Douglas Partners
Geotechnics / Environment / Groundwater

Integrated Practical Solutions

Report on
Preliminary Site Investigation (Contamination)

Proposed Helipad
89 - 151 Old Castlereagh Road, Penrith

Prepared for
Colliers International Pty Ltd

Project 204635.01
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Douglas Partners
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Executive Summary

Douglas Partners Pty Ltd (DP) has been engaged by Colliers International Pty Ltd to complete this Preliminary Site Investigation for Contamination (PSI) at 89 - 151 Old Castlereagh Road, Penrith (the site). The investigation was initially commissioned to facilitate master planning of a larger development that was meant to occupy the majority of the site. However, based on information provided by the client it is understood that the larger development is on hold and the current development application is for a Helipad with ground disturbance works limited to the central portion of the site as described in Section 1. Whilst noting that the works area that is the subject of the development application is limited to the central portion of the site, this report, nevertheless, presents the results of the investigation for the overall site.

The investigation included a desktop review of site history, a site walkover, development of a preliminary conceptual site model (CSM), intrusive soil sampling from 34 test pits that were placed across the larger site, laboratory analysis for contaminants of potential concern (COPC) and interpretation of results with reference to current NSW EPA endorsed guidelines.

The reviewed site history sources indicate that the site was used for farmland from at least 1913 until 1961, then for sand and gravel quarrying from 1961 until 1989. In 1989 the site was acquired by the Penrith Lakes Development Corporation and was developed for commercial / light industrial purposes. The surrounding land has a similar history, with the majority of surrounding land being used for agricultural purposes until the 1960's, then for quarrying, commercial, industrial and recreational purposes. The site history sources indicate that backfilling has occurred at the site and immediate surrounds following quarrying.

Identified potential sources of contamination at the site include fill, former agricultural and quarrying land uses, hazardous building materials from the buildings and structures on the site, dangerous goods currently stored on site (i.e., flammable liquids, potential underground fuel storage tanks and chemical storage) and surrounding (up-gradient) commercial / industrial land uses including service stations, chemical manufacturing and waste generation facilities.

The investigation encountered two distinct 'types' of fill across the site. Within 'non-quarried' parts of the site, surficial fill comprising sands, gravelly sands, silty clays underlying silty / clayey topsoils or asphaltic pavements, was encountered to maximum depths of about 1 m below the surface. In the 'quarried' parts of the site, material inferred to be possible fill was encountered to significant depths, potentially up to 12.2 m below existing surface levels. The inferred fill typically comprised layers of sands and clays, with gravel. Various anthropogenic materials were encountered in several test pits including timber, asphaltic concrete, PVC pipe, brick rubble, glass and a possible asbestos containing fibre cement pipe. The fill was underlain by natural alluvial sands and clays.

Several fragments of potential asbestos-containing material were observed at the surface near site buildings.

The results of the intrusive soil investigation indicated that levels of contaminants in the analysed fill and natural soil samples are within the adopted site assessment criteria (SAC).

The fill soils at the site have been given a preliminary waste classification of General Solid Waste (non-putrescible). A formal waste classification including additional testing and visual inspection, is necessary

for all soils requiring future off-site disposal. Final classification of soils / gravel which are to be disposed off-site (either to landfill or for re-use) will also be required in accordance with the POEO Act.

Overall, the results of the current investigation have not identified indicators of widespread contamination at the site. Notwithstanding, given the reduced sampling density adopted for this preliminary intrusive investigation and noting that investigations have not been undertaken in the vicinity of the underground fuel tanks identified in the SafeWork NSW records, the potential for unidentified contamination pockets cannot be completely ruled out. As such, it is recommended that a Detailed Site Investigation (Contamination) (DSI) is undertaken. As the works that are the subject of the current development application are limited to the central portion of the site, the DSI could potentially target the proposed works area/s that is the subject of the current development application. Additionally, given that the proposed works area is currently occupied by buildings, the DSI may be more readily undertaken following the demolition of the site buildings / structures. The purpose of the proposed DSI will be to further evaluate the potential contamination status (including testing around PAEC identified during this PSI) and confirm the perceived low potential for widespread contamination. If the DSI identifies contamination, a soil vapour or groundwater investigation may be further recommended. In addition, the DSI should provide recommendations on the need for any further targeted investigation(s) and / or remediation (if deemed necessary).

A hazardous building material (HAZMAT) assessment is required for the existing site buildings. Hazardous materials, if present, will need to be removed in accordance with relevant legislation and guidelines prior to demolition.

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1. Introduction

Douglas Partners Pty Ltd (DP) has been engaged by Colliers International Pty Ltd to complete this preliminary site investigation (Contamination) (PSI) at a portion of 89 - 151 Old Castlereagh Road, Penrith (the site). The site is shown on Drawing 1, Appendix A. The investigation was undertaken in accordance with DP's proposal 204635.00 dated 7 May 2021.

The investigation was initially commissioned to facilitate master planning of a larger development that was meant to occupy the majority of the site. However, based on information provided by the client it is understood that the larger development is on hold and the current development application is for a Helipad with limited ground disturbance works in the central portion of the site as follows:

- Demolition of 2x single storey sheds and integrated hardstand extending beyond the footprint of the sheds;
- Demolition of 1 small single storey shed and associated pavement;
- Removal of 1 inground stromwater tank;
- Removal of 1 flood light;
- Removal of less than 10 trees;
- Reinstatement of grass turf in locations of removed hardstands and pavement;
- New concrete hardstand in location of existing concrete hardstands; and
- New lighting as required for the final approach and take-off (FATO) pad.

Whilst noting that the works area that is the subject of the development application is limited to the central portion of the site, this report, nevertheless, presents the results of the investigation for the overall site.

The objective of the PSI is to assess the potential for contamination at the site based on past and present land uses and to comment on the need for further investigation and / or management with regard to the proposed development. The PSI is required to address the Standard Secretary's Environmental Assessment Requirements (SEARs) for the development.

The investigation was undertaken concurrently with a geotechnical investigation[1], reported separately.

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

[1] DP, *Report on Geotechnical Investigation, Proposed Helicopter Facility, 89 - 151Old Castlereagh Road, Penrith*, dated September 2021, DP Reference: 204635.00.R.001.Rev1.

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).

2. Scope of Works

The NSW *Sampling Design Guidelines* 1995 recommends a minimum of 135 systematic grid-based sampling locations for a site area of 11.3 ha. A reduced / limited sampling density comprising 25% of the recommended sampling density (i.e., 33 test locations) has been adopted for this PSI to obtain preliminary data on the contamination status of the site.

The scope of works for this PSI included the following:

- Review of published site information, including:
  - Historical aerial photographs of the site and immediate surrounds;
  - Soil, geological, topographical, hydrogeological and acid sulphate soils (ASS) maps; and
  - Registered groundwater bore records.
- Review of previous reports prepared by DP for the site and immediate surrounds;
- Review of historical land title deed information;
- Review of NSW EPA records to determine the existence of statutory notices for the site, or adjacent land, under the *Contaminated Land Management Act 1997* and the *Protection of the Environment Operations Act 1997*;
- Review of publicly available Council Records available under the Government Information (Public Access) (GIPA) Act;
- Review of SafeWork NSW Records for the storage of dangerous goods and chemicals [not available at the time of reporting];
- Review of Council Section 10.7 (2 and 5) Planning Certificate [not available at the time of reporting];
- A site walkover to identify current site features and Potential Areas of Environmental Concern (PAEC);
- Preparation of a safe work method statement (SWMS) and field work safety environmental plan (FWSEP);
- Review of service plans obtained from a dial-before-you-dig (DBYD) services search, electronic scanning for services at the test locations and surveying of each test location using a differential GPS;
- Excavation of 20 test pits using an excavator to a depth of 0.1 m into natural soil, a maximum depth of 3.0 m bgl or prior refusal;
- Recording of pertinent field information including soil descriptions on test pit logs;

- Collection of soil samples from the 20 environmental test pits and the 14 test pits excavated for the geotechnical investigation (i.e., 34 locations) at regular depth intervals, at changes in strata and upon signs of contamination (i.e., odours or staining) to a depth of at least 1.0 m into natural soils;
- Recording of pertinent field information including soil descriptions on test pit logs;
- Screening of all soil samples with a photo-ionisation detector (PID) to assess the likely presence or absence of volatile organic compounds (VOC);
- Laboratory of selected soil samples for a range of commonly encountered contaminants including:
  - 8 heavy metals (arsenic, cadmium, chromium, copper, lead, mercury, nickel and zinc);
  - Total recoverable hydrocarbons (TRH);
  - Benzene, toluene, ethylbenzene and xylenes (BTEX);
  - Polycyclic aromatic hydrocarbons (PAH);
  - Organochlorine pesticides (OCP);
  - Organophosphorus pesticides (OPP);
  - Polychlorinated biphenyls (PCB);
  - Total phenols;
  - Per- and polyfluoroalkyl substances (PFAS); and
  - Asbestos (40 g soil screen).
- Field sampling and laboratory analysis in compliance with standard environmental protocols, including a Quality Assurance and Quality Control (QA / QC) Plan consisting of 10% replicate sampling, trip spikes, trip blanks, appropriate chain-of-custody procedures and in-house laboratory QA / QC testing;
- Development of a preliminary conceptual site model (CSM); and
- Preparation of this PSI report outlining the methodology and results of the assessment.

3. Site Information

Site Address	89 - 151 Old Castlereagh Road, Penrith
Legal Description	Lot 2, Deposited Plan 1013504
Area	The site: 11.3 ha Development area: 5 ha
Zoning	“Tourism” under the State Environmental Planning Policy (Penrith Lakes Scheme) 1989
Local Council Area	Penrith City Council
Current Use	Commercial The site forms part of the Penrith Lakes Site and is where the Penrith Lakes Development Corporation office is situated.

Surrounding Uses	North - Recreational - the Sydney International Regatta Centre ('Rowing Lake') East - Mostly landscaped areas. Beyond that are rural residential properties and a surface water body. South - Commercial / Industrial West - Commercial / Industrial comprising mostly open space

Figure 1: Site Location

The development area covers a portion of the site at 89 – 151 Old Castlereagh Road, Penrith as shown in Drawing 1, Appendix A. The site is currently occupied by several warehouse type buildings, storage sheds and office buildings. There is a man-made lake (Duck Pond) in the north-west corner of the site.

4. Environmental Setting

4.1 Topography

Regional topography slopes downwards to the west and north-west. Regional topography is shown on Figure 2.

Site topography slopes downwards to the north, sitting at 25.4 m relatively to Australian Height Datum (AHD) at the south site boundary to 17.4 m AHD at the north site boundary. Site topography is shown on Figure 3.

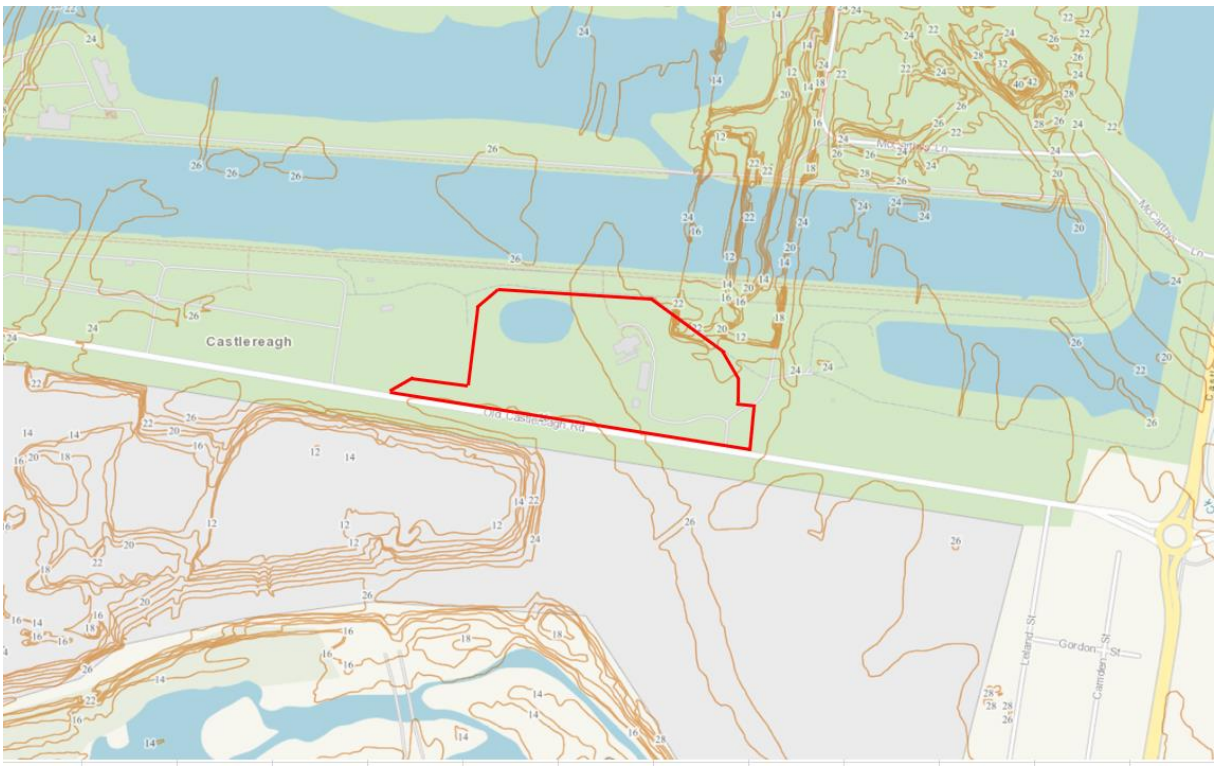


Figure 2: Regional Topography with 2 m Elevation Contours

Figure 3: Site Topography (surface levels obtained using dGPS)

4.2 Site Geology

The Sydney 1:100,000 Geology Sheet indicates that the site is underlain by Quaternary age alluvial sediment of the Cranebrook formation. The alluvium group comprises channel and flood plain alluvium; gravel, sand, silt and clay. The alluvial sediment is underlain by Bringelly Shale bedrock.

The Sydney 1:100,000 Soils Landscape Sheet indicates that the site is underlain by Richmond alluvial soils. The Richmond soils landscape group comprises poorly structured orange to red clay loams, clays and sands. Texture may increase with depth and ironstone nodules may be present. Plastic Clays are present in drainage lines. Deep acid non-calcic brown soils, red earths and red podzolic soils occur on terrace surfaces with earthy sands on terrace edges.

4.3 Acid Sulphate Soils

The site is not within a region of mapped acid sulphate soil risk. It is noted that acid sulphate soils mostly occur in low lying coastal areas, typically below RL 5 m AHD, and rarely above RL 10 m AHD. The nearest mapped region is the Nepean River to the south, where there is no known occurrence of acid sulphate soils.

4.4 Surface Water and Groundwater

The site is located over the Nepean River floodplain.

There is a pond located in the north-west portion of the site (known as Duck Pond). Based on site topography, surface water on the site is anticipated to flow into Duck Pond and the Regatta Centre 'Rowing Lake' north of the site.

A search of the publicly available registered groundwater bore indicated that there are 80 registered groundwater bores within 1 km of the site. The bores were registered for various purposes including domestic, monitoring, remediation and irrigation. The 7 groundwater bores that had recorded standing water level data are summarised in Table 1.

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

Bore ID Authorised Purpose	Location Relative to Site	Final Depth (m)	Standing Water Level (m bgl)
GW100913 Domestic	370 m east	14.0	1.2
GW100914 Domestic	275 m east	Not recorded	1.5
GW101892 Domestic	675 m north	14.3	6.7
GW107307 Monitoring	995 km south-east	13.2	7.5
GW107899 Monitoring Bore	1 km south-east	10.0	7.0
GW107900 Monitoring Bore	1 km south-east	10.0	7.0
GW108898 Monitoring Bore	1 km south	9.5	14.6

Based on the site regional topography, the anticipated flow direction of groundwater beneath the site is to the west and north-west, towards Duck Pond and the Rowing Lake north of the site, then the Hawkesbury River, the likely receiving surface water body for the groundwater flow path.

Given the local geology (i.e., alluvial sediment), the groundwater beneath the site is anticipated to be relatively fresh. Accordingly, potential beneficial uses could include irrigation or drinking water, although the future use of the groundwater for these purposes in the vicinity of the site is considered unlikely given the commercial / industrial setting.

5. Previous Investigations

DP has previously undertaken geotechnical investigations at the site. Reports relevant to this PSI summarised below are as follows:

- DP (2013), *Report on Desktop Assessment, Penrith Lakes Master Plan, Castlereagh*, Report Reference 73162, dated 21 February 2013. ‘
- Coffey (2014), *Landform Appraisal - Old Castlereagh Road Land Parcel*, Report Reference GEOTLCOV24000HB-CT, dated 12 June 2014.

5.1 (DP, 2013)

DP (2013) was undertaken for the development of the Penrith Lakes Master Plan directly north of the site. The report indicated that the pre-quarried subsurface profile around the site comprised fluvial sands, clays and silty sands to depths of between 6 m and 8 m, underlain by clayey gravel to depths of between 12 m and 20 m, underlain by shale or sandstone bedrock. Groundwater was understood to be between RL 10 m and RL 16 m AHD.

The report stated that the quarried areas of the site appeared to have been backfilled with overburden spoil, shaped into lakes / dams or used to store tailings.

The report also noted that rehabilitation works were understood the have occurred in quarried areas, particularly since 2001. The rehabilitation works were understood to have comprised earthworks including placement and compaction of imported fill.

5.2 (Coffey, 2014)

A Landform Appraisal was undertaken by Coffey (2014) which included a review of site history. The report indicated that alluvial sand and gravel extraction (i.e., quarrying) commenced at the site in about 1965 with material being excavated to bedrock. The report also indicated that the quarrying ceased about 30 m north of Old Castlereagh Road, except for a finger of land about 50 m wide beneath the current Muru Mittigar Aboriginal Cultural and Education Centre, as shown on Figure 4.

Figure 4: Historically Quarried Area of the Site [updated from Figure 2, Coffey (2014)]

The site history review found that backfilling of the quarried land commenced at the end of 1984 and the general landform profile at completion in March 1987 was summarised as scraper compacted fill (10 m - 13 m thick) over roller compacted fill (2 m - 4 m thick) over shale bedrock at about 11 m AHD. Previous intrusive investigations undertaken by Coffey at the site encountered fill that matched this profile. No records have been provided or reviewed which confirm the provenance or quality of the materials.

The report stated that the Muru Mittigar buildings were constructed at the site circa 1988, mostly located on the unmined portion of the site. The Penrith Lakes Development Corporation Site Office was constructed in 1993.

5.3 Other DP Investigations

Other DP investigations undertaken in the vicinity of the site, including intrusive investigations, have encountered fill to depths of up to 1.5 m underlain by natural clay or silty clay. Reports have estimated, however, that backfilled 'quarry overburden' could be present to depths of 10 m to 15 m at the site.

6. Site History

6.1 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 and other historical searches) is presented in Table 2a-2b. A copy of the title deeds is included in Appendix C.

Table 2a: Historical Title Deeds - part of site numbered (1) on attached Charting Map Extract, Appendix C

Date of Acquisition and Term Held	Registered Proprietor(s) & Occupations	Inferred Land Use
15.09.1913 (1913 to 1945)	Alan Long (Farmer)	Farmland
27.02.1945 (1945)	Elizabeth Ann Long (Widow)	Farmland
14.03.1945 (1945 to 1948)	Edward Lionel Shepherd (Dairyman)	Farmland
30.09.1948 (1948 to 1950)	Albert Milton Luck (Milk Vendor)	Farmland
25.01.1950 (1950 to 1953)	Evelyn Maude McKay (Married Woman)	Farmland
30.12.1954 (1954 to 1961)	Russell James Brown (Grazier)	Farmland
04.04.1961 (1961 to 1989)	River Sand and Gravel Pty Limited	Mining
13.10.1989 (1989 to date)	Penrith Lakes Development Corporation Limited #	Commercial / Industrial / Recreational

#: Denotes current registered proprietor

Table 3b: Historical Title Deeds - part of site numbered (2) on attached Charting Map Extract, Appendix C

Date of Acquisition and Term Held	Registered Proprietor(s) & Occupations	Inferred Land Use
25.01.1929 (1929 to 1937)	Josiah Stanton (Farmer)	Farmland
02.03.1937 (1937)	Lindsay John Stanton (Farmer) William Wellesley Lennox (Clerk)	Farmland
02.03.1937 (1937 to 1939)	Clarice Nation Broadbent (Married Woman)	Farmland
22.11.1939 (1939 to 1949)	David Broadbent (Farmer) Reginald Stanton Broadbent (Farmer)	Farmland
12.12.1949 (1949 to 1961)	Reginald Stanton Broadbent (Farmer)	Farmland
18.02.1961 (1961 to 1989)	River Sand and Gravel Pty Limited	Mining
13.10.1989 (1989 to date)	Penrith Lakes Development Corporation Limited #	Commercial / Industrial / Recreational

#: Denotes current registered proprietor

6.2 Historical Aerial Photography

Several historical aerial photographs were obtained from public databases. Extracts of the aerial photographs are included in Appendix D. A summary of key features observed for the site and surrounding land is presented in Table 4.

Table 4: Summary of Historical Aerial Photographs

Year	Site	Surrounding Land Use
1955	The site was covered by farmland. Plantations or orchards extended onto the east side of the site. Eight small buildings, likely residential dwellings and sheds were present in the middle of the site. The remainder of the site was appeared to be landscaped for agricultural purposes.	The surrounding land was used for agricultural purposes, with several plantations or orchards and possible grazing land. Small residential dwellings were present on some adjacent lots, although the surrounding land was largely absent of buildings. The Nepean River was visible approximately 650 m south of the site. A separate creek or river was visible approximately 500 m north-east of the site. No other water bodies were present on the surrounding land. Old Castlereagh Road ran along the south site boundary, consistent with its current orientation.
1975	The plantation or orchard that extended onto the site was no longer present and the site no longer appeared to be used for agricultural purposes. A diagonal cutting went through the centre of the site, possibly associated with sand / gravel mining or quarrying, or an ephemeral water body.	Many of the surrounding plantations or orchards and agricultural lots were cleared and appeared vacant / undeveloped. Mines or quarries were present approximately 50 m east, 600 m north-east and 500 m south-west of the site.
1979	The diagonal cutting through the site appeared to have been filled in.	The remaining plantations or orchards at surrounding lots were removed, although some agricultural land use was still apparent.
1986	All the buildings on the site except three were demolished. The site had significant ground disturbance with some tracks and appeared to have a possible extractive use.	The ground disturbance and possible mining use at the site extended to the site's adjacent lots, with no apparent agricultural land use remaining. Six mining / quarry pits were present to the south (across Old Castlereagh Road), west and north of the site.

Year	Site	Surrounding Land Use
		Several medium-sized, possible commercial buildings were constructed approximately 600 m south-east of the site.
1991	A large (500 m by 700 m) water body extended onto the north side of the site. The disturbed land on the site appeared to be at least partially restored and covered with new vegetation. The buildings formerly on the site were removed and replaced by one medium-sized commercial building (Muru Mittigar building). A new road or track was paved along the south site boundary.	Land to the north of the site was covered by the large mining / quarry pit or water body that extended onto the site. Surrounding pits and excavations to the south and east of the site changed in shape and orientation. The land to the west of the site appeared to be undergoing mining with significant ground disturbance and tracks.
2000	The pit or water body on the north side of the site was replaced by a smaller man-made lake (Duck Pond) in the north-west corner of the site. Several new commercial buildings were constructed on the east side of the site, including the Penrith Lakes Development Corporation office, along with a parking lot and paved road. The site appeared to be consistent with the current site layout.	The surrounding land underwent significant development with the north and east sides of the site being transformed into the Penrith Lakes Regional Park and Development. The park had several marinas, lines of trees and commercial buildings. The west side of the site was developed into parkland. A new road was constructed around the pits / water bodies south of the site (across Old Castlereagh Road).
2011	A road was extended to the west side of the site. A small building was constructed along the south site boundary.	The pit / water body south of the site (across Old Castlereagh Road) changed in shape, with several new tracks and disturbances. Land approximately 700 m south-east of the site underwent significant development for a commercial / industrial land use, and land approximately 600 m east of the site (across Castlereagh Road) was developed for a residential land use.

6.3 Public Registers and Planning Records

EPA Notices available under Section 58 of the Contaminated Lands Management Act (CLM Act) Database searched 3 June 2021	There were no records of Notices for the site. There was one site with an EPA notice within a 1.5 km search radius: • Crane Enfield Metals - 2115 Castlereagh Road, Penrith [1.5 km south-east] - metal industry - land declared as significantly contaminated land and is subject of an ongoing maintenance order.
Sites notified to EPA under Section 60 of the CLM Act Database searched 3 June 2021	The site was not listed as a notified contaminated site. There were four sites notified to the EPA within a 1.5 km search radius: • 7-Eleven Service Station - 212-222 Andres Road, Penrith [1.1 km south-east] - regulation under CLM act not required; • Caltex Service Station - Castlereagh Road, corner of Lugard Street, Penrith [1.2 km south-east] - regulation under the CLM act not required; • Crane Enfield Metals - 2115 Castlereagh Road, Penrith [1.5 km south-east] - metal industry - ongoing maintenance under the CLM Act required to manage residual contamination; and • Mirvac Industrial Site - 2101 Castlereagh Road, Penrith [1.4 km south-east] - regulation under the CLM act not required.
Licences listed under Section 308 of the Protection of the Environment Operations Act 1997 (POEO Act) Database searched 3 June 2021	There were no licences issued to the site. There were seven sites with licences within a 1.5 km search radius: • 5R Solutions Pty Ltd - 2115-2131 Castlereagh Road, Penrith [1.5 km south-east] - waste storage - POEO licence surrendered; • Capral Limited - 2115 Castlereagh Road, Penrith [1.5 km south-east] - metal waste generation - licence issued 2014; • Crane Enfield Metals - 2114 Castlereagh Road, Penrith [1.5 km south-east] - metal waste generation and processing - licence issued 2003; • Dorf Clark Industries Limited - 2101 Castlereagh Road, Penrith [1.4 km south-east] - POEO licence surrendered; • Meyer Timbers - 2101-2113 Castlereagh Road, Penrith [1.2 km south-east] - wood preservation - licence issued 2019; • Penrith Sewage Treatment System - 2151 Castlereagh Road, Penrith [1.5km south-east] - sewage treatment - licence issued 2000; and • Virbac - 2152 Castlereagh Road, Penrith [1.5 km south-east] - chemical production and waste generation - licence issued 2000.

