Douglas Partners
Geotechnics / Environment / Groundwater

Integrated Practical Solutions

Report on
Detailed Site Investigation (Contamination)

Rouse Hill High School Upgrade
240 Withers Road, Rouse Hill

Prepared for
NSW Department of Education

Project 215851.00
April 2024

Douglas Partners
Geotechnics / Environment / Groundwater

Document History

Document details

Project No.	215851.00	Document No.	R.002.Rev1
Document title	Report on Detailed Site Investigation (Contamination) Rouse Hill High School Upgrade		
Site address	240 Withers Road, Rouse Hill		
Report prepared for	NSW Department of Education		
File name	215851.00.R.002.Rev1.docx		

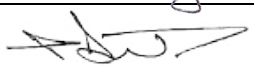
Document status and review

Status	Prepared by	Reviewed by	Date issued
Revision 0	Petrina Fielding	Tim Wright	10 November 2022
Revision 1	Petrina Fielding	Tim Wright	3 April 2024

Distribution of copies

Status	Electronic	Paper	Issued to
Revision 0	1	0	Frank Princi, NSW Department of Education
Revision 1	1	0	Frank Princi, NSW Department of Education

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

	Signature	Date
Author		3 April 2024
Reviewer		3 April 2024

bsi ISO 9001 Quality Management Systems CERTIFIED
FS 604853

Douglas Partners Pty Ltd
ABN 75 053 980 117
www.douglaspartners.com.au
Unit 2, 593 Withers Road
Rouse Hill NSW 2155
Phone (02) 4666 0450

Douglas Partners
Geotechnics / Environment / Groundwater

Table of Contents

Report on Detailed Site Investigation (Contamination)
Rouse Hill High School Upgrade
240 Withers Road, Rouse Hill

1. Introduction

Douglas Partners Pty Ltd (DP) has been engaged by NSW Department of Education to complete this detailed site investigation (contamination) (DSI) for the proposed Rouse Hill High School Upgrade within the existing school at 240 Withers Road, Rouse Hill. The site of the proposed development is shown on Drawing 1, Appendix A.

The investigation was undertaken in accordance with DP's proposal 215851.00.P.001.Rev1 dated 20 June 2022 and subsequent variation proposal 215851.00.P.002.Rev0 dated 29 August 2022.

It is understood that the proposed development of the site includes the construction of a new three-storey building along with associated pavements and infrastructure. It is further understood that no basement levels are proposed.

The objective of the DSI was to assess the potential for contamination at the site based on past and present land uses, provide a statement on the suitability of the site, from a contamination perspective, for the intended land use, and to comment on the need for further investigation and/or management regarding the proposed development. It is understood that the report will be used to support a planning application (most likely in the form of a development application) for the proposed development.

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

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

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

This investigation was carried out concurrently with a geotechnical investigation and waste classification assessment, both reported separately in DP reports 215851.00.R.001.Rev0 and 215851.R.003.Rev0, respectively.

It is noted that the area of the school site that DP was originally commissioned to investigate encompassed a larger part of the school. Following advice from Mr Frank Princi of Schools Infrastructure on 18 August 2022, the size of the site was reduced to the part of the school outlined in Section 3 below (the "site"). DP has included the field investigation that was carried out prior to the change of the footprint of the site within this report.

2. Scope of Work

The scope of work for the DSI comprised:

- A review of geological, soil, acid sulfate soil, salinity and hydrogeological published information to assess and document the site's environmental setting;
- A review of readily-available site history information, comprising:
  - Current and historical title deeds;
  - Historical aerial photographs;
  - Search of the NSW EPA Land Information public databases held under the Contaminated Land Management Act 1997 and the Protection of the Environment Operations Act 1997;
  - Records held by SafeWork NSW;
  - Council Section 10.7 Planning Certificate;
- Search for groundwater bores on or adjacent to the site registered with the NSW Department of Primary Industries (DPI) Water;
- A site walkover to identify conditions that may indicate potential areas of environmental concern (PAEC);
- Preparation of a conceptual site model (CSM);
- Completion of a Dial Before You Dig underground services records search and scan of underground services carried out by a Telstra accredited services locator;
- Drilling of fifteen boreholes (Bore 101 to Bore 115) across the larger school site;
- Collection of soil samples from each borehole location. Samples were collected at regular depth intervals, change of strata or indicators of potential contamination based on field observation;
- Installation and development of groundwater wells at four borehole locations to allow for future measurement/sampling of groundwater/levels;
- Survey of borehole locations using a differential GPS;
- Laboratory analysis of selected soil and groundwater samples for a range of the following contaminants:
  - Metals (arsenic, cadmium, chromium, copper, lead, mercury, nickel, zinc);
  - Polycyclic aromatic hydrocarbons (PAH);
  - Total recoverable hydrocarbons (TRH);
  - Benzene, toluene, ethylbenzene and xylene (BTEX);
  - Phenols;
  - Organochlorine pesticides (OCP);
  - Organophosphorus pesticides (OPP);
  - Polychlorinated biphenyls (PCB);
  - Per- and poly-fluoroalkyl substances (PFAS);
  - Volatile organic compounds (VOC);

- pH;
- Cation exchange capacity (CEC); and
- Asbestos (trace, fibrous asbestos (FA) and asbestos fines(AF)).

- Field sampling and laboratory analysis included a quality assurance/quality control (QA/QC) plan consisting of approximately 10% intra-laboratory replicates and appropriate chain of custody procedures and in-house laboratory QA/QC testing;
- Interpretation of laboratory results in accordance with current NSW EPA endorsed guidelines; and

Preparation of this DSI report outlining the methodology and results of the investigation, an assessment of the site's suitability for the proposed development and recommendations for further works if considered necessary

3. Site Information

The larger school site identification is presented in Table 1 and the site location is shown in Figure 1 (next page) and Drawing 1 in Appendix A.

Table 1: Site Identification

Item	Details
Site Address	240 Withers Road, Rouse Hill
Legal Description	Lot 105 DP 1108407
Area	Larger school site 5.8 hectares (approximately) Site development area 0.4 hectare (approximately)
Zoning	Medium Density Residential R3
Local Council Area	The Hills Shire Council
Current Use	High School
Surrounding Uses	North – Bruce Purser Reserve East – Withers Road South – Ironbark Public School West – Caballo Street with residential properties beyond

Figure 1: Site Location Plan (Source: Metro Map)

4. Environmental Setting

4.1 Topography

The regional topography falls to the south-west from an approximate north-west to south-east trending ridge line that follows Withers Road. The ridgeline is at maximum elevation at RL 58 m Australian Height Datum (AHD). The site is on the slope that falls to the south-west. Site surface levels generally fall towards the south-west with gradients estimated to be up to 5°. The overall difference in level is estimated to be about 4 m from the highest part of the site (approximately 50 m AHD in the north-east corner) to the lowest (approximately 46 m AHD in the south-west corner).

4.2 Site Geology

Reference to the Penrith 1: 100 000 scale Soil Landscape Series Sheet indicates that the site is located within the Blacktown soil landscape group. The Blacktown Group typically comprises shallow to moderately deep red and brown podzolic soils on crests, upper slopes and well drained areas. The

Blacktown Group is characterised by moderately reactive, highly plastic subsoil with poor drainage characteristics.

Reference to the Penrith 1:100 000 scale Geological Series Sheet indicates that the site is located near the geological boundary between the Ashfield Shale and Hawkesbury Sandstone formations both of Triassic Age. Ashfield Shale typically comprises dark grey to black shale, siltstone and laminite which weathers to a residual clay profile of medium to high plasticity. Hawkesbury Sandstone typically comprises medium to coarse grained quartz sandstone, with minor laminated mudstone and siltstone lenses, both massive and cross-bedded.

Field investigation confirmed the presence of Hawkesbury Sandstone underlying the site.

4.3 Acid Sulfate Soils

Review of published mapping indicates that the site is in an area of 'no known occurrence of acid sulfate soils.' The NSW Acid Sulfate Soils Manual 1998 published by the Acid Sulfate Soils Management Advisory Committee (ASSMAC) indicates that ASS (and Potential Acid Sulfate Soils – PASS) normally occur in alluvial or estuarine soils below RL 5 m AHD although occasionally are encountered up to RL 12 m AHD. Considering the ASS mapping and given that the site soils are at site elevations above RL 40 m AHD, it is considered unlikely that ASS is present on-site.

4.4 Salinity

The Department of Infrastructure, Planning and Natural Resources (DIPNR) "Map of Salinity Potential in Western Sydney 2002" suggests that the site is in an area of "moderate salinity potential" with a higher potential in the lower elevations areas in close proximity to the Caddies Creek system. Salinity investigation and testing was outside the agreed scope of this investigation.

4.5 Surface Water and Groundwater

The closest surface water receptor to the site is Caddies Creek located about 100 m south-west of the site.

Based on the local topography, groundwater is anticipated to flow to the south-west towards Caddies Creek.

A search of the NSW Department of Primary Industries Water (DPI Water) online map of registered groundwater works was undertaken as part of the investigation. The search carried out on 31 August 2022 identified no registered groundwater boreholes within 500 m of the site.

5. Site History

5.1 Title Deeds

A historical title deeds search was used to obtain ownership and occupancy information including company names and the occupations of individuals. The title information can assist in the identification of previous land uses by the company names or the site owners and can, therefore, assist in establishing whether there were potentially contaminating activities occurring at the site. A summary of the title deeds and possible land uses (with reference to the aerial photographs in Section 5.2 and other historical searches) is presented in Table 2. A full copy of the search is included in Appendix C.

Table 2: Historical Title Deeds

Date of Acquisition and Term Held	Registered Proprietor(s) & Occupations	Inferred Land Use
11.03.1922 (1922 to 1924)	Edward Charles Baker (Grazier)	Rural Residential/Agricultural
04.11.1924 (1924 to 1938)	Barclay Thomson Wright (Grazier)	Rural Residential/Agricultural
01.03.1938 (1938 to 1954)	J.N. Brimbecom Pty Ltd (Milk Vendor)	Rural Residential/Agricultural
28.06.1954 (1954 to 1962)	Ian Conrad Scharkie (Garage Proprietor now Farmer) Robert Fyfe Scharkie (Dairy Farmer now Farmer) Neil Lester Scharkie (Garage Proprietor)	Rural Residential/Agricultural
09.08.1962 (1962 to 1973)	Ian Conrad Scharkie (Garage Proprietor now Farmer) Robert Fyfe Scharkie (Dairy Farmer now Farmer)	Rural Residential/Agricultural
31.07.1973 (1973 to 1976)	Somerset Developments Pty Limited	Rural
22.04.1976 (1976 to 1980)	Taliac Pty Limited	Rural
02.12.1980 (1980 to 2007)	Minister Administering the Environmental Planning and Assessment Act 1979	Rural
03.08.2007 (2007 to Date)	# Minister for Education and Training	Educational

# Denotes current registered proprietor

Leases: -

- 21.03.2014 (AI398073): Lease to Axiom Education NSW N. 2 Pty Limited being Rouse Hill High School, 105 Withers Road, Rouse Hill. Expires: 31.12.2035.
    - 21.03.2014 (AI398074): Lease of Lease AI3980973 to Minister for Education being Rouse Hill High School, 105 Withers Road, Rouse Hill. Expires: 30.12.2035.

Easements: -

- 05.02.2009 (AE407311): Easement for Padmount Substation 5.5 wide affecting the part designated (A) in plan with AE407311.

5.2 Historical Aerial Photography

A review of historical aerial photographs was carried out to identify changes to the larger school site and surrounding areas which may include potential land contaminating activities. Images from 1955, 1961, 1965, 1978, 1986 and 1994 were sourced from public databases. Selected aerial photographs are included in Drawings 2 to 4 in Appendix D. A summary of key features observed for the larger school site and surrounding land is presented in Table 3.

Table 3: Summary of Historical Aerial Photographs

Year	Larger School Site	Surrounding Land Use
1955	The school site appears to be undeveloped and lightly vegetated.	The surrounding land to the north appears partially cleared and lightly vegetated. The surrounding land to the west and south appears undeveloped and lightly vegetated. The land to the east appears undeveloped and densely vegetated except for a residence to the northeast.
1961	The school site appears to be largely unchanged from the 1955 photograph.	The surrounding land appears to have remained largely unchanged from the 1955 photograph except for a residence to the east and additional structures to the northeast.
1965	The school site appears to be largely unchanged from the 1961 photograph except for the presence of a dam in the northwestern corner. Some possible filled in ponds/excavations were located along the eastern side of the school site.	The surrounding land appears to have remained largely unchanged from the 1961 photograph except for an additional structure to the northeast.
1978	The school site appears to be largely unchanged from the 1965 photograph.	The surrounding land appears to have remained largely unchanged from the 1965 photograph.

Year	Larger School Site	Surrounding Land Use
1986	The school site appears to be largely unchanged from the 1978 photograph.	The land to the north appears to have undergone construction for a possible agricultural development. The land to the northeast appears to have been further developed with large warehouse type structures visible. The surrounding land to the east, west and south appears to have remained largely unchanged from the 1978 photograph.
1994	The school site appears to be largely unchanged from the 1986 photograph.	The land to the northeast appears to have been further developed with an extension to one of the large warehouse type structure visible. The surrounding land to the east, west and south appears to have remained largely unchanged from the 1986 photograph.

A brief review of satellite images from Metro Map from 2000 to 2022 was also carried out. A summary of key features observed for the larger school site and surrounding land is presented in Table 4. Selected aerial photographs are included in Drawings 4 to 7 in Appendix D.

Table 4: Summary of Metro Map Images

Year	Site	Surrounding Land Use
2000	The school site appears to have remained largely unchanged from the 1994 photograph.	The surrounding land appears to have remained largely unchanged from the 1994 photograph.
2005	The school site appears to have remained largely unchanged from the 2000 photograph except for some small structures observed in the eastern corner of the school site.	The developments on the surrounding land to the north and northeast appear to have been removed except for one residence. The construction of the school on the land to the south appears to have commenced. The surrounding land to the east and west appears to have remained largely unchanged from the 2000 photograph.
2009	The high school buildings and associated playing fields and infrastructure appear to be completed.	An oval, pond and associated parking and structures appear to have been constructed on the land to the north. A lake and associated paths appear to have been constructed on the land to the west with a shopping centre beyond. The surrounding land to the east and south appears largely unchanged from the 2005 photo.

Year	Site	Surrounding Land Use
2016	The school site appears to have remained largely unchanged from the 2009 photograph except for an additional small structure within the site development area.	School buildings and associated parking and infrastructure appears to have been constructed on the land to the northeast. Residential development appears to have been constructed beyond the dense vegetation to the east. Residential properties appear to have been constructed to the southwest. The surrounding land to the south and west appears largely unchanged from the 2009 photograph.
2019	The school site appears to have remained largely unchanged from the 2016 photograph.	The surrounding land appears to have remained largely unchanged from the 2016 photograph.
2021	The school site appears to have remained largely unchanged from the 2019 photograph except for five small structures observed in the northeast portion of the school site.	The surrounding land appears to have remained largely unchanged from the 2019 photograph.
2022	The school site appears to have remained largely unchanged from the 2021 photograph.	The surrounding land appears to have remained largely unchanged from the 2021 photograph.

5.3 Public Registers and Planning Records

EPA Notices available under Section 58 of the Contaminated Lands Management Act (CLM Act) Database searched 19 October 2022	There were no records of notices for the site or adjacent sites.
Sites notified to EPA under Section 60 of the CLM Act Database searched 19 October 2022	The site and adjacent sites were not listed as a notified contaminated site.
Licences listed under Section 308 of the Protection of the	There were no records issued to the site or adjacent sites.

Environment Operations Act 1997 (POEO Act) Database searched 19 October 2022	
SafeWork NSW 19 October 2022	No records related to the storage of hazardous chemicals were reported in the NSW SafeWork search (provided in Appendix E)
Planning Certificate Section 10.7 (2&5) 14 July 2022	The site does not include or comprise critical habitat. The site not located in a conservation area. There is no item of environmental heritage on the site. The site is not affected by coastal protection works. The site is not proclaimed to be a mine subsidence district. The site is not affected by any road widening or realignment. The site is not subject to a Contaminated Lands Policy or an Asbestos Policy. The site is not affected by any other policies adopted by Council that restricts development due to likelihood of land slip, tidal inundation, subsidence or the occurrence of acid sulfate soils. The site is subject to a bushfire policy. The site is subject to flood related development controls. The site is not reserved for acquisition under an environmental planning instrument or proposed planning instrument. The site is not biodiversity certified land. The site is not subject to any biobanking stewardship agreement. The site is identified as bush fire prone land. The site is not subject to a property vegetation plan. (provided in Appendix E)
Council Records	No relevant records were available at the time of reporting

5.4 Site History Integrity Assessment

The information used to establish the history of the site was sourced from reputable and reliable reference documents, many of which were official records held by Government departments/agencies. The databases maintained by various Government agencies potentially can contain high quality information, but some of these do not contain any data.

In particular, aerial photographs provide generally high-quality information that is generally independent of memory or documentation. They are only available at intervals of several years, so some gaps exist in the information from this source. The observed site features are open to different interpretations and can be affected by the time of day and/or year at which they were taken, as well as specific events, such

as flooding. Care has been taken to consider different possible interpretations of aerial photographs and to consider them in conjunction with other lines of evidence.

5.5 Summary of Site History

The site history information suggests that the site was undeveloped rural residential or agricultural land until around 2007 when the land was acquired by the Minister for Education and Training. The site appears to have been developed into a high school between 2007 and 2009 and has undergone minimal changes until the present time.

6. Site Walkover

A site walkover was undertaken by a geotechnical engineer on 21 July 2022. The general site topography was consistent with that described in Section 4.1. The site layout appears to have remained unchanged from the 2022 satellite image. The following key site features pertinent to the DSI were observed:

- The site was being used as an open space/playing fields;
- The site was predominantly surfaced with grass with some concrete footpaths in the vicinity;
- Two cricket nets and two metal shade structures with associated seating were situated in the western and central portions of the site, respectively;
- There was no obvious evidence of underground storage tanks;
- There was no obvious evidence of asbestos-containing materials (ACM) on the ground surface;
- There was no significant staining observed on the ground surface; and
- There were no obvious odours or air emissions emitting from the site.

7. Preliminary Conceptual Site Model

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

Potential Sources

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

- S1: Fill: Associated with levelling for the construction of the existing school buildings.
  - o COPC include metals, TRH, BTEX, PAH, PCB, OCP, phenols and asbestos.
- S2: Previous agricultural activity.

- COPC include metals and OCP.

Potential Receptors

The following potential human receptors have been identified:

- R1: Current and end users [educational facility]; and
- R2: Construction and maintenance workers.

The following potential environmental receptors have been identified:

- R3: Surface water [Caddie Creek];
- R4: Groundwater; and
- R5: Terrestrial ecosystems.

Potential Pathways

The following potential pathways have been identified:

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

It is understood that groundwater at the site will not be used for drinking water or for irrigation. Therefore, these pathways have not been considered further.

Summary of Potentially Complete Exposure Pathways

A 'source–pathway–receptor' approach has been used to assess the potential risks of harm being caused to human or environmental receptors from contamination sources on or in the vicinity of the site, via exposure pathways (potential complete pathways). The possible pathways between the above sources (S1 and S2) and receptors (R1 to R5) are provided in Table 5.

Table 5: Summary of Potentially Complete Exposure Pathways

Source and COPC	Transport Pathway	Receptor	Risk Management Action
S1: Fill, Metals, TRH, BTEX, PAH, OCP and asbestos S2: Previous Agricultural Activity, Metals and OCP	P1: Ingestion and dermal contact P2: Inhalation of dust and/or vapours	R1: Current and end users [educational facility] R2: Construction and maintenance workers	An intrusive investigation is recommended to assess possible contamination including testing of the soils (primarily fill) and groundwater.
	P3: Surface water run-off P5: Lateral migration of groundwater providing base flow to water bodies	R3: Surface water	
	P4: Leaching of contaminants and vertical migration into groundwater	R4: Groundwater	
	P6: Inhalation, ingestion and absorption	R5: Terrestrial ecosystems	

8. Sampling and Analysis Quality Plan

8.1 Data Quality Objectives

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

8.2 Soil Sampling Rationale

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

A systematic sampling strategy based on NSW EPA *Contaminated Sites, Sampling Design Part 1 - Application* (NSW EPA, 2022) to determine borehole numbers. Table 2 of NSW EPA (2022) recommends a minimum of 11 sampling points for a site of 0.4 ha for site characterisation based on the detection of circular hot spots using a systemic grid sampling pattern. A total of 12 boreholes (Bores 103 and 105 to 115) were therefore positioned across accessible areas of the site An additional three boreholes (Bores 101, 102 and 104) were also sampled, however these were located within the original larger development footprint.

Soil samples were collected from each borehole at depths of approximately 0.1 m, 0.5 m, 1.0 m and every 0.5 m thereafter, and changes in lithology or signs of contamination.

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

8.3 Groundwater Sampling Rationale

In order to assess the current groundwater contamination status at the site and evaluate whether historical / current / off site land uses have impacted on groundwater, sampling from four groundwater monitoring wells installed in Bores 103, 104, 108 and 111 was undertaken.

The locations were selected based on the following rationale:

- Bore 103 is positioned hydraulically up-gradient of the site and will provide data on the concentration of contaminants in groundwater entering the site;
- Bores 108 and 111 are positioned hydraulically within the site. The results at these boreholes are expected to provide data on the concentration of contaminants in groundwater within and potentially exiting the site; and
- Bore 104 is positioned hydraulically down-gradient on the site. The results from Bore 104 will provide data on the concentration of contaminants in groundwater exiting the site.

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

9. Site Assessment Criteria

The site assessment criteria (SAC) applied in the current investigation are informed by the CSM (Section 6) which identified human and environmental receptors to potential contamination on the site. Analytical results are assessed (as a Tier 1 assessment) against the SAC comprising primarily the investigation and screening levels of Schedule B1 of NEPC (2013).

The investigation and screening levels applied in the current investigation comprise levels adopted for a high school with garden/accessible soil land use scenario. The derivation of the SAC is included in Appendix H and the adopted SAC are listed on the summary analytical results tables in Appendix I.

10. Results

10.1 Field Work Results

The borehole logs for this assessment are included in Appendix J. Notes defining classification methods and terms used to describe the soils and rocks are included in Appendix B. The logs recorded the following general sub-surface profile:

- Topsoil: - Clayey sand or silty clay topsoil fill with inclusions of gravel and rootlets to depths of between 0.1 m and 0.25 m in Bores 105 to 115.
- Fill: - Clayey sand fill with inclusions of gravel and roots to depths of between 0.05 m and 1.5 m in all boreholes except Bores 108, 110 and 111.

- Natural Soils: - Typically, very stiff sandy clay or silty clay with inclusions of gravel and roots to depths of between 1.3 m and 2.3 m in all boreholes. Medium dense to dense clayey sand was encountered to a depth of 1.0 m in Bore 1. A firm to stiff layer of sandy clay was encountered in Bore 9 between 0.15 m and 0.6 m depth.

- Very Low Strength Sandstone: - Very low strength, extremely weathered sandstone with clay bands was encountered in Bores 101, 102, 103 and 104 below depths of between 1.55 m and 2.3 m.

- Medium and Medium to High Strength Sandstone: - Medium strength, variably weathered sandstone below depths of 1.55 m and 2.5 m in Bores 101, 102, 103 and 108.
  - Medium to high strength, moderately weathered sandstone was encountered below a depth of 2.1 m in Bore 108.

- High Strength Sandstone: - High strength, variably weathered to fresh sandstone encountered below depths of between 1.65 m and 5.0 m in Bores 101, 102, 103, 104, 108 and 111.

No free groundwater was observed during auger drilling of the boreholes and the use of water as a drilling fluid prevented groundwater observations during coring. Backfilling of the boreholes (except where wells were installed in Bores 101, 102, 103, 104, 108 and 111) at the completion of drilling precluded long term monitoring of the groundwater levels. It is also noted that groundwater levels are affected by soil/rock permeability and preceding climatic conditions and can therefore vary with time.

No visual or olfactory evidence (e.g. staining, odours, free phase product) was observed during the investigations to suggest the presence of contamination within the soils or groundwater at the site.

Groundwater levels were measured by an experienced environmental engineer in selected monitoring wells on two subsequent occasions. A summary of the groundwater levels measured to date are provided in Table 6. The water levels measured suggest a likely slow groundwater flow to the west.

Table 6: Results of Groundwater Level Measurements

Borehole Location	Surface RL (m AHD)	Monitoring Well Measurements – Water Level			
		26 September 2022		1 November 2022	
		Depth (m)	RL (m AHD)	Depth (m)	RL (m AHD)
101	49.3	1.3	48.0	1.0	48.3
102	49.5	4.4	45.1	3.9	45.6
103	50.0	2.3	47.7	3.0	47.0
104	46.7	1.6	45.1	1.8	44.9
108	48.6	1.4	47.2	1.6	47.0
111	49.2	3.0	46.2	3.1	46.1

Note: RL = Reduced Levels relative to Australian Height Datum (AHD)

Based on the groundwater level measurements, groundwater is interpreted to be flowing generally to the west towards Caddies Creek. This was expected given the topography and the location of the down-gradient discharge point (i.e. the Parramatta River).

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

Physical parameters were measured in the boreholes located within the site footprint (Bores 103, 104, 108 and 111) whilst sampling and are summarised in Table 7.

Table 7: Summary of Field Parameters (Groundwater and Surface Water)

Well / Sample ID	Temp. (ºC)	DO (ppm)	TDS (ppm)	EC* (µS/cm)	pH	Redox (mV)
103	18.0	1.90	338	1752	6.02	-21
104	18.7	0.60	400	771	5.98	17.9
108	17.7	0.91	241	669	6.06	-7.3
111	18.3	0.46	428	1023	5.99	-62.4

Notes: *Calculated from TDS result

The dissolved oxygen levels indicated generally anoxic conditions. The pH was slightly acidic. The electrical conductivity values are typical of fresh water as would be expected of a Wianamatta Shale. Redox potential (Eh) indicates variable conditions.

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

10.2 Laboratory Analytical Results

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

- Table 1: Summary of Results of Soil Analysis (SAC);
- Table 2: Summary of Results of Soil Analysis PFAS; and
- Table 3: Summary of Results of Water Analysis.

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

11. Discussion

11.1 Soils

The analytical results for contaminants cadmium, mercury, TRH (except F3 and F4), BTEX, PAH, phenols, OCP, OPP, PCB and asbestos (both trace, and FA and AF) in the soil samples were below the laboratory practical quantitation limit (PQL), and therefore below the adopted SAC.

The analytical results for contaminants arsenic, chromium, copper, lead, nickel, zinc, TRH (F3 and F4 only) and PFAS were reported above the laboratory PQL but below the adopted SAC.

The full NATA laboratory certificates of analysis together with the chain of custody and sample receipt information are attached in Appendix K.

11.2 Groundwater

The analytical results for contaminants cadmium, chromium, lead, mercury, PAH, phenols, BTEX, PCB, OCP and OPP were below the laboratory PQL and the SAC in all groundwater samples tested.

The analytical results for contaminants arsenic, TRH and VOC were reported above the PQL but below the SAC.

Heavy metals were reported above the SAC in the following samples:

- Copper at 4 µg/L in Bore 103, 2 µg/L in Bore 104 and 4 µg/L in Bore 108, which exceeded the DGV of 1.4 µg/L;
- Nickel at 19 µg/L in Bore 103, which exceed the DGV of 11 µg/L; and
- Zinc at 100 µg/L in Bore 103, 19 µg/L in Bore 104, 31 µg/L in Bore 108, 11 µg/L in Bore 111 and 31 µg/L in BD01, which exceeded the DGV of 8 µg/L.

PFAS was reported above the SAC in the following samples:

- PFOS at 0.001 µg/L in Bores 103 and 104, 0.004 µg/L in Bore 108 and 0.005 µg/L in Bore 111 exceeding the DGV of 0.00023 µg/L.

Based on our experience in the area, the concentrations of metals in groundwater are considered likely to be attributed to the background concentrations that would be associated with the mineralogy of the clay / fractured rock shale, or with other diffuse sources such as service leakage.

Hardness values were reported for all groundwater samples between 56 mgCaCO3/L and 230 mgCaCO3/L. The degree of hardness for these values can be described as generally good quality. As one of the levels exceeds 200 mgCaCO3/L, it is considered that the groundwater is unsuitable for the purpose of human consumption.

11.3 Data Quality Assurance and Quality Control

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

12. Conclusions and Recommendations

The scope of the current DSI included a desktop study and a site walkover which informed a site specific CSM, together with sampling and laboratory testing of soils and groundwater. The current investigation identified two potential areas of environmental concern (PAEC) that required investigation to characterise whether they pose an actual contamination risk to the proposed development, being the presence of fill and previous agricultural activity.

The site history review indicates that the site has predominantly been used for rural residential or agricultural uses until the site was developed into a high school between 2005 and 2009.

Neighbouring land and nearby properties appear to have been used historically for residential, educational and agricultural purposes over the last 70 years.

Fill is present on site most likely as a result of the construction of the school for levelling or other earthworks purposes. Documentation of the fill used to level the site is not available.

Based on the findings of this investigation, DP concludes that the potential for contamination constraints at the site is considered to be relatively low. However, there is always the potential that concealed structures and / or contaminated materials may be present within the fill. Therefore, it is recommended that an unexpected finds protocol is prepared for the development works to ensure that due process is carried out in the event of a possible contaminated find during the works.

It is noted that elevated concentrations of PFAS were present in the groundwater samples recovered from the site. It is understood that groundwater at the site will not be used for drinking water or for irrigation. Therefore, the presence of PFAS in groundwater is not considered to affect site suitability. However, it is recommended that further investigation over the larger school site be undertaken to assess the potential source(s) and extent of PFAS impacted groundwater. This further investigation does not affect the proposed development.

Based on the results of the DSI it is considered that the site is suitable for the proposed development subject to the preparation and implementation of an unexpected finds protocol.

13. References

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

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

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

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

14. Limitations

Douglas Partners (DP) has prepared this report for this project at 240 Withers Road, Rouse Hill in accordance with DP's proposal dated 20 June 2022 and acceptance received from Mr Louis Liu of NSW Department of Education dated 1 July 2022. The work was carried out under contract No SINSW03429 dated 4 July 2022). This report is provided for the exclusive use of NSW Department of Education for this project only and for the purposes as described in the report. It should not be used by or relied upon for other projects or purposes on the same or other site or by a third party. Any party so relying upon this report beyond its exclusive use and purpose as stated above, and without the express written consent of DP, does so entirely at its own risk and without recourse to DP for any loss or damage. In preparing this report DP has necessarily relied upon information provided by the client and/or their agents.

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

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

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

This report must be read in conjunction with all of the attached notes 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.

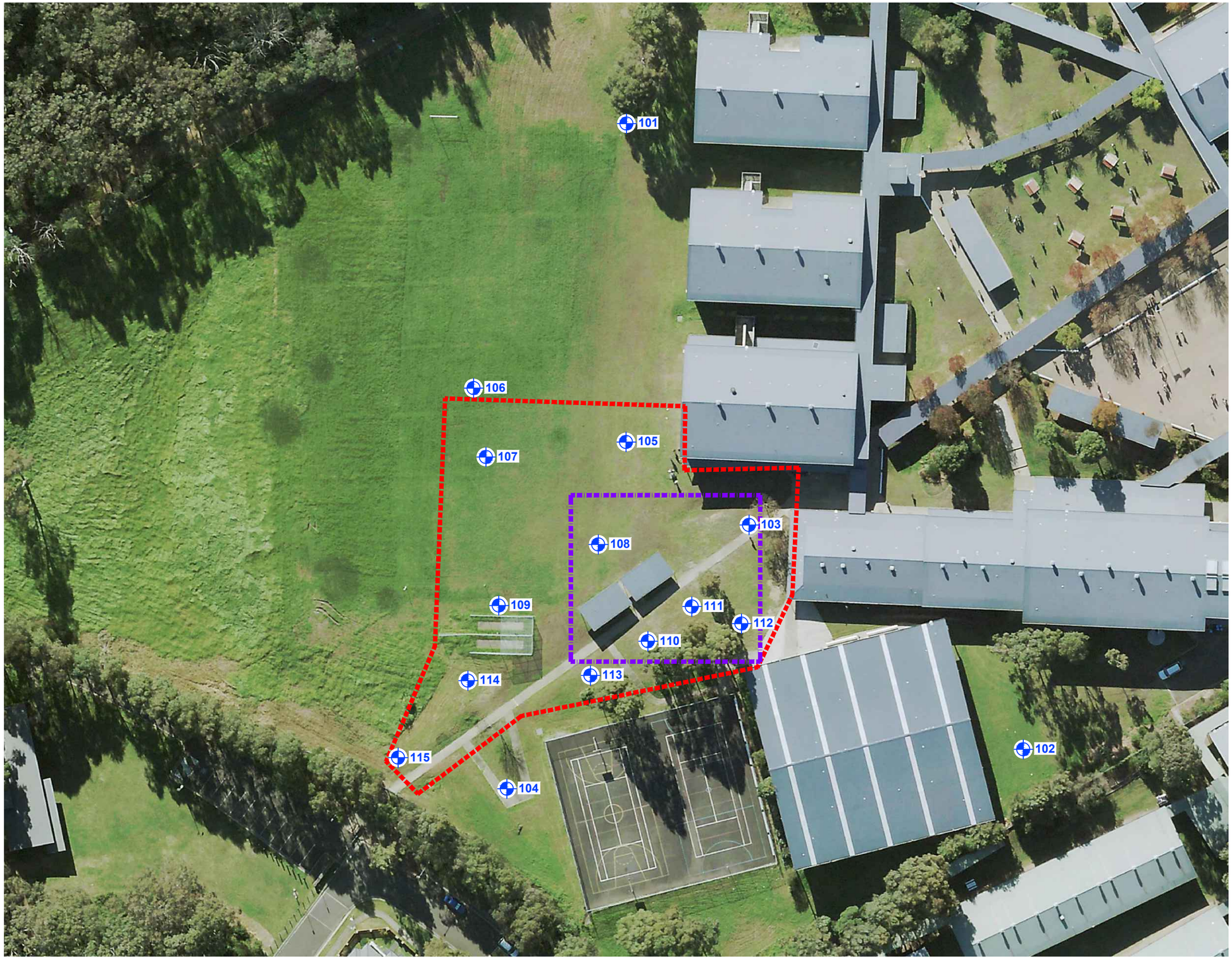
Asbestos has not been detected by observation or by laboratory analysis, either on the surface of the site, or in fill materials at the test locations sampled and analysed.

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

Douglas Partners Pty Ltd

Appendix A

Drawing 1



Location Plan

N

0 10 20 30 m

SCALE 1:750 (A3)

LEGEND:-

- Borehole Location and Number
- Approximate Footprint of Proposed New Building
- Approximate site area

NOTE:-

1. Test locations are approximate only and are shown with reference to existing site features.
2. Image obtained from Metromap. Date of imagery 06-06-2022.

Douglas Partners
Geotechnics | Environment | Groundwater

CLIENT: NSW Department of Education		
OFFICE: North West Sydney	DRAWN BY: JST	
SCALE: As shown	DATE: 2 November 2022	

TITLE: **Site and Test Location Plan**
Rouse Hill High School
240 Withers Road, Rouse Hill

PROJECT No:	215851.00
DRAWING No:	1
REVISION:	0

P:\NSW\215851.00\215851.00.D.001.Rev0.dwg

Appendix B

About This Report

About this Report

August 2020

Introduction

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

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

Copyright

Borehole and Test Pit Logs

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

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

Groundwater

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

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

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

Reports

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

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

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

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

continued next page

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.

intentionally blank

intentionally blank

Introduction to Terminology, Symbols and Abbreviations

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

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

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

Abbreviation Codes

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

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

Data Integrity Codes

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

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

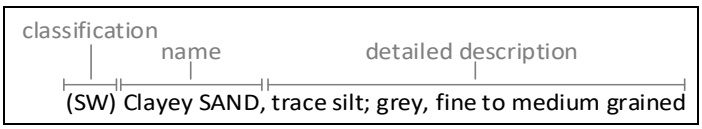
Graphic Symbols

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

intentionally blank

Introduction

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



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

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

Particle size designation and Behaviour Model

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

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

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

[1] – refer grain size subdivision descriptions below

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

Component proportions

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

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

[1] – As defined in AS1726-2017 6.1.4.4

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

Composite Materials

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

Classification

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

Soil Name

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

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

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

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

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

Identification of minor components

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

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

Soil Composition

Plasticity

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

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

Grain Size

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

Grading

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

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

intentionally blank

Soil Condition

Moisture

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

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

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

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

Consistency/Density/Compaction/Cementation/Extremely Weathered Rock

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

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

Quantitative engineering performance of these materials may be determined by laboratory testing, or estimated by correlated field tests (for example penetration or shear vane testing), or by tactile methods, as appropriate.

Consistency (fine grained soils)

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

Relative Density (coarse grained soils)

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

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

Compaction (anthropogenically modified soil)

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

Cementation (natural and anthropogenic)

Cementation Term	Abbreviation Code
Moderately cemented	MCE
Weakly cemented	WKCE
Cemented	CE
Strongly bound	SB
Weakly bound	WB
Unbound	UB

Extremely Weathered Rock

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

Soil Origin

Term	Description	Abbreviation Code
Residual	Derived from in-situ weathering of the underlying rock	RES
Extremely weathered material	Formed from in-situ weathering of geological formations. Has strength of less than 'very low' as per as1726 but retains the structure or fabric of the parent rock.	XWM
Alluvial	Deposited by streams and rivers	ALV
Estuarine	Deposited in coastal estuaries	EST
Marine	Deposited in a marine environment	MAR
Lacustrine	Deposited in freshwater lakes	LCS
Aeolian	Carried and deposited by wind	AEO
Colluvial	Soil and rock debris transported down slopes by gravity	COL
Topsoil	Mantle of surface soil, often with high levels of organic material	TOP
Fill	Any material which has been moved by man	FILL
Littoral	Deposited on the lake or sea shore	LIT
Unidentifiable	Not able to be identified	UID

Cobbles and Boulders

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

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

intentionally blank

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

[1] Assumes a ratio of 20:1 for UCS to $I_{s(50)}$. It should be noted that the UCS to $I_{s(50)}$ ratio varies significantly for different rock types and specific ratios may be required for each site.

On investigation logs only, the following data contiguity codes may be in rock strength tables for layers or seams of material "within rock", but for which the equivalent UCS strength is less than 0.6 MPa.

Scenario	Abbreviation Code
The material encountered has an equivalent UCS strength of less than 0.6 MPa, and therefore is considered to be soil (as per Note 1 of Table 20 of AS 1726-2017). The properties of the material encountered over this interval are described in the "Description of Strata" and soil properties columns.	SOIL
The material encountered has an equivalent UCS strength of less than 0.6 MPa, and therefore is considered to be soil (as per Note 1 of Table 20 of AS 1726-2017). The prominence of the material is such that it can be considered to be a seam (as defined in Table 22 of AS1726-2017) and the properties of the material are described in the defect column.	SEAM

Degree of Weathering

The degree of weathering of rock is classified as follows:

Weathering Term	Description	Abbreviation Code
Residual Soil[1,2]	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.	RS
Extremely weathered[1,2]	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	XW
Highly weathered	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.	HW
Moderately weathered	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.	MW
Slightly weathered	Rock is partially discoloured with staining or bleaching along joints but shows little or no change of strength from fresh rock.	SW
Fresh	No signs of decomposition or staining.	FR
Note: If HW and MW cannot be differentiated use DW (see below)		
Distinctly weathered	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.	DW

[1] – AS1726-2017 6.1.9 provides similar definitions for "residual soil" and "extremely weathered material" as soil origins. Generally, the soil origin terms would be used above the depth at which very low strength or stronger rock material is first encountered, while both soil origin and weathering should may be stated for soil encountered below the first contact with rock material, where appropriate.

[2] –The parent rock type, of which the residual/extremely weathered material is a derivative, will be stated in the description (where discernible).

Degree of Alteration

The degree of alteration of the rock material (physical or chemical changes caused by hot gasses or liquids at depth) is classified as follows:

Term	Description	Abbreviation Code
Extremely altered	Material is altered to such an extent that it has soil properties. Mass structure and material texture and fabric of original rock are still visible.	XA
Highly altered	The whole of the rock material is discoloured, usually by staining or bleaching to the extent that the colour of the original rock is not recognisable. Rock strength is changed by alteration. Some primary minerals are altered to clay minerals. Porosity may be increased by leaching, or may be decreased due to precipitation of secondary materials in pores.	HA
Moderately altered	The whole of the rock material is discoloured, usually by 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.	MA
Slightly altered	Rock is slightly discoloured but shows little or no change of strength from fresh rock	SA
Note: If HA and MA cannot be differentiated use DA (see below)		
Distinctly altered	Rock strength usually changed by alteration. The rock may be highly discoloured, usually by staining or bleaching. Porosity may be increased by leaching, or may be decreased due to precipitation of secondary minerals in pores.	DA

Degree of Fracturing

The following descriptive classification apply to the spacing of natural occurring fractures in the rock mass. It includes bedding plane partings, joints and other defects, but excludes drilling breaks. These terms are generally not required on investigation logs where fracture spacing is presented as a histogram, and where used are presented in an unabbreviated format.

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

These terms may be used to describe the spacing of bedding partings in sedimentary rocks. Where used, these terms are generally presented in an unabbreviated format

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

Defect Descriptions

Defect Type

Term	Abbreviation Code
Bedding plane	B
Clay seam	CS
Cleavage	CV
Crushed zone	CZ
Decomposed seam	DS
Fault	F
Joint	J
Lamination	LAM
Parting	PT
Sheared zone	SZ
Vein	VN
Drilling/handling break	DB , HB
Fracture	FCT

Rock Defect Orientation

Term	Abbreviation Code
Horizontal	H
Vertical	V
Sub-horizontal	SH
Sub-vertical	SV

Rock Defect Coating

Term	Abbreviation Code
Clean	CLN
Coating	CO
Healed	HE
Infilled	INF
Stained	STN
Tight	TI
Veneer	VEN

Rock Defect Infill

Term	Abbreviation Code
Calcite	CA
Carbonaceous	CBS
Clay	CLY
Iron oxide	FE
Manganese	MN
Silty	SLT

intentionally blank

Rock Defect Shape/Planarity

Term	Abbreviation Code
Curved	CU
Irregular	IR
Planar	PL
Stepped	ST
Undulating	UN

Rock Defect Roughness

Term	Abbreviation Code
Polished	PO
Rough	RO
Slickensided	SL
Smooth	SM
Very rough	VR

Other Rock Defect Attributes

Term	Abbreviation Code
Fragmented	FG
Band	BND
Quartz	QTZ

Defect Orientation

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

intentionally blank

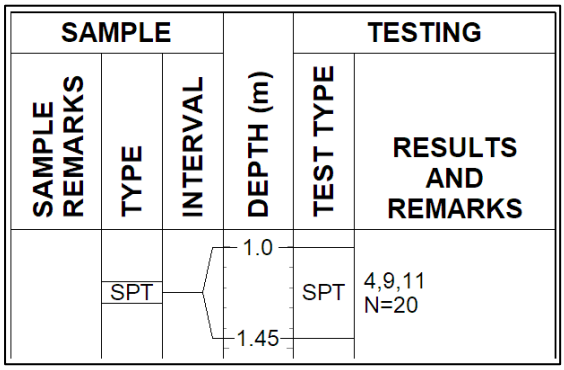
Sampling, Testing and Excavation Methodology

Terminology
Symbols
Abbreviations

August 2020

Sampling and Testing

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



Sampling

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

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

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

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

Field and Laboratory Testing

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

Test Type	Code
Pocket penetrometer (kpa)	PP
Photo ionisation detector	PID
Standard Penetration Test	SPT
Shear vane (kpa)	V
Unconfined compressive strength, (MPa)	UCS
Point load test, axial (A), diametric (D), irregular (I)	PLT(_)

Field and laboratory testing (continued)

Test Type	Code
Dynamic cone penetrometer, followed by blow count penetration increment in mm (cone tip, generally in accordance with AS1289.6.3.2)	DCP/150
Perth sand penetrometer, followed by blow count penetration increment in mm (flat tip, generally in accordance with AS1289.6.3.3)	PSP/150

Groundwater Observations

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

Drilling or Excavation Methods/Tools

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

Method	Abbreviation Code
Excavator/backhoe bucket	B[1]
Toothed bucket	TB[1]
Mud/blade bucket	MB[1]
Ripping tyne/ripper	RT
Rock breaker/hydraulic hammer	RB
Hand auger	HA[1]
NMLC series coring	NMLC
HMLC series coring	HMLC
NQ coring	NQ
HQ coring	HQ
PQ coring	PQ
Push tube	PT [1]
Rock roller	RR[1]
Solid flight auger. Suffixes (TC) and (V) indicate tungsten carbide or v-shaped tip respectively	SFA[1]
Sonic drilling	SON[1]
Vibrocore	VC[1]
Wash bore (unspecified bit type)	WB[1]
Existing exposure	X
Hand tools (unspecified)	HT
Predrilled	PD
Specialised bit (refer report)	SPEC[1]
Diatube	DT[1]
Hollow flight auger	HFA[1]
Vacuum excavation	VE

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

Appendix C

Title Deeds

ABN: 36 092 724 251
Ph: 02 9099 7400
(Ph: 0412 199 304)

Level 14, 135 King Street, Sydney
Sydney 2000
GPO Box 4103 Sydney NSW 2001
DX 967 Sydney

Summary of Owners Report

Address: Rouse Hill High School - 240 Withers Road, Rouse Hill, NSW 2155

Description: - Lot 105 D.P. 1108407

Date of Acquisition and term held	Registered Proprietor(s) & Occupations where available	Reference to Title at Acquisition and sale
11.03.1922 (1922 to 1924)	Edward Charles Baker (Grazier)	Volume 3387 Folio 133
04.11.1924 (1924 to 1938)	Barclay Thomson Wright (Grazier)	Volume 3387 Folio 133
01.03.1938 (1938 to 1954)	J.N. Brimbecom Pty. Limited	Volume 3387 Folio 133 Now Volume 6066 Folio 139
28.06.1954 (1954 to 1962)	Ian Conrad Scharkie (Garage Proprietor now Farmer) Robert Fyfe Scharkie (Dairy Farmer now Farmer) Neil Lester Scharkie (Garage Proprietor)	Volume 6066 Folio 139 Now Volume 6861 Folios 82 to 84
09.08.1962 (1962 to 1973)	Ian Conrad Scharkie (Garage Proprietor now Farmer) Robert Fyfe Scharkie (Dairy Farmer now Farmer)	Volume 6861 Folios 82 to 84 Then Volume 8439 Folios 145 to 146 Now Volume 10273 Folio 225
31.07.1973 (1973 to 1976)	Somerset Developments Pty. Limited	Volume 10273 Folio 225
22.04.1976 (1976 to 1980)	Taliac Pty. Limited	Volume 10273 Folio 225
02.12.1980 (1980 to 2007)	Minister Administering the Environmental Planning and Assessment Act 1979	Volume 10273 Folio 225 Then 1/518011 Then 16/830418 Then 100/1060353 Then 1/1077971 Now 105/1108407
03.08.2007 (2007 to Date)	# Minister for Education and Training	105/1108407

 # Denotes current registered proprietor

Continued Over.

ABN: 36 092 724 251
Ph: 02 9099 7400
(Ph: 0412 199 304)

Level 14, 135 King Street, Sydney
Sydney 2000
GPO Box 4103 Sydney NSW 2001
DX 967 Sydney

Leases: -

- 21.03.2014 (AI398073): Lease to Axiom Education NSW N. 2 Pty Limited being Rouse Hill High School, 105 Withers Road, Rouse Hill. Expires: 31.12.2035.
    - 21.03.2014 (AI398074): Lease of Lease AI3980973 to Minister for Education being Rough Hill High School, 105 Withers Road, Rouse Hill. Expires: 30.12.2035.

Easements: -

- 05.02.2009 (AE407311): Easement for Padmount Substation 5.5 wide affecting the pat designated (A) in plan with AE407311.

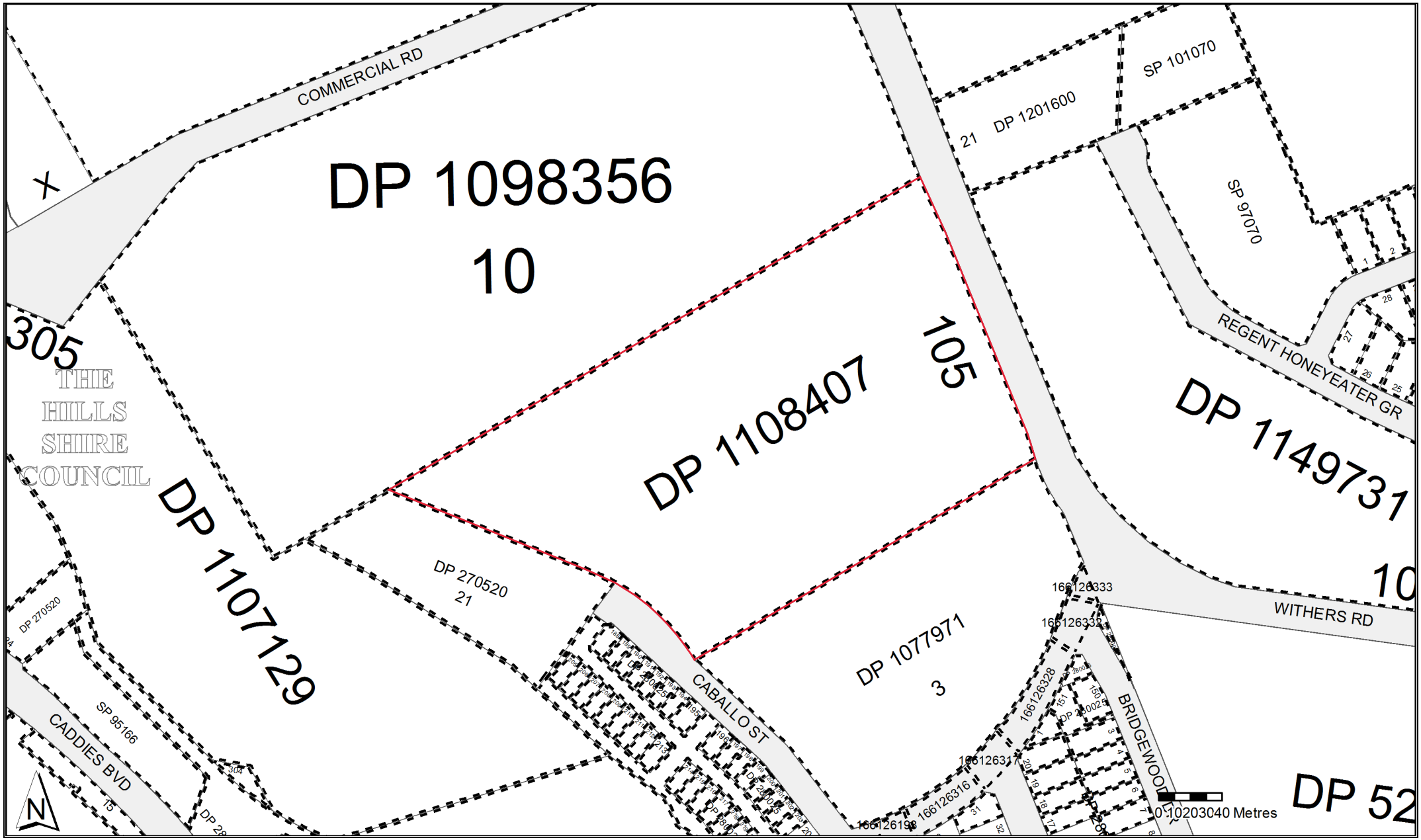
Yours Sincerely
Taylor Wilson
18th July 2022

Email: mark.groll@infotrack.com.au
Email: taylor.wilson@infotrack.com.au

Cadastral Records Enquiry Report : Lot 105 DP 1108407

Ref : Rouse Hill High School

Locality : ROUSE HILL
Parish : CASTLE HILL
LGA : THE HILLS SHIRE
County : CUMBERLAND



This information is provided as a searching aid only.Whilst every endeavour is made to ensure that current map, plan and titling information is accurately reflected, the Registrar General cannot guarantee the information provided. For ALL ACTIVITY PRIOR TO SEPTEMBER 2002 you must refer to the RGs Charting and Reference Maps

	Status	Surv/Comp	Purpose
DP386388			
Lot(s): 1			
DP1092662	REGISTERED	SURVEY	EASEMENT
DP1141979	REGISTERED	SURVEY	EASEMENT
DP590193			
Lot(s): 21			
DP1151382	REGISTERED	SURVEY	EASEMENT
DP1077971			
Lot(s): 3, 4			
DP589837	HISTORICAL	COMPILATION	SUBDIVISION
DP830418	HISTORICAL	SURVEY	RESUMPTION OR ACQUISITION
DP1060353	HISTORICAL	SURVEY	ROADS ACT, 1993
DP1098356			
Lot(s): 10			
DP363564	HISTORICAL	SURVEY	UNRESEARCHED
DP1107129			
Lot(s): 304, 305			
DP830418	HISTORICAL	SURVEY	RESUMPTION OR ACQUISITION
DP1108407	HISTORICAL	SURVEY	SUBDIVISION
Lot(s): 304			
DP589837	HISTORICAL	COMPILATION	SUBDIVISION
DP833071	HISTORICAL	SURVEY	RESUMPTION OR ACQUISITION
DP1040963	HISTORICAL	SURVEY	ROADS ACT, 1993
DP1060353	HISTORICAL	SURVEY	ROADS ACT, 1993
DP1077971	HISTORICAL	SURVEY	SUBDIVISION
DP1093612	HISTORICAL	SURVEY	ROADS ACT, 1993
DP1096167	HISTORICAL	SURVEY	SUBDIVISION
DP1108407			
Lot(s): 105			
DP270520	REGISTERED	SURVEY	COMMUNITY SUBDIVISION PLAN
DP589837	HISTORICAL	COMPILATION	SUBDIVISION
DP830418	HISTORICAL	SURVEY	RESUMPTION OR ACQUISITION
DP833071	HISTORICAL	SURVEY	RESUMPTION OR ACQUISITION
DP1040963	HISTORICAL	SURVEY	ROADS ACT, 1993
DP1060353	HISTORICAL	SURVEY	ROADS ACT, 1993
DP1077971	HISTORICAL	SURVEY	SUBDIVISION
DP1125374			
Lot(s): 4011			
DP280009	REGISTERED	SURVEY	PRECINCT SUBDIVISION PLAN
DP280025	REGISTERED	SURVEY	PRECINCT PLAN
DP280025	REGISTERED	SURVEY	PRECINCT SUBDIVISION PLAN
DP589837	HISTORICAL	COMPILATION	SUBDIVISION
DP830418	HISTORICAL	SURVEY	RESUMPTION OR ACQUISITION
DP833071	HISTORICAL	SURVEY	RESUMPTION OR ACQUISITION
DP1040963	HISTORICAL	SURVEY	ROADS ACT, 1993
DP1060353	HISTORICAL	SURVEY	ROADS ACT, 1993
DP1077971	HISTORICAL	SURVEY	SUBDIVISION
DP1093612	HISTORICAL	SURVEY	ROADS ACT, 1993
DP1096167	HISTORICAL	SURVEY	SUBDIVISION
DP1107129	HISTORICAL	SURVEY	SUBDIVISION
DP1108407	HISTORICAL	SURVEY	SUBDIVISION
DP1111687	HISTORICAL	COMPILATION	SUBDIVISION
DP1140711			
Lot(s): 101			
DP801012	HISTORICAL	SURVEY	SUBDIVISION
DP1171547	REGISTERED	SURVEY	SUBDIVISION
DP1210912	REGISTERED	SURVEY	EASEMENT

PLAN FORM 2

Plan Drawing only to appear in this space

SIGNATURE AND SEALS ONLY.

Signed for SYDNEY WATER CORPORATION by its Attorneys JEFFREY FRANCIS COLENSO and ROSS ROLAND WYNN who hereby state at the time of executing this instrument have no notice of the revocation of the Power of Attorney Registered No. 373 Book 4146 under Authority of which this instrument has been executed.

I hereby certify that I have no notice of the revocation of such delegation.

Department of Lands Approval

I, ... in approving this plan certify (Authorised Officer) that all necessary approvals in regard to the allocation of the land shown hereon have been given.

Signature: .....

Date: .....

File Number: .....

Office: .....

Subdivision Certificate

I certify that the provisions of s. 109J of the Environmental Planning and Assessment Act 1979 have been satisfied in relation to the proposed SUBDIVISION set out herein (Insert 'subdivision' or 'new road')

*Authorised Person/~~General Manager~~/~~Accredited Certifier~~

Consent Authority BAULKHAM HILLS SHIRE COUNCIL

Date of endorsement 15.01.2007

Accreditation No. —

Subdivision Certificate No. 10320

File No. 454-07

When the plan is to be lodged electronically in the Land Titles Office, it should include a signature in an electronic or digital format approved by the Registrar-General.

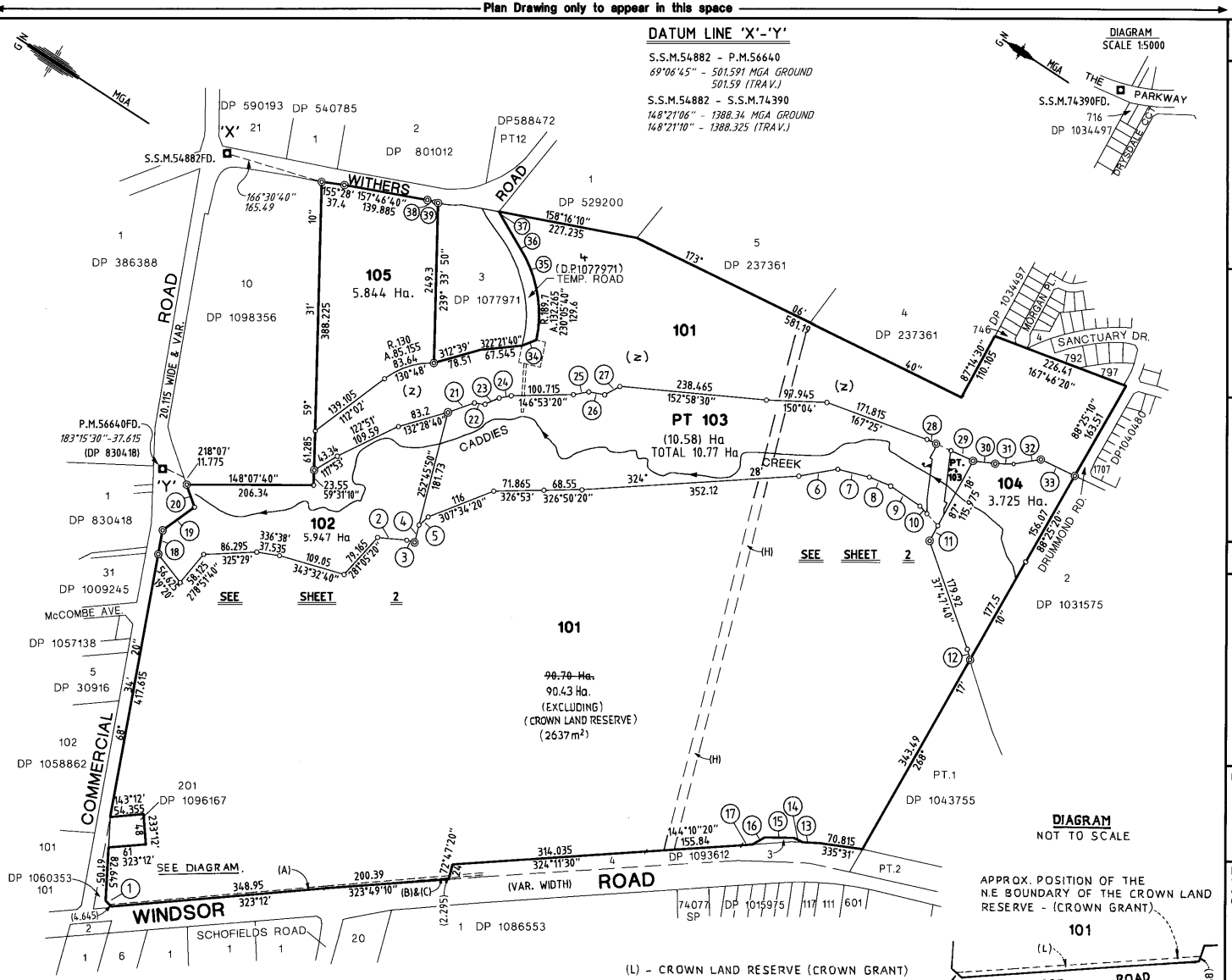
*Delete whichever is inapplicable.

