	243633-5
Your Reference	UNITS	BH107A	BH107B	BH109B	BH112A	BH112B
Date Sampled		26/05/2020	26/05/2020	26/05/2020	26/05/2020	26/05/2020
Type of sample		Water	Water	Water	Water	Water
Date extracted	-	27/05/2020	27/05/2020	27/05/2020	27/05/2020	27/05/2020
Date analysed	-	28/05/2020	28/05/2020	28/05/2020	28/05/2020	28/05/2020
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
Chlorpyrifos-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
Chlorpyrifos	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	%	74	72	73	77	82

PCBs in Water - Trace Level						
Our Reference		243633-1	243633-2	243633-3	243633-4	243633-5
Your Reference	UNITS	BH107A	BH107B	BH109B	BH112A	BH112B
Date Sampled		26/05/2020	26/05/2020	26/05/2020	26/05/2020	26/05/2020
Type of sample		Water	Water	Water	Water	Water
Date extracted	-	27/05/2020	27/05/2020	27/05/2020	27/05/2020	27/05/2020
Date analysed	-	28/05/2020	28/05/2020	28/05/2020	28/05/2020	28/05/2020
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	%	74	72	73	77	82

Total Phenolics in Water						
Our Reference		243633-1	243633-2	243633-3	243633-4	243633-5
Your Reference	UNITS	BH107A	BH107B	BH109B	BH112A	BH112B
Date Sampled		26/05/2020	26/05/2020	26/05/2020	26/05/2020	26/05/2020
Type of sample		Water	Water	Water	Water	Water
Date extracted	-	27/05/2020	27/05/2020	27/05/2020	27/05/2020	27/05/2020
Date analysed	-	27/05/2020	27/05/2020	27/05/2020	27/05/2020	27/05/2020
Total Phenolics (as Phenol)	mg/L	<0.05	<0.05	<0.05	<0.05	<0.05

HM in water - dissolved						
Our Reference		243633-1	243633-2	243633-3	243633-4	243633-5
Your Reference	UNITS	BH107A	BH107B	BH109B	BH112A	BH112B
Date Sampled		26/05/2020	26/05/2020	26/05/2020	26/05/2020	26/05/2020
Type of sample		Water	Water	Water	Water	Water
Date prepared	-	27/05/2020	27/05/2020	27/05/2020	27/05/2020	27/05/2020
Date analysed	-	27/05/2020	27/05/2020	27/05/2020	27/05/2020	27/05/2020
Arsenic-Dissolved	µg/L	<1	<1	6	<1	<1
Cadmium-Dissolved	µg/L	<0.1	<0.1	<0.1	<0.1	<0.1
Chromium-Dissolved	µg/L	<1	<1	<1	3	<1
Copper-Dissolved	µg/L	<1	<1	1	<1	1
Lead-Dissolved	µg/L	<1	<1	<1	<1	<1
Mercury-Dissolved	µg/L	<0.05	<0.05	<0.05	<0.05	<0.05
Nickel-Dissolved	µg/L	5	6	12	<1	7
Zinc-Dissolved	µg/L	140	64	11	4	21

HM in water - dissolved		
Our Reference		243633-6
Your Reference	UNITS	BD1/260520
Date Sampled		26/05/2020
Type of sample		Water
Date prepared	-	27/05/2020
Date analysed	-	27/05/2020
Arsenic-Dissolved	µg/L	<1
Cadmium-Dissolved	µg/L	<0.1
Chromium-Dissolved	µg/L	<1
Copper-Dissolved	µg/L	<1
Lead-Dissolved	µg/L	<1
Mercury-Dissolved	µg/L	<0.05
Nickel-Dissolved	µg/L	7
Zinc-Dissolved	µg/L	20

Miscellaneous Inorganics			
Our Reference		243633-1	243633-3
Your Reference	UNITS	BH107A	BH109B
Date Sampled		26/05/2020	26/05/2020
Type of sample		Water	Water
Date prepared	-	27/05/2020	27/05/2020
Date analysed	-	27/05/2020	27/05/2020
Total Cyanide	mg/L	<0.004	<0.004

Cations in water Dissolved						
Our Reference		243633-1	243633-2	243633-3	243633-4	243633-5
Your Reference	UNITS	BH107A	BH107B	BH109B	BH112A	BH112B
Date Sampled		26/05/2020	26/05/2020	26/05/2020	26/05/2020	26/05/2020
Type of sample		Water	Water	Water	Water	Water
Date digested	-	27/05/2020	27/05/2020	27/05/2020	27/05/2020	27/05/2020
Date analysed	-	27/05/2020	27/05/2020	27/05/2020	27/05/2020	27/05/2020
Calcium - Dissolved	mg/L	48	47	40	23	10
Magnesium - Dissolved	mg/L	14	12	34	3.4	11
Hardness	mgCaCO ₃ /L	180	170	240	71	71

Method ID	Methodology Summary
Inorg-014	<p>Cyanide - free, total, weak acid dissociable by segmented flow analyser (in line dialysis with colourimetric finish).</p> <p>Solids/Filters and sorbents are extracted in a caustic media prior to analysis. Impingers are pH adjusted as required prior to analysis.</p> <p>Cyanides amenable to Chlorination - samples are analysed untreated and treated with hyperchlorite to assess the potential for chlorination of cyanide forms. Based on APHA latest edition, 4500-CN_G,H.</p>
Inorg-031	<p>Total Phenolics by segmented flow analyser (in line distillation with colourimetric finish).</p> <p>Solids are extracted in a caustic media prior to analysis.</p>
Metals-020	Determination of various metals by ICP-AES.
Metals-021	Determination of Mercury by Cold Vapour AAS.
Metals-022	Determination of various metals by ICP-MS.
Org-020	<p>Soil samples are extracted with Dichloromethane/Acetone and waters with Dichloromethane and analysed by GC-FID.</p> <p>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.</p>
Org-021	Soil samples are extracted with dichloromethane/acetone and waters with dichloromethane and analysed by GC-ECD.
Org-022/025	Soil samples are extracted with Dichloromethane/Acetone and waters with Dichloromethane and analysed by GC-MS/GC-MSMS.
Org-022/025	Soil samples are extracted with Dichloromethane/Acetone and waters with Dichloromethane and analysed by GC-MS/GC-MSMS. Benzo(a)pyrene TEQ as per NEPM B1 Guideline on Investigation Levels for Soil and Groundwater - 2013.
Org-023	Water samples are analysed directly by purge and trap GC-MS.
Org-023	Soil samples are extracted with methanol and spiked into water prior to analysing by purge and trap GC-MS. Water samples are analysed directly by purge and trap GC-MS. F1 = (C6-C10)-BTEX as per NEPM B1 Guideline on Investigation Levels for Soil and Groundwater.

QUALITY CONTROL: VOCs in water					Duplicate			Spike Recovery %		
Test Description	Units	PQL	Method	Blank	#	Base	Dup.	RPD	LCS-W1	[NT]
Date extracted	-			27/05/2020	[NT]	[NT]	[NT]	[NT]	27/05/2020	[NT]
Date analysed	-			28/05/2020	[NT]	[NT]	[NT]	[NT]	28/05/2020	[NT]
Dichlorodifluoromethane	µg/L	10	Org-023	<10	[NT]	[NT]	[NT]	[NT]	[NT]	[NT]
Chloromethane	µg/L	10	Org-023	<10	[NT]	[NT]	[NT]	[NT]	[NT]	[NT]
Vinyl Chloride	µg/L	10	Org-023	<10	[NT]	[NT]	[NT]	[NT]	[NT]	[NT]
Bromomethane	µg/L	10	Org-023	<10	[NT]	[NT]	[NT]	[NT]	[NT]	[NT]
Chloroethane	µg/L	10	Org-023	<10	[NT]	[NT]	[NT]	[NT]	[NT]	[NT]
Trichlorofluoromethane	µg/L	10	Org-023	<10	[NT]	[NT]	[NT]	[NT]	[NT]	[NT]
1,1-Dichloroethene	µg/L	1	Org-023	<1	[NT]	[NT]	[NT]	[NT]	[NT]	[NT]
Trans-1,2-dichloroethene	µg/L	1	Org-023	<1	[NT]	[NT]	[NT]	[NT]	[NT]	[NT]
1,1-dichloroethane	µg/L	1	Org-023	<1	[NT]	[NT]	[NT]	[NT]	94	[NT]
Cis-1,2-dichloroethene	µg/L	1	Org-023	<1	[NT]	[NT]	[NT]	[NT]	[NT]	[NT]
Bromochloromethane	µg/L	1	Org-023	<1	[NT]	[NT]	[NT]	[NT]	[NT]	[NT]
Chloroform	µg/L	1	Org-023	<1	[NT]	[NT]	[NT]	[NT]	98	[NT]
2,2-dichloropropane	µg/L	1	Org-023	<1	[NT]	[NT]	[NT]	[NT]	[NT]	[NT]
1,2-dichloroethane	µg/L	1	Org-023	<1	[NT]	[NT]	[NT]	[NT]	100	[NT]
1,1,1-trichloroethane	µg/L	1	Org-023	<1	[NT]	[NT]	[NT]	[NT]	94	[NT]
1,1-dichloropropene	µg/L	1	Org-023	<1	[NT]	[NT]	[NT]	[NT]	[NT]	[NT]
Cyclohexane	µg/L	1	Org-023	<1	[NT]	[NT]	[NT]	[NT]	[NT]	[NT]
Carbon tetrachloride	µg/L	1	Org-023	<1	[NT]	[NT]	[NT]	[NT]	[NT]	[NT]
Benzene	µg/L	1	Org-023	<1	[NT]	[NT]	[NT]	[NT]	[NT]	[NT]
Dibromomethane	µg/L	1	Org-023	<1	[NT]	[NT]	[NT]	[NT]	[NT]	[NT]
1,2-dichloropropane	µg/L	1	Org-023	<1	[NT]	[NT]	[NT]	[NT]	[NT]	[NT]
Trichloroethene	µg/L	1	Org-023	<1	[NT]	[NT]	[NT]	[NT]	98	[NT]
Bromodichloromethane	µg/L	1	Org-023	<1	[NT]	[NT]	[NT]	[NT]	85	[NT]
trans-1,3-dichloropropene	µg/L	1	Org-023	<1	[NT]	[NT]	[NT]	[NT]	[NT]	[NT]
cis-1,3-dichloropropene	µg/L	1	Org-023	<1	[NT]	[NT]	[NT]	[NT]	[NT]	[NT]
1,1,2-trichloroethane	µg/L	1	Org-023	<1	[NT]	[NT]	[NT]	[NT]	[NT]	[NT]
Toluene	µg/L	1	Org-023	<1	[NT]	[NT]	[NT]	[NT]	[NT]	[NT]
1,3-dichloropropane	µg/L	1	Org-023	<1	[NT]	[NT]	[NT]	[NT]	[NT]	[NT]
Dibromochloromethane	µg/L	1	Org-023	<1	[NT]	[NT]	[NT]	[NT]	87	[NT]
1,2-dibromoethane	µg/L	1	Org-023	<1	[NT]	[NT]	[NT]	[NT]	[NT]	[NT]
Tetrachloroethene	µg/L	1	Org-023	<1	[NT]	[NT]	[NT]	[NT]	100	[NT]
1,1,1,2-tetrachloroethane	µg/L	1	Org-023	<1	[NT]	[NT]	[NT]	[NT]	[NT]	[NT]
Chlorobenzene	µg/L	1	Org-023	<1	[NT]	[NT]	[NT]	[NT]	[NT]	[NT]
Ethylbenzene	µg/L	1	Org-023	<1	[NT]	[NT]	[NT]	[NT]	[NT]	[NT]
Bromoform	µg/L	1	Org-023	<1	[NT]	[NT]	[NT]	[NT]	[NT]	[NT]
m+p-xylene	µg/L	2	Org-023	<2	[NT]	[NT]	[NT]	[NT]	[NT]	[NT]
Styrene	µg/L	1	Org-023	<1	[NT]	[NT]	[NT]	[NT]	[NT]	[NT]
1,1,2,2-tetrachloroethane	µg/L	1	Org-023	<1	[NT]	[NT]	[NT]	[NT]	[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	[NT]	[NT]	[NT]	[NT]	[NT]	[NT]
1,2,3-trichloropropane	µg/L	1	Org-023	<1	[NT]	[NT]	[NT]	[NT]	[NT]	[NT]
Isopropylbenzene	µg/L	1	Org-023	<1	[NT]	[NT]	[NT]	[NT]	[NT]	[NT]
Bromobenzene	µg/L	1	Org-023	<1	[NT]	[NT]	[NT]	[NT]	[NT]	[NT]
n-propyl benzene	µg/L	1	Org-023	<1	[NT]	[NT]	[NT]	[NT]	[NT]	[NT]
2-chlorotoluene	µg/L	1	Org-023	<1	[NT]	[NT]	[NT]	[NT]	[NT]	[NT]
4-chlorotoluene	µg/L	1	Org-023	<1	[NT]	[NT]	[NT]	[NT]	[NT]	[NT]
1,3,5-trimethyl benzene	µg/L	1	Org-023	<1	[NT]	[NT]	[NT]	[NT]	[NT]	[NT]
Tert-butyl benzene	µg/L	1	Org-023	<1	[NT]	[NT]	[NT]	[NT]	[NT]	[NT]
1,2,4-trimethyl benzene	µg/L	1	Org-023	<1	[NT]	[NT]	[NT]	[NT]	[NT]	[NT]
1,3-dichlorobenzene	µg/L	1	Org-023	<1	[NT]	[NT]	[NT]	[NT]	[NT]	[NT]
Sec-butyl benzene	µg/L	1	Org-023	<1	[NT]	[NT]	[NT]	[NT]	[NT]	[NT]
1,4-dichlorobenzene	µg/L	1	Org-023	<1	[NT]	[NT]	[NT]	[NT]	[NT]	[NT]
4-isopropyl toluene	µg/L	1	Org-023	<1	[NT]	[NT]	[NT]	[NT]	[NT]	[NT]
1,2-dichlorobenzene	µg/L	1	Org-023	<1	[NT]	[NT]	[NT]	[NT]	[NT]	[NT]
n-butyl benzene	µg/L	1	Org-023	<1	[NT]	[NT]	[NT]	[NT]	[NT]	[NT]
1,2-dibromo-3-chloropropane	µg/L	1	Org-023	<1	[NT]	[NT]	[NT]	[NT]	[NT]	[NT]
1,2,4-trichlorobenzene	µg/L	1	Org-023	<1	[NT]	[NT]	[NT]	[NT]	[NT]	[NT]
Hexachlorobutadiene	µg/L	1	Org-023	<1	[NT]	[NT]	[NT]	[NT]	[NT]	[NT]
1,2,3-trichlorobenzene	µg/L	1	Org-023	<1	[NT]	[NT]	[NT]	[NT]	[NT]	[NT]
Surrogate Dibromofluoromethane	%		Org-023	103	[NT]	[NT]	[NT]	[NT]	95	[NT]
Surrogate toluene-d8	%		Org-023	98	[NT]	[NT]	[NT]	[NT]	99	[NT]
Surrogate 4-BFB	%		Org-023	103	[NT]	[NT]	[NT]	[NT]	101	[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	-			27/05/2020	4	27/05/2020	28/05/2020		27/05/2020	[NT]
Date analysed	-			28/05/2020	4	28/05/2020	29/05/2020		28/05/2020	[NT]
TRH C ₆ - C ₉	µg/L	10	Org-023	<10	4	<10	<10	0	99	[NT]
TRH C ₆ - C ₁₀	µg/L	10	Org-023	<10	4	11	<10	10	99	[NT]
Benzene	µg/L	1	Org-023	<1	4	<1	<1	0	98	[NT]
Toluene	µg/L	1	Org-023	<1	4	<1	<1	0	101	[NT]
Ethylbenzene	µg/L	1	Org-023	<1	4	1	1	0	96	[NT]
m+p-xylene	µg/L	2	Org-023	<2	4	<2	<2	0	100	[NT]
o-xylene	µg/L	1	Org-023	<1	4	1	1	0	96	[NT]
Naphthalene	µg/L	1	Org-023	<1	4	2	2	0	[NT]	[NT]
Surrogate Dibromofluoromethane	%		Org-023	103	4	107	109	2	95	[NT]
Surrogate toluene-d8	%		Org-023	98	4	97	100	3	99	[NT]
Surrogate 4-BFB	%		Org-023	103	4	102	99	3	101	[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	-			27/05/2020	[NT]	[NT]	[NT]	[NT]	27/05/2020	[NT]
Date analysed	-			28/05/2020	[NT]	[NT]	[NT]	[NT]	28/05/2020	[NT]
TRH C ₁₀ - C ₁₄	µg/L	50	Org-020	<50	[NT]	[NT]	[NT]	[NT]	94	[NT]
TRH C ₁₅ - C ₂₈	µg/L	100	Org-020	<100	[NT]	[NT]	[NT]	[NT]	85	[NT]
TRH C ₂₉ - C ₃₆	µg/L	100	Org-020	<100	[NT]	[NT]	[NT]	[NT]	82	[NT]
TRH >C ₁₀ - C ₁₆	µg/L	50	Org-020	<50	[NT]	[NT]	[NT]	[NT]	94	[NT]
TRH >C ₁₆ - C ₃₄	µg/L	100	Org-020	<100	[NT]	[NT]	[NT]	[NT]	85	[NT]
TRH >C ₃₄ - C ₄₀	µg/L	100	Org-020	<100	[NT]	[NT]	[NT]	[NT]	82	[NT]
Surrogate o-Terphenyl	%		Org-020	98	[NT]	[NT]	[NT]	[NT]	91	[NT]