SafeWork NSW	A SafeWork NSW search was ordered on 15 June 2021. The results of the search showed that the licenses for a 3000L underground petrol storage tank was renewed up to February 2006. Additionally, the records suggest that up to two other underground tanks may have also been installed at the site in 1964. However, based on the sketches provided in the SafeWork NSW results, it is not possible to identify the exact locations of the tanks. Copies of the SafeWork NSW are provided in Appendix F.
Planning Certificate(s)	Section 10.7 (2&5) were not available at the time of reporting.
Council Records	Several public records were available from Penrith City Council. The following relevant information was included in the records: • A Development Application (DA) submitted in 2014 (JBA Urban Planning Consultants Pty Ltd, February 2014) for the Penrith Lakes (which includes the site). The DA indicated that the surrounding area was mined for sand and gravel from the 1880's, with quarrying away from the Nepean River from the late 1950's. The Penrith Lakes Scheme concept was launched and implemented in the 1980's, which involved rehabilitation sections of the Castlereagh floodplain with quarrying operations. To implement the Scheme, four large lakes and water-related areas are being formed, with 75% of these works having been completed. A copy of the DA from the records is included in Appendix E.

6.4 Other Sources

A 1985 article accessed through the Trove digital database[2] indicated that the site and surrounding area was subject to the Penrith Lakes Scheme. The article stated that the area was acquired from farmland for sand and gravel extraction.

6.5 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 at all.

In particular, aerial photographs provide 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

[2] The Soil Conservation Service of NSW, *The Penrith Lakes Scheme*, Journal of Soil Conservation New South Wales Volume 41, No. 1, January 1985, available at <https://nla.gov.au/nla.obj-761064000/view?sectionId=nla.obj-762647424&searchTerm=penrith+lakes&partId=nla.obj-761067012#page/n0/mode/1up>, accessed 3 June 2021.

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.

6.6 Summary of Site History

Information on historical aerial photographs, council records and publicly available sources and historical leases suggest the site was divided into two separate lots and was used as farmland from at least 1913 until 1961, when it was acquired by River Sand and Gravel Pty Limited. From 1961 until 1989 it was used for alluvial sand and gravel quarrying. In 1989 the site was acquired by Penrith Lakes Development Corporation and was incorporated into the Penrith Lakes Scheme. Several commercial / light industrial buildings, including the Muru Mittigar building, the Penrith Lakes Development Corporation office and a paved road were constructed on the site at this time, developing it into its current commercial land use.

The site surrounding has a similar history, with agricultural land use until the 1950's, followed by a sand and gravel quarrying land use and incorporation into the Penrith Lakes Scheme from the early 1990's. The Penrith Lake Scheme is still being developed at this time, and it appears that some mining is still occurring south of the site. Residential and commercial developments were constructed east and south-east (up-gradient) of the site following the mining land use in that area. Some of these developments have been notified or licenced as contaminated for land uses such as service stations, waste storage, sewage treatment and chemical production.

Based on council records, restoration (rehabilitation) and redevelopment likely occurred at the site and surrounds following quarrying, however remediation records have not been provided and are not reviewed herein.

7. Site Walkover

A site walkover was undertaken by an environmental scientist on 24 May 2021. The general site topography was consistent with that described in Section 4.1. The site layout appears to have remained unchanged from the 2000 aerial photograph. The following key site features pertinent to the PSI were observed (refer to photographs in Appendix H). A map showing the photograph locations for reference is included as Drawing 3, Appendix A.

- The site was occupied by several warehouse type buildings, storage sheds and office buildings including the Muru Mittigar Aboriginal Cultural and Education Centre;
- An access road runs through the site, which had some cracking;
- A pond (Duck Pond) was located in the north-west portion of the site;
- The site had a commercial / light industrial use;
- Several general waste bins, drums and rubbish were observed around the site buildings;
- A buried pipe was observed in the south-west corner of the site beside the access road (photo 1);
- A telecom pit was observed along the south site boundary. It was presumed to not contain ACM based on visual appearance (photo 2);

- A gravel and concrete stockpile was present beside Duck Pond. No ACM or other anthropogenic material was observed in the stockpile (photo 3);
- A pumphouse with an electrical backing board (EBB) presumed to contain asbestos was located beside Duck Pond (photos 4 and 5);
- A chemical storage shipping container near the middle-south site boundary, with herbicide storage drums directly outside (photos 6 and 7). The trailer was locked and a detailed inspection was not undertaken. The trailer had a sign that read 'PLDC chemical store';
- An industrial garage with plant machinery and gas cylinders was observed in the middle of the site (photo 8);
- A flammable liquids storage locker was located near the main site buildings (photo 9);
- An embankment with an EPA Point notification sign with located near the north-east site boundary (photo 10);
- Potential ACM fragments were observed at the surface outside the Muru Mittigar building (photo 11);
- A telecom pit with suspected ACM lining was observed in the south-east corner of the site (photo 12); and
- The site was bounded by the Sydney International Regatta Centre ('Rowing Lake') to the north, Old Castlereagh Road to the south, a landscaped open space area with several commercial buildings and a lake to the east and an area with a light industrial use and racecourse to the west.

8. 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 and backfilling of quarries for site development. It is estimated that up to 15 m of fill could be present at the site, although no records have been provided or reviewed which confirm the provenance or quality of the materials.
  - o COPC include metals, total recoverable hydrocarbons (TRH), benzene, toluene, ethylbenzene, xylene (BTEX), polycyclic aromatic hydrocarbons (PAH), polychlorinated biphenyls (PCB), organochlorine pesticides (OCP), organophosphorus pesticides (OPP), phenols and asbestos.

- S2: Former agricultural land use[3].
  - COPC include metals, TRH, BTEX, OCP and OPP.
- S3: Former quarrying activities on site.
  - COPC include metals, TRH and BTEX.
- S4: Dangerous goods kept on site (i.e., flammable liquids and chemical storage identified during the site walkover and from SafeWork NSW records)
  - COPC include metals, TRH, BTEX, PAH, PCB, OCP, OPP, phenols and herbicides.
- S5: Buildings / structures on the site (present on site, possibly constructed between 1955 and 1975).
  - COPC include asbestos, synthetic mineral fibres (SMF), lead (in paint), PCB and herbicides.
- S6: Surrounding (up-gradient) commercial / industrial land uses such as service stations, chemical manufacturing and waste generation.
  - COPC include metals, TRH, BTEX, PAH and VOC,

Potential Receptors

The following potential human receptors have been identified:

- R1: Current and end users [commercial];
- R2: Construction and maintenance workers; and
- R3: Adjacent site users [commercial and recreational].

The following potential environmental receptors have been identified:

- R4: Surface water [lake on site and adjacent to site];
- R5: Groundwater; and
- R6: Terrestrial ecology.

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: Lateral migration of groundwater providing base flow to water bodies;
- P5: Leaching of contaminants and vertical migration into groundwater; and
- P6: Contact with terrestrial ecology.

[3] Given the time since the agricultural site use (est. 1955) and the short half-life of some pesticides such as carbamates, thiocarbamates, dithiocarbonates and synthetic pyrethroids (i.e., less than one year), these have not been listed as contaminants of concern associated with the site's former agricultural land use.

Summary of Potentially Complete Exposure Pathways

A 'source–pathway–receptor' approach has been used to assess the potential risks of harm being caused to human or environmental receptors from contamination sources on or in the vicinity of the site, via exposure pathways (potential complete pathways). The possible pathways between the above sources (S1 to S4) and receptors (R1 to R7) are provided in below 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, PCB, OCP, OPP, phenols and asbestos. **S2: Former agricultural land use** Metals, TRH, BTEX, OCP and OPP. **S3: Former quarrying activities** Metals, TRH and BTEX. **S4: Dangerous goods / chemicals on site** Metals, TRH, BTEX, PAH, PCB, OCP, OPP, PCB, phenols and herbicides.	P1: Ingestion and dermal contact P2: Inhalation of dust and/or vapours	R1: Current and end users [commercial] R2: Construction and maintenance workers	An intrusive investigation to identify the presence and nature of fill (included in this PSI). Additional soil sampling for site coverage consistent with sampling design guidelines, The DSI should including soil sampling and analysis for herbicides, which have been identified as a COPC in this investigation. Intrusive investigation of groundwater and / or soil vapour (if required) based on the results of the soil investigation.
	P2: Inhalation of dust and/or vapours	R3: Adjacent site users [commercial and recreational].	
	P3: Surface water run-off P4: Lateral migration of groundwater providing base flow to water bodies	R4: Surface water [lakes on and adjacent to site]	
	P5: Leaching of contaminants and vertical migration into groundwater	R5: Groundwater	
	P6: Contact with terrestrial ecology	R6: Terrestrial ecology	
S5: Site buildings / structures Asbestos, SMF, lead, PCB and herbicides.	P1: Ingestion and dermal contact P2: Inhalation of dust and/or vapours	R1: Current and end users [commercial] R2: Construction and maintenance workers	
S6: Surrounding industrial / commercial land uses	P5: Leaching of contaminants and vertical migration into groundwater [and onto site]	R1: Current and end users [commercial] R2: Construction and maintenance workers	

Source and COPC	Transport Pathway	Receptor	Risk Management Action
Metals, TRH, BTEX and PAH		R4: Surface water [lakes on and adjacent to site] R5: Groundwater	

Notes:

1. Non-persistent herbicides and pesticides associated with former agricultural site use have not been listed as potential contaminants of concern due to the short half-life of those contaminants and their likely biodegradation.

9. Sampling and Analysis Quality Plan

9.1 Data Quality Objectives

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

9.2 Soil Sampling Rationale

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

A systematic sampling strategy based on NSW EPA *Contaminated Sites, Sampling Design Guidelines* (NSW EPA, 1995) to determine test pit locations which was adopted based on areas of access. Test pit locations are shown on Drawing 2, in Appendix A.

Table A of NSW EPA (1995) recommends a minimum of 135 sampling points for a site of 11.3 ha for site characterisation based on the detection of circular hot spots using a systemic grid sampling pattern. Given the size of the site, a reduced sampling density comprising 25% of the minimum recommended sampling points (i.e., 34 test pits) was adopted to gain preliminary data on the contamination status of the site. Test locations were positioned across accessible parts of the site, excluding the footprints of the existing commercial buildings due to access constraints.

PAEC identified in the CSM, including the site building / structure footprints and dangerous goods / chemicals storage, should be targeted in future site investigations (i.e., the proposed DSI as discussed in Section 13).

Soil samples were collected from each test pit at approximately the surface, 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 J.

10. Site Assessment Criteria

The Site Assessment Criteria (SAC) applied in the current investigation are informed by the CSM (Section 8) which identified human and environmental receptors to potential contamination on the site. Analytical results are assessed (as a Tier 1 assessment) against the SAC comprising primarily the investigation and screening levels of Schedule B1 of NEPC (2013).

The investigation and screening levels applied in the current investigation comprise levels adopted for a generic commercial / industrial land use scenario. The derivation of the SAC is included in Appendix K and the adopted SAC are listed on the summary analytical results tables in Appendix M.

11. Results

11.1 Field Work Results

The borehole logs for this assessment are included in Appendix L. A summary of the typical subsurface conditions encountered at the site is presented below (including conditions encountered through cone penetration testing (CPTu) at 16 additional locations undertaken for the geotechnical investigation.

Topsoil / Fill

Generally comprising two distinct 'types' of fill across the site.

Within the region shown as 'non-quarried land' on Figure 4 (Section 5.2), surficial fill, typically comprising sands, gravelly sands, silty clays underlying silty / clayey topsoils or asphaltic pavements, was encountered to maximum depths of about 1 m below the surface. The surficial fill in these areas typically appeared variably compacted.

Generally, beyond the region shown as 'non-quarried land' on Figure 4 (Section 5.2), material inferred to be possible fill was encountered to significant depths, potentially up to 12.2 m below existing surface levels. The inferred fill typically comprised layers of sands and clays, with gravel (possibly site won from nearby quarrying activities), and generally appeared variably compacted.

Various anthropogenic materials were encountered in test pits TP26, TP28, TP29 and TP30 including timber, asphaltic concrete, PVC pipe, brick rubble, glass and a possible asbestos containing fibre cement pipe.

Alluvial Sediments

Underlying the fill, alluvial sediments were typically encountered to the investigation limits or refusal (typically inferred to be on gravel), to depths of between 2.2 m and 8.6 m in the 'non-quarried' areas, and to depths of between 5.9 m and 15 m in the 'quarried' areas.

The alluvial sediments generally comprised interbedded loose to very dense sands, and firm to hard clays.

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

No free groundwater was observed during excavation of test pits. Groundwater was observed in three of the geotechnical CPTu locations, as summarised in Table 5 below.

Table 5: Summary of Groundwater Observations

Location	Date	Depth to Groundwater (m)	Groundwater Elevation (m AHD)
6	19/05/21	5.5	19.9
7	19/05/21	6.1	19.8
12	19/05/21	5.6	17.9

It should be noted that groundwater levels are transient and may fluctuate in response to seasonal and climatic variations.

As noted in Section 7, several fragments of potential ACM were observed at the surface (A01) near site buildings, with one being collected for laboratory analysis.

11.2 Laboratory Analytical Results

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

- Table M1: Summary of Results of Soil Analysis; and
- Table M2: Summary of Preliminary Waste Classification Assessment.

The laboratory certificate of analysis together with the chain of custody and sample receipt information is provided in Appendix N.

12. Discussion

12.1 Soils

The analytical results for all contaminants tested in all samples were below the SAC.

Reported concentrations of BTEX, OCP, OPP, PCB, phenols and asbestos in all samples were below the laboratory practical quantitation limit (PQL).

Reported concentrations of some metals, TRH and PAH were above the PQL in some fill samples, but below the SAC.

The sample of potential ACM (A01) collected from the surface near the Muru Mittigar building did not contain asbestos. It is noted that the fragment tested was one of several observed and it is considered that the other fragments may contain asbestos.

12.2 Preliminary Waste Classification Assessment

In order to assess the potential waste classification for fill soils, a preliminary waste classification of fill soils in the boreholes was undertaken.

The NSW EPA (2014) *Waste Classification Guidelines* contains a six step procedure for determining the type of waste and the waste classification. Part of the procedure, for materials not classified as special waste or pre-classified waste, is a comparison of analytical data initially against contaminant threshold (CT) values specific to a waste category. Alternatively, the data can be assessed against specific contaminant concentration (SCC) thresholds when used in conjunction with TCLP thresholds.

The CT, SCC, and TCLP values relevant to this preliminary waste classification are shown in Table M2, Appendix M.

The following Table 6 presents the results of the six-step procedure outlined in EPA (2014) for determining the type of waste and the waste classification. This process applies to the fill at the site.

Table 6: Six Step Classification

Step	Comments	Rationale
1. Is it special waste?	No	No Asbestos-Containing Materials (ACM), coal tar, clinical or related waste, or waste tyres were detected in any samples or observed on the site surface or in any of the boreholes. Asbestos was not detected by the analytical laboratory, however, building rubble and potential ACM fragments were observed in the surface and in the fill. Therefore, it is considered possible that asbestos is present at the site.
2. Is it liquid waste?	No	Materials composed of a soil matrix.
3. Is the waste "pre-classified"?	No	The fill is not pre-classified with reference to NSW EPA (2014). The natural material, if classified as VENM, is pre-classified as General Solid Waste (non-putrescible).
4. Does the Waste have hazardous waste characteristics	No	The fill was not observed to contain or considered at risk to contain explosives, gases, flammable solids, oxidising agents, organic peroxides, toxic substances, corrosive substances, coal tar, batteries, lead paint or dangerous goods containers.
5. Chemical Assessment	Conducted	Refer to Table 2 in Appendix M.
6. Is the waste putrescible or non-putrescible?	Non-putrescible	The fill does not contain materials considered to be putrescible[a].

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

All contaminant concentrations for the analysed fill were within the CT1s for General Solid Waste with the exception of benzo(a)pyrene in TP17/0-0.08, with a concentration of 0.98 mg/kg. TCLP analysis was conducted for PAH on that sample and the SCC and TCLP concentrations were within the contaminant thresholds SCC1 and TCLP1 for General Solid Waste. Consequently, the preliminary classification for the fill material across the site is General Solid Waste (non-putrescible).

Note: The information provided in this section does not constitute a formal waste classification for off-site disposal purposes. Should any fill or soils require off-site disposal a formal waste classification assessment must be undertaken and reported. In addition, if any soil or fill materials are designated for off-site re-use then a formal classification must be undertaken under the appropriate Resource Recovery Order. The preliminary waste classification does not apply to the subsurface pipes and telecom pits identified at the site, which should be assessed and removed by a licenced operator.

12.3 Data Quality Assurance and Quality Control

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

13. Conclusions and Recommendations

DP has been engaged by Colliers International Pty Ltd to complete this PSI at 89 - 151 Old Castlereagh Road, Penrith (the site). The investigation was initially commissioned to facilitate master planning of a larger development that was meant to occupy the majority of the site. However, based on information provided by the client it is understood that the larger development is on hold and the current development application is for a Helipad with ground disturbance works limited to the central portion of the site as described in Section 1. Whilst noting that the works area that is the subject of the development application is limited to the central portion of the site, this report, nevertheless, presents the results of the investigation for the overall site.

Based on the site history information reviewed herein, the site is understood to have been used for farmland until 1961, at which time it was acquired by River Sand and Gravel Pty Limited and used for alluvial sand and gravel quarrying. In 1989 the site was acquired by Penrith Lakes Development Corporation and developed into its current commercial / light industrial land use.

The site's surrounding has a similar history, with agricultural land use until the 1950's, followed by a mining land use and incorporation into the Penrith Lakes Scheme from the early 1990's. Residential and commercial developments were constructed east and south-east (up-gradient) of the site following the mining land use in that area. Some of these developments have been notified or licenced as contaminated for land uses.

The results of the SafeWork NSW search showed that a license for a 3000L underground petrol storage tank was renewed up to February 2006. Additionally, the records suggest that up to two other underground tanks may have also been installed at the site in 1964. However, based on the sketches provided in the SafeWork NSW results, it is not possible to identify the exact locations of the tanks.

Section 10.7 (2 & 5) Planning Certificates were not available at the time of reporting. Once received, the results of these records will be included in a revised version of this report if they provide any information pertaining to contamination at the site.

Identified potential sources of contamination at the site include fill, former agricultural and quarrying land uses, hazardous building materials from the buildings and structures on the site, dangerous goods currently stored on site (i.e., flammable liquids, underground tanks and chemical storage) and surrounding (up-gradient) commercial / industrial land uses including service stations, chemical manufacturing and waste generation facilities.

The intrusive investigation including soil sampling from 34 test pits encountered two distinct 'types' of fill across the site. Within 'non-quarried' parts of the site, surficial fill comprising sands, gravelly sands, silty clays underlying silty / clayey topsoils or asphaltic pavements, was encountered to maximum depths of about 1 m below the surface. In the 'quarried' parts of the site, material inferred to be possible fill was encountered to significant depths, potentially up to 12.2 m below existing surface levels. The inferred fill typically comprised layers of sands and clays, with gravel. Various anthropogenic materials were encountered in test pits near the site buildings including timber, asphaltic concrete, PVC pipe, brick rubble, glass and a possible asbestos containing fibre cement pipe. The fill was underlain by natural alluvial sands and clays. Groundwater was observed in three of the geotechnical CPTu locations, with groundwater measured between 5.5 and 6.1 m bgl. Several fragments of potential asbestos-containing material were observed at the surface near site buildings, with one collected for analysis.

Although the fragment of potential ACM collected at the surface and tested did not contain asbestos, other potential ACM fragments and building rubble were observed at the surface. It is therefore considered possible that ACM may be present at the site, particularly within and around site structures.

The results of the intrusive soil investigation indicated that levels of contaminants in the fill and natural soils are within the adopted SAC.

The fill soils at the site have been given a preliminary waste classification of General Solid Waste (non-putrescible). A formal waste classification including additional testing and visual inspection, is necessary for all soils requiring future off-site disposal. The preliminary waste classification does not apply to the subsurface pipes and telecom pits identified at the site, which should be assessed and removed by a licenced operator.

Overall, the results of the current investigation have not identified indicators of widespread contamination at the site. Notwithstanding, given the reduced sampling density adopted for this preliminary intrusive investigation and noting that investigations have not been undertaken in the vicinity of the underground fuel tanks identified in the SafeWork NSW records, the potential for unidentified contamination pockets cannot be completely ruled out. As such, it is recommended that a Detailed Site Investigation (Contamination) (DSI) is undertaken. As the works that are the subject of the current development application are limited to the central portion of the site, the DSI could potentially target the proposed works area/s that is the subject of the current development application. Additionally, given that the proposed works area is currently occupied by buildings, the DSI may be more readily undertaken following the demolition of the site buildings / structures. The purpose of the proposed DSI will be to further evaluate the potential contamination status (including testing around PAEC identified during this PSI) and confirm the perceived low potential for widespread contamination. If the DSI identifies contamination, a soil vapour or groundwater investigation may be further recommended. In addition,

the DSI should provide recommendations on the need for any further targeted investigation(s) and / or remediation (if deemed necessary).

A hazardous building material (HAZMAT) assessment is required for the existing site buildings. Hazardous materials, if present, will need to be removed in accordance with relevant legislation and guidelines prior to demolition.

14. References

Coffey. (2014). *Landform Appraisal - Old Catlereagh Road Land Parcel.* dated 12 June 2014: Reference GEOTLCOV24000HB-CT.

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

DP. (2013). *Report on Desktop Assessment, Penrith Lakes Master Plan, Castlereagh.* Douglas Partners Pty Ltd: Reference 73162.

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

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

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

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

15. Limitations

Douglas Partners (DP) has prepared this report for this project at 89 - 151 Old Castlereagh Road, Penrith in accordance with DP's proposal 204635.00.P.001.Rev0 dated 7 May 2021 and acceptance received from Scott Anderson of Colliers International Pty Ltd. The work was carried out under DP's Conditions of Engagement. This report is provided for the exclusive use of Colliers International Pty Ltd for this project only and for the purposes as described in the report. It should not be used by or relied upon for other projects or purposes on the same or other site or by a third party. Any party so relying upon this report beyond its exclusive use and purpose as stated above, and without the express written consent of DP, does so entirely at its own risk and without recourse to DP for any loss or damage. In preparing this report DP has necessarily relied upon information provided by the client and/or their agents.

The results provided in the report are indicative of the sub-surface conditions on the site only at the specific sampling and/or testing locations, and then only to the depths investigated and at the time the

work was carried out. Sub-surface conditions can change abruptly due to variable geological processes and also as a result of human influences. Such changes may occur after DP's field testing has been completed.
DP's advice is based upon the conditions encountered during this investigation. The accuracy of the advice provided by DP in this report may be affected by undetected variations in ground conditions across the site between and beyond the sampling and/or testing locations. The advice may also be limited by budget constraints imposed by others or by site accessibility.