DATUM LINE 'X'-'Y'

S.S.M.54882 - P.M.56640
69°06'45" - 501.591 MGA GROUND
501.59 (TRAV.)

S.S.M.54882 - S.S.M.74390
148°27'06" - 1388.34 MGA GROUND
148°21'10" - 1388.325 (TRAV.)

DIAGRAM SCALE 1:5000



(L) - CROWN LAND RESERVE (CROWN GRANT)
(z) - BENEFITED BY - DP 1077971 - EASEMENT TO DRAIN WATER 4 WIDE

(A) - EASEMENT FOR WATER SUPPLY WORKS 3.5 WIDE (O 102909) (SEE DP 647991).
(B) - PROPOSED ROAD WIDENING VIDE (DP 446436)
(C) - RESTRICTION ON THE USE OF LAND (H 709057).
(H) - LAND EXCLUDES MINERALS - SEE CROWN GRANT

SCHEDULE OF BOUNDARY LINES

No.	BEARING	DISTANCE	ARC.	RAD.	No.	BEARING	DISTANCE	ARC.	RAD.	No.	BEARING	DISTANCE	ARC.	RAD.
1	192°19'40"	13.11			14	173°45'	15.89			27	119°07'40"	27.87		
2	332°55'40"	47.385			15	149°10'	53.36			28	171°57'	15.755		
3	343°14'	13.235			16	118°47'	22.915			29	171°57'	38.645		
4	252°45'50"	28.425			17	324°15'	17.225			30	154°27'20"	36.26		
5	287°13'40"	19.32	19.33	195.41	18	68°34'20"	37.83			31	148°53'40"	30.015		
6	318°08'	63.995			19	112°44'	62.84			32	138°25'	44.685		
7	341°28'	52.7			20	38°07'	37.24			33	172°42'	60.74		
8	349°30'20"	37.19			21	128°10'40"	45.385			34	127°36'	24.925		
9	1°12'	56.55			22	154°47'	17.4			35	208°07'30"	31.975	31.98	459.5
10	14°08'40"	15.53			23	124°45'20"	24.93			36	206°08'	45.22		
11	87°18'	27.085			24	139°16'40"	20.155			37	203°44'40"	6.3		
12	42°38'40"	17.355			25	138°52'40"	25.94			38	162°46'	8.395	8.4	89
13	330°10'20"	20.675			26	158°02'20"	25.59			39	163°52'	6.185	6.185	111

SURVEYING REGULATION 2006 : CLAUSE 61(2)

MARK	M.G.A. CO-ORDINATES EASTING	M.G.A. CO-ORDINATES NORTHING	ZONE	CLASS	ORDER
P.M.56640	307860·435	6270809·479	56	B	2
S.S.M.54882	308329·083	6270988·321	56	B	2
S.S.M.74390	309057·584	6269806·401	56	C	3

SOURCE:- M.G.A. CO-ORDINATES ADOPTED FROM L.P.I. N.S.W. AT 10 SEPT 2006 COMBINED SCALE FACTOR:- 1·000044

DP1108407

Registered: 22-3-2007

C.A: SEE CERTIFICATE

Title System: TORRENS

Purpose: SUBDIVISION

Ref. Map: U9167-4

Last Plan: DP 830418, DP 833071, DP 1077971, DP 1096167, DP 1093612

PLAN OF SUBDIVISION OF LOTS 1 & 5 DP1077971 LOT 7 DP833071 LOT 202 DP1096167 LOT 2 DP1093612 LOT 13 DP830418

Lengths are in metres. Reduction Ratio 1:5000

L G A: BAULKHAM HILLS

Locality: ROUSE HILL

Parish: CASTLE HILL

County: CUMBERLAND

This is sheet 1 of my plan in 2 sheets. (Delete if inapplicable).

Surveying Regulation 2006

I, ROBERT BERNARD GALLAGHER of PROUST & GARDNER CONSULTING P/L. 406 PACIFIC HIGHWAY, LINDFIELD a surveyor registered under the Surveying Act 2002, certify that the survey represented in this plan is accurate, has been made in accordance with the Surveying Regulation 2006 and was completed on 23 NOVEMBER 2006

The survey relates to LOTS 101-105 PART OF LOT 101 IS COMPILED. (specify the land actually surveyed or specify any land shown in the plan that is not the subject of the survey)

(Signature) ..... Dated: 30/11/06

Surveyor registered under the Surveying Act 2002

Datum Line: 'X' - 'Y'

Type: Urban/~~Rural~~

Plans used in preparation of survey/compilation.

D.P. 1096167 D.P. 1077971
D.P. 1093612 D.P. 830418
D.P. 833071 D.P. 1006402
D.P. 1030189 D.P. 647991
D.P. 1060353

PANEL FOR USE ONLY for statements of intention to dedicate public roads, to create public reserves, drainage reserves, easements, restrictions on the use of land or positive covenants.

PLAN AMENDED BY A.R. MILLER 14.3.07

SURVEYOR'S REFERENCE: 21478/DP/004 REPORT

2006 M7100 (1389) PARTIAL SURVEY

WARNING: CREASING OR FOLDING WILL LEAD TO REJECTION

PLAN FORM 3 | To be used in conjunction with Plan Form 2 | WARNING: CREASING OR FOLDING WILL LEAD TO REJECTION

DP1108407

Registered: 22.3.2007

This is sheet 2 of my plan in 2 sheets dated 30/11/06

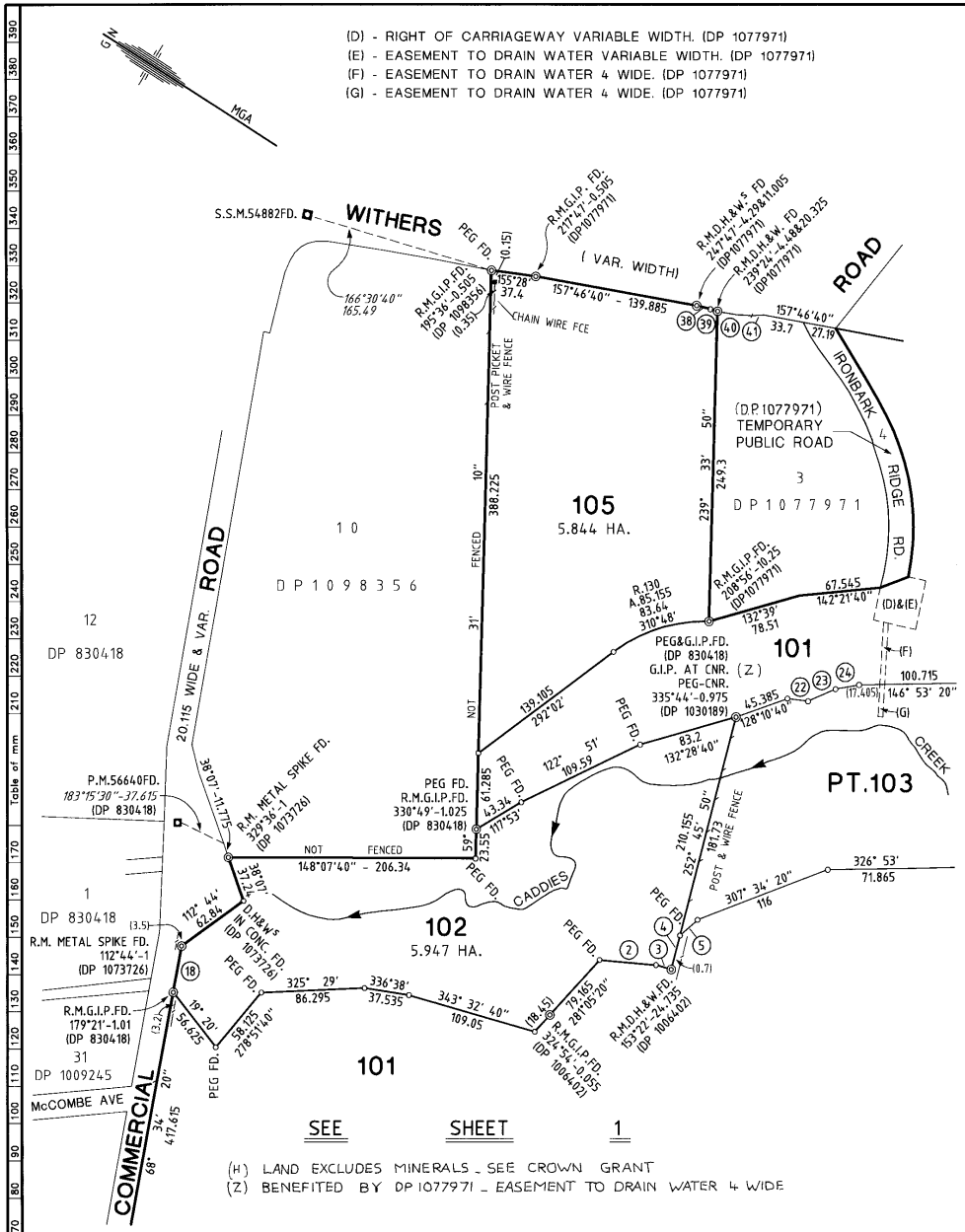
Surveyor registered under the Surveying Act 2002

This is sheet 2 of the plan of 2 sheets covered by subdivision certificate No. 10320 of 15.01.2007

Authorised Person/~~General Manager~~/~~Accredited Certifier~~

For use where space is insufficient in any panel on Plan Form 2

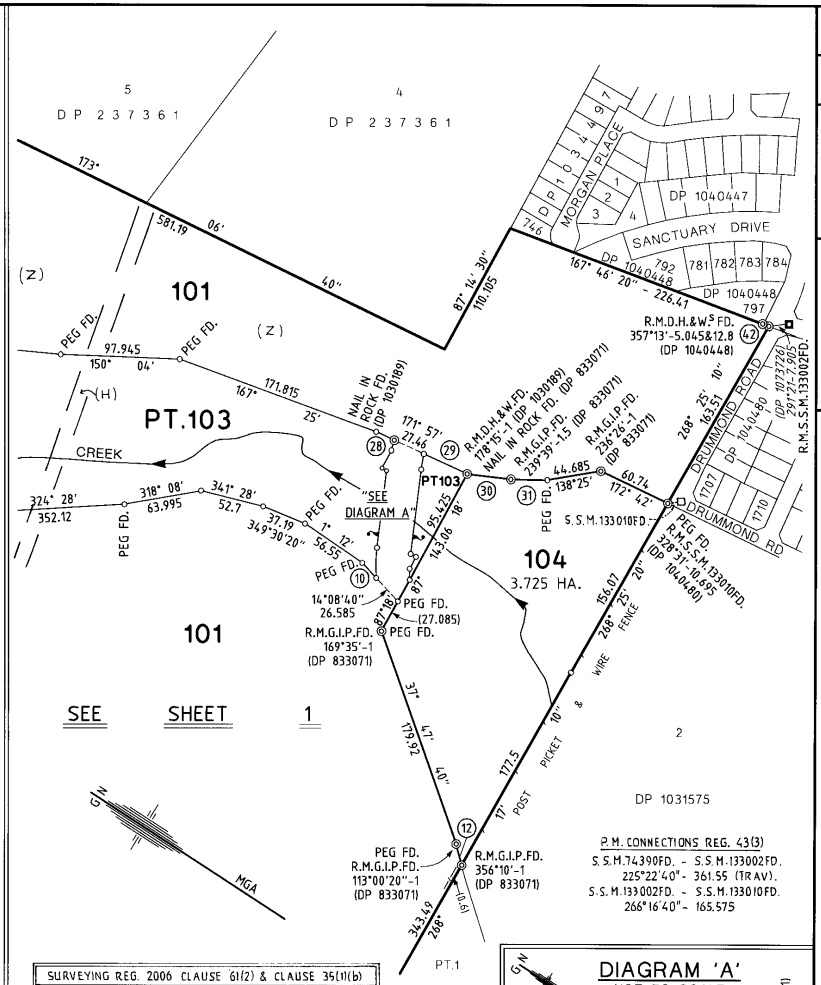
(D) - RIGHT OF CARRIAGEWAY VARIABLE WIDTH. (DP 1077971)
(E) - EASEMENT TO DRAIN WATER VARIABLE WIDTH. (DP 1077971)
(F) - EASEMENT TO DRAIN WATER 4 WIDE. (DP 1077971)
(G) - EASEMENT TO DRAIN WATER 4 WIDE. (DP 1077971)



(H) LAND EXCLUDES MINERALS _ SEE CROWN GRANT
(Z) BENEFITED BY DP 1077971 _ EASEMENT TO DRAIN WATER 4 WIDE

SCHEDULE OF BOUNDARY LINES

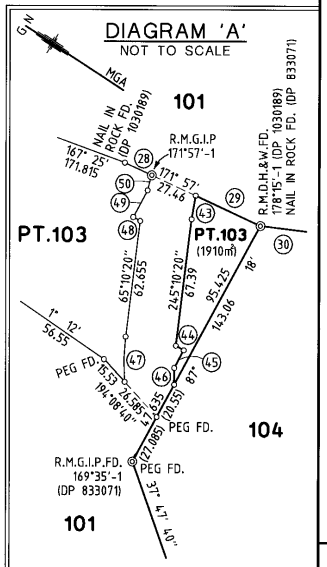
No.	BEARING	DISTANCE	ARC	RAD.	No.	BEARING	DISTANCE	ARC	RAD.
2	332°55'40"	47.385			23	124°45'20"	24.93		
3	343°14'	13.235			24	139°16'40"	20.155		
4	252°45'50"	(28.425)			38	162°46'	8.395	8.4	89
5	287°13'40"	19.32	19.33	195.41	39	163°52'	6.185	6.185	111
18	68°34'20"	37.83			40	154°51'40"	28.635	28.715	111
22	154°47'	17.4			41	145°55'	9.885	9.885	185.2



SURVEYING REG. 2006 CLAUSE 61(2) & CLAUSE 35(11)(b)					
MARK	M.G.A. CO-ORDINATES		CLASS	ORDER	ORIGIN
	EASTING	NORTHING			
SSM133002	308800.228	6269552.447	C	3	SCIMS
SSM133010	308635.017	6269541.670	C	3	SCIMS
MGA CO-ORDINATES OF MARKS WITH SCIMS ORIGIN ARE AS AT 18/1/07 COMBINED SCALE FACTOR 1.000044 ZONE 56					

SCHEDULE OF BOUNDARY LINES

No.	BEARING	DISTANCE	ARC	RAD.
10	14°08'40"	15.53		
12	42°38'40"	17.355		
28	171°57'	15.755		
29	171°57'	38.645		
30	154°27'20"	36.26		
31	148°53'40"	30.015		
42	167°46'20"	(4.075)		
43	247°49'	12.715	12.72	138.015
44	176°50'	4.46		
45	266°50'	9.57		
46	238°33'	8.98	8.98	109
47	59°37'	22.415	22.45	115.785
48	356°50'	3.815		
49	86°49'40"	14.215		
50	73°40'	10.33	10.33	144.63



Reduction Ratio 1: 3000

PLAN AMENDED BY A.R. MILLER 14.3.07

Plan Drawing only to appear in this space

SURVEYOR'S REFERENCE: 21478/DP/004

10273225

[redacted]FICATE OF TITLE

NEW SOUTH WALES — RTY ACT, 1900, as amended.

Application No. 22416

F[redacted]

ID [redacted]

CANCELLED

Edition issued 21-3-1966

SEE AUTO FOLIO

Vol. 10273 Fol. 225

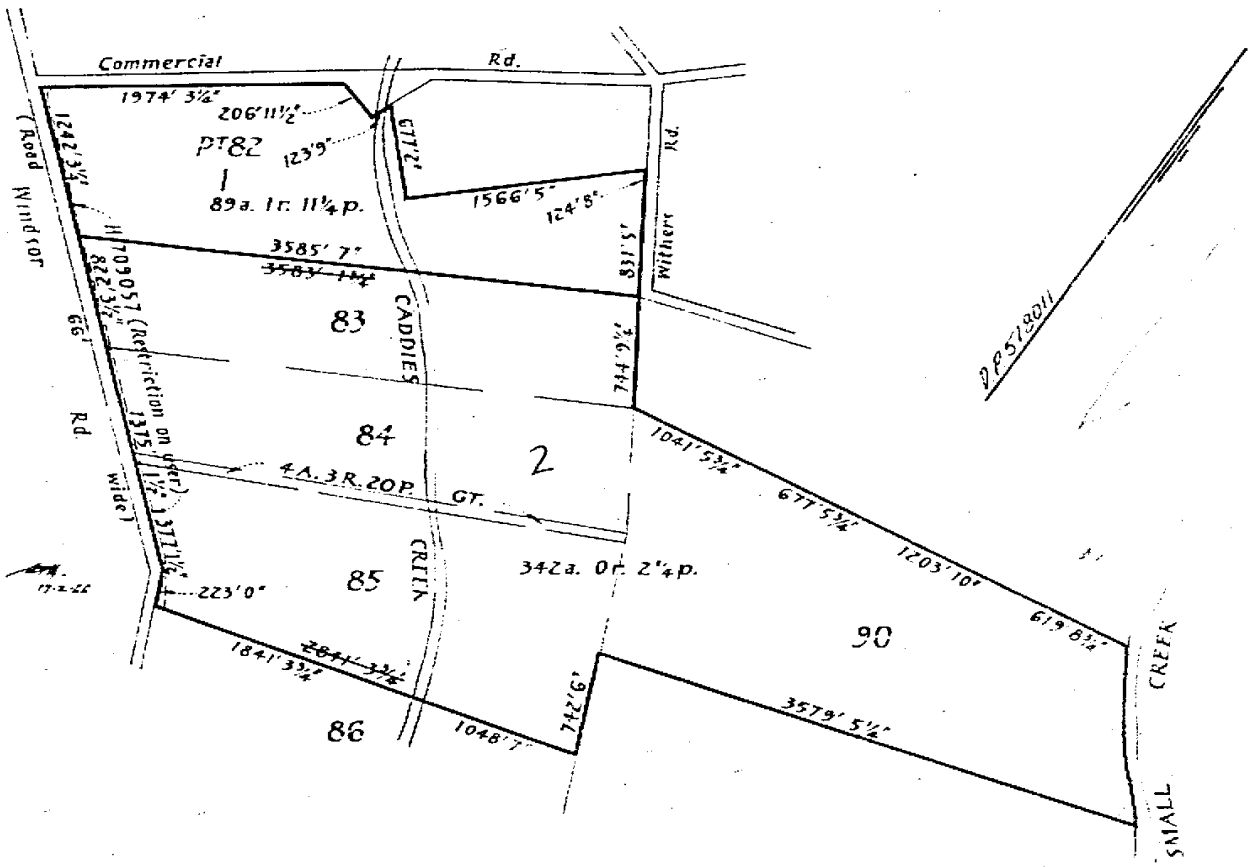
(Page 1)

I certify that the person described in the First Schedule is the registered proprietor of the undermentioned estate in the land within described subject nevertheless to such exceptions encumbrances and interests as are shown in the Second Schedule.

Witness J. Charles

Registrar General.

PLAN SHOWING LOCATION OF LAND



ESTATE AND LAND REFERRED TO

Estate in Fee Simple in Lot 1 in Deposited Plan 518011 in the Shire of Baulkham Hills Parish of Castle Hill and County of Cumberland Excepting thereout the land within 50 feet from the centre of Hawkesbury (now Windsor) Road for a wider one reserved by the Crown Grant.

FIRST SCHEDULE (continued overleaf)

I [redacted] both of Rouse Hill, F[redacted], as Tenants in Common in equal shares.

Registrar General

GRY

SECOND SCHEDULE (continued overleaf)

1. Reservations and conditions, if any, contained in the Crown Grant above referred to.
2. Restriction on user No. H709057 of part of the land above described — See Section 27E(6) Main Roads Act 1924 Entered 15-6-1962.
3. Mortgage No. J378930 to The English Scottish and Australian Bank Limited Entered 12-7-1963. Discharged 0393754

Registrar General

NOTE: ENTRIES RULED THROUGH AND AUTHENTICATED BY THE SEAL OF THE REGISTRAR GENERAL ARE CANCELLED

PT 1 , 17 V.C.N. Blight, Government Printer

Vol. 10273 Fol 225

FIRST SCHEDULE (continued)

REGISTERED PROPRIETOR	INSTRUMENT NATURE	INSTRUMENT NUMBER	INSTRUMENT DATE	ENTERED	Signature of Registrar-General
[redacted]	[redacted]				

N392754 STC — 6

N405064 Registered 31.7.1973 P551609 — 10 — 12 — 13

P559311 M

S182561 — 6

S900950 — 5/9

SECOND SCHEDULE (continued)

INSTRUMENT NATURE	INSTRUMENT NUMBER	INSTRUMENT DATE	PARTICULARS	ENTERED	Signature of Registrar-General	CANCELLATION		
Mortgage	N392756	31-7-1973	to Jan Conrad Schaake and Robert Tyfe Schaake both of Rouse Hill, Farmers	22-10-1973		Discharged	P551612	
Mortgage	N405064	31-7-1973	to Industrial Acceptance Corporation Limited	22-10-1973		Discharged	P551610	
Mortgage	P559311		to Industrial Acceptance Corporation Limited	22-4-1976		Discharged	S182561	
S900950	Lease to New South Wales Postal Institute Members Club Limited, with Option of Renewal. Expires: 12.11.1986. Registered 3.2.1982.							

CANCELLED SEE AUTO FOLIO

(Page 2 of 2 pages)

NOTE: ENTRIES RULED THROUGH AND AUTHENTICATED BY THE SEAL OF THE REGISTRAR-GENERAL ARE CANCELLED

NEW SOUTH WALES LAND REGISTRY SERVICES - HISTORICAL SEARCH

SEARCH DATE
29/7/2022 7:39PM

FOLIO: 1/1077971

First Title(s): VOL 3627 FOL 1 OLD SYSTEM
Prior Title(s): 61/589837 2/1040963
100/1060353

Recorded	Number	Type of Instrument	C.T. Issue
18/3/2005	DP1077971	DEPOSITED PLAN	FOLIO CREATED EDITION 1
7/9/2005	AB752671	DEPARTMENTAL DEALING	
22/3/2007	DP1108407	DEPOSITED PLAN	FOLIO CANCELLED

*** END OF SEARCH ***

Rouse Hill High School PRINTED ON 29/7/2022

NEW SOUTH WALES LAND REGISTRY SERVICES - HISTORICAL SEARCH

SEARCH DATE

29/7/2022 7:39PM

FOLIO: 105/1108407

First Title(s): OLD SYSTEM
Prior Title(s): 1/1077971

Recorded	Number	Type of Instrument	C.T. Issue
22/3/2007	DP1108407	DEPOSITED PLAN	FOLIO CREATED EDITION 1
22/3/2007	AD8421	DEPARTMENTAL DEALING	EDITION 2
3/8/2007	AD284208	TRANSFER	EDITION 3
5/2/2009	AE407311	TRANSFER GRANTING EASEMENT	
5/2/2009	AE407310	REQUEST	EDITION 4
15/6/2010	DP270520	DEPOSITED PLAN	
18/6/2010	AF561622	APPLICATION FOR REPLACEMENT CERTIFICATE OF TITLE	EDITION 5
21/3/2014	AI398073	LEASE	
21/3/2014	AI398074	SUB-LEASE	EDITION 6

*** END OF SEARCH ***

Form: 01T
Release: 3.3
www.lands.nsw.gov.au

TRANSFER

New South Wales
Real Property Act 1900

AD284208J

PRIVACY NOTE: Section 31B of the Real Property Act 1900 (RP Act) authorises the Registrar General to collect the information required by this form for the establishment and maintenance of the Real Property Act Register. Section 96B RP Act requires that the Register is made available to any person for search upon payment of a fee, if any.

STAMP DUTY Office of State Revenue use only

Crown Instrument not liable to Stamp Duty
Section 308 Duties Act 1997 No 123
I. V. KNIGHT Crown Solicitor
Per

(A) [redacted]
1 [redacted] 7

(B) **LODGED BY**

Document Collection Box	Name, Address or DX, Telephone, and LLPN if any	CODES
813E	Crown Solicitor's Office DX 19 Sydney 123589U Tel: (02) 9224 5273 Reference: 200701460 PEC	T TW (Sheriff)

(C) T [redacted] R
[redacted] 9
(ABN: 36 691 806 169)

(D) **CONSIDERATION** The transferor acknowledges receipt of the consideration of $ 19,800,000.00 and as regards

(E) **ESTATE** the above folio of the Register transfers to the transferee an estate in fee simple

(F) **SHARE TRANSFERRED**

(G) Encumbrances (if applicable):

(H) [redacted] E
[redacted] G (ABN:40 300 173 822)

(I) **TENANCY:**

DATE 13 JULY 2007

(J) I certify that the person(s) signing opposite, with whom I am personally acquainted or as to whose identity I am otherwise satisfied, signed this instrument in my presence.

Signature of witness:

Name of witness:
Address of witness:

Certified correct for the purposes of the Real Property Act 1900 by the authorised officer named below.

"See annexure"

Signature of authorised officer:

Authorised officer's name:
Authority of officer:
Signing on behalf of:

Certified correct for the purposes of the Real Property Act 1900 by the person whose signature appears below.

Signature: I. V. Knight
I. V. KNIGHT
Crown Solicitor
par

Signatory's name:
Signatory's capacity: Solicitor for Transferee

RELODGED
26 JUL 2007
TIME: 11.25

ALL HANDWRITING MUST BE IN BLOCK CAPITALS.
0706

DEPARTMENT OF LANDS
LAND AND PROPERTY INFORMATION DIVISION

NB1 1073726
PLAN/ACC

Annexure "A" **to** Transfer

Parties: The Minster administering the Environmental Planning and Assessment Act, 1979 and The Minister for Education and Training

Dated

SIGNED by me, Peter Lee , Director Land Management Branch,
Department of Planning as delegate of THE MINISTER
ADMINISTERING THE ENVIRONMENTAL PLANNING
AND ASSESSMENT ACT 1979, as a Corporation Sole.
I hereby certify that I have no notification of
revocation of such delegation: and in the presence of:

N. Lennon
.....
Signature of witness

NICHOLAS LENNON.
.....
Name of witness (block letters)

10 Valentine St
Parramatta
NSW 2150

P Lee
.....
Signature of delegate

Peter Lee, Delegate of the Miniter administering the Environmental Planning and Assessment Act, 1979

NEW SOUTH WALES LAND REGISTRY SERVICES - TITLE SEARCH

FOLIO: 105/1108407

SEARCH DATE	TIME	EDITION NO	DATE
29/7/2022	7:38 PM	6	21/3/2014

LAND

LOT 105 IN DEPOSITED PLAN 1108407
AT KELLYVILLE
LOCAL GOVERNMENT AREA THE HILLS SHIRE
PARISH OF CASTLE HILL COUNTY OF CUMBERLAND
TITLE DIAGRAM DP1108407

FIRST SCHEDULE

MINISTER FOR EDUCATION AND TRAINING (T AD284208)

SECOND SCHEDULE (6 NOTIFICATIONS)

---

1 RESERVATIONS AND CONDITIONS IN THE CROWN GRANT(S)
2 DP1077971 EASEMENT TO DRAIN WATER APPURTENANT TO THE LAND ABOVE DESCRIBED
3 AE407311 EASEMENT FOR PADMOUNT SUBSTATION 5.5 WIDE AFFECTING THE PART DESIGNATED (A) IN PLAN WITH AE407311
4 AE407310 RESTRICTION(S) ON THE USE OF LAND
5 DP270520 EASEMENT TO DRAIN WATER 3 METRE(S) WIDE AND VARIABLE (A) APPURTENANT TO THE LAND ABOVE DESCRIBED (DOC.6)
6 AI398073 LEASE TO AXIOM EDUCATION NSW NO.2 PTY LIMITED BEING ROUSE HILL HIGH SCHOOL, 105 WITHERS ROAD, ROUSE HILL. EXPIRES: 31/12/2035.
AI398074 LEASE OF LEASE AI398073 TO MINISTER FOR EDUCATION BEING ROUSE HILL HIGH SCHOOL, 105 WITHERS ROAD, ROUSE HILL. EXPIRES: 30/12/2035.

NOTATIONS

DP1073726 NOTE: PLAN OF ACQUISITION

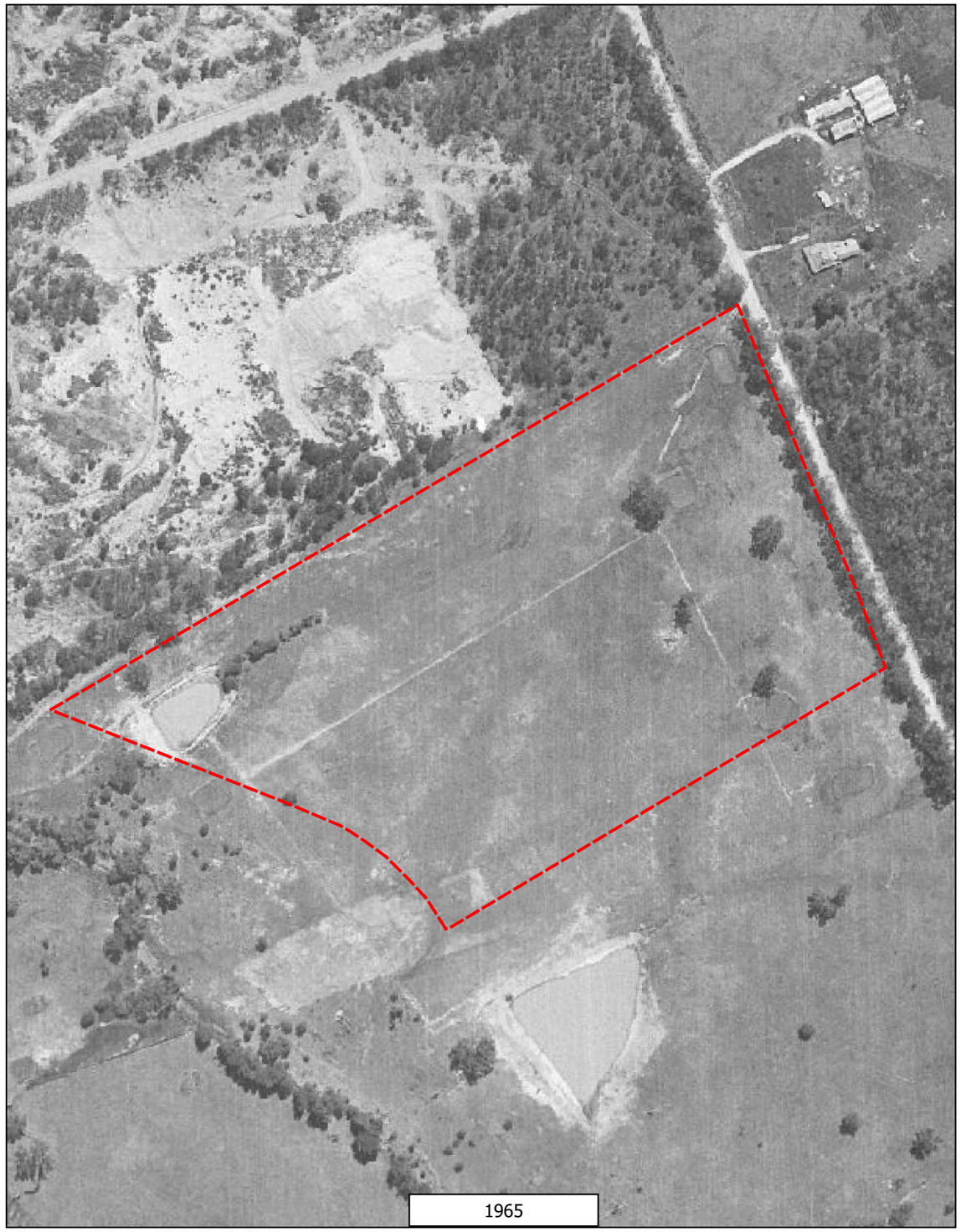
UNREGISTERED DEALINGS: NIL

*** END OF SEARCH ***

Received: 29/07/2022 19:38:42

Appendix D

Historical Aerial Photographs Drawing Nos 2 to 7



70 0 70 140 210 280 m

Douglas Partners
Geotechnics / Environment / Groundwater

CLIENT: NSW Department of Education	
OFFICE:North West Sydney	DRAWN BY: KN
SCALE: 1:2500 @ A3	DATE: 20.10.22

TITLE: **Historical Aerial Photos**
Rouse Hill High School
240 Withers Road, Rouse Hill

PROJECT No:	215851.00
DRAWING No:	2
REVISION:	0

70 0 70 140 210 280 m

Douglas Partners
Geotechnics / Environment / Groundwater

CLIENT: NSW Department of Education		TITLE: **Historical Aerial Photos**	PROJECT No:215851.00
OFFICE:North West Sydney	DRAWN BY: KN	**Rouse Hill High School**	DRAWING No: 3
SCALE: 1:2500 @ A3	DATE: 20.10.22	**240 Withers Road, Rouse Hill**	REVISION: 0

70 0 70 140 210 280 m

Douglas Partners
Geotechnics / Environment / Groundwater

CLIENT: NSW Department of Education		TITLE: **Historical Aerial Photos**	PROJECT No:215851.00
OFFICE:North West Sydney	DRAWN BY: KN	**Rouse Hill High School**	DRAWING No: 4
SCALE: 1:2500 @ A3	DATE: 20.10.22	**240 Withers Road, Rouse Hill**	REVISION: 0

Douglas Partners Geotechnics / Environment / Groundwater	CLIENT: NSW Department of Education	TITLE: **Historical Aerial Photos** **Rouse Hill High School** **240 Withers Road, Rouse Hill**	PROJECT No:215851.00
	OFFICE:North West Sydney / DRAWN BY: KN		DRAWING No: 5
	SCALE: 1:2500 @ A3 / DATE: 20.10.22		REVISION: 0

70 0 70 140 210 280 m

Douglas Partners
Geotechnics / Environment / Groundwater

CLIENT: NSW Department of Education	
OFFICE:North West Sydney	DRAWN BY: KN
SCALE: 1:2500 @ A3	DATE: 20.10.22

TITLE: **Historical Aerial Photos**
Rouse Hill High School
240 Withers Road, Rouse Hill

PROJECT No:	215851.00
DRAWING No:	6
REVISION:	0

70 0 70 140 210 280 m

Douglas Partners
Geotechnics / Environment / Groundwater

CLIENT: NSW Department of Education	
OFFICE:North West Sydney	DRAWN BY: KN
SCALE: 1:2500 @ A3	DATE: 20.10.22

TITLE: **Historical Aerial Photos**
Rouse Hill High School
240 Withers Road, Rouse Hill

PROJECT No:	215851.00
DRAWING No:	7
REVISION:	0

Appendix E

SafeWork, Section 10.7 (2 & 5) Certificate

Kristine Nicodemus

From: Customer Service Centre Licensing <licensing@safework.nsw.gov.au>
Sent: Wednesday, 19 October 2022 12:22 PM
To: Kristine Nicodemus
Subject: SafeWork NSW: 00729697 –Site Search application – Result not found

Security Classification: Sensitive Personal

Please do not amend the subject line of this email

Dear Kristine

Re: Site Search for Schedule 11 Hazardous Chemicals on premises Application – Result not found

I refer to your application for a Site Search for Schedule 11 Hazardous Chemicals on premises for the following site: LOT105 DP1108407 240 WITHERS ROAD NSW 2155.

A search of the records held by SafeWork NSW has not located any records pertaining to the above-mentioned premises.

If you have any further information or if you have any questions, please use one of the following options, quoting the SafeWork NSW enquiry reference number: 00729697

1. Email: licensing@safework.nsw.gov.au
2. Phone: 13 10 50

Kind regards

Danielle Wilson-Thomas
Licensing Representative
SafeWork NSW | Better Regulation Division
Department of Customer Service
p- 13 10 50
e- licensing@safework.nsw.gov.au | www.customerservice.nsw.gov.au
Level 3, 32 Mann Street, Gosford, NSW 2250

THE HILLS SHIRE COUNCIL
3 Columbia Court, Norwest NSW 2153
PO Box 7064, Norwest 2153
ABN 25 034 494 656 | DX 9966 Norwest

PLANNING CERTIFICATE UNDER SECTION 10.7 (2) & (5)

ENVIRONMENTAL PLANNING AND ASSESSMENT ACT 1979 AS AMENDED.

Certificate Number:	**73156**
Reference:	215851.00:220590
Issue Date:	14 July 2022
Receipt No:	6909657
Fee Paid:	$ 156.00

ADDRESS:	Rouse Hill High School, 240 Withers Road, ROUSE HILL NSW 2155
DESCRIPTION:	Lot 105 DP 1108407

The land is zoned:
Zone R3 Medium Density Residential

The following prescribed matters apply to the land to which this certificate relates:

The Environmental Planning and Assessment Amendment Act 1997 commenced operation on 1 July 1998. As a consequence of this Act, the information contained in this certificate needs to be read in conjunction with the provisions of the Environmental Planning and Assessment Regulation 2000.

PLEASE NOTE: THIS CERTIFICATE IS AUTOMATICALLY GENERATED. IT MAY CONTAIN EXCESSIVE SPACES AND/OR BLANK PAGES.

THIS CERTIFICATE IS DIRECTED TO THE FOLLOWING MATTERS PRESCRIBED UNDER SECTION 10.7 (2) OF THE ABOVE ACT.

1. Names of relevant planning instruments and DCPs

(1) The name of each environmental planning instrument that applies to the carrying out of development on the land.

(A) **Local Environmental Plans**

The Hills Local Environmental Plan 2019, as amended, applies to all land in the Shire unless otherwise stated in this certificate.

State Environmental Planning Policies

SEPP (Biodiversity and Conservation) 2021 – including but not limited to
Chapter 2 Vegetation in non rural areas
Chapter 6 Bushland in urban areas
Chapter 7 Canal estate development
Chapter 9 Hawkesbury – Nepean River

SEPP (Resilience and Hazards) 2021 – including but not limited to

Chapter 3 Hazardous and offensive development
Chapter 4 Remediation of land

SEPP (Industry and Employment) 2021 – Including but not limited to
Chapter 3 Advertising and signage

SEPP No.65 - Design Quality Of Residential Apartment Development

SEPP (Building Sustainability Index: Basix) 2004

SEPP (Precincts-Central River City) 2021 – Including but not limited to
Chapter 2 State significant precincts

SEPP (Resources and Energy) 2021 – including but not limited to
Chapter 2 Mining, petroleum production and extractive industries
Chapter 3 Extractive industries in Sydney area

SEPP (Transport and Infrastructure) 2021 – including but not limited to
Chapter 2 Infrastructure
Chapter 3 Educational establishments and childcare

SEPP (Exempt and Complying Development Codes) 2008

SEPP (Planning Systems) 2021 – including but not limited to
Chapter 2 State and regional development
Chapter 4 Concurrences and consents

SEPP (Primary Production) 2021 – including but not limited to
Chapter 2 Primary production and rural development

SEPP (Precincts – Western Parkland City) 2021 – Including but not limited to Chapter 4 Western Sydney Aerotropolis

SEPP (Housing) 2021

(2) The name of each **proposed environmental planning instrument** that will apply to the carrying out of development on the land and that is or has been the subject of community consultation or on public exhibition under the Act (unless the Secretary has notified the council that the making of the proposed instrument has been deferred indefinitely or has not been approved).

(A) **Proposed Local Environmental Plans**

No Proposed Local Environmental Plans apply to this land.

(B) **Proposed State Environmental Planning Policies**

Draft State Environmental Planning Policy (Environment)
Draft Remediation of Land State Environmental Planning Policy
Draft State Environmental Planning Policy (Short-term Rental Accommodation) 2019
Draft Activation Precincts State Environmental Planning Policy
Draft Housing Diversity State Environmental Planning Policy
Draft Design and Place State Environmental Planning Policy

(3) The name of each development control plan that applies to the carrying out of development on the land.

The Hills Development Control Plan 2012
Note: the land is within The Hills Development Control Plan 2012 Part D map sheet. Refer Council's website www.thehills.nsw.gov.au to view the map sheet.

(4) In this clause, proposed environmental planning instrument includes a planning proposal for a LEP or a draft environmental planning instrument.

2. Zoning and land use under relevant LEPs

For each environmental planning instrument or proposed instrument referred to in clause 1 (other than a SEPP or proposed SEPP).

(A) The Hills Local Environmental Plan 2019 applies to the land unless otherwise stated in this certificate and identifies the land to be:

Zone R3 Medium Density Residential

(B) The purposes for which the instrument provides that development may be carried out within the zone without development consent:

Refer Attachment 2(B)

Also refer to the applicable instrument for provisions regarding Exempt Development

(C) The purposes for which the instrument provides that development may not be carried out within the zone except with development consent:

Refer Attachment 2(B)

Also refer to the applicable instrument for provisions regarding Complying Development

(D) The purposes for which the instrument provides that development is prohibited in the zone:

Refer Attachment 2(B)

(E) Whether any development standards applying to the land fix minimum land dimensions for the erection of a dwelling-house on the land and, if so, the minimum land dimensions so fixed?

The Hills Local Environmental Plan 2019?

YES

Clause 4.1B of The Hills Local Environmental Plan 2019 provides, in part, minimum land dimensions for the erection of a dwelling house on land zoned R3 Medium Density Residential or R4 High Density Residential where it is undertaken as a single development application in conjunction with the subdivision of land.

Any other Planning Proposal?

NO

(F) Whether the land includes or comprises critical habitat?

The Hills Local Environmental Plan 2019?

NO

Any other Planning Proposal?

NO

(G) Whether the land is in a conservation area (however described)?

The Hills Local Environmental Plan 2019?

NO

Any Other Planning Proposal?

NO

(H) Whether an item of environmental heritage (however described) is situated on the land?

The Hills Local Environmental Plan 2019?

NO

Any other Planning Proposal?

NO

2A. Zoning and land use under State Environmental Planning Policy (Sydney Region Growth Centres) 2006

Note: As of 1st March 2022, State Environmental Planning Policy (Sydney Region Growth Centres) 2006 as it applies to The Hills Shire LGA was replaced by State Environmental Planning Policy (Precincts-Central River City) 2021, Chapter 3 Sydney Region Growth Centres. A reference to State Environmental Planning Policy (Sydney Region Growth Centres) 2006 in this document should be taken to be reference to State Environmental Planning Policy (Precincts - Central River City) 2021, Chapter 3 Sydney Region Growth Centres.

To the extent that the land is within any zone (however described) under:

(a) Part 3 of the *State Environmental Planning Policy (Sydney Region Growth Centres) 2006 (the 2006 SEPP), or*

(b) a Precinct Plan (within the meaning of the 2006 SEPP), or

(c) a proposed Precinct Plan that is or has been the subject of community consultation or on public exhibition under the ACT.

(A) State Environmental Planning Policy (Precincts-Central River City) 2021, Chapter 3 Sydney Region Growth Centres (Appendix 5 North Kellyville Precinct Plan) applies to the land unless otherwise stated in this certificate and identifies the land to be:

State Environmental Planning Policy (Precincts-Central River City) Chapter 3 Sydney Region Growth Centres (Appendix 5 North Kellyville Precinct Plan) does not apply.

State Environmental Planning Policy (Precincts-Central River City) 2021, Chapter 3 Sydney Region Growth Centres 2006 (Appendix 10 The Hills Growth Centre Precincts Plan) applies to the land unless otherwise stated in this certificate and identifies the land to be:

State Environmental Planning Policy (Precincts-Central River City) 2021, Chapter 3 Sydney Region Growth Centres (Appendix 10 The Hills Growth Centre Precincts Plan) does not apply.

Note: This precinct plan applies to land within the Box Hill Precinct or Box Hill Industrial Precinct.

(B) The purposes for which the instrument provides that development may be carried out within the zone without development consent:

Refer Attachment 2(B)

Also refer to the applicable instrument for provisions regarding Exempt Development.

(C) The purposes for which the instrument provides that development may not be carried out within the zone except with development consent:

Refer Attachment 2(B)

Also refer to the applicable instrument for provisions regarding Complying Development

(D) The purposes for which the instrument provides that development is prohibited in the zone:

Refer Attachment 2(B)

(E) Whether any development standards applying to the land fix minimum land dimensions for the erection of a dwelling-house on the land and, if so, the minimum land dimensions so fixed?

State Environmental Planning Policy (Precincts-Central River City) 2021, Chapter 3 Sydney Region Growth Centres (Appendix 5 North Kellyville Precinct Plan)?

NO

Any amendments to the relevant planning instrument (Appendix 5 North Kellyville Precinct Plan)?

NO

State Environmental Planning Policy (Precincts-Central River City) 2021, Chapter 3 Sydney Region Growth Centres (Appendix 10 The Hills Growth Centre Precincts Plan)?

NO

Any amendments to the relevant planning instrument (Appendix 10 The Hills Growth Centre Precincts Plan)?

NO

(F) Whether the land includes or comprises critical habitat?

State Environmental Planning Policy (Precincts-Central River City) 2021, Chapter 3 Sydney Region Growth Centres (Appendix 5 North Kellyville Precinct Plan)?

NO

State Environmental Planning Policy (Precincts-Central River City) 2021, Chapter 3 Sydney Region Growth Centres (Appendix 10 The Hills Growth Centre Precincts Plan)?

NO

(G) Whether the land is in a conservation area (however described)?

State Environmental Planning Policy (Precincts-Central River City) 2021, Chapter 3 Sydney Region Growth Centres (Appendix 5 North Kellyville Precinct Plan)?

NO

State Environmental Planning Policy (Precincts-Central River City) 2021, Chapter 3 Sydney Region Growth Centres (Appendix 10 The Hills Growth Centre Precincts Plan)?

NO

(H) Whether an item of environmental heritage (however described) is situated on the land?

State Environmental Planning Policy (Precincts-Central River City) 2021, Chapter 3 Sydney Region Growth Centres (Appendix 5 North Kellyville Precinct Plan)?

NO

State Environmental Planning Policy (Precincts-Central River City) 2021, Chapter 3 Sydney Region Growth Centres (Appendix 10 The Hills Growth Centre Precincts Plan)?

NO

3. Complying Development

(1) The extent to which the land is land on which complying development may be carried out under each of the codes for complying development because of the provisions of clauses 1.17A (1) (c) to (e), (2), (3) and (4), 1.18 (1) (c3) and 1.19 of *State Environmental Planning Policy (Exempt and Complying Development Codes) 2008*.

(2) The extent to which complying development may not be carried out on that land because of the provisions of clauses 1.17A (1) (c) to (e), (2), (3) and (4), 1.18 (1) (c3) and 1.19 of that Policy and the reasons why it may not be carried out under those clauses.

(3) If the council does not have sufficient information to ascertain the extent to which complying development may or may not be carried out on the land, a statement that a restriction applies to the land, but it may not apply to all of the land, and that council does not have sufficient information to ascertain the extent to which complying development may or may not be carried out on the land.

Housing Code, Rural Housing Code, Low Rise Housing Diversity Code and Greenfield Housing Code
Complying Development under the Housing Code, Rural Housing Code, Low Rise Housing Diversity Code and Greenfield Housing Code **may be** carried out on the land.

Housing Alterations Code and General Development Code
Complying Development under the Housing Alterations Code and General Development Code **may be** carried out on the land.

Industrial and Business Buildings Code
Complying Development under the Industrial and Business Buildings Code **may be** carried out on the land.

Industrial and Business Alterations, Container Recycling Facilities, Subdivision, Demolition and Fire Safety Codes
Complying Development under the Industrial and Business Alterations, Container Recycling Facilities, Subdivision, Demolition and Fire Safety Codes **may be** carried out on the land.

Note: Where reference is made to an applicable map, this information can be sourced from the following websites:

The Hills Local Environmental Plan 2019 - www.thehills.nsw.gov.au
State Environmental Planning Policy (Precincts-Central River City) 2021, Chapter 3 Sydney Region Growth Centres (Appendix 2 North Kellyville Precinct) or (Appendix 11 The Hills Growth Centre Precincts Plan) – In force legislation - NSW legislation

4, 4A (Repealed)

4B. Annual charges under Local Government Act 1993 for coastal protection services that relate to existing coastal protection works

Whether the owner (or any previous owner) of the land has consented in writing to the land being subject to annual charges under section 496B of the *Local Government Act 1993* for coastal protection services that relate to existing coastal protection works (within the meaning of section 553B of that Act).

NO

Note. "Existing coastal protection works" are works to reduce the impact of coastal hazards on land (such as seawalls, revetments, groynes and beach nourishment) that existed before the commencement of section 553B of the *Local Government Act 1993*.

5. Mine subsidence

Whether or not the land is proclaimed to be a mine subsidence district within the meaning of section 15 of the *Coal Mine Subsidence Compensation Act 2017*?

NO

6. Road widening and road realignment

Whether or not the land is affected by any road widening or road realignment under -

(A) Division 2 of Part 3 of the *Roads Act 1993*; or

NO

(B) any environmental planning instrument; or

NO

(C) any resolution of council?

a) The Hills Development Control Plan 2012?

NO

b) Any other resolution of council?

NO

7. Council and other public authority policies on hazard risk restrictions

Whether or not the land is affected by a policy:

(a) adopted by council, or

(b) adopted by any other public authority and notified to the council for the express purpose of its adoption by that authority being referred to in planning certificates issued by the council,

that restricts the development of the land because of the likelihood of land slip, bushfire, tidal inundation, subsidence, acid sulphate soils or any other risk (other than flooding)?

Council's policies on hazard risk restrictions are as follows:

(i) Landslip

a) By The Hills Local Environmental Plan 2019 zoning?

NO

No resolution has been adopted but attention is directed to the fact that there are areas within the Shire liable to landslip.

b) By The Hills Local Environmental Plan 2019 local provision?

NO

No resolution has been adopted but attention is directed to the fact that there are areas within the Shire liable to landslip.

c) By The Hills Development Control Plan 2012 provision?

NO

No resolution has been adopted but attention is directed to the fact that there are areas within the Shire liable to landslip.

(ii) Bushfire

YES

Please note this is a statement of policy only and NOT a statement on whether or not the property is affected by bushfire. That question is answered in Section 11 of this certificate.

The NSW Rural Fire Service Guidelines entitled 'Planning for Bushfire Protection 2018'. Development subject to bushfire risk will be required to address the requirements in these guidelines and can be downloaded off the RFS web site www.rfs.nsw.gov.au

The Development Control Plan may also contain provisions for development on Bushfire Prone Land and Bushfire Hazard Management. Refer Part 1(3) of this certificate for the applicable Development Control Plan.

(iii) Tidal inundation

NO

Please note this is a statement of Council policy only and NOT a statement on whether or not the property is affected by tidal inundation.

(iv) Subsidence

NO

Please note this is a statement of Council policy only and NOT a statement on whether or not the property is affected by subsidence.

(v) Acid sulphate soils

NO

(vi) Land contamination

NO

Please note this is a statement of Council policy only and NOT a statement on whether or not the property is affected by contamination or potential contamination.

(vii) Any other risk

NO

7A. Flood related development controls

(1) If the land or part of the land is within the flood planning area and subject to flood related development controls.

NO

(2) If the land or part of the land is between the flood planning area and the probable maximum flood and subject to flood related development controls.

UNKNOWN

Please contact Council's Waterways team on 9843 0555 for information on the flood planning area and probable maximum flood.

(3) In this clause—
***flood planning area* has the same meaning as in the Floodplain Development Manual.**
***Floodplain Development Manual* means the *Floodplain Development Manual* (ISBN 0 7347 5476 0) published by the NSW Government in April 2005.**

probable maximum flood **has the same meaning as in the Floodplain Development Manual.**

8. Land reserved for acquisition

Whether or not any environmental planning instrument or proposed environmental planning instrument referred to in clause 1 makes provision in relation to the acquisition of the land by a public authority, as referred to in section 3.15 of the Act.

The Hills Local Environmental Plan 2019?

NO

Any other Planning Proposal?

NO

State Environmental Planning Policy?

NO

Proposed State Environmental Planning Policy?

NO

9. Contributions plans

The name of each contributions plan applying to the land:

08A-08D - KELLYVILLE/ROUSE HILL
THE HILLS SECTION 7.12

9A. Biodiversity Certified Land

Whether the land is biodiversity certified land under Part 8 of the *Biodiversity Conservation Act 2016*?

NO

Note: Biodiversity certified land includes land certified under Part 7AA of the *Threatened Species Conservation Act 1995* that is taken to be certified under Part 8 of the *Biodiversity Conservation Act 2016*.

10. Biodiversity stewardship sites

Whether the land is a biodiversity stewardship site under a biodiversity stewardship agreement under Part 5 of the *Biodiversity Conservation Act 2016* (but only if the council has been notified of the existence of the agreement by the Chief Executive of the Office of Environment and Heritage)?

NO

Note: Biodiversity stewardship agreements include biobanking agreements under Part 7A of the *Threatened Species Conservation Act 1995* that are taken to be biodiversity stewardship agreements under Part 5 of the *Biodiversity Conservation Act 2016*.

10A. Native vegetation clearing set asides

Whether the land contains a set aside area under section 60ZC of the *Local Land Services Act 2013* (but only if the council has been notified of the existence of the set aside area by Local Land Services or it is registered in the public register under that section)?

NO

11. Bush fire prone land

Has the land been identified as bush fire prone land?

YES

The land is identified on Council's certified Bush Fire Prone Land map as being partly or wholly bush fire prone land. For details refer to the Bush Fire Prone Land map that can be viewed on Council's website at www.thehills.nsw.gov.au

12. Property vegetation plans

Has the council been notified that a property vegetation plan approved under Part 4 of the *Native Vegetation Act 2003* (and that continues in force) applies to this land?

NO

13. Orders under Trees (Disputes Between Neighbours) Act 2006

Whether an order has been made under the *Trees (Disputes Between Neighbours) Act 2006* to carry out work in relation to a tree on this land (but only if the council has been notified of the order)?

NO

14. Directions under Part 3A

Whether there is a direction by the Minister in force under section 75P (2)(c1) of the Act that a provision of an environmental planning instrument prohibiting or restricting the carrying out of a project or a stage of a project on the land under Part 4 of the Act does not have effect?

NO

15. Conditions for seniors housing

Whether there are any terms of a kind referred to in clause 88(2) of *State Environmental Planning Policy (Housing) 2021*, Chapter 3, Part 5 that have been imposed as a condition of consent after 11 October 2007 in relation to the land?

NO

16. Site compatibility certificates for infrastructure, schools or TAFE establishments

Whether there is a valid site compatibility certificate (infrastructure) or site compatibility certificate (schools or TAFE establishments), of which the council is aware, in respect of proposed development on the land?

NO

17. Site compatibility certificates and conditions for affordable rental housing

(1) Whether there is a current site compatibility certificate (affordable rental housing), of which the council is aware, in respect of proposed development on the land?

NO

(2) Whether there are any terms of a kind referred to in clause 21(1) or 40(1) of *State Environmental Planning Policy (Housing) 2021*, Chapter 2, Part 2, Division 1 or 5 that have been imposed as a condition of consent in relation to the land?

NO

18. Paper subdivision information

(1) The name of any development plan adopted by a relevant authority that applies to the land or that is proposed to be subject to a consent ballot.

NO DEVELOPMENT PLAN APPLIES

(2) The date of any subdivision order that applies to the land.

NO SUBDIVISION ORDER APPLIES

(3) Words and expressions used in this clause have the same meaning as they have in Part 16C of this Regulation.

19. Site verification certificates

Whether there is a current site verification certificate, of which the council is aware, in respect of the land?

NO

Note. A site verification certificate sets out the Secretary's opinion as to whether the land concerned is or is not biophysical strategic agricultural land or critical industry cluster land - see Division 3 of Part 4AA of *State Environmental Planning Policy (Mining, Petroleum Production and Extractive Industries) 2007.*

As of 1st March 2022, State Environmental Planning Policy (Mining, Petroleum Production and Extractive Industries) 2007 was replaced by State Environmental Planning Policy (Resources and Energy)

2021, Chapter 2 Mining, petroleum production and extractive industries

20. Loose-fill asbestos insulation

Does the land include any residential premises (within the meaning of Division 1A of Part 8 of the *Home Building Act 1989*) that is listed on the Loose-Fill Asbestos Insulation Register that is required to be maintained under that Division?

Council has **not** been notified by NSW Fair Trading that the land includes any residential premises that are listed on the register. Refer to the NSW Fair Trading website at www.fairtrading.nsw.gov.au to confirm that the land is not listed on this register.

Note: There is potential for loose-fill asbestos insulation in residential premises that are not listed on the Register. Contact NSW Fair Trading for further information.

21. Affected building notices and building product rectification orders

(1) Whether there is any affected building notice of which the council is aware that is in force in respect of the land?

NO

(2) (a) Whether there is any building product rectification order of which the council is aware that is in force in respect of the land and has not been fully complied with?

NO

(b) Whether any notice of intention to make a building product rectification order of which the council is aware has been given in respect of the land and is outstanding?

NO

(3) In this clause:

affected building notice has the same meaning as in Part 4 of the *Building Products (Safety) Act 2017*.
building product rectification order has the same meaning as in the *Building Products (Safety) Act 2017*.

22. State Environmental Planning Policy (Western Sydney Aerotropolis) 2020

Note: As of 1st March 2022, State Environmental Planning Policy (Western Sydney Aerotropolis) 2020 was replaced by State Environmental Planning Policy (Precincts – Western Parkland City) 2021, Chapter 4 Western Sydney Aerotropolis

(a) in an ANEF or ANEC contour of 20 or greater as referred to in clause 19 of that Policy, or

NO

(b) shown on the Lighting Intensity and Wind Shear Map under that Policy, or

NO

(c) shown on the Obstacle Limitation Surface Map under that Policy, or

NO

(d) in the "public safety area" on the Public Safety Area Map under that Policy, or

NO

(e) in the "3 kilometre wildlife buffer zone" or the "13 kilometre wildlife buffer zone" on the Wildlife Buffer Zone Map under that Policy.

NO

Note. The following matters are prescribed by section 59 (2) of the *Contaminated Land Management Act 1997* as additional matters to be specified in a planning certificate:

(a) that the land to which the certificate relates is significantly contaminated land within the meaning of that Act – if the land (or part of the land) is significantly contaminated land at the date when the certificate is issued,

NO

(b) that the land to which the certificate relates is subject to a management order within the meaning of that Act – if it is subject to such an order at the date when the certificate is issued,

NO

(c) that the land to which the certificate relates is the subject of an approved voluntary management proposal within the meaning of that Act – if it is the subject of such an approved proposal at the date when the certificate is issued,

NO

(d) that the land to which the certificate relates is subject to an ongoing maintenance order within the meaning of the Act – if it is subject to such an order at the date when the certificate is issued,

NO

(e) that the land to which the certificate relates is the subject of a site audit statement within the meaning of the Act – if a copy of such a statement has been provided at any time to the local authority issuing the certificate.

NO

THIS PART IS DIRECTED TO THE FOLLOWING MATTERS PRESCRIBED UNDER SECTION 10.7 (5) OF THE ABOVE ACT

NOTE: "When information pursuant to Section 10.7 (5) is requested the council is under no obligation to furnish any of the information supplied herein pursuant to that Section. Council draws your attention to Section 10.7 (6), which states that a council shall not incur any liability in respect of any advice provided in good faith pursuant to sub-section (5). The absence of any reference to any matter affecting the land shall not imply that the land is not affected by any matter not referred to in this certificate."