QUALITY CONTROL: PAHs in Water - Low Level					Duplicate			Spike Recovery %		
Test Description	Units	PQL	Method	Blank	#	Base	Dup.	RPD	LCS-W5	[NT]
Date extracted	-			27/05/2020	[NT]	[NT]	[NT]	[NT]	27/05/2020	[NT]
Date analysed	-			28/05/2020	[NT]	[NT]	[NT]	[NT]	28/05/2020	[NT]
Naphthalene	µg/L	0.2	Org-022/025	<0.2	[NT]	[NT]	[NT]	[NT]	96	[NT]
Acenaphthylene	µg/L	0.1	Org-022/025	<0.1	[NT]	[NT]	[NT]	[NT]	[NT]	[NT]
Acenaphthene	µg/L	0.1	Org-022/025	<0.1	[NT]	[NT]	[NT]	[NT]	[NT]	[NT]
Fluorene	µg/L	0.1	Org-022/025	<0.1	[NT]	[NT]	[NT]	[NT]	74	[NT]
Phenanthrene	µg/L	0.1	Org-022/025	<0.1	[NT]	[NT]	[NT]	[NT]	82	[NT]
Anthracene	µg/L	0.1	Org-022/025	<0.1	[NT]	[NT]	[NT]	[NT]	[NT]	[NT]
Fluoranthene	µg/L	0.1	Org-022/025	<0.1	[NT]	[NT]	[NT]	[NT]	98	[NT]
Pyrene	µg/L	0.1	Org-022/025	<0.1	[NT]	[NT]	[NT]	[NT]	104	[NT]
Benzo(a)anthracene	µg/L	0.1	Org-022/025	<0.1	[NT]	[NT]	[NT]	[NT]	[NT]	[NT]
Chrysene	µg/L	0.1	Org-022/025	<0.1	[NT]	[NT]	[NT]	[NT]	72	[NT]
Benzo(b,j+k)fluoranthene	µg/L	0.2	Org-022/025	<0.2	[NT]	[NT]	[NT]	[NT]	[NT]	[NT]
Benzo(a)pyrene	µg/L	0.1	Org-022/025	<0.1	[NT]	[NT]	[NT]	[NT]	118	[NT]
Indeno(1,2,3-c,d)pyrene	µg/L	0.1	Org-022/025	<0.1	[NT]	[NT]	[NT]	[NT]	[NT]	[NT]
Dibenzo(a,h)anthracene	µg/L	0.1	Org-022/025	<0.1	[NT]	[NT]	[NT]	[NT]	[NT]	[NT]
Benzo(g,h,i)perylene	µg/L	0.1	Org-022/025	<0.1	[NT]	[NT]	[NT]	[NT]	[NT]	[NT]
Surrogate p-Terphenyl-d14	%		Org-022/025	97	[NT]	[NT]	[NT]	[NT]	104	[NT]

QUALITY CONTROL: OCPs in Water - Trace Level					Duplicate			Spike Recovery %		
Test Description	Units	PQL	Method	Blank	#	Base	Dup.	RPD	LCS-W5	[NT]
Date extracted	-			27/05/2020	[NT]	[NT]	[NT]	[NT]	27/05/2020	[NT]
Date analysed	-			28/05/2020	[NT]	[NT]	[NT]	[NT]	28/05/2020	[NT]
alpha-BHC	µg/L	0.001	Org-022/025	<0.001	[NT]	[NT]	[NT]	[NT]	90	[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]	100	[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]	82	[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]	74	[NT]
Heptachlor Epoxide	µg/L	0.001	Org-022/025	<0.001	[NT]	[NT]	[NT]	[NT]	128	[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]	106	[NT]
Dieldrin	µg/L	0.001	Org-022/025	<0.001	[NT]	[NT]	[NT]	[NT]	90	[NT]
Endrin	µg/L	0.001	Org-022/025	<0.001	[NT]	[NT]	[NT]	[NT]	88	[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]	108	[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]	96	[NT]
Methoxychlor	µg/L	0.001	Org-022/025	<0.001	[NT]	[NT]	[NT]	[NT]	[NT]	[NT]
Surrogate TCMX	%		Org-022/025	89	[NT]	[NT]	[NT]	[NT]	108	[NT]

QUALITY CONTROL: OP in water Trace ANZECCF/ADWG					Duplicate			Spike Recovery %		
Test Description	Units	PQL	Method	Blank	#	Base	Dup.	RPD	LCS-W5	[NT]
Date extracted	-			27/05/2020	[NT]	[NT]	[NT]	[NT]	27/05/2020	[NT]
Date analysed	-			28/05/2020	[NT]	[NT]	[NT]	[NT]	28/05/2020	[NT]
Dichlorovos	µg/L	0.2	Org-022/025	<0.2	[NT]	[NT]	[NT]	[NT]	126	[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]
Chlorpyrifos-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]	108	[NT]
Fenitrothion	µg/L	0.2	Org-022/025	<0.2	[NT]	[NT]	[NT]	[NT]	126	[NT]
Malathion	µg/L	0.05	Org-022/025	<0.05	[NT]	[NT]	[NT]	[NT]	96	[NT]
Chlorpyrifos	µg/L	0.009	Org-022/025	<0.009	[NT]	[NT]	[NT]	[NT]	122	[NT]
Parathion	µg/L	0.004	Org-022/025	<0.004	[NT]	[NT]	[NT]	[NT]	120	[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]	122	[NT]
Azinphos-methyl (Guthion)	µg/L	0.02	Org-022/025	<0.02	[NT]	[NT]	[NT]	[NT]	[NT]	[NT]
Surrogate TCMX	%		Org-022/025	89	[NT]	[NT]	[NT]	[NT]	108	[NT]

QUALITY CONTROL: PCBs in Water - Trace Level					Duplicate			Spike Recovery %		
Test Description	Units	PQL	Method	Blank	#	Base	Dup.	RPD	LCS-W5	[NT]
Date extracted	-			27/05/2020	[NT]	[NT]	[NT]	[NT]	27/05/2020	[NT]
Date analysed	-			28/05/2020	[NT]	[NT]	[NT]	[NT]	28/05/2020	[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]	89	[NT]
Aroclor 1260	µg/L	0.01	Org-021	<0.01	[NT]	[NT]	[NT]	[NT]	[NT]	[NT]
Surrogate TCMX	%		Org-021	89	[NT]	[NT]	[NT]	[NT]	108	[NT]

QUALITY CONTROL: Total Phenolics in Water					Duplicate			Spike Recovery %		
Test Description	Units	PQL	Method	Blank	#	Base	Dup.	RPD	LCS-W1	243633-2
Date extracted	-			27/05/2020	1	27/05/2020	27/05/2020		27/05/2020	27/05/2020
Date analysed	-			27/05/2020	1	27/05/2020	27/05/2020		27/05/2020	27/05/2020
Total Phenolics (as Phenol)	mg/L	0.05	Inorg-031	<0.05	1	<0.05	<0.05	0	101	99

QUALITY CONTROL: HM in water - dissolved					Duplicate			Spike Recovery %		
Test Description	Units	PQL	Method	Blank	#	Base	Dup.	RPD	LCS-W1	[NT]
Date prepared	-			27/05/2020	1	27/05/2020	27/05/2020		27/05/2020	[NT]
Date analysed	-			27/05/2020	1	27/05/2020	27/05/2020		27/05/2020	[NT]
Arsenic-Dissolved	µg/L	1	Metals-022	<1	1	<1	<1	0	94	[NT]
Cadmium-Dissolved	µg/L	0.1	Metals-022	<0.1	1	<0.1	<0.1	0	94	[NT]
Chromium-Dissolved	µg/L	1	Metals-022	<1	1	<1	<1	0	106	[NT]
Copper-Dissolved	µg/L	1	Metals-022	<1	1	<1	<1	0	105	[NT]
Lead-Dissolved	µg/L	1	Metals-022	<1	1	<1	<1	0	101	[NT]
Mercury-Dissolved	µg/L	0.05	Metals-021	<0.05	1	<0.05	<0.05	0	101	[NT]
Nickel-Dissolved	µg/L	1	Metals-022	<1	1	5	5	0	96	[NT]
Zinc-Dissolved	µg/L	1	Metals-022	<1	1	140	140	0	98	[NT]

QUALITY CONTROL: Miscellaneous Inorganics						Duplicate		Spike Recovery %		
Test Description	Units	PQL	Method	Blank	#	Base	Dup.	RPD	LCS-W1	[NT]
Date prepared	-			27/05/2020	[NT]	[NT]	[NT]	[NT]	27/05/2020	[NT]
Date analysed	-			27/05/2020	[NT]	[NT]	[NT]	[NT]	27/05/2020	[NT]
Total Cyanide	mg/L	0.004	Inorg-014	<0.004	[NT]	[NT]	[NT]	[NT]	101	[NT]

QUALITY CONTROL: Cations in water Dissolved					Duplicate			Spike Recovery %		
Test Description	Units	PQL	Method	Blank	#	Base	Dup.	RPD	LCS-W1	[NT]
Date digested	-			27/05/2020	1	27/05/2020	27/05/2020		27/05/2020	[NT]
Date analysed	-			27/05/2020	1	27/05/2020	27/05/2020		27/05/2020	[NT]
Calcium - Dissolved	mg/L	0.5	Metals-020	<0.5	1	48	47	2	100	[NT]
Magnesium - Dissolved	mg/L	0.5	Metals-020	<0.5	1	14	14	0	99	[NT]
Hardness	mgCaCO ₃ /L	3		<3	1	180	180	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.

Project No: 86767.03			Suburb: Haymarket			To: Envirolab Services		
Project Name: Haymarket, SSI			Order Number					
Project Manager WFY			Sampler: WFY			Attn: Aileen Hie		
Emails: wunfei.yuan@douglaspartners.com.au and ayla.sorensen@douglaspartners.com.au			Phone:					
Date Required: Same day <input type="checkbox"/> 24 hours <input type="checkbox"/> 48 hours <input type="checkbox"/> 72 hours <input type="checkbox"/> Standard <input type="checkbox"/>			Email:					
Prior Storage: <input type="checkbox"/> Esky <input type="checkbox"/> Fridge/Freezer <input type="checkbox"/> Shelved			Do samples contain 'potential' HBM? Yes <input type="checkbox"/> No <input type="checkbox"/> (If YES, then handle, transport and store in accordance with FPM HAZID)					

Sample ID	Lab ID	Date Sampled	Sample Type	Container Type	Analytes							Notes	
			S - soil W - water	G - glass P - plastic	Combo3	Hardness	Cyanide	VOC	TRH/BTE X				
BH107A	1	26/05/20	W	G/P	X		X	X	X				* Low level PAH
BH107B	2	26/05/20	W	G/P	X		X						*Trace level for OCP/OPP
BH109B	3	26/05/20	W	G/P	X		X	X	X				
BH112A	4	26/05/20	W	G/P	X		X						
BH112B	5	26/05/20	W	G/P	X		X						
BD1/260520	6	26/05/20	W	G/P		X							
TS	7	-	W	G						BTEX			
TB	8	-	W	G						TRH/BTEX			
PQL (S) mg/kg										ANZECC PQLs req'd for all water analytes <input type="checkbox"/>			
PQL = practical quantitation limit. If none given, default to Laboratory Method Detection Limit										Lab Report/Reference No:			
Metals to Analyse: 8HM unless specified here:													
Total number of samples in container:			Relinquished by: WFY			Transported to laboratory by: dropped off							
Send Results to: Douglas Partners Pty Ltd			Address: 96 Hermitage Road, West Ryde			Phone: 9809 0999							
Signed: [Signature]			Received by: [Signature]			Date & Time: 26/5/20							

Envirolab Services
12 Ashley St
Chatswood NSW 2057
Ph: (02) 9310 6200

Job No: 243633

Date Received: 26/5/20

Time Received: 14:20

Received By: [Signature]

Temp: Cool/Ambient

Cooling: Ice/Icepack

Security: Intact/Broken/None

SAMPLE RECEIPT ADVICE

Client Details

Client	Douglas Partners Pty Ltd
Attention	Ayla Sorensen, Wen-Fei Yuan

Sample Login Details

Your reference	86767.03, Haymarket, SSI
Envirolab Reference	243633
Date Sample Received	26/05/2020
Date Instructions Received	26/05/2020
Date Results Expected to be Reported	02/06/2020

Sample Condition

Samples received in appropriate condition for analysis	Yes
No. of Samples Provided	8 Water
Turnaround Time Requested	Standard
Temperature on Receipt (°C)	11.2
Cooling Method	Ice Pack
Sampling Date Provided	YES

Comments

#6 labelled as "BD1/20200526"

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	PAHs in Water - Low Level	OCPs in Water - Trace Level	OP in water Trace ANZECC/ADWG	PCBs in Water - Trace Level	Total Phenolics in Water	HM in water - dissolved	Total Cyanide	Cations in water Dissolved
BH107A	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
BH107B		✓	✓	✓	✓	✓	✓	✓	✓		✓
BH109B	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
BH112A		✓	✓	✓	✓	✓	✓	✓	✓		✓
BH112B		✓	✓	✓	✓	✓	✓	✓	✓		✓
BD1/260520		✓	✓	✓					✓		
TS		✓									
TB		✓									

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

Additional Info

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

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

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

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

CERTIFICATE OF ANALYSIS 243218-A

Client Details

Client	Douglas Partners Pty Ltd
Attention	Wen-Fei Yuan
Address	96 Hermitage Rd, West Ryde, NSW, 2114

Sample Details

Your Reference	<u>86767.03, Haymarket</u>
Number of Samples	15 SOIL
Date samples received	18/05/2020
Date completed instructions received	29/06/2020

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	05/06/2020
Date of Issue	05/06/2020
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

Josh Williams, Senior Chemist

Authorised By



Nancy Zhang, Laboratory Manager

PAHs in TCLP (USEPA 1311)						
Our Reference		243218-A-2	243218-A-4	243218-A-6	243218-A-8	243218-A-13
Your Reference	UNITS	BD1/20200516	BH108	BH112B	BH117	BH112B
Depth		-	0.23-0.25	0.6-0.7	0.2-0.25	1.2-1.4
Date Sampled		16/05/2020	17/05/2020	18/05/2020	17/05/2020	13/05/2020
Type of sample		SOIL	SOIL	SOIL	SOIL	SOIL
pH of soil for fluid# determ.	pH units	9.6	7.9	7.4	8.6	7.3
pH of soil TCLP (after HCl)	pH units	1.8	1.7	1.7	1.7	1.7
Extraction fluid used	-	1	1	1	1	1
pH of final Leachate	pH units	5.3	5.0	5.1	5.0	5.0
Date extracted	-	02/06/2020	02/06/2020	02/06/2020	02/06/2020	02/06/2020
Date analysed	-	02/06/2020	02/06/2020	02/06/2020	02/06/2020	02/06/2020
Naphthalene in TCLP	mg/L	<0.001	<0.001	0.010	0.067	<0.001
Acenaphthylene in TCLP	mg/L	<0.001	<0.001	<0.001	0.016	<0.001
Acenaphthene in TCLP	mg/L	<0.001	<0.001	<0.001	0.009	<0.001
Fluorene in TCLP	mg/L	<0.001	<0.001	<0.001	0.007	<0.001
Phenanthrene in TCLP	mg/L	<0.001	<0.001	0.010	0.021	0.010
Anthracene in TCLP	mg/L	<0.001	<0.001	<0.001	0.002	<0.001
Fluoranthene in TCLP	mg/L	<0.001	<0.001	<0.001	0.003	<0.001
Pyrene in TCLP	mg/L	<0.001	<0.001	<0.001	0.002	<0.001
Benzo(a)anthracene in TCLP	mg/L	<0.001	<0.001	<0.001	<0.001	<0.001
Chrysene in TCLP	mg/L	<0.001	<0.001	<0.001	<0.001	<0.001
Benzo(bjk)fluoranthene in TCLP	mg/L	<0.002	<0.002	<0.002	<0.002	<0.002
Benzo(a)pyrene in TCLP	mg/L	<0.001	<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	<0.001
Dibenzo(a,h)anthracene in TCLP	mg/L	<0.001	<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	<0.001
Total +ve PAH's	mg/L	NIL (+)VE	NIL (+)VE	0.020	0.13	0.010
Surrogate p-Terphenyl-d14	%	80	72	71	76	72

Method ID	Methodology Summary
EXTRACT.7	Toxicity Characteristic Leaching Procedure (TCLP) using Zero Headspace Extraction (zHE) using AS4439 and USEPA 1311.
Inorg-001	pH - Measured using pH meter and electrode in accordance with APHA latest edition, 4500-H+. Please note that the results for water analyses are indicative only, as analysis outside of the APHA storage times.
Inorg-004	Toxicity Characteristic Leaching Procedure (TCLP) using in house method INORG-004. Please note that the mass used may be scaled down from the default based on sample mass available.
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	-			02/06/2020	[NT]	[NT]	[NT]	[NT]	02/06/2020	[NT]
Date analysed	-			02/06/2020	[NT]	[NT]	[NT]	[NT]	02/06/2020	[NT]
Naphthalene in TCLP	mg/L	0.001	Org-022/025	<0.001	[NT]	[NT]	[NT]	[NT]	114	[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]	[NT]	[NT]
Fluorene in TCLP	mg/L	0.001	Org-022/025	<0.001	[NT]	[NT]	[NT]	[NT]	96	[NT]
Phenanthrene in TCLP	mg/L	0.001	Org-022/025	<0.001	[NT]	[NT]	[NT]	[NT]	94	[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]	100	[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]	78	[NT]
Benzo(b)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	86	[NT]	[NT]	[NT]	[NT]	81	[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	

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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.