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

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

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

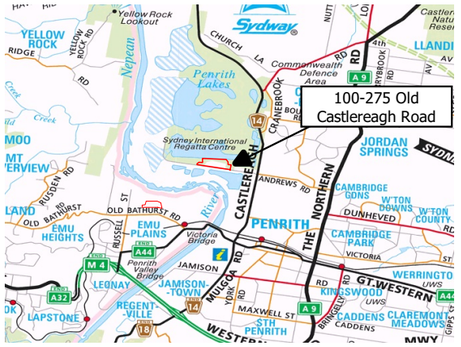
Asbestos has not been detected by observation or by laboratory analysis, either on the surface of the site, or in filling materials at the test locations sampled and analysed. Building demolition materials, such as concrete and brick, were, however, observed at the site surface, and these are considered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

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

Douglas Partners Pty Ltd

Appendix A

Drawings



LOCALITY MAP

Notes:
1. Basemap from metromap.com (dated 29/08/2020)

Legend

- Site Boundary
- Proposed Development Area

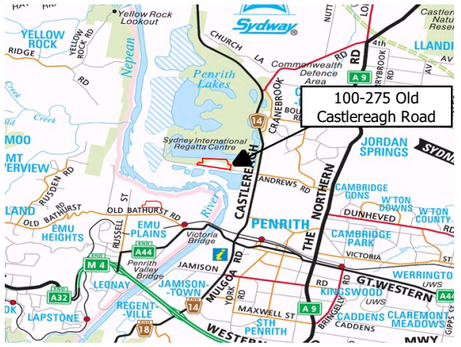
0 80 160 240 m

Douglas Partners
Geotechnics / Environment / Groundwater

CLIENT:	Colliers International Pty Ltd		
OFFICE:	Sydney	DRAWN BY:	AS
SCALE:	1:3600 @ A3	DATE:	01.06.2021

TITLE: **Site Layout**
Proposed Helicopter Facility
89 - 151 Old Castlereagh Road, Penrith

PROJECT No:	204635.01
DRAWING No:	1
REVISION:	1



LOCALITY MAP

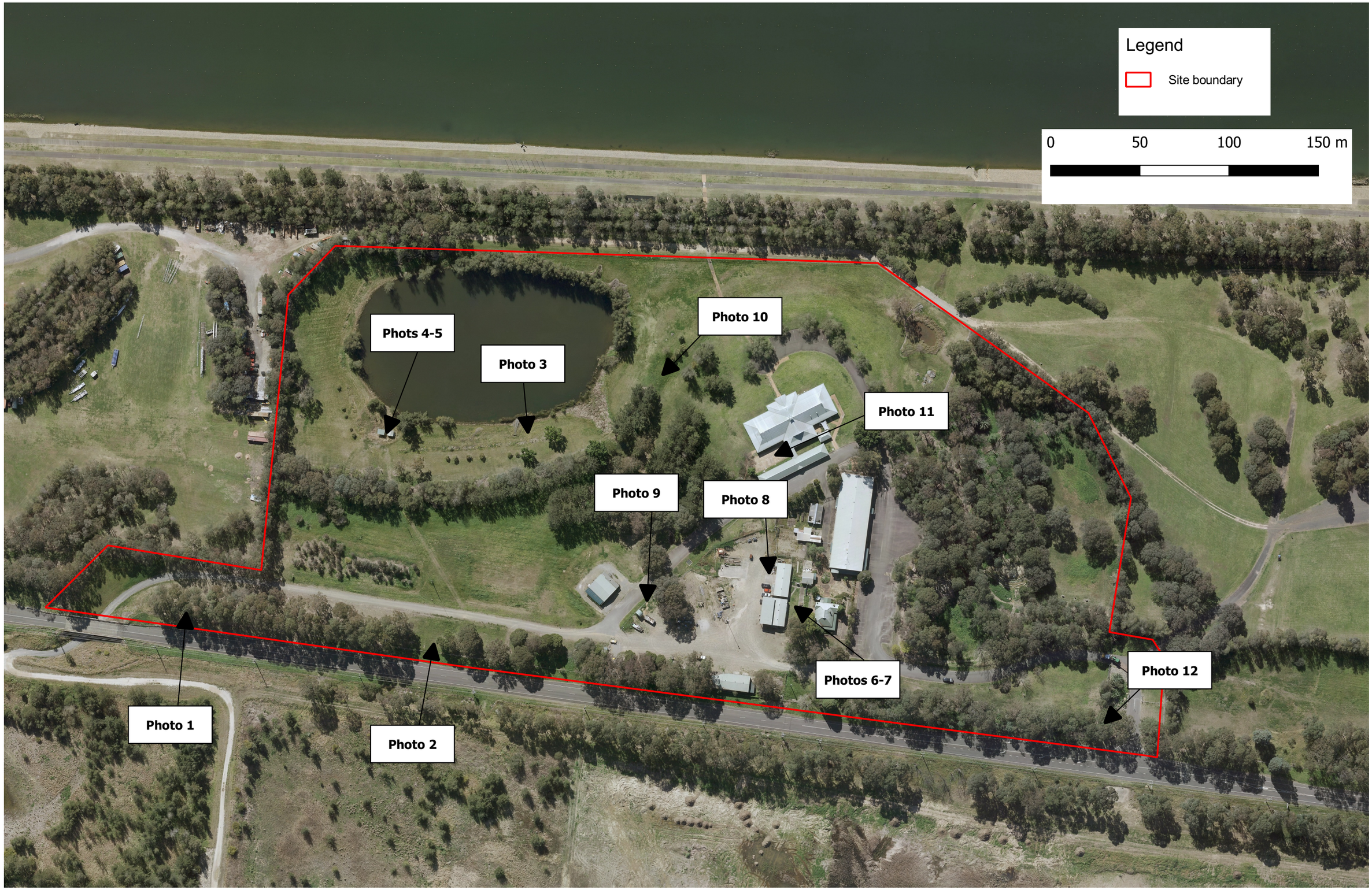
Notes:
1. Basemap from metromap.com (dated 29/08/2020)

Legend

- Site boundary
- Test Pit Locations

0 50 100 150 m

Douglas Partners Geotechnics / Environment / Groundwater	CLIENT: Colliers International Pty Ltd	TITLE: **Test Pit Locations**	PROJECT No: 204635.01
	OFFICE: Sydney / DRAWN BY: AS	**Proposed Helicopter Facility**	DRAWING No: 2
	SCALE: 1:2500 @ A3 / DATE: 04.06.2021	**89 - 151 Old Castlereagh Road, Penrith**	REVISION: 1



Douglas Partners Geotechnics / Environment / Groundwater	CLIENT: Colliers International Pty Ltd	TITLE: **Photograph Locations** **Proposed Helicopter Facility** **89 -151 Old Castlereagh Road, Penrith**	PROJECT No: 204635.01
	OFFICE: Sydney / DRAWN BY: AS		DRAWING No: 3
	SCALE: 1:1987 @ A3 / DATE: 09.06.2021		REVISION: 1

Appendix B

Notes About this Report

About this Report

Douglas Partners

Introduction

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

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

Copyright

Borehole and Test Pit Logs

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

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

Groundwater

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

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

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

Reports

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

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

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

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

About this Report

Site Anomalies

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

Information for Contractual Purposes

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

Site Inspection

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

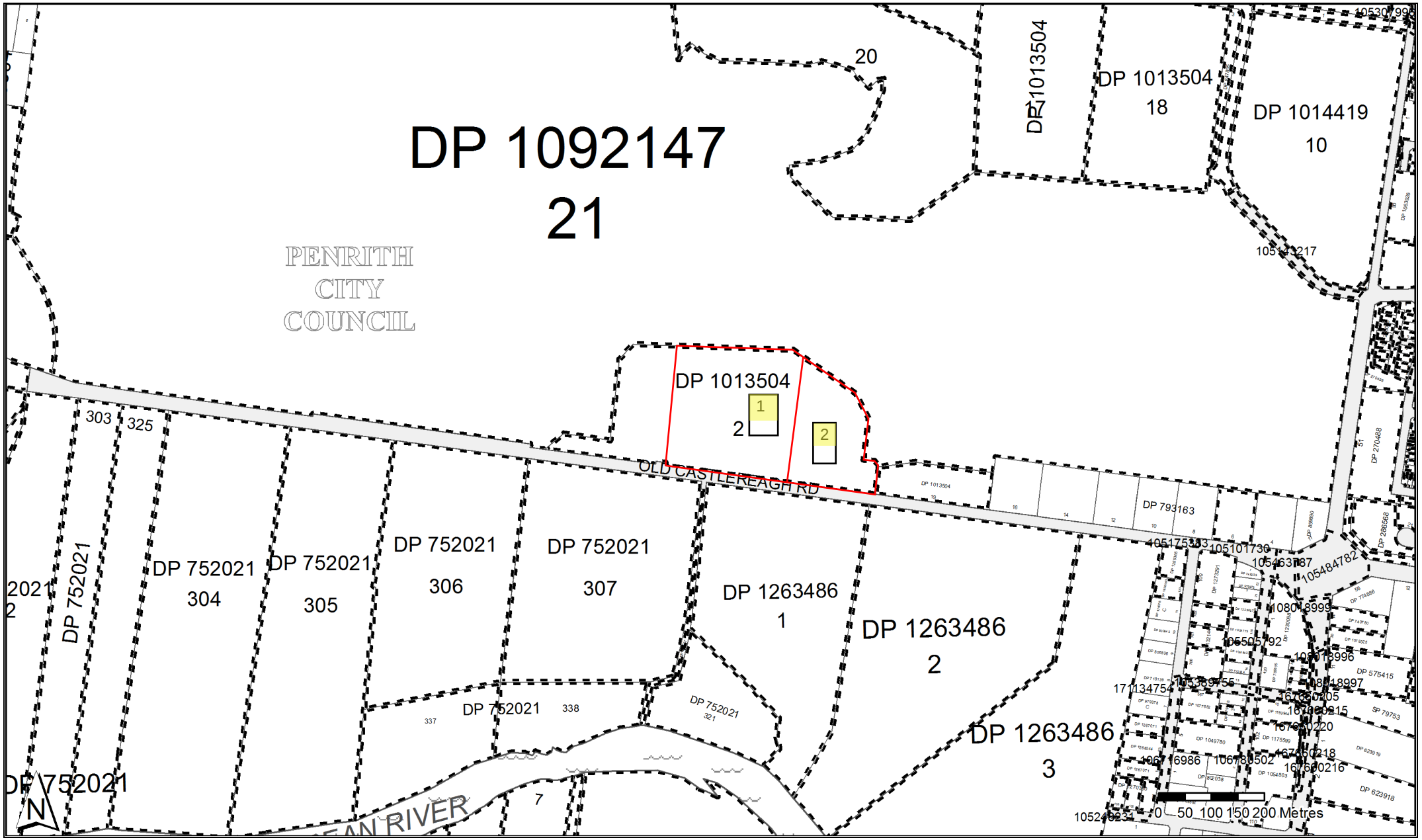
Appendix C

Historical Title Deeds

Cadastral Records Enquiry Report : Lot 2 DP 1013504

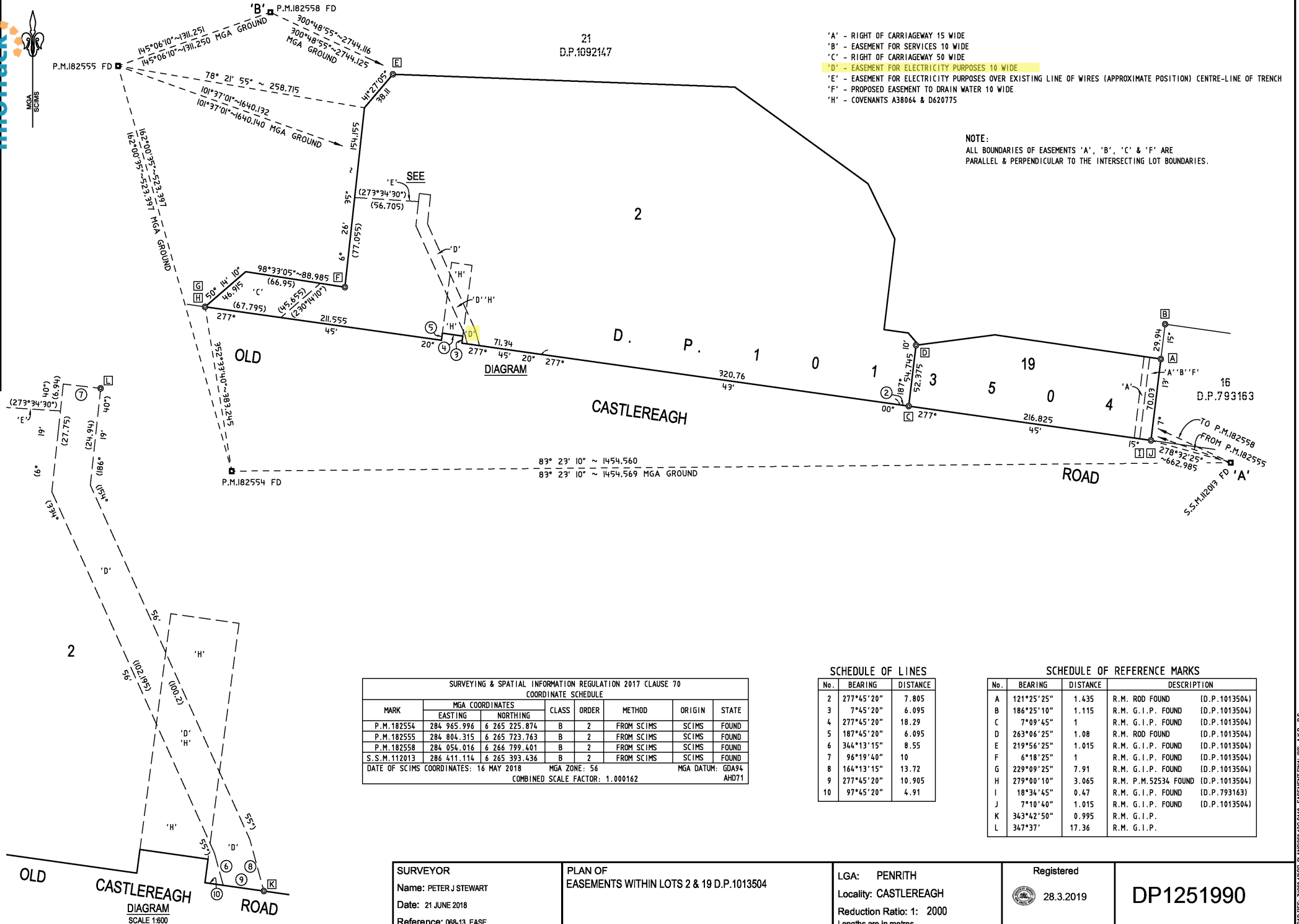
Ref : 100-275 Old Castlereagh Road, Penrith

Locality : CASTLEREAGH
Parish : CASTLEREAGH
LGA : PENRITH
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

SS137550F
DP 1013504
OLD CASTLEREAGH ROAD
PM45634D
DP 752021
21



SURVEYING & SPATIAL INFORMATION REGULATION 2017 CLAUSE 70
COORDINATE SCHEDULE

MARK	MGA COORDINATES EASTING	MGA COORDINATES NORTHING	CLASS	ORDER	METHOD	ORIGIN	STATE
P.M.182554	284 965.996	6 265 225.874	B	2	FROM SCIMS	SCIMS	FOUND
P.M.182555	284 804.315	6 265 723.763	B	2	FROM SCIMS	SCIMS	FOUND
P.M.182558	284 054.016	6 266 799.401	B	2	FROM SCIMS	SCIMS	FOUND
S.S.M.112013	286 411.114	6 265 393.436	B	2	FROM SCIMS	SCIMS	FOUND

DATE OF SCIMS COORDINATES: 16 MAY 2018 MGA ZONE: 56 MGA DATUM: GDA94
COMBINED SCALE FACTOR: 1.000162 AHD71

SCHEDULE OF LINES

No.	BEARING	DISTANCE
2	277°45'20"	7.805
3	7°45'20"	6.095
4	277°45'20"	18.29
5	187°45'20"	6.095
6	344°13'15"	8.55
7	96°19'40"	10
8	164°13'15"	13.72
9	277°45'20"	10.905
10	97°45'20"	4.91

SCHEDULE OF REFERENCE MARKS

No.	BEARING	DISTANCE	DESCRIPTION
A	121°25'25"	1.435	R.M. ROD FOUND (D.P.1013504)
B	186°25'10"	1.115	R.M. G.I.P. FOUND (D.P.1013504)
C	7°09'45"	1	R.M. G.I.P. FOUND (D.P.1013504)
D	263°06'25"	1.08	R.M. ROD FOUND (D.P.1013504)
E	219°56'25"	1.015	R.M. G.I.P. FOUND (D.P.1013504)
F	6°18'25"	1	R.M. G.I.P. FOUND (D.P.1013504)
G	229°09'25"	7.91	R.M. G.I.P. FOUND (D.P.1013504)
H	279°00'10"	3.065	R.M. P.M.52534 FOUND (D.P.1013504)
I	18°34'45"	0.47	R.M. G.I.P. FOUND (D.P.793163)
J	7°10'40"	1.015	R.M. G.I.P. FOUND (D.P.1013504)
K	343°42'50"	0.995	R.M. G.I.P.
L	347°37'	17.36	R.M. G.I.P.

SURVEYOR Name: PETER J STEWART Date: 21 JUNE 2018 Reference: 068-13_EASE	PLAN OF EASEMENTS WITHIN LOTS 2 & 19 D.P.1013504	LGA: PENRITH Locality: CASTLEREAGH Reduction Ratio: 1: 2000 Lengths are in metres	Registered 28.3.2019	DP1251990

PLAN FORM 6 (2017)	DEPOSITED PLAN ADMINISTRATION SHEET	Sheet 1 of 3 sheet(s)

Office Use Only

Registered: 28.3.2019

Title System: TORRENS

Office Use Only

DP1251990

PLAN OF
EASEMENTS WITHIN LOTS 2 & 19 D.P.1013504

LGA: PENRITH
Locality: CASTLEREAGH
Parish: CASTLEREAGH
County: CUMBERLAND

Survey Certificate

I, PETER J STEWART

of CRAIG & RHODES PTY LTD

a surveyor registered under the *Surveying and Spatial Information Act 2002*, certify that:

*(a) The land shown in the plan was surveyed in accordance with the *Surveying and Spatial Information Regulation 2017*, is accurate and the survey was completed on 21 JUNE 2018, or

~~*(b) The part of the land shown in the plan(*being/*excluding **.....) was surveyed in accordance with the *Surveying and Spatial Information Regulation 2017*, the part surveyed is accurate and the survey was completed on, ... the part not surveyed was compiled in accordance with that~~ Regulation, or

~~*(c) The land shown in this plan was compiled in accordance with the *Surveying and Spatial Information Regulation 2017*.~~

Datum Line: 'A' - 'B'

Type: *Urban/~~*Rural~~

The terrain is *Level-Undulating / ~~*Steep-Mountainous~~

Signature: Peter Stewart Dated: 22-2-19

Surveyor Identification No: 8598
Surveyor registered under
the *Surveying and Spatial Information Act 2002*

*Strike out inappropriate words.

**Specify the land actually surveyed or specify any land shown in the plan that is not the subject of the survey.

Crown Lands NSW/Western Lands Office Approval

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

Signature: .....

Date: .....

File Number: .....

Office: .....

Subdivision Certificate

I, ...

*Authorised Person/*General Manager/*Accredited Certifier, certify that the provisions of s.109J of the *Environmental Planning and Assessment Act 1979* have been satisfied in relation to the proposed subdivision, new road or reserve set out herein.

Signature: .....

Accreditation number: .....

Consent Authority: .....

Date of endorsement: .....

Subdivision Certificate number: .....

File number: .....

*Strike through if inapplicable.

Plans used in the preparation of survey/~~compilation~~.
D.P.1013504

Statements of intention to dedicate public roads, create public reserves and drainage reserves, acquire/resume land.

Surveyor's Reference: 068-13_EASE

Signatures, Seals and Section 88B Statements should appear on PLAN FORM 6A

CAD REF: Z:\068-13\ER_PLANS\068-13G S11B - EASEMENT FINAL [00] - AKP - PS

PLAN FORM 6A (2017) **DEPOSITED PLAN ADMINISTRATION SHEET** Sheet 2 of 3 sheet(s)

Office Use Only

Registered: 28.3.2019

Office Use Only

DP1251990

PLAN OF
EASEMENTS WITHIN LOTS 2 & 19 D.P.1013504

Subdivision Certificate number: .....

Date of Endorsement: .....

This sheet is for the provision of the following information as required:

- A schedule of lots and addresses - See 60(c) *SSI Regulation 2017*
- Statements of intention to create and release affecting interests in accordance with section 88B *Conveyancing Act 1919*
- Signatures and seals- see 195D *Conveyancing Act 1919*
- Any information which cannot fit in the appropriate panel of sheet 1 of the administration sheets.

PURSUANT TO SECTION 88B OF THE CONVEYANCING ACT 1919 AS AMENDED AND IN TERMS OF THE ACCOMPANYING INSTRUMENT IT IS INTENDED

TO CREATE:

1. RIGHT OF CARRIAGEWAY 15 WIDE (A)
2. EASEMENT FOR SERVICES 10 WIDE (B)
3. RIGHT OF CARRIAGEWAY 50 WIDE (C)
4. EASEMENT FOR ELECTRICITY PURPOSES 10 WIDE (D)
5. EASEMENT FOR ELECTRICITY PURPOSES OVER EXISTING LINE OF WIRES (E)

If space is insufficient use additional annexure sheet

Surveyor's Reference: 068-13_EASE

CAD REF: Z:\068-13\CR_PLANS\068-13G S11B - EASEMENT FINAL [00] - AKP - PS

PLAN FORM 6A (2017) **DEPOSITED PLAN ADMINISTRATION SHEET** Sheet 3 of 3 sheet(s)

Office Use Only

Registered: 28.3.2019

Office Use Only

DP1251990

PLAN OF
EASEMENTS WITHIN LOTS 2 & 19 D.P.1013504

Subdivision Certificate number: .....

Date of Endorsement: .....

This sheet is for the provision of the following information as required:

- A schedule of lots and addresses - See 60(c) *SSI Regulation 2017*
- Statements of intention to create and release affecting interests in accordance with section 88B *Conveyancing Act 1919*
- Signatures and seals- see 195D *Conveyancing Act 1919*
- Any information which cannot fit in the appropriate panel of sheet 1 of the administration sheets.

EXECUTED BY PENRITH LAKES DEVELOPMENT)
CORPORATION LTD)
(ACN 000 133 951))
IN ACCORDANCE WITH SECTION 127 (1) OF THE)
CORPORATIONS ACT:)

.....
SIGNATURE OF DIRECTOR

BRIAN V TASKER
.....
NAME OF DIRECTOR

.....
SIGNATURE OF DIRECTOR/ SECRETARY

KEITH L CAREW
.....
NAME OF DIRECTOR/ SECRETARY

If space is insufficient use additional annexure sheet

Surveyor's Reference: 068-13_EASE

CAD REF: Z:\068-13\CR_PLANS\068-13G S118 - EASEMENT FINAL [00] - AKP - PS

Historical Title

NEW SOUTH WALES LAND REGISTRY SERVICES - HISTORICAL SEARCH

SEARCH DATE
8/6/2021 8:02AM

FOLIO: 4/127978

First Title(s): OLD SYSTEM
Prior Title(s): VOL 5712 FOL 175

Recorded	Number	Type of Instrument	C.T. Issue
14/7/1994	DP127978	DEPOSITED PLAN	FOLIO CREATED CT NOT ISSUED
18/7/1994		AMENDMENT: VOL FOL INDEX	
28/7/1999	6037796	DEPARTMENTAL DEALING	
15/3/2001	DP1013504	DEPOSITED PLAN	FOLIO CANCELLED

*** END OF SEARCH ***

Received: 08/06/2021 08:02:50

Historical Title

NEW SOUTH WALES LAND REGISTRY SERVICES - HISTORICAL SEARCH

SEARCH DATE
8/6/2021 8:01AM

FOLIO: 1/181273

First Title(s): SEE PRIOR TITLE(S)
Prior Title(s): VOL 6070 FOL 10

Recorded	Number	Type of Instrument	C.T. Issue
2/9/1989		TITLE AUTOMATION PROJECT	LOT RECORDED FOLIO NOT CREATED
11/11/1992		CONVERTED TO COMPUTER FOLIO	FOLIO CREATED CT NOT ISSUED
15/3/2001	DP1013504	DEPOSITED PLAN	FOLIO CANCELLED

*** END OF SEARCH ***

Received: 08/06/2021 08:02:49

Historical Title

NEW SOUTH WALES LAND REGISTRY SERVICES - HISTORICAL SEARCH

SEARCH DATE
8/6/2021 7:53AM

FOLIO: 2/1013504

First Title(s): OLD SYSTEM
Prior Title(s): 3-4/127978 1/181273
BK 3787 NO 189

Recorded	Number	Type of Instrument	C.T. Issue
15/3/2001	DP1013504	DEPOSITED PLAN	FOLIO CREATED EDITION 1
28/9/2001	7985460	DEPARTMENTAL DEALING	EDITION 2
24/8/2007	AD314172	APPLICATION FOR REPLACEMENT CERTIFICATE OF TITLE	EDITION 3
28/3/2019	DP1251990	DEPOSITED PLAN	EDITION 4
23/4/2021	AQ988200	CAVEAT	

*** END OF SEARCH ***

Received: 08/06/2021 07:54:09

Title Search

NEW SOUTH WALES LAND REGISTRY SERVICES - TITLE SEARCH

FOLIO: 2/1013504

SEARCH DATE	TIME	EDITION NO	DATE
8/6/2021	7:51 AM	4	28/3/2019

LAND

LOT 2 IN DEPOSITED PLAN 1013504
AT CRANEBROOK
LOCAL GOVERNMENT AREA PENRITH
PARISH OF CASTLEREAGH COUNTY OF CUMBERLAND
TITLE DIAGRAM DP1013504

FIRST SCHEDULE

PENRITH LAKES DEVELOPMENT CORPORATION LIMITED

SECOND SCHEDULE (8 NOTIFICATIONS)

1 RESERVATIONS AND CONDITIONS IN THE CROWN GRANT(S)
2 QUALIFIED TITLE. CAUTION PURSUANT TO SECTION 28J(1) AND 28J(1A) OF THE REAL PROPERTY ACT, 1900. ENTERED 15.03.2001 BK3787 NO189 AS REGARDS THE PART FORMERLY IN BK3787 NO.189
3 A38064 COVENANT AFFECTING THE PART SHOWN SO BURDENED IN THE TITLE DIAGRAM.
4 D620775 COVENANT AFFECTING THE PART SHOWN SO BURDENED IN THE TITLE DIAGRAM.
5 DP1251990 RIGHT OF CARRIAGEWAY 50 METRE(S) WIDE AFFECTING THE PART(S) SHOWN SO BURDENED IN DP1251990
6 DP1251990 EASEMENT FOR ELECTRICITY PURPOSES 10 METRE(S) WIDE AFFECTING THE PART(S) SHOWN SO BURDENED IN DP1251990
7 DP1251990 EASEMENT FOR ELECTRICITY PURPOSES OVER EXISTING LINE OF WIRES AFFECTING THE PART(S) SHOWN SO BURDENED IN DP1251990
* 8 AQ988200 CAVEAT BY HELIPORT DEVELOPERS P/L

NOTATIONS

UNREGISTERED DEALINGS: NIL

*** END OF SEARCH ***

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: - 100 to 275 Old Castlereagh Road, Penrith