A. Whether there are any provisions applying to the land that control the management of trees and bushland?

YES

Part C Section 3 of The Hills Development Control Plan 2012 contain provisions for the control and management of actions in respect of trees and bushland.

B. Does the land contain a foreshore area as identified on The Hills Local Environmental Plan 2019 Foreshore Building Line map?

NO

C. Is the land subject to a listing on a public register maintained by Council under the Protection of the Environment Operations Act 1997?
Note: This information relates specifically to the land and includes any existing or in force environmental notice, civil proceedings or prosecutions under the Act (where notified to Council).

NO

D. Is the land affected by any special provisions of State Environmental Planning Policy (Resources and Energy) 2021 – Chapter 3 Extractive industries in Sydney area?

NO

E. Is the land affected by a restricted development area as identified under The Hills Development Control Plan 2012?

NO

F. Is the land within an area where a Special Infrastructure Contribution, as determined by the Minister for Planning and Environment, applies?

NO

G. Is the land in the vicinity of a heritage item or heritage conservation area as described in The Hills Local Environmental Plan 2019 **OR** State Environmental Planning Policy (Precincts-Central River City) 2021, Chapter 3 Sydney Region Growth Centres?

YES

Clause 5.10 (5) of The Hills Local Environmental Plan 2019 provides specific considerations for development in the vicinity of a heritage item or heritage conservation area.

H. Whether Council has executed a Voluntary Planning Agreement within the meaning of S7.4 of the Environmental Planning and Assessment Act 1979, as amended, in relation to the land?

YES

01/2018/VPA

I. Is the land within or adjacent to the Sydney Metro Northwest as identified on the maps prepared by Transport NSW?

NO

J. Does the land contain a proposed road as identified within a Development Control Plan under State Environmental Planning Policy (Precincts-Central River City) 2021, Chapter 3 Sydney Region Growth Centres?

NO

K. Has Council been notified by NSW Land and Property Information that the land is affected by a plan of acquisition for railway purposes (Sydney Metro Northwest)?

NO

L. Has Council been notified of the land being listed on the NSW Government's Combustible Cladding Register under the Environmental Planning and Assessment Regulation 2000?

NO

Note: There is potential for combustible cladding to be present on premises that are not listed on the Register. Contact Council's Regulatory Team for further information.

THE HILLS SHIRE COUNCIL

MICHAEL EDGAR
GENERAL MANAGER

Per:

PLEASE NOTE: COUNCIL RETAINS THE ELECTRONIC ORIGINAL OF THIS CERTIFICATE. WHERE THIS CERTIFICATE REFERS TO INFORMATION DISPLAYED ON COUNCIL'S WEBSITE OR TO ANY EXTERNAL WEBSITE, IT REFERS TO INFORMATION DISPLAYED ON THE WEBSITE ON THE DATE THIS CERTIFICATE IS ISSUED.

ATTACHMENT 2(B)

Zone R3 Medium Density Residential

1 Objectives of zone

- To provide for the housing needs of the community within a medium density residential environment.
- To provide a variety of housing types within a medium density residential environment.
- To enable other land uses that provide facilities or services to meet the day to day needs of residents.
- To encourage medium density residential development in locations that are close to population centres and public transport routes.

2 Permitted without consent

Home businesses; Home occupations

3 Permitted with consent

Attached dwellings; Boarding houses; Building identification signs; Business identification signs; Centre-based child care facilities; Community facilities; Dual occupancies; Dwelling houses; Group homes; Home-based child care; Multi dwelling housing; Neighbourhood shops; Oyster aquaculture; Places of public worship; Respite day care centres; Roads; Seniors housing; Tank-based aquaculture; Any other development not specified in item 2 or 4

4 Prohibited

Agriculture; Air transport facilities; Airstrips; Amusement centres; Animal boarding or training establishments; Boat building and repair facilities; Boat launching ramps; Boat sheds; Camping grounds; Caravan parks; Cemeteries; Charter and tourism boating facilities; Commercial premises; Correctional centres; Crematoria; Depots; Eco-tourist facilities; Electricity generating works; Entertainment facilities; Environmental facilities; Extractive industries; Farm buildings; Forestry; Freight transport facilities; Function centres; Heavy industrial storage establishments; Helipads; Highway service centres; Home occupations (sex services); Industrial retail outlets; Industrial training facilities; Industries; Information and education facilities; Jetties; Local distribution premises; Marinas; Mooring pens; Moorings; Mortuaries; Open cut mining; Passenger transport facilities; Port facilities; Public administration buildings; Recreation facilities (indoor); Recreation facilities (major); Recreation facilities (outdoor); Registered clubs; Research stations; Residential accommodation; Restricted premises; Rural industries; Service stations; Sewerage systems; Sex services premises; Signage; Storage premises; Tourist and visitor accommodation; Transport depots; Truck depots; Vehicle body repair workshops; Vehicle repair stations; Veterinary hospitals; Warehouse or distribution centres; Waste or resource management facilities; Water recreation structures; Water supply systems**;** Wharf or boating facilities; Wholesale supplies

NOTE: This land use table should be read in conjunction with the Dictionary at the end of The Hills LEP 2019 which defines words and expressions for the purpose of the plan.

NOTE: Activities permitted without development consent are still subject to other provisions in Environmental Planning Instruments and/or Acts.

2.5 Additional permitted uses for particular land

(1) Development on particular land that is described or referred to in Schedule 1 may be carried out:
(a) with development consent, or
(b) if the Schedule so provides—without development consent,
in accordance with the conditions (if any) specified in that Schedule in relation to that development.

(2) This clause has effect despite anything to the contrary in the Land Use Table or other provision of this Plan.

Schedule 1 Additional permitted uses

(Clause 2.5)

1 Use of certain land at Rouse Hill Regional Centre, Rouse Hill

(1) This clause applies to land at Rouse Hill Regional Centre, Rouse Hill, shown as "Item 2" on the Additional Permitted Uses Map.

(2) Development for a purpose shown in Column 2 of the Table to this item is permitted with development consent in a zone shown opposite in Column 1, subject to any condition shown opposite in Column 3.

Column 1	Column 2	Column 3
Zone R3 Medium Density Residential	Residential flat buildings Shop top housing Business premises	In conjunction with shop top housing
Zone R4 High Density Residential	Business premises	In conjunction with shop top housing
Zone B4 Mixed Use	Attached dwellings Multi dwelling housing	

2 Use of certain land at Samantha Riley Drive, Kellyville

(1) This clause applies to certain land at Kellyville, being:
(a) 301 Samantha Riley Drive, comprising Lots 101 and 103, DP 1122070, and
(b) part of drainage reserves fronting Samantha Riley Drive, comprising part of Lot 192, DP 1249550, part of Lot 1, DP 1184376 and part of Lot 1, DP 1028391, shown as "Item 3" on the Additional Permitted Uses Map.

(2) Development for the purposes of shops is permitted with development consent.

(3) Development consent under subclause (2) may only be granted if the retail floor space on the site is no more than 1,900m².

3 Use of certain land at Wilkins Avenue and Windsor Road, Beaumont Hills

(1) This clause applies to certain land at Beaumont Hills, being:

(a) part of 1-3 Wilkins Avenue, comprising part of Lot 101, DP 1124350, and

(b) RMB 104 Windsor Road, comprising Lot 7, DP 13822, and

(c) RMB 104A Windsor Road, comprising Lot 80, DP 1014622, and

(d) RMB 105 Windsor Road, comprising Lot 104, DP 1124350,

shown as "Item 4" on the Additional Permitted Uses Map.

(2) Development for the purposes of a garden centre and landscaping material supplies is permitted with development consent.

5 Use of certain land at Solent Circuit, Norwest

(1) This clause applies to that part of land at 11-13 Solent Circuit, Norwest, comprising Lot 5074, DP 1003042, that is zoned SP2 Infrastructure, shown as "Item 6" on the Additional Permitted Uses Map.

(2) Development for the purposes of building identification signs, business identification signs, commercial premises or residential flat buildings is permitted with consent.

6 Use of certain land within Bella Vista Station Precinct in Zone B7

(1) This clause applies to certain land within the Bella Vista Station Precinct that is in Zone B7 Business Park, shown as "Item 7" on the Additional Permitted Uses Map.

(2) Development for the purposes of a market is permitted with development consent.

(3) Development for the purpose of a shop with a gross floor area not exceeding 2,500m^2 is permitted with development consent.

7 Use of certain land at 74 O'Briens Road, Cattai

(1) This clause applies to land at 74 O'Briens Road, Cattai, being Lot 28, DP 270416, shown as "Item 8" on the Additional Permitted Uses Map.

(2) Development for the purpose of dwelling houses is permitted with development consent.

(3) Development consent under this clause may only be granted if the consent authority is satisfied that:

(a) the development will not result in the erection of more than 300 dwelling houses on the land to which this clause applies, and

(b) no dwelling house will be erected on a lot with a lot size of less than 450 square metres.

(4) Development consent must not be granted for development under this clause unless a development control plan that provides for the phasing of development has been prepared for the land.

8 Use of certain land at Commercial Road, Rouse Hill

(1) This clause applies to certain land at Commercial Road, Rouse Hill, being part of Lot 5, DP 30916, that is in Zone R1 General Residential, shown as "Item 9" on the Additional Permitted Uses Map.

(2) Development for the purposes of shops is permitted with development consent.

(3) Development consent under subclause (2) may only be granted if the retail floor space on the site is no more than 1,700m^2.

9 Use of certain land at 6 McCausland Place, Kellyville

(1) This clause applies to land at 6 McCausland Place, Kellyville, being Lot 1, DP 1273532, shown as "Item 10" on the Additional Permitted Uses Map.

(2) Development for the purposes of a residential flat building is permitted with development consent.

(3) Development consent under subclause (2) may only be granted if the number of dwellings contained, or proposed to be contained, in the residential flat building does not exceed 20.

10 Use of certain land at 26-30 Norbrik Drive, Bella Vista

(1) This clause applies to land at 26-30 Norbrik Drive, Bella Vista, being Lot 1, DP 1217654, shown as "Item 11" on the Additional Permitted Uses Map.

(2) Development for the purposes of seniors housing is permitted with development consent.

11 Use of certain land at 2 Natura Rise, Norwest

(1) This clause applies to land at 2 Natura Rise, Norwest, being SP 97750, shown as "Item 13" on the Additional Permitted Uses Map.

(2) Development for the following purposes is permitted with development consent:

(a) restaurants or cafes, but only if the total maximum gross floor area of all restaurants and cafes on the land does not exceed 200m^2,

(b) business premises or shops, but only if the total maximum gross floor area of all business premises and shops on the land does not exceed 200m^2.

12 Use of certain land at 522 Windsor Road, Baulkham Hills

(1) This clause applies to land at 522 Windsor Road, Baulkham Hills, being Lot 533, DP 773889 and Lot 22, DP 1075051, shown as "Item 14" on the Additional Permitted Uses Map.

(2) Development for the purposes of seniors housing and associated restaurants or cafes, shops or business premises is permitted with development consent.

(3) Development consent under this clause may only be granted if:
- (a) the number of beds contained in a residential care facility that is part of the development does not exceed 120, and
- (b) the number of self-contained dwellings contained in the development does not exceed 70, and
- (c) the gross floor area of any restaurant or cafe, shop or business premises contained in the development is no more than 100m^2, with a maximum combined gross floor area of no more than 300m^2.

13 Use of certain land at Fullers Road and Old Northern Road, Glenhaven

(1) This clause applies to certain land at Glenhaven, being:
- (a) 2 and 2a Fullers Road, being Lots 1 and 2, SP 46522, and
- (b) 434 Old Northern Road, being Lot 1, DP 369807,

shown as "Item 15" on the Additional Permitted Uses Map.

(2) Development for the purposes of seniors housing is permitted with development consent if the seniors housing comprises no more than 9 self-contained dwellings.

14 Use of certain land within Bella Vista Station Precinct and Kellyville Station Precinct in Zone SP2

(1) This clause applies to certain land within the Bella Vista Station Precinct and the Kellyville Station Precinct that is in Zone SP2 Infrastructure, shown as "Item 20" on the Additional Permitted Uses Map.

(2) Development for the purposes of an environmental facility or a recreation area is permitted with development consent.

15 Use of certain land within Bella Vista Station Precinct and Kellyville Station Precinct in Zones R1 and R4

(1) This clause applies to certain land within the Bella Vista Station Precinct and the Kellyville Station Precinct that is in Zone R1 General Residential and Zone R4 High Density Residential, shown as "Item 21" on the Additional Permitted Uses Map.

(2) Development for the purposes of an exhibition village or recreation facility (outdoor) is permitted with development consent.

16 Use of certain land at 328-334 Annangrove Road, Rouse Hill

(1) This clause applies to land at 328-334 Annangrove Road, Rouse Hill, being Lot 34, DP 834050 and Lots 12 and 13, DP 833069, shown as "Item 22" on the Additional Permitted Uses Map.

(2) Development for the purposes of specialised retail premises is permitted with development consent.

17 Use of certain land at 55 Coonara Avenue, West Pennant Hills

(1) This clause applies to certain land at 55 Coonara Avenue, West Pennant Hills, being parts of Lot 61, DP 737386, that is in Zone E2 Environmental Conservation, shown as "Item 23" and "Item 24" on the Additional Permitted Uses Map.

(2) Development for the purposes of recreation areas or recreation facilities (indoor) is permitted with development consent on the land shown as "Item 23".

(3) Development for the following purposes is permitted with development consent on the land shown as "Item 24"-
- (a) building identification signs,
- (b) kiosks,
- (c) recreation areas,
- (d) restaurants or cafes, but only if the gross floor area of any restaurant or café on the land does not exceed 50 square metres.

18 Use of certain land at 40 Solent Circuit, Norwest

(1) This clause applies to land at 40 Solent Circuit, Norwest, being Lot 2107, DP 1216268, shown as "Item 12" on the Additional Permitted Uses Map.

(2) Development for the following purposes is permitted with development consent—
(a) business premises, but only if the total gross floor area of all business premises on the land does not exceed 1,500m2,
(b) recreation facilities (indoor), but only if the total gross floor area of all recreation facilities (indoor) on the land does not exceed 1,500m2,
(c) restaurants or cafes, but only if the total gross floor area of all restaurants and cafes on the land does not exceed 500m2,
(d) shops, but only if the total gross floor area of all shops on the land does not exceed 1,000m2.

19 Use of certain land at 25–31 Brookhollow Avenue, Norwest

(1) This clause applies to 25–31 Brookhollow Avenue, Norwest, Lot 71, DP 1252765, identified as "Item 25" on the Additional Permitted Uses Map.

(2) Development for the purposes of neighbourhood supermarkets is permitted with development consent if the gross floor area of all neighbourhood supermarkets on the land is no more than 1,000m2.

Appendix F

Data Quality Objectives

Appendix F
Data Quality Objectives
240 Withers Road, Rouse Hill

F1.0 Data Quality Objectives

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

Step	Summary
1: State the problem	The objective of the investigation is to assess the suitability of the site from a contamination perspective, for the proposed development. The report is being undertaken as the land is to be redeveloped. A preliminary conceptual site model (CSM) has been prepared (Section 7) for the proposed development. The project team consisted of experienced environmental engineers and scientists working in the roles of Project Principal, Project Reviewer, Project Manager, field staff.
2: Identify the decisions / goal of the study	The site history has identified possible contaminating previous uses which are identified in the CSM (Section 7). The CSM identifies the associated contaminants of potential concern (COPC) and the likely impacted media. The site assessment criteria (SAC) for each of the COPC are detailed in Appendix H. The decision is to establish whether or not the results fall below the SAC. On this basis, an assessment of the site's suitability from a contamination perspective will be derived and a decision made on whether (or not) further assessment and / or remediation will be required.
3: Identify the information inputs	Inputs to the investigation will be the results of analysis of samples to measure the concentrations of COPC identified in the CSM (Section 7) at the site using NATA accredited laboratories and methods, where possible. The SAC for each of the COPC are detailed in Appendix H.
4: Define the study boundaries	The lateral boundaries of the investigation area are shown on Drawing 1, Appendix A. The vertical boundaries are to the extent of contamination impact as determined from the site history assessment and site observations. The assessment is limited to the timeframe over which the field investigation was undertaken.
5: Develop the analytical approach (or decision rule)	The decision rule is to compare all analytical results with SAC (Appendix H, based on NEPC (2013)). Where guideline values are absent, other sources of guideline values accepted by NEPC (2013) shall be adopted where possible. Where a sample result exceeds the adopted criterion, a further site-specific assessment will be made as to the risk posed by the presence of that contaminant(s). Initial comparisons will be with individual results then, where required, summary statistics (including mean, standard deviation and 95% upper confidence limit (UCL) of the arithmetic mean (95% UCL)) to assess potential risks posed by the site contamination.

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

F2.0 References

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

Douglas Partners Pty Ltd

Appendix G

Field Work Methodology

Appendix G
Field Work Methodology
240 Withers Road, Rouse Hill

G1.0 Guidelines

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

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

G2.0 Soil Sampling

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

- Collect soil samples directly from the solid flight auger at the nominated sample depths;
- Collect near surface samples using hand tools;
- Transfer samples in laboratory-prepared glass jars with Teflon lined lids by hand, capping immediately and minimising headspace within the sample jar;
- Transfer samples in laboratory-prepared container (specific for PFAS) by hand, capping immediately and minimising headspace within the sample jar;
- Collect ~500 ml samples for FA and AF analysis;
- Collect ~40 g to 50 g samples in zip-lock bags for asbestos (presence / absence) analysis;
- Wear a new disposable nitrile glove for each sample point thereby minimising potential for cross-contamination;
- Collect 10% replicate samples for QC purposes;
- Label sample containers with individual and unique identification details, including project number, sample location and sample depth (where applicable);
- Place samples into a cooled, insulated and sealed container for transport to the laboratory; and
- Use chain of custody documentation.

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

G3.0 Groundwater Sampling

G3.1 Monitoring Well Installation

Monitoring wells are constructed using class 18 uPVC machine slotted screen and blank sections with screw threaded joints. The screened section of each well is backfilled with a washed sand filter pack to approximately 0.5 m above the screened interval. Each well is completed with a hydrated bentonite plug of at least 0.5 m thick and then gravel to the surface, finished with lockable steel monument set in a concrete plinth.

G3.2 Monitoring Well Development

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

G3.3 Groundwater Sampling

Groundwater sampling was carried out in accordance with DP standard operating procedures. Groundwater samples are collected using a low flow peristaltic pump via the micro-purge (minimal drawdown) method. The sampling method is described as follows:

- Measure the static water level using an electronic interface probe and record the thickness of any LNAPL (if encountered);
- Decontaminate the interface probe and cable between monitoring wells by rinsing in a diluted Decon-90 solution and then rinsing in demineralised water;
- Lower the well-dedicated tubing into the well then clamped at a level estimated to be 1 m below the top of the water column (provided the depth of the pump is within the screened section) or to the approximate mid-point of the well screen;
- Set the pump at the lowest rate possible to minimise drawdown of the water column;
- Measure physical parameters by continuously passing the purged water through a flow cell; and
- Following stabilisation of the field parameters, collect samples in laboratory-prepared bottles minimising headspace within the sample bottle and cap immediately.

The general groundwater sample handling and management procedures comprise:

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

G4.0 References

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

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

Douglas Partners Pty Ltd

Appendix H

Site Assessment Criteria

Appendix H
Site Assessment Criteria
240 Withers Road, Rouse Hill

H1.0 Introduction

H1.1 Guidelines

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

- NEPC *National Environment Protection (Assessment of Site Contamination) Measure 1999 (as amended 2013) [NEPM]* (NEPC, 2013).
- CRC CARE *Health screening levels for petroleum hydrocarbons in soil and groundwater* (CRC CARE, 2011).
- HEPA *PFAS National Environmental Management Plan (NEMP)* (HEPA, 2020).

H1.2 General

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

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

- Land use: school
  - Corresponding to land use category 'A', residential with garden / accessible soil (home grown produce <10% fruit and vegetable intake, (no poultry)), also includes children's day care centres, preschools and primary schools. This category will provide a conservative assessment for this initial screen for a high school.
- Soil type: sand

H2.0 Soils

H2.1 Health Investigation and Screening Levels

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

Table 1: Health Investigation Levels (mg/kg)

Contaminant	HIL-A
Metals	
Arsenic	100
Cadmium	20
Chromium (VI)	100
Copper	6000
Lead	300
Mercury (inorganic)	40
Nickel	400
Zinc	7400
PAH	
B(a)P TEQ	3
Total PAH	300
Phenols	
Phenol	3000
Pentachlorophenol	100
OCP	
DDT+DDE+DDD	240
Aldrin and dieldrin	6
Chlordane	50
Endosulfan	270
Endrin	10
Heptachlor	6
HCB	10
Methoxychlor	300
OPP	
Chlorpyrifos	160
PCB	
PCB	1

Table 2: Health Screening Levels (mg/kg)

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

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

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

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

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

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

Contaminant	DC HSL-A
Benzene	100
Toluene	14 000
Ethylbenzene	4500
Xylenes	12 000
Naphthalene	1400
TRH F1	4400
TRH F2	3300
TRH F3	4500
TRH F4	6300

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

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

H2.2 Health Investigation Levels for Per- and Poly-Fluoroalkyl Substances in Soil

The laboratory analytical results for per- and poly-fluoroalkyl substances (PFAS) in soil have been assessed against HIL published in HEPA (2020). The HIL represent a nationally-agreed suite that should be used to inform site investigations. The HIL are intentionally conservative, and an exceedance

of these criteria may not constitute a risk if other exposure pathways are controlled. An exceedance of the HIL should trigger further investigations, such as a site-specific risk assessment. At the time of this investigation, screening values were available only for perfluorooctane sulfonate (PFOS), perfluorooctanoic acid (PFOA) and perfluorohexane sulfonate (PFHxS).

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

Table 4: Health Investigation Levels (mg/kg)

Contaminant	HIL-A
PFOS and PFHxS *	0.01
PFOA	0.1

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

H2.3 Asbestos in Soil

Based on the CSM and/or current site access limitations, a detailed asbestos assessment was not considered to be warranted at this stage. However, due to the history of widespread use of ACM products across Australia, ACM can be encountered unexpectedly and sporadically at 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.

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

- Bonded asbestos containing material (ACM); and
- Fibrous asbestos and asbestos fines (FA and AF).

Selected samples were tested for FA and AF.

The HSL are in Table 5.

Table 5: Health Screening Levels for Asbestos

Form of Asbestos	HSL-A
ACM	0.01%
FA and AF	0.001%
FA and AF and ACM	No visible asbestos for surface soil *

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

H2.4 Ecological Investigation Levels

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

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

Variable	Input	Rationale
Age of contaminants	"Aged" (>2 years)	Given the potential sources of soil contamination are from historic use, the contamination is considered as "aged" (>2 years)
pH	5	Conservative value for initial screening
CEC	4 $cmol_c/kg$	Conservative value for initial screening
Clay content	50%	Based on soil type encountered during investigation
Traffic volumes	low	The site is located within a low traffic area
State / Territory	NSW	-

Table 7: Ecological Investigation Levels (mg/kg)

Contaminant	EIL-A-B-C
Metals	
Arsenic	100
Copper	90
Nickel	25
Chromium III	410
Lead	1100
Zinc	190
PAH	
Naphthalene	170
OCP	
DDT	180

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

H2.5 Ecological Screening Levels

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

Table 8: Ecological Screening Levels (mg/kg)

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

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

H2.6 Ecological Soil Guideline Values

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

Table 9: Ecological Soil Guideline Values (mg/kg) – All Land Uses

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

Notes: NC no criterion

H2.7 Management Limits

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

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

The adopted management limits are in Table 10.

Table 10: Management Limits (mg/kg)

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

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

H3.0 Groundwater

H3.1 Introduction

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

Table 11: Summary of Potential Receptors and Potential Risks

Receptor	Location	Exposure Point	Exposure Pathway
Surface water aquatic ecosystem	Down-gradient from site.	Receiving surface water body at the groundwater discharge point.	Exposure to contaminants.
Occupants of buildings	On site and down-gradient from site.	Enclosed buildings (proposed).	Inhalation of VOC (including TRH and BTEX) overlying VOC impacted groundwater via the vapour intrusion pathway.

The rationale for the selection of GIL is in Table .

Table 12: Groundwater Investigation Level Rationale

Receptor / Beneficial Use	GIL	Source	Comments / Rationale
Aquatic ecosystem	DGV	ANZG (2018)	Freshwater 99% LOP for bioaccumulative contaminants 95% LOP for non-bioaccumulative contaminants
Aquatic ecosystem	DGV	HEPA (2020)	Freshwater 99% LOP Screening values were only available for PFOS and PFOA at the time of this investigation.
Building occupants (vapour intrusion)	HSL	NEPC (2013)	There are no available HSLs for depths of up to 2 m. the laboratory practical quantitation limits (PGL) have been adopted.

Notes: DGV default guideline value
% LOP percentage level of protection of species
HSL health screening level

H3.2 Groundwater Investigation Levels for Aquatic Ecosystems

The DGV for the protection of aquatic ecosystems derived from ANZG (2018) are in Table 3.

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

Contaminant	Fresh Water
Metals	
Arsenic (III/IV)	24/13
Cadmium	0.2
Chromium (III/VI)	3.3/1.0
Copper	1.4
Lead	3.4
Mercury (inorganic)	0.6
Nickel	11
Zinc	8
PAH	
B(a)P TEQ	0.2
Phenols	
Phenol	320
Pentachlorophenol	10
OCP	

Contaminant	Fresh Water
Aldrin and dieldrin	0.001 and 0.01
Chlordane	0.08
Endosulfan	0.2
Endrin	0.02
Heptachlor	0.09
Methoxychlor	0.005
OPP	
Chlorpyrifos	0.01

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

The DGV for the protection of aquatic ecosystems derived from HEPA (2020) are in Table 4.

Table 5: Groundwater Investigation Levels for Protection of Aquatic Ecosystems (µg/L)

Contaminant / LOP	Fresh Water DGV
PFOS 99% LOP	0.00023
PFOA 99% LOP	19

H4.0 References

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

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

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

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

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

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

NHMRC, NRMMC. (2016). *Australian Drinking Water Guidelines 6 2011, Version 3.2.* Canberra: National Health and Medical Research Council, National Resource Management Ministerial Council.

Douglas Partners Pty Ltd

Appendix I

Laboratory Results Summary Tables

Douglas Partners
Geotechnics | Environment | Groundwater

Table I1: Summary of Laboratory Results – Site Assessment Criteria

			Metals								TRH						BTEX				PAH			
			Arsenic	Cadmium	Total Chromium	Copper	Lead	Mercury (inorganic)	Nickel	Zinc	TRH C6 - C10	TRH >C10-C16	F1 ((C6-C10)-BTEX)	F2 (>C10-C16 less Naphthalene)	F3 (>C16-C34)	F4 (>C34-C40)	Benzene	Toluene	Ethylbenzene	Total Xylenes	Naphthalene [b]	Benzo(a)pyrene (BaP)	Benzo(a)pyrene TEQ	Total PAHs
		PQL	4	0.4	1	1	1	0.1	1	1	25	50	25	50	100	100	0.2	0.5	1	1	0.1	0.05	0.5	0.05
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
BH101	0.1 m	21/07/2022	6	<0.4	12	7	16	<0.1	3	10	<25	<50	<25	<50	<100	<100	<0.2	<0.5	<1	<1	<0.1	<0.05	<0.5	<0.05
			100 100	20 -	100 410	6000 90	300 1100	40 -	400 25	7400 190	- -	- 120	45 180	110 -	- 300	- 2800	0.5 50	160 85	55 70	40 105	3 170	- 0.7	3 -	300 -
BH101	0.5 m	21/07/2022	5	<0.4	16	2	13	<0.1	1	3	<25	<50	<25	<50	<100	<100	<0.2	<0.5	<1	<1	<0.1	<0.05	<0.5	<0.05
			100 100	20 -	100 410	6000 90	300 1100	40 -	400 25	7400 190	- -	- 120	45 180	110 -	- 300	- 2800	0.5 50	160 85	55 70	40 105	3 170	- 0.7	3 -	300 -
BH102	0.1 m	20/07/2022	5	<0.4	11	8	13	<0.1	4	42	<25	<50	<25	<50	<100	<100	<0.2	<0.5	<1	<1	<0.1	<0.05	<0.5	<0.05
			100 100	20 -	100 410	6000 90	300 1100	40 -	400 25	7400 190	- -	- 120	45 180	110 -	- 300	- 2800	0.5 50	160 85	55 70	40 105	3 170	- 0.7	3 -	300 -
BH102	0.5 m	20/07/2022	7	<0.4	23	5	12	<0.1	3	8	<25	<50	<25	<50	<100	<100	<0.2	<0.5	<1	<1	<0.1	<0.05	<0.5	<0.05
			100 100	20 -	100 410	6000 90	300 1100	40 -	400 25	7400 190	- -	- 120	45 180	110 -	- 300	- 2800	0.5 50	160 85	55 70	40 105	3 170	- 0.7	3 -	300 -
BH103	0.1 m	20/07/2022	8	<0.4	14	10	13	<0.1	3	26	<25	<50	<25	<50	<100	<100	<0.2	<0.5	<1	<1	<0.1	<0.05	<0.5	<0.05
			100 100	20 -	100 410	6000 90	300 1100	40 -	400 25	7400 190	- -	- 120	45 180	110 -	- 300	- 2800	0.5 50	160 85	55 70	40 105	3 170	- 0.7	3 -	300 -
BH104	0.1 m	21/07/2022	4	<0.4	15	35	14	<0.1	8	34	<25	<50	<25	<50	<100	<100	<0.2	<0.5	<1	<1	<0.1	<0.05	<0.5	<0.05
			100 100	20 -	100 410	6000 90	300 1100	40 -	400 25	7400 190	- -	- 120	45 180	110 -	- 300	- 2800	0.5 50	160 85	55 70	40 105	3 170	- 0.7	3 -	300 -
BH104	0.5 m	21/07/2022	7	<0.4	18	3	11	<0.1	2	7	<25	<50	<25	<50	<100	<100	<0.2	<0.5	<1	<1	<0.1	<0.05	<0.5	<0.05
			100 100	20 -	100 410	6000 90	300 1100	40 -	400 25	7400 190	- -	- 120	45 180	110 -	- 300	- 2800	0.5 50	160 85	55 70	40 105	3 170	- 0.7	3 -	300 -
BH105	0.1 - 0.2 m	08/09/2022	8	<0.4	16	10	17	<0.1	5	18	<25	<50	<25	<50	<100	<100	<0.2	<0.5	<1	<1	<0.1	<0.05	<0.5	<0.05
			100 100	20 -	100 410	6000 90	300 1100	40 -	400 25	7400 190	- -	- 120	45 180	110 -	- 300	- 2800	0.5 50	160 85	55 70	40 105	3 170	- 0.7	3 -	300 -
BH109	0.1 - 0.2 m	08/09/2022	7	<0.4	17	8	16	<0.1	4	21	<25	<50	<25	<50	<100	120	<0.2	<0.5	<1	<1	<0.1	<0.05	<0.5	<0.05
			100 100	20 -	100 410	6000 90	300 1100	40 -	400 25	7400 190	- -	- 120	45 180	110 -	- 300	- 2800	0.5 50	160 85	55 70	40 105	3 170	- 0.7	3 -	300 -
BH110	0.1 - 0.2 m	08/09/2022	7	<0.4	14	13	19	<0.1	4	14	<25	<50	<25	<50	100	<100	<0.2	<0.5	<1	<1	<0.1	<0.05	<0.5	<0.05
			100 100	20 -	100 410	6000 90	300 1100	40 -	400 25	7400 190	- -	- 120	45 180	110 -	- 300	- 2800	0.5 50	160 85	55 70	40 105	3 170	- 0.7	3 -	300 -
BH110	0.4 - 0.5 m	08/09/2022	8	<0.4	19	12	19	<0.1	7	17	<25	<50	<25	<50	<100	<100	<0.2	<0.5	<1	<1	<0.1	<0.05	<0.5	<0.05
			100 100	20 -	100 410	6000 90	300 1100	40 -	400 25	7400 190	- -	- 120	45 180	110 -	- 300	- 2800	0.5 50	160 85	55 70	40 105	3 170	- 0.7	3 -	300 -
BH112	0.1 - 0.2 m	08/09/2022	6	<0.4	16	12	16	<0.1	6	32	<25	<50	<25	<50	<100	<100	<0.2	<0.5	<1	<1	<0.1	<0.05	<0.5	<0.05
			100 100	20 -	100 410	6000 90	300 1100	40 -	400 25	7400 190	- -	- 120	45 180	110 -	- 300	- 2800	0.5 50	160 85	55 70	40 105	3 170	- 0.7	3 -	300 -
BH112	0.4 - 0.5 m	08/09/2022	7	<0.4	13	23	15	<0.1	9	31	<25	<50	<25	<50	<100	<100	<0.2	<0.5	<1	<1	<0.1	<0.05	<0.5	<0.05
			100 100	20 -	100 410	6000 90	300 1100	40 -	400 25	7400 190	- -	- 120	45 180	110 -	- 300	- 2800	0.5 50	160 85	55 70	40 105	3 170	- 0.7	3 -	300 -
BH112	0.9 - 1 m	08/09/2022	6	<0.4	9	7	14	<0.1	2	28	<25	<50	<25	<50	<100	<100	<0.2	<0.5	<1	<1	<0.1	<0.05	<0.5	<0.05
			100 100	20 -	100 410	6000 90	300 1100	40 -	400 25	7400 190	- -	- 120	45 180	110 -	- 300	- 2800	0.5 50	160 85	55 70	40 105	3 170	- 0.7	3 -	300 -
BH113	0.1 - 0.2 m	08/09/2022	7	<0.4	15	8	17	<0.1	4	14	<25	<50	<25	<50	<100	<100	<0.2	<0.5	<1	<1	<0.1	<0.05	<0.5	<0.05
			100 100	20 -	100 410	6000 90	300 1100	40 -	400 25	7400 190	- -	- 120	45 180	110 -	- 300	- 2800	0.5 50	160 85	55 70	40 105	3 170	- 0.7	3 -	300 -
BD1-08/09/2022	0 m	08/09/2022	9	<0.4	17	15	18	<0.1	6	17	<25	<50	<25	<50	<100	<100	<0.2	<0.5	<1	<1	<0.1	<0.05	<0.5	<0.05
			100 100	20 -	100 410	6000 90	300 1100	40 -	400 25	7400 190	- -	- 120	45 180	110 -	- 300	- 2800	0.5 50	160 85	55 70	40 105	3 170	- 0.7	3 -	300 -
BH114	0.1 - 0.2 m	08/09/2022	6	<0.4	14	6	15	<0.1	3	9	<25	<50	<25	<50	<100	<100	<0.2	<0.5	<1	<1	<0.1	<0.05	<0.5	<0.05
			100 100	20 -	100 410	6000 90	300 1100	40 -	400 25	7400 190	- -	- 120	45 180	110 -	- 300	- 2800	0.5 50	160 85	55 70	40 105	3 170	- 0.7	3 -	300 -
BH114	0.4 - 0.5 m	08/09/2022	7	<0.4	14	8	15	<0.1	4	12	<25	<50	<25	<50	<100	<100	<0.2	<0.5	<1	<1	<0.1	<0.05	<0.5	<0.05
			100 100	20 -	100 410	6000 90	300 1100	40 -	400 25	7400 190	- -	- 120	45 180	110 -	- 300	- 2800	0.5 50	160 85	55 70	40 105	3 170	- 0.7	3 -	300 -
BH114	0.9 - 1 m	08/09/2022	15	<0.4	14	6	11	<0.1	3	15	<25	<50	<25	<50	<100	<100	<0.2	<0.5	<1	<1	<0.1	<0.05	<0.5	<0.05
			100 100	20 -	100 410	6000 90	300 1100	40 -	400 25	7400 190	- -	- 120	45 180	110 -	- 300	- 2800	0.5 50	160 85	55 70	40 105	3 170	- 0.7	3 -	300 -
BH115	0.1 - 0.2 m	08/09/2022	6	<0.4	15	5	13	<0.1	3	12	<25	<50	<25	<50	<100	<100	<0.2	<0.5	<1	<1	<0.1	<0.05	<0.5	<0.05
			100 100	20 -	100 410	6000 90	300 1100	40 -	400 25	7400 190	- -	- 120	45 180	110 -	- 300	- 2800	0.5 50	160 85	55 70	40 105	3 170	- 0.7	3 -	300 -
BH108	0.1 - 0.2 m	13/09/2022	8	<0.4	18	7	17	<0.1	3	18	<25	<50	<25	<50	<100	<100	<0.2	<0.5	<1	<1	<0.1	<0.05	<0.5	<0.05
			100 100	20 -	100 410	6000 90	300 1100	40 -	400 25	7400 190	- -	- 120	45 180	110 -	- 300	- 2800	0.5 50	160 85	55 70	40 105	3 170	- 0.7	3 -	300 -
BD1-13/09/2022	0 m	13/09/2022	6	<0.4	23	8	17	<0.1	4	16	<25	<50	<25	<50	<100	<100	<0.2	<0.5	<1	<1	<0.1	<0.05	<0.5	<0.05
			100 100	20 -	100 410	6000 90	300 1100	40 -	400 25	7400 190	- -	- 120	45 180	110 -	- 300	- 2800	0.5 50	160 85	55 70	40 105	3 170	- 0.7	3 -	300 -
BH108	0.4 - 0.5 m	13/09/2022	7	<0.4	20	4	13	<0.1	2	10	<25	<50	<25	<50	<100	<100	<0.2	<0.5	<1	<1	<0.1	<0.05	<0.5	<0.05
			100 100	20 -	100 410	6000 90	300 1100	40 -	400 25	7400 190	- -	- 120	45 180	110 -	- 300	- 2800	0.5 50	160 85	55 70	40 105	3 170	- 0.7	3 -	300 -
BH108	0.9 - 1 m	13/09/2022	5	<0.4	14	2	11	<0.1	2	9	<25	<50	<25	<50	<100	<100	<0.2	<0.5	<1	<1	<0.1	<0.05	<0.5	<0.05
			100 100	20 -	100 410	6000 90	300 1100	40 -	400 25	7400 190	- -	- 120	45 180	110 -	- 300	- 2800	0.5 50	160 85	55 70	40 105	3 170	- 0.7	3 -	300 -
BH111	0.1 - 0.2 m	13/09/2022	8	<0.4	25	10	18	<0.1	6	25	<25	<50	<25	<50	130	<100	<0.2	<0.5	<1	<1	<0.1	<0.05	<0.5	<0.05
			100 100	20 -	100 410	6000 90	300 1100	40 -	400 25	7400 190	- -	- 120	45 180	110 -	- 300	- 2800	0.5 50	160 85	55 70	40 105	3 170	- 0.7	3 -	300 -
BH111	0.4 - 0.5 m	13/09/2022	5	<0.4	16	3	10	<0.1	4	17	<25	<50	<25	<50	<100	<100	<0.2	<0.5	<1	<1	<0.1	<0.05	<0.5	<0.05
			100 100	20 -	100 410	6000 90	300 1100	40 -	400 25	7400 190	- -	- 120	45 180	110 -	- 300	- 2800	0.5 50	160 85	55 70	40 105	3 170	- 0.7	3 -	300 -
BD2-13/09/2022	0 m	13/09/2022	8	<0.4	17	4	15	<0.1	3	10	<25	<50	<25	<50	<100	<100	<0.2	<0.5	<1	<1	<0.1	<0.05	<0.5	<0.05
			100 100	20 -	100 410	6000 90	300 1100	40 -	400 25	7400 190	- -	- 120	45 180	110 -	- 300	- 2800	0.5 50	160 85	55 70	40 105	3 170	- 0.7	3 -	300 -
BH111	0.9 - 1 m	13/09/2022	9	<0.4	25	4	13	<0.1	3	19	<25	<50	<25	<50	<100	<100	<0.2	<0.5	<1	<1	<0.1	<0.05	<0.5	<0.05
			100 100	20 -	100 410	6000 90	300 1100	40 -	400 25	7400 190	- -	- 120	45 180	110 -	- 300	- 2800	0.5 50	160 85	55 70	40 105	3 170	- 0.7	3 -	300 -
BH115	0.1 - 0.2 m	13/09/2022	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
			100 100	20 -	100 410	6000 90	300 1100	40 -	400 25	7400 190	- -	- 120	45 180	110 -	- 300	- 2800	0.5 50	160 85	55 70	40 105	3 170	- 0.7	3 -	300 -
BH109	0.4 - 0.5 m	13/09/2022	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
			100 100	20 -	100 410	6000 90	300 1100	40 -	400 25	7400 190	- -	- 120	45 180	110 -	- 300	- 2800	0.5 50	160 85	55 70	40 105	3 170	- 0.7	3 -	300 -
BH114	0.4 - 0.5 m	08/09/2022	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
			100 100	20 -	100 410	6000 90	300 1100	40 -	400 25	7400 190	- -	- 120	45 180	110 -	- 300	- 2800	0.5 50	160 85	55 70	40 105	3 170	- 0.7	3 -	300 -
BH110	0.1 - 0.2 m	08/09/2022	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
			100 100	20 -	100 410	6000 90	300 1100	40 -	400 25	7400 190	- -	- 120	45 180	110 -	- 300	- 2800	0.5 50	160 85	55 70	40 105	3 170	- 0.7	3 -	300 -
BH113	0.4 - 0.5 m	08/09/2022	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
			100 100	20 -	100 410	6000 90	300 1100	40 -	400 25	7400 190	- -	- 120	45 180	110 -	- 300	- 2800	0.5 50	160 85	55 70	40 105	3 170	- 0.7	3 -	300 -
BD3-13/09/2022	0 m	13/09/2022	6	<0.4	12	7	15	<0.1	4	10	<25	<50	<25	<50	<100	<100	<0.2	<0.5	<1	<1	<0.1	<0.05	<0.5	<0.05
			100 100	20 -	100 410	6000 90	300 1100	40 -	400 25	7400 190	- -	- 120	45 180	110 -	- 300	- 2800	0.5 50	160 85	55 70	40 105	3 170	- 0.7	3 -	300 -

			Phenol	OCP											OPP		Asbestos			
			Phenol	DDD	DDT+DDE+DDD [c]	DDE	DDT	Aldrin & Dieldrin	Total Chlordane	Endrin	Total Endosulfan	Heptachlor	Hexachlorobenzene	Methoxychlor	Chlorpyriphos	Total PCB	Asbestos ID in soil >0.1g/kg	Asbestos ID in soil <0.1g/kg	FA and AF Estimation	Total Asbestos
		PQL	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			<0.001	
Sample ID	Depth	Sample Date	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	-	-	%(w/w)	-
BH101	0.1 m	21/07/2022	<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
			100 -	- -	240 180	- -	- 180	6 -	50 -	10 -	270 -	6 -	10 -	300 -	160 -	1 -				
BH101	0.5 m	21/07/2022	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
			100 -	- -	240 180	- -	- 180	6 -	50 -	10 -	270 -	6 -	10 -	300 -	160 -	1 -				
BH102	0.1 m	20/07/2022	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
			100 -	- -	240 180	- -	- 180	6 -	50 -	10 -	270 -	6 -	10 -	300 -	160 -	1 -				
BH102	0.5 m	20/07/2022	<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
			100 -	- -	240 180	- -	- 180	6 -	50 -	10 -	270 -	6 -	10 -	300 -	160 -	1 -				
BH103	0.1 m	20/07/2022	<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
			100 -	- -	240 180	- -	- 180	6 -	50 -	10 -	270 -	6 -	10 -	300 -	160 -	1 -				
BH104	0.1 m	21/07/2022	<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
			100 -	- -	240 180	- -	- 180	6 -	50 -	10 -	270 -	6 -	10 -	300 -	160 -	1 -				
BH104	0.5 m	21/07/2022	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
			100 -	- -	240 180	- -	- 180	6 -	50 -	10 -	270 -	6 -	10 -	300 -	160 -	1 -				
BH105	0.1 - 0.2 m	08/09/2022	<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
			100 -	- -	240 180	- -	- 180	6 -	50 -	10 -	270 -	6 -	10 -	300 -	160 -	1 -				
BH109	0.1 - 0.2 m	08/09/2022	<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
			100 -	- -	240 180	- -	- 180	6 -	50 -	10 -	270 -	6 -	10 -	300 -	160 -	1 -				
BH110	0.1 - 0.2 m	08/09/2022	<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
			100 -	- -	240 180	- -	- 180	6 -	50 -	10 -	270 -	6 -	10 -	300 -	160 -	1 -				
BH110	0.4 - 0.5 m	08/09/2022	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
			100 -	- -	240 180	- -	- 180	6 -	50 -	10 -	270 -	6 -	10 -	300 -	160 -	1 -				
BH112	0.1 - 0.2 m	08/09/2022	<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
			100 -	- -	240 180	- -	- 180	6 -	50 -	10 -	270 -	6 -	10 -	300 -	160 -	1 -				
BH112	0.4 - 0.5 m	08/09/2022	<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
			100 -	- -	240 180	- -	- 180	6 -	50 -	10 -	270 -	6 -	10 -	300 -	160 -	1 -				
BH112	0.9 - 1 m	08/09/2022	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
			100 -	- -	240 180	- -	- 180	6 -	50 -	10 -	270 -	6 -	10 -	300 -	160 -	1 -				
BH113	0.1 - 0.2 m	08/09/2022	<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
			100 -	- -	240 180	- -	- 180	6 -	50 -	10 -	270 -	6 -	10 -	300 -	160 -	1 -				
BD1-08/09/2022	0 m	08/09/2022	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	-	-	-	-
			100 -	- -	240 180	- -	- 180	6 -	50 -	10 -	270 -	6 -	10 -	300 -	160 -	1 -				
BH114	0.1 - 0.2 m	08/09/2022	<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
			100 -	- -	240 180	- -	- 180	6 -	50 -	10 -	270 -	6 -	10 -	300 -	160 -	1 -				
BH114	0.4 - 0.5 m	08/09/2022	<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
			100 -	- -	240 180	- -	- 180	6 -	50 -	10 -	270 -	6 -	10 -	300 -	160 -	1 -				
BH114	0.9 - 1 m	08/09/2022	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
			100 -	- -	240 180	- -	- 180	6 -	50 -	10 -	270 -	6 -	10 -	300 -	160 -	1 -				
BH115	0.1 - 0.2 m	08/09/2022	<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
			100 -	- -	240 180	- -	- 180	6 -	50 -	10 -	270 -	6 -	10 -	300 -	160 -	1 -				
BH108	0.1 - 0.2 m	13/09/2022	<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
			100 -	- -	240 180	- -	- 180	6 -	50 -	10 -	270 -	6 -	10 -	300 -	160 -	1 -				
BD1-13/09/2022	0 m	13/09/2022	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	-	-	-	-
			100 -	- -	240 180	- -	- 180	6 -	50 -	10 -	270 -	6 -	10 -	300 -	160 -	1 -				
BH108	0.4 - 0.5 m	13/09/2022	<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
			100 -	- -	240 180	- -	- 180	6 -	50 -	10 -	270 -	6 -	10 -	300 -	160 -	1 -				
BH108	0.9 - 1 m	13/09/2022	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
			100 -	- -	240 180	- -	- 180	6 -	50 -	10 -	270 -	6 -	10 -	300 -	160 -	1 -				
BH111	0.1 - 0.2 m	13/09/2022	<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
			100 -	- -	240 180	- -	- 180	6 -	50 -	10 -	270 -	6 -	10 -	300 -	160 -	1 -				
BH111	0.4 - 0.5 m	13/09/2022	<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
			100 -	- -	240 180	- -	- 180	6 -	50 -	10 -	270 -	6 -	10 -	300 -	160 -	1 -				
BD2-13/09/2022	0 m	13/09/2022	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	-	-	-	-
			100 -	- -	240 180	- -	- 180	6 -	50 -	10 -	270 -	6 -	10 -	300 -	160 -	1 -				
BH111	0.9 - 1 m	13/09/2022	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
			100 -	- -	240 180	- -	- 180	6 -	50 -	10 -	270 -	6 -	10 -	300 -	160 -	1 -				
BH115	0.1 - 0.2 m	13/09/2022	-	-	-	-	-	-	-	-	-	-	-	-	-	-	NAD	NAD	<0.001	NAD
			100 -	- -	240 180	- -	- 180	6 -	50 -	10 -	270 -	6 -	10 -	300 -	160 -	1 -				
BH109	0.4 - 0.5 m	13/09/2022	-	-	-	-	-	-	-	-	-	-	-	-	-	-	NAD	NAD	<0.001	NAD
			100 -	- -	240 180	- -	- 180	6 -	50 -	10 -	270 -	6 -	10 -	300 -	160 -	1 -				
BH114	0.4 - 0.5 m	08/09/2022	-	-	-	-	-	-	-	-	-	-	-	-	-	-	NAD	NAD	<0.001	NAD
			100 -	- -	240 180	- -	- 180	6 -	50 -	10 -	270 -	6 -	10 -	300 -	160 -	1 -				
BH110	0.1 - 0.2 m	08/09/2022	-	-	-	-	-	-	-	-	-	-	-	-	-	-	NAD	NAD	<0.001	NAD
			100 -	- -	240 180	- -	- 180	6 -	50 -	10 -	270 -	6 -	10 -	300 -	160 -	1 -				
BH113	0.4 - 0.5 m	08/09/2022	-	-	-	-	-	-	-	-	-	-	-	-	-	-	NAD	NAD	<0.001	NAD
			100 -	- -	240 180	- -	- 180	6 -	50 -	10 -	270 -	6 -	10 -	300 -	160 -	1 -				
BD3-13/09/2022	0 m	13/09/2022	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	-	-	-	-
			100 -	- -	240 180	- -	- 180	6 -	50 -	10 -	270 -	6 -	10 -	300 -	160 -	1 -				

Lab result
HIL/HSL value   EIL/ESL value

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

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

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

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

Notes:

a   QA/QC replicate of sample listed directly below the primary sample
b   Reported naphthalene laboratory result obtained from BTEXN suite
c   Criteria applies to DDT only

Site Assessment Criteria (SAC):

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

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

HIL A	Residential / Low - High Density (NEPC, 2013)
HSL A/B	Residential / Low - High Density (vapour intrusion) (NEPC, 2013)
DC HSL A	Direct contact HSL A Residential (Low density) (direct contact) (CRC CARE, 2011)
EIL/ESL UR/POS	Urban Residential and Public Open Space (NEPC, 2013)
ML R/P/POS	Residential, Parkland and Public Open Space (NEPC, 2013)

Douglas Partners
Geotechnics / Environment / Groundwater

Table I2: PFAS in Soil

			PFAS in Soil				
			PFOS	PFOA	PFHxS	PFOS and PFHxS *	Total PFAS
		PQL	0.1	0.1	0.1	0.1	0.1
Sample ID	Depth	Sample Date	µg/kg	µg/kg	µg/kg	µg/kg	µg/kg
Site Assessment Criteria							
Human Health			**-**	**100**	**-**	**10**	**-**
Ecological (Direct exposure)			**1000**	**10000**	**-**	**-**	**-**
Ecological (Indirect exposure)			**10**	**-**	**-**	**-**	**-**
Agricultural Guideline Levels			**10**				
September 2022							
BH106	0.1-0.2	13-09-22	0.5	0.2	<0.1	0.5	0.7
BH107	0.1-0.2	13-09-22	0.4	0.3	<0.1	0.4	0.8
BH108	0.1-0.2	13-09-22	0.3	0.3	<0.1	0.3	0.6
BH111	0.1-0.2	13-09-22	0.4	0.3	<0.1	0.4	0.8
BH114A	0.1-0.2	13-09-22	0.5	0.3	<0.1	0.5	0.8

Douglas Partners
Geotechnics - Environment - Groundwater

Table I3: Summary of Groundwater Analytical Results - Site Assessment Criteria (All results in μg/L unless otherwise stated)

Sample ID	Heavy Metals								PAH and Phenols							TRH							BTEX				PCB	PFAS			VOC [2]										
	As	Cd	Cr[1]	Cu	Pb	Hg	Ni	Zn	Napthalene	Anthracene	Phenanthrene	Fluoranthene	Benzo(a)pyrene	Total +ve PAH	Total Phenolics	C6-C10	C10-C14	C15-C28	C29-C36	TRH>C10-C16	TRH>C16-C34	TRH>C34-C40	Benzene	Toulene	Ethyl-benzene	Total Xylenes	Total PCB	PFOS	PFOA	PFOS/PFHxS	Chloroform	1,2-Dichloroethane	1,1,1-Trichloroethane	Carbon Tetrachloride	1,2-Dichloropropane	1,1,2-Trichloroethane	1,3-Dichloropropane	1,1,2,2-Tetrachloroethane	1,3-Dichlorobenzene	1,4-Dichlorobenzene
PQL	1	0.1	1	1	1	0.05	1	1	0.2	0.1	0.1	0.1	0.1	0.1	0.05	10	50	100	100	50	100	100	1	1	1	3	2	0.001	0.001	0.001	1	1	1	1	1	1	1	1	1	1
BH103	2	<0.1	<1	4	<1	<0.05	19	100	<0.2	<0.1	<0.1	<0.1	<0.1	<0.1	<0.05	<10	<50	<100	<100	<50	<100	<100	<1	<1	<1	<3	<2	0.001	<0.001	0.001	4	<1	<1	<1	<1	<1	<1	<1	<1	<1
BH104	2	<0.1	<1	2	<1	<0.05	9	19	<0.2	<0.1	<0.1	<0.1	<0.1	<0.1	<0.05	<10	<50	<100	<100	<50	<100	<100	<1	<1	<1	<3	<2	0.001	<0.001	0.001	3	<1	<1	<1	<1	<1	<1	<1	<1	<1
BH108	<1	<0.1	<1	4	1	<0.05	8	31	<0.2	<0.1	<0.1	<0.1	<0.1	<0.1	<0.05	<10	<50	<100	<100	<50	<100	<100	<1	<1	<1	<3	<2	0.004	0.008	0.005	10	<1	<1	<1	<1	<1	<1	<1	<1	<1
BH111	<1	0.1	<1	<1	<1	<0.05	9	11	<0.2	<0.1	<0.1	<0.1	<0.1	<0.1	<0.05	28	<50	<100	<100	<50	<100	<100	<1	<1	<1	<3	<2	0.005	0.009	0.008	42	<1	<1	<1	<1	<1	<1	<1	<1	<1
BD01	<1	0.1	<1	<1	<1	<0.05	9	31	<0.2	<0.1	<0.1	<0.1	<0.1	<0.1	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
TS	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
TB	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Groundwater Investigation Levels (GIL) [3]																																								
Fresh water [4]	13.0	0.2	3.3	1.4	3.4	0.60	11	8	16	0.4*	2.0*	1.4*	0.2*	-	-	-	-	-	-	-	-	-	950	180*	80*	625*	-	0.00023	19	-	770*	1900*	270*	240*	900*	6500	1100*	400*	260	60

Notes:

1	Assumed as Cr(III) oxidation state
2	Only those compounds for which GILs have been determined are included in the list
3	NEPC (2013) and ANZG (2018) Australian and New Zealand Guidelines for Fresh & Marine Water Quality
4	Fresh water trigger values for slightly to moderately disturbed ecosystems - 95% species protection (99% for PFAS)
*	Insufficient data for reliable trigger value. Interim working value or low reliability value used for screening purposes
**	No positive PAHs detected by the laboratory
-	Not defined/ not analysed/ not applicable
	Exceeds GIL
	Exceeds PQL
NL	Not limiting
PQL	Practical Quantification Limit of Laboratory

Douglas Partners
Geotechnics - Environment - Groundwater

Table I3: Summary of Groundwater Analytical Results - Site Assessment Criteria (All results in µg/L unless otherwise stated)

Sample ID								OCP																		OPP				
	1,2-Dichlorobenzene	1,2,3-Trichlorobenzene	Isopropylbenzene	n-propyl benzene	Sec-butyl benzene	n-butyl benzene	All other VOC	a-BHC	Aldrin	b-BHC	Chlordane (cis)	Chlordane (trans)	d-BHC	DDD	DDT	Dieldrin	Endosulfan I	Endosulfan II	Endosulfan sulphate	Endrin	g-BHC (Lindane)	HCB	Heptachlor	Heptachlor epoxide	Mirex	Methoxychlor	Chlorpyrifos	Diazinon	Dimethoate	Fenitrothion	Ethion
PQL	1	1	1	1	1	1		0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2
BH103	<1	<1	<1	<1	<1	<1	<PQL	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2
BH104	<1	<1	<1	<1	<1	<1	<PQL	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2
BH108	<1	<1	<1	<1	<1	<1	<PQL	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2
BH111	<1	<1	<1	<1	<1	<1	<PQL	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2
BD01	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
TS	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
TB	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Fresh water [4]	160	10	30	-	-	-	-	-	0.001	-	0.08		-	-	0.01	0.01	0.2		-	0.02	-	-	0.09	-	0.04	0.005	0.01	0.01	0.15	0.2	-

Notes:

1	Assumed as Cr(III) oxidation state
2	Only those compounds for which GILs have been determined are included in the list
3	NEPC (2013) and ANZG (2018) Australian and New Zealand Guidelines for Fresh & Marine Water Quality
4	Fresh water trigger values for slightly to moderately disturbed ecosystems - 95% species protection
*	Insufficient data for reliable trigger value. Interim working value or low reliability value used for screening purposes
**	No positive PAHs detected by the laboratory
-	Not defined/ not analysed/ not applicable
	Exceeds GIL
	Exceeds PQL
NL	Not limiting
PQL	Practical Quantification Limit of Laboratory

Appendix J

Results of Field Work

BOREHOLE LOG

CLIENT: NSW Department of Education
PROJECT: Rouse Hill High School Upgrade
LOCATION: 240 Withers Road, Rouse Hill

SURFACE LEVEL: 49.3 AHD
COORDINATE E:308201 **N:** 6270702.5
DATUM/GRID: MGA94 Zone 56
DIP/AZIMUTH: 90°/---

LOCATION ID: 101
PROJECT No: 215851.00
DATE: 21/07/22
SHEET: 1 of 2

GROUNDWATER	RL (m)	DEPTH (m)	DESCRIPTION OF STRATA	GRAPHIC	SOIL ORIGIN(#)	SOIL CONSIS.(*) DENSITY.(*)	SOIL MOISTURE	ROCK WEATH.	ROCK DEPTH (m)	ROCK STRENGTH	ROCK RECOVERY (%)	ROCK RQD	FRACTURE SPACING (m)	DEFECTS & REMARKS	SAMPLE REMARKS	SAMPLE TYPE	SAMPLE INTERVAL	DEPTH (m)	TESTING TEST TYPE	TESTING RESULTS AND REMARKS
	49	0.05	FILL/ (SC) Clayey SAND; dark brown; fine to medium; trace organic root matter and ironstone gravel		FILL	WC	<PL									A E	0.1 0.2			
			(CI) Sandy CLAY; orange-brown becoming orange; medium plasticity; trace ironstone gravel													A E	0.5 0.6			
	48	1			RES	VST	=PL									A E SPT	1.0 1.1		S	12,17,13/110
		1.41																		
	47	1.9 2	SANDSTONE; pale orange; medium to coarse; very low strength, extremely weathered with clay bands, Hawkesbury Sandstone		XWM	XWR	NA									A E	1.5 1.6 2.0 2.1			
	46	2.5 3	SANDSTONE; orange-red and grey; medium to coarse; medium strength, moderately to highly weathered, slightly fractured, Hawkesbury Sandstone					HW MW	2.5 2.9					2.5-2.51m: Cs 10mm; 2.6-2.63m: Cs 30mm; 2.79m: B 0°-15° PL, RO, fe STN; 2.88m: B 0°-15° ST, RO, cly vn; 2.95m: B 0°-15° PL, RO, cly CO; 2.99-3.01m: Cs 20mm; 3.08m: B 0°-15° PL, RO, fe STN			3	PLT	0.62
	45	3.71 4	SANDSTONE; pale grey; medium to coarse; medium then high strength, fresh, slightly fractured, Hawkesbury Sandstone					FS	3.7	M	100	95		3.55m: B 0°-10° PL, RO, fe STN; 3.6m: B 0°-10° ST, RO, cly vn; 3.65m: B 0°-10° PL, RO, cly vn; 3.69m: B 0°-10° PL, RO, fe STN; 3.79m: B 0°-10° ST, RO, STN; 4.6m: B 0°-10° ST, RO, CLN			4	PLT	0.94
																			PLT	0.99

NOTES: (#)Soil origin is "probable" unless otherwise stated. (*)Consistency/Relative density shading is for visual reference only - no correlation between cohesive and granular materials is implied.