Andrew (Fitzy) Fitzsimons

From: Andrew (Fitzy) Fitzsimons
Sent: Monday, 1 June 2020 12:55 PM
To: Andrew (Fitzy) Fitzsimons
Subject: FW: Results for Registration 243218 86767.03, Haymarket

243218-A
Due: 5/6/20
fitz

Kind Regards,

Andrew (Fitzy) Fitzsimons | Customer Service | Envirolab Services Pty Ltd

Celebrating 15 years of Great Science. Great Service.

12 Ashley Street Chatswood NSW 2067

T 612 9910 6200 F 612 9910 6201

E afitzsimons@envirolab.com.au | W www.envirolab.com.au

[View reduced sampling bottle provision for PFAS in water](#) | [COVID-19 Update](#)

Please note that all samples submitted to the Envirolab Group laboratories will be analysed under the Envirolab Group Terms and Conditions. The Terms and Conditions are accessible by clicking this link

From: Wen-Fei Yuan <WenFei.Yuan@douglaspartners.com.au>
Sent: Friday, 29 May 2020 4:34 PM
To: Ken Nguyen <KNguyen@envirolab.com.au>
Cc: Alyssa Spencer <Alyssa.Spencer@douglaspartners.com.au>
Subject: RE: Results for Registration 243218 86767.03, Haymarket

Hi Ken,

Please conduct TCLP on the following samples for PAH:

BD1/20200516; - 2
BH108/0.23-0.25; - 4
BH112B/0.6-0.7; - 6
BH117/0.2-0.25; and - 8
BH112B/1.2-1.4. - 13

Standard TAT.

Regards

Wen-Fei Yuan | 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 8878 0693 | M: 0448 280 782 | E: WenFei.Yuan@douglaspartners.com.au



CLIENT CHOICE
2020 WINNER

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

Jessica Hie

From: Nick Sarlamis
Sent: Friday, 29 May 2020 4:40 PM
To: Wen-Fei Yuan
Cc: Alyssa Spencer; Joshua Williams; Jessica Hie
Subject: RE: Results for Registration 243428 86767.03/Haymarket,DSI

Hi Wen

No worries, Have a good weekend

Kind Regards,

Nick Sarlamis | Inorganics Supervisor | Envirolab Services Pty Ltd

Celebrating 15 years of Great Science. Great Service.

12 Ashley Street Chatswood NSW 2067

T 612 9910 6200 F 612 9910 6201

E nsarlamis@envirolab.com.au | W www.envirolab.com.au

[View reduced sampling bottle provision for PFAS in water | COVID-19 Update](#)

Please note that all samples submitted to the Envirolab Group laboratories will be analysed under the Envirolab Group Terms and Conditions. The Terms and Conditions are accessible by clicking this link

From: Wen-Fei Yuan <WenFei.Yuan@douglaspartners.com.au>
Sent: Friday, 29 May 2020 4:21 PM
To: Nick Sarlamis <NSarlamis@envirolab.com.au>
Cc: Alyssa Spencer <Alyssa.Spencer@douglaspartners.com.au>
Subject: RE: Results for Registration 243428 86767.03/Haymarket,DSI

Hi Nick,

Please perform TCLP on:

- BH111/1.3-1.4 – PAH and lead; and -2
- BH110/0.5-0.6 – PAH -3

Regards

Wen-Fei Yuan | 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 8878 0693 | M: 0448 280 782 | E: WenFei.Yuan@douglaspartners.com.au



CLIENT CHO
2020 WINNER

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

CERTIFICATE OF ANALYSIS 243428-A

Client Details

Client	Douglas Partners Pty Ltd
Attention	Alyssa Spencer, Wen-Fei Yuan
Address	96 Hermitage Rd, West Ryde, NSW, 2114

Sample Details

Your Reference	<u>86767.03/Haymarket,DSI</u>
Number of Samples	4 Soil
Date samples received	19/05/2020
Date completed instructions received	29/05/2020

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	05/06/2020
Date of Issue	05/06/2020
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

Jaimie Loa-Kum-Cheung, Metals Supervisor
Josh Williams, Senior Chemist

Authorised By



Nancy Zhang, Laboratory Manager

Metals in TCLP USEPA1311			
Our Reference		243428-A-2	243428-A-3
Your Reference	UNITS	BH111	BH110
Depth		1.3-1.4	0.5-0.6
Date Sampled		19/05/2020	21/05/2020
Type of sample		Soil	Soil
Date extracted	-	05/06/2020	05/06/2020
Date analysed	-	05/06/2020	05/06/2020
pH of soil for fluid# determ.	pH units	7.5	9.7
pH of soil TCLP (after HCl)	pH units	1.7	1.9
Extraction fluid used	-	1	1
pH of final Leachate	pH units	5.0	5.3
Lead in TCLP	mg/L	0.09	[NA]

PAHs in TCLP (USEPA 1311)			
Our Reference		243428-A-2	243428-A-3
Your Reference	UNITS	BH111	BH110
Depth		1.3-1.4	0.5-0.6
Date Sampled		19/05/2020	21/05/2020
Type of sample		Soil	Soil
Date extracted	-	01/06/2020	01/06/2020
Date analysed	-	01/06/2020	01/06/2020
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(b)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	0.001
Surrogate <i>p</i> -Terphenyl-d14	%	75	71

Method ID	Methodology Summary
EXTRACT.7	Toxicity Characteristic Leaching Procedure (TCLP) using Zero Headspace Extraction (zHE) using AS4439 and USEPA 1311.
Inorg-001	pH - Measured using pH meter and electrode in accordance with APHA latest edition, 4500-H+. Please note that the results for water analyses are indicative only, as analysis outside of the APHA storage times.
Inorg-004	Toxicity Characteristic Leaching Procedure (TCLP) using in house method INORG-004. Please note that the mass used may be scaled down from the default based on sample mass available.
Metals-020 ICP-AES	Determination of various metals by ICP-AES.
Org-022/025	Leachates are extracted with Dichloromethane and analysed by GC-MS/GC-MSMS.

QUALITY CONTROL: Metals in TCLP USEPA1311						Duplicate		Spike Recovery %		
Test Description	Units	PQL	Method	Blank	#	Base	Dup.	RPD	LCS-W1	[NT]
Date extracted	-		Metals-020 ICP-AES	05/06/2020	[NT]	[NT]	[NT]	[NT]	05/06/2020	[NT]
Date analysed	-			05/06/2020	[NT]	[NT]	[NT]	[NT]	05/06/2020	[NT]
Lead in TCLP	mg/L	0.03		<0.03	[NT]	[NT]	[NT]	[NT]	86	[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	-			01/06/2020	[NT]	[NT]	[NT]	[NT]	01/06/2020	[NT]
Date analysed	-			01/06/2020	[NT]	[NT]	[NT]	[NT]	01/06/2020	[NT]
Naphthalene in TCLP	mg/L	0.001	Org-022/025	<0.001	[NT]	[NT]	[NT]	[NT]	87	[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]	[NT]	[NT]
Fluorene in TCLP	mg/L	0.001	Org-022/025	<0.001	[NT]	[NT]	[NT]	[NT]	87	[NT]
Phenanthrene in TCLP	mg/L	0.001	Org-022/025	<0.001	[NT]	[NT]	[NT]	[NT]	78	[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]	74	[NT]
Pyrene in TCLP	mg/L	0.001	Org-022/025	<0.001	[NT]	[NT]	[NT]	[NT]	84	[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]	71	[NT]
Benzo(b)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]	88	[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	85	[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.

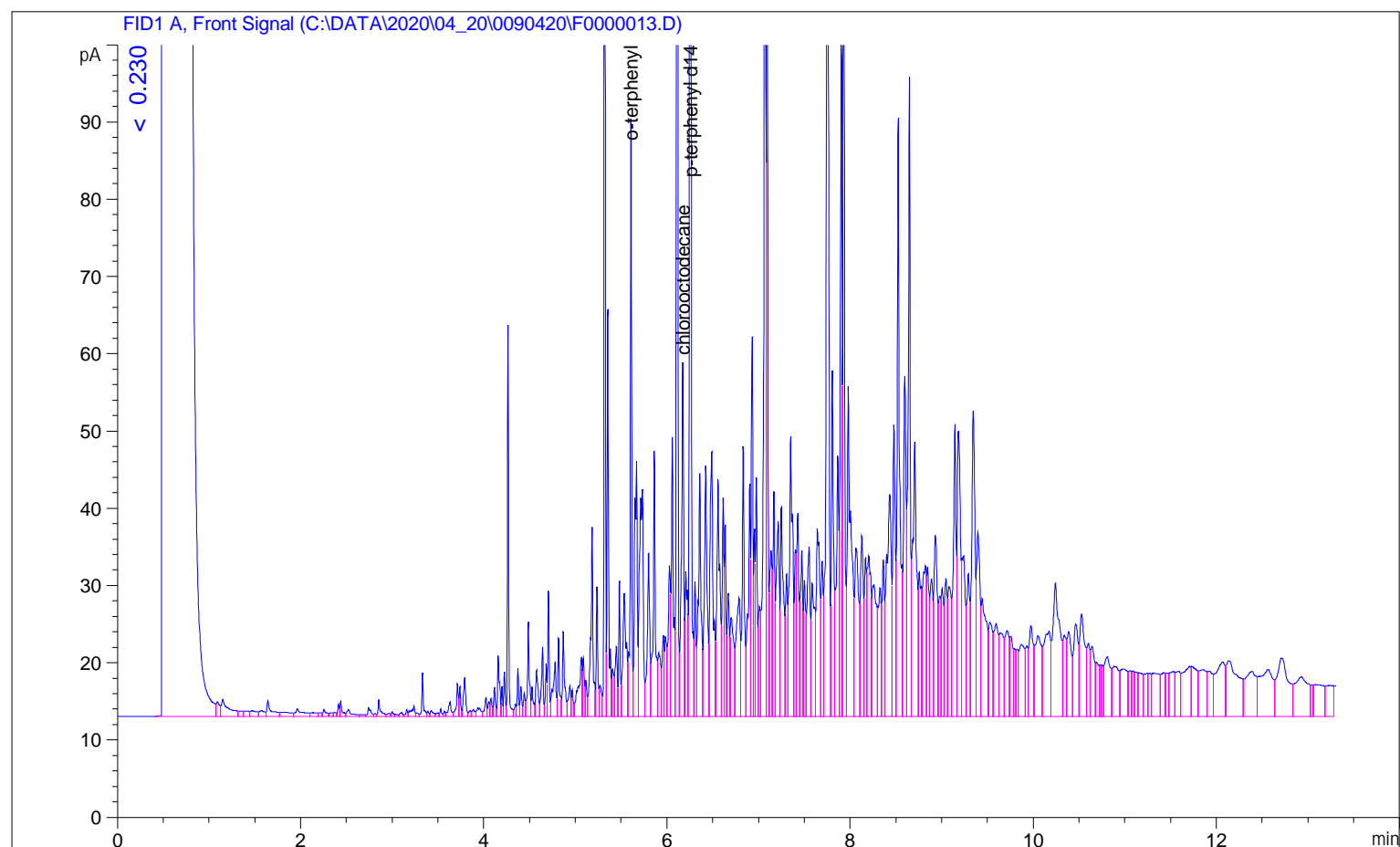
Appendix H

Chromatograms

Sample Name: s240556-1

=====

Acq. Operator	:		Seq. Line	:	13
Acq. Instrument	:	GC#4	Location	:	Vial 13
Injection Date	:	09/04/2020 9:20:56 PM	Inj	:	1
			Inj Volume	:	1 µl
Acq. Method	:	C:\CHEM32\1\METHODS\NEPM JF.M			
Last changed	:	16/01/2020 11:55:46 AM			
Analysis Method	:	C:\METHODS\2020\04_20\090420-F-PROCESSING-.M			
Last changed	:	14/04/2020 8:56:26 AM			
		(modified after loading)			
Method Info	:	FAST TPH WITH 15M HP5 COLUMNS			



=====

External Standard Report

=====

Sorted By : Signal
Calib. Data Modified : 14/04/2020 8:38:12 AM
Multiplier: : 1.0000
Dilution: : 1.0000
Do not use Multiplier & Dilution Factor with ISTDs

Signal 1: FID1 A, Front Signal

RetTime [min]	Type	Area [pA*s]	Amt/Area	Amount [mg/L]	Grp	Name
5.608	VV	89.85716	1.56180e-1	14.03390		o-terphenyl
6.174	VV	75.93970	1.80796e-1	13.72961		chl orooctadecane
6.256	VV	283.04919	6.30277e-2	17.83994		p-terphenyl d14

Sample Name: s240556-1

RetTime [min]	Type	Area [pA*s]	Amt/Area	Amount [mg/L]	Grp	Name
----- ----- ----- ----- ----- ----- -----						
Totals :				45.60345		

1 Warnings or Errors :

Warning : Calibration warnings (see calibration table listing)

```
=====
                        Summed Peaks Report
=====
```

Signal 1: FID1 A, Front Signal

Name	Start Time [min]	End Time [min]	Total Area [pA*s]	Amount [mg/L]
----- ----- ----- ----- -----				
TRH C10-C14	2.040	4.105	87.47794	13.5076
NEPM >C10-C16	2.551	4.770	236.85195	36.5728
TRH C15-C28	4.106	7.840	3371.38792	452.9965
NEPM >C16-C34	4.771	8.951	4910.49732	659.7990
TRH C29-C36	7.841	9.310	2117.13193	284.6865
NEPM >C34-C40	8.952	10.360	1177.91111	158.3914

Totals :	1605.9538
----------	-----------

```
=====
                        Final Summed Peaks Report
=====
```

Signal 1: FID1 A, Front Signal

Name	Total Area [pA*s]	Amount [mg/L]
----- ----- -----		
TRH C10-C14	87.47794	13.5076
NEPM >C10-C16	236.85195	36.5728
TRH C15-C28	3371.38792	452.9965
NEPM >C16-C34	4910.49732	659.7990
TRH C29-C36	2117.13193	284.6865
NEPM >C34-C40	1177.91111	158.3914
o-terphenyl	89.85716	14.0339
chlorooctodecan	75.93970	13.7296
p-terphenyl d14	283.04919	17.8399

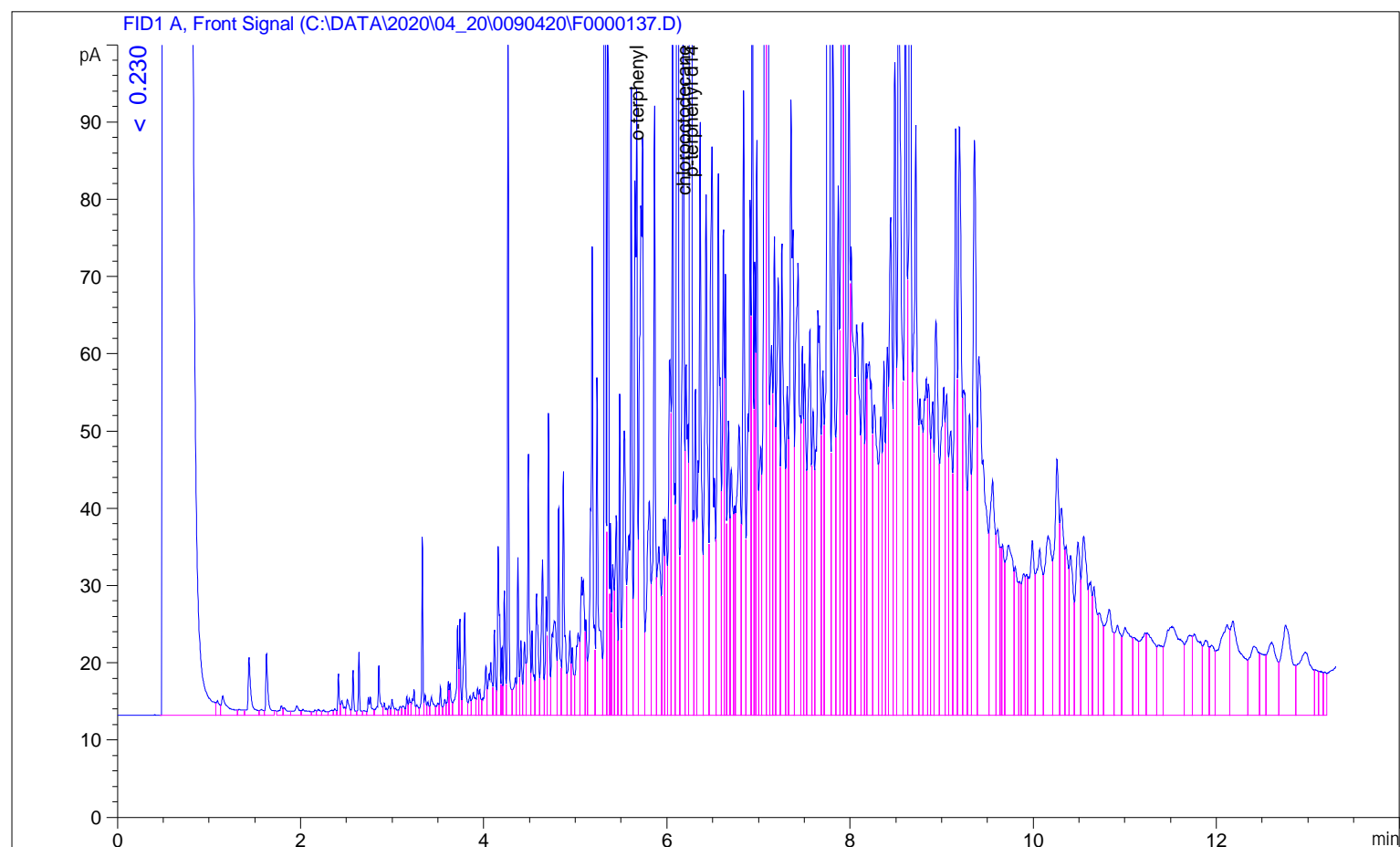
Totals :	1651.5572
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*** End of Report ***