Description: - Lot 1 D.P. 719819, Lots 3 & 4 D.P. 468 & Lot 1 D.P. 548915

As regards the part numbered (1) on the attached Charting Map Extract

Date of Acquisition and term held	Registered Proprietor(s) & Occupations where available	Reference to Title at Acquisition and sale
15.09.1913 (1913 to 1945)	Alan Long (Farmer)	Vol 2401 Fol 43
27.02.1945 (1945 to 1945)	Elizabeth Ann Long (Widow) (Transmission Application not investigated)	Vol 2401 Fol 43
14.03.1945 (1945 to 1948)	Edward Lionel Shepherd (Dairyman)	Vol 2401 Fol 43 Now Vol 5712 Fol 175
30.09.1948 (1948 to 1950)	Albert Milton Luck (Milk Vendor)	Vol 5712 Fol 175
25.01.1950 (1950 to 1953)	Alfred Mervyn Phillis (Grazier)	Vol 5712 Fol 175
31.07.1953 (1953 to 1954)	Evelyn Maude McKay (Married Woman)	Vol 5712 Fol 175
30.12.1954 (1954 to 1961)	Russell James Brown (Grazier)	Vol 5712 Fol 175
04.04.1961 (1961 to 1989)	River Sand and Gravel Pty Limited	Vol 5712 Fol 175
13.10.1989 (1989 to date)	Penrith Lakes Development Corporation Limited	Vol 5712 Fol 175 Now 2/1013504

Denotes current registered proprietor

As regards the part numbered (2) on the attached Charting Map Extract

Date of Acquisition and term held	Registered Proprietor(s) & Occupations where available	Reference to Title at Acquisition and sale
25.01.1929 (1929 to 1937)	Josiah Stanton (Farmer)	Vol 4240 Fol 213
02.03.1937 (1937 to 1037)	Lindsay John Stanton (Farmer) William Wellesley Lennox (Clerk) (Transmission Application not investigated)	Vol 4240 Fol 213
02.03.1937 (1937 to 1939)	Clarice Nation Broadbent (Married Woman)	Vol 4240 Fol 213
22.11.1939 (1939 to 1949)	David Broadbent (Farmer) Reginald Stanton Broadbent (Farmer) (Transmission Application not investigated)	Vol 4240 Fol 213 Now Vol 5099 Fol's 28 & 29
12.12.1949 (1949 to 1961)	Reginald Stanton Broadbent (Farmer) (Transmission Application not investigated)	Vol 5099 Fol's 28 & 29 Now Vol 6070 Fol 10

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

Continued as regards the part numbered (2) on the attached Charting Map Extract

Date of Acquisition and term held	**Registered Proprietor(s) & Occupations where available**	**Reference to Title at Acquisition and sale**
08.02.1961 (1961 to 1989)	River Sand and Gravel Pty Limited	Vol 6070 Fol 10
13.10.1989 (1989 to date)	Penrith Lakes Development Corporation Limited	Vol 6070 Fol 10 Now Vol 6070 Fol 10

Denotes current registered proprietor

Leases as regards the whole: - NIL

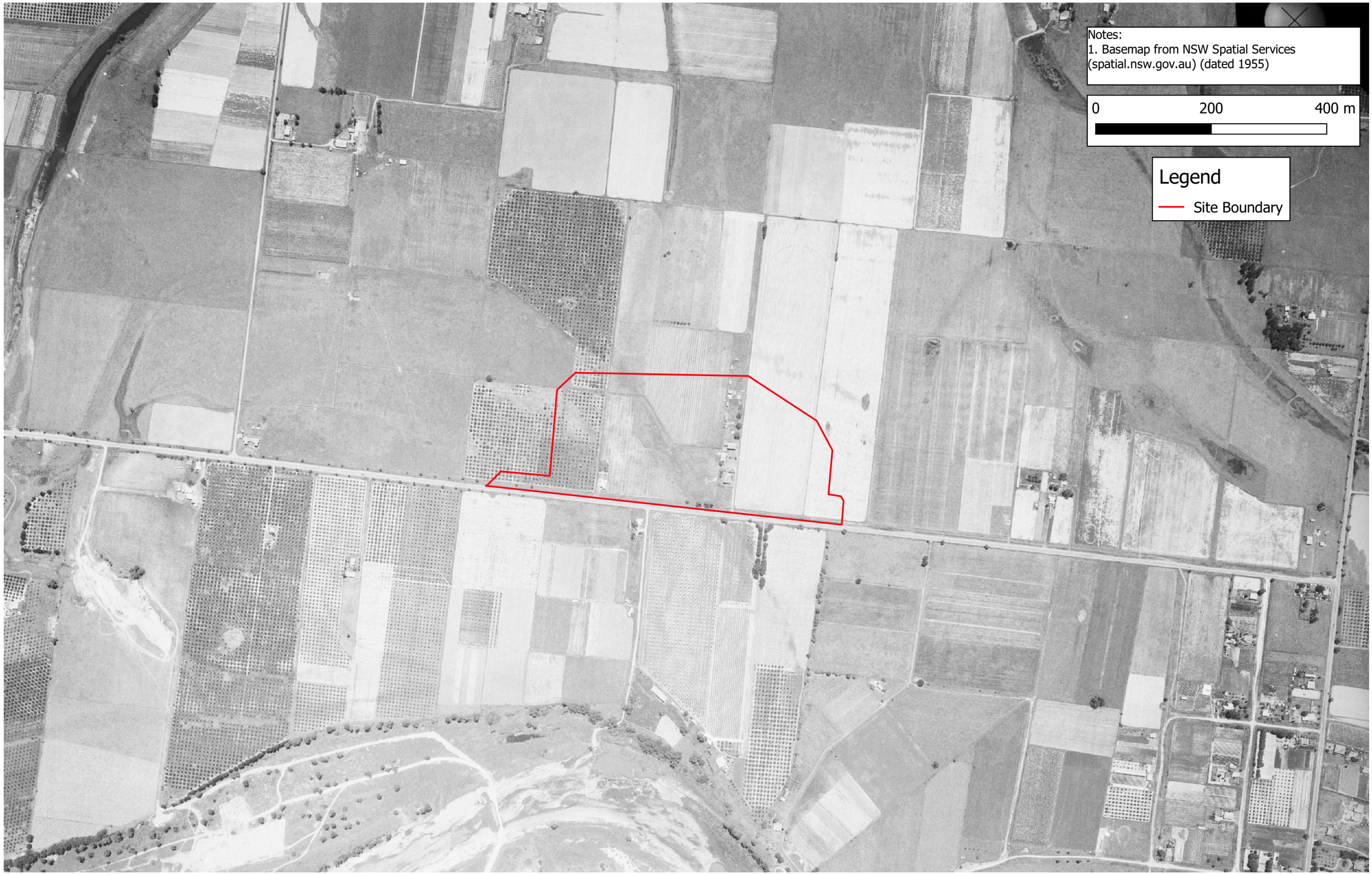
Easements as regards the whole: -

- 28.03.2019 (D.P. 1251990) Easement for Electricity purposes 10 wide.

Yours Sincerely,
Mark Groll
10 June 2021

Appendix D

Historical Aerial Photographs



Douglas Partners
Geotechnics / Environment / Groundwater

CLIENT:	Colliers International Pty Ltd		
OFFICE:	Sydney	DRAWN BY:	AS
SCALE:	1:6000 @ A3	DATE:	03.06.2021

TITLE: **1955 Aerial Photograph**
Proposed Helicopter Facility
89 -151 Old Castlereagh Road, Penrith

N

PROJECT No:	204635.01
DRAWING No:	D1
REVISION:	1

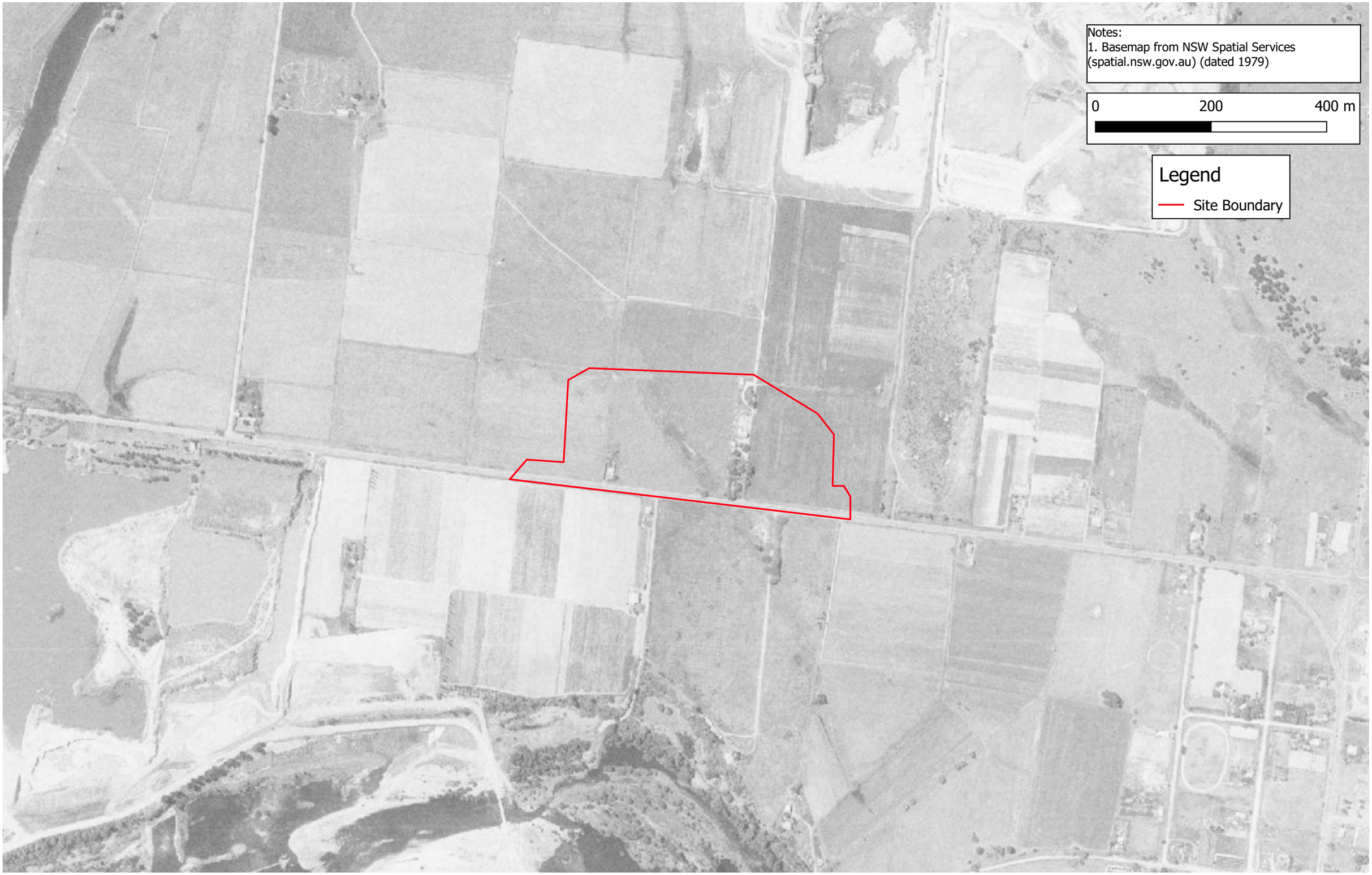
Douglas Partners
Geotechnics / Environment / Groundwater

CLIENT:	Colliers International Pty Ltd		
OFFICE:	Sydney	DRAWN BY:	AS
SCALE:	1:6000 @ A3	DATE:	03.06.2021

TITLE: **1975 Aerial Photograph**
Proposed Helicopter Facility
89 - 151 Old Castlereagh Road, Penrith

N

PROJECT No:	204635.01
DRAWING No:	D2
REVISION:	1



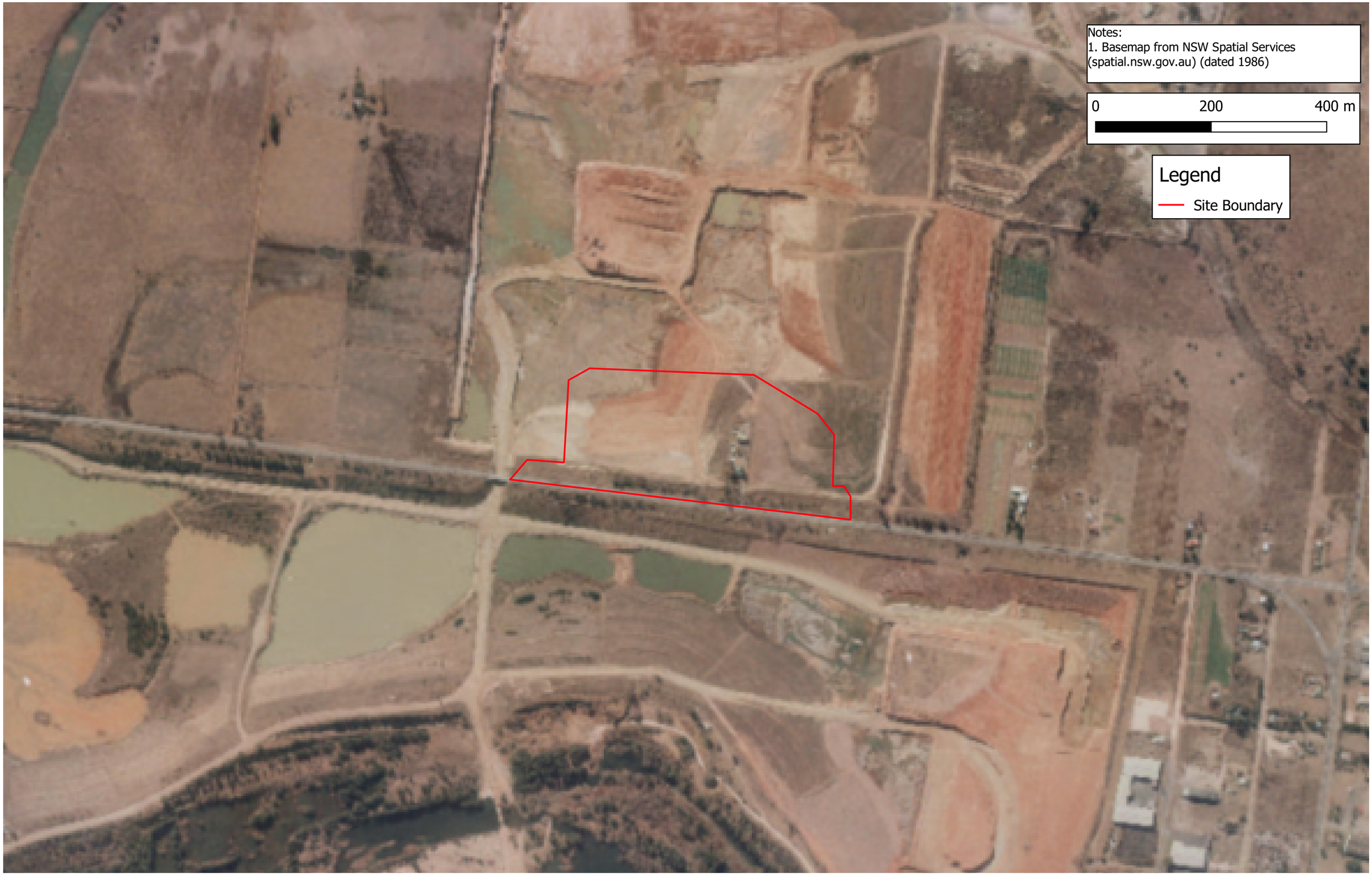
Douglas Partners
Geotechnics / Environment / Groundwater

CLIENT:	Colliers International Pty Ltd		
OFFICE:	Sydney	DRAWN BY:	AS
SCALE:	1:6000 @ A3	DATE:	03.06.2021

TITLE: **1979 Aerial Photograph**
Proposed Helicopter Facility
89 - 151 Old Castlereagh Road, Penrith

N

PROJECT No:	204635.01
DRAWING No:	D3
REVISION:	1



Douglas Partners
Geotechnics / Environment / Groundwater

CLIENT:	Colliers International Pty Ltd		
OFFICE:	Sydney	DRAWN BY:	AS
SCALE:	1:6000 @ A3	DATE:	03.06.2021

TITLE: **1986 Aerial Photograph**
Proposed Helicopter Facility
89 - 151 Old Castlereagh Road, Penrith

N

PROJECT No:	204635.01
DRAWING No:	D4
REVISION:	1

Douglas Partners
Geotechnics / Environment / Groundwater

CLIENT:	Colliers International Pty Ltd		
OFFICE:	Sydney	DRAWN BY:	AS
SCALE:	1:6000 @ A3	DATE:	03.06.2021

TITLE: **1991 Aerial Photograph**
Proposed Helicopter Facility
89 - 151 Old Castlereagh Road, Penrith

N

PROJECT No:	204635.01
DRAWING No:	D5
REVISION:	1

Douglas Partners Geotechnics / Environment / Groundwater	CLIENT: Colliers International Pty Ltd	TITLE: **2000 Aerial Photograph** **Proposed Helicopter Facility** **89 - 151 Old Castlereagh Road, Penrith**	N
	OFFICE: Sydney / DRAWN BY: AS		PROJECT No: 204635.01
	SCALE: 1:6000 @ A3 / DATE: 03.06.2021		DRAWING No: D6
			REVISION: 1

Douglas Partners *Geotechnics / Environment / Groundwater*	CLIENT: Colliers International Pty Ltd	TITLE: **2011 Aerial Photograph**	PROJECT No: 204635.01
	OFFICE: Sydney / DRAWN BY: AS	**Proposed Helicopter Facility**	DRAWING No: D7
	SCALE: 1:8000 @ A3 / DATE: 03.06.2021	**89 - 151 Old Castlereagh Road, Penrith**	REVISION: 1

Appendix E

Council Records

Development Application

Statement of Environmental Effects

Penrith Lakes

Staged Development Application for Subdivision

Submitted to Penrith City Council
On Behalf of Penrith Lakes Development Corporation

February 2014 ■ 13257

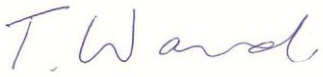
JBA Urban Planning Consultants Pty Ltd ABN 84 060 735 104 w jbaplanning.com.au
North Sydney t +61 2 9956 6962 ■ Newcastle t +61 2 4927 0980

JBA Urban Planning Consultants Pty Ltd operates under a Quality Management System. This report has been prepared and reviewed in accordance with that system. If the report is not signed below, it is a preliminary draft.

This report has been prepared by:

Samantha Miller 13/02/2014

This report has been reviewed by:



Tim Ward 13/02/2014

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Appendices

1.0 Introduction

This Statement of Environmental Effects (SEE) is submitted to Penrith City Council (Council) in support of a Development Application (DA) for a Staged Development of the Penrith Lakes Site in Castlereagh.

For consistency with the existing referencing protocol for current DAs relating to the Penrith Lakes Site, the subject DA is referred to as 'DA5' and follows on from DAs referred to as DAs 1-4.

The SEE has been prepared by JBA on behalf of Penrith Lakes Development Corporation (PLDC), and is based on supporting technical information appended to the report (see Table of Contents) and takes into consideration the feedback obtained in pre-lodgement meeting with Council (see Section 1.1).

The land to which this DA is the majority of the land known as the Penrith Lakes Site and shown in **Figure 1** below. The Penrith Lakes Site refers to all land that is included in the *State Environmental Planning Policy (Penrith Lakes Scheme) 1989* and *State Environmental Planning Policy (State and Regional Development) 2011*. This DA does not apply to certain lands within the Penrith Lakes Site (see **Figure 5**) and a more detailed description of the development site is provided at Section 3.0 of this report. All land to which this DA relates is herein referred to as the 'development site'.

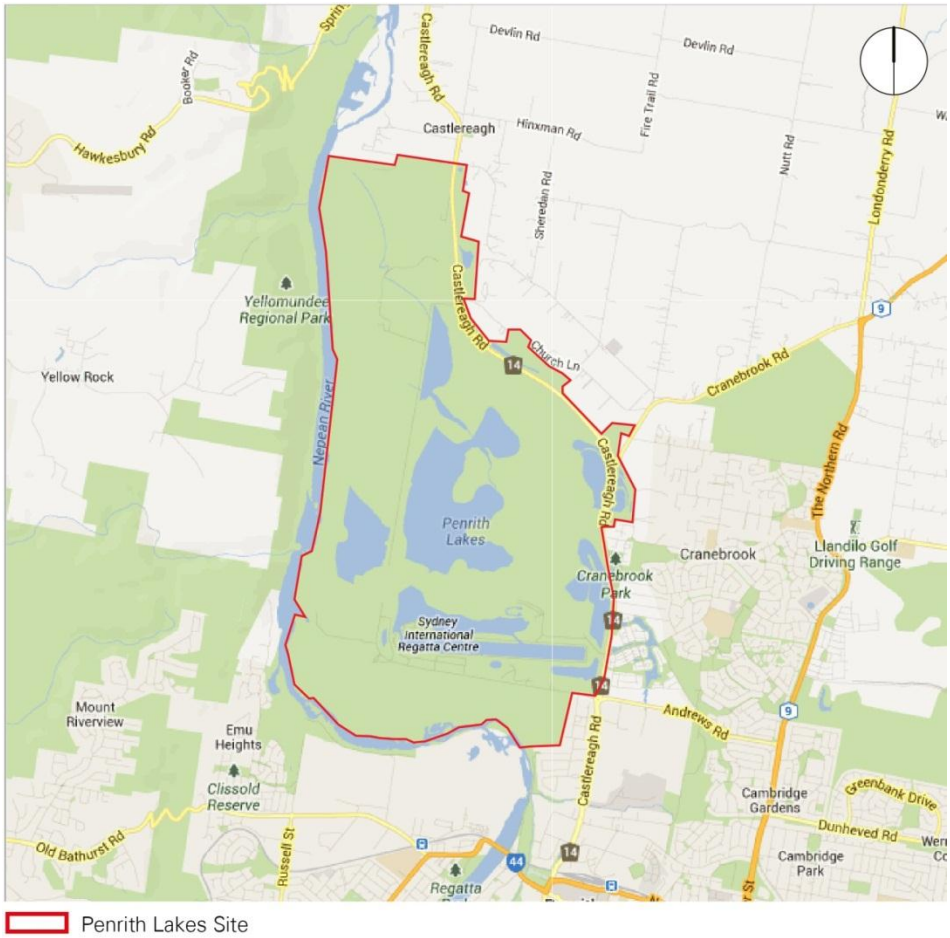


Figure 1 – Indicative Plan of the Penrith Lakes Site

In accordance with section 83B of the *Environmental Planning and Assessment Act* 1979 (EP&A Act) this DA seeks approval for Staged Development for the subdivision and associated development of the development site. A staged

development application is one that sets out concept proposals for the development of a site, and for which detailed proposals for distinctive stages will be the subject of subsequent development applications. The application, however, also sets out and seeks contemporaneous approval for the development in the first stage (referred to as DA5 - Stage 1).

The proposed Staged DA seeks to implement the Penrith Lakes Scheme by consolidating and reconfiguring the allotment pattern for the development site to create super lots that generally accord with Penrith Lakes Scheme shown in the Structure Plan under the Penrith Lakes SEPP and to later facilitate subsequent subdivision of some of the super lots into smaller lots of 2ha or greater in size.

Each super lot created by Stage 1 is proposed with the intent to facilitate the future and current use of that land (or water body) shown in the Penrith Lakes SEPP Structure Plan. No use or change of use of the subdivided land is sought as part of this Staged DA.

Specifically this Staged DA seeks consent under section 83B of the EP&A Act for:

- consolidation and subdivision of the development site into super lots;
- construction of a car park; and
- subdivision of proposed super lot 4 into lots no smaller than 2 hectares, subject to a Stage 2 development application.

The Stage 1 (DA5.1) development seeks consent for the following:

- the initial paper lot subdivision of the development site into 23 super lots to create proposed Lots 1 to 23; and
- construction of a small car parking area adjacent to McCathy's Lane and outside the McCathy's Cemetery Heritage Precinct.

A future Stage 2 (DA5.2) development application will be lodged for the subdivision of proposed super Lot 4. This application will seek to create various rural residential allotments that are 2 hectares or greater in area and associated road and drainage network servicing the subdivision.

In accordance with section 91 of the EP&A Act the proposed development is integrated development. Therefore, in addition to development consent under the EP&A Act, it requires:

- approval pursuant to section 58 of the *Heritage Act 1997*; and
- authorisation from the NSW Rural Fire Service under section 100B of the *Rural Fires Act 1997*.

This report describes the development site, its environs, the proposed development, and provides an assessment of the proposal in terms of the matters for consideration under section 79C(1) of the EP&A Act.

1.1 Pre DA Consultation

In preparing the DA PLDC met with officers from Penrith City Council for a formal pre-DA meeting on 7 November 2013. The background to and the proposed development was detailed and discussed with various Council officers from different departments, including planning, engineering and environmental management. The key matters raised by Council officers and the proposed resolutions are surmised in **Table 1** below.

Table 1 – Summary of issues raised in Pre-DA consultation.