EXPORTED 07/11/22 12:56. TEMPLATE ID: DP_103.02.00_COMBINED

PLANT: MD300
OPERATOR: Traccess
LOGGED: Harini S

METHOD: Solid Flight Auger to 2.5m, NMLC to 8.0m
CASING: NW to 2.5m

REMARKS: Well construction: Gatic cover, Blank 0 - 2.5m, Screen 2.5 - 8.04m, Backfill: Bentonite 0 - 2.5m, Gravel 2.5 to 8.04m

BOREHOLE LOG

CLIENT: NSW Department of Education
PROJECT: Rouse Hill High School Upgrade
LOCATION: 240 Withers Road, Rouse Hill

SURFACE LEVEL: 49.3 AHD
COORDINATE E:308201 **N:** 6270702.5
DATUM/GRID: MGA94 Zone 56
DIP/AZIMUTH: 90°/---

LOCATION ID: 101
PROJECT No: 215851.00
DATE: 21/07/22
SHEET: 2 of 2

CONDITIONS ENCOUNTERED																			SAMPLE				TESTING	
				SOIL				ROCK																
GROUNDWATER	RL (m)	DEPTH (m)	DESCRIPTION OF STRATA	GRAPHIC	ORIGIN(#)	CONSIS.(*) DENSITY.(*)	MOISTURE	WEATH.	DEPTH (m)	STRENGTH VL L M H VH EH	RECOVERY (%)	RQD	FRACTURE SPACING (m) 0.01 0.05 0.10 0.50 1.00 5.00	DEFECTS & REMARKS	SAMPLE REMARKS	TYPE	INTERVAL	DEPTH (m)	TEST TYPE	RESULTS AND REMARKS
	44	5	SANDSTONE; pale grey; medium to coarse; medium then high strength, fresh, slightly fractured, Hawkesbury Sandstone *(continued)*						5.0		100	95						5.73	UCS	25.9MPa
																UCS		5.92	PLT	1.6
	43	6						FS		H				6.1m: B 0°-10° PL, RO, STN				6	PLT	1.8
														6.27m: B 0°-15° ST, RO, STN						
	42	7									100	99						7		
														7.33m: B 0°-10° PL, RO, STN						
		8	Borehole discontinued at 8.00m depth						8.0									8	PLT	1.6
	41	9																9		
	40																			

NOTES: (#)Soil origin is "probable" unless otherwise stated. (*)Consistency/Relative density shading is for visual reference only - no correlation between cohesive and granular materials is implied.

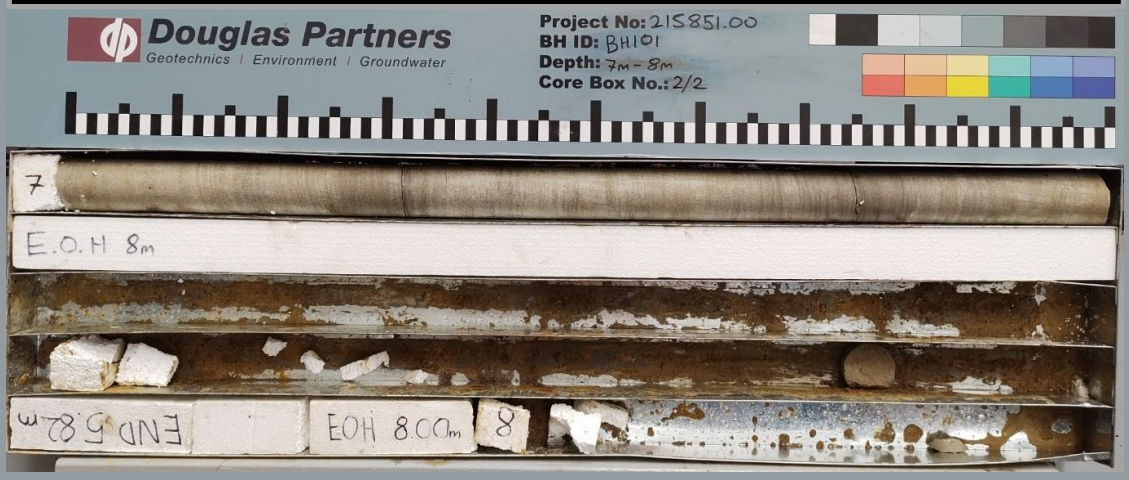
PLANT: MD300
OPERATOR: Traccess
LOGGED: Harini S
METHOD: Solid Flight Auger to 2.5m, NMLC to 8.0m
CASING: NW to 2.5m
REMARKS: Well construction: Gatic cover, Blank 0 - 2.5m, Screen 2.5 - 8.04m, Backfill: Bentonite 0 - 2.5m, Gravel 2.5 to 8.04m

EXPORTED 07/11/22 12:56. TEMPLATE ID: DP_103.02.00_COMBINED

BORE: BH101 PROJECT: 215851.00 July 2022

2.5m – 7.0m

BORE: BH101 PROJECT: 215851.00 July 2022



7.0m – 8.0m

BOREHOLE LOG

CLIENT: NSW Department of Education
PROJECT: Rouse Hill High School Upgrade
LOCATION: 240 Withers Road, Rouse Hill

SURFACE LEVEL: 49.5 AHD
COORDINATE E:308298 **N:** 6270579.6
DATUM/GRID: MGA94 Zone 56
DIP/AZIMUTH: 90°/---

LOCATION ID: 102
PROJECT No: 215851.00
DATE: 20/07/22
SHEET: 1 of 2

CONDITIONS ENCOUNTERED																		SAMPLE				TESTING	
				SOIL			ROCK																
GROUNDWATER	RL (m)	DEPTH (m)	DESCRIPTION OF STRATA	GRAPHIC	ORIGIN(#)	CONSIS.(*) DENSITY.(*)	MOISTURE	WEATH.	DEPTH (m)	STRENGTH VL L M H VH EH	RECOVERY (%)	RQD	FRACTURE SPACING (m) 0.01 0.05 0.10 0.50 1.00 5.00	DEFECTS & REMARKS	SAMPLE REMARKS	TYPE	INTERVAL	DEPTH (m)	TEST TYPE	RESULTS AND REMARKS
	49	0.0	FILL/ (SC) Clayey SAND; dark brown, mottled with orange and red; fine to medium; trace organic root matter and ironstone gravel		FILL	WC	=PL									A E		0.1 0.2		
		0.5	(Cl) Sandy CLAY; brown mottled red; medium plasticity; trace ironstone gravel		RES	VST	<PL									A E		0.5 0.6		
		1																1.0		
		1.25	(Cl) Sandy CLAY; dark red mottled orange and grey; medium plasticity; trace organic root matter		RES	VST	<PL									SPT		1.38	S	5,16,14/80
	48	1.55	SANDSTONE; dark orange; medium to coarse; very low strength, extremely weathered with clay bands, Hawkesbury Sandstone		XWM	XWR	NA									A E		1.5 1.6		
		2														A E		2.0 2.1		
	47	2.5	SANDSTONE; orange and grey; coarse; with 5% siltstone clasts, medium to high strength, moderately to slightly weathered, slightly fractured, with trace siltstone laminations, Hawkesbury Sandstone					MW-SW	2.5 3.02	M H	100	87		2.57m: B 0°-5° PL, RO, cly CO 2.73-2.76m: B 0°-5° PL, SM, cly CO 2.84m: B 0°-10° PL, RO, CLN 3.35m: B 0°-20° IR, RO, cly vn 3.59-3.63m: J 0°-40° PL, RO, cly vn 3.62m: B 0°-15° PL, RO, cly vn 3.65m: B 0°-15° PL, RO, fe STN 3.65-3.7m: J 40° PL, RO, cly vn 3.7m: B 0°-20° PL, RO, cly CO 3.78-3.8m: B x2 0°-10° PL, RO, cly CO 3.88m: J 50° PL, RO, cly CO 3.92m: B 0°-10° PL, RO, cly CO 3.94-4.02m: J 60° PL, RO, cly vn 4.16m: B 0°-15° PL, RO, fe vn 4.21-4.27m: Cs cly, 60mm 4.33m: B 0°-5° PL, RO, cly CO 4.38-4.44m: B x3 0°-15° PL, RO, cly vn			3 4	PLT PLT PLT	0.63 1.3 1.2

NOTES: (#)Soil origin is "probable" unless otherwise stated. (*)Consistency/Relative density shading is for visual reference only - no correlation between cohesive and granular materials is implied.

PLANT: MD300
OPERATOR: Traccess
LOGGED: Harini S

METHOD: Solid Flight Auger to 2.5m, NMLC to 8.06m
CASING: NW to 2.5m

REMARKS: Well construction: Gatic cover, Blank 0 - 2.5m, Screen 2.5 - 8.06m, Backfill: Bentonite 0 - 2.5m, Gravel 2.5 to 8.06m

EXPORTED 07/11/22 12:56. TEMPLATE ID: DP_103.02.00_COMBINED

BOREHOLE LOG

CLIENT: NSW Department of Education
PROJECT: Rouse Hill High School Upgrade
LOCATION: 240 Withers Road, Rouse Hill

SURFACE LEVEL: 49.5 AHD
COORDINATE E:308298 **N:** 6270579.6
DATUM/GRID: MGA94 Zone 56
DIP/AZIMUTH: 90°/---

LOCATION ID: 102
PROJECT No: 215851.00
DATE: 20/07/22
SHEET: 2 of 2

GROUNDWATER	RL (m)	DEPTH (m)	DESCRIPTION OF STRATA	GRAPHIC	SOIL: ORIGIN(#)	SOIL: CONSIS.(*) DENSITY.(*)	SOIL: MOISTURE	ROCK: WEATH.	ROCK: DEPTH (m)	ROCK: STRENGTH (VL L M H VH EH)	ROCK: RECOVERY (%)	ROCK: RQD	ROCK: FRACTURE SPACING (m) (0.01 0.05 0.10 0.50 1.00 5.00)	ROCK: DEFECTS & REMARKS	SAMPLE: SAMPLE REMARKS	SAMPLE: TYPE	SAMPLE: INTERVAL	DEPTH (m)	TESTING: TEST TYPE	TESTING: RESULTS AND REMARKS
	44	6	SANDSTONE; orange and grey; coarse; with 5% siltstone clasts, medium to high strength, moderately to slightly weathered, slightly fractured, with trace siltstone laminations, Hawkesbury Sandstone *(continued)*					MW-SW		H	100	87		5.01m: B 0°-10° PL, RO, fe STN 5.14m: B 0°-10° PL, RO, fe vn 5.19m: B 0°-15° PL, RO, fe CO 5.35-5.37m: B x2 0°-10° PL, RO, fe vn 5.83-5.85m: B x2 0°-10° PL, RO, cly vn 5.93m: B 0°-10° PL, RO, vn 6.04m: B 0°-5° PL, RO, fe vn 6.09m: B 0°-5° PL, RO, cly vn				6	PLT 1.0
	43	6.12	SANDSTONE; pale grey; fresh, medium and high strength, slightly fractured, Hawkesbury Sandstone					FS	6.2		100	95		7.32m: B 0°-10° PL, RO, CLN 7.51m: B 0°-15° PL, RO, vn		UCS		6.75 6.94	UCS 12.1MPa PLT 1.1	
	42	8	Borehole discontinued at 8.06m depth						7.8 8.06	M								8	PLT 0.92	
	41	9																9		
	40																			

NOTES: (#)Soil origin is "probable" unless otherwise stated. (*)Consistency/Relative density shading is for visual reference only - no correlation between cohesive and granular materials is implied.

PLANT: MD300
OPERATOR: Traccess
LOGGED: Harini S

METHOD: Solid Flight Auger to 2.5m, NMLC to 8.06m
CASING: NW to 2.5m

REMARKS: Well construction: Gatic cover, Blank 0 - 2.5m, Screen 2.5 - 8.06m, Backfill: Bentonite 0 - 2.5m, Gravel 2.5 to 8.06m

BORE: BH102 PROJECT: 215851.00 July 2022

2.5m – 7.0m

BORE: BH102 PROJECT: 215851.00 July 2022

7.0m – 8.06m

BOREHOLE LOG

CLIENT: NSW Department of Education
PROJECT: Rouse Hill High School Upgrade
LOCATION: 240 Withers Road, Rouse Hill

SURFACE LEVEL: 50 AHD
COORDINATE E:308245 **N:** 6270623
DATUM/GRID: MGA94 Zone 56
DIP/AZIMUTH: 90°/---

LOCATION ID: 103
PROJECT No: 215851.00
DATE: 20/07/22
SHEET: 1 of 2

CONDITIONS ENCOUNTERED																				SAMPLE				TESTING	
				SOIL				ROCK																	
GROUNDWATER	RL (m)	DEPTH (m)	DESCRIPTION OF STRATA	GRAPHIC	ORIGIN(#)	CONSIS.(*) DENSITY.(*)	MOISTURE	WEATH.	DEPTH (m)	STRENGTH VL L M H VH EH	RECOVERY (%)	RQD	FRACTURE SPACING 0.01 0.05 0.10 0.50 1.00 5.00	DEFECTS & REMARKS	SAMPLE REMARKS	TYPE	INTERVAL	DEPTH (m)	TEST TYPE	RESULTS AND REMARKS
	50	0.0																							
		0.05	FILL/ (SC) Clayey SAND; dark brown; fine to medium; trace ironstone gravel		FILL	WC	<PL																	
			(CI) Sandy CLAY; orange brown mottled red; medium plasticity; trace ironstone gravel		RES	VST	=PL									A	0.1							
																E	0.2							
																A	0.5							
	49	1														E	0.6							
																	1.0							
																SPT					S	7,19,11/90		
																	1.39							
																A	1.5							
		1.8														E	1.6							
			SANDSTONE; orange and grey; medium to coarse; very low strength, extremely weathered with clay bands, Hawkesbury Sandstone		XWM	XWR	NA																	
	48	2														A	2.0							
																E	2.1							
		2.5							2.5					2.51m: B 0° PL, SM, fe STN										
			SANDSTONE; orange and grey; coarse; high strength, slightly to moderately weathered, slightly fractured, Hawkesbury Sandstone											2.66m: B 0° PL, SM, fe STN										
														2.72m: B 0° PL, SM, fe STN										
														2.74m: B 0°-10° PL, SM, fe STN										
	47	3																3						
								MW-SW						3.28m: B 0°-10° PL, SM, fe vn										
														3.32-3.35m: B x3 0°-15° PL, SM, fe CO										
														3.52m: B 0°-10° PL, RO, cly CO										
														3.58m: B 0°-10° PL, RO, cly vn										
										H	100	91		3.61m: B 0°-10° IR, RO, cly vn										
														3.65m: B 0°-10° PL, RO, cly vn										
														3.67m: B 0°-10° PL, RO, fe STN										
	46	4												3.94-3.96m: B x2 0°-10° PL, RO, fe STN				4					
		4.22							4.22					4.12m: B 0°-10° PL, RO, fe STN										
			SANDSTONE; pale grey; medium to coarse; high strength, fresh, slightly fractured, Hawkesbury Sandstone					FS																

NOTES: (#)Soil origin is "probable" unless otherwise stated. (*)Consistency/Relative density shading is for visual reference only - no correlation between cohesive and granular materials is implied.

PLANT: MD300
OPERATOR: Traccess
LOGGED: Harini S

METHOD: Solid Flight Auger to 2.5m, NMLC to 8.04m
CASING: NW to 2.5m

REMARKS: Well construction: Gatic cover, Blank 0 - 2.5m, Screen 2.5 - 8.04m, Backfill: Bentonite 0 - 2.5m, Gravel 2.5 to 8.04m

EXPORTED 07/11/22 12:56. TEMPLATE ID: DP_103.02.00_COMBINED

Refer to explanatory notes for symbol and abbreviation definitions

Douglas Partners
Geotechnics | Environment | Groundwater

BOREHOLE LOG

CLIENT: NSW Department of Education
PROJECT: Rouse Hill High School Upgrade
LOCATION: 240 Withers Road, Rouse Hill

SURFACE LEVEL: 50 AHD
COORDINATE E:308245 **N:** 6270623
DATUM/GRID: MGA94 Zone 56
DIP/AZIMUTH: 90°/---

LOCATION ID: 103
PROJECT No: 215851.00
DATE: 20/07/22
SHEET: 2 of 2

GROUNDWATER	RL (m)	DEPTH (m)	DESCRIPTION OF STRATA	GRAPHIC	SOIL: ORIGIN(#)	SOIL: CONSIS.(*) DENSITY.(*)	SOIL: MOISTURE	ROCK: WEATH.	ROCK: DEPTH (m)	ROCK: STRENGTH	ROCK: RECOVERY (%)	ROCK: RQD	ROCK: FRACTURE SPACING (m)	ROCK: DEFECTS & REMARKS	SAMPLE: SAMPLE REMARKS	SAMPLE: TYPE	SAMPLE: INTERVAL	DEPTH (m)	TESTING: TEST TYPE	TESTING: RESULTS AND REMARKS
	44	6	SANDSTONE; pale grey; medium to coarse; high strength, fresh, slightly fractured, Hawkesbury Sandstone *(continued)*								100	91		5.56-5.58m: Cs 20mm				6	PLT	1.9
														6.2m: B 10° PL, SM, STN						
								FS		H										
	43	7									100	99				UCS	6.72 - 6.92	7	PLT UCS	1.7 20MPa
			7.37-7.45m: siltstone band																	
	42	8																8	PLT	1.8
		8.04	Borehole discontinued at 8.04m depth						8.04											
	41	9																9		

NOTES: (#)Soil origin is "probable" unless otherwise stated. (*)Consistency/Relative density shading is for visual reference only - no correlation between cohesive and granular materials is implied.

PLANT: MD300
OPERATOR: Traccess
LOGGED: Harini S

METHOD: Solid Flight Auger to 2.5m, NMLC to 8.04m
CASING: NW to 2.5m

REMARKS: Well construction: Gatic cover, Blank 0 - 2.5m, Screen 2.5 - 8.04m, Backfill: Bentonite 0 - 2.5m, Gravel 2.5 to 8.04m

EXPORTED 07/11/22 12:56. TEMPLATE ID: DP_103.02.00_COMBINED

BORE: BH103 PROJECT: 215851.00 July 2022

2.5m – 7.0m

BORE: BH103 PROJECT: 215851.00 July 2022

7.0m – 8.04m

BOREHOLE LOG

CLIENT: NSW Department of Education
PROJECT: Rouse Hill High School Upgrade
LOCATION: 240 Withers Road, Rouse Hill

SURFACE LEVEL: 46.7 AHD
COORDINATE E:308198.1 **N:** 6270572
DATUM/GRID: MGA94 Zone 56
DIP/AZIMUTH: 90°/---

LOCATION ID: 104
PROJECT No: 215851.00
DATE: 22/07/22
SHEET: 1 of 2

GROUNDWATER	RL (m)	DEPTH (m)	DESCRIPTION OF STRATA	GRAPHIC	SOIL ORIGIN(#)	SOIL CONSIS.(*) DENSITY.(*)	SOIL MOISTURE	ROCK WEATH.	ROCK DEPTH (m)	ROCK STRENGTH	ROCK RECOVERY (%)	ROCK RQD	FRACTURE SPACING (m)	DEFECTS & REMARKS	SAMPLE REMARKS	SAMPLE TYPE	SAMPLE INTERVAL	DEPTH (m)	TESTING TEST TYPE	TESTING RESULTS AND REMARKS
	46	0.0	FILL/ (SC) Clayey SAND; dark brown; medium to fine; trace ironstone gravel, igneous gravel and organic root matter		FILL	WC	W									A E	0.1 0.2			
		0.5	(CI) Sandy CLAY; dark brown becoming dark orange; medium plasticity; trace ironstone gravel		RES	VST	=PL									A E	0.5 0.6			
	45	1 1.35	(CL) Sandy CLAY; orange mottled white and red; low plasticity		RES	VST	>PL									SPT	1.0 1.4	S	10,17,13/100	
		2 2.3														A E	1.5 1.6 2.0 2.1			
	44	2.4	SANDSTONE; dark orange; medium to coarse; very low strength, extremely weathered, Hawkesbury Sandstone		XWM	XWR	NA		2.4					2.4-2.54m: Cs 20mm						
		3	SANDSTONE; orange-red; coarse; high strength, moderately weathered, Hawkesbury Sandstone					MW						3.07m: B 0°-10° PL, RO, cly vn				3	PLT	1.3
	43	3.3	SANDSTONE; pale grey; fine to medium; high strength, fresh, slightly fractured, with siltstone laminations, Hawkesbury Sandstone					FS	3.3	H	100	93		4.31m: B 0°-20° PL, RO, CLN 4.68-4.76m: J 60° PL, RO, CLN 4.72m: B 0°-5° PL, RO, CLN				4	PLT	1.2
	42	4																	PLT	1.2

NOTES: (#)Soil origin is "probable" unless otherwise stated. (*)Consistency/Relative density shading is for visual reference only - no correlation between cohesive and granular materials is implied.

EXPORTED 07/11/22 13:16. TEMPLATE ID: DP_103.02.00_COMBINED

PLANT: MD300 **OPERATOR:** Traccess **LOGGED:** Harini S
METHOD: Solid Flight Auger to 2.4m, NMLC to 8.0m **CASING:** NW to 2.4m
REMARKS: Well construction: Gatic cover, Blank 0 - 2.5m, Screen 2.5 - 8.0m, Backfill: Bentonite 0 - 2.5m, Gravel 2.5 to 8.0m

BOREHOLE LOG

CLIENT: NSW Department of Education
PROJECT: Rouse Hill High School Upgrade
LOCATION: 240 Withers Road, Rouse Hill

SURFACE LEVEL: 46.7 AHD
COORDINATE E:308198.1 **N:** 6270572
DATUM/GRID: MGA94 Zone 56
DIP/AZIMUTH: 90°/---

LOCATION ID: 104
PROJECT No: 215851.00
DATE: 22/07/22
SHEET: 2 of 2

CONDITIONS ENCOUNTERED																				SAMPLE				TESTING	
				SOIL				ROCK																	
GROUNDWATER	RL (m)	DEPTH (m)	DESCRIPTION OF STRATA	GRAPHIC	ORIGIN(#)	CONSIS.(*) DENSITY.(*)	MOISTURE	WEATH.	DEPTH (m)	STRENGTH VL L M H VH EH	RECOVERY (%)	RQD	FRACTURE SPACING (m) 0.01 0.05 0.10 0.50 1.00 5.00	DEFECTS & REMARKS	SAMPLE REMARKS	TYPE	INTERVAL	DEPTH (m)	TEST TYPE	RESULTS AND REMARKS
	41		SANDSTONE; pale grey; fine to medium; high strength, fresh, slightly fractured, with siltstone laminations, Hawkesbury Sandstone *(continued)*																PLT	2.5
																		5.76		
																UCS			UCS	15.1MPa
	6																	6.0		
														6.23-6.27m: B x2 0°-20° PL, RO, CLN						
	40							FS		H	100	98								
	7																	7	PLT	1.6
														7.11m: B 0°-10° PL, RO, cly vn						
	39	8.0							8.0											
			Borehole discontinued at 8.00m depth															8		
	38																			
	9																	9		
	37																			

NOTES: (#)Soil origin is "probable" unless otherwise stated. (*)Consistency/Relative density shading is for visual reference only - no correlation between cohesive and granular materials is implied.

PLANT: MD300
OPERATOR: Traccess
LOGGED: Harini S

METHOD: Solid Flight Auger to 2.4m, NMLC to 8.0m
CASING: NW to 2.4m

REMARKS: Well construction: Gatic cover, Blank 0 - 2.5m, Screen 2.5 - 8.0m, Backfill: Bentonite 0 - 2.5m, Gravel 2.5 to 8.0m

EXPORTED 07/11/22 13:16. TEMPLATE ID: DP_103.02.00_COMBINED

BORE: BH104 PROJECT: 215851.00 July 2022

2.4m – 7.0m

BORE: BH104 PROJECT: 215851.00 July 2022

7.0m –8.0m

BOREHOLE LOG

CLIENT: NSW Department of Education
PROJECT: Rouse Hill High School Upgrade
LOCATION: 240 Withers Road, Rouse Hill

SURFACE LEVEL: 49.3 AHD
COORDINATE E:308221.2 **N:** 6270639
DATUM/GRID: MGA94 Zone 56
DIP/AZIMUTH: 90°/---

LOCATION ID: 105
PROJECT No: 215851.00
DATE: 08/09/22
SHEET: 1 of 1

CONDITIONS ENCOUNTERED								SAMPLE			TESTING AND REMARKS	
GROUNDWATER	RL (m) / DEPTH (m)	DESCRIPTION OF STRATA	GRAPHIC	ORIGIN(#)	CONSIS.(*) / DENSITY.(*)	MOISTURE	REMARKS	TYPE	INTERVAL	DEPTH (m)	TEST TYPE	RESULTS AND REMARKS
No free groundwater observed	49 / 0.0	FILL/ (SC) Clayey SAND; dark brown; trace gravel, with rootlets throughout (Topsoil)		FILL	VC	D		A, E, B		0.0, 0.1, 0.2	DCP9/150	5, 10, 15; 34, 30, 27, 29
	0.25	FILL/ (CI) Sandy CLAY; brown orange; medium plasticity; trace ironstone gravel		FILL	WC	<PL		A, E		0.4, 0.5		
	0.9 / 1	(CI-CH) Sandy CLAY; orange, mottled red; medium to high plasticity		RES	VST	<PL		A, E		0.9, 1.0		
	48 / 1.2	(CH) Silty CLAY; pale orange, grey; high plasticity		RES	VST	<PL		B, A, E		1.2, 1.4, 1.5, 1.6		
	1.7	Borehole discontinued at 1.70m depth Practical Refusal on at least very low strength rock										
	2 / 47									2		
	3 / 46									3		
	4 / 45									4		

NOTES: (#)Soil origin is "probable" unless otherwise stated. (*)Consistency/Relative density shading is for visual reference only - no correlation between cohesive and granular materials is implied.

PLANT: 3.5 Tonne excavator
METHOD: 150mm diameter Solid Flight Auger to 1.7m
REMARKS: BD3-08/09/2022 sample taken from 0.1-0.2m depth

OPERATOR: A&A Hire
CASING: Not used

LOGGED: RD

EXPORTED 07/11/22 12:57. TEMPLATE ID: DP_101.02.00_SOILLOG

BOREHOLE LOG

CLIENT: NSW Department of Education
PROJECT: Rouse Hill High School Upgrade
LOCATION: 240 Withers Road, Rouse Hill

SURFACE LEVEL: 48.6 AHD
COORDINATE E:308191.7 **N:** 6270649.4
DATUM/GRID: MGA94 Zone 56
DIP/AZIMUTH: 90°/---

LOCATION ID: 106
PROJECT No: 215851.00
DATE: 13/09/22
SHEET: 1 of 1

CONDITIONS ENCOUNTERED								SAMPLE				TESTING AND REMARKS	
GROUNDWATER	RL (m) / DEPTH (m)	DESCRIPTION OF STRATA	GRAPHIC	ORIGIN(#)	CONSIS.(*) / DENSITY.(*)	MOISTURE	REMARKS	TYPE	INTERVAL	DEPTH (m)	TEST TYPE	RESULTS AND REMARKS
No free groundwater observed	48 / 0.0	FILL/ Silty CLAY; dark brown; with rootlets throughout (Topsoil)		FILL	VC	<PL		A	0.0–0.1	0.0		
	0.15	FILL/ (CL-CI) Silty CLAY; dark orange, brown; low to medium plasticity; trace gravel						E	0.1–0.2	0.1		
								B	0.2–0.4	0.2		
								A	0.4–0.5	0.4		
								E	0.5–0.9	0.5		
				FILL	WC	<PL				0.9		
	1							A	0.9–1.0	1.0		
								E	1.0–1.4		S	4,12,26 N=38
								SPT	1.0–1.45			
	1.5 / 47	(CI) Silty CLAY; pale orange; medium plasticity		RES	VST	<PL		A	1.4–1.45	1.4		
								E	1.45–1.5	1.45		
	1.7	Borehole discontinued at 1.70m depth Practical Refusal on at least very low strength sandstone								1.5		
	2 / 46									2		
	3 / 45									3		
	4 / 44									4		

NOTES: (#)Soil origin is "probable" unless otherwise stated. (*)Consistency/Relative density shading is for visual reference only - no correlation between cohesive and granular materials is implied.

PLANT: MD300
METHOD: 110mm diameter Solid Flight Auger to 1.7m
REMARKS: BD3-13/09/2022 sample taken from 0.1 - 0.2m depth

OPERATOR: Traccess
CASING: Not used

LOGGED: RD

EXPORTED 07/11/22 12:57. TEMPLATE ID: DP_101.02.00_SOILLOG

BOREHOLE LOG

CLIENT: NSW Department of Education
PROJECT: Rouse Hill High School Upgrade
LOCATION: 240 Withers Road, Rouse Hill

SURFACE LEVEL: 48.6 AHD
COORDINATE **E:**308194.1 **N:** 6270636.1
DATUM/GRID: MGA94 Zone 56
DIP/AZIMUTH: 90°/---

LOCATION ID: 107
PROJECT No: 215851.00
DATE: 13/09/22
SHEET: 1 of 1

CONDITIONS ENCOUNTERED								SAMPLE				TESTING AND REMARKS	
GROUNDWATER	RL (m)	DEPTH (m)	DESCRIPTION OF STRATA	GRAPHIC	ORIGIN(#)	CONSIS.(*) DENSITY.(*)	MOISTURE	REMARKS	TYPE	INTERVAL	DEPTH (m)	TEST TYPE	RESULTS AND REMARKS
No free groundwater observed	48	0.0	FILL/ Silty CLAY; dark brown; with rootlets throughout (Topsoil)		FILL	VC	<PL		A		0.0		
		0.1							E		0.1		
		0.2	FILL/ (CI) Silty CLAY; dark orange, brown; medium plasticity; trace gravel						B		0.2		
		0.4							A		0.4		
		0.5							E		0.5		
		0.9			FILL	WC	<PL		A		0.9		
	1	1.0							E		1.0		
									SPT			S	4,7,11 N=18
		1.4							A		1.4		
		1.45							E		1.45		
	47	1.5	(CI) Silty CLAY; pale orange; medium plasticity		RES	VST	<PL				1.5		
		1.6	Borehole discontinued at 1.60m depth Practical Refusal on at least very low strength sandstone										
	46	2									2		
	45	3									3		
	44	4									4		

NOTES: (#)Soil origin is "probable" unless otherwise stated. (*)Consistency/Relative density shading is for visual reference only - no correlation between cohesive and granular materials is implied.

PLANT: MD300
METHOD: 110mm diameter Solid Flight Auger to 1.6m
REMARKS:

OPERATOR: Traccess
CASING: Not used

LOGGED: RD

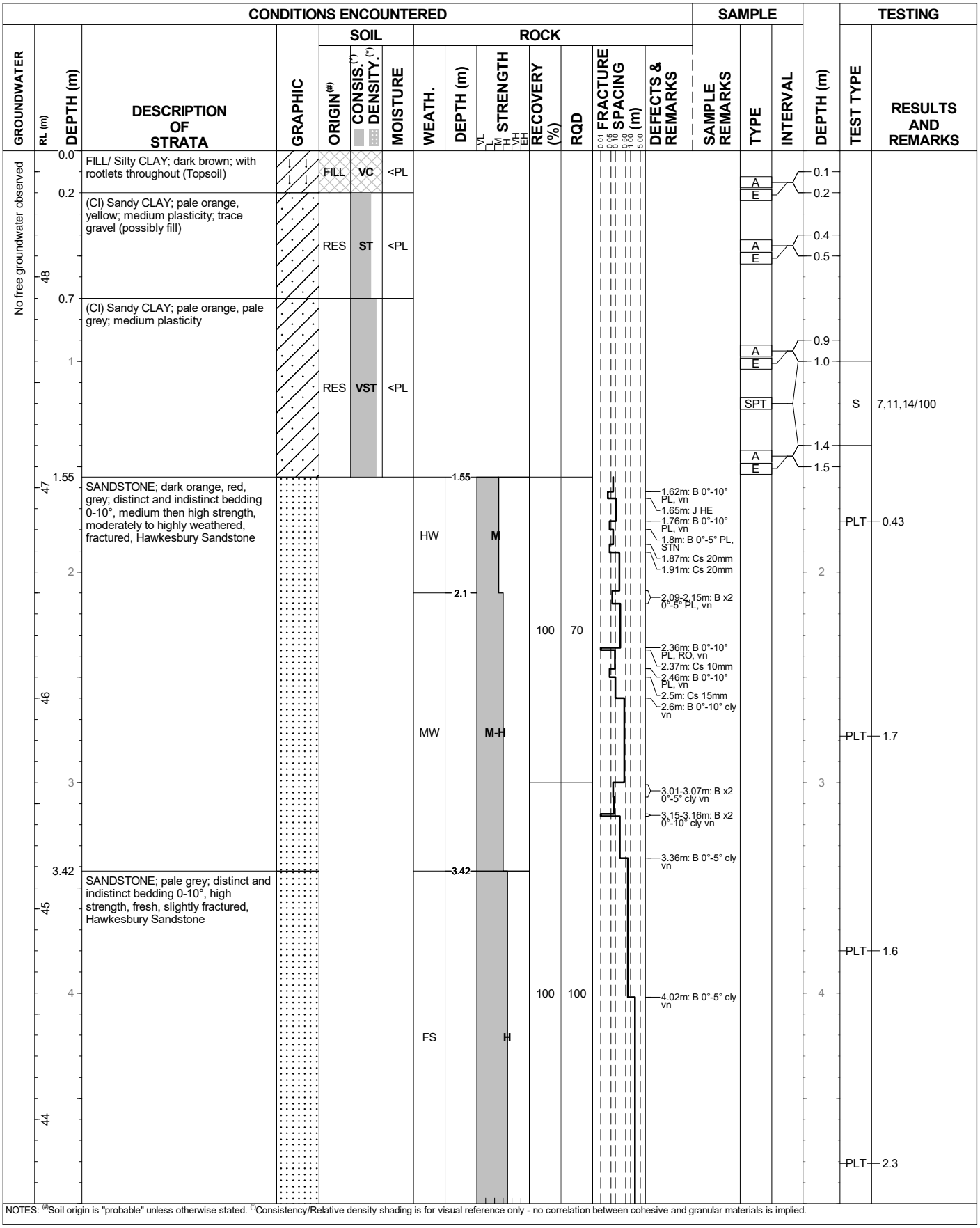
EXPORTED 07/11/22 12:57. TEMPLATE ID: DP_101.02.00_SOILLOG

BOREHOLE LOG

CLIENT: NSW Department of Education
PROJECT: Rouse Hill High School Upgrade
LOCATION: 240 Withers Road, Rouse Hill

SURFACE LEVEL: 48.6 AHD
COORDINATE E:308215.8 **N:** 6270619.2
DATUM/GRID: MGA94 Zone 56
DIP/AZIMUTH: 90°/---

LOCATION ID: 108
PROJECT No: 215851.00
DATE: 13/09/22
SHEET: 1 of 2



NOTES: (#)Soil origin is "probable" unless otherwise stated. (*)Consistency/Relative density shading is for visual reference only - no correlation between cohesive and granular materials is implied.

PLANT: MD300 **OPERATOR:** Traccess **LOGGED:** RD

METHOD: 110mm diameter Solid Flight Auger to 1.55m **CASING:** HW to 1.55m

REMARKS: Well construction: Gattic cover, Blank 0-5.0m, Screen 5-8.0m, Backfill: Bentonite 0-0.5m, Gravel 0.5-4.0m, Bentonite 4-4.5m, Gravel 4.5-8.0m

BD1-13/09/2022 sample taken from 0.1 - 0.2m depth

BOREHOLE LOG

CLIENT: NSW Department of Education
PROJECT: Rouse Hill High School Upgrade
LOCATION: 240 Withers Road, Rouse Hill

SURFACE LEVEL: 48.6 AHD
COORDINATE E:308215.8 **N:** 6270619.2
DATUM/GRID: MGA94 Zone 56
DIP/AZIMUTH: 90°/---

LOCATION ID: 108
PROJECT No: 215851.00
DATE: 13/09/22
SHEET: 2 of 2

CONDITIONS ENCOUNTERED																				SAMPLE				TESTING	
GROUNDWATER	RL (m)	DEPTH (m)	DESCRIPTION OF STRATA	GRAPHIC	SOIL ORIGIN(#)	SOIL CONSIS.(*) DENSITY.(*)	SOIL MOISTURE	ROCK WEATH.	ROCK DEPTH (m)	ROCK STRENGTH	ROCK RECOVERY (%)	ROCK RQD	ROCK FRACTURE SPACING (m)	ROCK DEFECTS & REMARKS	SAMPLE REMARKS	SAMPLE TYPE	SAMPLE INTERVAL	DEPTH (m)	TEST TYPE	RESULTS AND REMARKS
No free groundwater observed	43	6	SANDSTONE; pale grey; distinct and indistinct bedding 0-10°, high strength, fresh, slightly fractured, Hawkesbury Sandstone *(continued)*					FS		H	100	100		6.04m: B 0°-10° cly vn 6.37m: B 0°-10° cly vn				6	PLT	1.4
	42	7									100	100		7.13m: J 40°-50° PL, RO, cly vn				7	PLT	1.3
	41	8.0	Borehole discontinued at 8.00m depth						8.0					7.94m: B 0°-5° cly vn 7.96m: B 0°-5° cly vn				8	PLT	1.6
	40	9																9		
	39																			

NOTES: (#)Soil origin is "probable" unless otherwise stated. (*)Consistency/Relative density shading is for visual reference only - no correlation between cohesive and granular materials is implied.

PLANT: MD300 **OPERATOR:** Traccess **LOGGED:** RD

METHOD: 110mm diameter Solid Flight Auger to 1.55m **CASING:** HW to 1.55m

REMARKS: Well construction: Gattic cover, Blank 0-5.0m, Screen 5-8.0m, Backfill: Bentonite 0-0.5m, Gravel 0.5-4.0m, Bentonite 4-4.5m, Gravel 4.5-8.0m

BD1-13/09/2022 sample taken from 0.1 - 0.2m depth

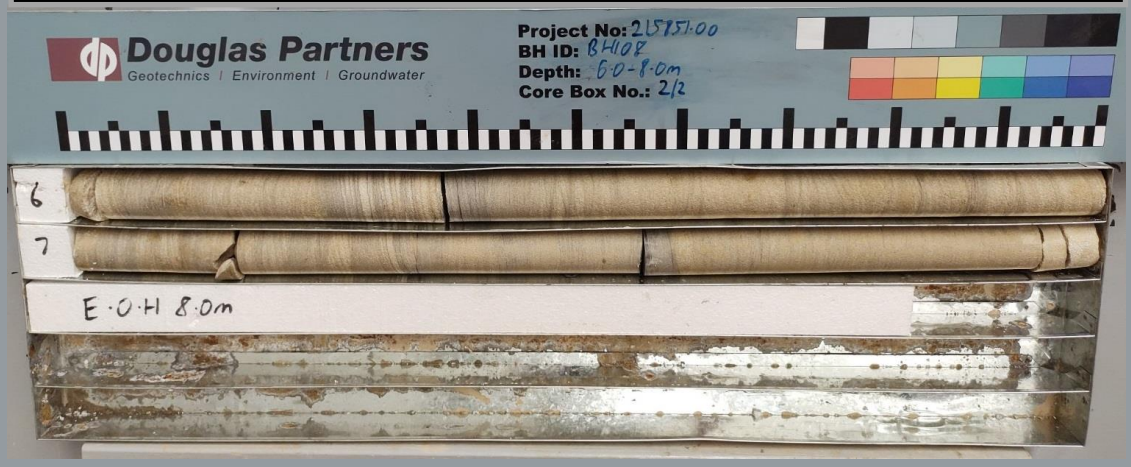
Refer to explanatory notes for symbol and abbreviation definitions

Douglas Partners
Geotechnics / Environment / Groundwater

BORE: BH108 PROJECT: 215851.00 September 2022

1.55m – 6.0m

BORE: BH108 PROJECT: 215851.00 September 2022



6.0m – 8.0m

BOREHOLE LOG

CLIENT: NSW Department of Education
PROJECT: Rouse Hill High School Upgrade
LOCATION: 240 Withers Road, Rouse Hill

SURFACE LEVEL: 48 AHD
COORDINATE E:308196.6 **N:** 6270607.4
DATUM/GRID: MGA94 Zone 56
DIP/AZIMUTH: 90°/---

LOCATION ID: 109
PROJECT No: 215851.00
DATE: 08/09/22
SHEET: 1 of 1

CONDITIONS ENCOUNTERED								SAMPLE			TESTING AND REMARKS	
GROUNDWATER	RL (m) / DEPTH (m)	DESCRIPTION OF STRATA	GRAPHIC	ORIGIN(#)	CONSIS.(*) / DENSITY.(*)	MOISTURE	REMARKS	TYPE	INTERVAL	DEPTH (m)	TEST TYPE	RESULTS AND REMARKS
No free groundwater observed	0.0 / 48	FILL/ (CL) Silty CLAY; dark brown; low plasticity; trace sand, with rootlets throughout (Topsoil)		FILL	VC	<PL		A		0.0	DCP9/150	5 10 15
	0.2	FILL/ (CI) Sandy CLAY; brown orange; medium plasticity; trace ripped sandstone and gravel		FILL	WC	<PL		E B A E		0.1 0.2 0.4 0.5		
	1 / 47							A E		0.9 1.0		
	1.1	(CI-CH) Sandy CLAY; orange, mottled red; medium to high plasticity		RES	VST	<PL						23
	1.4	(CH) Silty CLAY; pale orange, grey; high plasticity		RES	VST	<PL		A		1.4 1.5		27
	1.7	Borehole discontinued at 1.70m depth Practical Refusal on at least very low strength rock										
	2 / 46									2		
	3 / 45									3		
	4 / 44									4		

NOTES: (#)Soil origin is "probable" unless otherwise stated. (*)Consistency/Relative density shading is for visual reference only - no correlation between cohesive and granular materials is implied.

PLANT: 3.5 Tonne excavator
METHOD: 150mm diameter Solid Flight Auger to 1.7m
REMARKS:

OPERATOR: A&A Hire
CASING: Not used

LOGGED: RD

EXPORTED 07/11/22 12:57. TEMPLATE ID: DP_101.02.00_SOILLOG

BOREHOLE LOG

CLIENT: NSW Department of Education
PROJECT: Rouse Hill High School Upgrade
LOCATION: 240 Withers Road, Rouse Hill

SURFACE LEVEL: 48.7 AHD
COORDINATE E:308225.4 **N:** 6270600.5
DATUM/GRID: MGA94 Zone 56
DIP/AZIMUTH: 90°/---

LOCATION ID: 110
PROJECT No: 215851.00
DATE: 08/09/22
SHEET: 1 of 1

CONDITIONS ENCOUNTERED								SAMPLE				TESTING AND REMARKS	
GROUNDWATER	RL (m) / DEPTH (m)	DESCRIPTION OF STRATA	GRAPHIC	ORIGIN(#)	CONSIS.(*) / DENSITY.(*)	MOISTURE	REMARKS	TYPE	INTERVAL	DEPTH (m)	TEST TYPE	RESULTS AND REMARKS
No free groundwater observed	48 / 0.0	FILL/ (SC) Clayey SAND; dark brown; trace gravel, with rootlets throughout (Topsoil)		FILL	VC	D		A, E		0.1, 0.2	DCP9/150	5, 10, 15, 30
	0.2	(CI) Sandy CLAY; dark orange; medium plasticity; trace ironstone gravel (possibly fill)		RES	ST	<PL		A, E		0.4, 0.5		
	0.7	(CI-CH) Sandy CLAY; dark orange; medium to high plasticity; trace ironstone gravel		RES	VST	<PL		A, E, B		0.8, 0.9, 1.0, 1.2		
	1	1.4m: extremely weathered sandstone below						B		1.6		
	47 / 1.7	Borehole discontinued at 1.70m depth Practical Refusal on at least very low strength sandstone										
	2									2		
	46											
	3									3		
	45											
	4									4		
	44											

NOTES: (#)Soil origin is "probable" unless otherwise stated. (*)Consistency/Relative density shading is for visual reference only - no correlation between cohesive and granular materials is implied.

PLANT: 3.5 Tonne excavator
METHOD: 150mm diameter Solid Flight Auger to 1.7m
REMARKS:

OPERATOR: A&A Hire
CASING: Not used

LOGGED: RD

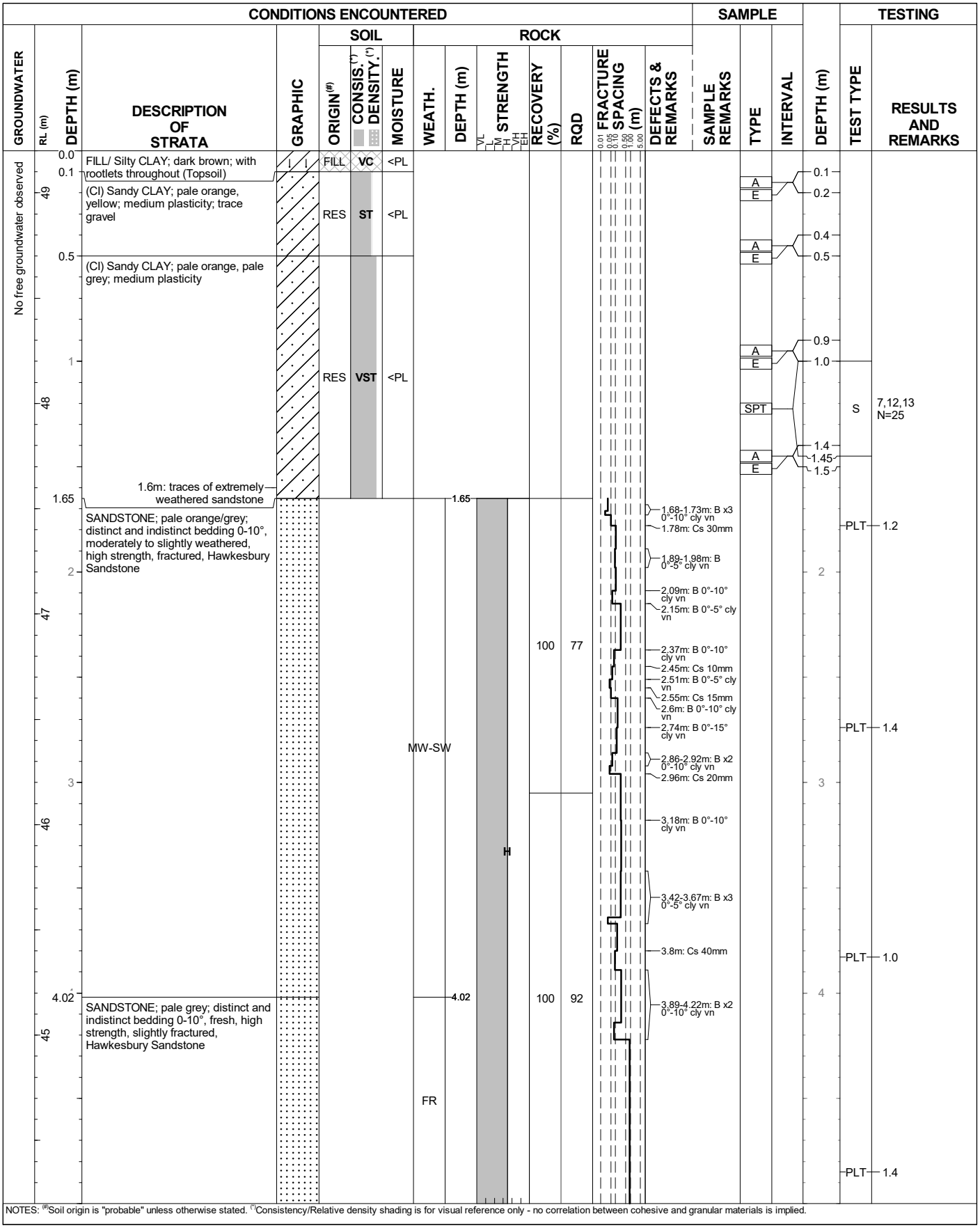
EXPORTED 07/11/22 12:57. TEMPLATE ID: DP_101.02.00_SOILLOG

BOREHOLE LOG

CLIENT: NSW Department of Education
PROJECT: Rouse Hill High School Upgrade
LOCATION: 240 Withers Road, Rouse Hill

SURFACE LEVEL: 49.2 AHD
COORDINATE E:308233.9 **N:** 6270607.2
DATUM/GRID: MGA94 Zone 56
DIP/AZIMUTH: 90°/---

LOCATION ID: 111
PROJECT No: 215851.00
DATE: 13/09/22
SHEET: 1 of 2



NOTES: (#)Soil origin is "probable" unless otherwise stated. (*)Consistency/Relative density shading is for visual reference only - no correlation between cohesive and granular materials is implied.

PLANT: MD300 **OPERATOR:** Traccess **LOGGED:** RD

METHOD: 110mm diameter Solid Flight Auger to 1.65m **CASING:** HW to 1.65m

REMARKS: Well construction: Gattic cover, Blank 0-2.8m, Screen 2.8-5.8m, Backfill: Bentonite 0-0.5m, Gravel 0.5-1.8m, Bentonite 1.8-2.3m, Gravel 2.3-5.8m

BD2-13/09/2022 sample taken from 0.4 - 0.5m depth

BOREHOLE LOG

CLIENT: NSW Department of Education
PROJECT: Rouse Hill High School Upgrade
LOCATION: 240 Withers Road, Rouse Hill

SURFACE LEVEL: 49.2 AHD
COORDINATE E:308233.9 **N:** 6270607.2
DATUM/GRID: MGA94 Zone 56
DIP/AZIMUTH: 90°/---

LOCATION ID: 111
PROJECT No: 215851.00
DATE: 13/09/22
SHEET: 2 of 2

CONDITIONS ENCOUNTERED																				SAMPLE				TESTING	
					SOIL			ROCK																	
GROUNDWATER	RL (m)	DEPTH (m)	DESCRIPTION OF STRATA	GRAPHIC	ORIGIN(#)	CONSIS.(*) DENSITY.(*)	MOISTURE	WEATH.	DEPTH (m)	STRENGTH VL L M H VH EH	RECOVERY (%)	RQD	FRACTURE SPACING (m) 0.01 0.05 0.10 0.50 1.00 5.00	DEFECTS & REMARKS	SAMPLE REMARKS	TYPE	INTERVAL	DEPTH (m)	TEST TYPE	RESULTS AND REMARKS
No free groundwater observed	44	6	SANDSTONE; pale grey; distinct and indistinct bedding 0-10°, fresh, high strength, slightly fractured, Hawkesbury Sandstone *(continued)*					FR		H	100	92		5.17m: B 0°-15° cly vn 5.37m: B 10°-20° cly vn				6	PLT	1.0
	43																			
	42	7												6.42-7.84m: B x2 0°-10° cly vn				7	PLT	1.2
		8.0	Borehole discontinued at 8.00m depth						8.0									8	PLT	1.5
	41	9																9		
	40																			

NOTES: (#)Soil origin is "probable" unless otherwise stated. (*)Consistency/Relative density shading is for visual reference only - no correlation between cohesive and granular materials is implied.

PLANT: MD300
OPERATOR: Traccess
LOGGED: RD

METHOD: 110mm diameter Solid Flight Auger to 1.65m
CASING: HW to 1.65m

REMARKS: Well construction: Gattic cover, Blank 0-2.8m, Screen 2.8-5.8m, Backfill: Bentonite 0-0.5m, Gravel 0.5-1.8m, Bentonite 1.8-2.3m, Gravel 2.3-5.8m

BD2-13/09/2022 sample taken from 0.4 - 0.5m depth

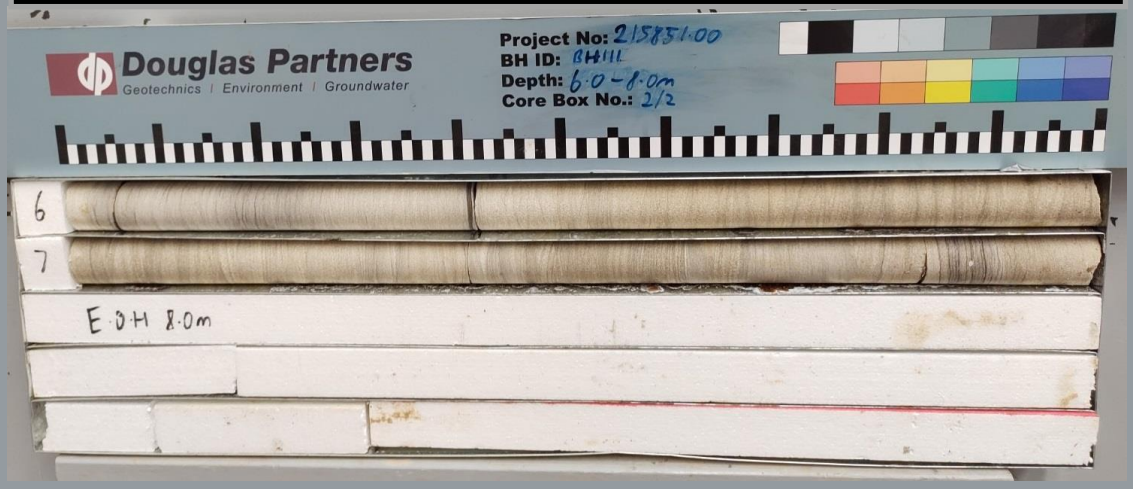
Refer to explanatory notes for symbol and abbreviation definitions

Douglas Partners
Geotechnics / Environment / Groundwater

BORE: BH111 PROJECT: 215851.00 September 2022

1.65m – 6.0m

BORE: BH111 PROJECT: 215851.00 September 2022



6.0m – 8.0m

BOREHOLE LOG

CLIENT: NSW Department of Education
PROJECT: Rouse Hill High School Upgrade
LOCATION: 240 Withers Road, Rouse Hill

SURFACE LEVEL: 49.7 AHD
COORDINATE E:308243.5 **N:** 6270603.9
DATUM/GRID: MGA94 Zone 56
DIP/AZIMUTH: 90°/---

LOCATION ID: 112
PROJECT No: 215851.00
DATE: 08/09/22
SHEET: 1 of 1

CONDITIONS ENCOUNTERED								SAMPLE				TESTING AND REMARKS	
GROUNDWATER	RL (m)	DEPTH (m)	DESCRIPTION OF STRATA	GRAPHIC	ORIGIN(#)	CONSIS.(*) DENSITY.(*)	MOISTURE	REMARKS	TYPE	INTERVAL	DEPTH (m)	TEST TYPE	RESULTS AND REMARKS
No free groundwater observed	49	0.0	FILL/ (CL) Silty CLAY; dark brown; low plasticity; trace sand, with rootlets throughout (Topsoil)		FILL	VC	<PL		A E		0.1 0.2	DCP9/150	5 10 15 26
		0.2	FILL/ (CI) Sandy CLAY; brown orange; medium plasticity; trace gravel		FILL	WC	<PL		A E		0.4 0.5		
		0.8	(CI-CH) Sandy CLAY; orange, mottled red; medium to high plasticity		RES	VST	<PL		A E		0.8 0.9		
		1.0	(CI-CH) Sandy CLAY; dark orange; medium to high plasticity; trace ironstone gravel		RES	VST	<PL		E B		1.0		
		1.2	(CH) Silty CLAY; pale orange, grey; high plasticity		RES	VST	<PL				1.2		
	48	1.6	Borehole discontinued at 1.60m depth Practical Refusal on at least very low strength sandstone										
	47	2									2		
	46	3									3		
	45	4									4		

NOTES: (#)Soil origin is "probable" unless otherwise stated. (*)Consistency/Relative density shading is for visual reference only - no correlation between cohesive and granular materials is implied.

PLANT: 3.5 Tonne excavator
METHOD: 150mm diameter Solid Flight Auger to 1.6m
REMARKS:

OPERATOR: A&A Hire
CASING: Not used

LOGGED: RD

EXPORTED 07/11/22 12:57. TEMPLATE ID: DP_101.02.00_SOILLOG

BOREHOLE LOG

CLIENT: NSW Department of Education
PROJECT: Rouse Hill High School Upgrade
LOCATION: 240 Withers Road, Rouse Hill

SURFACE LEVEL: 48.2 AHD
COORDINATE E:308214.3 **N:** 6270593.9
DATUM/GRID: MGA94 Zone 56
DIP/AZIMUTH: 90°/---

LOCATION ID: 113
PROJECT No: 215851.00
DATE: 08/09/22
SHEET: 1 of 1

CONDITIONS ENCOUNTERED								SAMPLE			TESTING AND REMARKS	
GROUNDWATER	RL (m) / DEPTH (m)	DESCRIPTION OF STRATA	GRAPHIC	ORIGIN(#)	CONSIS.(*) / DENSITY.(*)	MOISTURE	REMARKS	TYPE	INTERVAL	DEPTH (m)	TEST TYPE	RESULTS AND REMARKS
No free groundwater observed	48 / 0.0	FILL/ (CL) Silty CLAY; dark brown; low plasticity; trace sand, with rootlets throughout (Topsoil)		FILL	VC	<PL		A		0.0	DCP9/150	5 10 15
	0.2	FILL/ (CI) Sandy CLAY; brown orange; medium plasticity; trace gravel		FILL	WC	<PL		B E B A E		0.1 0.2 0.4 0.5		32
	47 / 0.75	(CI-CH) Sandy CLAY; orange, mottled red; medium to high plasticity; trace sand		RES	VST	<PL		A E		0.9 1.0		
	1.3	Borehole discontinued at 1.30m depth Practical Refusal on at least very low strength rock										
	46 / 2									2		
	45 / 3									3		
	44 / 4									4		

NOTES: (#)Soil origin is "probable" unless otherwise stated. (*)Consistency/Relative density shading is for visual reference only - no correlation between cohesive and granular materials is implied.