Sample Name: s240556-2 rr

```
=====
Acq. Operator   :                               Seq. Line : 137
Acq. Instrument : GC#4                         Location  : Vial 62
Injection Date  : 14/04/2020 5:31:35 PM        Inj       : 1
                                                Inj Volume: 1 µl

Acq. Method     : C:\CHEM32\1\METHODS\NEPM JF.M
Last changed    : 16/01/2020 11:55:46 AM
Analysis Method : C:\METHODS\2020\04_20\090420-F-PROCESSING-.M
Last changed    : 15/04/2020 8:19:46 AM
                  (modified after loading)
Method Info     : FAST TPH WITH 15M HP5 COLUMNS
=====
```



```
=====
External Standard Report
=====
```

```
Sorted By      : Signal
Calib. Data Modified : 14/04/2020 8:38:12 AM
Multiplier:    : 1.0000
Dilution:      : 1.0000
Do not use Multiplier & Dilution Factor with ISTDs
```

Signal 1: FID1 A, Front Signal

RetTime [min]	Type	Area [pA*s]	Amt/Area	Amount [mg/L]	Grp	Name
5.669	VV	158.86197	1.56180e-1	24.81107		o-terphenyl
6.178	VV	159.43396	1.80796e-1	28.82506		chl oroctododecane
6.262	VV	618.70367	6.30277e-2	38.99546		p-terphenyl d14

Sample Name: s240556-2 rr

RetTime [min]	Type	Area [pA*s]	Amt/Area	Amount [mg/L]	Grp	Name
----- ----- ----- ----- ----- ----- -----						
Totals :				92.63160		

1 Warnings or Errors :

Warning : Calibration warnings (see calibration table listing)

```
=====
                        Summed Peaks Report
=====
```

Signal 1: FID1 A, Front Signal

Name	Start Time [min]	End Time [min]	Total Area [pA*s]	Amount [mg/L]
----- ----- ----- ----- -----				
TRH C10-C14	2.040	4.105	245.72722	37.9432
NEPM >C10-C16	2.551	4.770	640.55721	98.9097
TRH C15-C28	4.106	7.840	7863.15939	1.057e3
NEPM >C16-C34	4.771	8.951	1.11825e4	1.503e3
TRH C29-C36	7.841	9.310	4660.53757	626.6932
NEPM >C34-C40	8.952	10.360	2466.63420	331.6834

Totals :	3654.3016
----------	-----------

```
=====
                        Final Summed Peaks Report
=====
```

Signal 1: FID1 A, Front Signal

Name	Total Area [pA*s]	Amount [mg/L]
----- ----- -----		
TRH C10-C14	245.72722	37.9432
NEPM >C10-C16	640.55721	98.9097
TRH C15-C28	7863.15939	1.057e3
NEPM >C16-C34	1.11825e4	1.503e3
TRH C29-C36	4660.53757	626.6932
NEPM >C34-C40	2466.63420	331.6834
o-terphenyl	158.86197	24.8111
chlorooctodecan	159.43396	28.8251
p-terphenyl d14	618.70367	38.9955

Totals :	3746.9332
----------	-----------

*** End of Report ***

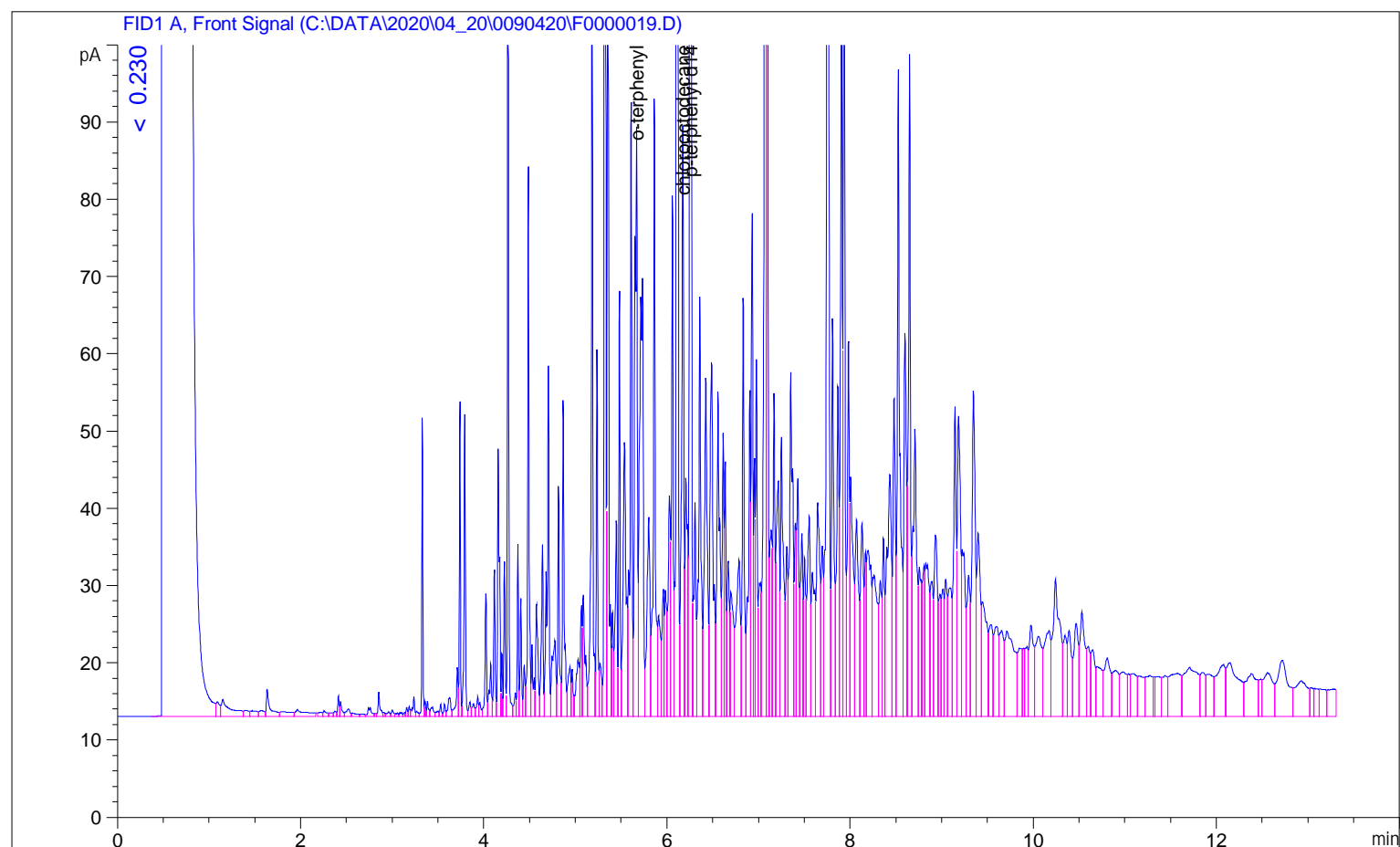
Sample Name: s240556-7

```

=====
Acq. Operator   :                               Seq. Line :   19
Acq. Instrument : GC#4                         Location  : Vial 19
Injection Date  : 09/04/2020 11:11:30 PM        Inj       :    1
                                                Inj Volume: 1 µl

Acq. Method     : C:\CHEM32\1\METHODS\NEPM JF.M
Last changed    : 16/01/2020 11:55:46 AM
Analysis Method : C:\METHODS\2020\04_20\090420-F-PROCESSING-.M
Last changed    : 14/04/2020 8:57:45 AM
                  (modified after loading)
Method Info     : FAST TPH WITH 15M HP5 COLUMNS
=====

```



```

=====
External Standard Report
=====

```

```

Sorted By      : Signal
Calib. Data Modified : 14/04/2020 8:38:12 AM
Multiplier:    : 1.0000
Dilution:      : 1.0000
Do not use Multiplier & Dilution Factor with ISTDs

```

Signal 1: FID1 A, Front Signal

RetTime [min]	Type	Area [pA*s]	Amt/Area	Amount [mg/L]	Grp	Name
5.668	VV	142.11632	1.56180e-1	22.19574		o-terphenyl
6.175	VV	119.25624	1.80796e-1	21.56108		chl oroctodecane
6.259	VV	471.47327	6.30277e-2	29.71587		p-terphenyl d14

Sample Name: s240556-7

RetTime [min]	Type	Area [pA*s]	Amt/Area	Amount [mg/L]	Grp	Name
----- ----- ----- ----- ----- ----- -----						
Totals :				73.47269		

1 Warnings or Errors :

Warning : Calibration warnings (see calibration table listing)

```

=====
                        Summed Peaks Report
=====

```

Signal 1: FID1 A, Front Signal

Name	Start Time [min]	End Time [min]	Total Area [pA*s]	Amount [mg/L]
----- ----- ----- ----- -----				
TRH C10-C14	2.040	4.105	215.49837	33.2755
NEPM >C10-C16	2.551	4.770	686.22606	105.9615
TRH C15-C28	4.106	7.840	5550.54606	745.7991
NEPM >C16-C34	4.771	8.951	6913.22482	928.8955
TRH C29-C36	7.841	9.310	2272.69348	305.6045
NEPM >C34-C40	8.952	10.360	1188.29961	159.7883

Totals :	2279.3245
----------	-----------

```

=====
                        Final Summed Peaks Report
=====

```

Signal 1: FID1 A, Front Signal

Name	Total Area [pA*s]	Amount [mg/L]
----- ----- -----		
TRH C10-C14	215.49837	33.2755
NEPM >C10-C16	686.22606	105.9615
TRH C15-C28	5550.54606	745.7991
NEPM >C16-C34	6913.22482	928.8955
TRH C29-C36	2272.69348	305.6045
NEPM >C34-C40	1188.29961	159.7883
o-terphenyl	142.11632	22.1957
chlorooctodecan	119.25624	21.5611
p-terphenyl d14	471.47327	29.7159

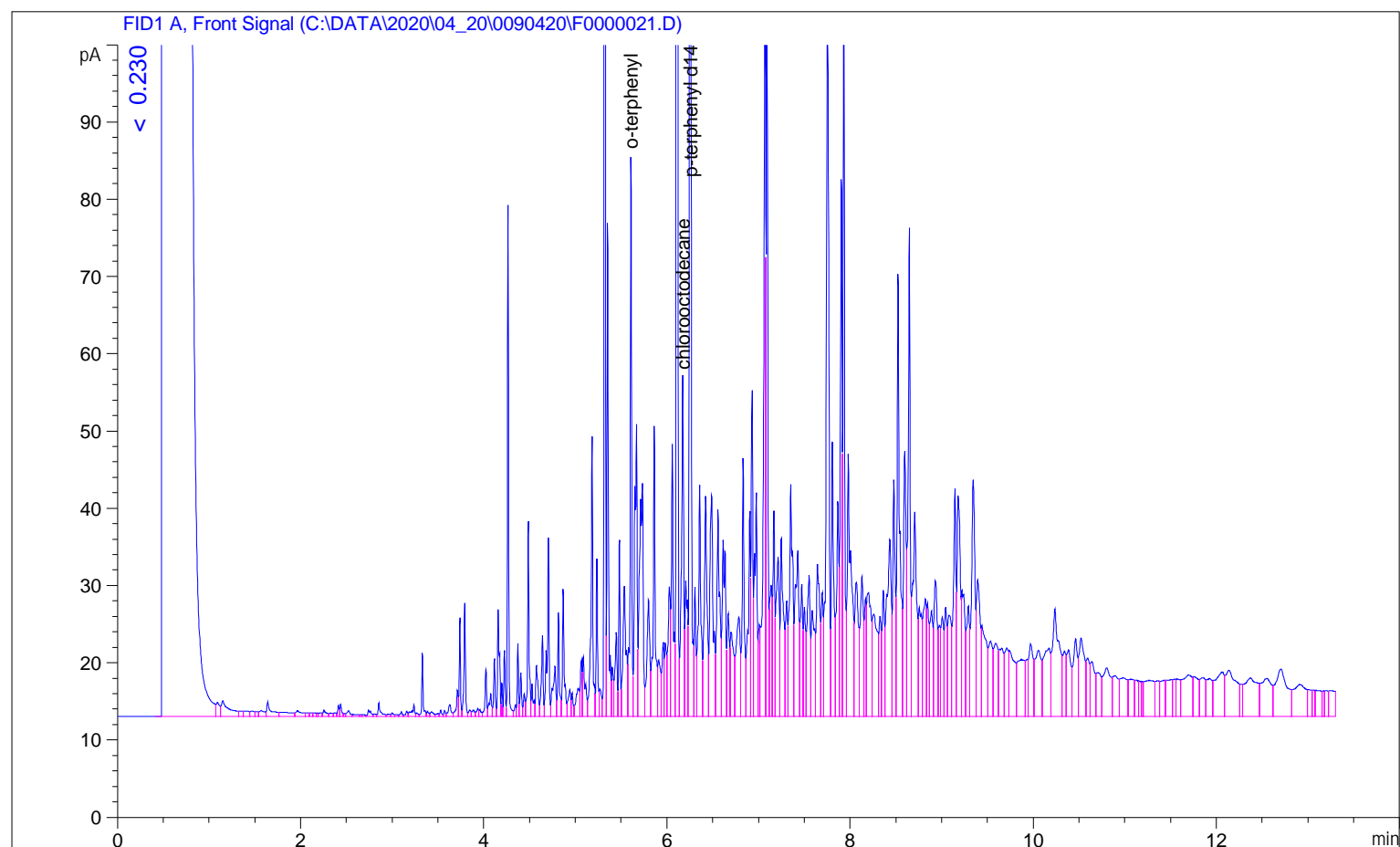
Totals :	2352.7972
----------	-----------

*** End of Report ***

Sample Name: s246556-8

```
=====
Acq. Operator   :                               Seq. Line :   21
Acq. Instrument : GC#4                         Location  : Vial  21
Injection Date  : 09/04/2020 11:48:23 PM        Inj       :    1
                                                Inj Volume: 1 µl

Acq. Method     : C:\CHEM32\1\METHODS\NEPM JF.M
Last changed    : 16/01/2020 11:55:46 AM
Analysis Method : C:\METHODS\2020\04_20\090420-F-PROCESSING-.M
Last changed    : 14/04/2020 8:57:45 AM
                  (modified after loading)
Method Info     : FAST TPH WITH 15M HP5 COLUMNS
=====
```



```
=====
External Standard Report
=====
```

```
Sorted By           :      Signal
Calib. Data Modified :      14/04/2020 8:38:12 AM
Multiplier:         :      1.0000
Dilution:           :      1.0000
Do not use Multiplier & Dilution Factor with ISTDs
```

Signal 1: FID1 A, Front Signal

RetTime [min]	Type	Area [pA*s]	Amt/Area	Amount [mg/L]	Grp	Name
5.608	VV	86.66840	1.56180e-1	13.53588		o-terphenyl
6.174	VV	71.17850	1.80796e-1	12.86881		chl orooctadecane
6.255	VV	270.91080	6.30277e-2	17.07488		p-terphenyl d14

Sample Name: s246556-8

RetTime [min]	Type	Area [pA*s]	Amt/Area	Amount [mg/L]	Grp	Name
----- ----- ----- ----- ----- ----- -----						
Totals :				43.47956		

1 Warnings or Errors :

Warning : Calibration warnings (see calibration table listing)

```
=====
                        Summed Peaks Report
=====
```

Signal 1: FID1 A, Front Signal

Name	Start Time [min]	End Time [min]	Total Area [pA*s]	Amount [mg/L]
----- ----- ----- ----- -----				
TRH C10-C14	2.040	4.105	105.13381	16.2339
NEPM >C10-C16	2.551	4.770	310.45435	47.9379
TRH C15-C28	4.106	7.840	3174.68882	426.5671
NEPM >C16-C34	4.771	8.951	4277.81376	574.7884
TRH C29-C36	7.841	9.310	1644.77239	221.1693
NEPM >C34-C40	8.952	10.360	931.13076	125.2073

Totals :	1411.9039
----------	-----------

```
=====
                        Final Summed Peaks Report
=====
```