Council Issue	Resolution	Report Section/Appendix
A Heritage Impact Statement is required in support of the application.	The applicant is currently in liaison with the Office of Environment and Heritage. Heritage conservation has informed the proposed development and potential impacts are discussed throughout the SEE. A detailed and separate Heritage Impact Statement (HIS) will be submitted to Council under separate cover for this DA shortly after this DA is lodged. The HIS will involve a full appraisal of what (if any) impacts the proposal will have on the heritage value of the Penrith Lakes Site.	Sections 3.4, 5.2, 6.5
Rationale for proposed allotment layout.	The subdivisions seeks to separate land and water parcels and provide separate allotments that relate to heritage items.	Section 5.2
The application is to reflect the current master plan being undertaken by the DP&I	The subdivision application does not limit the master planning process currently being undertaken.	Section 2.4.2 and 6.2.1
Proposed lots are to be marked with their intended use/dedication	This application does not seek consent for the use of any land. The intended future use is set out under the Penrith Lakes SEPP	Section 5.2
The application is to address all relevant requirements of SEPP 55 Remediation of Land	This application does not seek consent for works, with the exception of car park facilities. A geotechnical assessment has been undertaken and appended to this report. The site is considered suitable for the proposed subdivision and works in accordance with SEPP 55.	Section 6.1 Appendix D
Flood evacuation constraints and all plans must include levels in AHD.	A flood report has been prepared to assess the impact of the proposed development on accessibility to the development site.	Section 6.6 Appendix F and Appendix G

2.0 Background

2.1 Penrith Lakes Scheme

The Penrith area has been a major source of supply of medium to coarse grained sand and crushed river gravel for the Sydney construction industry since the 1880's and today provides approximately 45% of Sydney's requirements for these materials.

Initially, excavation of the sand and gravel was from deposits in the Nepean River, however, as these reserves were depleted during the late 1950's attention was turned to the reserves under the Penrith-Castlereagh floodplain. Development consents to quarry parts of the floodplain to the northwest of Penrith were subsequently obtained by five quarrying companies, which through acquisitions have reduced to three parties; namely Boral, Hanson and Holcim.

In the late 1960's, the piecemeal manner in which the quarrying operations were being undertaken and the restriction this placed on the rehabilitation of the quarried areas was causing concern regarding the efficiency of the operations and environmental impacts.

At the request of the Penrith City Council, the State Planning Authority (now the Department of Planning and Infrastructure) examined options for coordinating the extraction of the sand and gravel resources and rehabilitation of the quarried areas. As a result, the Penrith Lakes Scheme Working Party was established, comprising representatives of five State Government Departments, the Penrith City Council and the quarrying companies. Its aim was to examine the feasibility of a program of orderly and economical extraction and comprehensive rehabilitation with a view to creating a regional water-orientated recreation resource in the former quarry areas. This concept became known as the 'Penrith Lakes Scheme'.

In 1976 the working party prepared an interim report for the comprehensive rehabilitation of the area. Further studies were undertaken to assess the technical, environmental and financial feasibility of the proposal, including determining a suitable water supply for the new lakes, and agreed mechanism for coordinating the extraction and rehabilitation activities of the independent companies.

In 1980 the Penrith Lakes Development Corporation Ltd, comprising representatives of the participating companies, was formed and commenced operation as a single entity continuing to research the rehabilitation options for the Penrith Lakes Scheme.

Consequently, in 1984 the State government published the findings of over ten years of detailed investigations in the Regional Environmental Study (RES 1984). This document remains the principle guiding document for the Scheme, outlining the preferred option of a four lakes system, and details the public and social benefits of a major water based recreational parkland to be constructed during the course of orderly excavation and rehabilitation of the Scheme.

2.2 The Corporation and its Shareholders

The PLDC was formed to undertake the coordinated extraction and rehabilitation operations of its three shareholder companies in accordance with the expressed wish of the NSW Government and the Penrith City Council.

The shareholders, Boral, Hanson and Holcim exercise joint control by means of their ownership in the Corporation. The Corporation was established to:

- undertake detailed studies to test the technical, environmental and financial feasibility of the Scheme;
- obtain approvals for quarrying and rehabilitation;
- coordinate the sequential long-term quarrying and rehabilitation operations of the shareholder companies in the Penrith-Castlereagh floodplain;
- ensure that the quarrying and rehabilitation operations were undertaken in an economical and environmentally acceptable manner; and
- maximise the future urban potential of lands within the Scheme

The PLDC undertakes the extraction of the raw material and subsequent rehabilitation work that would otherwise have been carried out separately by the shareholder companies.

By selling the raw material to its shareholders, the Corporation is able to raise sufficient revenue to implement the Penrith Lakes Scheme. The shareholder companies continue to process the raw material in their existing plants.

2.3 The Penrith Lakes Scheme

The Penrith Lakes Scheme, which involves rehabilitating sections of the Castlereagh floodplain concurrently with quarrying operations, is a complex engineering undertaking, requiring the excavation of overburden, sand and gravel to a typical depth of about 14m below ground level over a total area of about 1,935 hectares. The Penrith Lakes Scheme is specifically defined by State Environmental Planning Policy (Penrith Lakes Scheme) 1989, which is the principal planning instrument applying to the development site – see Section 6.1.1 for more detail.

Approximately 50% of the material excavated is processed and sold, while the remaining overburden is redistributed to create a variety of landforms, within the Scheme lands.

To implement the Scheme a total of four large lakes and other water-related areas with a combined water area in excess of 700 hectares are being formed. Approximately 75% of these works have been completed.

The total land area excluding lakes and water bodies will be approximately 1,200 hectares. Approximately 410 hectares of this has been envisaged for possible future urban uses under the Penrith Lakes SEPP – see Section 6.1.1 for more detail.

2.4 Planning History

The extensive deposits of sand and gravel occurring in the floodplain of the Nepean River, north of Penrith, have long been recognised by the State Government as a resource of regional significance. As a result, the resource has been identified in a number of planning instruments with the objective of providing a development control process establishing environmental and technical matters which must be taken into account in implementing the Penrith Lakes Scheme in order to protect the environment. The key documents governing the development of the Scheme since 1981 are listed in **Table 2**.

In 1986, Sydney Regional Environmental Plan 11 (SREP 11) was made. The aim of the SREP 11 was to permit the implementation of the Penrith Lakes Scheme, to identify and protect items of environmental heritage and to identify land which could later be rezoned for urban purposes. SREP 11 was later amended to be

known as State Environmental Planning Policy (Penrith Lakes Scheme) 1989 – see Section 6.1.1 for more detail about the SEPP.

Table 2 – Key documents and outcomes

Date	Document/Report	Outcomes
1984	Penrith Lakes Scheme-Regional Environmental Study	Selection of preferred Scheme and description of its effects.
1986	Sydney Regional Environmental Plan No. 9 – Extractive industry	Identified Penrith Lakes as priority for extraction.
1986	Sydney Regional Environmental Plan No. 11–Penrith Lakes Scheme.	Statutory planning framework for implementation of Scheme.
1987	1987 Deed of Agreement	Formalised the ongoing quarry operations on the site and set out the contractual obligations between the PLDC and the NSW Government.
1988	Amendment No. 1 to SREP 11	The amendment was an administrative amendment to remove the expiry clause.
1989	Amendment No. 2 to SREP 11	Amendment extended REP boundary and made provision to incorporate international standard rowing course into Scheme. This amendment increased the Scheme area by 50 hectares in the south west corner, and increased the Scheme's resources by another 12 million tonnes of sand and gravel. The Minister for Sport and Recreation lodged a development application in September 1989 to quarry and rehabilitate the area with PLDC as project manager. This was approved in November 1989.
1989	Amendment to the 1987 Deed of Agreement	Amendment made provision for the construction of the Sydney International Rowing Centre (SIRC).
1994	Amendment No. 3 to SREP 11	Amendment to incorporate results of flood and drainage studies, providing the Scheme with design changes to better define flood control and water management arrangements. The amendment established an urban area of 230ha.
1998	Amendment No. 4 to SREP 11 - Structure Plan	Proposed amendment to incorporate implications arising from geological review, providing changes to the lake shape and size.

2.4.1 Deed of Agreement

In 1987 PLDC entered into a Deed of Agreement with the NSW Government, through the Minister administering the *Environmental Planning and Assessment Act 1979*. The implementation and completion of the Penrith Lakes Scheme is a cooperative venture between the Minister and PLDC in accordance with the Deed. The 1987 Deed of Agreement sets out the processes dealing with the use of the land for quarrying, standards for rehabilitation and other associated works related to quarrying operations. The Deed has been varied once, to enable the inclusion of an international standard rowing course known as the Sydney International Regatta Centre (SIRC).

Relocation of Castlereagh Road

PLDC undertook the relocation of Castlereagh Road in accordance with its commitment at Part 11 in the 1987 Deed of Agreement with the NSW Government. These works were completed in 2007 and have created a number of residual lots.

Urban Land

The 1987 Deed states that the Penrith Lakes Scheme cannot be successfully implemented and completed unless the potential urban land identified is considered and redeveloped for urban purposes.

2.4.2 Penrith Lakes Master Plan

We understand that the Department of Planning & Infrastructure intends to undertake a master planning exercise on the Penrith Lakes Site to establish future land use patterns and urban design. A future master plan will underpin a planning proposal to rezone the Penrith Lakes Site in accordance with the long term vision post quarrying operations.

2.5 Development Consents

The Penrith Lakes Site has been the subject of various DAs for quarrying, extraction and rehabilitation. The following details the various DAs that approved and are being implemented across the Penrith Lakes Site. All of these approvals have been granted with the objective to deliver the Penrith Lakes Scheme.

Development Application No.1 (DA1)

DA1 (DA 350/81) was approved by the Minister for Planning and Environment in July 1982 and allowed for the extraction of sand and gravel from approximately 100 hectares of land within the Penrith Lakes Site. The approved extraction was designed to be an interim activity while the preferred Scheme for Penrith Lakes was developed. The approval allowed for an estimated 12.5 million tonnes of sand and gravel to be removed from the area. As the site was being quarried under this approval, a Structure Plan for the Penrith Lakes Scheme was finalised and SREP 11 was prepared and adopted by the Minister. Under SREP 11, provision was made for the submission of sequential development applications for the progressive release of resource-bearing land within the site.

Ongoing rehabilitation of the site, with the implementation of the impending Scheme in mind, was also approved under DA1. The rehabilitation was related to extensively quarried areas of the site, undertaken before the approval of DA1.

Development Application No.2 (DA2)

A second DA (DA86-2720 and P92/00744/001) was issued on the 24 February 1987 by the Minister for Planning, for sand and gravel extraction and rehabilitation works. The main scope of the approval for DA2 (as amended) includes:

- extraction of approximately 786 ha of land to generate an anticipated yield of an estimated 39 million tonnes of sand and gravel and 20 million tonnes of overburden;
- rehabilitation and land reformation to give effect to the Penrith Lakes Scheme; and
- importation of Virgin Excavated Natural Material (VENM) to fill areas where extraction has occurred and to assist in land reformation.

In 1989 DA2 was modified to facilitate the construction of the rowing lake and associated facilities (known as SIRC), and the Castlereagh underpass.

On 20 December 2006, DA2 was further modified to undertake trials of dynamic compaction within a 39 hectare area (the DC extension area) within the 327 hectares covered by DA2. The proposal involved:

- stripping and stockpiling approximately 100mm of topsoil from the site;
- placing approximately 500-600mm of fill sourced from other areas within the Scheme over the site's exposed surface;
- flattening the site's surface with a dozer;
- establishing erosion and sediment controls;
- compacting the site to specified geotechnical standards using a 20 tonne weight that would be dropped from a height of up to 25 meters at specified locations; and
- spreading the topsoil and re-seeding the site.

The dynamic compaction testing objective was to assess its effectiveness in alleviating the need for the site to be rehabilitated via more intrusive means such as the re-excavation, re-filling and layered compaction of land, which would generate considerable additional noise and dust impacts.

Development Application No.3 (DA3)

DA3 (P92/00744/001) was approved in July 1995 and allowed for the continuation of mining activity to the north of the area mined under DA2. Approximately 406 hectares of land was approved for mining activity, and this area yielded an estimated 35 million tonnes of sand and gravel resource.

Development Application No.4 (DA4)

DA4 (P97/00237 Pt4) was lodged in November 1997 for the extraction of the remaining resources on the site, being west of Castlereagh Road. Consent was granted by the Minister for Planning on 9 September 1998 and allowed for extraction of resources from approximately 737 hectares of land primarily between the Nepean River and Castlereagh Road in the western part of the site. The mining of smaller areas of land to the north of Church Lane was also approved under DA4.

The quarrying approved by DA4 (as amended) is expected to yield in the order of 57 million tonnes of sand and gravel and 6 million tonnes of fine sand. Approval under DA4 has been granted for:

- the ongoing rehabilitation approximately 407 ha of the Penrith Lakes Site consistent with the eventual development of the Penrith Lakes Scheme; and
- importation of VENM to fill areas where extraction has occurred over the Penrith Lakes Site and to contribute to the work to create final landforms in accordance with the Penrith Lakes Scheme.

Since September 1998 six subsequent modifications have been made and approved relating to DA4 which were minor in nature.

Modification 7 was approved by the Department of Planning and Infrastructure on 2 February 2014, for the formalisation of the use of the existing water body, known as "Lewis Lagoon" as a Water Quality Control Pond to treat water before it enters the Wildlife Lake.

Modifications to DA2, DA3 and DA4 – Importation of VENM

The Department of Planning and Infrastructure approved a collective modification to all three DAs on the 2 February 2014 for the following amendments relating to the Penrith Lakes Site:

- to extend the timing of the consent to late 2015;
- to alter the source of the VENM used to rehabilitate the Penrith Lakes Site;
- minor changes to haulage routes into the Penrith Lakes Site;
- removal of one access point into the Penrith Lakes Site; and
- a change in acoustic legislation in NSW has necessitated updated noise monitoring to assess the works against noise criteria.

2.5.1 Pending Development Applications

There are various development applications and modifications to existing approvals that are currently being assessed at the time of preparing this DA.

DA – Cranebrook West 7 Lot Subdivision

PLDC has submitted a DA to Penrith City Council to subdivide land east of Castlereagh Road (reference DA13/1410). The proposal seeks approval to create 7 lots ranging in site area from 585m^2 to 1,733m^2 and for associated earthworks. This Stage 1 development application is set to precede DA13/1410 and form a strategic basis for that application.

DA – Escarpment 9 Lot Subdivision

PLDC has submitted a DA to Penrith City Council (DA14/0027) to subdivide approximately 24 hectares of land east of Castlereagh Road and on the southern side of Church Land to create nine rural residential allotments ranging from 2-5 hectares in size. This Stage 1 development application is set to precede DA14/0027 and form a strategic basis for that application.

DA – Nepean River Pump and Pipeline

PLDC will submit an application to the Department of Planning & Infrastructure for the construction of a pumping station and pipeline on the banks of the Nepean River for the purpose of extracting water for use in the Penrith Lakes Scheme. The pumping station is part of the infrastructure required for the first filling and maintenance of lake water levels. The pumping station was envisaged in the RES 1984 as a key piece of infrastructure required by the State government to manage the water based parklands and was agreed by the PLDC to be constructed as part of the deliverables under the 1987 Deed of Agreement.

3.0 Site Analysis

3.1 Site Location and Context

The Penrith Lakes Site is located on the Castlereagh floodplain of the Nepean River, approximately 3 km to the north of the Penrith CBD (**Figure 2**). The Penrith Lakes Site is approximately 1935 ha in area and is approximately 6.5 km long and 3.5 km wide (at its widest point). It is located at the edge of the Sydney Basin adjacent to the Blue Mountains and bounded by the Nepean River to the south and west, Cranebrook Village and the Cranebrook Escarpment to the east, and rural land to the north. The Penrith Lakes Site sits adjacent to existing rural land uses, villages and residential development. Penrith Lakes is easily accessed by the M4 and in close proximity to Penrith CBD, a key regional city within metropolitan Sydney.

Figure 2 – Penrith Lakes Site Location and Context

3.2 Existing Site Functions

The Penrith Lakes Site has been intensively quarried for sand and gravel over the past 20 years (see **Figure 5**) and is a major source of sand and gravel for Sydney's building industry and has traditionally supplied about 45% of the sand and gravel resource over the past 20 years. The total sand and gravel resource on the site was approximately 220 million tonnes, of which 200 million tonnes has been extracted. Approximately 8% of the original sand and gravel resource remains available for extraction. At current rates the remaining quarry resource is expected to take around 12-15 months to be fully extracted.

Before quarrying operations the land has been used for agriculture and horticulture, particularly orchards. The Darug people used the land for hunting, gathering and as a meeting place before European settlement. Due to the current and post

European settlement uses the Penrith Lakes Site has limited vegetation left, however, there are stands of native vegetation remaining including Cumberland Plain Woodland. The majority of the Penrith Lakes Site now consists of exotic grasslands or quarried land in various stages of rehabilitation. Consequently, the main environmental considerations relate to the physical heritage and the existing geotechnical and hydrological conditions.

The ongoing quarrying activities have continued to extract sand and gravel and to form the lakes and landforms as identified in the Structure Plan in State Environmental Planning Policy (Penrith Lakes Scheme), the main planning instrument currently applying to the Penrith Lakes Site. Part of Lake A has been formed and the Sydney International Regatta Centre (SIRC) and Penrith White-water Stadium have been established on the Penrith Lakes Site. The SIRC was the location of the rowing competition at the Sydney 2000 Olympic Games. The land adjacent to the SIRC has been landscaped and revegetated. The SIRC is currently used as a recreational and elite sport venue for triathlons, rowing, canoeing, cycling, walking and picnicking.

As quarrying operations are completed the Penrith Lakes Site is being progressively rehabilitated to form a series lakes and open space areas. Rehabilitation is also being undertaken to allow for future urban development over a portion of the Penrith Lakes Site. PLDC estimate that extractive quarrying operations will be completed by April 2015 (depending on market demand).

3.3 Heritage

The Penrith Lakes Site includes a number of natural and indigenous cultural heritage sites and areas and a number of European heritage items. The key heritage items are identified within SEPP Penrith Lakes and Penrith Local Environmental Plan 1991 (Heritage and Conservation), with the 'Upper Castlereagh Public School and Residence' also listed on the State Heritage Register. "The Poplars" also containing archaeological relics defined under the Heritage Act 1977. The key heritage items are depicted in **Figure 3** and identified in **Figure 4**.

Nepean Park

Christ Church Castlereagh

Methodist Church Hall and Bell Tower

Methodist Church Hall and Cemetery

Figure 3 – Heritage Items

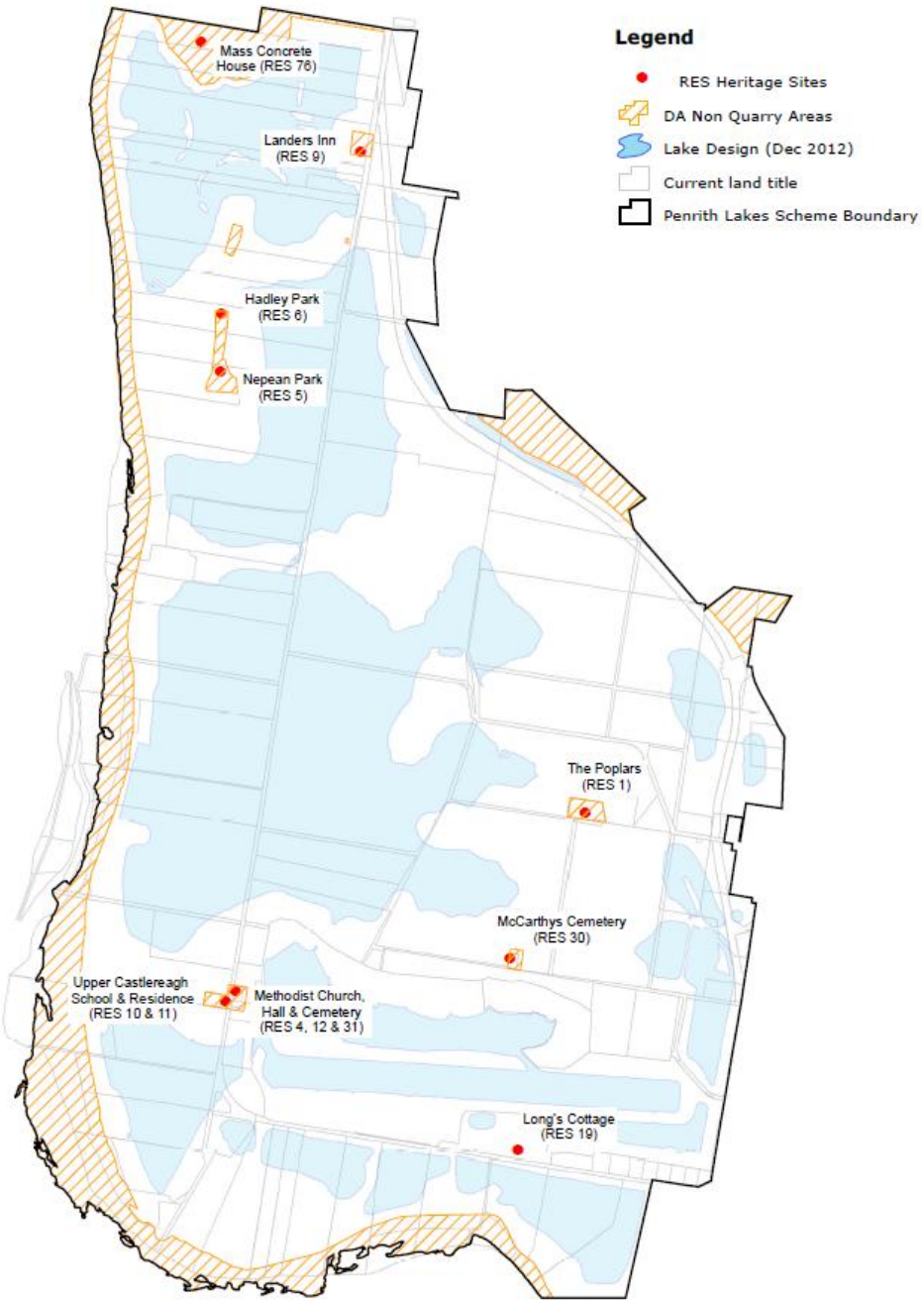


Figure 4 – Key heritage sites and conservation areas within the Penrith Lakes Site

3.4 The Development Site

Land within the Penrith Lakes Scheme boundary comprises land owned by PLDC, the NSW Government and private landowners. However, the significant majority of the Penrith Lakes Site is owned by PLDC. This application only relates to land under ownership of PLDC and the NSW Government and is referred to as the development site, indicatively shown in **Figure 5**. The legal descriptions of the land to which the proposed Staged DA applies and associated ownership details are included in **Appendix C**.

A number of allotments within the Penrith Lakes Site have been excluded from this application as the lots have been rehabilitated, consolidated and returned to

Government ownership, or the allotment contains an item of heritage significance where the existing allotment pattern affords the preservation of that item. The following Lots within the Penrith Lakes Site are not included as part of this application:

- Lot 482 DP849952 (Nepean Park)
- Lots 1 and 2 DP735602 (Upper Castlereagh Public School and residence)
- Lots 1 and 2 DP196573 (Upper Castlereagh Methodist church, hall and cemetery)
- Lots 20 and 21 DP1092147
- Lots 16,14, 12, 10, 8, 6, 4 DP793163
- Lot 82 DP1129226 (McCarthy's Cemetery)
- Lot 10 DP1014419 (The Poplars)
- Lot 2 DP229462
- Lot 2 DP1107181
- Lot 61 DP581560
- Lot 1 DP1191173
- Lot 247 DP752021
- Lot 103 DP1143931
- Lot C DP374804
- Lot 2 DP522490
- Lot 11 DP839890

Figure 5 – Existing development and the development site

4.0 Relevant Planning Framework

The following legislation and strategies are relevant to the proposed development:

- Environmental Planning and Assessment Act 1979
- Heritage Act 1977
- Rural Fires Act 1997
- Metropolitan Plan for Sydney 2036
- Draft Northwest Subregional Strategy

4.1 Legislative Framework

The legislative framework for the development site and the relevant scope of each piece of legislation in relation to the development proposed is identified in **Table 3** overleaf.

Table 3 – Legislative Framework

Legislation	Comment/Requirement
Environmental Planning and Assessment Act 1979 (EP&A Act)	
Development Consent	– Development consent is required under Part 4 of the EP&A Act and pursuant to the relevant provisions of SEPP (Penrith Lakes Scheme).
Environmental Assessment	– Requires a consent authority to have regard to the environmental impacts of development and assess development in accordance with relevant environmental planning instruments, development control plans, policies etc (s.79C(1)). This assessment is included at Section 6.0.
Staged Development	– In accordance with section 83B, consent is sought for the overall concept and layout of the subdivision of the development site. In addition, consent is also sought for the subdivision and associated works for the first stage of the development (known as Stage 1) (s.83B(3)(b)).
Integrated Development	– Pursuant to section 91, the development is integrated development. Hence, additional consent and approvals are required from various authorities (see below for more detail).
Heritage Act 1977	
	– The Upper Castlereagh School and the School Master's Residence (State Register) and the Nepean Park (National Estate) are listed as a State Heritage Listed items pursuant to the *Heritage Act*.
	– Where a site is listed as a State Heritage listed item, approval is required from Office of Heritage to the carrying out of any development in relation to the land on which the item, work or relic is situated, the land that comprises the place, or land within the precinct.
National Parks and Wildlife Act 1974	
	– Consent is required pursuant to section 90 from the Director General of NPWS to permit the removal/disturbance of an Aboriginal object on a site for the purposes of any proposed works or development. – A AHIP permit allowing testing and salvage excavations of Aboriginal objects or places on the Penrith Lakes Site has been issued under section 90 of the National Parks and Wildlife Act 1974 (NPW Act). All salvage works have been carried out across the Penrith Lakes Site in accordance with this permit. – A permit is not considered to be required as there is little likelihood of finding any Aboriginal objects over the development site and only physical works proposed for Stage 1 relate to the construction of the McCarthy's Cemetery. – However, as a precaution, if during the carrying out of the development (in particular earthworks and remediation) any Aboriginal objects are located the works will cease and an Aboriginal Heritage Investigation Permit (section 90 permit) will be sought from NPWS to carry out investigations by a qualified consultant.
Rural Fires Act 1997	
	– Fringes of the site are identified as being bushfire prone – Approval is required from the NSW Rural Fire Service under section 100B of the Rural Fire Act.