PLANT: 3.5 Tonne excavator
METHOD: 150mm diameter Solid Flight Auger to 1.3m
REMARKS: BD108092022 sample taken at 0.1-0.2m depth

OPERATOR: A&A Hire
CASING: Not used

LOGGED: RD

EXPORTED 07/11/22 12:57. TEMPLATE ID: DP_101.02.00_SOILLOG

BOREHOLE LOG

CLIENT: NSW Department of Education
PROJECT: Rouse Hill High School Upgrade
LOCATION: 240 Withers Road, Rouse Hill

SURFACE LEVEL: 47.5 AHD
COORDINATE E:308190.6 **N:** 6270592.9
DATUM/GRID: MGA94 Zone 56
DIP/AZIMUTH: 90°/---

LOCATION ID: 114
PROJECT No: 215851.00
DATE: 08/09/22
SHEET: 1 of 1

GROUNDWATER	RL (m)	DEPTH (m)	DESCRIPTION OF STRATA	GRAPHIC	ORIGIN(#)	CONSIS.(*) / DENSITY.(*)	MOISTURE	REMARKS	SAMPLE TYPE	SAMPLE INTERVAL	DEPTH (m)	TESTING AND REMARKS: TEST TYPE	RESULTS AND REMARKS
No free groundwater observed	47	0.0	FILL/ (CL) Silty CLAY; dark brown; low plasticity; trace sand, with rootlets throughout (Topsoil)		FILL	VC	<PL		A, E, B		0.0, 0.1, 0.2	DCP9/150	5, 10, 15, 25
		0.25	FILL/ (CI) Sandy CLAY; brown orange; medium plasticity; trace gravel		FILL	WC	=PL		A, E		0.4, 0.5		
		0.8	(CI) Sandy CLAY; white, pale brown; medium plasticity; (possibly fill)		RES	VST	<PL		A, E		0.9, 1.0		
	46	1.1	(CI-CH) Sandy CLAY; orange, mottled red; medium to high plasticity		RES	VST	<PL		A, E		1.4, 1.5		
			1.7m: becoming pale grey, pale orange below (traces of extremely weathered sandstone)										
		2							A, E		1.9, 2.0		
	45	2.2	Borehole discontinued at 2.20m depth Practical Refusal on at least very low strength rock										
		3									3		
	44												
		4									4		
	43												

NOTES: (#)Soil origin is "probable" unless otherwise stated. (*)Consistency/Relative density shading is for visual reference only - no correlation between cohesive and granular materials is implied.

PLANT: 3.5 Tonne excavator
METHOD: 150mm diameter Solid Flight Auger to 2.2m
REMARKS:

OPERATOR: A&A Hire
CASING: Not used

LOGGED: RD

EXPORTED 07/11/22 12:57. TEMPLATE ID: DP_101.02.00_SOILLOG

BOREHOLE LOG

CLIENT: NSW Department of Education
PROJECT: Rouse Hill High School Upgrade
LOCATION: 240 Withers Road, Rouse Hill

SURFACE LEVEL: 45.9 AHD
COORDINATE E:308177.1 **N:** 6270578
DATUM/GRID: MGA94 Zone 56
DIP/AZIMUTH: 90°/---

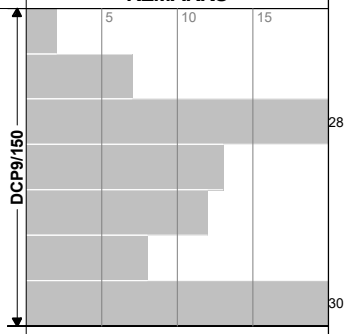
LOCATION ID: 115
PROJECT No: 215851.00
DATE: 08/09/22
SHEET: 1 of 1

GROUNDWATER	RL (m)	DEPTH (m)	DESCRIPTION OF STRATA	GRAPHIC	ORIGIN(#)	CONSIS.(*) / DENSITY.(*)	MOISTURE	REMARKS	SAMPLE TYPE	SAMPLE INTERVAL	DEPTH (m)
No free groundwater observed	45.9	0.0	FILL/ (CL) Silty CLAY; dark brown; low plasticity; trace sand, with rootlets throughout (Topsoil)		FILL	VC	<PL		A, E	0.0–0.1, 0.1–0.2	0.0
	45.7	0.2	FILL/ (CI) Sandy CLAY; brown orange; medium plasticity; trace gravel		FILL	WC	<PL		B, A, E	0.2–0.4, 0.4–0.5	0.1, 0.2, 0.4, 0.5
	45.2	0.7	(CI-CH) Sandy CLAY; orange, mottled red; medium to high plasticity		RES	VST	<PL		A, E	0.9–1.0	0.9
	44.9	1.0	(CH) Silty CLAY; pale orange, grey; high plasticity		RES	VST	<PL				1.0
	44.5	1.4	(CH) Sandy CLAY; pale red/pink, grey; high plasticity 1.5m: traces of extremely weathered rock		RES	VST	<PL		A, E	1.4–1.5	1.4, 1.5
	44.2	1.7	Borehole discontinued at 1.70m depth Practical Refusal on at least very low strength sandstone								

TESTING AND REMARKS

TEST TYPE: DCP9/150

RESULTS AND REMARKS



NOTES: (#)Soil origin is "probable" unless otherwise stated. (*)Consistency/Relative density shading is for visual reference only - no correlation between cohesive and granular materials is implied.

PLANT: 3.5 Tonne excavator
METHOD: 150mm diameter Solid Flight Auger to 1.7m
REMARKS: BD208092022 sample taken from 0.1-0.2m depth

OPERATOR: A&A Hire
CASING: Not used

LOGGED: RD

EXPORTED 07/11/22 12:57. TEMPLATE ID: DP_101.02.00_SOILLOG

Refer to explanatory notes for symbol and abbreviation definitions

Douglas Partners
Geotechnics / Environment / Groundwater

Douglas Partners
Geotechnics / Environment / Groundwater

Groundwater Field Sheet

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

Project and Bore Installation Details	
Bore / Standpipe ID:	BH104
Project Name:	
Project Number:	215851.00
Site Location:	
Bore GPS Co-ord:	
Installation Date:	
GW Level (during drilling):	- m bgl
Well Depth:	m bgl
Screened Interval:	m bgl
Contaminants/Comments:	-

Bore Development Details	
Date/Time:	21-9-22
Purged By:	VV
GW Level (pre-purge):	1.6 m bgl
GW Level (post-purge):	6.0 m bgl
PSH observed:	Yes / (No) (interface / (visual)). Thickness if observed:
Observed Well Depth:	6.1m m bgl
Estimated Bore Volume:	L (4.2 - 1.3) x 7.2
Total Volume Purged:	(target: no drill mud, min 3 well vol. or dry) dry
Equipment:	Twister Pump

Micropurge and Sampling Details	
Date/Time:	26-9-22
Sampled By:	VV
Weather Conditions:	cloudy
GW Level (pre-purge):	1.56 m bgl
GW Level (post sample):	2.35 m bgl
PSH observed:	Yes / (No) (interface / (visual)). Thickness if observed:
Observed Well Depth:	6.0 m bgl
Estimated Bore Volume:	L
Total Volume Purged:	L
Equipment:	Peri Pump, YSI, 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**
0	18.7	1.28	793	6.11	187	8.0
1	18.6	0.94	776	6.05	376	12.2
2	18.7	0.74	771	6.01	310	15.4
3	18.6	0.63	769	5.99	356	16.1
4	18.7	0.60	771	5.98	400	17.4

Additional Readings Following stabilisation:	DO % Sat	SPC	TDS			
	6.2	877	570			

Sample Details

Sampling Depth (rationale):	4-5 m m bgl,
Sample Appearance (e.g. colour, siltiness, odour):	silty appearance, sulfide odour,
Sample ID:	BH104
QA/QC Samples:	
Sampling Containers and filtration:	same as 108
Comments / Observations:	

Douglas Partners
Geotechnics / Environment / Groundwater

Groundwater Field Sheet

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

Project and Bore Installation Details	
Bore / Standpipe ID:	BH108
Project Name:	215851.00
Project Number:	
Site Location:	
Bore GPS Co-ord:	
Installation Date:	
GW Level (during drilling):	- m bgl
Well Depth:	m bgl
Screened Interval:	m bgl
Contaminants/Comments:	-

Bore Development Details	
Date/Time:	21-9-22
Purged By:	VV
GW Level (pre-purge):	1.4 m bgl
GW Level (post-purge):	8.0 m bgl
PSH observed:	Yes / (No) (interface / (visual)). Thickness if observed:
Observed Well Depth:	8.0 m bgl
Estimated Bore Volume:	dry L (4.2 - 1.3) x 7.2
Total Volume Purged:	(target: no drill mud, min 3 well vol. or dry)
Equipment:	Twister Pump.

Micropurge and Sampling Details	
Date/Time:	26-9-22
Sampled By:	VV
Weather Conditions:	cloudy
GW Level (pre-purge):	1.4 m bgl
GW Level (post sample):	2.0 m bgl
PSH observed:	Yes / (No) (interface / (visual)). Thickness if observed:
Observed Well Depth:	8.0 m bgl
Estimated Bore Volume:	L
Total Volume Purged:	L
Equipment:	Peristaltic pump, YSI, 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**
0	18.4	2.11	716	6.09	294	-12.7
1	17.9	1.45	668	6.07	300	-11.0
2	17.7	1.14	686	6.05	286	-9.9
3	17.7	0.93	675	6.06	233	-8.6
4	17.7	0.91	669	6.06	241	-7.5

Additional Readings Following stabilisation:	DO % Sat	SPC	TDS
	9.7	779	506

Sample Details

Sampling Depth (rationale):	5-6 m bgl,
Sample Appearance (e.g. colour, siltiness, odour):	cloudy appearance, sulfide odours.
Sample ID:	BH108
QA/QC Samples:	—
Sampling Containers and filtration:	same as 103
Comments / Observations:	

Douglas Partners
Geotechnics / Environment / Groundwater

Groundwater Field Sheet

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

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

Project and Bore Installation Details	
Bore / Standpipe ID:	BH103
Project Name:	Rowville High School
Project Number:	215851
Site Location:	
Bore GPS Co-ord:	
Installation Date:	
GW Level (during drilling):	- m bgl
Well Depth:	m bgl
Screened Interval:	m bgl
Contaminants/Comments:	-

Bore Development Details	
Date/Time:	21-9-22
Purged By:	VV
GW Level (pre-purge):	2-3m m bgl
GW Level (post-purge):	6.2 m bgl
PSH observed:	Yes / (No) (interface / visual). Thickness if observed:
Observed Well Depth:	6.3m m bgl
Estimated Bore Volume:	L [4.2 - 1.3] x 7.2
Total Volume Purged:	(target: no drill mud, min 3 well vol. or dry) dry
Equipment:	

Micropurge and Sampling Details	
Date/Time:	26-9-22 2PM
Sampled By:	VV
Weather Conditions:	cloudy
GW Level (pre-purge):	2.3 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:	Peripump, YSI

Water Quality Parameters

Time / Volume	Temp (°C)	DO (mg/L)	EC (µS or mS/cm)	pH	Turbidity	Redox (mV)
Stabilisation Criteria (3 readings)	***0.1° C***	**+/- 0.3 mg/L**	**+/- 3%**	**+/- 0.1**	**+/- 10%**	**+/- 10 mV**
0	18.5	2.00	2133	6.16	194	-61
1	18.3	0.83	2100	6.18	200	-47
2	18.2	1.11	1833	6.08	310	-29
3	18.0	1.86	1780	6.04	316	-23
4	18.0	1.90	1752	6.02	338	-21

Additional Readings Following stabilisation:	DO % Sat	SPC	TDS			
	20.2	1998	1298			

Sample Details

Sampling Depth (rationale):	4-5 m bgl,
Sample Appearance (e.g. colour, siltiness, odour):	cloudy appearance, sulfide odour
Sample ID:	BH103
QA/QC Samples:	—
Sampling Containers and filtration:	same as 111
Comments / Observations:	

Douglas Partners
Geotechnics | Environment | Groundwater

Groundwater Field Sheet

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

Project and Bore Installation Details	
Bore / Standpipe ID:	111
Project Name:	215851.00
Project Number:	
Site Location:	
Bore GPS Co-ord:	
Installation Date:	
GW Level (during drilling):	- m bgl
Well Depth:	m bgl
Screened Interval:	m bgl
Contaminants/Comments:	-

Bore Development Details	
Date/Time:	21-9-22 9AM
Purged By:	VV
GW Level (pre-purge):	3.0 m bgl
GW Level (post-purge):	5.5 m bgl
PSH observed:	Yes / No (interface / visual). Thickness if observed:
Observed Well Depth:	5.5 m bgl
Estimated Bore Volume:	L (4.2 - 1.3) x 7.2
Total Volume Purged:	(target: no drill mud, min 3 well vol. or dry) 2 x 4
Equipment:	Twister Pump.

Micropurge and Sampling Details	
Date/Time:	26-9-22 1PM
Sampled By:	VV
Weather Conditions:	Cloudy
GW Level (pre-purge):	3.0 m bgl
GW Level (post sample):	3.8 m bgl
PSH observed:	Yes / No (interface / visual). Thickness if observed:
Observed Well Depth:	5.5 m bgl
Estimated Bore Volume:	L
Total Volume Purged:	L
Equipment:	PeriPump, YSI, 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**
0	18.7	1.86	1366	5.90	528	-43.5
1	18.3	0.87	1144	5.97	522	-52.7
2	18.3	0.58	1058	5.98	445	-57.6
3	18.3	0.48	1032	5.99	477	-60.0
4	18.3	0.46	1023	5.99	428	-62.4

Additional Readings Following stabilisation:	DO % Sat	SPC	TDS			
	4.0	1166	758			

Sample Details

Sampling Depth (rationale):	4-5 m bgl,
Sample Appearance (e.g. colour, siltiness, odour):	Pale Grey, sulphide odour
Sample ID:	BH111
QA/QC Samples:	BD01
Sampling Containers and filtration:	Metals filtered 2-Amber glass, 1-Plastic, 2-PFAS, 3-vials.
Comments / Observations:	

Appendix K

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

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

CERTIFICATE OF ANALYSIS 301756

Client Details

Client	Douglas Partners Pty Ltd
Attention	Paul Gorman
Address	96 Hermitage Rd, West Ryde, NSW, 2114

Sample Details

Your Reference	**215851.00, Rouse Hill**
Number of Samples	9 Soil
Date samples received	29/07/2022
Date completed instructions received	29/07/2022

Analysis Details

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

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

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

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

Report Details

Date results requested by	05/08/2022
Date of Issue	05/08/2022

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

Results Approved By
Giovanni Agosti, Group Technical Manager
Hannah Nguyen, Metals Supervisor
Josh Williams, Organics and LC Supervisor
Kyle Gavrily, Senior Chemist
Lucy Zhu, Asbestos Supervisor
Priya Samarawickrama, Senior Chemist

Authorised By

Nancy Zhang, Laboratory Manager

vTRH(C6-C10)/BTEXN in Soil						
Our Reference		301756-1	301756-2	301756-3	301756-4	301756-5
Your Reference	UNITS	BH101	BH101	BH102	BH102	BH103
Depth		0.1	0.5	0.1	0.5	0.1
Date Sampled		21/07/2022	21/07/2022	20/07/2022	20/07/2022	20/07/2022
Type of sample		Soil	Soil	Soil	Soil	Soil
Date extracted	-	02/08/2022	02/08/2022	02/08/2022	02/08/2022	02/08/2022
Date analysed	-	04/08/2022	04/08/2022	04/08/2022	04/08/2022	04/08/2022
TRH C_6 - C_9	mg/kg	<25	<25	<25	<25	<25
TRH C_6 - C_{10}	mg/kg	<25	<25	<25	<25	<25
vTPH C_6 - C_{10} less BTEX (F1)	mg/kg	<25	<25	<25	<25	<25
Benzene	mg/kg	<0.2	<0.2	<0.2	<0.2	<0.2
Toluene	mg/kg	<0.5	<0.5	<0.5	<0.5	<0.5
Ethylbenzene	mg/kg	<1	<1	<1	<1	<1
m+p-xylene	mg/kg	<2	<2	<2	<2	<2
o-Xylene	mg/kg	<1	<1	<1	<1	<1
Naphthalene	mg/kg	<1	<1	<1	<1	<1
Total +ve Xylenes	mg/kg	<1	<1	<1	<1	<1
Surrogate aaa-Trifluorotoluene	%	78	70	70	71	91

vTRH(C6-C10)/BTEXN in Soil					
Our Reference		301756-6	301756-7	301756-8	301756-9
Your Reference	UNITS	BH104	BH104	TS	TB
Depth		0.1	0.5	-	-
Date Sampled		21/07/2022	21/07/2022	21/07/2022	21/07/2022
Type of sample		Soil	Soil	Soil	Soil
Date extracted	-	02/08/2022	02/08/2022	02/08/2022	02/08/2022
Date analysed	-	04/08/2022	04/08/2022	04/08/2022	04/08/2022
TRH C_6 - C_9	mg/kg	<25	<25	[NA]	[NA]
TRH C_6 - C_{10}	mg/kg	<25	<25	[NA]	[NA]
vTPH C_6 - C_{10} less BTEX (F1)	mg/kg	<25	<25	[NA]	[NA]
Benzene	mg/kg	<0.2	<0.2	108%	<0.2
Toluene	mg/kg	<0.5	<0.5	118%	<0.5
Ethylbenzene	mg/kg	<1	<1	122%	<1
m+p-xylene	mg/kg	<2	<2	120%	<2
o-Xylene	mg/kg	<1	<1	116%	<1
Naphthalene	mg/kg	<1	<1	[NT]	<1
Total +ve Xylenes	mg/kg	<1	<1	[NT]	<1
Surrogate aaa-Trifluorotoluene	%	87	79	71	73

svTRH (C10-C40) in Soil						
Our Reference		301756-1	301756-2	301756-3	301756-4	301756-5
Your Reference	UNITS	BH101	BH101	BH102	BH102	BH103
Depth		0.1	0.5	0.1	0.5	0.1
Date Sampled		21/07/2022	21/07/2022	20/07/2022	20/07/2022	20/07/2022
Type of sample		Soil	Soil	Soil	Soil	Soil
Date extracted	-	02/08/2022	02/08/2022	02/08/2022	02/08/2022	02/08/2022
Date analysed	-	05/08/2022	05/08/2022	05/08/2022	05/08/2022	05/08/2022
TRH C_{10} - C_{14}	mg/kg	<50	<50	<50	<50	<50
TRH C_{15} - C_{28}	mg/kg	<100	<100	<100	<100	<100
TRH C_{29} - C_{36}	mg/kg	<100	<100	<100	<100	<100
Total +ve TRH (C10-C36)	mg/kg	<50	<50	<50	<50	<50
TRH >C_{10} -C_{16}	mg/kg	<50	<50	<50	<50	<50
TRH >C_{10} - C_{16} less Naphthalene (F2)	mg/kg	<50	<50	<50	<50	<50
TRH >C_{16} -C_{34}	mg/kg	<100	<100	<100	<100	<100
TRH >C_{34} -C_{40}	mg/kg	<100	<100	<100	<100	<100
Total +ve TRH (>C10-C40)	mg/kg	<50	<50	<50	<50	<50
Surrogate o-Terphenyl	%	76	74	74	74	77

svTRH (C10-C40) in Soil			
Our Reference		301756-6	301756-7
Your Reference	UNITS	BH104	BH104
Depth		0.1	0.5
Date Sampled		21/07/2022	21/07/2022
Type of sample		Soil	Soil
Date extracted	-	02/08/2022	02/08/2022
Date analysed	-	05/08/2022	05/08/2022
TRH C_{10} - C_{14}	mg/kg	<50	<50
TRH C_{15} - C_{28}	mg/kg	<100	<100
TRH C_{29} - C_{36}	mg/kg	<100	<100
Total +ve TRH (C10-C36)	mg/kg	<50	<50
TRH >C_{10} -C_{16}	mg/kg	<50	<50
TRH >C_{10} - C_{16} less Naphthalene (F2)	mg/kg	<50	<50
TRH >C_{16} -C_{34}	mg/kg	<100	<100
TRH >C_{34} -C_{40}	mg/kg	<100	<100
Total +ve TRH (>C10-C40)	mg/kg	<50	<50
Surrogate o-Terphenyl	%	73	71

PAHs in Soil						
Our Reference		301756-1	301756-2	301756-3	301756-4	301756-5
Your Reference	UNITS	BH101	BH101	BH102	BH102	BH103
Depth		0.1	0.5	0.1	0.5	0.1
Date Sampled		21/07/2022	21/07/2022	20/07/2022	20/07/2022	20/07/2022
Type of sample		Soil	Soil	Soil	Soil	Soil
Date extracted	-	02/08/2022	02/08/2022	02/08/2022	02/08/2022	02/08/2022
Date analysed	-	04/08/2022	04/08/2022	04/08/2022	04/08/2022	04/08/2022
Naphthalene	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Acenaphthylene	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Acenaphthene	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Fluorene	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Phenanthrene	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Anthracene	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Fluoranthene	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Pyrene	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Benzo(a)anthracene	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Chrysene	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Benzo(b,j+k)fluoranthene	mg/kg	<0.2	<0.2	<0.2	<0.2	<0.2
Benzo(a)pyrene	mg/kg	<0.05	<0.05	<0.05	<0.05	<0.05
Indeno(1,2,3-c,d)pyrene	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Dibenzo(a,h)anthracene	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Benzo(g,h,i)perylene	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Total +ve PAH's	mg/kg	<0.05	<0.05	<0.05	<0.05	<0.05
Benzo(a)pyrene TEQ calc (zero)	mg/kg	<0.5	<0.5	<0.5	<0.5	<0.5
Benzo(a)pyrene TEQ calc(half)	mg/kg	<0.5	<0.5	<0.5	<0.5	<0.5
Benzo(a)pyrene TEQ calc(PQL)	mg/kg	<0.5	<0.5	<0.5	<0.5	<0.5
Surrogate p-Terphenyl-d14	%	123	123	116	109	130

PAHs in Soil			
Our Reference		301756-6	301756-7
Your Reference	UNITS	BH104	BH104
Depth		0.1	0.5
Date Sampled		21/07/2022	21/07/2022
Type of sample		Soil	Soil
Date extracted	-	02/08/2022	02/08/2022
Date analysed	-	04/08/2022	04/08/2022
Naphthalene	mg/kg	<0.1	<0.1
Acenaphthylene	mg/kg	<0.1	<0.1
Acenaphthene	mg/kg	<0.1	<0.1
Fluorene	mg/kg	<0.1	<0.1
Phenanthrene	mg/kg	<0.1	<0.1
Anthracene	mg/kg	<0.1	<0.1
Fluoranthene	mg/kg	<0.1	<0.1
Pyrene	mg/kg	<0.1	<0.1
Benzo(a)anthracene	mg/kg	<0.1	<0.1
Chrysene	mg/kg	<0.1	<0.1
Benzo(b,j+k)fluoranthene	mg/kg	<0.2	<0.2
Benzo(a)pyrene	mg/kg	<0.05	<0.05
Indeno(1,2,3-c,d)pyrene	mg/kg	<0.1	<0.1
Dibenzo(a,h)anthracene	mg/kg	<0.1	<0.1
Benzo(g,h,i)perylene	mg/kg	<0.1	<0.1
Total +ve PAH's	mg/kg	<0.05	<0.05
Benzo(a)pyrene TEQ calc (zero)	mg/kg	<0.5	<0.5
Benzo(a)pyrene TEQ calc(half)	mg/kg	<0.5	<0.5
Benzo(a)pyrene TEQ calc(PQL)	mg/kg	<0.5	<0.5
Surrogate p-Terphenyl-d14	%	116	113

Organochlorine Pesticides in soil					
Our Reference		301756-1	301756-4	301756-5	301756-6
Your Reference	UNITS	BH101	BH102	BH103	BH104
Depth		0.1	0.5	0.1	0.1
Date Sampled		21/07/2022	20/07/2022	20/07/2022	21/07/2022
Type of sample		Soil	Soil	Soil	Soil
Date extracted	-	02/08/2022	02/08/2022	02/08/2022	02/08/2022
Date analysed	-	04/08/2022	04/08/2022	04/08/2022	04/08/2022
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	%	105	98	117	102

Organophosphorus Pesticides in Soil					
Our Reference		301756-1	301756-4	301756-5	301756-6
Your Reference	UNITS	BH101	BH102	BH103	BH104
Depth		0.1	0.5	0.1	0.1
Date Sampled		21/07/2022	20/07/2022	20/07/2022	21/07/2022
Type of sample		Soil	Soil	Soil	Soil
Date extracted	-	02/08/2022	02/08/2022	02/08/2022	02/08/2022
Date analysed	-	04/08/2022	04/08/2022	04/08/2022	04/08/2022
Dichlorvos	mg/kg	<0.1	<0.1	<0.1	<0.1
Dimethoate	mg/kg	<0.1	<0.1	<0.1	<0.1
Diazinon	mg/kg	<0.1	<0.1	<0.1	<0.1
Chlorpyriphos-methyl	mg/kg	<0.1	<0.1	<0.1	<0.1
Ronnel	mg/kg	<0.1	<0.1	<0.1	<0.1
Fenitrothion	mg/kg	<0.1	<0.1	<0.1	<0.1
Malathion	mg/kg	<0.1	<0.1	<0.1	<0.1
Chlorpyriphos	mg/kg	<0.1	<0.1	<0.1	<0.1
Parathion	mg/kg	<0.1	<0.1	<0.1	<0.1
Bromophos-ethyl	mg/kg	<0.1	<0.1	<0.1	<0.1
Ethion	mg/kg	<0.1	<0.1	<0.1	<0.1
Azinphos-methyl (Guthion)	mg/kg	<0.1	<0.1	<0.1	<0.1
Surrogate TCMX	%	105	98	117	102

PCBs in Soil					
Our Reference		301756-1	301756-4	301756-5	301756-6
Your Reference	UNITS	BH101	BH102	BH103	BH104
Depth		0.1	0.5	0.1	0.1
Date Sampled		21/07/2022	20/07/2022	20/07/2022	21/07/2022
Type of sample		Soil	Soil	Soil	Soil
Date extracted	-	02/08/2022	02/08/2022	02/08/2022	02/08/2022
Date analysed	-	04/08/2022	04/08/2022	04/08/2022	04/08/2022
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	%	105	98	117	102

Acid Extractable metals in soil						
Our Reference		301756-1	301756-2	301756-3	301756-4	301756-5
Your Reference	UNITS	BH101	BH101	BH102	BH102	BH103
Depth		0.1	0.5	0.1	0.5	0.1
Date Sampled		21/07/2022	21/07/2022	20/07/2022	20/07/2022	20/07/2022
Type of sample		Soil	Soil	Soil	Soil	Soil
Date prepared	-	02/08/2022	02/08/2022	02/08/2022	02/08/2022	02/08/2022
Date analysed	-	03/08/2022	03/08/2022	03/08/2022	03/08/2022	03/08/2022
Arsenic	mg/kg	6	5	5	7	8
Cadmium	mg/kg	<0.4	<0.4	<0.4	<0.4	<0.4
Chromium	mg/kg	12	16	11	23	14
Copper	mg/kg	7	2	8	5	10
Lead	mg/kg	16	13	13	12	13
Mercury	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Nickel	mg/kg	3	1	4	3	3
Zinc	mg/kg	10	3	42	8	26

Acid Extractable metals in soil			
Our Reference		301756-6	301756-7
Your Reference	UNITS	BH104	BH104
Depth		0.1	0.5
Date Sampled		21/07/2022	21/07/2022
Type of sample		Soil	Soil
Date prepared	-	02/08/2022	02/08/2022
Date analysed	-	03/08/2022	03/08/2022
Arsenic	mg/kg	4	7
Cadmium	mg/kg	<0.4	<0.4
Chromium	mg/kg	15	18
Copper	mg/kg	35	3
Lead	mg/kg	14	11
Mercury	mg/kg	<0.1	<0.1
Nickel	mg/kg	8	2
Zinc	mg/kg	34	7

Misc Soil - Inorg					
Our Reference		301756-1	301756-4	301756-5	301756-6
Your Reference	UNITS	BH101	BH102	BH103	BH104
Depth		0.1	0.5	0.1	0.1
Date Sampled		21/07/2022	20/07/2022	20/07/2022	21/07/2022
Type of sample		Soil	Soil	Soil	Soil
Date prepared	-	02/08/2022	02/08/2022	02/08/2022	02/08/2022
Date analysed	-	02/08/2022	02/08/2022	02/08/2022	02/08/2022
Total Phenolics (as Phenol)	mg/kg	<5	<5	<5	<5

Moisture						
Our Reference		301756-1	301756-2	301756-3	301756-4	301756-5
Your Reference	UNITS	BH101	BH101	BH102	BH102	BH103
Depth		0.1	0.5	0.1	0.5	0.1
Date Sampled		21/07/2022	21/07/2022	20/07/2022	20/07/2022	20/07/2022
Type of sample		Soil	Soil	Soil	Soil	Soil
Date prepared	-	02/08/2022	02/08/2022	02/08/2022	02/08/2022	02/08/2022
Date analysed	-	03/08/2022	03/08/2022	03/08/2022	03/08/2022	03/08/2022
Moisture	%	20	8.4	17	16	20

Moisture			
Our Reference		301756-6	301756-7
Your Reference	UNITS	BH104	BH104
Depth		0.1	0.5
Date Sampled		21/07/2022	21/07/2022
Type of sample		Soil	Soil
Date prepared	-	02/08/2022	02/08/2022
Date analysed	-	03/08/2022	03/08/2022
Moisture	%	20	12

Asbestos ID - soils					
Our Reference		301756-1	301756-4	301756-5	301756-6
Your Reference	UNITS	BH101	BH102	BH103	BH104
Depth		0.1	0.5	0.1	0.1
Date Sampled		21/07/2022	20/07/2022	20/07/2022	21/07/2022
Type of sample		Soil	Soil	Soil	Soil
Date analysed	-	05/08/2022	05/08/2022	05/08/2022	05/08/2022
Sample mass tested	g	Approx. 40g	Approx. 30g	Approx. 35g	Approx. 35g
Sample Description	-	Brown fine-grained soil and rocks	Red clayey soil and rocks	Brown fine-grained soil and rocks	Brown fine-grained soil and rocks
Asbestos ID in soil	-	No asbestos detected at reporting limit of 0.1g/kg Organic fibres detected	No asbestos detected at reporting limit of 0.1g/kg Organic fibres detected	No asbestos detected at reporting limit of 0.1g/kg Organic fibres detected	No asbestos detected at reporting limit of 0.1g/kg Organic fibres detected
Trace Analysis	-	No asbestos detected	No asbestos detected	No asbestos detected	No asbestos detected

Misc Inorg - Soil		
Our Reference		301756-1
Your Reference	UNITS	BH101
Depth		0.1
Date Sampled		21/07/2022
Type of sample		Soil
Date prepared	-	05/08/2022
Date analysed	-	05/08/2022
pH 1:5 soil:water	pH Units	6.0

CEC		
Our Reference		301756-1
Your Reference	UNITS	BH101
Depth		0.1
Date Sampled		21/07/2022
Type of sample		Soil
Date prepared	-	05/08/2022
Date analysed	-	05/08/2022
Exchangeable Ca	meq/100g	5.2
Exchangeable K	meq/100g	0.8
Exchangeable Mg	meq/100g	1.6
Exchangeable Na	meq/100g	<0.1
Cation Exchange Capacity	meq/100g	7.6

Method ID	Methodology Summary
ASB-001	Asbestos ID - Qualitative identification of asbestos in bulk samples using Polarised Light Microscopy and Dispersion Staining Techniques including Synthetic Mineral Fibre and Organic Fibre as per Australian Standard 4964-2004.
Inorg-001	pH - Measured using pH meter and electrode in accordance with APHA latest edition, 4500-H+. Please note that the results for water analyses are indicative only, as analysis outside of the APHA storage times.
Inorg-008	Moisture content determined by heating at 105+/-5 °C for a minimum of 12 hours.
Inorg-031	Total Phenolics by segmented flow analyser (in line distillation with colourimetric finish). Solids are extracted in a caustic media prior to analysis.
Metals-020	Determination of various metals by ICP-AES.
Metals-020	Determination of exchangeable cations and cation exchange capacity in soils using 1M Ammonium Chloride exchange and ICP-OES analytical finish.
Metals-021	Determination of Mercury by Cold Vapour AAS.
Org-020	Soil samples are extracted with Dichloromethane/Acetone and waters with Dichloromethane and analysed by GC-FID. F2 = (>C10-C16)-Naphthalene as per NEPM B1 Guideline on Investigation Levels for Soil and Groundwater (HSLs Tables 1A (3, 4)). Note Naphthalene is determined from the VOC analysis.
Org-020	Soil samples are extracted with Dichloromethane/Acetone and waters with Dichloromethane and analysed by GC-FID. F2 = (>C10-C16)-Naphthalene as per NEPM B1 Guideline on Investigation Levels for Soil and Groundwater (HSLs Tables 1A (3, 4)). Note Naphthalene is determined from the VOC analysis. Note, the Total +ve TRH PQL is reflective of the lowest individual PQL and is therefore "Total +ve TRH" is simply a sum of the positive individual TRH fractions (>C10-C40).
Org-021	Soil samples are extracted with dichloromethane/acetone and waters with dichloromethane and analysed by GC-ECD.
Org-021	Soil samples are extracted with dichloromethane/acetone and waters with dichloromethane and analysed by GC-ECD. Note, the Total +ve PCBs PQL is reflective of the lowest individual PQL and is therefore" Total +ve PCBs" is simply a sum of the positive individual PCBs.
Org-022	Determination of VOCs sampled onto coconut shell charcoal sorbent tubes, that can be desorbed using carbon disulphide, and analysed by GC-MS.
Org-022/025	Soil samples are extracted with Dichloromethane/Acetone and waters with Dichloromethane and analysed by GC-MS/GC-MSMS.

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

QUALITY CONTROL: vTRH(C6-C10)/BTEXN in Soil						Duplicate			Spike Recovery %	
Test Description	Units	PQL	Method	Blank	#	Base	Dup.	RPD	LCS-11	[NT]
Date extracted	-			02/08/2022	1	02/08/2022	02/08/2022		02/08/2022	[NT]
Date analysed	-			04/08/2022	1	04/08/2022	04/08/2022		04/08/2022	[NT]
TRH C_6 - C_9	mg/kg	25	Org-023	<25	1	<25	<25	0	101	[NT]
TRH C_6 - C_{10}	mg/kg	25	Org-023	<25	1	<25	<25	0	101	[NT]
Benzene	mg/kg	0.2	Org-023	<0.2	1	<0.2	<0.2	0	101	[NT]
Toluene	mg/kg	0.5	Org-023	<0.5	1	<0.5	<0.5	0	101	[NT]
Ethylbenzene	mg/kg	1	Org-023	<1	1	<1	<1	0	97	[NT]
m+p-xylene	mg/kg	2	Org-023	<2	1	<2	<2	0	102	[NT]
o-Xylene	mg/kg	1	Org-023	<1	1	<1	<1	0	102	[NT]
Naphthalene	mg/kg	1	Org-023	<1	1	<1	<1	0	[NT]	[NT]
Surrogate aaa-Trifluorotoluene	%		Org-023	101	1	78	90	14	100	[NT]

QUALITY CONTROL: svTRH (C10-C40) in Soil						Duplicate			Spike Recovery %	
Test Description	Units	PQL	Method	Blank	#	Base	Dup.	RPD	LCS-10	[NT]
Date extracted	-			02/08/2022	1	02/08/2022	02/08/2022		02/08/2022	[NT]
Date analysed	-			05/08/2022	1	05/08/2022	05/08/2022		05/08/2022	[NT]
TRH C_{10} - C_{14}	mg/kg	50	Org-020	<50	1	<50	<50	0	102	[NT]
TRH C_{15} - C_{28}	mg/kg	100	Org-020	<100	1	<100	<100	0	96	[NT]
TRH C_{29} - C_{36}	mg/kg	100	Org-020	<100	1	<100	<100	0	71	[NT]
TRH >C_{10} -C_{16}	mg/kg	50	Org-020	<50	1	<50	<50	0	102	[NT]
TRH >C_{16} -C_{34}	mg/kg	100	Org-020	<100	1	<100	<100	0	96	[NT]
TRH >C_{34} -C_{40}	mg/kg	100	Org-020	<100	1	<100	<100	0	71	[NT]
Surrogate o-Terphenyl	%		Org-020	75	1	76	73	4	94	[NT]

QUALITY CONTROL: PAHs in Soil						Duplicate			Spike Recovery %	
Test Description	Units	PQL	Method	Blank	#	Base	Dup.	RPD	LCS-11	[NT]
Date extracted	-			02/08/2022	1	02/08/2022	02/08/2022		02/08/2022	[NT]
Date analysed	-			04/08/2022	1	04/08/2022	04/08/2022		04/08/2022	[NT]
Naphthalene	mg/kg	0.1	Org-022/025	<0.1	1	<0.1	<0.1	0	84	[NT]
Acenaphthylene	mg/kg	0.1	Org-022/025	<0.1	1	<0.1	<0.1	0	[NT]	[NT]
Acenaphthene	mg/kg	0.1	Org-022/025	<0.1	1	<0.1	<0.1	0	81	[NT]
Fluorene	mg/kg	0.1	Org-022/025	<0.1	1	<0.1	<0.1	0	86	[NT]
Phenanthrene	mg/kg	0.1	Org-022/025	<0.1	1	<0.1	<0.1	0	116	[NT]
Anthracene	mg/kg	0.1	Org-022/025	<0.1	1	<0.1	<0.1	0	[NT]	[NT]
Fluoranthene	mg/kg	0.1	Org-022/025	<0.1	1	<0.1	<0.1	0	123	[NT]
Pyrene	mg/kg	0.1	Org-022/025	<0.1	1	<0.1	<0.1	0	131	[NT]
Benzo(a)anthracene	mg/kg	0.1	Org-022/025	<0.1	1	<0.1	<0.1	0	[NT]	[NT]
Chrysene	mg/kg	0.1	Org-022/025	<0.1	1	<0.1	<0.1	0	79	[NT]
Benzo(b,j+k)fluoranthene	mg/kg	0.2	Org-022/025	<0.2	1	<0.2	<0.2	0	[NT]	[NT]
Benzo(a)pyrene	mg/kg	0.05	Org-022/025	<0.05	1	<0.05	<0.05	0	90	[NT]
Indeno(1,2,3-c,d)pyrene	mg/kg	0.1	Org-022/025	<0.1	1	<0.1	<0.1	0	[NT]	[NT]
Dibenzo(a,h)anthracene	mg/kg	0.1	Org-022/025	<0.1	1	<0.1	<0.1	0	[NT]	[NT]
Benzo(g,h,i)perylene	mg/kg	0.1	Org-022/025	<0.1	1	<0.1	<0.1	0	[NT]	[NT]
Surrogate p-Terphenyl-d14	%		Org-022/025	112	1	123	114	8	108	[NT]

QUALITY CONTROL: Organochlorine Pesticides in soil						Duplicate			Spike Recovery %	
Test Description	Units	PQL	Method	Blank	#	Base	Dup.	RPD	LCS-11	[NT]
Date extracted	-			02/08/2022	1	02/08/2022	02/08/2022		02/08/2022	[NT]
Date analysed	-			04/08/2022	1	04/08/2022	04/08/2022		04/08/2022	[NT]
alpha-BHC	mg/kg	0.1	Org-022/025	<0.1	1	<0.1	<0.1	0	68	[NT]
HCB	mg/kg	0.1	Org-022/025	<0.1	1	<0.1	<0.1	0	[NT]	[NT]
beta-BHC	mg/kg	0.1	Org-022/025	<0.1	1	<0.1	<0.1	0	92	[NT]
gamma-BHC	mg/kg	0.1	Org-022/025	<0.1	1	<0.1	<0.1	0	[NT]	[NT]
Heptachlor	mg/kg	0.1	Org-022/025	<0.1	1	<0.1	<0.1	0	107	[NT]
delta-BHC	mg/kg	0.1	Org-022/025	<0.1	1	<0.1	<0.1	0	[NT]	[NT]
Aldrin	mg/kg	0.1	Org-022/025	<0.1	1	<0.1	<0.1	0	107	[NT]
Heptachlor Epoxide	mg/kg	0.1	Org-022/025	<0.1	1	<0.1	<0.1	0	100	[NT]
gamma-Chlordane	mg/kg	0.1	Org-022/025	<0.1	1	<0.1	<0.1	0	[NT]	[NT]
alpha-chlordane	mg/kg	0.1	Org-022/025	<0.1	1	<0.1	<0.1	0	[NT]	[NT]
Endosulfan I	mg/kg	0.1	Org-022/025	<0.1	1	<0.1	<0.1	0	[NT]	[NT]
pp-DDE	mg/kg	0.1	Org-022/025	<0.1	1	<0.1	<0.1	0	109	[NT]
Dieldrin	mg/kg	0.1	Org-022/025	<0.1	1	<0.1	<0.1	0	80	[NT]
Endrin	mg/kg	0.1	Org-022/025	<0.1	1	<0.1	<0.1	0	111	[NT]
Endosulfan II	mg/kg	0.1	Org-022/025	<0.1	1	<0.1	<0.1	0	[NT]	[NT]
pp-DDD	mg/kg	0.1	Org-022/025	<0.1	1	<0.1	<0.1	0	92	[NT]
Endrin Aldehyde	mg/kg	0.1	Org-022/025	<0.1	1	<0.1	<0.1	0	[NT]	[NT]
pp-DDT	mg/kg	0.1	Org-022/025	<0.1	1	<0.1	<0.1	0	[NT]	[NT]
Endosulfan Sulphate	mg/kg	0.1	Org-022/025	<0.1	1	<0.1	<0.1	0	80	[NT]
Methoxychlor	mg/kg	0.1	Org-022/025	<0.1	1	<0.1	<0.1	0	[NT]	[NT]
Surrogate TCMX	%		Org-022/025	100	1	105	100	5	101	[NT]

QUALITY CONTROL: Organophosphorus Pesticides in Soil						Duplicate			Spike Recovery %	
Test Description	Units	PQL	Method	Blank	#	Base	Dup.	RPD	LCS-11	[NT]
Date extracted	-			02/08/2022	1	02/08/2022	02/08/2022		02/08/2022	[NT]
Date analysed	-			04/08/2022	1	04/08/2022	04/08/2022		04/08/2022	[NT]
Dichlorvos	mg/kg	0.1	Org-022/025	<0.1	1	<0.1	<0.1	0	99	[NT]
Dimethoate	mg/kg	0.1	Org-022/025	<0.1	1	<0.1	<0.1	0	[NT]	[NT]
Diazinon	mg/kg	0.1	Org-022/025	<0.1	1	<0.1	<0.1	0	[NT]	[NT]
Chlorpyriphos-methyl	mg/kg	0.1	Org-022/025	<0.1	1	<0.1	<0.1	0	[NT]	[NT]
Ronnel	mg/kg	0.1	Org-022/025	<0.1	1	<0.1	<0.1	0	97	[NT]
Fenitrothion	mg/kg	0.1	Org-022/025	<0.1	1	<0.1	<0.1	0	87	[NT]
Malathion	mg/kg	0.1	Org-022/025	<0.1	1	<0.1	<0.1	0	71	[NT]
Chlorpyriphos	mg/kg	0.1	Org-022/025	<0.1	1	<0.1	<0.1	0	84	[NT]
Parathion	mg/kg	0.1	Org-022/025	<0.1	1	<0.1	<0.1	0	99	[NT]
Bromophos-ethyl	mg/kg	0.1	Org-022	<0.1	1	<0.1	<0.1	0	[NT]	[NT]
Ethion	mg/kg	0.1	Org-022/025	<0.1	1	<0.1	<0.1	0	80	[NT]
Azinphos-methyl (Guthion)	mg/kg	0.1	Org-022/025	<0.1	1	<0.1	<0.1	0	[NT]	[NT]
Surrogate TCMX	%		Org-022/025	100	1	105	100	5	101	[NT]

QUALITY CONTROL: PCBs in Soil						Duplicate			Spike Recovery %	
Test Description	Units	PQL	Method	Blank	#	Base	Dup.	RPD	LCS-11	[NT]
Date extracted	-			02/08/2022	1	02/08/2022	02/08/2022		02/08/2022	[NT]
Date analysed	-			04/08/2022	1	04/08/2022	04/08/2022		04/08/2022	[NT]
Aroclor 1016	mg/kg	0.1	Org-021	<0.1	1	<0.1	<0.1	0	[NT]	[NT]
Aroclor 1221	mg/kg	0.1	Org-021	<0.1	1	<0.1	<0.1	0	[NT]	[NT]
Aroclor 1232	mg/kg	0.1	Org-021	<0.1	1	<0.1	<0.1	0	[NT]	[NT]
Aroclor 1242	mg/kg	0.1	Org-021	<0.1	1	<0.1	<0.1	0	[NT]	[NT]
Aroclor 1248	mg/kg	0.1	Org-021	<0.1	1	<0.1	<0.1	0	[NT]	[NT]
Aroclor 1254	mg/kg	0.1	Org-021	<0.1	1	<0.1	<0.1	0	118	[NT]
Aroclor 1260	mg/kg	0.1	Org-021	<0.1	1	<0.1	<0.1	0	[NT]	[NT]
Surrogate TCMX	%		Org-021	100	1	105	100	5	101	[NT]

QUALITY CONTROL: Acid Extractable metals in soil						Duplicate			Spike Recovery %	
Test Description	Units	PQL	Method	Blank	#	Base	Dup.	RPD	LCS-11	[NT]
Date prepared	-			02/08/2022	1	02/08/2022	02/08/2022		02/08/2022	[NT]
Date analysed	-			03/08/2022	1	03/08/2022	03/08/2022		03/08/2022	[NT]
Arsenic	mg/kg	4	Metals-020	<4	1	6	7	15	94	[NT]
Cadmium	mg/kg	0.4	Metals-020	<0.4	1	<0.4	<0.4	0	89	[NT]
Chromium	mg/kg	1	Metals-020	<1	1	12	14	15	99	[NT]
Copper	mg/kg	1	Metals-020	<1	1	7	7	0	95	[NT]
Lead	mg/kg	1	Metals-020	<1	1	16	17	6	98	[NT]
Mercury	mg/kg	0.1	Metals-021	<0.1	1	<0.1	<0.1	0	95	[NT]
Nickel	mg/kg	1	Metals-020	<1	1	3	3	0	95	[NT]
Zinc	mg/kg	1	Metals-020	<1	1	10	13	26	94	[NT]

QUALITY CONTROL: Misc Soil - Inorg					Duplicate				Spike Recovery %	
Test Description	Units	PQL	Method	Blank	#	Base	Dup.	RPD	LCS-1	[NT]
Date prepared	-			02/08/2022	[NT]	[NT]	[NT]	[NT]	02/08/2022	[NT]
Date analysed	-			02/08/2022	[NT]	[NT]	[NT]	[NT]	02/08/2022	[NT]
Total Phenolics (as Phenol)	mg/kg	5	Inorg-031	<5	[NT]	[NT]	[NT]	[NT]	98	[NT]

QUALITY CONTROL: Misc Inorg - Soil						Duplicate			Spike Recovery %	
Test Description	Units	PQL	Method	Blank	#	Base	Dup.	RPD	LCS-1	[NT]
Date prepared	-			05/08/2022	[NT]	[NT]	[NT]	[NT]	05/08/2022	[NT]
Date analysed	-			05/08/2022	[NT]	[NT]	[NT]	[NT]	05/08/2022	[NT]
pH 1:5 soil:water	pH Units		Inorg-001	[NT]	[NT]	[NT]	[NT]	[NT]	102	[NT]

QUALITY CONTROL: CEC						Duplicate			Spike Recovery %	
Test Description	Units	PQL	Method	Blank	#	Base	Dup.	RPD	LCS-W1	[NT]
Date prepared	-			05/08/2022	[NT]	[NT]	[NT]	[NT]	05/08/2022	[NT]
Date analysed	-			05/08/2022	[NT]	[NT]	[NT]	[NT]	05/08/2022	[NT]
Exchangeable Ca	meq/100g	0.1	Metals-020	<0.1	[NT]	[NT]	[NT]	[NT]	91	[NT]
Exchangeable K	meq/100g	0.1	Metals-020	<0.1	[NT]	[NT]	[NT]	[NT]	96	[NT]
Exchangeable Mg	meq/100g	0.1	Metals-020	<0.1	[NT]	[NT]	[NT]	[NT]	87	[NT]
Exchangeable Na	meq/100g	0.1	Metals-020	<0.1	[NT]	[NT]	[NT]	[NT]	94	[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 according to ASB-001 asbestos subsampling procedure. We cannot guarantee that this sub-sample is indicative of the entire sample. Envirolab/MPL recommends supplying 40-60g or 500ml of sample in its own container.
Note: Samples requested for Asbestos testing were sub-sampled from jars provided by the client.

pH
Samples were out of the recommended holding time for this analysis.

Douglas Partners
Geotechnics | Environment | Groundwater

CHAIN OF CUSTODY DESPATCH SHEET

Project No:	215851.00	**Suburb:**	Rouse Hill	**To:**	Envirolab Services
Project Name:	Rouse Hill	**Order Number**			12 Ashley Street, Chatswood NSW 2067
Project Manager:	Paul Gorman	**Sampler:**		**Attn:**	Aileen Hie
Emails:	paul.gorman@douglaspartners.com.au			**Phone:**	(02) 6610 6200
Date Required:	Same day ☐ 24 hours ☐ 48 hours ☐ 72 hours ☐ Standard X			**Email:**	Ahie@envirolab.com.au
Prior Storage:	☐ Esky ☐ Fridge ☐ Shelved	Do samples contain 'potential' HBM?	Yes ☐ No ☐	(If YES, then handle, transport and store in accordance with FPM HAZID)	

Sample ID	Lab ID	Date Sampled	Sample Type: S - soil W - water	Container Type: G - glass P - plastic	Analytes: Heavy Metals	OCP/OPP PCB	TRH and BTEX	PAH	Total Phenols	pH/CEC	Combo 8A	Combo 3	BTEX	Notes/preservation
BH101/0.1	1	21.7.22	s	G						X	X			
BH101/0.5	2	21.7.22	s	G								X		
BH102/0.1	3	20.7.22	s	G								X		
BH102/0.5	4	20.7.22	s	G							X			
BH103/0.1	5	20.7.22	s	G							X			
BH104/0.1	6	21.7.22	s	G							X			
BH104/0.5	7	21.7.22	s	G								X		
TS	8												X	
TB	9												X	
PQL (S) mg/kg												**ANZECC PQLs req'd for all water analytes** ☐		

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

Job No: 301756
Date Received: 29-7-22
Time Received: 11:15
Received By: AP
Temp: Cool/Ambient 16°C
Cooling: Ice/Icepack
Security: Intact/Broken/None

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:** | **Transported to laboratory by:**

Send Results to: Douglas Partners Pty Ltd | **Address** | **Phone:** | **Fax:**

Signed: | **Received by:** AP ELS SYD | **Date & Time:** 1115 29-7-22

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

SAMPLE RECEIPT ADVICE

Client Details

Client	Douglas Partners Pty Ltd
Attention	Paul Gorman

Sample Login Details

Your reference	215851.00, Rouse Hill
Envirolab Reference	301756
Date Sample Received	29/07/2022
Date Instructions Received	29/07/2022
Date Results Expected to be Reported	05/08/2022

Sample Condition

Samples received in appropriate condition for analysis	Yes
No. of Samples Provided	9 Soil
Turnaround Time Requested	Standard
Temperature on Receipt (°C)	10
Cooling Method	Ice Pack
Sampling Date Provided	YES

Comments

Nil

Please direct any queries to:

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

Analysis Underway, details on the following page:

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

Sample ID	vTRH(C6-C10)/BTEXN in Soil	svTRH (C10-C40) in Soil	PAHs in Soil	Organochlorine Pesticides in soil	Organophosphorus Pesticides in Soil	PCBs in Soil	Acid Extractable metalsin soil	Misc Soil - Inorg	Asbestos ID - soils	Misc Inorg - Soil	CEC
BH101-0.1	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
BH101-0.5	✓	✓	✓				✓				
BH102-0.1	✓	✓	✓				✓				
BH102-0.5	✓	✓	✓	✓	✓	✓	✓	✓	✓		
BH103-0.1	✓	✓	✓	✓	✓	✓	✓	✓	✓		
BH104-0.1	✓	✓	✓	✓	✓	✓	✓	✓	✓		
BH104-0.5	✓	✓	✓				✓				
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.

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

CERTIFICATE OF ANALYSIS 306351

Client Details

Client	Douglas Partners Pty Ltd
Attention	Gavin Boyd
Address	96 Hermitage Rd, West Ryde, NSW, 2114

Sample Details

Your Reference	**215851.00, Rouse Hill**
Number of Samples	49 Soil
Date samples received	21/09/2022
Date completed instructions received	21/09/2022

Analysis Details

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

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

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

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

Report Details

Date results requested by	29/09/2022
Date of Issue	18/10/2022
Reissue Details	This report replaces R00 due to an amendment to sample depth (ELS 1-5)

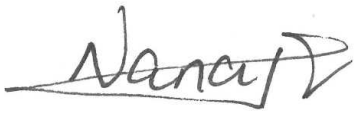
NATA Accreditation Number 2901. This document shall not be reproduced except in full.