Signal 1: FID1 A, Front Signal

Name	Total Area [pA*s]	Amount [mg/L]
----- ----- -----		
TRH C10-C14	105.13381	16.2339
NEPM >C10-C16	310.45435	47.9379
TRH C15-C28	3174.68882	426.5671
NEPM >C16-C34	4277.81376	574.7884
TRH C29-C36	1644.77239	221.1693
NEPM >C34-C40	931.13076	125.2073
o-terphenyl	86.66840	13.5359
chlorooctodecan	71.17850	12.8688
p-terphenyl d14	270.91080	17.0749

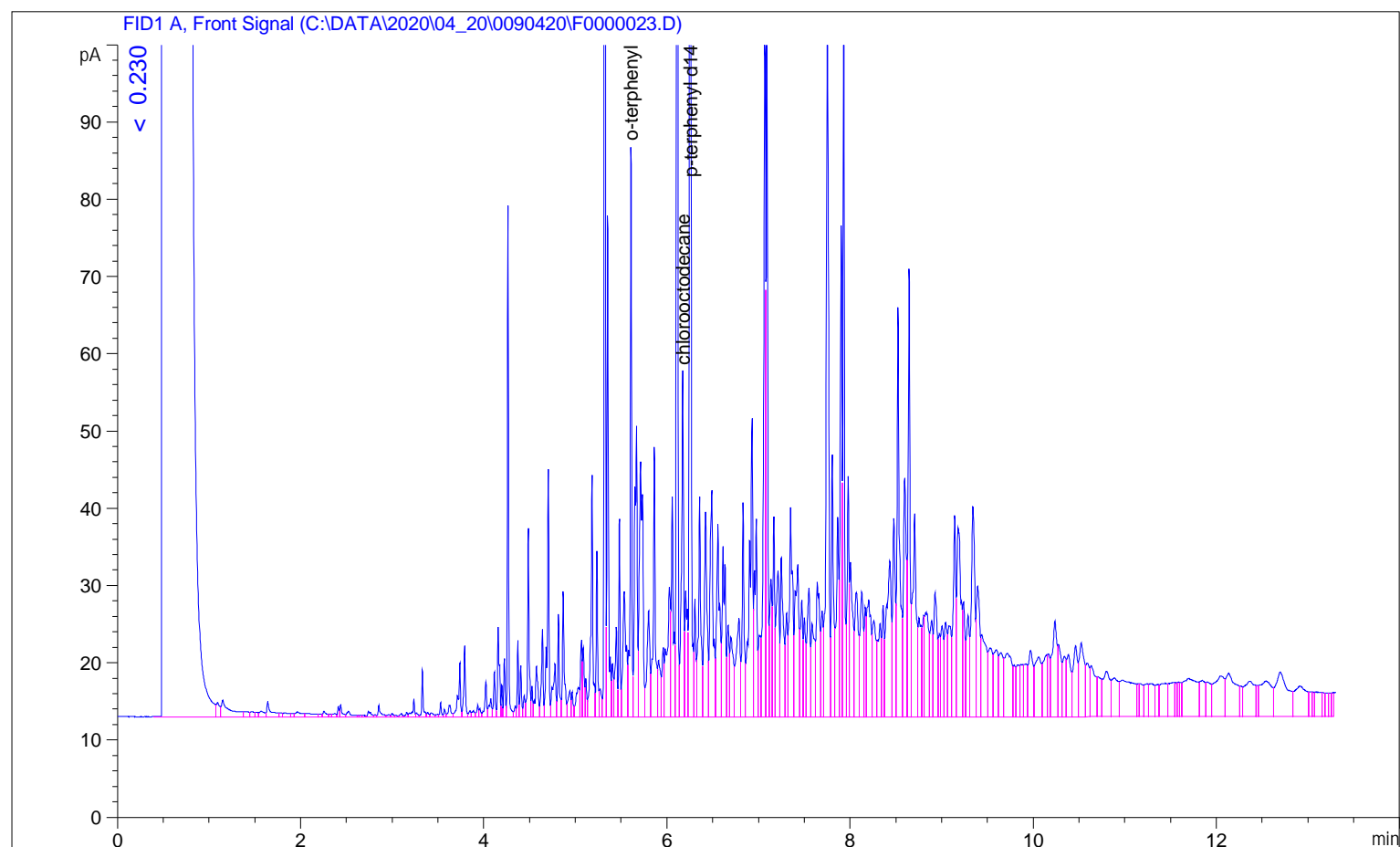
Totals :	1455.3834
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*** End of Report ***

Sample Name: s240556-9

```
=====
Acq. Operator   :                               Seq. Line :   23
Acq. Instrument : GC#4                         Location  : Vial  23
Injection Date  : 10/04/2020 12:25:14 AM        Inj       :    1
                                                Inj Volume: 1 µl

Acq. Method     : C:\CHEM32\1\METHODS\NEPM JF.M
Last changed    : 16/01/2020 11:55:46 AM
Analysis Method : C:\METHODS\2020\04_20\090420-F-PROCESSING-.M
Last changed    : 14/04/2020 8:57:45 AM
                  (modified after loading)
Method Info     : FAST TPH WITH 15M HP5 COLUMNS
=====
```



```
=====
External Standard Report
=====
```

```
Sorted By      : Signal
Calib. Data Modified : 14/04/2020 8:38:12 AM
Multiplier:    : 1.0000
Dilution:      : 1.0000
Do not use Multiplier & Dilution Factor with ISTDs
```

Signal 1: FID1 A, Front Signal

RetTime [min]	Type	Area [pA*s]	Amt/Area	Amount [mg/L]	Grp	Name
5.608	VV	85.99023	1.56180e-1	13.42996		o-terphenyl
6.174	VV	69.31743	1.80796e-1	12.53233		chl orooctadecane
6.255	VV	258.59787	6.30277e-2	16.29883		p-terphenyl d14

Sample Name: s240556-9

RetTime [min]	Type	Area [pA*s]	Amt/Area	Amount [mg/L]	Grp	Name
----- ----- ----- ----- ----- ----- -----						
Totals :				42.26112		

1 Warnings or Errors :

Warning : Calibration warnings (see calibration table listing)

```
=====
                        Summed Peaks Report
=====
```

Signal 1: FID1 A, Front Signal

Name	Start Time [min]	End Time [min]	Total Area [pA*s]	Amount [mg/L]
----- ----- ----- ----- -----				
TRH C10-C14	2.040	4.105	85.05168	13.1330
NEPM >C10-C16	2.551	4.770	292.48265	45.1628
TRH C15-C28	4.106	7.840	3022.60581	406.1324
NEPM >C16-C34	4.771	8.951	4010.84344	538.9170
TRH C29-C36	7.841	9.310	1499.46271	201.6298
NEPM >C34-C40	8.952	10.360	854.08363	114.8469

Totals :	1319.8219
----------	-----------

```
=====
                        Final Summed Peaks Report
=====
```

Signal 1: FID1 A, Front Signal

Name	Total Area [pA*s]	Amount [mg/L]
----- ----- -----		
TRH C10-C14	85.05168	13.1330
NEPM >C10-C16	292.48265	45.1628
TRH C15-C28	3022.60581	406.1324
NEPM >C16-C34	4010.84344	538.9170
TRH C29-C36	1499.46271	201.6298
NEPM >C34-C40	854.08363	114.8469
o-terphenyl	85.99023	13.4300
chlorooctodecan	69.31743	12.5323
p-terphenyl d14	258.59787	16.2988

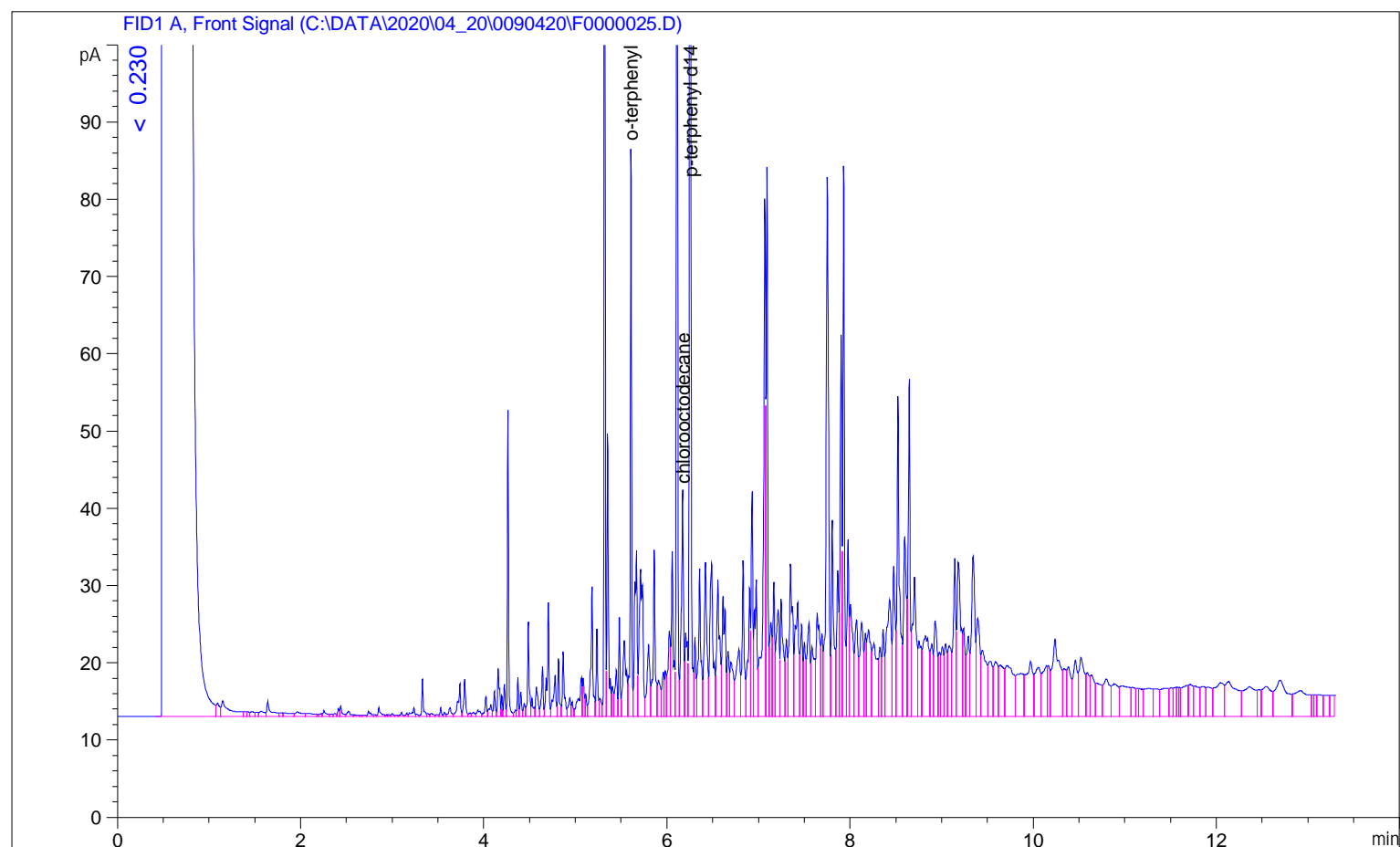
Totals :	1362.0830
----------	-----------

*** End of Report ***

Sample Name: s240556-9d

```
=====
Acq. Operator   :                               Seq. Line :   25
Acq. Instrument : GC#4                         Location  : Vial 25
Injection Date  : 10/04/2020 1:02:17 AM         Inj       :    1
                                                Inj Volume: 1 µl

Acq. Method     : C:\CHEM32\1\METHODS\NEPM JF.M
Last changed    : 16/01/2020 11:55:46 AM
Analysis Method : C:\METHODS\2020\04_20\090420-F-PROCESSING-.M
Last changed    : 14/04/2020 8:57:45 AM
                  (modified after loading)
Method Info     : FAST TPH WITH 15M HP5 COLUMNS
=====
```



```
=====
External Standard Report
=====
```

```
Sorted By           :      Signal
Calib. Data Modified :      14/04/2020 8:38:12 AM
Multiplier:         :      1.0000
Dilution:           :      1.0000
Do not use Multiplier & Dilution Factor with ISTDs
```

Signal 1: FID1 A, Front Signal

RetTime [min]	Type	Area [pA*s]	Amt/Area	Amount [mg/L]	Grp	Name
5.608	VV	77.34288	1.56180e-1	12.07942		o-terphenyl
6.173	VV	47.28260	1.80796e-1	8.54852		chl oroctadecane
6.254	VV	174.76909	6.30277e-2	11.01529		p-terphenyl d14

Sample Name: s240556-9d

RetTime [min]	Type	Area [pA*s]	Amt/Area	Amount [mg/L]	Grp	Name
----- ----- ----- ----- ----- ----- -----						
Totals :				31.64323		

1 Warnings or Errors :

Warning : Calibration warnings (see calibration table listing)

```
=====
                        Summed Peaks Report
=====
```

Signal 1: FID1 A, Front Signal

Name	Start Time [min]	End Time [min]	Total Area [pA*s]	Amount [mg/L]
----- ----- ----- ----- -----				
TRH C10-C14	2.040	4.105	63.51051	9.8068
NEPM >C10-C16	2.551	4.770	175.18078	27.0500
TRH C15-C28	4.106	7.840	1999.31191	268.6375
NEPM >C16-C34	4.771	8.951	2781.05172	373.6760
TRH C29-C36	7.841	9.310	1129.93935	151.9407
NEPM >C34-C40	8.952	10.360	675.24207	90.7985

Totals :	921.9095
----------	----------

```
=====
                        Final Summed Peaks Report
=====
```

Signal 1: FID1 A, Front Signal

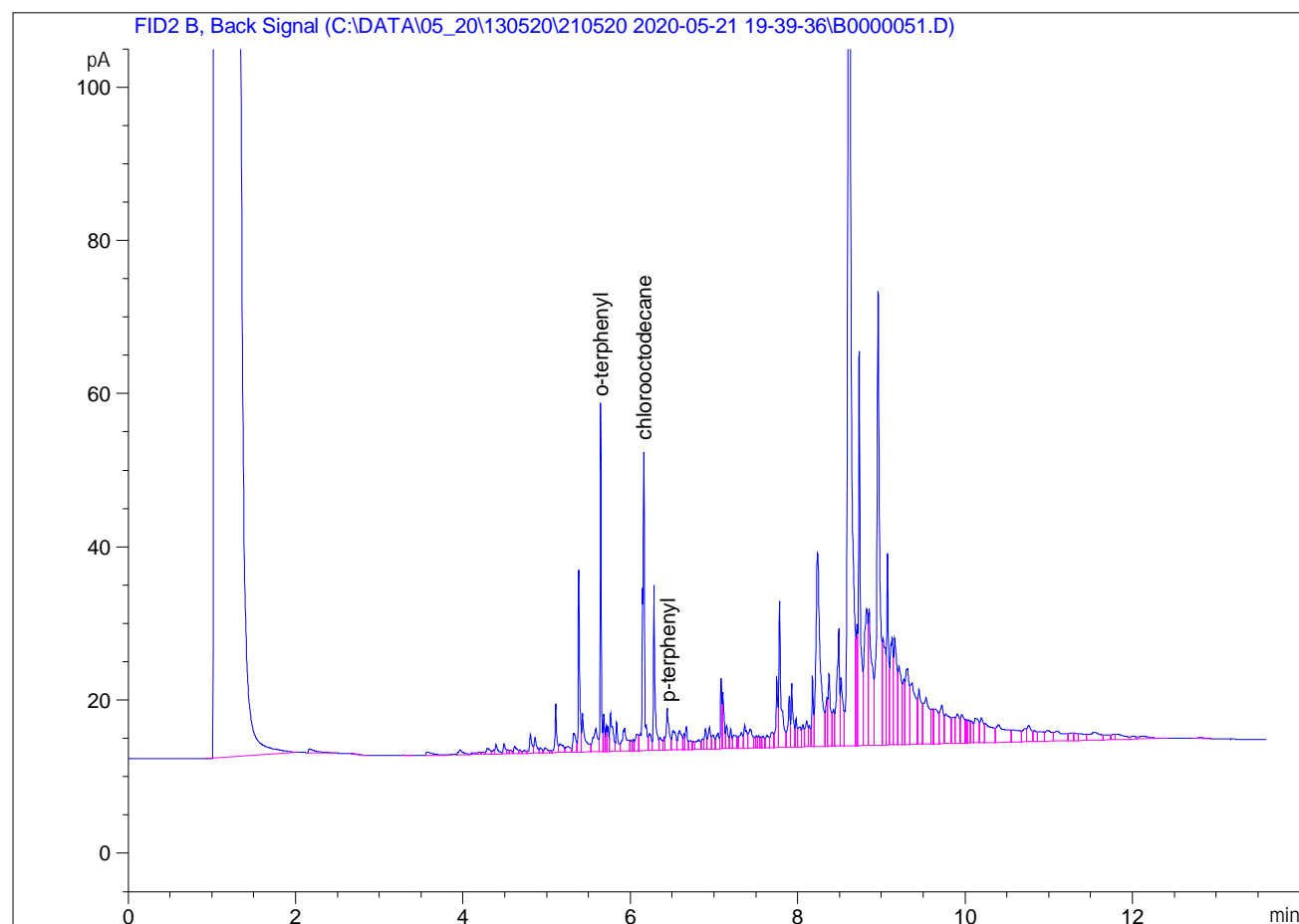
Name	Total Area [pA*s]	Amount [mg/L]
----- ----- -----		
TRH C10-C14	63.51051	9.8068
NEPM >C10-C16	175.18078	27.0500
TRH C15-C28	1999.31191	268.6375
NEPM >C16-C34	2781.05172	373.6760
TRH C29-C36	1129.93935	151.9407
NEPM >C34-C40	675.24207	90.7985
o-terphenyl	77.34288	12.0794
chlorooctodecan	47.28260	8.5485
p-terphenyl d14	174.76909	11.0153