4.2 Strategies

In December 2010, the NSW Government released its Metropolitan Plan for Sydney 2036. This document supersedes the Metropolitan Strategy for Sydney to 2031, which was released in December 2005. Broadly the plan sets the direction and context for taking forward development across the Sydney Metropolitan area to deliver improved transport, housing and employment opportunities over the next 25 years.

The draft North West Sub-Regional Strategy is a key state planning tool to guide Council in achieving the Metropolitan Plan's objectives at a local level. Relevant to the Site and its development, the sub-regional strategy identifies that the North West Region is expected to deliver approximately 140,000 new dwellings by 2031, of which the Penrith Local Government Area (LGA) is to contribute approximately 25,000 of these.

The intended and future use of part of the Penrith Lakes Site for urban development is likely to include a component of residential development that will assist in contributing to these targets. However, the proposed development does not propose to facilitate housing at this stage, but rather implement a subdivision framework that supports the future implementation Penrith Lakes Scheme as illustrated in the Structure Plan of the Penrith Lakes SEPP.

5.0 Description of Proposed Development

5.1 Purpose of Development

The proposed Staged Development seeks to implement the Penrith Lakes Scheme by consolidating and reconfiguring the allotment pattern for the development site to generally accord with Penrith Lakes Scheme shown in the Structure Plan under the Penrith Lakes SEPP and to later facilitate subsequent subdivision of some of the super lots into smaller lots of 2ha or greater in size.

Each super lot created by Stage 1 is proposed with the intent to facilitate the future and current use of that land (or water body) shown in the Structure Plan and is to be dedicated to the State government or retained for possible future urban purposes. No use or change of use of the subdivided land is sought as part of this Staged Development application.

5.2 Stage 1

5.2.1 Subdivision

The first stage of subdivision seeks to create 23 super lots that reflect both the Penrith Lakes SEPP, the associated Structure Plan and lands to be dedicated under the Deed.

The proposed Stage 1 subdivision consolidates more than 200 lot parcels into 23 relatively large consolidated lots – see **Table 4** for more detail. The existing subdivision pattern does not reflect the quarried and rehabilitated state of the land and nor does it facilitate the delivery of the Penrith Lakes Scheme as it does not adequately reflect land and water bodies and potential urban areas under the Structure Plan. Further the existing subdivision pattern does not facilitate the timely return of land to Government ownership as rehabilitation works are completed.

The proposed Stage 1 subdivision primarily seeks to excise water bodies from land area. These areas are shown in blue in **Figure 6**. A number of the man-made lakes under the Penrith Lakes Scheme are nearing completion, however the existing subdivision pattern does not reflect the alignment and buffer area surrounding these water bodies.

Remaining land within the development has been separated into parcels reflective of the level of completion, to facilitate a timely return of land to public ownership. Certain parcels of land within the development will not undergo any boundary change but still form part of this application as to rationalise the existing Lot and DP function of the development site and to be inclusive under a single Deposited Plan.

The proposed Stage 1 subdivision pattern will provide separate allotments to significant heritage items that respond to context of the item within the overall development site. Lots 20 and 7 have been separated for this reason and the rational applies to the division of Lots 21 and 3.

Table 4 provides a summary of the proposed allotment areas and a representation of the proposed plan of subdivision is provided at **Figure 6**. More detailed subdivision plans are included in **Appendix A**.

Future land ownership transfer will be subject of the Deed of Agreement between the State Government and PLDC and is not a consideration of this application.

Stage 2 of the development will seek to subdivide lot 4, which relate to land referred to as 'Future Urban' under the Structure Plan, to a minimum of 2 hectares in accordance with the minimum lot sizes provided for under Penrith Interim Development Order No.93 (the "IDO 93").

Table 4 – Proposed Super Lots for Stage 1

Proposed Lot Number	Location Name	Proposed Lot Area	Reason for Subdivision
1	Lake A	366.9ha	Lake & Buffer Area
2	Quarantine Lake	51.5ha	Lake & Buffer Area
3	Southern Wetlands	239.8ha	Residual area
4	Future Urban Area	339.2ha	Residual area
5	Landers Inn	5ha	Residual lot including heritage item
6	Smiths Road	14.5ha	Residual lot including heritage item
7	Wildlife Lake	41ha	Residual area
8	Nepean Lake B	26.1ha	Residual area
9	Nepean Lake A/B	50.2ha	Residual area
10	Wildlife Lake	175.5ha	Lake & Buffer Area
11	Lake B	158.5ha	Lake & Buffer Area
12	Lewis Lagoon	18.9ha	Residual area
13	The Escarpment	24.4ha	Residual area (subject of DA14/0027)
14	Vincent Creek	7.5 ha	Residual area
15	Cranebrook Lake	12.9ha	Lake & Buffer Area
16	Cranebrook Urban	3.6ha	Residual area (subject of DA13/1410)
17	Cranebrook West	0.9ha	Residual area (subject of DA13/1410)
18	Stilling Basin	Part 1 2.2ha Part 2 1.2ha	Residual area
19	PLDC Offices	12. ha	Residual area
20	Hadley Park	21.9ha	Residual lot including heritage item
21	Heritage Village	48.2ha	Residual lot including heritage item
22	Wilchards North	Part1 0.5ha Part 2 5.8ha	Residual area
23	Church Lane	2.5ha	Residual area

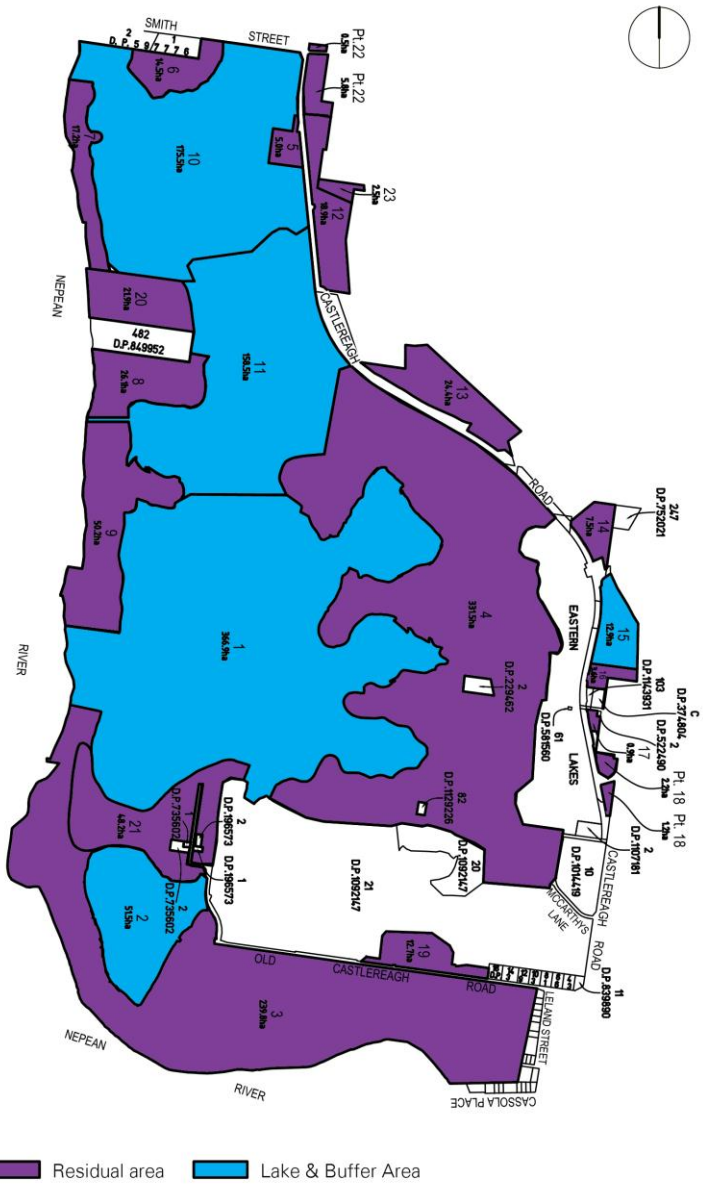


Figure 6 – Proposed subdivision

5.2.2 Car Parking Area

The proposed development consists of the construction of a car park on vacant land adjacent to McCarthy's Cemetery (NB: Cemetery site is not included in this application). The car park provides a total sealed area of approximately 200 square metres comprising five standard car spaces and one disabled car space, conforming with the Australian Standards (AS2890.1:2004 & AS2890.6:2009). The car park is accessed via the existing haulage road through the Penrith Lakes Site.

Engineers designs for the proposed car park at tabled at **Appendix B**.

5.3 Development Staging

As stated in Section 5.0 of this report, this application is a staged development application. This Stage 1 development application incorporates the following:

- Consolidation and reconfiguration of 211 existing allotments into 23 super lots conforming with the indicative layout of the Penrith Lakes Structure Plan;
- Construction of a six-space car park adjacent to McCarthy's Cemetery; and
- In principle support for Stage 2 of the development proposal.

Stage 2 of the proposed development provides for the following:

- Subdivision of the proposed super lot 4 of the Stage 1 development into parcels no smaller than 2 hectares in area;
- Design of drainage network servicing subdivided super lot 4; and
- Design of road network internal to the Penrith Lakes Site and providing servicing to proposed subdivision.

Further traffic, flood evacuation and urban design studies will be undertaken to inform the Stage 2 application and it is considered that these issues will be subject to assessment at the time of lodgement of the Stage 2 development application with Council. An indicative layout of the overall development is set out in **Figure 7** below and presented at **Appendix A**.

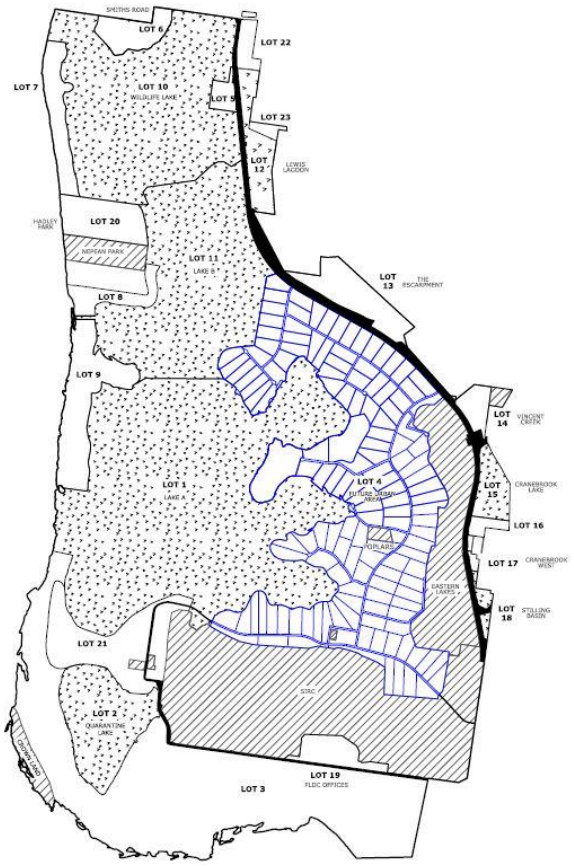


Figure 7 – Indicative staged subdivision development application

5.4 Alternatives to the proposed development

The alternative development scenario discussed by Council during the pre-DA consultation, involved the amalgamation of the development site into a single allotment. This option is not considered viable as this would not facilitate the staged handover of the development site and is not reflective of the Penrith Lakes Scheme. The proposed development seeks to reconfigure allotment boundaries to be generally in accordance with the Structure Plan 1998 to facilitate the staged dedication of land to Government ownership once extraction and rehabilitation is complete for that parcel. The proposed subdivision pattern allows for further investigation of the land designated as 'future urban' under the Structure Plan, subject to further development application. Further, the proposed subdivision will provide greater protection to items of heritage significance in comparison to a single allotment covering the entire development site.

5.5 Consequences for not carrying out the Development

The proposed subdivision facilitates the orderly rehabilitation and hand over of land from PLDC to the State Government in accordance with the Penrith Lakes SEPP and the Deed of Agreement. Without the proposed consolidation and realignment of allotments within the Penrith Lakes Site, the orderly exchange of land cannot proceed, which will slow progress across the Penrith Lakes Site. The consequence of not carrying out the proposed development will limit the timely and efficient implementation of the Penrith Lakes Scheme and not define significant heritage allotments.

6.0 Assessment of Environmental Impacts

This section considers the planning issues relevant to the proposed development. It contains our assessment of the environmental impacts of the proposal and identifies the steps to be taken to prevent or mitigate the potential impacts on the environment.

6.1 Compliance with Relevant Strategic and Statutory Plans and Policies

The following planning instruments and policies apply to the site:

- SEPP Penrith Lakes;
- SEPP 55 – Remediation of Land;
- SEPP (State & Regional Development);
- Interim Development Order 93;
- Interim Development Order 47;
- Interim Development Order 13;
- Penrith Local Environmental Plan 1988 (Urban Land);
- Penrith Local Environmental Plan 1991 (Environmental Heritage Conservation);
- Draft Penrith Local Environmental Plan 2013; and
- Penrith Development Control Plan 2006.

Figure 8 below is provided to assist in illustrating the extent to which of each of the current local environmental planning instruments applies to the site. It is noted that the Penrith Development Control Plan 2010 only applies to land to which the Penrith LEP 2010 applies – this area is not the subject of this development application. A comprehensive assessment of the relevant provisions of these instruments and the proposed development is provided below.

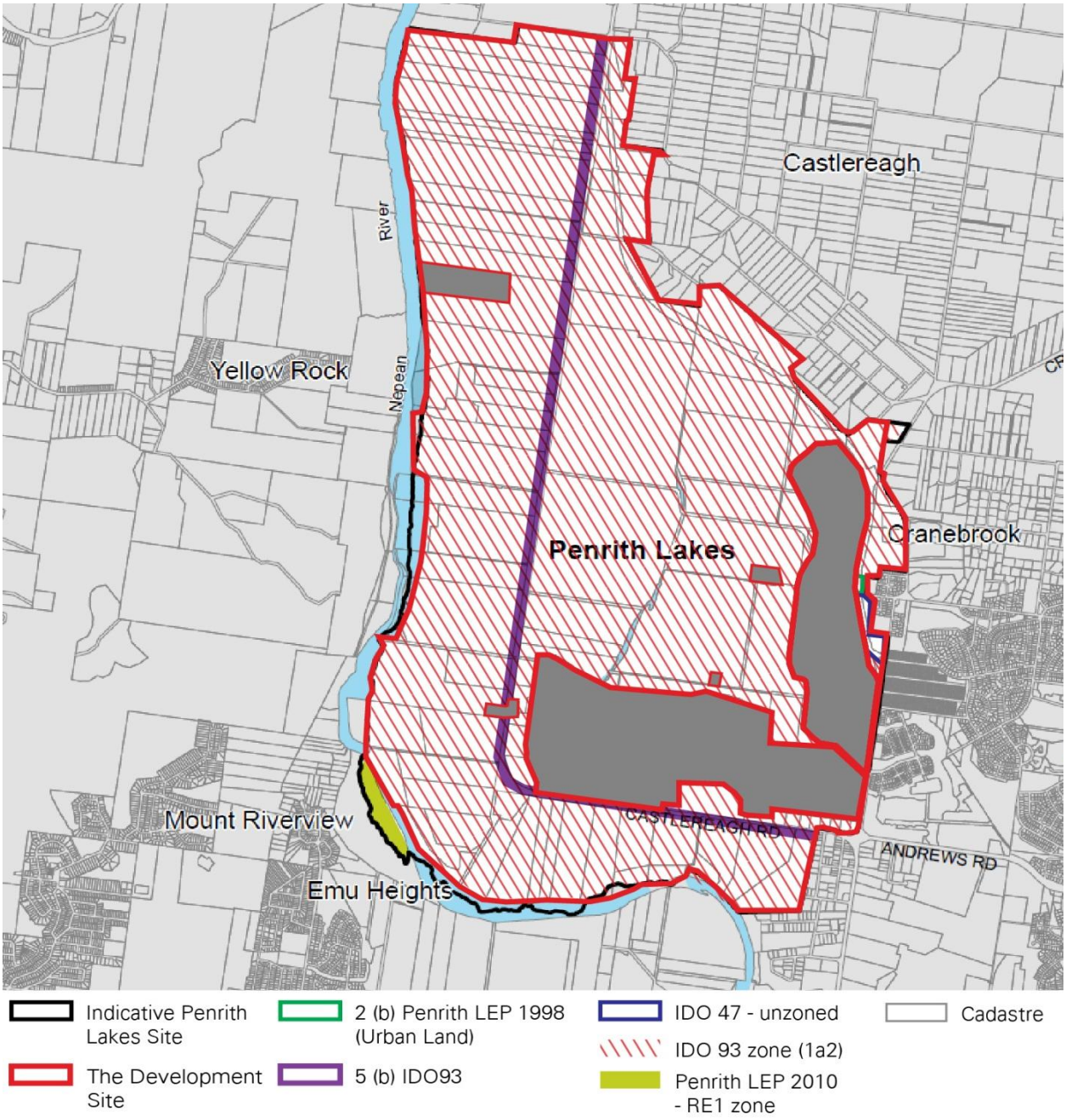


Figure 8 – Indicative Plan of Local Planning Instruments applying to the Penrith Lakes Site

6.1.1 State Environmental Planning Instruments

State Environmental Planning Policy – Penrith Lakes Scheme (Penrith Lakes SEPP) 1989

The Penrith Lakes SEPP applies to the whole of the development site. It is the key planning instrument that relates to the Penrith Lakes Site and its development.

Unless the development on the Penrith Lakes Site is considered to be State Significant Development or Regional Development pursuant to the EP&A Act, Penrith City Council is the consent authority for all other development pursuant to clause 6 of the Penrith Lakes SEPP. Development for the purposes of this

application is not State or Regional Development, consequently Council is the consent authority.

Clause 7 of the Penrith Lakes SEPP requires that no development should be carried out on the Penrith Lakes Site unless the development is authorised by the Penrith Lakes SEPP. Development permitted by the Penrith Lakes SEPP includes that referred to as the 'Penrith Lakes Scheme'.

Under clause 2 the objective of the SEPP is also to permit the implementation of the Penrith Lakes Scheme, which is specifically defined under Schedule 1 as follows:

> *" The Penrith Lakes Scheme is the creation of a regional recreational lake system as shown on the **structure plan** for the benefit of the public as a result of:*
>
> *(a) the staged optimum extraction of sand and gravel reserves,*
>
> *(b) the staged rehabilitation, reconstruction and landscaping of the land, and*
>
> *(c) the staged formation of a series of interconnected lakes,*
>
> *and includes the identification of land for possible future urban purposes as a result of the work referred to in paragraphs (a) and (b)."* (emphasis added)

The Structure Plan is shown in **Figure 9** below. It identifies the number, size and structure of lakes and future urban areas to be developed over the Penrith Lakes Site. The plan also identifies heritage items, open space, detention basins and the realigned Castlereagh Road within the Penrith Lakes Site. Pursuant to clause 8 of the SEPP, development for the purposes of the Penrith Lakes Scheme is permissible with development consent.

In accordance with clause 8(2) of the SEPP, Council shall grant consent for development for the purpose of implementing the Penrith Lakes Scheme, on the Penrith Lakes Site unless it is of the opinion that the development:

- does not fully implement the Penrith Lakes Scheme;
- will not ensure the satisfactory implementation of the Penrith Lakes Scheme; or
- does not generally accord with the Structure Plan.

All works pertaining to existing DA for the Penrith Lakes Site (see Section 2.5) have been or are being carried out to give effect to the implementation of the Penrith Lakes Scheme. Specifically these works have been carried out generally accordance with the Structure Plan, to create a substantial portion of the lake formations and developable areas of the Penrith Lakes Site generally. Moreover, the new and realigned Castlereagh Road has been provided and accords with that alignment shown in the Structure Plan.

The proposed Staged Development seeks to contribute towards further implementation of the Penrith Lakes Scheme in accordance with the clauses 7 and 8(2) of the Penrith Lakes SEPP. Specifically, the proposed Stage 1 subdivision will replicate the lake layout of the Structure Plan through the formation of lots 1,2, 10, 11, 15 and 18.

This proposed pattern of subdivision layout also supports the staged implementation of the Penrith Lakes Scheme by removing the extensive and somewhat cumbersome existing subdivision pattern across the development site, and by setting a subdivision layout that reflects the future and likely development of the Scheme.

Lots to the east of the realigned Castlereagh Road have been included in this application to facilitate the orderly subdivision of the development site as a single

Deposited Plan rather than part allotments, remaining from original subdivision pattern. The proposed subdivision of land east of Castlereagh Road does not preclude the future urban use as prescribed under the Structure Plan. This land is considered within the transition zone between the existing urban area and the Penrith Lakes Site.

Eight heritage items have been identified and protected by the Penrith Lakes SEPP, including the following structural items are listed for retention in Schedule 3 (Heritage Items) of SEPP 11:

- Hadley Park, lots 1 and 2, MPS (OS) 8807 (shown as Heritage Item No 1 on the structure plan).
- Nepean Park, part portion 48 (shown as Heritage Item No 2 on the structure plan).
- McCarthys Cemetery, part portion 82, (shown as Heritage Item No 3 on the structure plan).
- Upper Castlereagh Methodist Church and Hall, part portion 71 (shown as Heritage Item No 4 on the structure plan).
- Upper Castlereagh School and Residence, part portion 54 (shown as Heritage Item No 5 on the structure plan). Permanent Conservation Order No 339 under the Heritage Act 1977, applies to Upper Castlereagh School.
- Methodist Cemetery, part portion 71 (shown as Heritage Item No 6 on the structure plan).

These heritage items are shown on the Penrith Lakes SEPP Structure Plan at **Figure 9**, see also **Figure 4** above.

Proposed lots 5, 20 and 21 have been divided from the residual land as to provide separate allotments that relate to heritage items as set out under the Penrith Lakes SEPP. The allotment boundaries generally conform with the Structure Plan and have been informed by the significant heritage items within the development site. In accordance with clause 15 of the SEPP(Development in the vicinity of an item of environmental heritage) a detailed assessment of the proposed development's potential impacts to these will be addressed in the Heritage Impact Statement to be submitted in due course

This SEE report has been prepared in accordance with clause 8(3) of the Penrith Lakes SEPP, which requires the SEE to consider and address all matters listed in Schedule 2 and in clause 8(4). The **Tables 5 and 6** below address in detail the various matters listed in these provisions.