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

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

Results Approved By
Josh Williams, Organics and LC Supervisor
Kyle Gavrily, Senior Chemist
Liam Timmins, Organic Instruments Team Leader
Loren Bardwell, Development Chemist
Lucy Zhu, Asbestos Supervisor
Phalak Inthakesone, Organics Development Manager, Sydney
Priya Samarawickrama, Senior Chemist

Authorised By



Nancy Zhang, Laboratory Manager

vTRH(C6-C10)/BTEXN in Soil						
Our Reference		306351-6	306351-7	306351-8	306351-9	306351-10
Your Reference	UNITS	BH105	BH109	BH110	BH110	BH112
Depth		0.1-0.2	0.1-0.2	0.1-0.2	0.4-0.5	0.1-0.2
Date Sampled		08/09/2022	08/09/2022	08/09/2022	08/09/2022	08/09/2022
Type of sample		Soil	Soil	Soil	Soil	Soil
Date extracted	-	26/09/2022	26/09/2022	26/09/2022	26/09/2022	26/09/2022
Date analysed	-	26/09/2022	26/09/2022	26/09/2022	26/09/2022	26/09/2022
TRH C_6 - C_9	mg/kg	<25	<25	<25	<25	<25
TRH C_6 - C_{10}	mg/kg	<25	<25	<25	<25	<25
vTPH C_6 - C_{10} less BTEX (F1)	mg/kg	<25	<25	<25	<25	<25
Benzene	mg/kg	<0.2	<0.2	<0.2	<0.2	<0.2
Toluene	mg/kg	<0.5	<0.5	<0.5	<0.5	<0.5
Ethylbenzene	mg/kg	<1	<1	<1	<1	<1
m+p-xylene	mg/kg	<2	<2	<2	<2	<2
o-Xylene	mg/kg	<1	<1	<1	<1	<1
Naphthalene	mg/kg	<1	<1	<1	<1	<1
Total +ve Xylenes	mg/kg	<1	<1	<1	<1	<1
Surrogate aaa-Trifluorotoluene	%	75	76	83	90	85

vTRH(C6-C10)/BTEXN in Soil						
Our Reference		306351-11	306351-12	306351-13	306351-14	306351-15
Your Reference	UNITS	BH112	BH112	BH113	BH114	BH114
Depth		0.4-0.5	0.9-1	0.1-0.2	0.1-0.2	0.4-0.5
Date Sampled		08/09/2022	08/09/2022	08/09/2022	08/09/2022	08/09/2022
Type of sample		Soil	Soil	Soil	Soil	Soil
Date extracted	-	26/09/2022	26/09/2022	26/09/2022	26/09/2022	26/09/2022
Date analysed	-	26/09/2022	26/09/2022	26/09/2022	26/09/2022	26/09/2022
TRH C_6 - C_9	mg/kg	<25	<25	<25	<25	<25
TRH C_6 - C_{10}	mg/kg	<25	<25	<25	<25	<25
vTPH C_6 - C_{10} less BTEX (F1)	mg/kg	<25	<25	<25	<25	<25
Benzene	mg/kg	<0.2	<0.2	<0.2	<0.2	<0.2
Toluene	mg/kg	<0.5	<0.5	<0.5	<0.5	<0.5
Ethylbenzene	mg/kg	<1	<1	<1	<1	<1
m+p-xylene	mg/kg	<2	<2	<2	<2	<2
o-Xylene	mg/kg	<1	<1	<1	<1	<1
Naphthalene	mg/kg	<1	<1	<1	<1	<1
Total +ve Xylenes	mg/kg	<1	<1	<1	<1	<1
Surrogate aaa-Trifluorotoluene	%	81	87	79	72	80

vTRH(C6-C10)/BTEXN in Soil						
Our Reference		306351-16	306351-17	306351-18	306351-19	306351-20
Your Reference	UNITS	BH114	BH115	BH108	BH108	BH108
Depth		0.9-1	0.1-0.2	0.1-0.2	0.4-0.5	0.9-1
Date Sampled		08/09/2022	08/09/2022	13/09/2022	13/09/2022	13/09/2022
Type of sample		Soil	Soil	Soil	Soil	Soil
Date extracted	-	26/09/2022	26/09/2022	26/09/2022	26/09/2022	26/09/2022
Date analysed	-	26/09/2022	26/09/2022	26/09/2022	26/09/2022	26/09/2022
TRH C_6 - C_9	mg/kg	<25	<25	<25	<25	<25
TRH C_6 - C_{10}	mg/kg	<25	<25	<25	<25	<25
vTPH C_6 - C_{10} less BTEX (F1)	mg/kg	<25	<25	<25	<25	<25
Benzene	mg/kg	<0.2	<0.2	<0.2	<0.2	<0.2
Toluene	mg/kg	<0.5	<0.5	<0.5	<0.5	<0.5
Ethylbenzene	mg/kg	<1	<1	<1	<1	<1
m+p-xylene	mg/kg	<2	<2	<2	<2	<2
o-Xylene	mg/kg	<1	<1	<1	<1	<1
Naphthalene	mg/kg	<1	<1	<1	<1	<1
Total +ve Xylenes	mg/kg	<1	<1	<1	<1	<1
Surrogate aaa-Trifluorotoluene	%	85	85	82	83	88

vTRH(C6-C10)/BTEXN in Soil						
Our Reference		306351-21	306351-22	306351-23	306351-44	306351-45
Your Reference	UNITS	BH111	BH111	BH111	Trip Spike	Trip Blank
Depth		0.1-0.2	0.4-0.5	0.9-1	-	-
Date Sampled		13/09/2022	13/09/2022	13/09/2022	13/09/2022	13/09/2022
Type of sample		Soil	Soil	Soil	Soil	Soil
Date extracted	-	26/09/2022	26/09/2022	26/09/2022	26/09/2022	26/09/2022
Date analysed	-	26/09/2022	26/09/2022	26/09/2022	28/09/2022	26/09/2022
TRH C_6 - C_9	mg/kg	<25	<25	<25	[NA]	<25
TRH C_6 - C_{10}	mg/kg	<25	<25	<25	[NA]	<25
vTPH C_6 - C_{10} less BTEX (F1)	mg/kg	<25	<25	<25	[NA]	<25
Benzene	mg/kg	<0.2	<0.2	<0.2	101%	<0.2
Toluene	mg/kg	<0.5	<0.5	<0.5	102%	<0.5
Ethylbenzene	mg/kg	<1	<1	<1	101%	<1
m+p-xylene	mg/kg	<2	<2	<2	101%	<2
o-Xylene	mg/kg	<1	<1	<1	101%	<1
Naphthalene	mg/kg	<1	<1	<1	[NA]	<1
Total +ve Xylenes	mg/kg	<1	<1	<1	[NA]	<1
Surrogate aaa-Trifluorotoluene	%	84	67	89	78	88

vTRH(C6-C10)/BTEXN in Soil					
Our Reference		306351-46	306351-47	306351-48	306351-49
Your Reference	UNITS	BD1-08/09/2022	BD1-13/09/2022	BD2-13/09/2022	BD3-13/09/2022
Depth		-	-	-	-
Date Sampled		08/09/2022	13/09/2022	13/09/2022	13/09/2022
Type of sample		Soil	Soil	Soil	Soil
Date extracted	-	26/09/2022	26/09/2022	26/09/2022	26/09/2022
Date analysed	-	26/09/2022	26/09/2022	26/09/2022	26/09/2022
TRH C_6 - C_9	mg/kg	<25	<25	<25	<25
TRH C_6 - C_{10}	mg/kg	<25	<25	<25	<25
vTPH C_6 - C_{10} less BTEX (F1)	mg/kg	<25	<25	<25	<25
Benzene	mg/kg	<0.2	<0.2	<0.2	<0.2
Toluene	mg/kg	<0.5	<0.5	<0.5	<0.5
Ethylbenzene	mg/kg	<1	<1	<1	<1
m+p-xylene	mg/kg	<2	<2	<2	<2
o-Xylene	mg/kg	<1	<1	<1	<1
Naphthalene	mg/kg	<1	<1	<1	<1
Total +ve Xylenes	mg/kg	<1	<1	<1	<1
Surrogate aaa-Trifluorotoluene	%	85	82	84	84

svTRH (C10-C40) in Soil						
Our Reference		306351-6	306351-7	306351-8	306351-9	306351-10
Your Reference	UNITS	BH105	BH109	BH110	BH110	BH112
Depth		0.1-0.2	0.1-0.2	0.1-0.2	0.4-0.5	0.1-0.2
Date Sampled		08/09/2022	08/09/2022	08/09/2022	08/09/2022	08/09/2022
Type of sample		Soil	Soil	Soil	Soil	Soil
Date extracted	-	26/09/2022	26/09/2022	26/09/2022	26/09/2022	26/09/2022
Date analysed	-	26/09/2022	26/09/2022	26/09/2022	26/09/2022	26/09/2022
TRH C_{10} - C_{14}	mg/kg	<50	<50	<50	<50	<50
TRH C_{15} - C_{28}	mg/kg	<100	<100	<100	<100	<100
TRH C_{29} - C_{36}	mg/kg	<100	120	<100	<100	<100
Total +ve TRH (C10-C36)	mg/kg	<50	120	<50	<50	<50
TRH >C_{10} -C_{16}	mg/kg	<50	<50	<50	<50	<50
TRH >C_{10} - C_{16} less Naphthalene (F2)	mg/kg	<50	<50	<50	<50	<50
TRH >C_{16} -C_{34}	mg/kg	<100	<100	100	<100	<100
TRH >C_{34} -C_{40}	mg/kg	<100	120	<100	<100	<100
Total +ve TRH (>C10-C40)	mg/kg	<50	120	100	<50	<50
Surrogate o-Terphenyl	%	79	90	85	82	83

svTRH (C10-C40) in Soil						
Our Reference		306351-11	306351-12	306351-13	306351-14	306351-15
Your Reference	UNITS	BH112	BH112	BH113	BH114	BH114
Depth		0.4-0.5	0.9-1	0.1-0.2	0.1-0.2	0.4-0.5
Date Sampled		08/09/2022	08/09/2022	08/09/2022	08/09/2022	08/09/2022
Type of sample		Soil	Soil	Soil	Soil	Soil
Date extracted	-	26/09/2022	26/09/2022	26/09/2022	26/09/2022	26/09/2022
Date analysed	-	26/09/2022	26/09/2022	26/09/2022	27/09/2022	27/09/2022
TRH C_{10} - C_{14}	mg/kg	<50	<50	<50	<50	<50
TRH C_{15} - C_{28}	mg/kg	<100	<100	<100	<100	<100
TRH C_{29} - C_{36}	mg/kg	<100	<100	<100	<100	<100
Total +ve TRH (C10-C36)	mg/kg	<50	<50	<50	<50	<50
TRH >C_{10} -C_{16}	mg/kg	<50	<50	<50	<50	<50
TRH >C_{10} - C_{16} less Naphthalene (F2)	mg/kg	<50	<50	<50	<50	<50
TRH >C_{16} -C_{34}	mg/kg	<100	<100	<100	<100	<100
TRH >C_{34} -C_{40}	mg/kg	<100	<100	<100	<100	<100
Total +ve TRH (>C10-C40)	mg/kg	<50	<50	<50	<50	<50
Surrogate o-Terphenyl	%	81	81	82	79	80

svTRH (C10-C40) in Soil						
Our Reference		306351-16	306351-17	306351-18	306351-19	306351-20
Your Reference	UNITS	BH114	BH115	BH108	BH108	BH108
Depth		0.9-1	0.1-0.2	0.1-0.2	0.4-0.5	0.9-1
Date Sampled		08/09/2022	08/09/2022	13/09/2022	13/09/2022	13/09/2022
Type of sample		Soil	Soil	Soil	Soil	Soil
Date extracted	-	26/09/2022	26/09/2022	26/09/2022	26/09/2022	26/09/2022
Date analysed	-	27/09/2022	27/09/2022	27/09/2022	27/09/2022	27/09/2022
TRH C_{10} - C_{14}	mg/kg	<50	<50	<50	<50	<50
TRH C_{15} - C_{28}	mg/kg	<100	<100	<100	<100	<100
TRH C_{29} - C_{36}	mg/kg	<100	<100	<100	<100	<100
Total +ve TRH (C10-C36)	mg/kg	<50	<50	<50	<50	<50
TRH >C_{10} -C_{16}	mg/kg	<50	<50	<50	<50	<50
TRH >C_{10} - C_{16} less Naphthalene (F2)	mg/kg	<50	<50	<50	<50	<50
TRH >C_{16} -C_{34}	mg/kg	<100	<100	<100	<100	<100
TRH >C_{34} -C_{40}	mg/kg	<100	<100	<100	<100	<100
Total +ve TRH (>C10-C40)	mg/kg	<50	<50	<50	<50	<50
Surrogate o-Terphenyl	%	74	84	87	83	83

svTRH (C10-C40) in Soil						
Our Reference		306351-21	306351-22	306351-23	306351-46	306351-47
Your Reference	UNITS	BH111	BH111	BH111	BD1-08/09/2022	BD1-13/09/2022
Depth		0.1-0.2	0.4-0.5	0.9-1	-	-
Date Sampled		13/09/2022	13/09/2022	13/09/2022	08/09/2022	13/09/2022
Type of sample		Soil	Soil	Soil	Soil	Soil
Date extracted	-	26/09/2022	26/09/2022	26/09/2022	26/09/2022	26/09/2022
Date analysed	-	27/09/2022	27/09/2022	27/09/2022	27/09/2022	27/09/2022
TRH C_{10} - C_{14}	mg/kg	<50	<50	<50	<50	<50
TRH C_{15} - C_{28}	mg/kg	<100	<100	<100	<100	<100
TRH C_{29} - C_{36}	mg/kg	<100	<100	<100	<100	<100
Total +ve TRH (C10-C36)	mg/kg	<50	<50	<50	<50	<50
TRH >C_{10} -C_{16}	mg/kg	<50	<50	<50	<50	<50
TRH >C_{10} - C_{16} less Naphthalene (F2)	mg/kg	<50	<50	<50	<50	<50
TRH >C_{16} -C_{34}	mg/kg	130	<100	<100	<100	<100
TRH >C_{34} -C_{40}	mg/kg	<100	<100	<100	<100	<100
Total +ve TRH (>C10-C40)	mg/kg	130	<50	<50	<50	<50
Surrogate o-Terphenyl	%	87	84	85	87	84

svTRH (C10-C40) in Soil			
Our Reference		306351-48	306351-49
Your Reference	UNITS	BD2-13/09/2022	BD3-13/09/2022
Depth		-	-
Date Sampled		13/09/2022	13/09/2022
Type of sample		Soil	Soil
Date extracted	-	26/09/2022	26/09/2022
Date analysed	-	27/09/2022	27/09/2022
TRH C_{10} - C_{14}	mg/kg	<50	<50
TRH C_{15} - C_{28}	mg/kg	<100	<100
TRH C_{29} - C_{36}	mg/kg	<100	<100
Total +ve TRH (C10-C36)	mg/kg	<50	<50
TRH >C_{10} -C_{16}	mg/kg	<50	<50
TRH >C_{10} - C_{16} less Naphthalene (F2)	mg/kg	<50	<50
TRH >C_{16} -C_{34}	mg/kg	<100	<100
TRH >C_{34} -C_{40}	mg/kg	<100	<100
Total +ve TRH (>C10-C40)	mg/kg	<50	<50
Surrogate o-Terphenyl	%	84	84

PAHs in Soil						
Our Reference		306351-6	306351-7	306351-8	306351-9	306351-10
Your Reference	UNITS	BH105	BH109	BH110	BH110	BH112
Depth		0.1-0.2	0.1-0.2	0.1-0.2	0.4-0.5	0.1-0.2
Date Sampled		08/09/2022	08/09/2022	08/09/2022	08/09/2022	08/09/2022
Type of sample		Soil	Soil	Soil	Soil	Soil
Date extracted	-	26/09/2022	26/09/2022	26/09/2022	26/09/2022	26/09/2022
Date analysed	-	29/09/2022	29/09/2022	29/09/2022	29/09/2022	29/09/2022
Naphthalene	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Acenaphthylene	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Acenaphthene	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Fluorene	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Phenanthrene	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Anthracene	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Fluoranthene	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Pyrene	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Benzo(a)anthracene	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Chrysene	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Benzo(b,j+k)fluoranthene	mg/kg	<0.2	<0.2	<0.2	<0.2	<0.2
Benzo(a)pyrene	mg/kg	<0.05	<0.05	<0.05	<0.05	<0.05
Indeno(1,2,3-c,d)pyrene	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Dibenzo(a,h)anthracene	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Benzo(g,h,i)perylene	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Total +ve PAH's	mg/kg	<0.05	<0.05	<0.05	<0.05	<0.05
Benzo(a)pyrene TEQ calc (zero)	mg/kg	<0.5	<0.5	<0.5	<0.5	<0.5
Benzo(a)pyrene TEQ calc(half)	mg/kg	<0.5	<0.5	<0.5	<0.5	<0.5
Benzo(a)pyrene TEQ calc(PQL)	mg/kg	<0.5	<0.5	<0.5	<0.5	<0.5
Surrogate p-Terphenyl-d14	%	92	92	86	114	80

PAHs in Soil						
Our Reference		306351-11	306351-12	306351-13	306351-14	306351-15
Your Reference	UNITS	BH112	BH112	BH113	BH114	BH114
Depth		0.4-0.5	0.9-1	0.1-0.2	0.1-0.2	0.4-0.5
Date Sampled		08/09/2022	08/09/2022	08/09/2022	08/09/2022	08/09/2022
Type of sample		Soil	Soil	Soil	Soil	Soil
Date extracted	-	26/09/2022	26/09/2022	26/09/2022	26/09/2022	26/09/2022
Date analysed	-	29/09/2022	29/09/2022	29/09/2022	29/09/2022	29/09/2022
Naphthalene	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Acenaphthylene	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Acenaphthene	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Fluorene	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Phenanthrene	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Anthracene	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Fluoranthene	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Pyrene	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Benzo(a)anthracene	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Chrysene	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Benzo(b,j+k)fluoranthene	mg/kg	<0.2	<0.2	<0.2	<0.2	<0.2
Benzo(a)pyrene	mg/kg	<0.05	<0.05	<0.05	<0.05	<0.05
Indeno(1,2,3-c,d)pyrene	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Dibenzo(a,h)anthracene	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Benzo(g,h,i)perylene	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Total +ve PAH's	mg/kg	<0.05	<0.05	<0.05	<0.05	<0.05
Benzo(a)pyrene TEQ calc (zero)	mg/kg	<0.5	<0.5	<0.5	<0.5	<0.5
Benzo(a)pyrene TEQ calc(half)	mg/kg	<0.5	<0.5	<0.5	<0.5	<0.5
Benzo(a)pyrene TEQ calc(PQL)	mg/kg	<0.5	<0.5	<0.5	<0.5	<0.5
Surrogate p-Terphenyl-d14	%	85	122	89	83	84

PAHs in Soil						
Our Reference		306351-16	306351-17	306351-18	306351-19	306351-20
Your Reference	UNITS	BH114	BH115	BH108	BH108	BH108
Depth		0.9-1	0.1-0.2	0.1-0.2	0.4-0.5	0.9-1
Date Sampled		08/09/2022	08/09/2022	13/09/2022	13/09/2022	13/09/2022
Type of sample		Soil	Soil	Soil	Soil	Soil
Date extracted	-	26/09/2022	26/09/2022	26/09/2022	26/09/2022	26/09/2022
Date analysed	-	29/09/2022	29/09/2022	29/09/2022	29/09/2022	29/09/2022
Naphthalene	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Acenaphthylene	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Acenaphthene	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Fluorene	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Phenanthrene	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Anthracene	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Fluoranthene	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Pyrene	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Benzo(a)anthracene	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Chrysene	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Benzo(b,j+k)fluoranthene	mg/kg	<0.2	<0.2	<0.2	<0.2	<0.2
Benzo(a)pyrene	mg/kg	<0.05	<0.05	<0.05	<0.05	<0.05
Indeno(1,2,3-c,d)pyrene	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Dibenzo(a,h)anthracene	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Benzo(g,h,i)perylene	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Total +ve PAH's	mg/kg	<0.05	<0.05	<0.05	<0.05	<0.05
Benzo(a)pyrene TEQ calc (zero)	mg/kg	<0.5	<0.5	<0.5	<0.5	<0.5
Benzo(a)pyrene TEQ calc(half)	mg/kg	<0.5	<0.5	<0.5	<0.5	<0.5
Benzo(a)pyrene TEQ calc(PQL)	mg/kg	<0.5	<0.5	<0.5	<0.5	<0.5
Surrogate p-Terphenyl-d14	%	120	79	89	88	111

PAHs in Soil						
Our Reference		306351-21	306351-22	306351-23	306351-46	306351-47
Your Reference	UNITS	BH111	BH111	BH111	BD1-08/09/2022	BD1-13/09/2022
Depth		0.1-0.2	0.4-0.5	0.9-1	-	-
Date Sampled		13/09/2022	13/09/2022	13/09/2022	08/09/2022	13/09/2022
Type of sample		Soil	Soil	Soil	Soil	Soil
Date extracted	-	26/09/2022	26/09/2022	26/09/2022	26/09/2022	26/09/2022
Date analysed	-	29/09/2022	29/09/2022	29/09/2022	29/09/2022	29/09/2022
Naphthalene	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Acenaphthylene	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Acenaphthene	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Fluorene	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Phenanthrene	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Anthracene	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Fluoranthene	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Pyrene	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Benzo(a)anthracene	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Chrysene	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Benzo(b,j+k)fluoranthene	mg/kg	<0.2	<0.2	<0.2	<0.2	<0.2
Benzo(a)pyrene	mg/kg	<0.05	<0.05	<0.05	<0.05	<0.05
Indeno(1,2,3-c,d)pyrene	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Dibenzo(a,h)anthracene	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Benzo(g,h,i)perylene	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Total +ve PAH's	mg/kg	<0.05	<0.05	<0.05	<0.05	<0.05
Benzo(a)pyrene TEQ calc (zero)	mg/kg	<0.5	<0.5	<0.5	<0.5	<0.5
Benzo(a)pyrene TEQ calc(half)	mg/kg	<0.5	<0.5	<0.5	<0.5	<0.5
Benzo(a)pyrene TEQ calc(PQL)	mg/kg	<0.5	<0.5	<0.5	<0.5	<0.5
Surrogate p-Terphenyl-d14	%	81	84	119	118	127

PAHs in Soil			
Our Reference		306351-48	306351-49
Your Reference	UNITS	BD2-13/09/2022	BD3-13/09/2022
Depth		-	-
Date Sampled		13/09/2022	13/09/2022
Type of sample		Soil	Soil
Date extracted	-	26/09/2022	26/09/2022
Date analysed	-	29/09/2022	29/09/2022
Naphthalene	mg/kg	<0.1	<0.1
Acenaphthylene	mg/kg	<0.1	<0.1
Acenaphthene	mg/kg	<0.1	<0.1
Fluorene	mg/kg	<0.1	<0.1
Phenanthrene	mg/kg	<0.1	<0.1
Anthracene	mg/kg	<0.1	<0.1
Fluoranthene	mg/kg	<0.1	<0.1
Pyrene	mg/kg	<0.1	<0.1
Benzo(a)anthracene	mg/kg	<0.1	<0.1
Chrysene	mg/kg	<0.1	<0.1
Benzo(b,j+k)fluoranthene	mg/kg	<0.2	<0.2
Benzo(a)pyrene	mg/kg	<0.05	<0.05
Indeno(1,2,3-c,d)pyrene	mg/kg	<0.1	<0.1
Dibenzo(a,h)anthracene	mg/kg	<0.1	<0.1
Benzo(g,h,i)perylene	mg/kg	<0.1	<0.1
Total +ve PAH's	mg/kg	<0.05	<0.05
Benzo(a)pyrene TEQ calc (zero)	mg/kg	<0.5	<0.5
Benzo(a)pyrene TEQ calc(half)	mg/kg	<0.5	<0.5
Benzo(a)pyrene TEQ calc(PQL)	mg/kg	<0.5	<0.5
Surrogate p-Terphenyl-d14	%	111	112

Organochlorine Pesticides in soil						
Our Reference		306351-6	306351-7	306351-8	306351-10	306351-11
Your Reference	UNITS	BH105	BH109	BH110	BH112	BH112
Depth		0.1-0.2	0.1-0.2	0.1-0.2	0.1-0.2	0.4-0.5
Date Sampled		08/09/2022	08/09/2022	08/09/2022	08/09/2022	08/09/2022
Type of sample		Soil	Soil	Soil	Soil	Soil
Date extracted	-	26/09/2022	26/09/2022	26/09/2022	26/09/2022	26/09/2022
Date analysed	-	29/09/2022	29/09/2022	29/09/2022	29/09/2022	29/09/2022
alpha-BHC	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
HCB	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
beta-BHC	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
gamma-BHC	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Heptachlor	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
delta-BHC	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Aldrin	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Heptachlor Epoxide	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
gamma-Chlordane	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
alpha-chlordane	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Endosulfan I	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
pp-DDE	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Dieldrin	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Endrin	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Endosulfan II	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
pp-DDD	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Endrin Aldehyde	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
pp-DDT	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Endosulfan Sulphate	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Methoxychlor	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Total +ve DDT+DDD+DDE	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Surrogate TCMX	%	90	89	80	82	83

Organochlorine Pesticides in soil						
Our Reference		306351-13	306351-14	306351-15	306351-17	306351-18
Your Reference	UNITS	BH113	BH114	BH114	BH115	BH108
Depth		0.1-0.2	0.1-0.2	0.4-0.5	0.1-0.2	0.1-0.2
Date Sampled		08/09/2022	08/09/2022	08/09/2022	08/09/2022	13/09/2022
Type of sample		Soil	Soil	Soil	Soil	Soil
Date extracted	-	26/09/2022	26/09/2022	26/09/2022	26/09/2022	26/09/2022
Date analysed	-	29/09/2022	29/09/2022	29/09/2022	29/09/2022	29/09/2022
alpha-BHC	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
HCB	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
beta-BHC	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
gamma-BHC	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Heptachlor	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
delta-BHC	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Aldrin	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Heptachlor Epoxide	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
gamma-Chlordane	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
alpha-chlordane	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Endosulfan I	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
pp-DDE	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Dieldrin	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Endrin	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Endosulfan II	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
pp-DDD	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Endrin Aldehyde	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
pp-DDT	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Endosulfan Sulphate	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Methoxychlor	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Total +ve DDT+DDD+DDE	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Surrogate TCMX	%	81	79	81	80	83

Organochlorine Pesticides in soil				
Our Reference		306351-19	306351-21	306351-22
Your Reference	UNITS	BH108	BH111	BH111
Depth		0.4-0.5	0.1-0.2	0.4-0.5
Date Sampled		13/09/2022	13/09/2022	13/09/2022
Type of sample		Soil	Soil	Soil
Date extracted	-	26/09/2022	26/09/2022	26/09/2022
Date analysed	-	29/09/2022	29/09/2022	29/09/2022
alpha-BHC	mg/kg	<0.1	<0.1	<0.1
HCB	mg/kg	<0.1	<0.1	<0.1
beta-BHC	mg/kg	<0.1	<0.1	<0.1
gamma-BHC	mg/kg	<0.1	<0.1	<0.1
Heptachlor	mg/kg	<0.1	<0.1	<0.1
delta-BHC	mg/kg	<0.1	<0.1	<0.1
Aldrin	mg/kg	<0.1	<0.1	<0.1
Heptachlor Epoxide	mg/kg	<0.1	<0.1	<0.1
gamma-Chlordane	mg/kg	<0.1	<0.1	<0.1
alpha-chlordane	mg/kg	<0.1	<0.1	<0.1
Endosulfan I	mg/kg	<0.1	<0.1	<0.1
pp-DDE	mg/kg	<0.1	<0.1	<0.1
Dieldrin	mg/kg	<0.1	<0.1	<0.1
Endrin	mg/kg	<0.1	<0.1	<0.1
Endosulfan II	mg/kg	<0.1	<0.1	<0.1
pp-DDD	mg/kg	<0.1	<0.1	<0.1
Endrin Aldehyde	mg/kg	<0.1	<0.1	<0.1
pp-DDT	mg/kg	<0.1	<0.1	<0.1
Endosulfan Sulphate	mg/kg	<0.1	<0.1	<0.1
Methoxychlor	mg/kg	<0.1	<0.1	<0.1
Total +ve DDT+DDD+DDE	mg/kg	<0.1	<0.1	<0.1
Surrogate TCMX	%	78	81	79

Organophosphorus Pesticides in Soil						
Our Reference		306351-6	306351-7	306351-8	306351-10	306351-11
Your Reference	UNITS	BH105	BH109	BH110	BH112	BH112
Depth		0.1-0.2	0.1-0.2	0.1-0.2	0.1-0.2	0.4-0.5
Date Sampled		08/09/2022	08/09/2022	08/09/2022	08/09/2022	08/09/2022
Type of sample		Soil	Soil	Soil	Soil	Soil
Date extracted	-	26/09/2022	26/09/2022	26/09/2022	26/09/2022	26/09/2022
Date analysed	-	29/09/2022	29/09/2022	29/09/2022	29/09/2022	29/09/2022
Dichlorvos	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Dimethoate	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Diazinon	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Chlorpyriphos-methyl	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Ronnel	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Fenitrothion	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Malathion	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Chlorpyriphos	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Parathion	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Bromophos-ethyl	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Ethion	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Azinphos-methyl (Guthion)	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Surrogate TCMX	%	90	89	80	82	83

Organophosphorus Pesticides in Soil						
Our Reference		306351-13	306351-14	306351-15	306351-17	306351-18
Your Reference	UNITS	BH113	BH114	BH114	BH115	BH108
Depth		0.1-0.2	0.1-0.2	0.4-0.5	0.1-0.2	0.1-0.2
Date Sampled		08/09/2022	08/09/2022	08/09/2022	08/09/2022	13/09/2022
Type of sample		Soil	Soil	Soil	Soil	Soil
Date extracted	-	26/09/2022	26/09/2022	26/09/2022	26/09/2022	26/09/2022
Date analysed	-	29/09/2022	29/09/2022	29/09/2022	29/09/2022	29/09/2022
Dichlorvos	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Dimethoate	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Diazinon	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Chlorpyriphos-methyl	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Ronnel	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Fenitrothion	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Malathion	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Chlorpyriphos	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Parathion	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Bromophos-ethyl	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Ethion	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Azinphos-methyl (Guthion)	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Surrogate TCMX	%	81	79	81	80	83

Organophosphorus Pesticides in Soil				
Our Reference		306351-19	306351-21	306351-22
Your Reference	UNITS	BH108	BH111	BH111
Depth		0.4-0.5	0.1-0.2	0.4-0.5
Date Sampled		13/09/2022	13/09/2022	13/09/2022
Type of sample		Soil	Soil	Soil
Date extracted	-	26/09/2022	26/09/2022	26/09/2022
Date analysed	-	29/09/2022	29/09/2022	29/09/2022
Dichlorvos	mg/kg	<0.1	<0.1	<0.1
Dimethoate	mg/kg	<0.1	<0.1	<0.1
Diazinon	mg/kg	<0.1	<0.1	<0.1
Chlorpyriphos-methyl	mg/kg	<0.1	<0.1	<0.1
Ronnel	mg/kg	<0.1	<0.1	<0.1
Fenitrothion	mg/kg	<0.1	<0.1	<0.1
Malathion	mg/kg	<0.1	<0.1	<0.1
Chlorpyriphos	mg/kg	<0.1	<0.1	<0.1
Parathion	mg/kg	<0.1	<0.1	<0.1
Bromophos-ethyl	mg/kg	<0.1	<0.1	<0.1
Ethion	mg/kg	<0.1	<0.1	<0.1
Azinphos-methyl (Guthion)	mg/kg	<0.1	<0.1	<0.1
Surrogate TCMX	%	78	81	79

PCBs in Soil						
Our Reference		306351-6	306351-7	306351-8	306351-10	306351-11
Your Reference	UNITS	BH105	BH109	BH110	BH112	BH112
Depth		0.1-0.2	0.1-0.2	0.1-0.2	0.1-0.2	0.4-0.5
Date Sampled		08/09/2022	08/09/2022	08/09/2022	08/09/2022	08/09/2022
Type of sample		Soil	Soil	Soil	Soil	Soil
Date extracted	-	26/09/2022	26/09/2022	26/09/2022	26/09/2022	26/09/2022
Date analysed	-	29/09/2022	29/09/2022	29/09/2022	29/09/2022	29/09/2022
Aroclor 1016	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Aroclor 1221	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Aroclor 1232	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Aroclor 1242	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Aroclor 1248	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Aroclor 1254	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Aroclor 1260	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Total +ve PCBs (1016-1260)	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Surrogate TCMX	%	90	89	80	82	83

PCBs in Soil						
Our Reference		306351-13	306351-14	306351-15	306351-17	306351-18
Your Reference	UNITS	BH113	BH114	BH114	BH115	BH108
Depth		0.1-0.2	0.1-0.2	0.4-0.5	0.1-0.2	0.1-0.2
Date Sampled		08/09/2022	08/09/2022	08/09/2022	08/09/2022	13/09/2022
Type of sample		Soil	Soil	Soil	Soil	Soil
Date extracted	-	26/09/2022	26/09/2022	26/09/2022	26/09/2022	26/09/2022
Date analysed	-	29/09/2022	29/09/2022	29/09/2022	29/09/2022	29/09/2022
Aroclor 1016	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Aroclor 1221	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Aroclor 1232	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Aroclor 1242	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Aroclor 1248	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Aroclor 1254	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Aroclor 1260	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Total +ve PCBs (1016-1260)	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Surrogate TCMX	%	81	79	81	80	83

PCBs in Soil				
Our Reference		306351-19	306351-21	306351-22
Your Reference	UNITS	BH108	BH111	BH111
Depth		0.4-0.5	0.1-0.2	0.4-0.5
Date Sampled		13/09/2022	13/09/2022	13/09/2022
Type of sample		Soil	Soil	Soil
Date extracted	-	26/09/2022	26/09/2022	26/09/2022
Date analysed	-	29/09/2022	29/09/2022	29/09/2022
Aroclor 1016	mg/kg	<0.1	<0.1	<0.1
Aroclor 1221	mg/kg	<0.1	<0.1	<0.1
Aroclor 1232	mg/kg	<0.1	<0.1	<0.1
Aroclor 1242	mg/kg	<0.1	<0.1	<0.1
Aroclor 1248	mg/kg	<0.1	<0.1	<0.1
Aroclor 1254	mg/kg	<0.1	<0.1	<0.1
Aroclor 1260	mg/kg	<0.1	<0.1	<0.1
Total +ve PCBs (1016-1260)	mg/kg	<0.1	<0.1	<0.1
Surrogate TCMX	%	78	81	79

Acid Extractable metals in soil						
Our Reference		306351-6	306351-7	306351-8	306351-9	306351-10
Your Reference	UNITS	BH105	BH109	BH110	BH110	BH112
Depth		0.1-0.2	0.1-0.2	0.1-0.2	0.4-0.5	0.1-0.2
Date Sampled		08/09/2022	08/09/2022	08/09/2022	08/09/2022	08/09/2022
Type of sample		Soil	Soil	Soil	Soil	Soil
Date prepared	-	27/09/2022	27/09/2022	27/09/2022	27/09/2022	27/09/2022
Date analysed	-	28/09/2022	28/09/2022	28/09/2022	28/09/2022	28/09/2022
Arsenic	mg/kg	8	7	7	8	6
Cadmium	mg/kg	<0.4	<0.4	<0.4	<0.4	<0.4
Chromium	mg/kg	16	17	14	19	16
Copper	mg/kg	10	8	13	12	12
Lead	mg/kg	17	16	19	19	16
Mercury	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Nickel	mg/kg	5	4	4	7	6
Zinc	mg/kg	18	21	14	17	32

Acid Extractable metals in soil						
Our Reference		306351-11	306351-12	306351-13	306351-14	306351-15
Your Reference	UNITS	BH112	BH112	BH113	BH114	BH114
Depth		0.4-0.5	0.9-1	0.1-0.2	0.1-0.2	0.4-0.5
Date Sampled		08/09/2022	08/09/2022	08/09/2022	08/09/2022	08/09/2022
Type of sample		Soil	Soil	Soil	Soil	Soil
Date prepared	-	27/09/2022	27/09/2022	27/09/2022	27/09/2022	27/09/2022
Date analysed	-	28/09/2022	28/09/2022	28/09/2022	28/09/2022	28/09/2022
Arsenic	mg/kg	7	6	7	6	7
Cadmium	mg/kg	<0.4	<0.4	<0.4	<0.4	<0.4
Chromium	mg/kg	13	9	15	14	14
Copper	mg/kg	23	7	8	6	8
Lead	mg/kg	15	14	17	15	15
Mercury	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Nickel	mg/kg	9	2	4	3	4
Zinc	mg/kg	31	28	14	9	12

Acid Extractable metals in soil						
Our Reference		306351-16	306351-17	306351-18	306351-19	306351-20
Your Reference	UNITS	BH114	BH115	BH108	BH108	BH108
Depth		0.9-1	0.1-0.2	0.1-0.2	0.4-0.5	0.9-1
Date Sampled		08/09/2022	08/09/2022	13/09/2022	13/09/2022	13/09/2022
Type of sample		Soil	Soil	Soil	Soil	Soil
Date prepared	-	27/09/2022	27/09/2022	27/09/2022	27/09/2022	27/09/2022
Date analysed	-	28/09/2022	28/09/2022	28/09/2022	28/09/2022	28/09/2022
Arsenic	mg/kg	15	6	8	7	5
Cadmium	mg/kg	<0.4	<0.4	<0.4	<0.4	<0.4
Chromium	mg/kg	14	15	18	20	14
Copper	mg/kg	6	5	7	4	2
Lead	mg/kg	11	13	17	13	11
Mercury	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Nickel	mg/kg	3	3	3	2	2
Zinc	mg/kg	15	12	18	10	9

Acid Extractable metals in soil						
Our Reference		306351-21	306351-22	306351-23	306351-46	306351-47
Your Reference	UNITS	BH111	BH111	BH111	BD1-08/09/2022	BD1-13/09/2022
Depth		0.1-0.2	0.4-0.5	0.9-1	-	-
Date Sampled		13/09/2022	13/09/2022	13/09/2022	08/09/2022	13/09/2022
Type of sample		Soil	Soil	Soil	Soil	Soil
Date prepared	-	27/09/2022	27/09/2022	27/09/2022	27/09/2022	27/09/2022
Date analysed	-	28/09/2022	28/09/2022	28/09/2022	28/09/2022	28/09/2022
Arsenic	mg/kg	8	5	9	9	6
Cadmium	mg/kg	<0.4	<0.4	<0.4	<0.4	<0.4
Chromium	mg/kg	25	16	25	17	23
Copper	mg/kg	10	3	4	15	8
Lead	mg/kg	18	10	13	18	17
Mercury	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Nickel	mg/kg	6	4	3	6	4
Zinc	mg/kg	25	17	19	17	16

Acid Extractable metals in soil			
Our Reference		306351-48	306351-49
Your Reference	UNITS	BD2-13/09/2022	BD3-13/09/2022
Depth		-	-
Date Sampled		13/09/2022	13/09/2022
Type of sample		Soil	Soil
Date prepared	-	27/09/2022	27/09/2022
Date analysed	-	28/09/2022	28/09/2022
Arsenic	mg/kg	8	6
Cadmium	mg/kg	<0.4	<0.4
Chromium	mg/kg	17	12
Copper	mg/kg	4	7
Lead	mg/kg	15	15
Mercury	mg/kg	<0.1	<0.1
Nickel	mg/kg	3	4
Zinc	mg/kg	10	10

Misc Soil - Inorg						
Our Reference		306351-6	306351-7	306351-8	306351-10	306351-11
Your Reference	UNITS	BH105	BH109	BH110	BH112	BH112
Depth		0.1-0.2	0.1-0.2	0.1-0.2	0.1-0.2	0.4-0.5
Date Sampled		08/09/2022	08/09/2022	08/09/2022	08/09/2022	08/09/2022
Type of sample		Soil	Soil	Soil	Soil	Soil
Date prepared	-	28/09/2022	28/09/2022	28/09/2022	28/09/2022	28/09/2022
Date analysed	-	28/09/2022	28/09/2022	28/09/2022	28/09/2022	28/09/2022
Total Phenolics (as Phenol)	mg/kg	<5	<5	<5	<5	<5

Misc Soil - Inorg						
Our Reference		306351-13	306351-14	306351-15	306351-17	306351-18
Your Reference	UNITS	BH113	BH114	BH114	BH115	BH108
Depth		0.1-0.2	0.1-0.2	0.4-0.5	0.1-0.2	0.1-0.2
Date Sampled		08/09/2022	08/09/2022	08/09/2022	08/09/2022	13/09/2022
Type of sample		Soil	Soil	Soil	Soil	Soil
Date prepared	-	28/09/2022	28/09/2022	28/09/2022	28/09/2022	28/09/2022
Date analysed	-	28/09/2022	28/09/2022	28/09/2022	28/09/2022	28/09/2022
Total Phenolics (as Phenol)	mg/kg	<5	<5	<5	<5	<5

Misc Soil - Inorg				
Our Reference		306351-19	306351-21	306351-22
Your Reference	UNITS	BH108	BH111	BH111
Depth		0.4-0.5	0.1-0.2	0.4-0.5
Date Sampled		13/09/2022	13/09/2022	13/09/2022
Type of sample		Soil	Soil	Soil
Date prepared	-	28/09/2022	28/09/2022	28/09/2022
Date analysed	-	28/09/2022	28/09/2022	28/09/2022
Total Phenolics (as Phenol)	mg/kg	<5	<5	<5

Moisture						
Our Reference		306351-1	306351-2	306351-3	306351-4	306351-5
Your Reference	UNITS	BH106	BH107	BH108	BH111	BH114A
Depth		0.1-0.2	0.1-0.2	0.1-0.2	0.1-0.2	0.1-0.2
Date Sampled		13/09/2022	13/09/2022	13/09/2022	13/09/2022	13/09/2022
Type of sample		Soil	Soil	Soil	Soil	Soil
Date prepared	-	26/09/2022	26/09/2022	26/09/2022	26/09/2022	26/09/2022
Date analysed	-	27/09/2022	27/09/2022	27/09/2022	27/09/2022	27/09/2022
Moisture	%	18	21	18	12	21

Moisture						
Our Reference		306351-6	306351-7	306351-8	306351-9	306351-10
Your Reference	UNITS	BH105	BH109	BH110	BH110	BH112
Depth		0.1-0.2	0.1-0.2	0.1-0.2	0.4-0.5	0.1-0.2
Date Sampled		08/09/2022	08/09/2022	08/09/2022	08/09/2022	08/09/2022
Type of sample		Soil	Soil	Soil	Soil	Soil
Date prepared	-	26/09/2022	26/09/2022	26/09/2022	26/09/2022	26/09/2022
Date analysed	-	27/09/2022	27/09/2022	27/09/2022	27/09/2022	27/09/2022
Moisture	%	21	24	10	11	19

Moisture						
Our Reference		306351-11	306351-12	306351-13	306351-14	306351-15
Your Reference	UNITS	BH112	BH112	BH113	BH114	BH114
Depth		0.4-0.5	0.9-1	0.1-0.2	0.1-0.2	0.4-0.5
Date Sampled		08/09/2022	08/09/2022	08/09/2022	08/09/2022	08/09/2022
Type of sample		Soil	Soil	Soil	Soil	Soil
Date prepared	-	26/09/2022	26/09/2022	26/09/2022	26/09/2022	26/09/2022
Date analysed	-	27/09/2022	27/09/2022	27/09/2022	27/09/2022	27/09/2022
Moisture	%	12	7.1	15	18	19

Moisture						
Our Reference		306351-16	306351-17	306351-18	306351-19	306351-20
Your Reference	UNITS	BH114	BH115	BH108	BH108	BH108
Depth		0.9-1	0.1-0.2	0.1-0.2	0.4-0.5	0.9-1
Date Sampled		08/09/2022	08/09/2022	13/09/2022	13/09/2022	13/09/2022
Type of sample		Soil	Soil	Soil	Soil	Soil
Date prepared	-	26/09/2022	26/09/2022	26/09/2022	26/09/2022	26/09/2022
Date analysed	-	27/09/2022	27/09/2022	27/09/2022	27/09/2022	27/09/2022
Moisture	%	9.7	19	23	15	13

Moisture						
Our Reference		306351-21	306351-22	306351-23	306351-46	306351-47
Your Reference	UNITS	BH111	BH111	BH111	BD1-08/09/2022	BD1-13/09/2022
Depth		0.1-0.2	0.4-0.5	0.9-1	-	-
Date Sampled		13/09/2022	13/09/2022	13/09/2022	08/09/2022	13/09/2022
Type of sample		Soil	Soil	Soil	Soil	Soil
Date prepared	-	26/09/2022	26/09/2022	26/09/2022	26/09/2022	26/09/2022
Date analysed	-	27/09/2022	27/09/2022	27/09/2022	27/09/2022	27/09/2022
Moisture	%	13	11	8.7	16	13

Moisture			
Our Reference		306351-48	306351-49
Your Reference	UNITS	BD2-13/09/2022	BD3-13/09/2022
Depth		-	-
Date Sampled		13/09/2022	13/09/2022
Type of sample		Soil	Soil
Date prepared	-	26/09/2022	26/09/2022
Date analysed	-	27/09/2022	27/09/2022
Moisture	%	16	4.3

Misc Inorg - Soil						
Our Reference		306351-29	306351-30	306351-31	306351-32	306351-33
Your Reference	UNITS	BH114	BH110	BH107	BH106	BH107
Depth		1.4-1.5	0.9-1	0.4-0.5	0.1-0.2	0.9-1
Date Sampled		08/09/2022	08/09/2022	08/09/2022	08/09/2022	13/09/2022
Type of sample		Soil	Soil	Soil	Soil	Soil
Date prepared	-	26/09/2022	26/09/2022	26/09/2022	26/09/2022	26/09/2022
Date analysed	-	28/09/2022	28/09/2022	28/09/2022	28/09/2022	28/09/2022
pH 1:5 soil:water	pH Units	5.4	6.0	5.8	6.8	4.5
Chloride, Cl 1:5 soil:water	mg/kg	95	[NA]	[NA]	[NA]	[NA]
Sulphate, SO4 1:5 soil:water	mg/kg	<10	[NA]	[NA]	[NA]	[NA]

Misc Inorg - Soil						
Our Reference		306351-34	306351-35	306351-36	306351-37	306351-38
Your Reference	UNITS	BH113	BH109	BH105	BH115	BH106
Depth		0.4-0.5	1.4-1.5	1.4-1.5	1.4-1.5	0.9-1
Date Sampled		13/09/2022	13/09/2022	13/09/2022	13/09/2022	13/09/2022
Type of sample		Soil	Soil	Soil	Soil	Soil
Date prepared	-	26/09/2022	26/09/2022	26/09/2022	26/09/2022	26/09/2022
Date analysed	-	28/09/2022	28/09/2022	28/09/2022	28/09/2022	28/09/2022
pH 1:5 soil:water	pH Units	5.3	5.0	5.2	5.2	4.7
Chloride, Cl 1:5 soil:water	mg/kg	36	[NA]	[NA]	[NA]	260
Sulphate, SO4 1:5 soil:water	mg/kg	60	[NA]	[NA]	[NA]	77

Misc Inorg - Soil						
Our Reference		306351-39	306351-40	306351-41	306351-42	306351-43
Your Reference	UNITS	BH110	BH111	BH106	BH114	BH109
Depth		1.4-1.5	1.4-1.5	0.4-0.5	1.9-2	0.4-0.5
Date Sampled		13/09/2022	13/09/2022	13/09/2022	13/09/2022	13/09/2022
Type of sample		Soil	Soil	Soil	Soil	Soil
Date prepared	-	26/09/2022	26/09/2022	26/09/2022	26/09/2022	26/09/2022
Date analysed	-	28/09/2022	28/09/2022	28/09/2022	28/09/2022	28/09/2022
pH 1:5 soil:water	pH Units	5.0	5.2	4.5	5.3	7.9

Texture and Salinity*						
Our Reference		306351-29	306351-30	306351-31	306351-32	306351-33
Your Reference	UNITS	BH114	BH110	BH107	BH106	BH107
Depth		1.4-1.5	0.9-1	0.4-0.5	0.1-0.2	0.9-1
Date Sampled		08/09/2022	08/09/2022	08/09/2022	08/09/2022	13/09/2022
Type of sample		Soil	Soil	Soil	Soil	Soil
Date prepared	-	26/09/2022	26/09/2022	26/09/2022	26/09/2022	26/09/2022
Date analysed	-	27/09/2022	27/09/2022	27/09/2022	27/09/2022	27/09/2022
Electrical Conductivity 1:5 soil:water	µS/cm	81	37	220	140	290
Texture Value	-	7.0	7.0	9.0	9.0	8.0
Texture	-	MEDIUM CLAY	MEDIUM CLAY	CLAY LOAM	CLAY LOAM	LIGHT MEDIUM CLAY
ECe	dS/m	<2	<2	<2	<2	2.3
Class	-	NON SALINE	NON SALINE	NON SALINE	NON SALINE	SLIGHTLY SALINE

Texture and Salinity*						
Our Reference		306351-34	306351-35	306351-36	306351-37	306351-38
Your Reference	UNITS	BH113	BH109	BH105	BH115	BH106
Depth		0.4-0.5	1.4-1.5	1.4-1.5	1.4-1.5	0.9-1
Date Sampled		13/09/2022	13/09/2022	13/09/2022	13/09/2022	13/09/2022
Type of sample		Soil	Soil	Soil	Soil	Soil
Date prepared	-	26/09/2022	26/09/2022	26/09/2022	26/09/2022	26/09/2022
Date analysed	-	27/09/2022	27/09/2022	27/09/2022	27/09/2022	27/09/2022
Electrical Conductivity 1:5 soil:water	µS/cm	93	78	31	58	250
Texture Value	-	9.0	7.0	7.0	7.0	9.0
Texture	-	CLAY LOAM	MEDIUM CLAY	MEDIUM CLAY	MEDIUM CLAY	CLAY LOAM
ECe	dS/m	<2	<2	<2	<2	2.2
Class	-	NON SALINE	NON SALINE	NON SALINE	NON SALINE	SLIGHTLY SALINE

Texture and Salinity*						
Our Reference		306351-39	306351-40	306351-41	306351-42	306351-43
Your Reference	UNITS	BH110	BH111	BH106	BH114	BH109
Depth		1.4-1.5	1.4-1.5	0.4-0.5	1.9-2	0.4-0.5
Date Sampled		13/09/2022	13/09/2022	13/09/2022	13/09/2022	13/09/2022
Type of sample		Soil	Soil	Soil	Soil	Soil
Date prepared	-	26/09/2022	26/09/2022	26/09/2022	26/09/2022	26/09/2022
Date analysed	-	27/09/2022	27/09/2022	27/09/2022	27/09/2022	27/09/2022
Electrical Conductivity 1:5 soil:water	µS/cm	42	46	300	50	220
Texture Value	-	7.0	7.0	9.0	7.0	9.0
Texture	-	MEDIUM CLAY	MEDIUM CLAY	CLAY LOAM	MEDIUM CLAY	CLAY LOAM
ECe	dS/m	<2	<2	2.7	<2	2.0
Class	-	NON SALINE	NON SALINE	SLIGHTLY SALINE	NON SALINE	SLIGHTLY SALINE

Asbestos ID - soils						
Our Reference		306351-6	306351-7	306351-8	306351-10	306351-11
Your Reference	UNITS	BH105	BH109	BH110	BH112	BH112
Depth		0.1-0.2	0.1-0.2	0.1-0.2	0.1-0.2	0.4-0.5
Date Sampled		08/09/2022	08/09/2022	08/09/2022	08/09/2022	08/09/2022
Type of sample		Soil	Soil	Soil	Soil	Soil
Date analysed	-	28/09/2022	28/09/2022	28/09/2022	28/09/2022	28/09/2022
Sample mass tested	g	Approx. 30g	Approx. 10g	Approx. 10g	Approx. 25g	Approx. 25g
Sample Description	-	Brown coarse-grained soil & rocks	Brown coarse-grained soil & rocks	Brown coarse-grained soil & rocks	Brown coarse-grained soil & rocks	Brown coarse-grained soil & rocks
Asbestos ID in soil	-	No asbestos detected at reporting limit of 0.1g/kg Organic fibres detected	No asbestos detected at reporting limit of 0.1g/kg Organic fibres detected	No asbestos detected at reporting limit of 0.1g/kg Organic fibres detected	No asbestos detected at reporting limit of 0.1g/kg Organic fibres detected	No asbestos detected at reporting limit of 0.1g/kg Organic fibres detected
Asbestos comments	-	NO	NO	NO	NO	NO
Trace Analysis	-	No asbestos detected	No asbestos detected	No asbestos detected	No asbestos detected	No asbestos detected

Asbestos ID - soils						
Our Reference		306351-13	306351-14	306351-15	306351-17	306351-18
Your Reference	UNITS	BH113	BH114	BH114	BH115	BH108
Depth		0.1-0.2	0.1-0.2	0.4-0.5	0.1-0.2	0.1-0.2
Date Sampled		08/09/2022	08/09/2022	08/09/2022	08/09/2022	13/09/2022
Type of sample		Soil	Soil	Soil	Soil	Soil
Date analysed	-	28/09/2022	28/09/2022	28/09/2022	28/09/2022	28/09/2022
Sample mass tested	g	Approx. 25g	Approx. 25g	Approx. 55g	Approx. 25g	Approx. 25g
Sample Description	-	Brown coarse-grained soil & rocks	Brown coarse-grained soil & rocks	Brown coarse-grained soil & rocks	Brown coarse-grained soil & rocks	Brown coarse-grained soil & rocks
Asbestos ID in soil	-	No asbestos detected at reporting limit of 0.1g/kg Organic fibres detected	No asbestos detected at reporting limit of 0.1g/kg Organic fibres detected	No asbestos detected at reporting limit of 0.1g/kg Organic fibres detected	No asbestos detected at reporting limit of 0.1g/kg Organic fibres detected	No asbestos detected at reporting limit of 0.1g/kg Organic fibres detected
Asbestos comments	-	NO	NO	NO	NO	NO
Trace Analysis	-	No asbestos detected	No asbestos detected	No asbestos detected	No asbestos detected	No asbestos detected

Asbestos ID - soils				
Our Reference		306351-19	306351-21	306351-22
Your Reference	UNITS	BH108	BH111	BH111
Depth		0.4-0.5	0.1-0.2	0.4-0.5
Date Sampled		13/09/2022	13/09/2022	13/09/2022
Type of sample		Soil	Soil	Soil
Date analysed	-	28/09/2022	28/09/2022	28/09/2022
Sample mass tested	g	Approx. 30g	Approx. 30g	Approx. 20g
Sample Description	-	Tan coarse-grained soil & rocks	Brown fine-grained soil & rocks	Brown fine-grained soil & rocks
Asbestos ID in soil	-	No asbestos detected at reporting limit of 0.1g/kg Organic fibres detected	No asbestos detected at reporting limit of 0.1g/kg Organic fibres detected	No asbestos detected at reporting limit of 0.1g/kg Organic fibres detected
Asbestos comments	-	NO	NO	NO
Trace Analysis	-	No asbestos detected	No asbestos detected	No asbestos detected

Asbestos ID - soils NEPM						
Our Reference		306351-24	306351-25	306351-26	306351-27	306351-28
Your Reference	UNITS	BH115	BH109	BH114	BH110	BH113
Depth		0.1-0.2	0.4-0.5	0.4-0.5	0.1-0.2	0.4-0.5
Date Sampled		13/09/2022	13/09/2022	08/09/2022	08/09/2022	08/09/2022
Type of sample		Soil	Soil	Soil	Soil	Soil
Date analysed	-	28/09/2022	28/09/2022	28/09/2022	28/09/2022	28/09/2022
Sample mass tested	g	474.69	523.45	593.97	553.28	647.88
Sample Description	-	Brown coarse-grained soil & rocks	Brown coarse-grained soil & rocks	Brown coarse-grained soil & rocks	Brown fine-grained soil & rocks	Brown coarse-grained soil & rocks
Asbestos ID in soil (AS4964) >0.1g/kg	-	No asbestos detected at reporting limit of 0.1g/kg Organic fibres detected	No asbestos detected at reporting limit of 0.1g/kg Organic fibres detected	No asbestos detected at reporting limit of 0.1g/kg Organic fibres detected	No asbestos detected at reporting limit of 0.1g/kg Organic fibres detected	No asbestos detected at reporting limit of 0.1g/kg Organic fibres detected
Trace Analysis	-	No asbestos detected	No asbestos detected	No asbestos detected	No asbestos detected	No asbestos detected
Total Asbestos[#1]	g/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Asbestos ID in soil <0.1g/kg*	-	No visible asbestos detected	No visible asbestos detected	No visible asbestos detected	No visible asbestos detected	No visible asbestos detected
ACM >7mm Estimation*	g	–	–	–	–	–
FA and AF Estimation*	g	–	–	–	–	–
FA and AF Estimation*#2	%(w/w)	<0.001	<0.001	<0.001	<0.001	<0.001

PFAS in Soils Extended						
Our Reference		306351-1	306351-2	306351-3	306351-4	306351-5
Your Reference	UNITS	BH106	BH107	BH108	BH111	BH114A
Depth		0.1-0.2	0.1-0.2	0.1-0.2	0.1-0.2	0.1-0.2
Date Sampled		13/09/2022	13/09/2022	13/09/2022	13/09/2022	13/09/2022
Type of sample		Soil	Soil	Soil	Soil	Soil
Date prepared	-	27/09/2022	27/09/2022	27/09/2022	27/09/2022	27/09/2022
Date analysed	-	27/09/2022	27/09/2022	27/09/2022	27/09/2022	27/09/2022
Perfluorobutanesulfonic acid	µg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Perfluoropentanesulfonic acid	µg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Perfluorohexanesulfonic acid - PFHxS	µg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Perfluoroheptanesulfonic acid	µg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Perfluorooctanesulfonic acid PFOS	µg/kg	0.5	0.4	0.3	0.4	0.5
Perfluorodecanesulfonic acid	µg/kg	<0.2	<0.2	<0.2	<0.2	<0.2
Perfluorobutanoic acid	µg/kg	<0.2	<0.2	<0.2	<0.2	<0.2
Perfluoropentanoic acid	µg/kg	<0.2	<0.2	<0.2	<0.2	<0.2
Perfluorohexanoic acid	µg/kg	<0.1	0.1	<0.1	0.1	<0.1
Perfluoroheptanoic acid	µg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Perfluorooctanoic acid PFOA	µg/kg	0.2	0.3	0.3	0.3	0.3
Perfluorononanoic acid	µg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Perfluorodecanoic acid	µg/kg	<0.5	<0.5	<0.5	<0.5	<0.5
Perfluoroundecanoic acid	µg/kg	<0.5	<0.5	<0.5	<0.5	<0.5
Perfluorododecanoic acid	µg/kg	<0.5	<0.5	<0.5	<0.5	<0.5
Perfluorotridecanoic acid	µg/kg	<0.5	<0.5	<0.5	<0.5	<0.5
Perfluorotetradecanoic acid	µg/kg	<5	<5	<5	<5	<5
4:2 FTS	µg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
6:2 FTS	µg/kg	0.1	<0.1	<0.1	<0.1	<0.1
8:2 FTS	µg/kg	<0.2	<0.2	<0.2	<0.2	<0.2
10:2 FTS	µg/kg	<0.2	<0.2	<0.2	<0.2	<0.2
Perfluorooctane sulfonamide	µg/kg	<1	<1	<1	<1	<1
N-Methyl perfluorooctane sulfonamide	µg/kg	<1	<1	<1	<1	<1
N-Ethyl perfluorooctanesulfon amide	µg/kg	<1	<1	<1	<1	<1
N-Me perfluorooctanesulfonamid oethanol	µg/kg	<1	<1	<1	<1	<1
N-Et perfluorooctanesulfonamid oethanol	µg/kg	<5	<5	<5	<5	<5
MePerfluorooctanesulf- amid oacetic acid	µg/kg	<0.2	<0.2	<0.2	<0.2	<0.2
EtPerfluorooctanesulf amid oacetic acid	µg/kg	<0.2	<0.2	<0.2	<0.2	<0.2
Surrogate $^{13}C_8$ *PFOS*	%	99	99	99	100	100
Surrogate $^{13}C_2$ *PFOA*	%	98	101	100	100	97
Extracted ISTD $^{13}C_3$ *PFBS*	%	85	90	86	90	85
Extracted ISTD $^{18}O_2$ *PFHxS*	%	92	92	92	95	89
Extracted ISTD $^{13}C_4$ *PFOS*	%	94	94	93	95	91

PFAS in Soils Extended						
Our Reference		306351-1	306351-2	306351-3	306351-4	306351-5
Your Reference	UNITS	BH106	BH107	BH108	BH111	BH114A
Depth		0.1-0.2	0.1-0.2	0.1-0.2	0.1-0.2	0.1-0.2
Date Sampled		13/09/2022	13/09/2022	13/09/2022	13/09/2022	13/09/2022
Type of sample		Soil	Soil	Soil	Soil	Soil
Extracted ISTD $^{13}C_4$ *PFBA*	%	96	98	98	103	96
Extracted ISTD $^{13}C_3$ *PFPeA*	%	94	95	97	101	94
Extracted ISTD $^{13}C_2$ *PFHxA*	%	90	92	93	97	87
Extracted ISTD $^{13}C_4$ *PFHpA*	%	94	92	89	95	90
Extracted ISTD $^{13}C_4$ *PFOA*	%	97	95	92	95	94
Extracted ISTD $^{13}C_5$ *PFNA*	%	101	99	100	101	103
Extracted ISTD $^{13}C_2$ *PFDA*	%	96	102	94	100	100
Extracted ISTD $^{13}C_2$ *PFUnDA*	%	97	110	112	48	89
Extracted ISTD $^{13}C_2$ *PFDoDA*	%	128	124	126	80	111
Extracted ISTD $^{13}C_2$ *PFTeDA*	%	105	104	101	58	78
Extracted ISTD $^{13}C_2$ *4:2FTS*	%	99	100	100	109	102
Extracted ISTD $^{13}C_2$ *6:2FTS*	%	109	114	110	128	112
Extracted ISTD $^{13}C_2$ *8:2FTS*	%	131	130	135	144	141
Extracted ISTD $^{13}C_8$ *FOSA*	%	100	101	101	97	99
Extracted ISTD d_3 *N MeFOSA*	%	89	89	88	74	80
Extracted ISTD d_5 *N EtFOSA*	%	101	104	105	97	100
Extracted ISTD d_7 *N MeFOSE*	%	99	101	100	95	95
Extracted ISTD d_9 *N EtFOSE*	%	96	99	109	92	92
Extracted ISTD d_3 *N MeFOSAA*	%	99	99	97	95	107
Extracted ISTD d_5 *N EtFOSAA*	%	98	103	101	66	91
Total Positive PFHxS & PFOS	µg/kg	0.5	0.4	0.3	0.4	0.5
Total Positive PFOS & PFOA	µg/kg	0.6	0.7	0.6	0.7	0.8
Total Positive PFAS	µg/kg	0.7	0.8	0.6	0.8	0.8

Method ID	Methodology Summary
ASB-001	Asbestos ID - Qualitative identification of asbestos in bulk samples using Polarised Light Microscopy and Dispersion Staining Techniques including Synthetic Mineral Fibre and Organic Fibre as per Australian Standard 4964-2004.
ASB-001	Asbestos ID - Identification of asbestos in soil samples using Polarised Light Microscopy and Dispersion Staining Techniques. Minimum 500mL soil sample was analysed as recommended by "National Environment Protection (Assessment of site contamination) Measure, Schedule B1 and "The Guidelines from the Assessment, Remediation and Management of Asbestos-Contaminated Sites in Western Australia - May 2009" with a reporting limit of 0.1g/kg (0.01% w/w) as per Australian Standard AS4964-2004. Results reported denoted with * are outside our scope of NATA accreditation. **NOTE** #1 Total Asbestos g/kg was analysed and reported as per Australian Standard AS4964 (This is the sum of ACM >7mm, <7mm and FA/AF) **NOTE** #2 The screening level of 0.001% w/w asbestos in soil for FA and AF only applies where the FA and AF are able to be quantified by gravimetric procedures. This screening level is not applicable to free fibres. Estimation = Estimated asbestos weight Results reported with "--" is equivalent to no visible asbestos identified using Polarised Light microscopy and Dispersion Staining Techniques.
Inorg-001	pH - Measured using pH meter and electrode in accordance with APHA latest edition, 4500-H+. Please note that the results for water analyses are indicative only, as analysis outside of the APHA storage times.
Inorg-002	Conductivity and Salinity - measured using a conductivity cell at 25°C in accordance with APHA latest edition 2510 and Rayment & Lyons.
Inorg-008	Moisture content determined by heating at 105+/-5 °C for a minimum of 12 hours.
Inorg-031	Total Phenolics by segmented flow analyser (in line distillation with colourimetric finish). Solids are extracted in a caustic media prior to analysis.
Inorg-081	Anions - a range of Anions are determined by Ion Chromatography, in accordance with APHA latest edition, 4110-B. Waters samples are filtered on receipt prior to analysis. Alternatively determined by colourimetry/turbidity using Discrete Analyser.
INORG-123	Determined using a "Texture by Feel" method.
Metals-020	Determination of various metals by ICP-AES.
Metals-021	Determination of Mercury by Cold Vapour AAS.

Method ID	Methodology Summary
Org-020	Soil samples are extracted with Dichloromethane/Acetone and waters with Dichloromethane and analysed by GC-FID. F2 = (>C10-C16)-Naphthalene as per NEPM B1 Guideline on Investigation Levels for Soil and Groundwater (HSLs Tables 1A (3, 4)). Note Naphthalene is determined from the VOC analysis.
Org-020	Soil samples are extracted with Dichloromethane/Acetone and waters with Dichloromethane and analysed by GC-FID. F2 = (>C10-C16)-Naphthalene as per NEPM B1 Guideline on Investigation Levels for Soil and Groundwater (HSLs Tables 1A (3, 4)). Note Naphthalene is determined from the VOC analysis. Note, the Total +ve TRH PQL is reflective of the lowest individual PQL and is therefore "Total +ve TRH" is simply a sum of the positive individual TRH fractions (>C10-C40).
Org-021	Soil samples are extracted with dichloromethane/acetone and waters with dichloromethane and analysed by GC-ECD.
Org-021	Soil samples are extracted with dichloromethane/acetone and waters with dichloromethane and analysed by GC-ECD. Note, the Total +ve PCBs PQL is reflective of the lowest individual PQL and is therefore" Total +ve PCBs" is simply a sum of the positive individual PCBs.
Org-022	Determination of VOCs sampled onto coconut shell charcoal sorbent tubes, that can be desorbed using carbon disulphide, and analysed by GC-MS.
Org-022/025	Soil samples are extracted with Dichloromethane/Acetone and waters with Dichloromethane and analysed by GC-MS/GC-MSMS.
Org-022/025	Soil samples are extracted with dichloromethane/acetone and waters with dichloromethane and analysed by GC-MS/GC-MSMS. Note, the Total +ve reported DDD+DDE+DDT PQL is reflective of the lowest individual PQL and is therefore simply a sum of the positive individually report DDD+DDE+DDT.
Org-022/025	Soil samples are extracted with Dichloromethane/Acetone and waters with Dichloromethane and analysed by GC-MS and/or GC-MS/MS. Benzo(a)pyrene TEQ as per NEPM B1 Guideline on Investigation Levels for Soil and Groundwater - 2013. For soil results:- 1. 'EQ PQL'values are assuming all contributing PAHs reported as <PQL are actually at the PQL. This is the most conservative approach and can give false positive TEQs given that PAHs that contribute to the TEQ calculation may not be present. 2. 'EQ zero'values are assuming all contributing PAHs reported as <PQL are zero. This is the least conservative approach and is more susceptible to false negative TEQs when PAHs that contribute to the TEQ calculation are present but below PQL. 3. 'EQ half PQL'values are assuming all contributing PAHs reported as <PQL are half the stipulated PQL. Hence a mid-point between the most and least conservative approaches above. Note, the Total +ve PAHs PQL is reflective of the lowest individual PQL and is therefore "Total +ve PAHs" is simply a sum of the positive individual PAHs.
Org-023	Soil samples are extracted with methanol and spiked into water prior to analysing by purge and trap GC-MS.