Totals :	953.5527
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*** End of Report ***

Sample Name: w

```
=====
Acq. Operator   : SYSTEM                      Seq. Line :   51
Sample Operator : SYSTEM
Acq. Instrument : GC6                        Location  : 126 (B)
Injection Date  : 22-May-20 8:29:09 AM        Inj       :    1
                                           Inj Volume: 1 µl
Acq. Method     : C:\DATA\05_20\130520\210520 2020-05-21 19-39-36\NEPM JF.M
Last changed    : 20-Mar-20 10:48:26 AM by SYSTEM
Analysis Method : C:\00 METHODS\2020\05_20\210520-B-Processing.M
Last changed    : 22-May-20 10:26:33 AM by SYSTEM
Method Info     : FAST TPH WITH 15M HP5 COLUMNS
=====
```



```
=====
External Standard Report
=====
```

```
Sorted By           : Signal
Calib. Data Modified : 22-May-20 10:26:16 AM
Multiplier          : 1.0000
Dilution            : 1.0000
Do not use Multiplier & Dilution Factor with ISTDs
```

Signal 1: FID2 B, Back Signal

RetTime [min]	Type	Area [pA*s]	Amt/Area	Amount [mg/L]	Grp	Name
5.646	VV	40.37806	2.51424e-1	10.15199		o-terphenyl
6.162	VV	61.66235	3.17479e-1	19.57648		chl oro octodecane
6.441	VV	13.01526	1.44002e-1	1.87423		p-terphenyl

Sample Name: w

RetTime [min]	Type	Area [pA*s]	Amt/Area	Amount [mg/L]	Grp	Name
----- ----- ----- ----- ----- ----- -----						
Totals :				31.60270		

=====

Summed Peaks Report

=====

Signal 1: FID2 B, Back Signal

Signal 1: FID2 B, Back Signal

Name	Start Time [min]	End Time [min]	Total Area [pA*s]	Amount [mg/L]
----- ----- ----- ----- -----				
TRH C10-C14	2.350	4.215	7.72807	2.1918
NEPM >C10-C16	2.810	4.840	27.62612	7.8350
TRH C15-C28	4.215	7.790	382.15653	100.6069
NEPM >C16-C34	4.841	8.850	1207.91010	317.9956
TRH C29-C36	7.791	9.170	1190.85612	315.7114
NEPM >C34-C40	8.851	9.810	573.02189	151.9156

Totals :	896.2563
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Final Summed Peaks Report

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Signal 1: FID2 B, Back Signal

Name	Total Area [pA*s]	Amount [mg/L]
------	----------------------	------------------

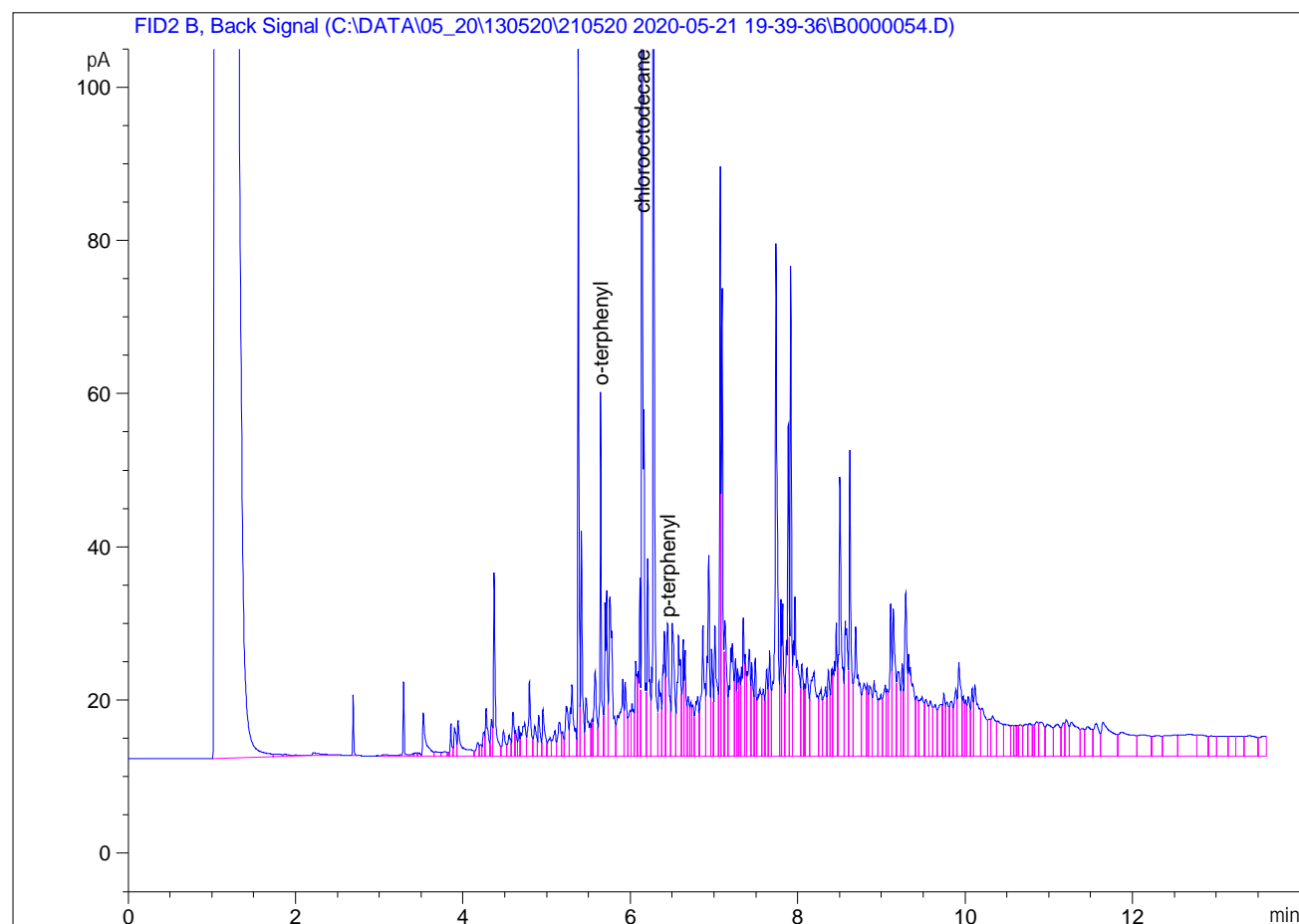
----- ----- -----		
TRH C10-C14	7.72807	2.1918
NEPM >C10-C16	27.62612	7.8350
TRH C15-C28	382.15653	100.6069
NEPM >C16-C34	1207.91010	317.9956
TRH C29-C36	1190.85612	315.7114
NEPM >C34-C40	573.02189	151.9156
o-terphenyl	40.37806	10.1520
chlorooctodecan	61.66235	19.5765
p-terphenyl	13.01526	1.8742

Totals :	927.8590
----------	----------

*** End of Report ***

Sample Name: s242711-5 x10

```
=====
Acq. Operator   : SYSTEM                      Seq. Line :   54
Sample Operator : SYSTEM
Acq. Instrument : GC6                        Location  : 129 (B)
Injection Date  : 22-May-20 9:26:50 AM        Inj       :    1
                                           Inj Volume: 1 µl
Acq. Method     : C:\DATA\05_20\130520\210520 2020-05-21 19-39-36\NEPM JF.M
Last changed    : 20-Mar-20 10:48:26 AM by SYSTEM
Analysis Method : C:\00 METHODS\2020\05_20\210520-B-Processing.M
Last changed    : 22-May-20 10:26:33 AM by SYSTEM
Method Info     : FAST TPH WITH 15M HP5 COLUMNS
=====
```



```
=====
External Standard Report
=====
```

```
Sorted By           :      Signal
Calib. Data Modified :      22-May-20 10:26:16 AM
Multiplier          :      1.0000
Dilution            :      1.0000
Do not use Multiplier & Dilution Factor with ISTDs
```

Signal 1: FID2 B, Back Signal

RetTime [min]	Type	Area [pA*s]	Amt/Area	Amount [mg/L]	Grp	Name
5.646	VV	55.05894	2.51424e-1	13.84311		o-terphenyl
6.142	VV	182.50238	3.17479e-1	57.94060		chl oroctodecane
6.446	VV	42.54058	1.44002e-1	6.12594		p-terphenyl

Sample Name: s242711-5 x10

RetTime [min]	Type	Area [pA*s]	Amt/Area	Amount [mg/L]	Grp	Name
----- ----- ----- ----- ----- -- -----						
Totals :				77.90966		

=====

Summed Peaks Report

=====

Signal 1: FID2 B, Back Signal

Signal 1: FID2 B, Back Signal

Name	Start Time [min]	End Time [min]	Total Area [pA*s]	Amount [mg/L]
----- ----- ----- ----- -----				
TRH C10-C14	2.350	4.215	72.36561	20.5236
NEPM >C10-C16	2.810	4.840	199.69376	56.6351
TRH C15-C28	4.215	7.790	1945.22793	512.1027
NEPM >C16-C34	4.841	8.850	2633.04318	693.1776
TRH C29-C36	7.791	9.170	1018.48623	270.0139
NEPM >C34-C40	8.851	9.810	514.30768	136.3497

Totals :	1688.8026
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Final Summed Peaks Report

=====

Signal 1: FID2 B, Back Signal

Name	Total Area [pA*s]	Amount [mg/L]
------	----------------------	------------------

----- ----- -----		
TRH C10-C14	72.36561	20.5236
NEPM >C10-C16	199.69376	56.6351
TRH C15-C28	1945.22793	512.1027
NEPM >C16-C34	2633.04318	693.1776
TRH C29-C36	1018.48623	270.0139
NEPM >C34-C40	514.30768	136.3497
o-terphenyl	55.05894	13.8431
chlorooctodecan	182.50238	57.9406
p-terphenyl	42.54058	6.1259

Totals :	1766.7122
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*** End of Report ***

Appendix I

Data Quality Report

Q1. Data Quality Objectives

This SSI has been devised in general accordance with the seven-step Data Quality Objective (DQO) process which is provided in Appendix B, Schedule B2 of NEPC (2013). The DQO process is outlined as follows:

- State the problem;
- Identify the decision;
- Identify inputs into the decision;
- Define the boundary of the assessment;
- Develop a decision rule;
- Specify acceptable limits on decision errors; and
- Optimise the design for obtaining data.

The DQOs have been addressed within this report as shown below:

(1) State the Problem

The “problem” to be addressed is whether there is potential soil and groundwater contamination at the site that could impact the proposed commercial development. The investigation was conducted to supplement the findings of the previous DSI (DP, 2019).

(2) Identify the Decision/Goal of the Study

The following specific decisions are required to be made from the investigation:

- Is the site suitable, or can it be made suitable, for the proposed development?
- Is remediation required in relation to soil and groundwater contaminants?

(3) Identifying the information Inputs

Inputs into the decision will be as follows:

- Available site information regarding previous and current activities undertaken on the site and the surrounding area;
- Details of the proposed development, as known at the time of preparing the report;
- Previous investigation findings and results;
- The local geology, topography and hydrology;
- Field results from the current investigation;
- Analytical results from the current investigation; and
- Field and laboratory QA/QC data to assess the suitability of the environmental data for the assessment.

(4) Define the Boundary of the Study

The site with the address of 8-10 Lee Street, Haymarket NSW, comprises Lot 116 in DP1078271 and Lot 117 in DP1078271 and part of Lot 13 in DP1062447. The site boundary is shown on Drawing 1, Appendix B.

The overall site (i.e. inclusive of both the 'State Works' and 'Developer Works' zones) is an irregular, 'L'-shaped site with an approximate area of 3400 m². The area of the proposed basement within the Developer Works zone has an approximate area of 1800 m². The site is bounded by Ambulance Avenue to the north, Central Station to the east, Adina Apartment Hotel to the west and a multi-storey government office building to the south.

(5) Develop an Analytical Approach (or decision rule)

The soil and groundwater will not be considered significantly impacted by a contaminant if there is no significant detection relative to the adopted SAC (Section 7).

Laboratory test results will only be accepted and considered useable for the assessment under the following conditions:

- All laboratories used must be accredited by NATA for the analyses undertaken;
- All practical quantitation limits (PQL) set by the laboratories must be below the investigation levels adopted;
- The differences between the reported concentrations of analytes in the intra and inter-laboratory replicate samples and the corresponding original samples are within adopted acceptance limits (with the exception of those that are not considered to be significant as discussed in Section Q2.7); and
- The quality assurance/quality control (QA / QC) protocols and results reported by the laboratories comply with the requirements of NEPM (2013) and ANZECC (1996) 'Guidelines for the Laboratory Analysis of Contaminated Soils'.

The limits on decision errors are as follows:

- Sampling locations are based on areas / sources of potential contamination and the locations of potential receptors;
- The analyte selection is based on the results of previous soil and groundwater testing, and the previous identified contaminants of concern and data gaps;
- The investigation / screening levels adopted were from NSW EPA produced and/or endorsed guidelines. The adopted investigation/screening levels have risk probabilities already incorporated; and
- The acceptance limits for laboratory QA / QC parameters are based on the laboratory reported acceptance limits, which comply with current national standards.

(6) Optimising the Design for Obtaining Data

Sampling locations have been selected for both geotechnical and environmental purposes. The locations were located in parts of the site that were accessible and were spaced out to gain

reasonable coverage of the soil profile and site contamination status, as well as in parts of the site that were known to contain elevated levels of contaminants based on the findings of DP (2019).

Due to the sites current land use there were parts of the site that could not be accessed.

It is recommended that intrusive investigation of the footprints of the existing buildings is undertaken following demolition.

Q2. Data Quality Indicators

The reliability of field procedures and analytical results was assessed against the following data quality indicators (DQIs):

- 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.

The DQIs were assessed as outlined in the following Table Q1.

Table Q1: Data Quality Indicators

DQI	Considerations as specified in NEPM Schedule B2	Comment
Completeness		
Field Considerations	All critical locations sampled	All critical locations were sampled in accordance with the proposal. Borehole locations were selected for both geotechnical and environmental purposes and were based on accessibility.
	All samples collected (from grid and at depth)	Soil and groundwater samples have been used to provide coverage of the site in accordance with the proposal.
	Standard operating practices (SOPs) appropriate and complied with	Field staff followed SOPs as defined in the DP Field Procedures Manual.
	Experienced sampler	A DP environmental scientist with ten years' experience led the field team.
	Documentation correct	Field staff followed SOPs as defined in the DP Field Procedures Manual/SWMS. Documentation was reviewed and signed off by the project manager.
Laboratory	All critical samples analysed according to	The proposal was followed. Any

DQI	Considerations as specified in NEPM Schedule B2	Comment
Considerations	the proposal	variation to the proposal has been recorded in the report.
	All analytes analysed according to proposal	All analytes have been analysed according to the proposal. Any variation has been recorded in the report.
	Appropriate methods and PQLs/LORs	NATA approved methods have been adopted. Limits of reporting (LORs) and practical quantitation limits (PQLs) in accordance with the method have been used by the contract laboratory.
	Sample Documentation complete	Chain-of-custody (COC) was maintained and appended to the Certificates of Analysis. All Certificates of Analysis are complete and appended to the report.
	Sample holding times complied with	Sample holding times complied with the NATA accredited Laboratory.
Comparability		
Field Considerations	Same SOPs used on each occasion	Field staff followed SOPs for each day of sampling as defined in the DP Field procedures Manual
	Experienced sampler	A DP environmental scientist with ten years' experience led the field team.
	Climatic conditions	Field staff recorded the climatic conditions at the time of sampling on field sheets, provided in Appendix D.
	Same types of samples collected	Field staff followed SOPs as defined in the DP Field Procedures Manual and sampling regime defined in the proposal.
Laboratory Considerations	Sample analytical methods used	The laboratories used are accredited by NATA for the analyses undertaken. Laboratory methods are as stated on the Certificates of Analysis
	Sample PQLs / LORs	PQLs or LORs set by the laboratories are below the adopted site criteria or indicate across-the-board lack of detection.
	Same laboratories	EnviroLab Services Pty Ltd was used for primary sample analysis. Eurofins Mgt Pty Ltd was used for inter-laboratory duplicate sample analysis.
	Same units	All laboratory results are expressed in consistent units for each media type.
Representativeness		
Field Considerations	Appropriate media sampled according to SAQP.	Appropriate media were sampled in accordance with the proposal.
	All media identified in SAQP sampled.	All media identified in the proposal were sampled.