Table 5 – Matters Specified in Schedule 2 of Penrith Lakes SEPP

Schedule 2	Matter	Location addressed in SEE
Subclause 1		
(a)	Justification of proposed development	Section 5.0 and 2.5
(b)	A full description of the development	Section 5.0
(c)	A statement of the objectives of the proposed development	Section 5.0
(d)	A full description of the existing environment likely to be affected by the proposed development if carried out	Section 3.0
(e)	Identification and analysis of the likely environmental impacts or consequences of carrying out the proposed development	Section 6.0
(f)	Analysis of the likely environmental impacts or consequences of carrying out the proposed development	Section 6.0
(g)	Justification of the proposed development in terms of environmental, economic and social considerations	Section 6.0

(h)	Measures to be taken in conjunction with the proposed development to protect the environment and an assessment of the likely effectiveness of the measures.	Section 6.0
(i)	Energy requirements of the proposed development	N/A
(j)	Any feasible alternatives to carrying out the proposed development and the reasons for choosing the latter	Section 5.4
(k)	The consequences of not carrying out the proposed development	Section 5.5
Subclause 2		
(a)	Relationship and extent of the proposed development to the completed scheme	Sections 5.1 and 6.1.1
(b)	Integration of the proposed development with development previously carried out	Section 6.2 and 2.5
(c)	The sequence of extraction and rehabilitation	N/A
(d)	The proposed control and management of the land	N/A
(e)	The management and control of water resources	N/A
(f)	The rehabilitation and reconstruction of the land	N/A
(g)	Any effect upon a locality, place or building not listed in Schedule 3	Section 6.5
(h)	Measures to conserve and preserve items of heritage	Section 6.5
(i)	Access to supply of water	N/A

Table 6 – Matters for Consideration under Clause 8(4) of Penrith Lakes SEPP

Subclause	Matter	Location addressed in SEE
(a)	Penrith Lakes Scheme Regional Environmental Study	Section 6.1.1
(b)	Recommendations of technical working parties as may be established	N/A
(c)	Statement of Environmental Effects	This report
(d)	Proposed sequence of extraction and rehabilitation	N/A
(e)	Proposed control and management of land, if not dedicated to Crown	N/A
(f)	Management of water and control of water resources	N/A
(g)	Rehabilitation and reconstruction of the land	N/A
(h)	Access to water supply	N/A
(i)	Heritage items listed in Schedule 3	Sections 6.5
(j)	Any effect upon a locality, place or building not listed in Schedule 3	Section 6.5
(k)	Provisions of the Act that apply to the development of implementing the Penrith Lakes Scheme	Section 4.0

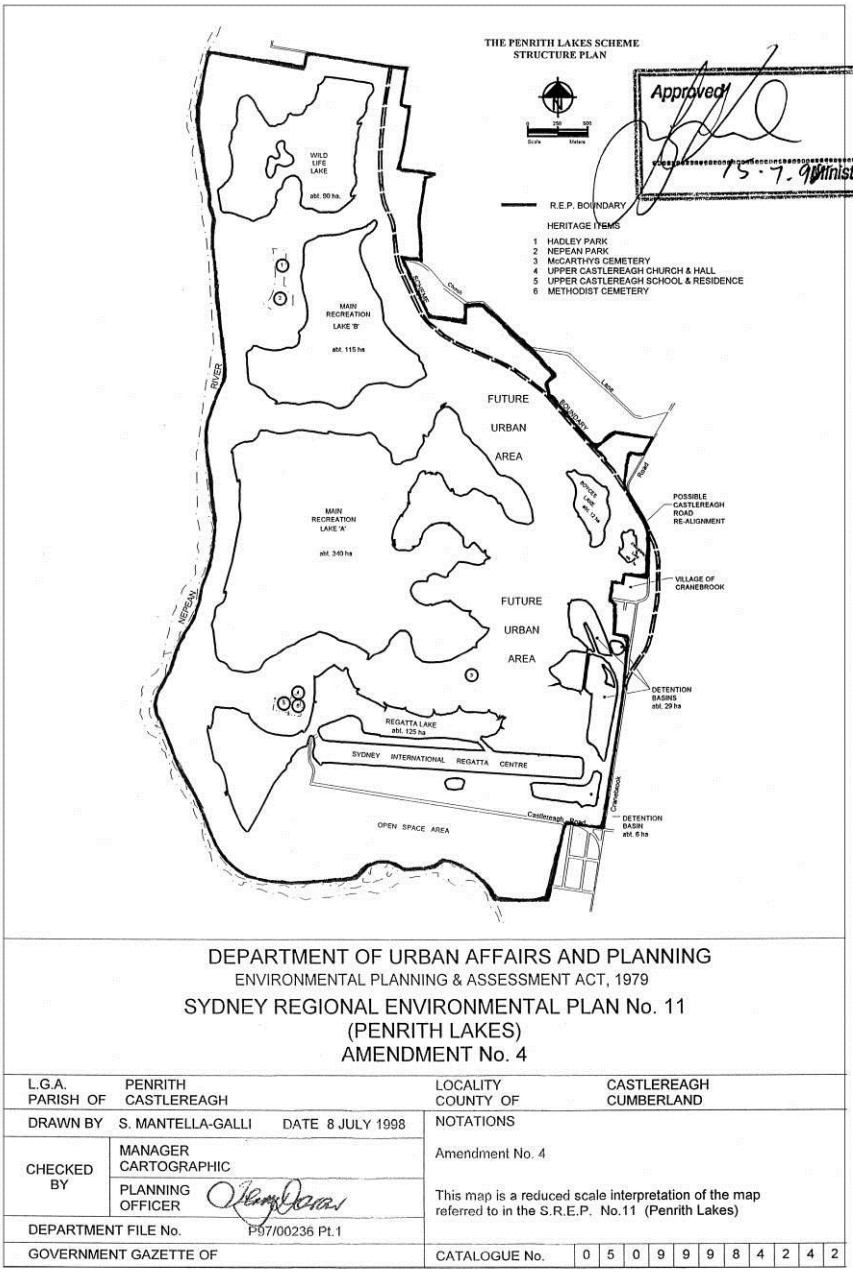


Figure 9 – Penrith Lakes SEPP Structure Plan

State Environmental Planning Policy 55 – Remediation of Land

SEPP 55 provides that a consent authority must not consent to the carrying out of development on land unless:

- it has considered whether the land is contaminated, and
- if the land is contaminated, it is satisfied that the land is suitable in its contaminated state (or will be suitable, after remediation) for the purpose for which the development is proposed to be carried out, and
- if the land requires remediation to be made suitable for the purpose for which the development is proposed to be carried out, it is satisfied that the land will be remediated before the land is used for that purpose.

The Land Use Suitability Review, conducted by DLA Environmental and tabled at **Appendix D**, confirms that the remediation works carried out under existing

consents on the development site are sufficient to facilitate the proposed development.

The development site is considered suitable for the purposes of the staged subdivision and does not require further remediation beyond that already undertaken or being carried out by the various DAs for the Penrith Lakes Scheme.

State Environmental Planning Policy (State and Regional Development) 2010

The Penrith Lakes Site is identified at clause 8 of Schedule 2 of the State and Regional Development SEPP. Development for the purposes of extraction, rehabilitation or lakes formation (including associated infrastructure) is prescribed as State Significant Development. The proposed development does not fall within these land uses and therefore the provisions of the S&RD SEPP do not apply to the proposed development.

6.1.2 Local Environmental Planning Instruments

Interim Development Order No. 93 (IDO 93)

Under IDO 93 the majority of the development site is zoned 1(a2) Rural A2. Only Old Castlereagh Road and Castlereagh Road west of the Waterside Residential development (Lakes Environs) is zoned 5(b) Special Uses (Roads) under IDO 93 (See **Figure 8**).

Development permitted with consent under the 1(a2) zone includes:

- *advertising structures, dwelling houses, educational establishments, extractive industries, home industries, home occupations, open space, roads, sand and gravel processing, utility installations.*

Under the '5(b) (Special Uses)(Roads) zone' drainage, roads and utility installations are permissible with consent.

Under clause 5 of IDO No. 93 the minimum size of allotments that can be created with consent of Council over land zoned 1(a2) is 2 hectares (20,000m^2).

There is no minimum allotment size for land that is zoned 5(b)(Special Uses)(Roads).

Under clause 6 of IDO 93 a dwelling house may be erected with the consent of Council provided that the area of the allotment to which the proposed dwelling relates is not less than 2 hectares.

The Stage 1 subdivision development is consistent with IDO 93 in that subdivision is permissible development and all proposed allotments to be created are larger than the minimum 2ha permitted. The subdivision of super lot 4 of Stage 1 to be further subdivided to lots no smaller than 2 hectares, subject to a Stage 2 development application, is also consistent with IDO 93.

Interim Development Order No. 47 (IDO 47)

A relatively small and eastern portion of the development site is land to which IDO No. 47 relates (see **Figure 8**). Part of this land includes the newly aligned and constructed Castlereagh Road that bypasses Cranebrook Village.

The following forms of interim development are permissible in the land to which IDO No. 47 relates:

Drainage; dwelling-houses; educational establishments; home industries; open space; places of public worship; road; subdivision; residential flat buildings class A and class B; units of single storey construction for aged persons; utility installations other than gas holders or generating works.

Other than the following forms of development that are described as prohibited and those listed above as interim development, all other interim development is permissible with consent.

Prohibited Development under IDO 47 includes:

Bulk stores; caravan parks; car repair stations; clubs; commercial premises; forestry; gas holders; general advertising structures; generating works; hotels; industries other than home industries; institutions; junk yards; liquid fuel depots; mines; motels; motor showrooms; places of assembly; refreshment rooms; residential flat buildings (other than for aged persons or class A or class B listed above); roadside stalls; shops; stables; stock and sale yards; transport terminals other than bus stations and bus depots.

Under clause 13 no development shall be carried out on land to which IDO No.47 applies except in accordance with a Development Control Plan (DCP) approved by the New South Wales Planning and Environment Commission (now known as the Department of Planning and Infrastructure (DP&I)). Despite this and in the absence of an approved DCP under clause 13(2) Council may approve development with concurrence of DP&I.

In accordance with clause 14 any development is not to take place until land is filled to a level satisfactory to Council. This would not preclude the ability for Council to approve the subdivision pending any filling of this land that may be required, if the current development site levels are not already satisfactory.

It is noted that there are no provisions under IDO no. 47 relating to subdivision of land. It is implied that the minimum allotment size that would be permitted in the absence of any such controls in the IDO would be 550m^2, based on the clauses relating to dwelling houses. On this basis the proposed subdivision of this part of the Penrith Lakes Site to create super lots is consistent with IDO 47.

Penrith Local Environmental Plan 1988 (Urban Land)

A very small parcel of land on the eastern portion of the development site is zoned 2(b) Residential (Low Density) under Penrith LEP 1988 (Urban Land) (see **Figure 7**).

Within the 2(b) zone the following types of development are permissible with consent:

buildings or other structures ordinarily associated with dwelling houses; changes of building use (as defined in the Act); child care centres; community facilities; demolition of buildings or other structures; drains; dual occupancies; dwelling houses; educational establishments; general stores; health care consulting rooms; home businesses; hospitals; internal structural work in bed and breakfast establishments; places of worship; recreation areas; roads; utility installations; utility undertakings.

The minimum standard lot size that is permissible under Penrith LEP 1988 for land zoned 2(b) is 550m^2. Therefore the proposed subdivision of this part of the development site is permitted and complies with this LEP.

Penrith Local Environmental Plan 1991 (Environmental Heritage Conservation)

Penrith Local Environmental Plan 1991 lists individual significant heritage assets (refer to **Figure 4**) that should be conserved and outlines the development consent and planning processes required to alter or demolish such places. Additional items of non-indigenous heritage (not listed in Schedule 3 of the existing Penrith Lakes SEPP) are included in this LEP.

For those items that are listed in the Penrith LEP but have been excluded from Penrith Lakes SEPP, clause 4 of the LEP states that Penrith Lakes SEPP prevails over the Local Environmental Plan to the extent of any inconsistency.

Notwithstanding this, the items within this plan remain applicable heritage items to consider with regard to the proposed development. It is noted that there is no consideration of indigenous heritage in LEP 1991.

The additional items of non-indigenous heritage (not listed in Schedule 3 of the Penrith Lakes SEPP) included in this LEP are:

- 'Ruin of Stone Stables associated with Landers Inn' (C6)(RES 9);
- 'Slab Cottage' (C7)(RES 16) (Puddledock);
- 'Ruins of Pise House Portion 280' (C13)(RES 37);
- 'The Poplars, Old Slab Cottage, Pise House & Garden' (CR8)(RES 1); and
- 'Upper Castlereagh War Memorial (part of Church/school precinct' (UC4)(RES 4, 10, 11 & 12).

6.1.3 Draft Environmental Planning Instruments

Draft Penrith Local Environmental Plan 2010

Under section 79C(a)(ii) of the EP&A Act and in assessing the proposed development, consideration must be given to all draft planning instruments that have been or are currently on public exhibition that apply to the development site and the proposed development.

Council placed Draft LEP 2010 on exhibition in June 2013. The draft plan is intended to amend the existing Penrith LEP 2010, which applies to much of the rural and employment lands throughout the Penrith LGA.

Draft LEP 2010 proposed to repeal the following current planning instruments applying to the development site:

- Penrith Planning Scheme Ordinance
- Penrith Interim Development Order No. 13
- Penrith Interim Development Order No. 47
- Penrith Local Environmental Plan 1991 (Environmental Heritage Conservation)
- Penrith Local Environmental Plan 1998 (Urban Land)
- Draft Amendment No.1 to Penrith Local Environmental Plan 1991 (Environmental Heritage Conservation).

It is noted that Penrith Interim Development Order No. 93 was not listed as one of many IDO's to be repealed by Draft LEP 2010 despite being listed as one of many existing environmental planning instruments in Appendix A of the Council's Planning Proposal Document in support of Draft LEP 2010 (dated May 2013), and despite the fact that this IDO applies to the majority of the development site.

Since exhibition, Council recently resolved to exclude the Penrith Lakes Site from being included as part of the lands to which the draft LEP was to apply. This means that all the existing local planning instruments applying to the development site remain (insofar as they relate to the Penrith Lakes Site) and will not be repealed by the Draft LEP once gazetted.

Despite this, the following provides an assessment of the proposed Stage 1 development against the provisions of the Draft LEP as is required under section 79C of the EP&A Act.

Under the exhibited Draft LEP the majority of the development site was proposed to be zoned 'RU1 Primary Production', with exception of a small sliver of land adjoining the new Castlereagh Road, which is proposed to be zoned SP2 Classified Road (see **Figure 10**).

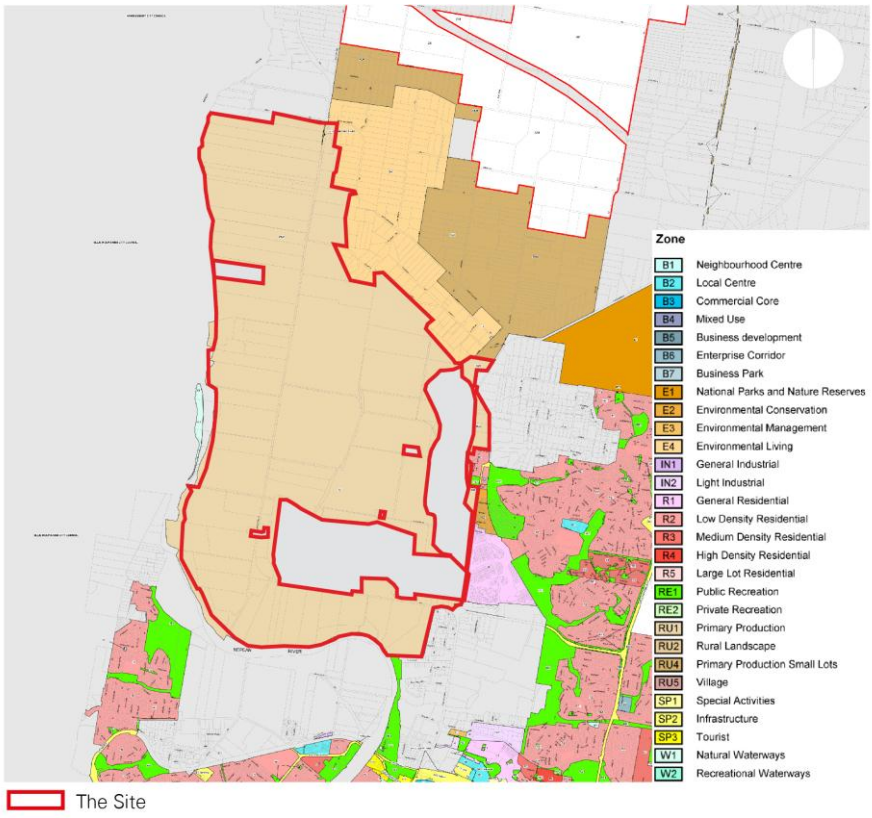


Figure 10 – Proposed zoning map for development site under exhibited Draft Penrith LEP 2010

Under the RU1 zone the following types of development are permissible with consent of Council:

- *agricultural produce industries; Agriculture; Animal boarding or training establishments, Bed and breakfast accommodation; Building identification signs; Business identification signs; Cellar door premises; Community facilities; Dual occupancies; Dwelling houses; Environmental facilities; Environmental protection works; Extractive industries; Farm buildings; Farm stay accommodation; Flood mitigation works; Forestry; Home-based child care; Home businesses; Home industries; Information and education facilities; Intensive livestock agriculture; Open Cut Mining; Roads; Roadside stalls; Rural supplies; Secondary dwellings; Stock and sale yards.*

All other types of development are prohibited under the RU1 zone.

Under clause 4.1 the minimum permitted lot size under Draft LEP 2010 for the RU1 zone was proposed to be 20ha. 52% of the proposed allotments are consistent with this control.

In accordance with clause 4.2 proposed allotments can with development consent, be less than the minimum required for the RU1 zone. This is provided that the land is subdivided for the purpose of primary production and the lots created do not include an existing dwelling or intent for a future dwelling to be erected on these types of lots. None of the 11 allotments less than 20ha in area seek to provide for an additional dwelling. The lots are consistent with the primary production use as this application does not seek consent for any change of use on the development site. Any change of use would be subject to a further development application to Council and would be assessed on the merits of that application.

6.1.4 Development Control Plans

The compliance of the proposed development is assessed against the relevant provisions of the Penrith DCP 2006 in **Table 7** below. As this development site area, subject of this development application, is not subject to the Penrith LEP 2010, the Penrith DCP 2010 is not considered a relevant matter of consideration given the nature of this application.

Table 7 – Compliance with Penrith DCP 2006

Provision	Compliance	Comment
Penrith Development Control Plan 2006		
2.1 Contaminated Land Objectives: a) To enable Council more adequately identify, record and manage known and potentially contaminated land; b) To provide direction for Council in the gathering and assessment of information in relation to previous land use activities that may have resulted in contamination; c) To assist Council in the discharge of its functions and responsibilities in relation to existing and potential land contamination with reasonable care and due diligence to minimise potential risk to both public health and the environment; d) To inform the community, particularly those interested or involved in the planning and development process, of Council's procedures relating to existing or potential land contamination; and e) To ensure that all stakeholders are aware of their responsibilities for the ongoing management of contaminated land.	✓	The proposed subdivision does not seek a change of use to the land in question. The Land Use Suitability Review, prepared by DLA Environmental (see **Appendix D**) confirms that the existing contamination strategies prepared for the approved DAs on the development site provide sufficient assessment and information relating to the ongoing management of contamination on the development site. All remediation works consistent with these consents render the land suitable for future development.
2.2 Crime Prevention Through Environmental Design Objectives: - Enhance and improve community safety within the City of Penrith. - Create a physical environment that encourages a feeling of safety	✓	The proposed subdivision does not preclude the future use of the Penrith Lakes Site achieving crime prevention through environmental design. CPTED controls will be implemented as part of any future relevant development

Provision	Compliance	Comment
- Address community concerns with regard to issues of community safety and crime prevention. - Reduce the level of crime within the City of Penrith. - Prevent the opportunity for criminal activity. - To ensure that new developments promote crime prevention through environmental design.		application.
2.2.3 Car Parking (a) Carparks, aisles and manoeuvring areas shall be: - designed with safety and function in mind, and - have dimensions in conformity with Australian Standards 2890 - Parking Facilities. Relevant parts of this standard are: - AS2890. 1 - Off-street parking. - AS2890.2 - Commercial vehicle facilities. - AS2890.3 - Bicycle parking facilities.	✓	The proposed car park has been designed in accordance with the relevant Australian Standards. This is confirmed in the JWP Engineers Statement, tabled at **Appendix E**.
(b) Where parking spaces are to be provided for people with disabilities, these spaces are to be: • suitably located near entrances to the building and lifts/ access ramps, if required; and • provided in accordance with Australian Standards 1428.1 - Design for access and mobility. • Appropriate signage and tactile pavement treatments should also be installed, where required.	✓	One disabled car space is provided and has been designed in accordance with the relevant Australian Standards and located at the nearest most space to the entrance to the cemetery. Appropriate signage and markings will be displayed.
(c) The design of carparking areas should incorporate the following elements: - provision of a safe and convenient vehicle entry and exit that avoids traffic/pedestrian conflict and impact on the surrounding road; - the internal (vehicular) circulation network is free of disruption to circulating traffic and ensures pedestrian safety.	✓	See **Appendix E**.
(d) The movement of pedestrians throughout the carpark should be clearly delineated by all users of the carpark and minimises conflict with vehicles.	✓	See **Appendix E**.
(e) The design of the car park should ensure that passive surveillance is possible and where appropriate, incorporate active measures such as cameras and security patrols. Car parks should be designed to minimize dark areas through the provision of appropriate lighting.	✓	See **Appendix E**.

Provision	Compliance	Comment
(f) Large car parks should incorporate communication devices such as: - Intercoms - Public address systems - Telephones - Emergency alarms	N/A	
(g) To ensure users of large car parks are easily able to determine their location, exit and access points security intercoms, and the like appropriate signage is to be included	N/A	
(h) All surfaces in the car park should be painted in light coloured paint or finished in light grey concrete to reflect as much light as possible.	X	The proposed car park is located outside and will have sufficient natural light as to not require surfaces to be painted.
(i) All potential entrapment points should be avoided , eg. under stairs, blind corners and wide columns. Adequate lighting and mirrors should be used when certain design features are unavoidable. Refer to Section B4 for more information on entrapment.	✓	No entrapment points as the car park will not be enclosed in a structure or building.
2.5 Heritage Management Objectives: (a) To conserve the environmental heritage of Penrith; (b) To conserve the heritage significance of existing significant fabric, relics, settings and views associated with the heritage significance of heritage items and heritage conservation areas; and (c) To allow for the protection of places which have the potential to have heritage significance but are not identified as heritage items; and (d) To ensure that the heritage conservation areas throughout Penrith retain their heritage significance. (e) To provide guidance on the range and application of available conservation incentives. (f) To ensure archival records of heritage items and potential heritage places are undertaken in certain circumstances to a prescribed standard. (g) To ensure that proposals for development of environmental heritage are sustainable and appropriate way that conserves its values	N/A	This item specifically identifies that it does not apply to the Penrith Lakes Site.
2.10 Flood Liable Land Objectives: (a) To reduce the impact of flooding and flood liability on individual owners and		See **Appendix F**

Provision	Compliance	Comment
occupiers; (b) To limit the potential risk to life and property resulting from flooding; (c) The potential for flood losses in all new developed areas shall be contained by the application of effective planning and development control; (d) A "merit approach" to all development and building decisions, which takes account of social, economic and ecological as well as flooding considerations, shall be followed; (e) To reduce the risk and implications of flooding to existing areas by flood mitigation works and other measures; and (f) To prevent the introduction of unsuitable land uses onto the land identified by council as being flood liable.		
2.10.2 The applicant shall be required to demonstrate to the satisfaction of Council: 1. That the development will not increase the flood hazard or risk to other properties as well as including details on the structural adequacy of any building works associated with the development with regard to the effects of flood waters. All applications for development shall be accompanied by a survey plan; 2. That the proposed building materials are suitable; and 3. That buildings are sited in the optimum position to avoid flood waters and allow safe flood access for evacuation.		See **Appendix F**
3.9 Subdivision (a) Council will not support the subdivision of any land located in floodway or high hazard areas. (b) Subdivision of flood liable land that either consolidates or does not create additional lots will be considered on its merits. (c) Subdivision of flood liable land in rural zones creating additional allotments will generally not be supported; however, where the applicant can demonstrate that the flood hazard is classified as "low" and for each allotment there is sufficient area of land (with a minimum of 1000 sqm) above the standard flood to allow for the erection of all buildings and ancillary works to be used in conjunction with development to be carried out on the allotment, then		See **Appendix F**

Provision	Compliance	Comment
Council may consider a subdivision application. Flood free access shall also be provided. (d) Generally, land situated within existing residential, commercial and industrial zones may only be subdivided to enable its development for urban purposes where the level of the existing land to be developed is not lower than the standard flood. All lots created by such subdivision shall have the portion of the lot that can be built upon filled to a level at least 0.5m above the standard flood. (e) If any filling is required on flood liable land, then the requirements of section 3.11 also applies.		
2.11 Car Parking	✓	No carparking rate for community services prescribed under clause 2.11. The proposed 6 car spaces are considered sufficient for the existing cemetery development.

6.2 Integration with previous development

The proposed Stage 1 subdivision directly reflects the works completed and currently being carried out under the existing consents detailed in Section 2 of this report. Primarily these works consist of the rehabilitation works that form the lakes system under the Scheme. The proposed subdivision provides for the separation of the water bodies (and associated buffer area) from the land parcels within the development site.

The proposed Stage 1 subdivision pattern reflects the land reformation works following the extraction uses and seeks to facilitate the future hand over of land as prescribed in the Deed of Agreement.

Further, the subdivision pattern provides for the preservation of heritage items as identified under the Scheme.

6.3 Urban Design

The proposed subdivision does not limit the future urban design of the Penrith Lakes Site in accordance with the Structure Plan presented at **Figure 9**.

The DP&I has been tasked with preparing a future master plan for the Penrith Lakes Site however this process is in a very preliminary stage and no negotiation with the PLDC has commenced. The master plan, nor the master planning process, do not form a matter for consideration under Section 79C of the *Environmental Planning and Assessment Act 1979* and it is considered that refusing consent to this staged development application on the grounds of a potential future master plan for the development site would be in direct breach of the aims and objectives as set out under the Penrith Lakes SEPP.

6.4 Transport and Accessibility

The proposed subdivision will not generate any traffic impact. Future use of the development site, and any associated traffic impacts, would be subject of a future development application to Council.

PLDC have provided that existing access arrangements to all allotments will be maintained and reinstated through the registration of titles and the transfer of ownership as necessary.

6.5 Heritage

The proposed subdivision pattern has taken into consideration the heritage significance of the development site. The applicant is currently meeting with the Office of Environment and Heritage to discuss the impact of the proposal on the items listed on the State Heritage Register.

The limited works proposed under this application will not result in the disturbance or damage to any items of European or indigenous heritage.

6.6 Flooding

The works carried out under the existing development consents operating on the development site have considered the impact of flooding and incorporated significant mitigation measures to regulate the impacts on future development. The flood statement provided by Cardno and tabled at **Appendix F**, confirms that proposed development will not adversely affect the flood behaviour of the development site. Further, the proposal will not adversely affect Nepean River geomorphology or the peak flood levels of surrounding regions in events up to the 1% flood event.

It is noted that residual lot 4, earmarked under the Structure Plan for future urban development will be set above the 1% flood area.

The proposed Stage 1 application does not result in an increase in traffic volumes and will not alter the existing evacuation plan for the development site. As stated in Section 6.5 – existing access provisions will be maintained and formally reinstated upon the handover of land to the State government and the registering of title arrangements. The Flood Evacuation Statement, submitted by Sinclair Knight Mers and tabled at **Appendix G**, confirms that the proposed development would not impede the evacuation of the development site nor surrounding urban areas. Stage 2 impacts will be assessed at the time of lodgement of Stage 2.

6.7 Bushfire Prone Land

The north-east and south-west fringes of the development site are classified as bushfire prone land. A Bushfire Hazard Assessment has been prepared by Cityscape Planning and Projects, in accordance with 'Planning for Bushfire Protection 2006' and appended at **Appendix H**. This assessment concludes that:

> *"The analysis undertaken in this report demonstrates that future development of the identified lots will be able to provide the required Asset Protection Zone, good vehicle access is already readily available and all the services are able to be provided in a suitable manner"*

The report provides that future Stage 2 development would be able to be accommodated but will be assessed under separate application. It is considered that the proposed development is suitable for the development site given the identified bushfire hazard constraints.