Method ID	Methodology Summary
Org-023	Soil samples are extracted with methanol and spiked into water prior to analysing by purge and trap GC-MS. Water samples are analysed directly by purge and trap GC-MS. F1 = (C6-C10)-BTEX as per NEPM B1 Guideline on Investigation Levels for Soil and Groundwater.
Org-023	Soil samples are extracted with methanol and spiked into water prior to analysing by purge and trap GC-MS. Water samples are analysed directly by purge and trap GC-MS. F1 = (C6-C10)-BTEX as per NEPM B1 Guideline on Investigation Levels for Soil and Groundwater. Note, the Total +ve Xylene PQL is reflective of the lowest individual PQL and is therefore "Total +ve Xylenes" is simply a sum of the positive individual Xylenes.
Org-029	Soil samples are extracted with basified Methanol. Waters and soil extracts are directly injected and/or concentrated/extracted using SPE. TCLPs/ASLP leachates are centrifuged, the supernatant is then analysed (including amendment with solvent) - as per the option in AS4439.3. Analysis is undertaken with LC-MS/MS. PFAS results include the sum of branched and linear isomers where applicable. Please note that PFAS results are corrected for Extracted Internal Standards (QSM 5.3 Table B-15 terminology), which are mass labelled analytes added prior to sample preparation to assess matrix effects and verify processing of the sample. PFAS analytes without a commercially available mass labelled analogue are corrected vs a closely eluting mass labelled PFAS compound. Surrogates are also reported, in this context they are mass labelled PFAS compounds added prior to extraction but are used as monitoring compounds only (not used for result correction). Envicarb (or similar) is used discretionally to remove interfering matrix components. Please contact the laboratory if estimates of Measurement Uncertainty are required as per WA DER.

QUALITY CONTROL: vTRH(C6-C10)/BTEXN in Soil						Duplicate			Spike Recovery %	
Test Description	Units	PQL	Method	Blank	#	Base	Dup.	RPD	LCS-12	306351-7
Date extracted	-			26/09/2022	6	26/09/2022	26/09/2022		26/09/2022	26/09/2022
Date analysed	-			26/09/2022	6	26/09/2022	26/09/2022		26/09/2022	26/09/2022
TRH C_6 - C_9	mg/kg	25	Org-023	<25	6	<25	<25	0	95	83
TRH C_6 - C_{10}	mg/kg	25	Org-023	<25	6	<25	<25	0	95	83
Benzene	mg/kg	0.2	Org-023	<0.2	6	<0.2	<0.2	0	85	73
Toluene	mg/kg	0.5	Org-023	<0.5	6	<0.5	<0.5	0	107	95
Ethylbenzene	mg/kg	1	Org-023	<1	6	<1	<1	0	91	80
m+p-xylene	mg/kg	2	Org-023	<2	6	<2	<2	0	95	83
o-Xylene	mg/kg	1	Org-023	<1	6	<1	<1	0	94	83
Naphthalene	mg/kg	1	Org-023	<1	6	<1	<1	0	[NT]	[NT]
Surrogate aaa-Trifluorotoluene	%		Org-023	88	6	75	72	4	89	82

QUALITY CONTROL: vTRH(C6-C10)/BTEXN in Soil						Duplicate			Spike Recovery %	
Test Description	Units	PQL	Method	Blank	#	Base	Dup.	RPD	LCS-13	[NT]
Date extracted	-			[NT]	17	26/09/2022	26/09/2022		26/09/2022	[NT]
Date analysed	-			[NT]	17	26/09/2022	26/09/2022		29/09/2022	[NT]
TRH C_6 - C_9	mg/kg	25	Org-023	[NT]	17	<25	<25	0	93	[NT]
TRH C_6 - C_{10}	mg/kg	25	Org-023	[NT]	17	<25	<25	0	93	[NT]
Benzene	mg/kg	0.2	Org-023	[NT]	17	<0.2	<0.2	0	82	[NT]
Toluene	mg/kg	0.5	Org-023	[NT]	17	<0.5	<0.5	0	105	[NT]
Ethylbenzene	mg/kg	1	Org-023	[NT]	17	<1	<1	0	90	[NT]
m+p-xylene	mg/kg	2	Org-023	[NT]	17	<2	<2	0	95	[NT]
o-Xylene	mg/kg	1	Org-023	[NT]	17	<1	<1	0	95	[NT]
Naphthalene	mg/kg	1	Org-023	[NT]	17	<1	<1	0	[NT]	[NT]
Surrogate aaa-Trifluorotoluene	%		Org-023	[NT]	17	85	84	1	89	[NT]

QUALITY CONTROL: vTRH(C6-C10)/BTEXN in Soil						Duplicate			Spike Recovery %	
Test Description	Units	PQL	Method	Blank	#	Base	Dup.	RPD	[NT]	[NT]
Date extracted	-			[NT]	46	26/09/2022	26/09/2022		[NT]	[NT]
Date analysed	-			[NT]	46	26/09/2022	26/09/2022		[NT]	[NT]
TRH C_6 - C_9	mg/kg	25	Org-023	[NT]	46	<25	<25	0	[NT]	[NT]
TRH C_6 - C_{10}	mg/kg	25	Org-023	[NT]	46	<25	<25	0	[NT]	[NT]
Benzene	mg/kg	0.2	Org-023	[NT]	46	<0.2	<0.2	0	[NT]	[NT]
Toluene	mg/kg	0.5	Org-023	[NT]	46	<0.5	<0.5	0	[NT]	[NT]
Ethylbenzene	mg/kg	1	Org-023	[NT]	46	<1	<1	0	[NT]	[NT]
m+p-xylene	mg/kg	2	Org-023	[NT]	46	<2	<2	0	[NT]	[NT]
o-Xylene	mg/kg	1	Org-023	[NT]	46	<1	<1	0	[NT]	[NT]
Naphthalene	mg/kg	1	Org-023	[NT]	46	<1	<1	0	[NT]	[NT]
Surrogate aaa-Trifluorotoluene	%		Org-023	[NT]	46	85	86	1	[NT]	[NT]

QUALITY CONTROL: svTRH (C10-C40) in Soil						Duplicate			Spike Recovery %	
Test Description	Units	PQL	Method	Blank	#	Base	Dup.	RPD	LCS-12	306351-7
Date extracted	-			26/09/2022	6	26/09/2022	26/09/2022		26/09/2022	26/09/2022
Date analysed	-			28/09/2022	6	26/09/2022	26/09/2022		26/09/2022	26/09/2022
TRH C_{10} - C_{14}	mg/kg	50	Org-020	<50	6	<50	<50	0	108	107
TRH C_{15} - C_{28}	mg/kg	100	Org-020	<100	6	<100	<100	0	108	111
TRH C_{29} - C_{36}	mg/kg	100	Org-020	<100	6	<100	<100	0	129	98
TRH >C_{10} -C_{16}	mg/kg	50	Org-020	<50	6	<50	<50	0	108	107
TRH >C_{16} -C_{34}	mg/kg	100	Org-020	<100	6	<100	<100	0	108	111
TRH >C_{34} -C_{40}	mg/kg	100	Org-020	<100	6	<100	<100	0	129	98
Surrogate o-Terphenyl	%		Org-020	93	6	79	79	0	94	97

QUALITY CONTROL: svTRH (C10-C40) in Soil						Duplicate			Spike Recovery %	
Test Description	Units	PQL	Method	Blank	#	Base	Dup.	RPD	LCS-13	[NT]
Date extracted	-			[NT]	17	26/09/2022	26/09/2022		26/09/2022	[NT]
Date analysed	-			[NT]	17	27/09/2022	27/09/2022		27/09/2022	[NT]
TRH C_{10} - C_{14}	mg/kg	50	Org-020	[NT]	17	<50	<50	0	109	[NT]
TRH C_{15} - C_{28}	mg/kg	100	Org-020	[NT]	17	<100	<100	0	110	[NT]
TRH C_{29} - C_{36}	mg/kg	100	Org-020	[NT]	17	<100	<100	0	105	[NT]
TRH >C_{10} -C_{16}	mg/kg	50	Org-020	[NT]	17	<50	<50	0	109	[NT]
TRH >C_{16} -C_{34}	mg/kg	100	Org-020	[NT]	17	<100	<100	0	110	[NT]
TRH >C_{34} -C_{40}	mg/kg	100	Org-020	[NT]	17	<100	<100	0	105	[NT]
Surrogate o-Terphenyl	%		Org-020	[NT]	17	84	85	1	95	[NT]

QUALITY CONTROL: svTRH (C10-C40) in Soil						Duplicate			Spike Recovery %	
Test Description	Units	PQL	Method	Blank	#	Base	Dup.	RPD	[NT]	[NT]
Date extracted	-			[NT]	46	26/09/2022	26/09/2022		[NT]	[NT]
Date analysed	-			[NT]	46	27/09/2022	27/09/2022		[NT]	[NT]
TRH C_{10} - C_{14}	mg/kg	50	Org-020	[NT]	46	<50	<50	0	[NT]	[NT]
TRH C_{15} - C_{28}	mg/kg	100	Org-020	[NT]	46	<100	<100	0	[NT]	[NT]
TRH C_{29} - C_{36}	mg/kg	100	Org-020	[NT]	46	<100	<100	0	[NT]	[NT]
TRH >C_{10} -C_{16}	mg/kg	50	Org-020	[NT]	46	<50	<50	0	[NT]	[NT]
TRH >C_{16} -C_{34}	mg/kg	100	Org-020	[NT]	46	<100	<100	0	[NT]	[NT]
TRH >C_{34} -C_{40}	mg/kg	100	Org-020	[NT]	46	<100	<100	0	[NT]	[NT]
Surrogate o-Terphenyl	%		Org-020	[NT]	46	87	84	4	[NT]	[NT]

QUALITY CONTROL: PAHs in Soil						Duplicate			Spike Recovery %	
Test Description	Units	PQL	Method	Blank	#	Base	Dup.	RPD	LCS-12	306351-7
Date extracted	-			26/09/2022	6	26/09/2022	26/09/2022		26/09/2022	26/09/2022
Date analysed	-			29/09/2022	6	29/09/2022	29/09/2022		29/09/2022	29/09/2022
Naphthalene	mg/kg	0.1	Org-022/025	<0.1	6	<0.1	<0.1	0	115	86
Acenaphthylene	mg/kg	0.1	Org-022/025	<0.1	6	<0.1	<0.1	0	[NT]	[NT]
Acenaphthene	mg/kg	0.1	Org-022/025	<0.1	6	<0.1	<0.1	0	119	91
Fluorene	mg/kg	0.1	Org-022/025	<0.1	6	<0.1	<0.1	0	112	95
Phenanthrene	mg/kg	0.1	Org-022/025	<0.1	6	<0.1	<0.1	0	116	110
Anthracene	mg/kg	0.1	Org-022/025	<0.1	6	<0.1	<0.1	0	[NT]	[NT]
Fluoranthene	mg/kg	0.1	Org-022/025	<0.1	6	<0.1	<0.1	0	121	102
Pyrene	mg/kg	0.1	Org-022/025	<0.1	6	<0.1	<0.1	0	117	111
Benzo(a)anthracene	mg/kg	0.1	Org-022/025	<0.1	6	<0.1	<0.1	0	[NT]	[NT]
Chrysene	mg/kg	0.1	Org-022/025	<0.1	6	<0.1	<0.1	0	107	85
Benzo(b,j+k)fluoranthene	mg/kg	0.2	Org-022/025	<0.2	6	<0.2	<0.2	0	[NT]	[NT]
Benzo(a)pyrene	mg/kg	0.05	Org-022/025	<0.05	6	<0.05	<0.05	0	112	112
Indeno(1,2,3-c,d)pyrene	mg/kg	0.1	Org-022/025	<0.1	6	<0.1	<0.1	0	[NT]	[NT]
Dibenzo(a,h)anthracene	mg/kg	0.1	Org-022/025	<0.1	6	<0.1	<0.1	0	[NT]	[NT]
Benzo(g,h,i)perylene	mg/kg	0.1	Org-022/025	<0.1	6	<0.1	<0.1	0	[NT]	[NT]
Surrogate p-Terphenyl-d14	%		Org-022/025	116	6	92	85	8	127	91

QUALITY CONTROL: PAHs in Soil						Duplicate			Spike Recovery %	
Test Description	Units	PQL	Method	Blank	#	Base	Dup.	RPD	LCS-13	[NT]
Date extracted	-			[NT]	17	26/09/2022	26/09/2022		26/09/2022	[NT]
Date analysed	-			[NT]	17	29/09/2022	28/09/2022		29/09/2022	[NT]
Naphthalene	mg/kg	0.1	Org-022/025	[NT]	17	<0.1	<0.1	0	92	[NT]
Acenaphthylene	mg/kg	0.1	Org-022/025	[NT]	17	<0.1	<0.1	0	[NT]	[NT]
Acenaphthene	mg/kg	0.1	Org-022/025	[NT]	17	<0.1	<0.1	0	96	[NT]
Fluorene	mg/kg	0.1	Org-022/025	[NT]	17	<0.1	<0.1	0	94	[NT]
Phenanthrene	mg/kg	0.1	Org-022/025	[NT]	17	<0.1	<0.1	0	91	[NT]
Anthracene	mg/kg	0.1	Org-022/025	[NT]	17	<0.1	<0.1	0	[NT]	[NT]
Fluoranthene	mg/kg	0.1	Org-022/025	[NT]	17	<0.1	<0.1	0	96	[NT]
Pyrene	mg/kg	0.1	Org-022/025	[NT]	17	<0.1	<0.1	0	98	[NT]
Benzo(a)anthracene	mg/kg	0.1	Org-022/025	[NT]	17	<0.1	<0.1	0	[NT]	[NT]
Chrysene	mg/kg	0.1	Org-022/025	[NT]	17	<0.1	<0.1	0	104	[NT]
Benzo(b,j+k)fluoranthene	mg/kg	0.2	Org-022/025	[NT]	17	<0.2	<0.2	0	[NT]	[NT]
Benzo(a)pyrene	mg/kg	0.05	Org-022/025	[NT]	17	<0.05	<0.05	0	101	[NT]
Indeno(1,2,3-c,d)pyrene	mg/kg	0.1	Org-022/025	[NT]	17	<0.1	<0.1	0	[NT]	[NT]
Dibenzo(a,h)anthracene	mg/kg	0.1	Org-022/025	[NT]	17	<0.1	<0.1	0	[NT]	[NT]
Benzo(g,h,i)perylene	mg/kg	0.1	Org-022/025	[NT]	17	<0.1	<0.1	0	[NT]	[NT]
Surrogate p-Terphenyl-d14	%		Org-022/025	[NT]	17	79	78	1	116	[NT]

QUALITY CONTROL: PAHs in Soil					Duplicate				Spike Recovery %	
Test Description	Units	PQL	Method	Blank	#	Base	Dup.	RPD	[NT]	[NT]
Date extracted	-			[NT]	46	26/09/2022	26/09/2022		[NT]	[NT]
Date analysed	-			[NT]	46	29/09/2022	29/09/2022		[NT]	[NT]
Naphthalene	mg/kg	0.1	Org-022/025	[NT]	46	<0.1	<0.1	0	[NT]	[NT]
Acenaphthylene	mg/kg	0.1	Org-022/025	[NT]	46	<0.1	<0.1	0	[NT]	[NT]
Acenaphthene	mg/kg	0.1	Org-022/025	[NT]	46	<0.1	<0.1	0	[NT]	[NT]
Fluorene	mg/kg	0.1	Org-022/025	[NT]	46	<0.1	<0.1	0	[NT]	[NT]
Phenanthrene	mg/kg	0.1	Org-022/025	[NT]	46	<0.1	<0.1	0	[NT]	[NT]
Anthracene	mg/kg	0.1	Org-022/025	[NT]	46	<0.1	<0.1	0	[NT]	[NT]
Fluoranthene	mg/kg	0.1	Org-022/025	[NT]	46	<0.1	<0.1	0	[NT]	[NT]
Pyrene	mg/kg	0.1	Org-022/025	[NT]	46	<0.1	<0.1	0	[NT]	[NT]
Benzo(a)anthracene	mg/kg	0.1	Org-022/025	[NT]	46	<0.1	<0.1	0	[NT]	[NT]
Chrysene	mg/kg	0.1	Org-022/025	[NT]	46	<0.1	<0.1	0	[NT]	[NT]
Benzo(b,j+k)fluoranthene	mg/kg	0.2	Org-022/025	[NT]	46	<0.2	<0.2	0	[NT]	[NT]
Benzo(a)pyrene	mg/kg	0.05	Org-022/025	[NT]	46	<0.05	<0.05	0	[NT]	[NT]
Indeno(1,2,3-c,d)pyrene	mg/kg	0.1	Org-022/025	[NT]	46	<0.1	<0.1	0	[NT]	[NT]
Dibenzo(a,h)anthracene	mg/kg	0.1	Org-022/025	[NT]	46	<0.1	<0.1	0	[NT]	[NT]
Benzo(g,h,i)perylene	mg/kg	0.1	Org-022/025	[NT]	46	<0.1	<0.1	0	[NT]	[NT]
Surrogate p-Terphenyl-d14	%		Org-022/025	[NT]	46	118	116	2	[NT]	[NT]

QUALITY CONTROL: Organochlorine Pesticides in soil						Duplicate			Spike Recovery %	
Test Description	Units	PQL	Method	Blank	#	Base	Dup.	RPD	LCS-12	306351-7
Date extracted	-			26/09/2022	6	26/09/2022	26/09/2022		26/09/2022	26/09/2022
Date analysed	-			29/09/2022	6	29/09/2022	29/09/2022		29/09/2022	29/09/2022
alpha-BHC	mg/kg	0.1	Org-022/025	<0.1	6	<0.1	<0.1	0	94	98
HCB	mg/kg	0.1	Org-022/025	<0.1	6	<0.1	<0.1	0	[NT]	[NT]
beta-BHC	mg/kg	0.1	Org-022/025	<0.1	6	<0.1	<0.1	0	96	96
gamma-BHC	mg/kg	0.1	Org-022/025	<0.1	6	<0.1	<0.1	0	[NT]	[NT]
Heptachlor	mg/kg	0.1	Org-022/025	<0.1	6	<0.1	<0.1	0	109	109
delta-BHC	mg/kg	0.1	Org-022/025	<0.1	6	<0.1	<0.1	0	[NT]	[NT]
Aldrin	mg/kg	0.1	Org-022/025	<0.1	6	<0.1	<0.1	0	113	116
Heptachlor Epoxide	mg/kg	0.1	Org-022/025	<0.1	6	<0.1	<0.1	0	110	106
gamma-Chlordane	mg/kg	0.1	Org-022/025	<0.1	6	<0.1	<0.1	0	[NT]	[NT]
alpha-chlordane	mg/kg	0.1	Org-022/025	<0.1	6	<0.1	<0.1	0	[NT]	[NT]
Endosulfan I	mg/kg	0.1	Org-022/025	<0.1	6	<0.1	<0.1	0	[NT]	[NT]
pp-DDE	mg/kg	0.1	Org-022/025	<0.1	6	<0.1	<0.1	0	115	113
Dieldrin	mg/kg	0.1	Org-022/025	<0.1	6	<0.1	<0.1	0	120	124
Endrin	mg/kg	0.1	Org-022/025	<0.1	6	<0.1	<0.1	0	117	127
Endosulfan II	mg/kg	0.1	Org-022/025	<0.1	6	<0.1	<0.1	0	[NT]	[NT]
pp-DDD	mg/kg	0.1	Org-022/025	<0.1	6	<0.1	<0.1	0	102	98
Endrin Aldehyde	mg/kg	0.1	Org-022/025	<0.1	6	<0.1	<0.1	0	[NT]	[NT]
pp-DDT	mg/kg	0.1	Org-022/025	<0.1	6	<0.1	<0.1	0	[NT]	[NT]
Endosulfan Sulphate	mg/kg	0.1	Org-022/025	<0.1	6	<0.1	<0.1	0	100	100
Methoxychlor	mg/kg	0.1	Org-022/025	<0.1	6	<0.1	<0.1	0	[NT]	[NT]
Surrogate TCMX	%		Org-022/025	85	6	90	86	5	86	84

QUALITY CONTROL: Organochlorine Pesticides in soil					Duplicate				Spike Recovery %	
Test Description	Units	PQL	Method	Blank	#	Base	Dup.	RPD	[NT]	[NT]
Date extracted	-			[NT]	17	26/09/2022	26/09/2022		[NT]	[NT]
Date analysed	-			[NT]	17	29/09/2022	29/09/2022		[NT]	[NT]
alpha-BHC	mg/kg	0.1	Org-022/025	[NT]	17	<0.1	<0.1	0	[NT]	[NT]
HCB	mg/kg	0.1	Org-022/025	[NT]	17	<0.1	<0.1	0	[NT]	[NT]
beta-BHC	mg/kg	0.1	Org-022/025	[NT]	17	<0.1	<0.1	0	[NT]	[NT]
gamma-BHC	mg/kg	0.1	Org-022/025	[NT]	17	<0.1	<0.1	0	[NT]	[NT]
Heptachlor	mg/kg	0.1	Org-022/025	[NT]	17	<0.1	<0.1	0	[NT]	[NT]
delta-BHC	mg/kg	0.1	Org-022/025	[NT]	17	<0.1	<0.1	0	[NT]	[NT]
Aldrin	mg/kg	0.1	Org-022/025	[NT]	17	<0.1	<0.1	0	[NT]	[NT]
Heptachlor Epoxide	mg/kg	0.1	Org-022/025	[NT]	17	<0.1	<0.1	0	[NT]	[NT]
gamma-Chlordane	mg/kg	0.1	Org-022/025	[NT]	17	<0.1	<0.1	0	[NT]	[NT]
alpha-chlordane	mg/kg	0.1	Org-022/025	[NT]	17	<0.1	<0.1	0	[NT]	[NT]
Endosulfan I	mg/kg	0.1	Org-022/025	[NT]	17	<0.1	<0.1	0	[NT]	[NT]
pp-DDE	mg/kg	0.1	Org-022/025	[NT]	17	<0.1	<0.1	0	[NT]	[NT]
Dieldrin	mg/kg	0.1	Org-022/025	[NT]	17	<0.1	<0.1	0	[NT]	[NT]
Endrin	mg/kg	0.1	Org-022/025	[NT]	17	<0.1	<0.1	0	[NT]	[NT]
Endosulfan II	mg/kg	0.1	Org-022/025	[NT]	17	<0.1	<0.1	0	[NT]	[NT]
pp-DDD	mg/kg	0.1	Org-022/025	[NT]	17	<0.1	<0.1	0	[NT]	[NT]
Endrin Aldehyde	mg/kg	0.1	Org-022/025	[NT]	17	<0.1	<0.1	0	[NT]	[NT]
pp-DDT	mg/kg	0.1	Org-022/025	[NT]	17	<0.1	<0.1	0	[NT]	[NT]
Endosulfan Sulphate	mg/kg	0.1	Org-022/025	[NT]	17	<0.1	<0.1	0	[NT]	[NT]
Methoxychlor	mg/kg	0.1	Org-022/025	[NT]	17	<0.1	<0.1	0	[NT]	[NT]
Surrogate TCMX	%		Org-022/025	[NT]	17	80	82	2	[NT]	[NT]

QUALITY CONTROL: Organophosphorus Pesticides in Soil						Duplicate			Spike Recovery %	
Test Description	Units	PQL	Method	Blank	#	Base	Dup.	RPD	LCS-12	306351-7
Date extracted	-			26/09/2022	6	26/09/2022	26/09/2022		26/09/2022	26/09/2022
Date analysed	-			29/09/2022	6	29/09/2022	29/09/2022		29/09/2022	29/09/2022
Dichlorvos	mg/kg	0.1	Org-022/025	<0.1	6	<0.1	<0.1	0	97	101
Dimethoate	mg/kg	0.1	Org-022/025	<0.1	6	<0.1	<0.1	0	[NT]	[NT]
Diazinon	mg/kg	0.1	Org-022/025	<0.1	6	<0.1	<0.1	0	[NT]	[NT]
Chlorpyriphos-methyl	mg/kg	0.1	Org-022/025	<0.1	6	<0.1	<0.1	0	[NT]	[NT]
Ronnel	mg/kg	0.1	Org-022/025	<0.1	6	<0.1	<0.1	0	97	95
Fenitrothion	mg/kg	0.1	Org-022/025	<0.1	6	<0.1	<0.1	0	99	95
Malathion	mg/kg	0.1	Org-022/025	<0.1	6	<0.1	<0.1	0	110	101
Chlorpyriphos	mg/kg	0.1	Org-022/025	<0.1	6	<0.1	<0.1	0	114	112
Parathion	mg/kg	0.1	Org-022/025	<0.1	6	<0.1	<0.1	0	109	113
Bromophos-ethyl	mg/kg	0.1	Org-022	<0.1	6	<0.1	<0.1	0	[NT]	[NT]
Ethion	mg/kg	0.1	Org-022/025	<0.1	6	<0.1	<0.1	0	106	108
Azinphos-methyl (Guthion)	mg/kg	0.1	Org-022/025	<0.1	6	<0.1	<0.1	0	[NT]	[NT]
Surrogate TCMX	%		Org-022/025	85	6	90	86	5	86	84

QUALITY CONTROL: Organophosphorus Pesticides in Soil						Duplicate			Spike Recovery %	
Test Description	Units	PQL	Method	Blank	#	Base	Dup.	RPD	[NT]	[NT]
Date extracted	-			[NT]	17	26/09/2022	26/09/2022		[NT]	[NT]
Date analysed	-			[NT]	17	29/09/2022	29/09/2022		[NT]	[NT]
Dichlorvos	mg/kg	0.1	Org-022/025	[NT]	17	<0.1	<0.1	0	[NT]	[NT]
Dimethoate	mg/kg	0.1	Org-022/025	[NT]	17	<0.1	<0.1	0	[NT]	[NT]
Diazinon	mg/kg	0.1	Org-022/025	[NT]	17	<0.1	<0.1	0	[NT]	[NT]
Chlorpyriphos-methyl	mg/kg	0.1	Org-022/025	[NT]	17	<0.1	<0.1	0	[NT]	[NT]
Ronnel	mg/kg	0.1	Org-022/025	[NT]	17	<0.1	<0.1	0	[NT]	[NT]
Fenitrothion	mg/kg	0.1	Org-022/025	[NT]	17	<0.1	<0.1	0	[NT]	[NT]
Malathion	mg/kg	0.1	Org-022/025	[NT]	17	<0.1	<0.1	0	[NT]	[NT]
Chlorpyriphos	mg/kg	0.1	Org-022/025	[NT]	17	<0.1	<0.1	0	[NT]	[NT]
Parathion	mg/kg	0.1	Org-022/025	[NT]	17	<0.1	<0.1	0	[NT]	[NT]
Bromophos-ethyl	mg/kg	0.1	Org-022	[NT]	17	<0.1	<0.1	0	[NT]	[NT]
Ethion	mg/kg	0.1	Org-022/025	[NT]	17	<0.1	<0.1	0	[NT]	[NT]
Azinphos-methyl (Guthion)	mg/kg	0.1	Org-022/025	[NT]	17	<0.1	<0.1	0	[NT]	[NT]
Surrogate TCMX	%		Org-022/025	[NT]	17	80	82	2	[NT]	[NT]

QUALITY CONTROL: PCBs in Soil						Duplicate			Spike Recovery %	
Test Description	Units	PQL	Method	Blank	#	Base	Dup.	RPD	LCS-12	306351-7
Date extracted	-			26/09/2022	6	26/09/2022	26/09/2022		26/09/2022	26/09/2022
Date analysed	-			29/09/2022	6	29/09/2022	29/09/2022		29/09/2022	29/09/2022
Aroclor 1016	mg/kg	0.1	Org-021	<0.1	6	<0.1	<0.1	0	[NT]	[NT]
Aroclor 1221	mg/kg	0.1	Org-021	<0.1	6	<0.1	<0.1	0	[NT]	[NT]
Aroclor 1232	mg/kg	0.1	Org-021	<0.1	6	<0.1	<0.1	0	[NT]	[NT]
Aroclor 1242	mg/kg	0.1	Org-021	<0.1	6	<0.1	<0.1	0	[NT]	[NT]
Aroclor 1248	mg/kg	0.1	Org-021	<0.1	6	<0.1	<0.1	0	[NT]	[NT]
Aroclor 1254	mg/kg	0.1	Org-021	<0.1	6	<0.1	<0.1	0	113	100
Aroclor 1260	mg/kg	0.1	Org-021	<0.1	6	<0.1	<0.1	0	[NT]	[NT]
Surrogate TCMX	%		Org-021	85	6	90	86	5	86	84

QUALITY CONTROL: PCBs in Soil						Duplicate			Spike Recovery %	
Test Description	Units	PQL	Method	Blank	#	Base	Dup.	RPD	[NT]	[NT]
Date extracted	-			[NT]	17	26/09/2022	26/09/2022		[NT]	[NT]
Date analysed	-			[NT]	17	29/09/2022	29/09/2022		[NT]	[NT]
Aroclor 1016	mg/kg	0.1	Org-021	[NT]	17	<0.1	<0.1	0	[NT]	[NT]
Aroclor 1221	mg/kg	0.1	Org-021	[NT]	17	<0.1	<0.1	0	[NT]	[NT]
Aroclor 1232	mg/kg	0.1	Org-021	[NT]	17	<0.1	<0.1	0	[NT]	[NT]
Aroclor 1242	mg/kg	0.1	Org-021	[NT]	17	<0.1	<0.1	0	[NT]	[NT]
Aroclor 1248	mg/kg	0.1	Org-021	[NT]	17	<0.1	<0.1	0	[NT]	[NT]
Aroclor 1254	mg/kg	0.1	Org-021	[NT]	17	<0.1	<0.1	0	[NT]	[NT]
Aroclor 1260	mg/kg	0.1	Org-021	[NT]	17	<0.1	<0.1	0	[NT]	[NT]
Surrogate TCMX	%		Org-021	[NT]	17	80	82	2	[NT]	[NT]

QUALITY CONTROL: Acid Extractable metals in soil						Duplicate			Spike Recovery %	
Test Description	Units	PQL	Method	Blank	#	Base	Dup.	RPD	LCS-12	306351-7
Date prepared	-			27/09/2022	6	27/09/2022	27/09/2022		27/09/2022	27/09/2022
Date analysed	-			28/09/2022	6	28/09/2022	28/09/2022		28/09/2022	28/09/2022
Arsenic	mg/kg	4	Metals-020	<4	6	8	7	13	99	86
Cadmium	mg/kg	0.4	Metals-020	<0.4	6	<0.4	<0.4	0	94	80
Chromium	mg/kg	1	Metals-020	<1	6	16	14	13	101	85
Copper	mg/kg	1	Metals-020	<1	6	10	9	11	101	105
Lead	mg/kg	1	Metals-020	<1	6	17	18	6	95	80
Mercury	mg/kg	0.1	Metals-021	<0.1	6	<0.1	<0.1	0	107	111
Nickel	mg/kg	1	Metals-020	<1	6	5	4	22	99	85
Zinc	mg/kg	1	Metals-020	<1	6	18	15	18	95	77

QUALITY CONTROL: Acid Extractable metals in soil						Duplicate			Spike Recovery %	
Test Description	Units	PQL	Method	Blank	#	Base	Dup.	RPD	LCS-13	[NT]
Date prepared	-			[NT]	17	27/09/2022	27/09/2022		27/09/2022	[NT]
Date analysed	-			[NT]	17	28/09/2022	28/09/2022		28/09/2022	[NT]
Arsenic	mg/kg	4	Metals-020	[NT]	17	6	5	18	103	[NT]
Cadmium	mg/kg	0.4	Metals-020	[NT]	17	<0.4	<0.4	0	97	[NT]
Chromium	mg/kg	1	Metals-020	[NT]	17	15	13	14	103	[NT]
Copper	mg/kg	1	Metals-020	[NT]	17	5	5	0	105	[NT]
Lead	mg/kg	1	Metals-020	[NT]	17	13	14	7	98	[NT]
Mercury	mg/kg	0.1	Metals-021	[NT]	17	<0.1	<0.1	0	119	[NT]
Nickel	mg/kg	1	Metals-020	[NT]	17	3	3	0	101	[NT]
Zinc	mg/kg	1	Metals-020	[NT]	17	12	10	18	98	[NT]

QUALITY CONTROL: Acid Extractable metals in soil						Duplicate			Spike Recovery %	
Test Description	Units	PQL	Method	Blank	#	Base	Dup.	RPD	[NT]	[NT]
Date prepared	-			[NT]	46	27/09/2022	27/09/2022		[NT]	[NT]
Date analysed	-			[NT]	46	28/09/2022	28/09/2022		[NT]	[NT]
Arsenic	mg/kg	4	Metals-020	[NT]	46	9	8	12	[NT]	[NT]
Cadmium	mg/kg	0.4	Metals-020	[NT]	46	<0.4	<0.4	0	[NT]	[NT]
Chromium	mg/kg	1	Metals-020	[NT]	46	17	16	6	[NT]	[NT]
Copper	mg/kg	1	Metals-020	[NT]	46	15	16	6	[NT]	[NT]
Lead	mg/kg	1	Metals-020	[NT]	46	18	19	5	[NT]	[NT]
Mercury	mg/kg	0.1	Metals-021	[NT]	46	<0.1	<0.1	0	[NT]	[NT]
Nickel	mg/kg	1	Metals-020	[NT]	46	6	5	18	[NT]	[NT]
Zinc	mg/kg	1	Metals-020	[NT]	46	17	18	6	[NT]	[NT]

QUALITY CONTROL: Misc Soil - Inorg						Duplicate			Spike Recovery %	
Test Description	Units	PQL	Method	Blank	#	Base	Dup.	RPD	LCS-12	306351-7
Date prepared	-			28/09/2022	6	28/09/2022	28/09/2022		28/09/2022	28/09/2022
Date analysed	-			28/09/2022	6	28/09/2022	28/09/2022		28/09/2022	28/09/2022
Total Phenolics (as Phenol)	mg/kg	5	Inorg-031	<5	6	<5	<5	0	103	99

QUALITY CONTROL: Misc Soil - Inorg						Duplicate			Spike Recovery %	
Test Description	Units	PQL	Method	Blank	#	Base	Dup.	RPD	[NT]	[NT]
Date prepared	-			[NT]	17	28/09/2022	28/09/2022		[NT]	[NT]
Date analysed	-			[NT]	17	28/09/2022	28/09/2022		[NT]	[NT]
Total Phenolics (as Phenol)	mg/kg	5	Inorg-031	[NT]	17	<5	<5	0	[NT]	[NT]

QUALITY CONTROL: Misc Inorg - Soil						Duplicate			Spike Recovery %	
Test Description	Units	PQL	Method	Blank	#	Base	Dup.	RPD	LCS-12	[NT]
Date prepared	-			26/09/2022	29	26/09/2022	26/09/2022		26/09/2022	[NT]
Date analysed	-			28/09/2022	29	28/09/2022	28/09/2022		28/09/2022	[NT]
pH 1:5 soil:water	pH Units		Inorg-001	[NT]	29	5.4	5.4	0	99	[NT]
Chloride, Cl 1:5 soil:water	mg/kg	10	Inorg-081	<10	29	95	[NT]		91	[NT]
Sulphate, SO4 1:5 soil:water	mg/kg	10	Inorg-081	<10	29	<10	[NT]		84	[NT]

QUALITY CONTROL: Misc Inorg - Soil						Duplicate			Spike Recovery %	
Test Description	Units	PQL	Method	Blank	#	Base	Dup.	RPD	LCS-13	[NT]
Date prepared	-			[NT]	39	26/09/2022	26/09/2022		26/09/2022	[NT]
Date analysed	-			[NT]	39	28/09/2022	28/09/2022		28/09/2022	[NT]
pH 1:5 soil:water	pH Units		Inorg-001	[NT]	39	5.0	5.0	0	101	[NT]

QUALITY CONTROL: Texture and Salinity*					Duplicate				Spike Recovery %	
Test Description	Units	PQL	Method	Blank	#	Base	Dup.	RPD	LCS-12	[NT]
Date prepared	-			26/09/2022	[NT]	[NT]	[NT]	[NT]	26/09/2022	[NT]
Date analysed	-			27/09/2022	[NT]	[NT]	[NT]	[NT]	27/09/2022	[NT]
Electrical Conductivity 1:5 soil:water	µS/cm	1	Inorg-002	<1	[NT]	[NT]	[NT]	[NT]	99	[NT]

QUALITY CONTROL: PFAS in Soils Extended						Duplicate			Spike Recovery %	
Test Description	Units	PQL	Method	Blank	#	Base	Dup.	RPD	LCS-12	[NT]
Date prepared	-			27/09/2022	[NT]	[NT]	[NT]	[NT]	27/09/2022	[NT]
Date analysed	-			27/09/2022	[NT]	[NT]	[NT]	[NT]	27/09/2022	[NT]
Perfluorobutanesulfonic acid	µg/kg	0.1	Org-029	<0.1	[NT]	[NT]	[NT]	[NT]	110	[NT]
Perfluoropentanesulfonic acid	µg/kg	0.1	Org-029	<0.1	[NT]	[NT]	[NT]	[NT]	102	[NT]
Perfluorohexanesulfonic acid - PFHxS	µg/kg	0.1	Org-029	<0.1	[NT]	[NT]	[NT]	[NT]	100	[NT]
Perfluoroheptanesulfonic acid	µg/kg	0.1	Org-029	<0.1	[NT]	[NT]	[NT]	[NT]	102	[NT]
Perfluorooctanesulfonic acid PFOS	µg/kg	0.1	Org-029	<0.1	[NT]	[NT]	[NT]	[NT]	101	[NT]
Perfluorodecanesulfonic acid	µg/kg	0.2	Org-029	<0.2	[NT]	[NT]	[NT]	[NT]	102	[NT]
Perfluorobutanoic acid	µg/kg	0.2	Org-029	<0.2	[NT]	[NT]	[NT]	[NT]	101	[NT]
Perfluoropentanoic acid	µg/kg	0.2	Org-029	<0.2	[NT]	[NT]	[NT]	[NT]	103	[NT]
Perfluorohexanoic acid	µg/kg	0.1	Org-029	<0.1	[NT]	[NT]	[NT]	[NT]	108	[NT]
Perfluoroheptanoic acid	µg/kg	0.1	Org-029	<0.1	[NT]	[NT]	[NT]	[NT]	108	[NT]
Perfluorooctanoic acid PFOA	µg/kg	0.1	Org-029	<0.1	[NT]	[NT]	[NT]	[NT]	102	[NT]
Perfluorononanoic acid	µg/kg	0.1	Org-029	<0.1	[NT]	[NT]	[NT]	[NT]	104	[NT]
Perfluorodecanoic acid	µg/kg	0.5	Org-029	<0.5	[NT]	[NT]	[NT]	[NT]	103	[NT]
Perfluoroundecanoic acid	µg/kg	0.5	Org-029	<0.5	[NT]	[NT]	[NT]	[NT]	101	[NT]
Perfluorododecanoic acid	µg/kg	0.5	Org-029	<0.5	[NT]	[NT]	[NT]	[NT]	94	[NT]
Perfluorotridecanoic acid	µg/kg	0.5	Org-029	<0.5	[NT]	[NT]	[NT]	[NT]	113	[NT]
Perfluorotetradecanoic acid	µg/kg	5	Org-029	<5	[NT]	[NT]	[NT]	[NT]	102	[NT]
4:2 FTS	µg/kg	0.1	Org-029	<0.1	[NT]	[NT]	[NT]	[NT]	99	[NT]
6:2 FTS	µg/kg	0.1	Org-029	<0.1	[NT]	[NT]	[NT]	[NT]	92	[NT]
8:2 FTS	µg/kg	0.2	Org-029	<0.2	[NT]	[NT]	[NT]	[NT]	91	[NT]
10:2 FTS	µg/kg	0.2	Org-029	<0.2	[NT]	[NT]	[NT]	[NT]	107	[NT]
Perfluorooctane sulfonamide	µg/kg	1	Org-029	<1	[NT]	[NT]	[NT]	[NT]	103	[NT]
N-Methyl perfluorooctane sulfonamide	µg/kg	1	Org-029	<1	[NT]	[NT]	[NT]	[NT]	108	[NT]
N-Ethyl perfluorooctanesulfon amide	µg/kg	1	Org-029	<1	[NT]	[NT]	[NT]	[NT]	101	[NT]
N-Me perfluorooctanesulfonamid oethanol	µg/kg	1	Org-029	<1	[NT]	[NT]	[NT]	[NT]	105	[NT]
N-Et perfluorooctanesulfonamid oethanol	µg/kg	5	Org-029	<5	[NT]	[NT]	[NT]	[NT]	107	[NT]
MePerfluorooctanesulf- amid oacetic acid	µg/kg	0.2	Org-029	<0.2	[NT]	[NT]	[NT]	[NT]	101	[NT]
EtPerfluorooctanesulf amid oacetic acid	µg/kg	0.2	Org-029	<0.2	[NT]	[NT]	[NT]	[NT]	94	[NT]
Surrogate $^{13}C_8$ *PFOS*	%		Org-029	97	[NT]	[NT]	[NT]	[NT]	99	[NT]
Surrogate $^{13}C_2$ *PFOA*	%		Org-029	97	[NT]	[NT]	[NT]	[NT]	99	[NT]

QUALITY CONTROL: PFAS in Soils Extended					Duplicate				Spike Recovery %	
Test Description	Units	PQL	Method	Blank	#	Base	Dup.	RPD	LCS-12	[NT]
Extracted ISTD $^{13}C_3$ *PFBS*	%		Org-029	97	[NT]	[NT]	[NT]	[NT]	95	[NT]
Extracted ISTD $^{18}O_2$ *PFHxS*	%		Org-029	102	[NT]	[NT]	[NT]	[NT]	103	[NT]
Extracted ISTD $^{13}C_4$ *PFOS*	%		Org-029	105	[NT]	[NT]	[NT]	[NT]	103	[NT]
Extracted ISTD $^{13}C_4$ *PFBA*	%		Org-029	107	[NT]	[NT]	[NT]	[NT]	105	[NT]
Extracted ISTD $^{13}C_3$ *PFPeA*	%		Org-029	106	[NT]	[NT]	[NT]	[NT]	103	[NT]
Extracted ISTD $^{13}C_2$ *PFHxA*	%		Org-029	107	[NT]	[NT]	[NT]	[NT]	102	[NT]
Extracted ISTD $^{13}C_4$ *PFHpA*	%		Org-029	104	[NT]	[NT]	[NT]	[NT]	102	[NT]
Extracted ISTD $^{13}C_4$ *PFOA*	%		Org-029	109	[NT]	[NT]	[NT]	[NT]	105	[NT]
Extracted ISTD $^{13}C_5$ *PFNA*	%		Org-029	105	[NT]	[NT]	[NT]	[NT]	104	[NT]
Extracted ISTD $^{13}C_2$ *PFDA*	%		Org-029	108	[NT]	[NT]	[NT]	[NT]	106	[NT]
Extracted ISTD $^{13}C_2$ *PFUnDA*	%		Org-029	112	[NT]	[NT]	[NT]	[NT]	111	[NT]
Extracted ISTD $^{13}C_2$ *PFDoDA*	%		Org-029	125	[NT]	[NT]	[NT]	[NT]	128	[NT]
Extracted ISTD $^{13}C_2$ *PFTeDA*	%		Org-029	163	[NT]	[NT]	[NT]	[NT]	164	[NT]
Extracted ISTD $^{13}C_2$ *4:2FTS*	%		Org-029	106	[NT]	[NT]	[NT]	[NT]	104	[NT]
Extracted ISTD $^{13}C_2$ *6:2FTS*	%		Org-029	108	[NT]	[NT]	[NT]	[NT]	110	[NT]
Extracted ISTD $^{13}C_2$ *8:2FTS*	%		Org-029	115	[NT]	[NT]	[NT]	[NT]	120	[NT]
Extracted ISTD $^{13}C_8$ *FOSA*	%		Org-029	111	[NT]	[NT]	[NT]	[NT]	108	[NT]
Extracted ISTD d_3 *N MeFOSA*	%		Org-029	109	[NT]	[NT]	[NT]	[NT]	106	[NT]
Extracted ISTD d_5 *N EtFOSA*	%		Org-029	116	[NT]	[NT]	[NT]	[NT]	114	[NT]
Extracted ISTD d_7 *N MeFOSE*	%		Org-029	106	[NT]	[NT]	[NT]	[NT]	108	[NT]

QUALITY CONTROL: PFAS in Soils Extended						Duplicate			Spike Recovery %	
Test Description	Units	PQL	Method	Blank	#	Base	Dup.	RPD	LCS-12	[NT]
Extracted ISTD d_9 *N EtFOSE*	%		Org-029	111	[NT]	[NT]	[NT]	[NT]	110	[NT]
Extracted ISTD d_3 *N MeFOSAA*	%		Org-029	105	[NT]	[NT]	[NT]	[NT]	106	[NT]
Extracted ISTD d_5 *N EtFOSAA*	%		Org-029	109	[NT]	[NT]	[NT]	[NT]	109	[NT]

Result Definitions

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

Quality Control Definitions

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

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

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

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

Laboratory Acceptance Criteria

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

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

Spikes for Physical and Aggregate Tests are not applicable.

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

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

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

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

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

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

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

Measurement Uncertainty estimates are available for most tests upon request.

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

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

Report Comments

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

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

pH/EC
Samples were out of the recommended holding time for this analysis.

Asbestos: A portion of the supplied sample was sub-sampled for asbestos according to ASB-001 asbestos subsampling procedure. We cannot guarantee that this sub-sample is indicative of the entire sample. Envirolab/MPL recommends supplying 40-60g or 500ml of sample in its own container.
Note: Samples 306351-6, 7, 8, 10, 11, 13, 14, 15, 17, 18, 19, 21, 22 were sub-sampled from jars provided by the client.

2/9 14:29

Douglas Partners
Geotechnics | Environment | Groundwater

CHAIN OF CUSTODY DESPATCH SHEET

Project No:	215851.00	**Suburb:**	Rouse Hill	**To**	Envirolab Services
Project Manager:	G Boyd	**Order Number:**		**Sampler:** R De Silva	12 Ashley Street, Chatswood, NSW 2067
Email:	gavin.boyd@douglaspartners.com.au			**Attn**	Aileen Hie
Turnaround time:	☑ Standard ☐ 72 hour ☐ 48 hour ☐ 24 hour ☐ Same day			**Cc**	02 9910 6200 Ahie@envirolab.com.au
Prior Storage:	☑ Fridge ☐ Freezer ☐ Shelf	**Do samples contain 'potential' HBM?**	☑ No ☐ Yes (If YES, then handle, transport and store in accordance with FPM HAZID)		

Lab ID	Sample ID: Location / Other ID	Depth From	Depth To	Date Sampled	Sample Type: S - soil W - water	Container Type: G - glass P - plastic	Analytes: PFAS (Extended Suite)	Combo 8a	Combo 8	FA/AF	pH, eCE	Cl, SO4	Combo 3	HM8, PAH/BTEX				Notes/ Preservation/ Additional Requirements
1	BH106 1	0	0.1	13/09/22	S	G	•											
2	BH107 2	0	0.1	13/09/22	S	G	•											
3	BH108 3	0	0.1	13/09/22	S	G	•											
4	BH111 4	0	0.1	13/09/22	S	G	•											
5	BH114A 5	0	0.1	13/09/22	S	G	•											
6	BH105 6	0.1	0.2	8/09/22	S	G		•										
7	BH109 7	0.1	0.2	8/09/22	S	G		•										
8	BH110 8	0.1	0.2	8/09/22	S	G		•										
9	BH110 9	0.4	0.5	8/09/22	S	G							•					
10	BH112 10	0.1	0.2	8/09/22	S	G		•										
11	BH112 11	0.4	0.5	8/09/22	S	G		•										
12	BH112 12	0.9	1	8/09/22	S	G							•					
13	BH113 13	0.1	0.2	8/09/22	S	G		•										
14	BH114 14	0.1	0.2	8/09/22	S	G		•										

Metals to analyse:	HM9 (As, Cd, Cr, Cu, Pb, Hg, Mn, Ni, Zn)		
Number of samples in container:		**Transported to laboratory by:**	Hunter Express
Send results to:	Douglas Partners Pty Ltd		
Address:	96 Hermitage Rd, West Ryde, 2114	**Phone:**	02 9809 0666
Relinquished by:	Ravin De Silva	**Date:**	20/09/2022 **Signed:**

LAB RECEIPT

Lab Ref. No:	305351
Received by:	AD - ELS SYD
Date & T	20/09/22 1530 15°C/P
Signed:	

#306351 AP 21/9

Douglas Partners
Geotechnics | Environment | Groundwater

CHAIN OF CUSTODY DESPATCH SHEET

Project No:	215851.00	**Suburb:**	Rouse Hill	To	Envirolab Services
Project Manager:		**Order Number:**	**Dispatch date:** 20/09/2022		12 Ashley Street, Chatswood, NSW 2067

Lab ID	Sample ID: Location / Other ID	Depth From	Depth To	Date Sampled	Sample Type: S - soil W - water	Container Type: G - glass P - plastic	Analytes: PFAS (Extended Suite)	Combo 8a	Combo 8	FA/AF	pH, eCE	Cl, SO4	Combo 3					Notes/ Preservation/ Additional Requirements
15	BH114 15	0.4	0.5	8/09/22	S	G		•										
16	BH114 16	0.9	1	8/09/22	S	G							•					
17	BH115 17	0.1	0.2	8/09/22	S	G		•										
18	BH108 18	0.1	0.2	13/09/22	S	G		•										
19	BH108 19	0.4	0.5	13/09/22	S	G		•										
20	BH108 20	0.9	1	13/09/22	S	G							•					
21	BH111 21	0.1	0.2	13/09/22	S	G		•										
22	BH111 22	0.4	0.5	13/09/22	S	G		•										
23	BH111 23	0.9	1	13/09/22	S	G							•					
26	BH115 24	0.1	0.2	8/09/2022	S	P				•								
27	BH109 25	0.4	0.5	8/09/2022	S	P				•								
28	BH114 26	0.4	0.5	8/09/2022	S	P				•								
29	BH110 27	0.1	0.2	8/09/2022	S	P				•								
30	BH113 28	0.4	0.5	8/09/2022	S	P				•								
31	BH114 29	1.4	1.5	8/09/2022	S	G					•	•						
32	BH110 30	0.9	1	8/09/2022	S	G					•							
33	BH107 31	0.4	0.5	13/09/2022	S	G					•							

Douglas Partners
Geotechnics | Environment | Groundwater

#306351 AP 21/9 **CHAIN OF CUSTODY DESPATCH SHEET**

Project No:	215851.00	**Suburb:**	Rouse Hill
Project Manager:	96 Hermitage Rd, West Ryde, 2114		

To: Envirolab Services
Dispatch date:

Lab ID	Sample ID: Location / Other ID	Depth From	Depth To	Date Sampled	Sample Type: S - soil W - water	Container Type: G - glass P - plastic	Analytes: PFAS (Extended Suite)	Combo 8a	Combo 8	FA/AF	pH, eCE	Cl, SO4	Combo 3	HM8, PAH/BTEX				Notes/ Preservation/ Additional Requirements
34	BH10632	0.1	0.2								•							
35	BH10733	0.9	1								•							
36	BH11334	0.4	0.5								•	•						
37	BH10935	1.4	1.5								•							
38	BH10536	1.4	1.5								•							
39	BH11537	1.4	1.5								•							
40	BH10638	0.9	1								•	•						
41	BH11039	1.4	1.5								•							
42	BH11140	1.4	1.5								•							
43	BH10641	0.4	0.5								•							
44	BH11442	1.9	2								•							
45	BH10943	0.4	0.5								•							
46	Trip Spike/Blank	44/45												•				
47	BD1-08/09/2022	46												•				
48	BD1-13/09/2022	4647												•				
49	BD2-13/09/2022	4748												•				
50	BD3-13/09/2022	48-49												•				

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

SAMPLE RECEIPT ADVICE

Client Details

Client	Douglas Partners Pty Ltd
Attention	Gavin Boyd

Sample Login Details

Your reference	215851.00, Rouse Hill
Envirolab Reference	306351
Date Sample Received	21/09/2022
Date Instructions Received	21/09/2022
Date Results Expected to be Reported	29/09/2022

Sample Condition

Samples received in appropriate condition for analysis	Yes
No. of Samples Provided	49 Soil
Turnaround Time Requested	Standard
Temperature on Receipt (°C)	13
Cooling Method	Ice Pack
Sampling Date Provided	YES

Comments

Nil

Please direct any queries to:

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

Analysis Underway, details on the following page:

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

Sample ID	vTRH(C6-C10)/BTEXN in Soil	svTRH (C10-C40) in Soil	PAHs in Soil	Organochlorine Pesticides in soil	Organophosphorus Pesticides in Soil	PCBs in Soil	Acid Extractable metalsin soil	Misc Soil - Inorg	Misc Inorg - Soil	Texture and Salinity*	Asbestos ID - soils	Asbestos ID - soils NEPM	PFAS in Soils Extended
BH106-0-0.1													✓
BH107-0-0.1													✓
BH108-0-0.1													✓
BH111-0-0.1													✓
BH114A-0-0.1													✓
BH105-0.1-0.2	✓	✓	✓	✓	✓	✓	✓	✓			✓		
BH109-0.1-0.2	✓	✓	✓	✓	✓	✓	✓	✓			✓		
BH110-0.1-0.2	✓	✓	✓	✓	✓	✓	✓	✓			✓		
BH110-0.4-0.5	✓	✓	✓				✓						
BH112-0.1-0.2	✓	✓	✓	✓	✓	✓	✓	✓			✓		
BH112-0.4-0.5	✓	✓	✓	✓	✓	✓	✓	✓			✓		
BH112-0.9-1	✓	✓	✓				✓						
BH113-0.1-0.2	✓	✓	✓	✓	✓	✓	✓	✓			✓		
BH114-0.1-0.2	✓	✓	✓	✓	✓	✓	✓	✓			✓		
BH114-0.4-0.5	✓	✓	✓	✓	✓	✓	✓	✓			✓		
BH114-0.9-1	✓	✓	✓				✓						
BH115-0.1-0.2	✓	✓	✓	✓	✓	✓	✓	✓			✓		
BH108-0.1-0.2	✓	✓	✓	✓	✓	✓	✓	✓			✓		
BH108-0.4-0.5	✓	✓	✓	✓	✓	✓	✓	✓			✓		
BH108-0.9-1	✓	✓	✓				✓						
BH111-0.1-0.2	✓	✓	✓	✓	✓	✓	✓	✓			✓		
BH111-0.4-0.5	✓	✓	✓	✓	✓	✓	✓	✓			✓		
BH111-0.9-1	✓	✓	✓				✓						
BH115-0.1-0.2												✓	
BH109-0.4-0.5												✓	
BH114-0.4-0.5												✓	
BH110-0.1-0.2												✓	
BH113-0.4-0.5												✓	
BH114-1.4-1.5									✓	✓			
BH110-0.9-1									✓	✓			
BH107-0.4-0.5									✓	✓			
BH106-0.1-0.2									✓	✓			

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

Sample ID	vTRH(C6-C10)/BTEXN in Soil	svTRH (C10-C40) in Soil	PAHs in Soil	Organochlorine Pesticides in soil	Organophosphorus Pesticides in Soil	PCBs in Soil	Acid Extractable metalsin soil	Misc Soil - Inorg	Misc Inorg - Soil	Texture and Salinity*	Asbestos ID - soils	Asbestos ID - soils NEPM	PFAS in Soils Extended
BH107-0.9-1									✓	✓			
BH113-0.4-0.5									✓	✓			
BH109-1.4-1.5									✓	✓			
BH105-1.4-1.5									✓	✓			
BH115-1.4-1.5									✓	✓			
BH106-0.9-1									✓	✓			
BH110-1.4-1.5									✓	✓			
BH111-1.4-1.5									✓	✓			
BH106-0.4-0.5									✓	✓			
BH114-1.9-2									✓	✓			
BH109-0.4-0.5									✓	✓			
Trip Spike	✓												
Trip Blank	✓												
BD1-08/09/2022	✓	✓	✓				✓						
BD1-13/09/2022	✓	✓	✓				✓						
BD2-13/09/2022	✓	✓	✓				✓						
BD3-13/09/2022	✓	✓	✓				✓						

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

Additional Info

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

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

CERTIFICATE OF ANALYSIS 306806

Client Details

Client	Douglas Partners Pty Ltd (Rouse Hill)
Attention	Gavin Boyd
Address	Unit 2/593 Withers Road, ROUSE HILL, NSW, 2155

Sample Details

Your Reference	**215851.00, Rouse Hill**
Number of Samples	5 Water
Date samples received	28/09/2022
Date completed instructions received	28/09/2022

Analysis Details

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

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

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

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

Report Details

Date results requested by	06/10/2022
Date of Issue	06/10/2022

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, Inorganics Supervisor
Giovanni Agosti, Group Technical Manager
Kyle Gavrily, Senior Chemist
Loren Bardwell, Development Chemist
Phalak Inthakesone, Organics Development Manager, Sydney

Authorised By

Nancy Zhang, Laboratory Manager

VOCs in water					
Our Reference		306806-1	306806-2	306806-3	306806-4
Your Reference	UNITS	103	104	108	111
Date Sampled		26/09/2022	26/09/2022	26/09/2022	26/09/2022
Type of sample		Water	Water	Water	Water
Date extracted	-	01/10/2022	01/10/2022	01/10/2022	01/10/2022
Date analysed	-	04/10/2022	04/10/2022	04/10/2022	04/10/2022
Dichlorodifluoromethane	µg/L	<10	<10	<10	<10
Chloromethane	µg/L	<10	<10	<10	<10
Vinyl Chloride	µg/L	<10	<10	<10	<10
Bromomethane	µg/L	<10	<10	<10	<10
Chloroethane	µg/L	<10	<10	<10	<10
Trichlorofluoromethane	µg/L	<10	<10	<10	<10
1,1-Dichloroethene	µg/L	<1	<1	<1	<1
Trans-1,2-dichloroethene	µg/L	<1	<1	<1	<1
1,1-dichloroethane	µg/L	<1	<1	<1	<1
Cis-1,2-dichloroethene	µg/L	<1	<1	<1	<1
Bromochloromethane	µg/L	<1	<1	<1	<1
Chloroform	µg/L	4	3	10	42
2,2-dichloropropane	µg/L	<1	<1	<1	<1
1,2-dichloroethane	µg/L	<1	<1	<1	<1
1,1,1-trichloroethane	µg/L	<1	<1	<1	<1
1,1-dichloropropene	µg/L	<1	<1	<1	<1
Cyclohexane	µg/L	<1	<1	<1	<1
Carbon tetrachloride	µg/L	<1	<1	<1	<1
Benzene	µg/L	<1	<1	<1	<1
Dibromomethane	µg/L	<1	<1	<1	<1
1,2-dichloropropane	µg/L	<1	<1	<1	<1
Trichloroethene	µg/L	<1	<1	<1	<1
Bromodichloromethane	µg/L	<1	<1	<1	<1
trans-1,3-dichloropropene	µg/L	<1	<1	<1	<1
cis-1,3-dichloropropene	µg/L	<1	<1	<1	<1
1,1,2-trichloroethane	µg/L	<1	<1	<1	<1
Toluene	µg/L	<1	<1	<1	<1
1,3-dichloropropane	µg/L	<1	<1	<1	<1
Dibromochloromethane	µg/L	<1	<1	<1	<1
1,2-dibromoethane	µg/L	<1	<1	<1	<1
Tetrachloroethene	µg/L	<1	<1	<1	<1
1,1,1,2-tetrachloroethane	µg/L	<1	<1	<1	<1
Chlorobenzene	µg/L	<1	<1	<1	<1
Ethylbenzene	µg/L	<1	<1	<1	<1