DQI	Considerations as specified in NEPM Schedule B2	Comment
Laboratory Considerations	All samples analysed according to SAQP.	All samples analysed according to proposal.
Precision		
Field Considerations	SOPs appropriate and complied with	Field staff followed SOPs as defined in the DP Field procedures Manual.
Laboratory Considerations	Analysis of: - intra-laboratory field duplicates - inter-laboratory field duplicates - laboratory-prepared volatile trip spikes and trip blanks	Envirolab Services - Laboratory acceptance limits of soil matrix are: 1 & 2) Average relative percentage difference (RPD) result <10 times PQL, no limit; results >10 times PQL, 0% - 50% 3) Recovery of 70-130% Eurofins Mgt Pty Ltd - Laboratory acceptance limits of soil matrix are: 1 & 2) RPD Duplicates: Global RPD Duplicates Acceptance Criteria is 30% however the following guidelines are equally applicable: 1 & 2) Result <10 times the LOR: No Limit; Results between 10-20 times the LOR; RPD must lie between 0-50%; Results >20 times the LOR: RPD must lie between 0-30%. 3) Surrogate Recoveries: Recoveries must lie between 50-150%; Phenols 20-130%.
Accuracy (bias)		
Field Considerations	SOPs Appropriate and complied with	Field staff to follow SOPs as defined in the DP Field procedures Manual.
Laboratory Considerations	Analysis of: field blanks rinsate blank reagent blank/method blank matrix spike	Laboratory acceptance limits are: Concentrations of analytes are <PQL/LOR Concentrations of analytes are <PQL/LOR Results are within acceptance limits as specified by the laboratory (recovery usually within 60-140%). Results are within acceptance limits as specified by the laboratory (recovery within 70-130% for inorganics and 60-140% for organics).

DQI	Considerations as specified in NEPM Schedule B2	Comment
	<p>surrogate spike</p> <p>reference material</p> <p>laboratory control sample</p> <p>laboratory-prepared spikes</p>	<p>Results are within acceptance limits as specified by the laboratory (recovery within 70-130% for inorganics and 60-140% for organics).</p> <p>Analysis within the acceptable limits of the Certificate of Analysis for the reference material. These results are generally not contained in the Certificate of Analysis.</p> <p>Results are within acceptance limits as specified by the laboratory (recovery within 70-130% for inorganics and 60-140% for organics).</p> <p>Results are within acceptance limits as specified by the laboratory (recovery within 60-140%).</p> <p>Discussion of the results outside the targets and/or with different acceptance limits for inter-laboratories discussed in s. Q3.</p>

Based on the above, the current assessment has generally complied with the quality assurance and quality control data quality indicators. As such, it is concluded that the laboratory test data obtained are reliable and useable for this assessment. Reference should be made to Section Q2 for a full analysis of the QA/QC protocols and outcomes.

Q3. Field Quality Assurance and Quality Control

The field QC procedures for sampling as prescribed in Douglas Partners' *Field Procedures Manual* were followed at all times during the assessment.

Q3.1 Sampling Team

Soil and groundwater sampling were undertaken by site engineers/geologists, Nick Burrows, Alyssa Spencer, Kritik Reddy and Joel James-Hall under the supervision of project manager, Wen-Fei Yuan. Site works were undertaken between 07 April and 26 May 2020. Sampling was not affected by weather conditions.

Q3.2 Sample Collection

Q3.2.1 Soil

Soil samples were collected from pushtube and / or solid flight auger from a track-mounted drilling rig and hand tools due to access restriction. Further details of the drilling and sampling methodology are presented in Section 6.4 of the report. The QA / QC samples collected during the course of soil sampling comprised the following:

- Collection of a minimum of 10% replicate samples (10% intra-laboratory replicates and 10% inter-laboratory replicates);
- Collection of a minimum one trip spike and one trip blank per round of sampling; and
- Collection of one rinsate sample on each day of sampling where decontamination procedures were undertaken.

Q3.2.2 Groundwater

The groundwater sampling procedures are outlined in Section 6.5 of the report. The QA / QC samples collected during the course of groundwater sampling comprised:

- Collection of a minimum of 10% replicate samples (10% intra-laboratory replicates and 10% inter-laboratory replicates) for QA / QC purposes, with a minimum of one replicate sample collected for each day of sampling;
- Collection of a minimum of one trip spike and one trip blank per day of sampling; and
- Collection of one rinsate sample per day, where decontamination procedures were undertaken.

Q3.3 Logs and Field Sheets

Logs for each soil sampling location were recorded in the field. The individual samples were recorded on the field logs along with the sample identity, location, depth, initials of sampler, replicate locations, replicate type and additional observations. Analysis to be performed on each sample and the dispatch courier were recorded on the COC in Appendix G. Logs are presented in Appendix C.

Field sheets of groundwater sampling and development were maintained including records of micro-purging and field parameters. The field sheets are presented in Appendix D.

Q3.4 Decontamination Procedure

All samples were taken with decontaminated re-useable sampling equipment or disposable sampling equipment.

Decontamination was undertaken by rinsing equipment with demineralised water to remove soil / sediment, spraying equipment with a 2% concentrated critical-cleaning liquid detergent (D90), rinsing equipment with demineralised water and finally allowing equipment to air dry.

Where re-useable sampling equipment was applied, a rinsate sample was collected to confirm adequate decontamination between samples. Rinsate samples were collected by running distilled water over the decontaminated sampling equipment directly into sampling bottles provided by the laboratory.

Q3.4.1 Chain of Custody

Chain-of-custody information was recorded on Chain-of-Custody (COC) sheets and accompanied samples to the analytical laboratory. Signed copies of COCs are presented in Appendix G, following the laboratory certificates of analysis.

Q3.4.2 Sample Splitting Techniques

Replicate samples were collected in the field as a measure of accuracy, precision and repeatability of the results.

Field replicate samples for soil were collected from the same location and an identical depth to the primary sample. Equal portions of the primary sample were placed into the sampling jars and sealed. The sample was split to prevent the loss of volatiles from the soil but not homogenised in a bowl. Replicate samples were labelled with a DP identification number and recorded on DP's borehole logs, so as to conceal their relationship to their primary sample from the analytical laboratory.

Groundwater replicate sample were collected by decanting equal portions of groundwater into separately and uniquely labelled groundwater bottles. Sample bottles were filled directly from the pump outlet to minimise disturbance.

Q3.4.3 Replicate Frequency

Field sampling included collection of a minimum of 10% replicate samples (10% intra- and 10% inter-laboratory replicates) for QA / QC purposes.

Q3.4.4 Field Blank

A field blank is a sample taken as an indication to demonstrate correct field handling. Field blank samples were collected at least once per round during soil and groundwater sampling.

Q2.5 Trip Spike

In accordance with the *NSW EPA Guidelines for Consultants Reporting on Contaminated Sites (2011)*, laboratory prepared trip spike results for volatile analytes are included in this report. The purpose of a trip spike is to assess the potential loss of volatile analytes that may have occurred between the time of collection and transfer of the sample to the laboratory. For the current investigation, a trip spike was taken into the field on each day of sampling with BTEX being the volatile assessed.

For soils, laboratory preparation of the trip spike involved putting 1mL of BTEX (using a 1500 ppm BTEX trip spike standard) into two jars which are cross referenced and labelled 'trip spike' and 'control'. Both jars were sealed with electrical tape. The trip spike was taken onto site and subject to

the same jar storage and transfer as the field samples. The control stayed refrigerated in the laboratory. Following receipt of the trip spike and field samples, the trip spike and corresponding control are both analysed with results of the trip spike being expressed as the % difference from the control sample.

A similar procedure is used for water trip spikes by injecting 220uL of BTEX into the trip spike. Results are then analysed and expressed as % of theoretical value of a 50ppb standard.

The acceptance limit for trip spikes is 60-140% in difference compared to the control or standard.

A trip spike was taken into the field on each soil and groundwater sampling round and dispatched with the batch sampling run.

Q2.6 Background Sample

A background sample is representative of natural, ambient background conditions. Background soil samples were collected from the natural soils (seven natural samples were selected for laboratory analysis) and background groundwater samples were collected from up-gradient groundwater monitoring well (BH103 and BH104).

Q2.7 Relative Percentage Difference

A measure of the consistency of results for field samples is derived by the calculation of relative percentage differences (RPDs) for replicate samples. A RPD of +/- 30% is generally considered typically acceptable for inorganic analytes by NSW EPA, although in general a wider RPD range (50%) may be acceptable for organic analytes. RPDs have only been considered where a concentration is greater than five times the PQL. High RPDs (if applicable) are shown in **bold and shaded** on the relevant tables below.

Replicate samples were collected at a rate of approximately one replicate sample for every ten original samples collected and also analysed at a rate of 10% of primary samples analysed (10% intra- and 10% inter-laboratory replicates), generally with a minimum of one replicate sample collected for each round of sampling.

Q2.7.1 Intra-Laboratory Analysis

Intra-laboratory replicates were analysed as an internal check of the reproducibility within the primary laboratory (EnviroLab Pty Ltd) and as a measure of consistency of sampling techniques.

A total of 3 primary soil samples and 2 primary groundwater samples had intra-laboratory replicates analysed. Therefore, the intra-laboratory replicate sampling requirement was met.

The comparative results of analysis between primary and replicate samples are summarised in Tables Q2 and Q3.

Table Q2: Intra-laboratory Results - Soils (mg/kg)

Analyte	BH107B/0.4-0.5	BD1/20200516	Difference	RPD (%)
Arsenic	<4	<4	0	0
Cadmium	<0.4	<0.4	0	0
Chromium	8	12	4	40
Copper	25	46	21	59
Lead	54	52	2	4
Mercury	0.2	0.2	0	0
Nickel	4	7	3	55
Zinc	49	81	32	49
Benzene	<0.2	<0.2	0	0
Toluene	<0.5	<0.5	0	0
Ethylbenzene	<1	<1	0	0
Total Xylenes	<3	<3	0	0
Naphthalene	<1	<1	0	0
TRHC ₆ -C ₁₀ (less BTEX)	<25	<25	0	0
TRH >C ₁₀ -C ₁₆ (less Naphthalene)	<50	<50	0	0
TRHC ₁₆ -C ₃₄	<100	<100	0	0
TRHC ₃₄ -C ₄₀	<100	<100	0	0
B(a)P	1.3	1.8	0.5	32
B(a)P TEQ	2.0	2.7	0.7	30
Naphthalene as PAH	<0.1	<0.1	0	0
Total +ve PAH	14	18	4	25

Analyte	BH113/0.15-0.25	BD2/070420	Difference	RPD (%)
Arsenic	26	10	16	89
Cadmium	<0.4	<0.4	0	0
Chromium	6	9	3	40
Copper	40	43	3	7
Lead	44	69	25	44
Mercury	<0.1	0.1	0	0
Nickel	4	4	0	0
Zinc	310	500	190	47
Benzene	<0.2	<0.2	0	0
Toluene	<0.5	<0.5	0	0
Ethylbenzene	<1	<1	0	0
Total Xylenes	<3	<3	0	0
Naphthalene	<1	<1	0	0
TRHC ₆ -C ₁₀ (less BTEX)	<25	<25	0	0
TRH >C ₁₀ -C ₁₆ (less Naphthalene)	<50	<50	0	0
TRHC ₁₆ -C ₃₄	790	760	30	4
TRHC ₃₄ -C ₄₀	220	180	40	20
B(a)P	12	14	2	15
B(a)P TEQ	17	20	3	16

Naphthalene as PAH	0.5	0.4	0.4	22
Total +ve PAH	150	180	30	18

Analyte	BH105/0.05-0.1	BD1/070420	Difference	RPD (%)
Arsenic	8	9	1	12
Cadmium	0.6	0.7	0.1	15
Chromium	13	14	1	7
Copper	93	99	6	6
Lead	280	300	20	7
Mercury	1	0.8	0.2	22
Nickel	14	11	3	24
Zinc	240	260	20	8
Benzene	<0.2	<0.2	0	0
Toluene	<0.5	<0.5	0	0
Ethylbenzene	<1	<1	0	0
Total Xylenes	<3	<3	0	0
Naphthalene	<1	<1	0	0
TRHC ₆ -C ₁₀ (less BTEX)	<25	<25	0	0
TRH >C ₁₀ -C ₁₆ (less Naphthalene)	<50	<50	0	0
TRHC ₁₆ -C ₃₄	330	170	160	64
TRHC ₃₄ -C ₄₀	<100	<100	0	0
B(a)P	2	1.8	0.2	11
B(a)P TEQ	2.9	2.5	0.4	15
Naphthalene as PAH	<0.1	<0.1	0	0
Total +ve PAH	17	17	0	0

The calculated RPD values were within the acceptable range of ± 30 for inorganic analytes and $\pm 50\%$ for organics apart from those shaded. However, this is not considered to be significant because:

- The typically low actual differences in the concentrations of the replicate pairs where some RPD exceedances occurred;
- A number of replicate pairs being collected from fill soils which by its nature is heterogeneous;
- Replicates, rather than homogenised replicates were used to avoid volatile loss, hence greater variability can be expected;
- The majority of RPDs within a replicate pair being within the acceptable limits; and
- All other QA / QC parameters met the DQIs.

It is noted that the large RPD's between BH115/0.23 and BD1/070420 are considered likely to be from the presence of coal or ash in the parent sample that were not in the duplicate sample. This likely occurred since the parent same and duplicate were not homogenised in a bowl.

Table Q3: Intra-laboratory Results - Groundwater (µg/L)

Analyte	BH112B	BD1/20200526	Difference	RPD (%)
Arsenic	<1	<1	0	0
Cadmium	<0.1	<0.1	0	0
Chromium	<1	<1	0	0
Copper	1	<1	0	0
Lead	<1	<1	0	0
Mercury	<0.05	<0.05	0	0
Nickel	7	7	0	0
Zinc	21	20	1	5
Benzene	<1	<1	0	0
Toluene	<1	<1	0	0
Ethylbenzene	<1	<1	0	0
Total Xylenes	<3	<3	0	0
Naphthalene	<1	<1	0	0
TRHC6-C10 (less BTEX)	<10	<10	0	0
TRH >C10-C16 (less Naphthalene)	<50	<50	0	0
TRHC16-C34	<100	<100	0	0
TRHC34-C40	<100	<100	0	0
B(a)P	<0.1	<0.1	0	0
Naphthalene as PAH	<0.2	<0.2	0	0
Total PAH	0.17	0.18	0.1	6

Analyte	BH103	BD1/20200424	Difference	RPD (%)
Arsenic	<1	<1	0	0
Cadmium	<0.1	<0.1	0	0
Chromium	<1	<1	0	0
Copper	3	26	23	158
Lead	<1	<1	0	0
Mercury	<0.05	<0.05	0	0
Nickel	6	9	3	40
Zinc	12	21	9	55
Benzene	<1	<1	0	0
Toluene	<1	<1	0	0
Ethylbenzene	<1	<1	0	0
Total Xylenes	<3	<3	0	0
Naphthalene	<1	<1	0	0
TRHC6-C10 (less BTEX)	<10	<10	0	0
TRH >C10-C16 (less Naphthalene)	<50	<50	0	0
TRHC16-C34	<100	<100	0	0
TRHC34-C40	<100	<100	0	0

The calculated RPD values were within the acceptable range of ± 30 for inorganic analytes and $\pm 50\%$ for organics apart from those shaded. However, this is not considered to be significant because:

- The typically low actual differences in the concentrations of the replicate pairs where some RPD exceedances occurred;
- The majority of RPDs within a replicate pair being within the acceptable limits; and
- All other QA/QC parameters met the DQIs.

Overall, the intra-laboratory comparisons indicate that the sampling technique was consistent and repeatable and therefore the results are useable and representative of the conditions encountered.

Q2.7.2 Inter-Laboratory Analysis

Inter-laboratory replicates were conducted as a check of the reproducibility of results between the primary laboratory (EnviroLab Services Pty Ltd) and the secondary laboratory (Eurofins Mgt Pty Ltd) and as a measure of consistency of sampling techniques.

A total of 3 soil samples had inter-laboratory replicates analysed.

The comparative results of analysis between original and inter-laboratory replicate samples are summarised in Table Q4.

Note that, where the laboratory PQL are different and both samples are below PQL (or one sample is below PQL and other has a recorded detection below the other lab PQL), the difference and RPD has been given as zero.

Table Q4: Inter-laboratory Results - Soils (mg/kg)

Analyte	BH104/1.4-1.5	BD2/140420	Difference	RPD (%)
Arsenic	<4	8.3	4.3	70
Cadmium	<0.4	<0.4	0	0
Chromium	6	11	5	59
Copper	28	32	4	13
Lead	14	23	9	48
Mercury	<0.1	<0.1	0	0
Nickel	7	9.9	2.9	34
Zinc	42	56	14	29
Benzene	<0.2	<0.1	0	0
Toluene	<0.5	<0.1	0	0
Ethylbenzene	<3	<0.1	0	0
Total Xylenes	<3	<0.3	0	0
Naphthalene	<1	<0.5	0	0
TRHC ₆ -C ₁₀ (less BTEX)	<25	<20	0	0
TRH >C ₁₀ -C ₁₆ (less Naphthalene)	<50	<50	0	0
TRHC ₁₆ -C ₃₄	<100	<100	0	0
TRHC ₃₄ -C ₄₀	<100	<100	0	0
B(a)P	0.53	<0.5	0.03	6
B(a)P TEQ	0.7	<0.5	0.2	33

Analyte	BH104/1.4-1.5	BD2/140420	Difference	RPD (%)
Naphthalene as PAH	<0.1	<0.5	0	0
Total PAH	6.1	3	3.1	68

Analyte	BH116/0.5-0.7	BD1/20200517	Difference	RPD (%)
Arsenic	<4	3.6	0.4	11
Cadmium	<0.4	<0.4	0	0
Chromium	6	8.2	2.2	31
Copper	5	9.9	4.9	66
Lead	12	16	4	29
Mercury	<0.1	<0.1	0	0
Nickel	<1	<5	0	0
Zinc	1	<5	4	133
Benzene	<0.2	<0.1	0	0
Toluene	<0.5	<0.1	0	0
Ethylbenzene	<1	<0.1	0	0
Total Xylenes	<3	<0.3	0	0
Naphthalene	<1	<0.5	0	0
TRHC ₆ -C ₁₀ (less BTEX)	<25	<20	0	0
TRH >C ₁₀ -C ₁₆ (less Naphthalene)	<50	<50	0	0
TRHC ₁₆ -C ₃₄	<100	<100	0	0
TRHC ₃₄ -C ₄₀	<100	<100	0	0
B(a)P	<0.05	<0.5	0	0
B(a)P TEQ	<0.5	<0.5	0	0
Naphthalene as PAH	<0.1	<0.5	0	0
Total PAH	<0.05	<0.5	0	0

Analyte	BH105/0.05-0.1	BD1/070420	Difference	RPD (%)
Arsenic	8	10	2	22
Cadmium	0.6	0.8	0.2	29
Chromium	13	20	7	42
Copper	93	110	17	17
Lead	280	460	180	49
Mercury	1	1.3	0.3	26
Nickel	14	17	3	19
Zinc	240	400	160	50

The RPD values were within the acceptable range of ± 30 for inorganic analytes ($\pm 50\%$ for organic) with the exception of one shaded RPD. However, this is not considered to be significant because:

- The typically low actual differences in the concentrations of the replicate pairs where some RPD exceedances occurred;
- Replicates, rather than homogenised soil duplicates were used to avoid volatile loss, hence greater variability can be expected;
- Most of the recorded concentrations being at / close to the practical quantitation limit;
- The majority of RPDs within a replicate pair being within the acceptable limits;

- The testing methods between two laboratories may result in the differences; and
- All other QA / QC parameters met the DQIs.

Overall, the inter-laboratory comparisons indicate that the sampling technique was consistent and repeatable and therefore the results are useable and representative of the conditions encountered.

Q2.8 Field Blanks

Laboratory prepared soil and groundwater field blanks were taken out to the site unopened on each day of sampling, subjected to the same preservation methods as the field samples, then analysed for the purposes of determining whether transfer of contaminants into the blank sample had occurred prior to reaching the laboratory. If this is confirmed, then there is also a potential for other samples in the batch to have been impacted. The results of the laboratory analysis for the field blanks is shown in Tables Q5 and Q6. A total of three soil blanks and two water blanks were analysed over the course of the investigation.

Table Q5: Trip Blank Results - Soils (mg/kg)

Sample ID	TB 07/04/2020	TB 14/04/2020	TB 12/05/2020
Benzene	<0.2	<0.2	<0.2
Toluene	<0.5	<0.5	<0.5
Ethylbenzene	<1	<1	<1
M + P Xylene	<2	<2	<2
O Xylene	<1	<1	<1
TRH C6 - C9	<25	<25	<25
TRH C6 - C10	<25	<25	<25
vTPH C6 - C10 less BTEX (F1)	<25	<25	<25

Table Q6: Trip Blank Results - Groundwater (µg/L)

Sample ID	TB 24/04/2020	TB 26/05/2020
Benzene	<1	<1
Toluene	<1	<1
Ethylbenzene	<1	<1
M + P Xylene	<2	<2
O Xylene	<1	<1
Naphthalene	<1	<1
TRH C6 - C9	<10	<10
TRH C6 - C10	<10	<10
vTPH C6 - C10 less BTEX (F1)	<10	<10

Levels of analytes were all below detection limits indicating that significant cross contamination had not occurred during transportation of samples from the site to the laboratory.

Q2.9 Trip Spikes

Laboratory prepared trip spikes were taken to the site on each day of sampling, subjected to the same preservation methods as the field samples, and dispatched with the batch sampling run. The results of the laboratory analysis for the field blanks is shown in Tables Q7 and Q8. A total of three soil blanks and two water blanks were analysed over the course of the investigation.

Table Q7: Trip Spike Results - Soils (% Recovery)

Sample ID	TS 07/04/2020	TS 14/04/2020	TS 12/05/2020
Benzene	117	97	100
Toluene	123	98	101
Ethylbenzene	119	94	102
M + P Xylene	120	95	103
O Xylene	122	93	103

Table Q8: Trip Spike Results - Groundwater (% Recovery)

Sample ID	TS 24/04/2020	TS 26/05/2020
Benzene	111	116
Toluene	108	115
Ethylbenzene	108	105
M + P Xylene	99	105
O Xylene	112	108

Results indicate that the percentage loss for BTEX during the trip was minimal and therefore appropriate preservation techniques were employed.

Q2.10 Rinsate Sample Results

Rinsate samples were taken by running rinsate water over reusable sampling equipment then collecting that water in sampling containers for analysis. If contaminants are present in the rinsate water, it indicates that contaminants from the sampling-equipment could have cross-contaminated samples. The results of analysis from two rinsate samples are shown in Table Q9.

Table Q9: Rinsate Results (µg/L)

Sample ID	Rinsate 07/04/2020	Rinsate 08/04/2020
Arsenic	<0.05	<0.05
Cadmium	<0.01	<0.01
Chromium	<0.01	<0.01
Copper	<0.01	<0.01
Lead	<0.03	<0.03
Mercury	<0.0005	<0.0005
Nickel	<0.02	<0.02
Zinc	<0.02	<0.02
TRHC ₆ -C ₁₀ (less BTEX)	<10	<10
TRHC ₁₀ -C ₁₆	<50	<50
TRHC ₁₆ -C ₃₄	<100	<100
TRHC ₃₄ -C ₄₀	<100	<100
B(a)P	<1	<1
B(a)P TEQ	<5	<5
Naphthalene	<1	<1
Total PAH	NIL(+)VE	NIL(+)VE

The concentrations of the analytes recorded in the rinsate sample was below the laboratory detection limits except for those in bold.

It is considered that the decontamination techniques employed during groundwater sampling were adequate and that the risk of cross-contamination was low.

Q2.11 Field Instrument Calibration

The photoionisation detector (PID) fitted with a 10.6 eV lamp was calibrated and serviced at Active Environmental Solutions Pty Ltd on 06/04/2020 and 15/05/2020 and in the field with isobutylene gas prior to field investigation. Calibration records are presented in Appendix E.

The water quality meter was calibrated by Thermo Fisher Scientific Pty Ltd on 14/05/2019 and internally calibrated prior to its use. Calibration records are presented in Appendix E.

Q4. Laboratory Quality Assurance and Quality Control

Q4.1 Chain of Custody

Chains-of-custody documentation for all samples is presented in Appendix G.

Q4.1.1 Holding Times

A review of the laboratory certificates of analysis and chain-of-custody documentation indicated that holding times were met.

Q4.2 Analytical Laboratories

Samples were submitted to the following laboratories for analysis:

- Primary Laboratory: Envirolab Services Pty Ltd (Envirolab); and
- Secondary Laboratory: Eurofins Mgt Pty Ltd (Eurofins).

The laboratories are all NATA accredited for the analysis undertaken. Envirolab's accreditation number is 2901 and is accredited for compliance with ISO/IEC 17025. Envirolab's tests comply with NATA and NEPC (2013). In-house procedures are employed by Envirolab in the absence of documented standards.

Eurofin's NATA accreditation number is 1261 and is accredited for compliance with ISO/IEC 17025. Eurofin's in-house laboratory methods are referenced from NEPC, ASTM and modified USEPA/ APHA documents.

It is noted that some of the test methods adopted are not NATA accredited where no NATA accredited method exists. The best international practices were adopted in the analytical methods for these tests. It is not considered that this will affect the validity of the results for this assessment.

Q4.3 Analytical Methods

The laboratory analytical methods are provided on the laboratory certificates of analysis in Appendix G.

Q4.4 Results of Laboratory QA/QC Procedures

The following QA/QC procedures were conducted by the laboratories. The results are included in the laboratory certificates of analysis in Appendix G.

Q3.4.1 Surrogate Spike

This sample is prepared by adding a known amount of surrogate, which behaves similarly to the analyte, prior to analysis to each sample. The recovery result indicates the proportion of the known

concentration of the surrogate that is detected during analysis. These results are within acceptance limits as specified by Envirolab Services Pty Ltd, indicating that the extraction technique was effective.

The laboratory acceptance criteria for surrogate samples is generally 60-140% for organics; and 10-140% for SVOC and speciated phenols. Percent recovery for the surrogate samples was within the acceptable standards with the exception of TRH C10-C40 in sample 240556-1 and 240556-7. Percent recovery for these samples was not possible to report as the high concentration of analytes in the samples have caused interference.

Q3.4.2 Practical Quantitation Limits - PQLs

The PQL is the lowest concentration of an analyte which can be measured with a high degree of confidence. PQLs at different analytical laboratories can differ based on the particular laboratories analytical techniques.

Q3.4.3 Reference and Daily Check Sample Results - Laboratory Control Sample (LCS)

This sample comprises spiking either a standard reference material or a control matrix (such as a blank of sand or water) with a known concentration of specific analytes. The analytical results of the LCS and the standard reference material are then compared against each other to determine how the laboratory has performed with regard to sample preparation and analytical procedure. LCSs are analysed at a frequency of 1 in 20, with a minimum of one analysed per batch.

The laboratory acceptance criteria for LCS samples are generally 70-130% for inorganic/ metals, 60-140% for organics, and 10-140% for SVOC and speciated phenols.

The laboratory QC for LCS was within the acceptance standards.

Q3.4.4 Laboratory Replicate Results

These are additional portions of a sample which are analysed in exactly the same manner as all other samples. The laboratory acceptance criteria for replicate samples are:

- In cases where the level is $<5 \times \text{PQL}$ - any RPD is acceptable; and
- In cases where the level is $>5 \times \text{PQL}$ - 0-50% RPD is acceptable.

The laboratory QC for laboratory replicate results was within the acceptance standards with the exception of the following samples. Triplicate results have been issued for all laboratory replicate RPD samples that exceeded the criteria listed above.

- Zn in 240692-1, triplicate 240692-13 (in ELS 240692);
- Hg and Cu in 240556-2, triplicate 240556-16 (in ELS 240556); and
- Zn in 240556-9, triplicate 240556-17 (in ELS 240556).

Q3.4.5 Laboratory Blank Results

The laboratory blank, sometimes referred to as the method blank or reagent blank is the sample prepared and analysed at the beginning of every analytical run, following calibration of the analytical apparatus. This is the component of the analytical signal which is not derived from the sample but from reagents, glassware, etc. It can be determined by processing solvents and reagents in exactly the same manner as for samples. Laboratory blanks are analysed at a frequency of 1 in 20, with a minimum of one per batch.

The laboratory QC for method blanks was within the acceptance standards.

Q3.4.6 Matrix Spike

This is a sample replicate prepared by adding a known amount of analyte prior to analysis, and then treated exactly the same as all other samples. The recovery result indicates the proportion of the known concentration of the analyte that is detected during analysis. The laboratory acceptance criteria for matrix spike sample is generally 70-130% for inorganic/metals, 60-140% for organics, and 10-140% for SVOC and speciated phenols.

The laboratory QC for matrix spikes was within the acceptance standards with the exception of sample 2406092-2ms in ELS 240692 and 240556-5ms in ELS 240556. The percent recovery for the matrix spike in those samples was not possible due to interface from analytes (other than those being tested).

Q3.5 Laboratory Comments

Comments made in the laboratory certificates of analysis are summarised in Table Q10 below, along with the results of the review of the laboratory QC by DP.

Table Q10: Laboratory QA Comments

Laboratory Certificate of Analysis	Laboratory Comment	DP Comment
243428	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 243428-1 to 3 were sub-sampled from jars provided by the client.	Acknowledged
243428-A	No comments	-
243218	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: Sample 243218-6 was sub-sampled from a jar provided by the client.	Acknowledged
243218-A	No comments	-

Laboratory Certificate of Analysis	Laboratory Comment	DP Comment
241179	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.	Acknowledged
240692	<p>Dissolved Metals: no filtered, preserved sample was received, therefore the unpreserved sample was filtered through 0.45µm filter at the lab. Note: there is a possibility some elements may be underestimated.</p> <p>Acid Extractable Metals in Soil:</p> <ul style="list-style-type: none"> • The laboratory RPD acceptance criteria has been exceeded for 240692-1 for Zn. Therefore, a triplicate result has been issued as laboratory sample number 240692-13. • # Percent recovery is not possible to report due to the inhomogeneous nature of the element/s in the sample/s. However, an acceptable recovery was obtained for the LCS. • ## Percent recovery is not possible to report due to the high concentration of the element/s in the sample/s. However, an acceptable recovery was obtained for the LCS. <p>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.</p> <p>TRH Soil C10-C40 NEPM (#) Percent recovery for the matrix spike is not possible to report due to interference from analytes (other than those being tested) in sample 240692-2ms.</p>	The unfiltered dissolved metals were from the rinsate sample; it is considered that rinsate filtration by the laboratory is most practical.
240692-A	No comments	n/a
240556	<p>TRH Soil C10-C40 NEPM (#) Percent recovery for the surrogate is not possible to report as the high concentration of analytes in samples 240556-1 and 7 have caused interference.</p> <p>Asbestos: Excessive sample volume was provided for asbestos analysis. A portion of the supplied sample was sub-sampled according to Envirolab procedures. We cannot guarantee that this sub-sample is indicative of the entire sample. Envirolab recommends supplying 40-50g (50mL) of sample in its own container as per AS4964-2004. Note: Samples were sub-sampled from bags provided by the client.</p> <p>Acid Extractable Metals in Soil:</p> <ul style="list-style-type: none"> • The laboratory RPD acceptance criteria has been exceeded for 240556-2 for Cu and Hg. Therefore, a triplicate result has been issued as laboratory sample number 240556-16. • The laboratory RPD acceptance criteria has been exceeded for 240556-9 for Zn. Therefore, a triplicate result has been issued as laboratory sample number 240556-17. • Spike recovery for Pb in sample 240556-5 at 67% which is outside lab acceptance criteria (70-130%), however, the LCS recovery is acceptable at 117%. Sample heterogeneity suspected. <p>PAHs in Soil (#) Percent recovery for the matrix spike is not possible to report due to interference from analytes (other than those being tested) in sample</p>	All sample integrity criteria were met

Laboratory Certificate of Analysis	Laboratory Comment	DP Comment
	240556-5ms. The RPD for duplicate results is accepted due to the non-homogenous nature of samples 240556-2 and 9.	
240556-A	No comments	n/a
241579	No comments	n/a
243633	No comments	n/a
714766-S	Custody Seals Intact (if used): N/A Attempt to Chill was evident: Yes Sample correctly preserved: Yes Appropriate sample containers have been used: Yes Sample containers for volatile analysis received with minimal headspace: Yes Samples received within Holding Time: Yes Some samples have been subcontracted: No	All sample integrity criteria were met
720825-S	Custody Seals Intact (if used): N/A Attempt to Chill was evident: Yes Sample correctly preserved: Yes Appropriate sample containers have been used: Yes Sample containers for volatile analysis received with minimal headspace: Yes Samples received within Holding Time: Yes Some samples have been subcontracted: No	All sample integrity criteria were met
723460-S	Custody Seals Intact (if used): N/A Attempt to Chill was evident: Yes Sample correctly preserved: Yes Appropriate sample containers have been used: Yes Sample containers for volatile analysis received with minimal headspace: Yes Samples received within Holding Time: Yes Some samples have been subcontracted: No	All sample integrity criteria were met

The majority of the laboratory quality control samples were within the laboratory acceptance criteria, with the exception of those identified in Table Q10. The QC failures, where they occurred, are considered to have been adequately addressed by the laboratories and not considered to have significantly impacted the quality of the results overall. It is considered that an acceptable level of laboratory precision and consistency was achieved and that surrogate spikes, LCS, laboratory replicate results, method blanks and matrix spike results were of an acceptable level overall. On the basis of this assessment, the laboratory data sets are considered to be reliable and useable for this assessment.

Appendix J

Environmental Risk Analysis

Appendix J: Standard Approach to Environmental Risk Assessment

The SEARs require an environmental risk analysis be included in the EIS to identify potential environmental impacts associated with the Project.

The following represents the standard way in which the environmental risk assessment can be undertaken in the RAP that can then inform the overall risk assessment which will be included in the overarching EIS document. This standard approach is outlined in the in the SSDA¹.

Risk comprises the likelihood of an event occurring and the consequences of that event. For the Project, the following descriptors were adopted for 'likelihood' and 'consequence'.

Table C1: Risk Descriptors and Risk Matrix

Contamination	Likelihood	Consequence	Risk Matrix
Soil	Almost Certain (A)	3	Medium
Groundwater	Unlikely (D)	3	Low

It should be noted that the above risk assessment is based on historical and current contamination data findings. The unexpected finds protocol in Section 14 of the RAP provides a procedure to be followed in the event of encountering an unexpected finds of contamination during the site preparation and construction work.

¹ Atlassian SSDA – Standard Text for Technical Reports, 5 August 2020.