VOCs in water					
Our Reference		306806-1	306806-2	306806-3	306806-4
Your Reference	UNITS	103	104	108	111
Date Sampled		26/09/2022	26/09/2022	26/09/2022	26/09/2022
Type of sample		Water	Water	Water	Water
Bromoform	µg/L	<1	<1	<1	<1
m+p-xylene	µg/L	<2	<2	<2	<2
Styrene	µg/L	<1	<1	<1	<1
1,1,2,2-tetrachloroethane	µg/L	<1	<1	<1	<1
o-xylene	µg/L	<1	<1	<1	<1
1,2,3-trichloropropane	µg/L	<1	<1	<1	<1
Isopropylbenzene	µg/L	<1	<1	<1	<1
Bromobenzene	µg/L	<1	<1	<1	<1
n-propyl benzene	µg/L	<1	<1	<1	<1
2-chlorotoluene	µg/L	<1	<1	<1	<1
4-chlorotoluene	µg/L	<1	<1	<1	<1
1,3,5-trimethyl benzene	µg/L	<1	<1	<1	<1
Tert-butyl benzene	µg/L	<1	<1	<1	<1
1,2,4-trimethyl benzene	µg/L	<1	<1	<1	<1
1,3-dichlorobenzene	µg/L	<1	<1	<1	<1
Sec-butyl benzene	µg/L	<1	<1	<1	<1
1,4-dichlorobenzene	µg/L	<1	<1	<1	<1
4-isopropyl toluene	µg/L	<1	<1	<1	<1
1,2-dichlorobenzene	µg/L	<1	<1	<1	<1
n-butyl benzene	µg/L	<1	<1	<1	<1
1,2-dibromo-3-chloropropane	µg/L	<1	<1	<1	<1
1,2,4-trichlorobenzene	µg/L	<1	<1	<1	<1
Hexachlorobutadiene	µg/L	<1	<1	<1	<1
1,2,3-trichlorobenzene	µg/L	<1	<1	<1	<1
Surrogate Dibromofluoromethane	%	111	114	109	112
Surrogate toluene-d8	%	101	102	99	104
Surrogate 4-BFB	%	102	102	102	101

vTRH(C6-C10)/BTEXN in Water					
Our Reference		306806-1	306806-2	306806-3	306806-4
Your Reference	UNITS	103	104	108	111
Date Sampled		26/09/2022	26/09/2022	26/09/2022	26/09/2022
Type of sample		Water	Water	Water	Water
Date extracted	-	02/10/2022	02/10/2022	02/10/2022	02/10/2022
Date analysed	-	04/10/2022	04/10/2022	04/10/2022	04/10/2022
TRH C_6 - C_9	µg/L	<10	<10	<10	27
TRH C_6 - C_{10}	µg/L	<10	<10	<10	28
TRH C_6 - C_{10} less BTEX (F1)	µg/L	<10	<10	<10	28
Benzene	µg/L	<1	<1	<1	<1
Toluene	µg/L	<1	<1	<1	<1
Ethylbenzene	µg/L	<1	<1	<1	<1
m+p-xylene	µg/L	<2	<2	<2	<2
o-xylene	µg/L	<1	<1	<1	<1
Naphthalene	µg/L	<1	<1	<1	<1
Surrogate Dibromofluoromethane	%	111	114	109	112
Surrogate toluene-d8	%	101	102	99	104
Surrogate 4-BFB	%	102	102	102	101

svTRH (C10-C40) in Water					
Our Reference		306806-1	306806-2	306806-3	306806-4
Your Reference	UNITS	103	104	108	111
Date Sampled		26/09/2022	26/09/2022	26/09/2022	26/09/2022
Type of sample		Water	Water	Water	Water
Date extracted	-	30/09/2022	30/09/2022	30/09/2022	30/09/2022
Date analysed	-	01/10/2022	01/10/2022	01/10/2022	01/10/2022
TRH C_{10} - C_{14}	µg/L	<50	<50	<50	<50
TRH C_{15} - C_{28}	µg/L	<100	<100	<100	<100
TRH C_{29} - C_{36}	µg/L	<100	<100	<100	<100
Total +ve TRH (C10-C36)	µg/L	<50	<50	<50	<50
TRH >C_{10} - C_{16}	µg/L	<50	<50	<50	<50
TRH >C_{10} - C_{16} less Naphthalene (F2)	µg/L	<50	<50	<50	<50
TRH >C_{16} - C_{34}	µg/L	<100	<100	<100	<100
TRH >C_{34} - C_{40}	µg/L	<100	<100	<100	<100
Total +ve TRH (>C10-C40)	µg/L	<50	<50	<50	<50
Surrogate o-Terphenyl	%	108	92	63	95

PAHs in Water - Low Level						
Our Reference		306806-1	306806-2	306806-3	306806-4	306806-5
Your Reference	UNITS	103	104	108	111	BD01
Date Sampled		26/09/2022	26/09/2022	26/09/2022	26/09/2022	26/09/2022
Type of sample		Water	Water	Water	Water	Water
Date extracted	-	30/09/2022	30/09/2022	30/09/2022	30/09/2022	30/09/2022
Date analysed	-	01/10/2022	01/10/2022	01/10/2022	01/10/2022	01/10/2022
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	<0.1	<0.1
Fluorene	µg/L	<0.1	<0.1	<0.1	<0.1	<0.1
Phenanthrene	µg/L	<0.1	<0.1	<0.1	<0.1	<0.1
Anthracene	µg/L	<0.1	<0.1	<0.1	<0.1	<0.1
Fluoranthene	µg/L	<0.1	<0.1	<0.1	<0.1	<0.1
Pyrene	µg/L	<0.1	<0.1	<0.1	<0.1	<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	<0.1	<0.1
Surrogate p-Terphenyl-d14	%	111	99	78	105	95

Organochlorine Pesticides in Water					
Our Reference		306806-1	306806-2	306806-3	306806-4
Your Reference	UNITS	103	104	108	111
Date Sampled		26/09/2022	26/09/2022	26/09/2022	26/09/2022
Type of sample		Water	Water	Water	Water
Date extracted	-	30/09/2022	30/09/2022	30/09/2022	30/09/2022
Date analysed	-	01/10/2022	01/10/2022	01/10/2022	01/10/2022
alpha-BHC	µg/L	<0.2	<0.2	<0.2	<0.2
HCB	µg/L	<0.2	<0.2	<0.2	<0.2
beta-BHC	µg/L	<0.2	<0.2	<0.2	<0.2
gamma-BHC	µg/L	<0.2	<0.2	<0.2	<0.2
Heptachlor	µg/L	<0.2	<0.2	<0.2	<0.2
delta-BHC	µg/L	<0.2	<0.2	<0.2	<0.2
Aldrin	µg/L	<0.2	<0.2	<0.2	<0.2
Heptachlor Epoxide	µg/L	<0.2	<0.2	<0.2	<0.2
gamma-Chlordane	µg/L	<0.2	<0.2	<0.2	<0.2
alpha-Chlordane	µg/L	<0.2	<0.2	<0.2	<0.2
Endosulfan I	µg/L	<0.2	<0.2	<0.2	<0.2
pp-DDE	µg/L	<0.2	<0.2	<0.2	<0.2
Dieldrin	µg/L	<0.2	<0.2	<0.2	<0.2
Endrin	µg/L	<0.2	<0.2	<0.2	<0.2
Endosulfan II	µg/L	<0.2	<0.2	<0.2	<0.2
pp-DDD	µg/L	<0.2	<0.2	<0.2	<0.2
Endrin Aldehyde	µg/L	<0.2	<0.2	<0.2	<0.2
pp-DDT	µg/L	<0.2	<0.2	<0.2	<0.2
Endosulfan Sulphate	µg/L	<0.2	<0.2	<0.2	<0.2
Methoxychlor	µg/L	<0.2	<0.2	<0.2	<0.2
Surrogate TCMX	%	100	95	77	103

OP Pesticides in Water					
Our Reference		306806-1	306806-2	306806-3	306806-4
Your Reference	UNITS	103	104	108	111
Date Sampled		26/09/2022	26/09/2022	26/09/2022	26/09/2022
Type of sample		Water	Water	Water	Water
Date extracted	-	30/09/2022	30/09/2022	30/09/2022	30/09/2022
Date analysed	-	01/10/2022	01/10/2022	01/10/2022	01/10/2022
Dichlorvos	µg/L	<0.2	<0.2	<0.2	<0.2
Dimethoate	µg/L	<0.2	<0.2	<0.2	<0.2
Diazinon	µg/L	<0.2	<0.2	<0.2	<0.2
Chlorpyriphos-methyl	µg/L	<0.2	<0.2	<0.2	<0.2
Ronnel	µg/L	<0.2	<0.2	<0.2	<0.2
Fenitrothion	µg/L	<0.2	<0.2	<0.2	<0.2
Malathion	µg/L	<0.2	<0.2	<0.2	<0.2
Chlorpyriphos	µg/L	<0.2	<0.2	<0.2	<0.2
Parathion	µg/L	<0.2	<0.2	<0.2	<0.2
Bromophos ethyl	µg/L	<0.2	<0.2	<0.2	<0.2
Ethion	µg/L	<0.2	<0.2	<0.2	<0.2
Azinphos-methyl (Guthion)	µg/L	<0.2	<0.2	<0.2	<0.2
Surrogate TCMX	%	100	95	77	103

PCBs in Water					
Our Reference		306806-1	306806-2	306806-3	306806-4
Your Reference	UNITS	103	104	108	111
Date Sampled		26/09/2022	26/09/2022	26/09/2022	26/09/2022
Type of sample		Water	Water	Water	Water
Date extracted	-	30/09/2022	30/09/2022	30/09/2022	30/09/2022
Date analysed	-	01/10/2022	01/10/2022	01/10/2022	01/10/2022
Aroclor 1016	µg/L	<2	<2	<2	<2
Aroclor 1221	µg/L	<2	<2	<2	<2
Aroclor 1232	µg/L	<2	<2	<2	<2
Aroclor 1242	µg/L	<2	<2	<2	<2
Aroclor 1248	µg/L	<2	<2	<2	<2
Aroclor 1254	µg/L	<2	<2	<2	<2
Aroclor 1260	µg/L	<2	<2	<2	<2
Surrogate TCMX	%	100	95	77	103

Total Phenolics in Water					
Our Reference		306806-1	306806-2	306806-3	306806-4
Your Reference	UNITS	103	104	108	111
Date Sampled		26/09/2022	26/09/2022	26/09/2022	26/09/2022
Type of sample		Water	Water	Water	Water
Date extracted	-	04/10/2022	04/10/2022	04/10/2022	04/10/2022
Date analysed	-	04/10/2022	04/10/2022	04/10/2022	04/10/2022
Total Phenolics (as Phenol)	mg/L	<0.05	<0.05	<0.05	<0.05

HM in water - dissolved						
Our Reference		306806-1	306806-2	306806-3	306806-4	306806-5
Your Reference	UNITS	103	104	108	111	BD01
Date Sampled		26/09/2022	26/09/2022	26/09/2022	26/09/2022	26/09/2022
Type of sample		Water	Water	Water	Water	Water
Date prepared	-	30/09/2022	30/09/2022	30/09/2022	30/09/2022	30/09/2022
Date analysed	-	30/09/2022	30/09/2022	30/09/2022	30/09/2022	30/09/2022
Arsenic-Dissolved	µg/L	2	2	<1	<1	<1
Cadmium-Dissolved	µg/L	<0.1	<0.1	<0.1	0.1	0.1
Chromium-Dissolved	µg/L	<1	<1	<1	<1	<1
Copper-Dissolved	µg/L	4	2	4	<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	19	9	8	9	9
Zinc-Dissolved	µg/L	100	19	31	11	31

PFAS in Water LOW LEVEL Extend					
Our Reference		306806-1	306806-2	306806-3	306806-4
Your Reference	UNITS	103	104	108	111
Date Sampled		26/09/2022	26/09/2022	26/09/2022	26/09/2022
Type of sample		Water	Water	Water	Water
Date prepared	-	04/10/2022	04/10/2022	04/10/2022	04/10/2022
Date analysed	-	04/10/2022	04/10/2022	04/10/2022	04/10/2022
Perfluorobutanesulfonic acid	µg/L	<0.001	<0.001	0.002	<0.001
Perfluoropentanesulfonic acid	µg/L	<0.001	<0.001	<0.001	<0.001
Perfluorohexanesulfonic acid - PFHxS	µg/L	<0.001	<0.001	0.002	0.003
Perfluoroheptanesulfonic acid	µg/L	<0.001	<0.001	<0.001	<0.001
Perfluorooctanesulfonic acid PFOS	µg/L	0.001	0.001	0.004	0.005
Perfluorodecanesulfonic acid	µg/L	<0.002	<0.002	<0.002	<0.002
Perfluorobutanoic acid	µg/L	<0.02	<0.02	<0.02	<0.02
Perfluoropentanoic acid	µg/L	<0.002	<0.002	0.007	0.004
Perfluorohexanoic acid	µg/L	0.001	0.001	0.006	0.004
Perfluoroheptanoic acid	µg/L	<0.001	<0.001	0.004	0.003
Perfluorooctanoic acid PFOA	µg/L	<0.001	<0.001	0.008	0.009
Perfluorononanoic acid	µg/L	<0.001	<0.001	<0.001	<0.001
Perfluorodecanoic acid	µg/L	<0.002	<0.002	<0.002	<0.002
Perfluoroundecanoic acid	µg/L	<0.002	<0.002	<0.002	<0.002
Perfluorododecanoic acid	µg/L	<0.005	<0.005	<0.005	<0.005
Perfluorotridecanoic acid	µg/L	<0.01	<0.01	<0.01	<0.01
Perfluorotetradecanoic acid	µg/L	<0.05	<0.05	<0.05	<0.05
4:2 FTS	µg/L	<0.001	<0.001	<0.001	<0.001
6:2 FTS	µg/L	<0.001	<0.001	<0.001	<0.001
8:2 FTS	µg/L	<0.002	<0.002	<0.002	<0.002
10:2 FTS	µg/L	<0.002	<0.002	<0.002	<0.002
Perfluorooctane sulfonamide	µg/L	<0.01	<0.01	<0.01	<0.01
N-Methyl perfluorooctane sulfonamide	µg/L	<0.05	<0.05	<0.05	<0.05
N-Ethyl perfluorooctanesulfon amide	µg/L	<0.1	<0.1	<0.1	<0.1
N-Me perfluorooctanesulfonamid oethanol	µg/L	<0.05	<0.05	<0.05	<0.05
N-Et perfluorooctanesulfonamid oethanol	µg/L	<0.5	<0.5	<0.5	<0.5
MePerfluorooctanesulf- amid oacetic acid	µg/L	<0.004	<0.002	<0.002	<0.002
EtPerfluorooctanesulf- amid oacetic acid	µg/L	<0.004	<0.002	<0.002	<0.002
Surrogate $^{13}C_8$ *PFOS*	%	92	85	88	82
Surrogate $^{13}C_2$ *PFOA*	%	119	117	118	113
Extracted ISTD $^{13}C_3$ *PFBS*	%	95	92	89	86
Extracted ISTD $^{18}O_2$ *PFHxS*	%	97	93	96	93
Extracted ISTD $^{13}C_4$ *PFOS*	%	74	105	112	112
Extracted ISTD $^{13}C_4$ *PFBA*	%	86	84	86	89

PFAS in Water LOW LEVEL Extend					
Our Reference		306806-1	306806-2	306806-3	306806-4
Your Reference	UNITS	103	104	108	111
Date Sampled		26/09/2022	26/09/2022	26/09/2022	26/09/2022
Type of sample		Water	Water	Water	Water
Extracted ISTD $^{13}C_3$ *PFPeA*	%	62	53	56	64
Extracted ISTD $^{13}C_2$ *PFHxA*	%	85	75	77	87
Extracted ISTD $^{13}C_4$ *PFHpA*	%	97	91	94	96
Extracted ISTD $^{13}C_4$ *PFOA*	%	112	115	120	119
Extracted ISTD $^{13}C_5$ *PFNA*	%	86	99	105	94
Extracted ISTD $^{13}C_2$ *PFDA*	%	64	95	99	92
Extracted ISTD $^{13}C_2$ *PFUnDA*	%	46	97	107	103
Extracted ISTD $^{13}C_2$ *PFDoDA*	%	30	87	96	95
Extracted ISTD $^{13}C_2$ *PFTeDA*	%	68	88	96	92
Extracted ISTD $^{13}C_2$ *4:2FTS*	%	131	137	134	151
Extracted ISTD $^{13}C_2$ *6:2FTS*	%	106	136	148	130
Extracted ISTD $^{13}C_2$ *8:2FTS*	%	72	130	139	150
Extracted ISTD $^{13}C_8$ *FOSA*	%	53	74	75	74
Extracted ISTD d_3 *N MeFOSA*	%	92	89	89	91
Extracted ISTD d_5 *N EtFOSA*	%	95	90	94	96
Extracted ISTD d_7 *N MeFOSE*	%	95	99	102	94
Extracted ISTD d_9 *N EtFOSE*	%	96	92	94	94
Extracted ISTD d_3 *N MeFOSAA*	%	48	100	117	118
Extracted ISTD d_5 *N EtFOSAA*	%	43	120	137	139
Total Positive PFHxS & PFOS	µg/L	0.001	0.001	0.005	0.008
Total Positive PFOA & PFOS	µg/L	0.001	0.001	0.012	0.014
Total Positive PFAS	µg/L	0.002	0.002	0.033	0.028

Cations in water Dissolved					
Our Reference		306806-1	306806-2	306806-3	306806-4
Your Reference	UNITS	103	104	108	111
Date Sampled		26/09/2022	26/09/2022	26/09/2022	26/09/2022
Type of sample		Water	Water	Water	Water
Date digested	-	30/09/2022	30/09/2022	30/09/2022	30/09/2022
Date analysed	-	30/09/2022	30/09/2022	30/09/2022	30/09/2022
Calcium - Dissolved	mg/L	10	6.1	23	6.0
Magnesium - Dissolved	mg/L	50	9.8	14	19
Hardness	mgCaCO 3 /L	230	56	110	94

Method ID	Methodology Summary
Inorg-031	Total Phenolics by segmented flow analyser (in line distillation with colourimetric finish). Solids are extracted in a caustic media prior to analysis.
Metals-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	Soil samples are extracted with Dichloromethane/Acetone and waters with Dichloromethane and analysed by GC-FID. F2 = (>C10-C16)-Naphthalene as per NEPM B1 Guideline on Investigation Levels for Soil and Groundwater (HSLs Tables 1A (3, 4)). Note Naphthalene is determined from the VOC analysis.
Org-021	Soil samples are extracted with dichloromethane/acetone and waters with dichloromethane and analysed by GC-ECD.
Org-022/025	Soil samples are extracted with Dichloromethane/Acetone and waters with Dichloromethane and analysed by GC-MS/GC-MSMS.
Org-022/025	Soil samples are extracted with Dichloromethane/Acetone and waters with Dichloromethane and analysed by GC-MS/GC-MSMS. Benzo(a)pyrene TEQ as per NEPM B1 Guideline on Investigation Levels for Soil and Groundwater - 2013.
Org-023	Water samples are analysed directly by purge and trap GC-MS.
Org-023	Soil samples are extracted with methanol and spiked into water prior to analysing by purge and trap GC-MS. Water samples are analysed directly by purge and trap GC-MS. F1 = (C6-C10)-BTEX as per NEPM B1 Guideline on Investigation Levels for Soil and Groundwater.
Org-029	Soil samples are extracted with basified Methanol. Waters and soil extracts are directly injected and/or concentrated/extracted using SPE. TCLPs/ASLP leachates are centrifuged, the supernatant is then analysed (including amendment with solvent) - as per the option in AS4439.3. Analysis is undertaken with LC-MS/MS. PFAS results include the sum of branched and linear isomers where applicable. Please note that PFAS results are corrected for Extracted Internal Standards (QSM 5.3 Table B-15 terminology), which are mass labelled analytes added prior to sample preparation to assess matrix effects and verify processing of the sample. PFAS analytes without a commercially available mass labelled analogue are corrected vs a closely eluting mass labelled PFAS compound. Surrogates are also reported, in this context they are mass labelled PFAS compounds added prior to extraction but are used as monitoring compounds only (not used for result correction). Envicarb (or similar) is used discretionally to remove interfering matrix components. Please contact the laboratory if estimates of Measurement Uncertainty are required as per WA DER.

QUALITY CONTROL: VOCs in water						Duplicate			Spike Recovery %	
Test Description	Units	PQL	Method	Blank	#	Base	Dup.	RPD	LCS-W2	[NT]
Date extracted	-			01/10/2022	4	01/10/2022	02/10/2022		01/10/2022	[NT]
Date analysed	-			04/10/2022	4	04/10/2022	05/10/2022		04/10/2022	[NT]
Dichlorodifluoromethane	µg/L	10	Org-023	<10	4	<10	<10	0	[NT]	[NT]
Chloromethane	µg/L	10	Org-023	<10	4	<10	<10	0	[NT]	[NT]
Vinyl Chloride	µg/L	10	Org-023	<10	4	<10	<10	0	[NT]	[NT]
Bromomethane	µg/L	10	Org-023	<10	4	<10	<10	0	[NT]	[NT]
Chloroethane	µg/L	10	Org-023	<10	4	<10	<10	0	[NT]	[NT]
Trichlorofluoromethane	µg/L	10	Org-023	<10	4	<10	<10	0	[NT]	[NT]
1,1-Dichloroethene	µg/L	1	Org-023	<1	4	<1	<1	0	[NT]	[NT]
Trans-1,2-dichloroethene	µg/L	1	Org-023	<1	4	<1	<1	0	[NT]	[NT]
1,1-dichloroethane	µg/L	1	Org-023	<1	4	<1	<1	0	95	[NT]
Cis-1,2-dichloroethene	µg/L	1	Org-023	<1	4	<1	<1	0	[NT]	[NT]
Bromochloromethane	µg/L	1	Org-023	<1	4	<1	<1	0	[NT]	[NT]
Chloroform	µg/L	1	Org-023	<1	4	42	41	2	97	[NT]
2,2-dichloropropane	µg/L	1	Org-023	<1	4	<1	<1	0	[NT]	[NT]
1,2-dichloroethane	µg/L	1	Org-023	<1	4	<1	<1	0	97	[NT]
1,1,1-trichloroethane	µg/L	1	Org-023	<1	4	<1	<1	0	92	[NT]
1,1-dichloropropene	µg/L	1	Org-023	<1	4	<1	<1	0	[NT]	[NT]
Cyclohexane	µg/L	1	Org-023	<1	4	<1	<1	0	[NT]	[NT]
Carbon tetrachloride	µg/L	1	Org-023	<1	4	<1	<1	0	[NT]	[NT]
Benzene	µg/L	1	Org-023	<1	4	<1	<1	0	[NT]	[NT]
Dibromomethane	µg/L	1	Org-023	<1	4	<1	<1	0	[NT]	[NT]
1,2-dichloropropane	µg/L	1	Org-023	<1	4	<1	<1	0	[NT]	[NT]
Trichloroethene	µg/L	1	Org-023	<1	4	<1	<1	0	99	[NT]
Bromodichloromethane	µg/L	1	Org-023	<1	4	<1	<1	0	94	[NT]
trans-1,3-dichloropropene	µg/L	1	Org-023	<1	4	<1	<1	0	[NT]	[NT]
cis-1,3-dichloropropene	µg/L	1	Org-023	<1	4	<1	<1	0	[NT]	[NT]
1,1,2-trichloroethane	µg/L	1	Org-023	<1	4	<1	<1	0	[NT]	[NT]
Toluene	µg/L	1	Org-023	<1	4	<1	<1	0	[NT]	[NT]
1,3-dichloropropane	µg/L	1	Org-023	<1	4	<1	<1	0	[NT]	[NT]
Dibromochloromethane	µg/L	1	Org-023	<1	4	<1	<1	0	93	[NT]
1,2-dibromoethane	µg/L	1	Org-023	<1	4	<1	<1	0	[NT]	[NT]
Tetrachloroethene	µg/L	1	Org-023	<1	4	<1	<1	0	92	[NT]
1,1,1,2-tetrachloroethane	µg/L	1	Org-023	<1	4	<1	<1	0	[NT]	[NT]
Chlorobenzene	µg/L	1	Org-023	<1	4	<1	<1	0	[NT]	[NT]
Ethylbenzene	µg/L	1	Org-023	<1	4	<1	<1	0	[NT]	[NT]
Bromoform	µg/L	1	Org-023	<1	4	<1	<1	0	[NT]	[NT]
m+p-xylene	µg/L	2	Org-023	<2	4	<2	<2	0	[NT]	[NT]
Styrene	µg/L	1	Org-023	<1	4	<1	<1	0	[NT]	[NT]
1,1,2,2-tetrachloroethane	µg/L	1	Org-023	<1	4	<1	<1	0	[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	4	<1	<1	0	[NT]	[NT]
1,2,3-trichloropropane	µg/L	1	Org-023	<1	4	<1	<1	0	[NT]	[NT]
Isopropylbenzene	µg/L	1	Org-023	<1	4	<1	<1	0	[NT]	[NT]
Bromobenzene	µg/L	1	Org-023	<1	4	<1	<1	0	[NT]	[NT]
n-propyl benzene	µg/L	1	Org-023	<1	4	<1	<1	0	[NT]	[NT]
2-chlorotoluene	µg/L	1	Org-023	<1	4	<1	<1	0	[NT]	[NT]
4-chlorotoluene	µg/L	1	Org-023	<1	4	<1	<1	0	[NT]	[NT]
1,3,5-trimethyl benzene	µg/L	1	Org-023	<1	4	<1	<1	0	[NT]	[NT]
Tert-butyl benzene	µg/L	1	Org-023	<1	4	<1	<1	0	[NT]	[NT]
1,2,4-trimethyl benzene	µg/L	1	Org-023	<1	4	<1	<1	0	[NT]	[NT]
1,3-dichlorobenzene	µg/L	1	Org-023	<1	4	<1	<1	0	[NT]	[NT]
Sec-butyl benzene	µg/L	1	Org-023	<1	4	<1	<1	0	[NT]	[NT]
1,4-dichlorobenzene	µg/L	1	Org-023	<1	4	<1	<1	0	[NT]	[NT]
4-isopropyl toluene	µg/L	1	Org-023	<1	4	<1	<1	0	[NT]	[NT]
1,2-dichlorobenzene	µg/L	1	Org-023	<1	4	<1	<1	0	[NT]	[NT]
n-butyl benzene	µg/L	1	Org-023	<1	4	<1	<1	0	[NT]	[NT]
1,2-dibromo-3-chloropropane	µg/L	1	Org-023	<1	4	<1	<1	0	[NT]	[NT]
1,2,4-trichlorobenzene	µg/L	1	Org-023	<1	4	<1	<1	0	[NT]	[NT]
Hexachlorobutadiene	µg/L	1	Org-023	<1	4	<1	<1	0	[NT]	[NT]
1,2,3-trichlorobenzene	µg/L	1	Org-023	<1	4	<1	<1	0	[NT]	[NT]
Surrogate Dibromofluoromethane	%		Org-023	112	4	112	111	1	95	[NT]
Surrogate toluene-d8	%		Org-023	100	4	104	105	1	98	[NT]
Surrogate 4-BFB	%		Org-023	102	4	101	102	1	98	[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	-			02/10/2022	4	02/10/2022	02/10/2022		02/10/2022	[NT]
Date analysed	-			04/10/2022	4	04/10/2022	05/10/2022		04/10/2022	[NT]
TRH C_6 - C_9	µg/L	10	Org-023	<10	4	27	28	4	93	[NT]
TRH C_6 - C_{10}	µg/L	10	Org-023	<10	4	28	30	7	93	[NT]
Benzene	µg/L	1	Org-023	<1	4	<1	<1	0	94	[NT]
Toluene	µg/L	1	Org-023	<1	4	<1	<1	0	94	[NT]
Ethylbenzene	µg/L	1	Org-023	<1	4	<1	<1	0	93	[NT]
m+p-xylene	µg/L	2	Org-023	<2	4	<2	<2	0	92	[NT]
o-xylene	µg/L	1	Org-023	<1	4	<1	<1	0	93	[NT]
Naphthalene	µg/L	1	Org-023	<1	4	<1	<1	0	[NT]	[NT]
Surrogate Dibromofluoromethane	%		Org-023	112	4	112	111	1	95	[NT]
Surrogate toluene-d8	%		Org-023	100	4	104	105	1	98	[NT]
Surrogate 4-BFB	%		Org-023	102	4	101	102	1	98	[NT]

QUALITY CONTROL: svTRH (C10-C40) in Water						Duplicate			Spike Recovery %	
Test Description	Units	PQL	Method	Blank	#	Base	Dup.	RPD	LCS-W3	306806-1
Date extracted	-			30/09/2022	[NT]	[NT]	[NT]	[NT]	30/09/2022	30/09/2022
Date analysed	-			01/10/2022	[NT]	[NT]	[NT]	[NT]	01/10/2022	01/10/2022
TRH C_{10} - C_{14}	µg/L	50	Org-020	<50	[NT]	[NT]	[NT]	[NT]	88	105
TRH C_{15} - C_{28}	µg/L	100	Org-020	<100	[NT]	[NT]	[NT]	[NT]	91	109
TRH C_{29} - C_{36}	µg/L	100	Org-020	<100	[NT]	[NT]	[NT]	[NT]	86	92
TRH >C_{10} - C_{16}	µg/L	50	Org-020	<50	[NT]	[NT]	[NT]	[NT]	88	105
TRH >C_{16} - C_{34}	µg/L	100	Org-020	<100	[NT]	[NT]	[NT]	[NT]	91	109
TRH >C_{34} - C_{40}	µg/L	100	Org-020	<100	[NT]	[NT]	[NT]	[NT]	86	92
Surrogate o-Terphenyl	%		Org-020	77	[NT]	[NT]	[NT]	[NT]	117	108

QUALITY CONTROL: PAHs in Water - Low Level						Duplicate			Spike Recovery %	
Test Description	Units	PQL	Method	Blank	#	Base	Dup.	RPD	LCS-W2	[NT]
Date extracted	-			30/09/2022	[NT]	[NT]	[NT]	[NT]	30/09/2022	[NT]
Date analysed	-			01/10/2022	[NT]	[NT]	[NT]	[NT]	01/10/2022	[NT]
Naphthalene	µg/L	0.2	Org-022/025	<0.2	[NT]	[NT]	[NT]	[NT]	101	[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]	107	[NT]
Fluorene	µg/L	0.1	Org-022/025	<0.1	[NT]	[NT]	[NT]	[NT]	109	[NT]
Phenanthrene	µg/L	0.1	Org-022/025	<0.1	[NT]	[NT]	[NT]	[NT]	108	[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]	110	[NT]
Pyrene	µg/L	0.1	Org-022/025	<0.1	[NT]	[NT]	[NT]	[NT]	111	[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]	129	[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]	98	[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	109	[NT]	[NT]	[NT]	[NT]	96	[NT]

QUALITY CONTROL: Organochlorine Pesticides in Water						Duplicate			Spike Recovery %	
Test Description	Units	PQL	Method	Blank	#	Base	Dup.	RPD	LCS-W2	[NT]
Date extracted	-			30/09/2022	[NT]	[NT]	[NT]	[NT]	30/09/2022	[NT]
Date analysed	-			01/10/2022	[NT]	[NT]	[NT]	[NT]	01/10/2022	[NT]
alpha-BHC	µg/L	0.2	Org-022/025	<0.2	[NT]	[NT]	[NT]	[NT]	112	[NT]
HCB	µg/L	0.2	Org-022/025	<0.2	[NT]	[NT]	[NT]	[NT]	[NT]	[NT]
beta-BHC	µg/L	0.2	Org-022/025	<0.2	[NT]	[NT]	[NT]	[NT]	117	[NT]
gamma-BHC	µg/L	0.2	Org-022/025	<0.2	[NT]	[NT]	[NT]	[NT]	[NT]	[NT]
Heptachlor	µg/L	0.2	Org-022/025	<0.2	[NT]	[NT]	[NT]	[NT]	97	[NT]
delta-BHC	µg/L	0.2	Org-022/025	<0.2	[NT]	[NT]	[NT]	[NT]	[NT]	[NT]
Aldrin	µg/L	0.2	Org-022/025	<0.2	[NT]	[NT]	[NT]	[NT]	118	[NT]
Heptachlor Epoxide	µg/L	0.2	Org-022/025	<0.2	[NT]	[NT]	[NT]	[NT]	110	[NT]
gamma-Chlordane	µg/L	0.2	Org-022/025	<0.2	[NT]	[NT]	[NT]	[NT]	[NT]	[NT]
alpha-Chlordane	µg/L	0.2	Org-022/025	<0.2	[NT]	[NT]	[NT]	[NT]	[NT]	[NT]
Endosulfan I	µg/L	0.2	Org-022/025	<0.2	[NT]	[NT]	[NT]	[NT]	[NT]	[NT]
pp-DDE	µg/L	0.2	Org-022/025	<0.2	[NT]	[NT]	[NT]	[NT]	117	[NT]
Dieldrin	µg/L	0.2	Org-022/025	<0.2	[NT]	[NT]	[NT]	[NT]	128	[NT]
Endrin	µg/L	0.2	Org-022/025	<0.2	[NT]	[NT]	[NT]	[NT]	100	[NT]
Endosulfan II	µg/L	0.2	Org-022/025	<0.2	[NT]	[NT]	[NT]	[NT]	[NT]	[NT]
pp-DDD	µg/L	0.2	Org-022/025	<0.2	[NT]	[NT]	[NT]	[NT]	88	[NT]
Endrin Aldehyde	µg/L	0.2	Org-022/025	<0.2	[NT]	[NT]	[NT]	[NT]	[NT]	[NT]
pp-DDT	µg/L	0.2	Org-022/025	<0.2	[NT]	[NT]	[NT]	[NT]	[NT]	[NT]
Endosulfan Sulphate	µg/L	0.2	Org-022/025	<0.2	[NT]	[NT]	[NT]	[NT]	114	[NT]
Methoxychlor	µg/L	0.2	Org-022/025	<0.2	[NT]	[NT]	[NT]	[NT]	[NT]	[NT]
Surrogate TCMX	%		Org-022/025	105	[NT]	[NT]	[NT]	[NT]	93	[NT]

QUALITY CONTROL: OP Pesticides in Water						Duplicate			Spike Recovery %	
Test Description	Units	PQL	Method	Blank	#	Base	Dup.	RPD	LCS-W2	[NT]
Date extracted	-			30/09/2022	[NT]	[NT]	[NT]	[NT]	30/09/2022	[NT]
Date analysed	-			01/10/2022	[NT]	[NT]	[NT]	[NT]	01/10/2022	[NT]
Dichlorvos	µg/L	0.2	Org-022/025	<0.2	[NT]	[NT]	[NT]	[NT]	120	[NT]
Dimethoate	µg/L	0.2	Org-022/025	<0.2	[NT]	[NT]	[NT]	[NT]	[NT]	[NT]
Diazinon	µg/L	0.2	Org-022/025	<0.2	[NT]	[NT]	[NT]	[NT]	[NT]	[NT]
Chlorpyriphos-methyl	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]	93	[NT]
Fenitrothion	µg/L	0.2	Org-022/025	<0.2	[NT]	[NT]	[NT]	[NT]	95	[NT]
Malathion	µg/L	0.2	Org-022/025	<0.2	[NT]	[NT]	[NT]	[NT]	116	[NT]
Chlorpyriphos	µg/L	0.2	Org-022/025	<0.2	[NT]	[NT]	[NT]	[NT]	112	[NT]
Parathion	µg/L	0.2	Org-022/025	<0.2	[NT]	[NT]	[NT]	[NT]	99	[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]	107	[NT]
Azinphos-methyl (Guthion)	µg/L	0.2	Org-022/025	<0.2	[NT]	[NT]	[NT]	[NT]	[NT]	[NT]
Surrogate TCMX	%		Org-022/025	105	[NT]	[NT]	[NT]	[NT]	93	[NT]

QUALITY CONTROL: PCBs in Water						Duplicate			Spike Recovery %	
Test Description	Units	PQL	Method	Blank	#	Base	Dup.	RPD	LCS-W2	[NT]
Date extracted	-			30/09/2022	[NT]	[NT]	[NT]	[NT]	30/09/2022	[NT]
Date analysed	-			01/10/2022	[NT]	[NT]	[NT]	[NT]	01/10/2022	[NT]
Aroclor 1016	µg/L	2	Org-021	<2	[NT]	[NT]	[NT]	[NT]	[NT]	[NT]
Aroclor 1221	µg/L	2	Org-021	<2	[NT]	[NT]	[NT]	[NT]	[NT]	[NT]
Aroclor 1232	µg/L	2	Org-021	<2	[NT]	[NT]	[NT]	[NT]	[NT]	[NT]
Aroclor 1242	µg/L	2	Org-021	<2	[NT]	[NT]	[NT]	[NT]	[NT]	[NT]
Aroclor 1248	µg/L	2	Org-021	<2	[NT]	[NT]	[NT]	[NT]	[NT]	[NT]
Aroclor 1254	µg/L	2	Org-021	<2	[NT]	[NT]	[NT]	[NT]	124	[NT]
Aroclor 1260	µg/L	2	Org-021	<2	[NT]	[NT]	[NT]	[NT]	[NT]	[NT]
Surrogate TCMX	%		Org-021	105	[NT]	[NT]	[NT]	[NT]	93	[NT]

QUALITY CONTROL: Total Phenolics in Water					Duplicate				Spike Recovery %	
Test Description	Units	PQL	Method	Blank	#	Base	Dup.	RPD	LCS-W1	[NT]
Date extracted	-			04/10/2022	[NT]	[NT]	[NT]	[NT]	04/10/2022	[NT]
Date analysed	-			04/10/2022	[NT]	[NT]	[NT]	[NT]	04/10/2022	[NT]
Total Phenolics (as Phenol)	mg/L	0.05	Inorg-031	<0.05	[NT]	[NT]	[NT]	[NT]	103	[NT]

QUALITY CONTROL: HM in water - dissolved						Duplicate			Spike Recovery %	
Test Description	Units	PQL	Method	Blank	#	Base	Dup.	RPD	LCS-W1	306806-2
Date prepared	-			30/09/2022	1	30/09/2022	30/09/2022		30/09/2022	30/09/2022
Date analysed	-			30/09/2022	1	30/09/2022	30/09/2022		30/09/2022	30/09/2022
Arsenic-Dissolved	µg/L	1	Metals-022	<1	1	2	[NT]		96	[NT]
Cadmium-Dissolved	µg/L	0.1	Metals-022	<0.1	1	<0.1	[NT]		99	[NT]
Chromium-Dissolved	µg/L	1	Metals-022	<1	1	<1	[NT]		93	[NT]
Copper-Dissolved	µg/L	1	Metals-022	<1	1	4	[NT]		92	[NT]
Lead-Dissolved	µg/L	1	Metals-022	<1	1	<1	[NT]		93	[NT]
Mercury-Dissolved	µg/L	0.05	Metals-021	<0.05	1	<0.05	<0.05	0	97	77
Nickel-Dissolved	µg/L	1	Metals-022	<1	1	19	[NT]		92	[NT]
Zinc-Dissolved	µg/L	1	Metals-022	<1	1	100	[NT]		95	[NT]

QUALITY CONTROL: PFAS in Water LOW LEVEL Extend						Duplicate			Spike Recovery %	
Test Description	Units	PQL	Method	Blank	#	Base	Dup.	RPD	LCS-W1	[NT]
Date prepared	-			04/10/2022	[NT]	[NT]	[NT]	[NT]	04/10/2022	[NT]
Date analysed	-			04/10/2022	[NT]	[NT]	[NT]	[NT]	04/10/2022	[NT]
Perfluorobutanesulfonic acid	µg/L	0.001	Org-029	<0.001	[NT]	[NT]	[NT]	[NT]	94	[NT]
Perfluoropentanesulfonic acid	µg/L	0.001	Org-029	<0.001	[NT]	[NT]	[NT]	[NT]	109	[NT]
Perfluorohexanesulfonic acid - PFHxS	µg/L	0.001	Org-029	<0.001	[NT]	[NT]	[NT]	[NT]	100	[NT]
Perfluoroheptanesulfonic acid	µg/L	0.001	Org-029	<0.001	[NT]	[NT]	[NT]	[NT]	97	[NT]
Perfluorooctanesulfonic acid PFOS	µg/L	0.001	Org-029	<0.001	[NT]	[NT]	[NT]	[NT]	108	[NT]
Perfluorodecanesulfonic acid	µg/L	0.002	Org-029	<0.002	[NT]	[NT]	[NT]	[NT]	88	[NT]
Perfluorobutanoic acid	µg/L	0.002	Org-029	<0.002	[NT]	[NT]	[NT]	[NT]	99	[NT]
Perfluoropentanoic acid	µg/L	0.002	Org-029	<0.002	[NT]	[NT]	[NT]	[NT]	102	[NT]
Perfluorohexanoic acid	µg/L	0.001	Org-029	<0.001	[NT]	[NT]	[NT]	[NT]	98	[NT]
Perfluoroheptanoic acid	µg/L	0.001	Org-029	<0.001	[NT]	[NT]	[NT]	[NT]	103	[NT]
Perfluorooctanoic acid PFOA	µg/L	0.001	Org-029	<0.001	[NT]	[NT]	[NT]	[NT]	96	[NT]
Perfluorononanoic acid	µg/L	0.001	Org-029	<0.001	[NT]	[NT]	[NT]	[NT]	111	[NT]
Perfluorodecanoic acid	µg/L	0.002	Org-029	<0.002	[NT]	[NT]	[NT]	[NT]	107	[NT]
Perfluoroundecanoic acid	µg/L	0.002	Org-029	<0.002	[NT]	[NT]	[NT]	[NT]	99	[NT]
Perfluorododecanoic acid	µg/L	0.005	Org-029	<0.005	[NT]	[NT]	[NT]	[NT]	102	[NT]
Perfluorotridecanoic acid	µg/L	0.01	Org-029	<0.01	[NT]	[NT]	[NT]	[NT]	87	[NT]
Perfluorotetradecanoic acid	µg/L	0.05	Org-029	<0.05	[NT]	[NT]	[NT]	[NT]	111	[NT]
4:2 FTS	µg/L	0.001	Org-029	<0.001	[NT]	[NT]	[NT]	[NT]	100	[NT]
6:2 FTS	µg/L	0.001	Org-029	<0.001	[NT]	[NT]	[NT]	[NT]	90	[NT]
8:2 FTS	µg/L	0.002	Org-029	<0.002	[NT]	[NT]	[NT]	[NT]	102	[NT]
10:2 FTS	µg/L	0.002	Org-029	<0.002	[NT]	[NT]	[NT]	[NT]	108	[NT]
Perfluorooctane sulfonamide	µg/L	0.01	Org-029	<0.01	[NT]	[NT]	[NT]	[NT]	98	[NT]
N-Methyl perfluorooctane sulfonamide	µg/L	0.05	Org-029	<0.05	[NT]	[NT]	[NT]	[NT]	101	[NT]
N-Ethyl perfluorooctanesulfon amide	µg/L	0.1	Org-029	<0.1	[NT]	[NT]	[NT]	[NT]	93	[NT]
N-Me perfluorooctanesulfonamid oethanol	µg/L	0.05	Org-029	<0.05	[NT]	[NT]	[NT]	[NT]	108	[NT]
N-Et perfluorooctanesulfonamid oethanol	µg/L	0.5	Org-029	<0.5	[NT]	[NT]	[NT]	[NT]	102	[NT]
MePerfluorooctanesulf- amid oacetic acid	µg/L	0.002	Org-029	<0.002	[NT]	[NT]	[NT]	[NT]	101	[NT]
EtPerfluorooctanesulf- amid oacetic acid	µg/L	0.002	Org-029	<0.002	[NT]	[NT]	[NT]	[NT]	102	[NT]
Surrogate $^{13}C_8$ *PFOS*	%		Org-029	90	[NT]	[NT]	[NT]	[NT]	100	[NT]
Surrogate $^{13}C_2$ *PFOA*	%		Org-029	107	[NT]	[NT]	[NT]	[NT]	106	[NT]

QUALITY CONTROL: PFAS in Water LOW LEVEL Extend					Duplicate				Spike Recovery %	
Test Description	Units	PQL	Method	Blank	#	Base	Dup.	RPD	LCS-W1	[NT]
Extracted ISTD $^{13}C_3$ *PFBS*	%		Org-029	89	[NT]	[NT]	[NT]	[NT]	92	[NT]
Extracted ISTD $^{18}O_2$ *PFHxS*	%		Org-029	95	[NT]	[NT]	[NT]	[NT]	92	[NT]
Extracted ISTD $^{13}C_4$ *PFOS*	%		Org-029	107	[NT]	[NT]	[NT]	[NT]	85	[NT]
Extracted ISTD $^{13}C_4$ *PFBA*	%		Org-029	115	[NT]	[NT]	[NT]	[NT]	116	[NT]
Extracted ISTD $^{13}C_3$ *PFPeA*	%		Org-029	90	[NT]	[NT]	[NT]	[NT]	87	[NT]
Extracted ISTD $^{13}C_2$ *PFHxA*	%		Org-029	103	[NT]	[NT]	[NT]	[NT]	101	[NT]
Extracted ISTD $^{13}C_4$ *PFHpA*	%		Org-029	98	[NT]	[NT]	[NT]	[NT]	93	[NT]
Extracted ISTD $^{13}C_4$ *PFOA*	%		Org-029	108	[NT]	[NT]	[NT]	[NT]	99	[NT]
Extracted ISTD $^{13}C_5$ *PFNA*	%		Org-029	97	[NT]	[NT]	[NT]	[NT]	89	[NT]
Extracted ISTD $^{13}C_2$ *PFDA*	%		Org-029	97	[NT]	[NT]	[NT]	[NT]	87	[NT]
Extracted ISTD $^{13}C_2$ *PFUnDA*	%		Org-029	98	[NT]	[NT]	[NT]	[NT]	84	[NT]
Extracted ISTD $^{13}C_2$ *PFDoDA*	%		Org-029	97	[NT]	[NT]	[NT]	[NT]	91	[NT]
Extracted ISTD $^{13}C_2$ *PFTeDA*	%		Org-029	58	[NT]	[NT]	[NT]	[NT]	60	[NT]
Extracted ISTD $^{13}C_2$ *4:2FTS*	%		Org-029	129	[NT]	[NT]	[NT]	[NT]	126	[NT]
Extracted ISTD $^{13}C_2$ *6:2FTS*	%		Org-029	123	[NT]	[NT]	[NT]	[NT]	122	[NT]
Extracted ISTD $^{13}C_2$ *8:2FTS*	%		Org-029	126	[NT]	[NT]	[NT]	[NT]	107	[NT]
Extracted ISTD $^{13}C_8$ *FOSA*	%		Org-029	74	[NT]	[NT]	[NT]	[NT]	65	[NT]
Extracted ISTD d_3 *N MeFOSA*	%		Org-029	96	[NT]	[NT]	[NT]	[NT]	96	[NT]
Extracted ISTD d_5 *N EtFOSA*	%		Org-029	100	[NT]	[NT]	[NT]	[NT]	97	[NT]
Extracted ISTD d_7 *N MeFOSE*	%		Org-029	103	[NT]	[NT]	[NT]	[NT]	103	[NT]

QUALITY CONTROL: PFAS in Water LOW LEVEL Extend					Duplicate				Spike Recovery %	
Test Description	Units	PQL	Method	Blank	#	Base	Dup.	RPD	LCS-W1	[NT]
Extracted ISTD d_9 *N EtFOSE*	%		Org-029	92	[NT]	[NT]	[NT]	[NT]	96	[NT]
Extracted ISTD d_3 *N MeFOSAA*	%		Org-029	95	[NT]	[NT]	[NT]	[NT]	74	[NT]
Extracted ISTD d_5 *N EtFOSAA*	%		Org-029	102	[NT]	[NT]	[NT]	[NT]	91	[NT]

QUALITY CONTROL: Cations in water Dissolved						Duplicate			Spike Recovery %	
Test Description	Units	PQL	Method	Blank	#	Base	Dup.	RPD	LCS-W1	[NT]
Date digested	-			30/09/2022	1	30/09/2022	30/09/2022		30/09/2022	[NT]
Date analysed	-			30/09/2022	1	30/09/2022	30/09/2022		30/09/2022	[NT]
Calcium - Dissolved	mg/L	0.5	Metals-020	<0.5	1	10	10	0	88	[NT]
Magnesium - Dissolved	mg/L	0.5	Metals-020	<0.5	1	50	50	0	87	[NT]
Hardness	mgCaCO 3 /L	3	Metals-020	[NT]	1	230	230	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.

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

Measurement Uncertainty estimates are available for most tests upon request.

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

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

Report Comments

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

Douglas Partners
Geotechnics | Environment | Groundwater

CHAIN OF CUSTODY DESPATCH SHEET

Project No:	215851.00	**Suburb:**	Rouse Hill	**To:**	Envirolab
Project Manager:	Gavin Boyd	**Order Number:**		**Sampler:** RD	12 Ashley Street, Chatswood
Email:	gavin.boyd@douglaspartners.com.au; kristine.nicodemus@douglaspartners.com.au petrina.fielding@d			**Attn:**	Aileen Hie
Turnaround time:	☑ Standard ☐ 72 hour ☐ 48 hour ☐ 24 hour ☐ Same day				02 9910 6200 Ahie@envirolab.com.au
Prior Storage:	☑ Fridge ☐ Freezer ☐ Esky ☐ Shelf	**Do samples contain 'potential' HBM?**	☑ No ☐ Yes	(If YES, then handle, transport and store in accordance with FPM HAZID)	

Lab ID	Sample ID: Location / Other ID	Depth From	Depth To	Date Sampled	Sample Type: S - soil W - water M - Material	Container Type: G - glass P - plastic	Analytes: Combo 8L	VOCS	PFAS (low level)	Hardenss	HM8, PAH							Notes/ Preservation/ Additional Requirements
1	103			26/09/22	W	G/P	•	•	•	•								
2	104			26/09/22	W	G/P	•	•	•	•								
3	108			26/09/22	W	G/P	•	•	•	•								
4	111			26/09/22	W	G/P	•	•	•	•								
5	BD01			26/09/22	W	G/P					•							

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

Job No: 306806
Date Received: 28-9-22
Time Received: 13°?
Received By: TJHAW
Temp: Cool/Ambient
Cooling: Ice/Icepack
Security: Intact/Broken/None

Metals to analyse:		**LAB RECEIPT**	
Number of samples in container:	**Transported to laboratory by:**	**Lab Ref. No:**	306806
Send results to:	Douglas Partners Pty Ltd	**Received by:**	TJHAW
Address:	Unit 2, 593 Withers Road Rouse Hill **Phone:** 02 4666 0450	**Date & Time:**	28·9·22 1300
Relinquished by:	**Date:** **Signed:**	**Signed:**	

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

SAMPLE RECEIPT ADVICE

Client Details

Client	Douglas Partners Pty Ltd (Rouse Hill)
Attention	Gavin Boyd

Sample Login Details

Your reference	215851.00, Rouse Hill
Envirolab Reference	306806
Date Sample Received	28/09/2022
Date Instructions Received	28/09/2022
Date Results Expected to be Reported	06/10/2022

Sample Condition

Samples received in appropriate condition for analysis	Yes
No. of Samples Provided	5 Water
Turnaround Time Requested	Standard
Temperature on Receipt (°C)	12
Cooling Method	Ice Pack
Sampling Date Provided	YES

Comments

Nil

Please direct any queries to:

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

Analysis Underway, details on the following page:

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

Sample ID	VOCs in water	vTRH(C6-C10)/BTEXN in Water	svTRH (C10-C40) in Water	PAHs in Water - Low Level	Organochlorine Pesticides in Water	OP Pesticides in Water	PCBs in Water	Total Phenolics in Water	HM in water - dissolved	PFAS in Water LOW LEVEL Extend	Cations in water Dissolved
103	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
104	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
108	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
111	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
BD01				✓					✓		

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

Additional Info

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

Appendix L

Quality Assurance and Quality Control

Appendix L
Quality Assurance and Quality Control
240 Withers Road, Rouse Hill

L1.0 Field and Laboratory Data Quality Assurance and Quality Control

The field and laboratory data quality assurance and quality control (QA/QC) procedures and results are summarised in the following Table 1. Reference should be made to the field work methodology and the laboratory results / certificates of analysis for further details. The relative percentage difference (RPD) results, along with the other field QC samples are included at the end of this appendix in Tables QA1, QA2 and QA3.

Table 1: Field and Laboratory Quality Control

Item	Evaluation / Acceptance Criteria	Compliance
Analytical laboratories used	NATA accreditation	C
Holding times	Various based on type of analysis	PC
Intra-laboratory replicates	10% of primary samples; <30% RPD	C
Trip Spikes	1 per sampling event; 60-140% recovery	C
Trip Blanks	1 per sampling event; <PQL	C
Laboratory / Reagent Blanks	1 per batch; <PQL	C
Laboratory Duplicate	1 per lab batch; As laboratory certificate	C
Matrix Spikes	1 per lab batch; 70-130% recovery (inorganics); 60-140% recovery (organics)	C
Surrogate Spikes	All organics analysis; 70-130% recovery (inorganics); 60-140% recovery (organics)	C
Control Samples	1 per lab batch; 70-130% recovery (inorganics); 60-140% recovery (organics)	C
Standard Operating Procedures (SOP)	Adopting SOP for all aspects of the sampling field work	C

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

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

- The typically low actual differences in the concentrations of the replicate pairs where some RPD exceedances occurred, particularly for groundwater;
- The replicate pairs being collected from fill soils which by its nature is heterogeneous;
- Replicates, rather than homogenised duplicates, were used to minimise risk of volatile loss, hence greater variability can be expected;
- Most of the recorded concentrations being relatively close to the PQL;
- The majority of RPDs within a replicate pair being within the acceptable limits; and
- All other QA/QC parameters met the DQIs.

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

L2.0 Data Quality Indicators

The reliability of field procedures and analytical results was assessed against the following data quality indicators (DQIs) as outlined in NEPC *National Environment Protection (Assessment of Site Contamination) Measure 1999 (as amended 2013) [NEPM]* (NEPC, 2013):

- Completeness: a measure of the amount of usable data from a data collection activity;
- Comparability: the confidence (qualitative) that data may be considered to be equivalent for each sampling and analytical event;
- Representativeness: the confidence (qualitative) of data representativeness of media present on-site;
- Precision: a measure of variability or reproducibility of data; and
- Accuracy: a measure of closeness of the data to the 'true' value.

Table 2: Data Quality Indicators

Data Quality Indicator	Method(s) of Achievement
Completeness	Systematic locations sampled.
	Preparation of borehole logs, sample location plan and chain of custody records.
	Preparation of field sampling sheets.
	Laboratory sample receipt information received confirming receipt of samples intact and appropriateness of the chain of custody.
	Samples analysed for contaminants of potential concern (COPC) identified in the Conceptual Site Model (CSM).
	Completion of chain of custody (COC) documentation.
	NATA accredited laboratory results certificates provided by the laboratory.
	Satisfactory frequency and results for field and laboratory quality control (QC) samples as discussed in Section 1.
Comparability	Using appropriate techniques for sample recovery, storage and transportation, which were the same for the duration of the project.
	Experienced sampler(s) used.
	Use of NATA registered laboratories, with test methods the same or similar between laboratories.
	Satisfactory results for field and laboratory QC samples.
Representativeness	Target media sampled.
	Sample numbers recovered and analysed are considered to be representative of the target media and complying with DQOs.
	Samples were analysed in accordance with the COC.
Precision	Field staff followed standard operating procedures.
	Acceptable RPD between original samples and replicates.
	Satisfactory results for all other field and laboratory QC samples.
Accuracy	Field staff followed standard operating procedures.
	Satisfactory results for all field and laboratory QC samples.

Based on the above, it is considered that the DQIs have been generally complied with.

L3.0 Conclusion

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

L4.0 References

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

Douglas Partners Pty Ltd

Douglas Partners
Geotechnics / Environment / Groundwater

Table QA1: Relative Percentage Difference Results – Intra-laboratory Replicates

			Metals								TRH						BTEX				PAH			
			Arsenic	Cadmium	Total Chromium	Copper	Lead	Mercury (inorganic)	Nickel	Zinc	TRH C6 - C10	TRH >C10-C16	F1 ((C6-C10)-BTEX)	F2 (>C10-C16 less Naphthalene)	F3 (>C16-C34)	F4 (>C34-C40)	Benzene	Toluene	Ethylbenzene	Total Xylenes	Naphthalene [b]	Benzo(a)pyrene (BaP)	Benzo(a)pyrene TEQ	Total PAHs
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
BD1-08/09/2022	0 m	08/09/2022	9	<0.4	17	15	18	<0.1	6	17	<25	<50	<25	<50	<100	<100	<0.2	<0.5	<1	<1	<0.1	<0.05	<0.5	<0.05
BH113	0.1 - 0.2 m	08/09/2022	7	<0.4	15	8	17	<0.1	4	14	<25	<50	<25	<50	<100	<100	<0.2	<0.5	<1	<1	<0.1	<0.05	<0.5	<0.05
		Difference	2	0	2	7	1	0	2	3	0	0	0	0	0	0	0	0	0	0	0	0	0	0
		RPD	25%	0%	13%	**61%**	6%	0%	**40%**	19%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%
BD1-13/09/2022	0 m	13/09/2022	6	<0.4	23	8	17	<0.1	4	16	<25	<50	<25	<50	<100	<100	<0.2	<0.5	<1	<1	<0.1	<0.05	<0.5	<0.05
BH108	0.1 - 0.2 m	13/09/2022	8	<0.4	18	7	17	<0.1	3	18	<25	<50	<25	<50	<100	<100	<0.2	<0.5	<1	<1	<0.1	<0.05	<0.5	<0.05
		Difference	2	0	5	1	0	0	1	2	0	0	0	0	0	0	0	0	0	0	0	0	0	0
		RPD	29%	0%	24%	13%	0%	0%	29%	12%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%
BD2-13/09/2022	0 m	13/09/2022	8	<0.4	17	4	15	<0.1	3	10	<25	<50	<25	<50	<100	<100	<0.2	<0.5	<1	<1	<0.1	<0.05	<0.5	<0.05
BH111	0.4 - 0.5 m	13/09/2022	5	<0.4	16	3	10	<0.1	4	17	<25	<50	<25	<50	<100	<100	<0.2	<0.5	<1	<1	<0.1	<0.05	<0.5	<0.05
		Difference	3	0	1	1	5	0	1	7	0	0	0	0	0	0	0	0	0	0	0	0	0	0
		RPD	**46%**	0%	6%	29%	**40%**	0%	29%	**52%**	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%
BD3-13/09/2022	0 m	13/09/2022	6	<0.4	12	7	15	<0.1	4	10	<25	<50	<25	<50	<100	<100	<0.2	<0.5	<1	<1	<0.1	<0.05	<0.5	<0.05
		Difference																						
		RPD																						

Table QA2: Trip Blank Results - Soils (mg/kg)

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

Table QA3: Trip Spike Results – Soils (% Recovery)

Sample ID	Benzene	Toluene	Ethylbenzene	o-Xylene	m+p-Xylene
TS	108	118	122	116	120
Trip Spike	101	102	101	101	101