6.8 Social and Economic Impacts

The proposed Stage 1 subdivision will facilitate the timely handover of recreation lands from PLDC to public ownership, generating public recreation services to the Penrith community. This application does not seek consent for any change of use

on the development site, and the existing use has been assessed as part of the assessment of existing DAs on the development site. The proposed subdivision will permit the return of land to public ownership as works are completed rather than withholding until extraction and rehabilitation works across the Penrith Lakes Site are complete.

The proposed development facilitates the implementation of the Penrith Lakes Scheme which seeks to realise significant community recreation infrastructure within the Penrith LGA. These facilities will provide overall social benefit to the residential and working population of the Penrith LGA and surrounding areas. The proposed development will generate significant social benefits in the medium-long term through the return of open space to public use.

6.9 Site Suitability

The development site is considered suitable for the proposed development as the proposal is conforming to the Penrith Lakes SEPP and the associated Structure Plan. The proposed Stage 1 subdivision does not generate any measurable environmental impact on surrounding land users and does not prohibit or limit any further detailed investigations in relation to the future uses of the development site that will be subject of a future master plan for the development site.

The proposed development is considered suitable for the development site as it rationalises a cumbersome existing subdivision pattern that limits the timely and efficient delivery of the Penrith Lakes Scheme. The proposed subdivision pattern aligns with the landform pattern set out under the Structure Plan and allows portions of the overall development site nearing completion to be returned to Government ownership as completed.

6.10 Public Benefit

The Penrith Lakes Scheme seeks to realise significant public benefit to the local community through the provision of significant open space within the local area. The proposed Staged application is considered to be in the public interest as it facilitates the delivery of the Penrith Lakes SEPP.

The proposed subdivision pattern seeks to separate land and water bodies within the development site and form allotments that reflect the biophysical and cultural characteristics of the Penrith Lakes Site and the level of completion of rehabilitation works. This rationale will facilitate the handover of public recreation land from the PLDC to public ownership.

Further, the proposed subdivision recognises the significant heritage items within the Penrith Lakes Site and affords boundaries that provide for conservation and interpretation of said items in their setting.

This application represents the orderly use of land and does not generate any significant environmental impacts. Stage 2 impacts will be subject to further detailed assessment.

7.0 Conclusion

This application is submitted to Penrith City Council as a Staged 1 of a staged development application for the subdivision of the Penrith Lakes Site to facilitate the delivery of the Penrith Lakes Scheme.

The application seeks to rationalise some 220 existing allotments into 23 superlots which are reflective of the Penrith Lakes SEPP Structure Plan and recognise the land and water areas of the development site as well as catering to the conservation of items of heritage significance within the area.

The Stage 1 proposal contributes to further the implementation of the Penrith Lakes Scheme, conforming with the key environmental planning instrument – the SEPP (Penrith Lakes Scheme) 1989 and associated Structure Plan – and enables the implementation of the Penrith Lakes Scheme in accordance with the cooperative venture between the PLDC and the NSW Government in accordance with the 1987 Deed of Agreement. The proposal is compliant with the relevant provisions of the environmental planning instruments applying to the development site and is generally consistent to the applicable development control plans.

The Stage 1 subdivision does not generate any significant environmental impact and is considered to be in the public interest as it facilitates the orderly return of public recreation areas within the Penrith LGA to public ownership in accordance with the Penrith Lakes SEPP.

In light of the considerations prescribed under Section 79C of the EP&A Act, we respectfully request that Council grant approval to the proposed development.

Appendix F

SafeWork Search Results

Licence Number 35/013059

CLOSED FILE
2006

Occupier: KAY J & D

Site: **LOT 2**
CASTLEREAGH RD,
PENRITH 2750

WorkCover. **Watching out for you.**

WorkCover NSW ABN 77 682 742 966 92-100 Donnison Street Gosford NSW 2250 Locked Bag 2906 Lisarow NSW 2252
Telephone 02 4321 5000 Facsimile 02 4325 4145 WorkCover Assistance Service **13 10 50**
DX 731 Sydney Website **www.workcover.nsw.gov.au**

WC1216LH

WorkCover NEW SOUTH WALES

DECLARATION

To be completed where notifiable amounts of Dangerous Goods are not stored.

I John Kay (name), of 680 High St, Penrith (address)
declare that I do not store and handle Dangerous Goods at premises 35/013059,
site CASTLEREAGH RD, PENRITH 2750
in quantities that exceed or are likely to exceed the manifest quantity in the Table to Schedule 5 of the Occupational Health and Safety Regulation 2001.

J Kay ..... Signature

13/1/2005 ..... Date

This declaration is to be returned with your licence to :

WorkCover New South Wales
Dangerous Goods Notification Team
LOCKED BAG 2906, LISAROW NSW 2252

Dangerous Goods Licensing
ph (02) 4321 5500 fax (02) 9287 5500

Attn: JOHN KAY
Licensee: **KAY J & D**
680 HIGH ST
PENRITH NSW 2750

LICENCE FOR THE KEEPING OF DANGEROUS GOODS

ISSUED UNDER AND SUBJECT TO THE PROVISIONS OF THE DANGEROUS GOODS ACT, 1975 AND REGULATIONS THEREUNDER

Licence Number 35/013059 **Expiry Date** 17/02/2006 **No. of Depots** 1

Licensee Contact JOHN KAY Ph. 02 4731 2432

Premises Licensed to Keep Dangerous Goods LOT 2
KAY J & D
CASTLEREAGH RD PENRITH 2750

Nature of Site BUILDING SUPPLIES WHOLESALING N.E.C.

Major Supplier of Dangerous Goods AUSTRALIAN (CALTEX)

Emergency Contact for this Site JOHN KAY Ph. 02 4773 8680

Site staffing 10 HRS 5 DAYS + HALF DAY

Details of Depots

Depot No.	Depot Type	Goods Stored in Depot	Qty
1	**UNDERGROUND TANK**	**Class 3**	**3000 L**
	UN 1203 PETROL		3000 L

PLEASE RETAIN AS PROOF OF LICENCE
Issued by Workcover Authority of New South Wales on 14 January 2005

1583 → 443-D.

Licence No. 35/013059

APPLICATION FOR RENEWAL

OF LICENCE TO KEEP DANGEROUS GOODS

ISSUED UNDER AND SUBJECT TO THE PROVISIONS OF THE DANGEROUS GOODS ACT, 1975 AND REGULATION THEREUNDER

DECLARATION: Please renew licence number 35/013059 to 17/02/2006 . I confirm that all the licence details shown below are correct (amend if necessary).

J Kay ..... John Kay 11/1/05

(Signature) *(Please print name)* *(Date signed)*

for: KAY J & D

*THIS **SIGNED** DECLARATION SHOULD BE **RETURNED TO:***

WorkCover New South Wales
Dangerous Goods Licensing Section
LOCKED BAG 2906
LISAROW NSW 2252

Enquiries:ph (02) 43215500
fax (02) 92875500

Details of licence on 4 January 2005

Licence Number 35/013059 **Expiry Date** 17/02/2005

Licensee KAY J & D

Postal Address: 680 HIGH ST PENRITH NSW 2750

Licensee Contact JOHN KAY Ph. 0247 312432

Premises Licensed to Keep Dangerous Goods LOT 2
KAY J & D
CASTLEREAGH RD PENRITH 2750

Nature of Site BUILDING SUPPLIES WHOLESALING N.E.C.

Major Supplier of Dangerous Goods AUSTRALIAN (CALTEX)

Emergency Contact for this Site JOHN KAY Ph. 0247 312432 02 47738680

Site staffing 10 HRS 5 DAYS + HALF DAY

Please note new phone number.

Details of Depots

Depot No.	Depot Type	Goods Stored in Depot	Qty
1	**UNDERGROUND TANK**	**Class 3**	**3000 L**
	UN 1203 PETROL		3000 L

54.

THE NEW SOUTH WALES GOVERNMENT
Putting people first by managing better

PART A

WORKCOVER AUTHORITY

LICENCE TO KEEP DANGEROUS GOODS

(Dangerous Goods Act 1975)

Application for new licence, amendment or transfer

Expiry 19.2.94

1. Name of applicant | ACN

Jand D KAY |

2. Site to be licensed — put in site to be licensed & delete 2 from street no.

No: *LOT 2 | Street: CASTLEREAGH RD

Suburb/Town: PENRITH | Postcode: 2750

3. Previous licence number (if known): 35/013059.

4. Nature of site: SAND and GRAVEL SUPPLIES * 4728.

5. Emergency contact on site:

Phone: *047 290 579 | Name: *JOHN KAY

6. Site staffing: Hours per day: *10 | Days per week: *5½ half day

7. Major supplier of dangerous goods: B.H. and A.S. WALKER *CALTEX

8. If new site or significant modification

Plan stamped by: | Accredited consultant's name: | Date stamped

9. Number of dangerous goods depots at site: 1

10. Trading name or occupier's name

Jand D. KAY

11. Postal address of applicant | Suburb/Town | Postcode

680 HIGH ST | PENRITH | 2750

12. Contact for licence enquiries:

Phone | Fax | Name

*047290579 | | *JOHN KAY

I certify that the details contained in this application (or the accompanying computer disk) are true and correct

13. Signature of applicant: J Kay | Date: 14-4-93

sent 3/5

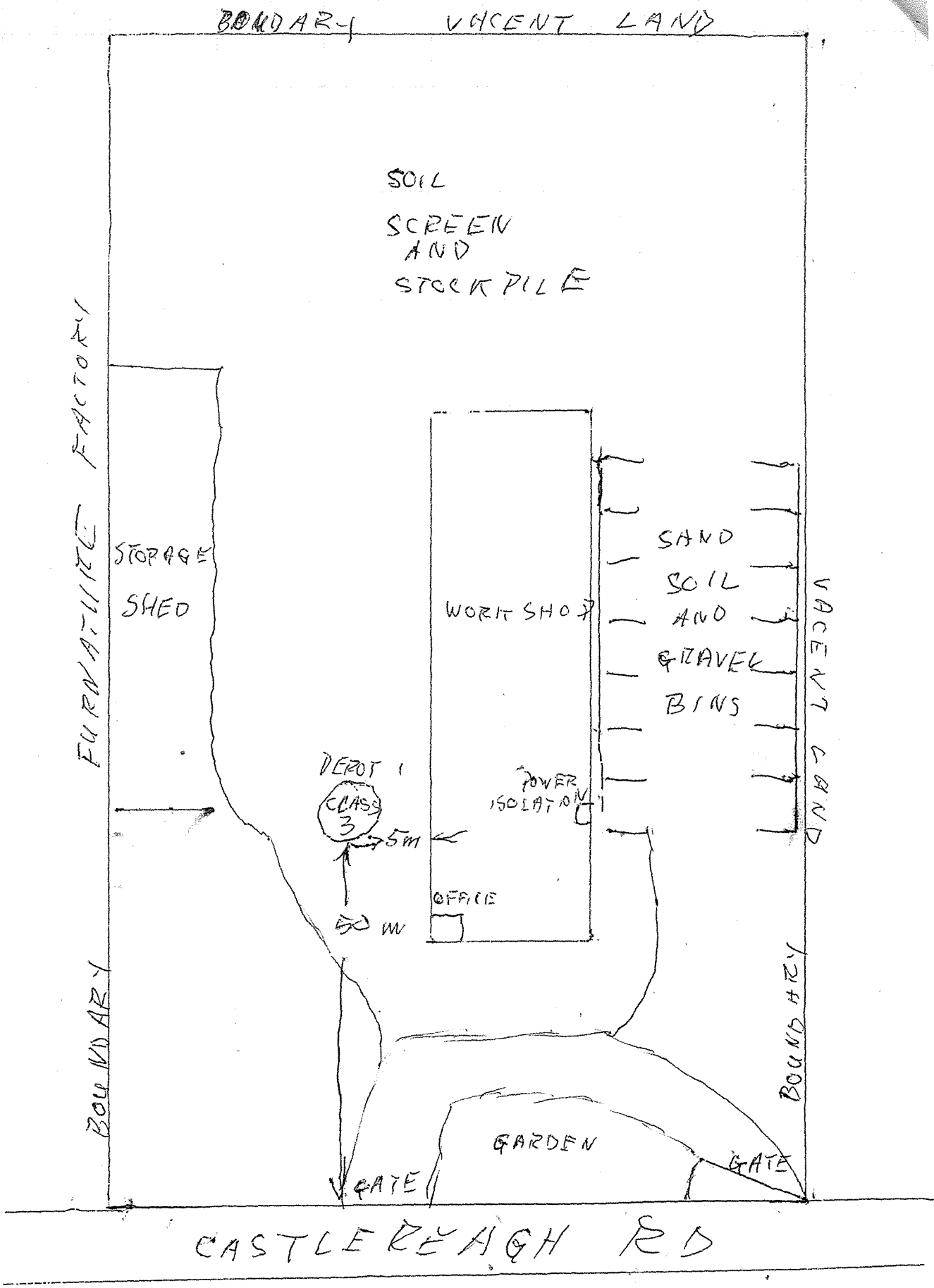
Please complete attached site sketch, depot listing and check sheet (if required) and return to WorkCover Authority in envelope provided.

Form DG1

35-013059

Site Sketch

Please carefully read the instructions in Part B of the guide before sketching the site.



...u have more depots than the space provided, photocopy sufficient sheets first.

Depot number	Type of depot	Class	Licensed maximum storage capacity
1	UNDERGROUND TANK	3	* 3000 LITRES

UN number	Shipping name	Class	Pkg. Group	EPG	Product or common name	Typical quantity	Unit eg. L, kg, m³
* 1203	Petrol	3	II	3A1	PETROL	3000	L

Depot number	Type of depot	Class	Licensed maximum storage capacity

UN number	Shipping name	Class	Pkg. Group	EPG	Product or common name	Typical quantity	Unit eg. L, kg, m³

Depot number	Type of depot	Class	Licensed maximum storage capacity

UN number	Shipping name	Class	Pkg. Group	EPG	Product or common name	Typical quantity	Unit eg. L, kg, m³

Depot number	Type of depot	Class	Licensed maximum storage capacity

UN number	Shipping name	Class	Pkg. Group	EPG	Product or common name	Typical quantity	Unit eg. L, kg, m³

INFLAMMABLE LIQUID ACT, 1915 (AS AMENDED)

Application for Registration of Premises or Store License under Division A or for the transfer, alteration or amendment of any such Registration or License, for the keeping of Inflammable Liquid and/or Dangerous Goods, in accordance with the provisions of the Inflammable Liquid Act, 1915 (as amended), for the ensuing year.

EXPLANATORY

Inflammable Liquid—

Mineral Oil—includes kerosene, mineral turpentine and white spirit (for cleaning), and compositions containing same.
Mineral Spirit—includes petrol, benzene, benzolene, benzol and naphtha, and compositions containing same.

Dangerous Goods—

Class 1.—Acetone, amyl acetate, butyl acetate, carbon bisulphide; any combination of substances of an inflammable character suitable for use as an industrial solvent and having a true flashing point of less than 73 degrees Fahrenheit.

Class 2.—Nitro-cellulose (also known as "pyroxylin" and "collodion cotton") moistened with an alcohol, butyl alcohol (also known as "butanol"), methylated spirits, vegetable turpentine; and any liquid or solid containing methylated spirits, having a true flashing point of less than 150 degrees Fahrenheit.

Class 3.—Nitro-cellulose product.

Class 4.—Compressed or dissolved acetylene contained in a porous substance.

new licence AMOCO.

DIRECTIONS

1. Applications must be forwarded to the Chief Inspector of Inflammable Liquid, Explosives Department, 2nd Floor, 82 Pitt Street, Sydney (Box 48, G.P.O.), and must be accompanied by the prescribed fee, as set out hereunder:—

Registration of Premises (Fee £1 10s. 0d. p.a.).—For quantities not exceeding 300 gallons of mineral oil and 100 gallons of mineral spirit, if kept together; or 800 gallons of mineral oil and 100 gallons of mineral spirit, if kept in separate depots; or 500 gallons of mineral spirit, if kept in an underground tank depot; or 800 gallons of mineral oil and 500 gallons of mineral spirit, if mineral spirit is kept in an underground tank depot.

In addition to, or in lieu of the above, similar quantities of Dangerous Goods of Classes 1 and 2 may be kept under the like conditions; reading Dangerous Goods of Class 1 for the words Mineral Spirit and Dangerous Goods of Class 2 for the words Mineral Oil.

Store License, Div. A (Fee, £3 5s. 0d. p.a.).—For quantities in excess of those stated above, but not exceeding 4,000 gallons mineral oil and/or mineral spirit, and/or Dangerous Goods of Classes 1 and 2.

Store License, Div. B (Fees, See Regulation 7).—For quantities exceeding 4,000 gallons of mineral and/or mineral spirit, and/or dangerous goods of Classes 1 and 2, and/or dangerous goods of Class 3.
For the keeping of Dangerous Goods of Classes 3 and/or 4. **(£7 10s. 0d. p.a.).**

2. The certificate of inspection at foot hereof must be signed by an Inspector under the Inflammable Liquid Act, 1915 (as amended), or Police Officer, or other officer duly authorised in that behalf, and where the premises are situated outside the Metropolitan Area of Sydney, it is requested that such certificate be obtained prior to forwarding application.

1. Name in full of occupier ... ... Kenneth Herbert DIXON
Henry Desch MITCHELL
2. Occupation ... ... TIMBER MERCHANT
3. Locality of the premises in which the depot or depots are situated ... No. or Name LOT 2
Street Castlereagh Rd
Town PENRITH
4. Nature of premises (Dwelling, Garage, Store, etc.) ... ... TRUCK DEPOT
5. Will mineral spirit be kept in a prescribed underground tank depot? YES

6. Particulars of construction of depots and maximum quantities of inflammable liquid and/or Dangerous Goods to be kept at any one time.

Depot No.	Construction of Depots			Inflammable Liquid		Dangerous Goods			
	Walls	Roof	Floor	Mineral Spirit Gallons	Mineral Oil Gallons	Class 1 Gallons	Class 2 Gallons	Class 3 lb.	Class 4 cub. ft.
1	Underground Tank.			1000					
2									
3									
4									
5									
6									
7									
8									
9									
10									

Date of Application 9/2/65. 19

Signature of Applicant K H D Mitchell

Postal Address P.O. Box 87 Penrith

CERTIFICATE OF INSPECTION

I, Albert Leonard Bartlett being an Inspector under the Inflammable Liquid Act, 1915 (as amended), do hereby certify that the premises or store herein referred to and described is suitable with regard to its situation and construction for the safe keeping of inflammable liquid and/or dangerous goods in quantity

AMOCO AUSTRALIA PTY. LIMITED

(INCORPORATED IN A C T)

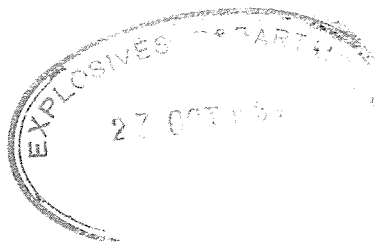
MANUFACTURERS AND MARKETERS OF PETROLEUM PRODUCTS

TRANSFIELD HOUSE . 102-106 ARTHUR STREET . NORTH SYDNEY . N.S.W.
TELEPHONE: 92-0842

D. D. UTGAARD
STATE BRANCH MANAGER

BOX 507, NORTH SYDNEY

23.10.64



The Superintendent,
Department of Mines,
Explosives Branch,
Box 42, G.P.O.
SYDNEY, N.S.W.

Dear Sir,

We seek your approval for the following Industrial Installations:

Name DIXON & MITCHELL

Location CASTLEREAGH ROAD, PENRITH.

Equipment 2 x 1000 GALLON U.G.S. & 2 x INDUSTRIAL PUMPS.

Hoping this matter meets with your approval.

Yours truly,
AMOCO AUSTRALIA PTY. LIMITED.

D.D. Utgaard,
State Branch Manager.

The State Branch Manager,
Amoco Australia Pty. Ltd.,
Box 507 P.O.,
NORTH SYDNEY. N.S.W.

Dear Sir,

Inflammable Liquid Act, 1915, as amended.

Approval is granted for petrol storage installations detailed hereunder:-

L.R. Langbien, Bungle Gumbie Road, Dubbo -
1 x 1,000 gallon tank,

Illawarra Pressed Metal Pty. Ltd.,
Fourth Avenue, Unanderra -
1 x 2,000 gallon tank,

Dixon & Mitchell, Castlereagh Road, Penrith -
2 x 1,000 gallon tanks,

Nasso & Sons, 16 Denham Court Lane, Ingleburn -
1 x 1,000 gallon tank.

Sketch copies in respect of Ingleburn installation were not received and it is pointed out that, if the pump is to be installed inside a building prior approval of the Chief Inspector is required.

Approval for the installation at the premises of Luigi Marciano, Bonnyrigg, will be recommended subject to compliance with Regulation 23 (2) (b) of above Act.

Endorsed copies of sketches received are enclosed.

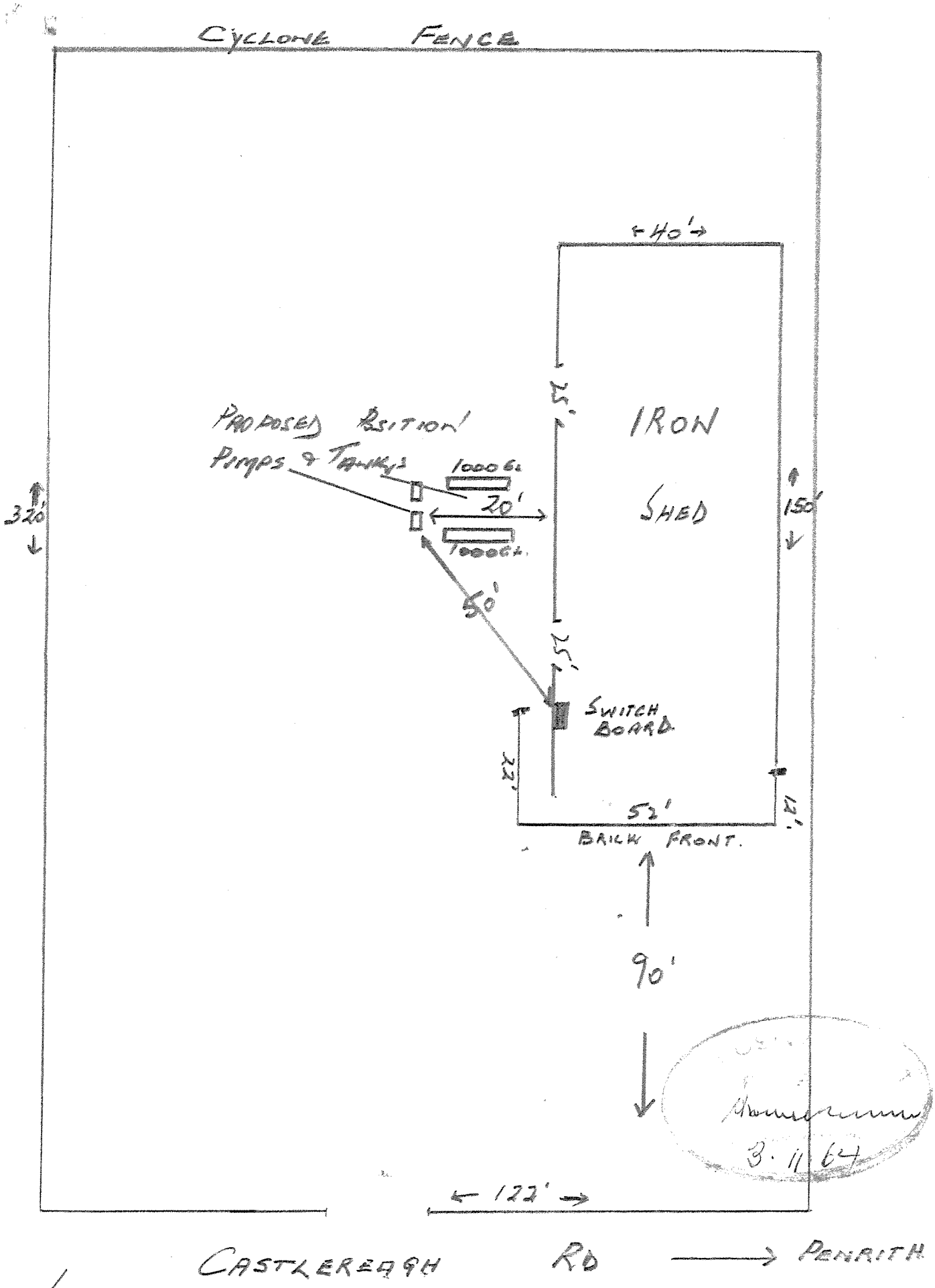
Yours faithfully,

Chief Inspector of
Inflammable Liquids.

Encls. R/S 1.1.65

These may be installed.
14.12.64

Mr Bartlett



TITLE PROPOSED PUMP INSTALLATION. DIXON & MITCH
CASTLEREACH RD PENRITH.

SCALE	DATE	DRAWN	SKETCH No.

Appendix G

Section 10.7 (2 & 5) Planning Certificates [not available at the time of reporting]

Appendix H

Site Photographs

Photo 1: Buried pipe beside access road in south-west corner of the site

Photo 2: Telecom pit along south site boundary

Douglas Partners Geotechnics / Environment / Groundwater	**Site Photographs**	PROJECT:	204635.01
	Preliminary Site Investigation	PLATE No:	1
	100-275 Old Castlereagh Road, Penrith	REV:	1
	CLIENT: Colliers International Pty Ltd	DATE	08/06/2021

Photo 3: Gravel and concrete stockpile

Photo 4: Pumphouse beside pond

Douglas Partners Geotechnics / Environment / Groundwater	**Site Photographs**	PROJECT:	204635.01
	Preliminary Site Investigation	PLATE No:	2
	100-275 Old Castlereagh Road, Penrith	REV:	1
	CLIENT: Colliers International Pty Ltd	DATE	08/06/2021

Photo 5: Tank beside electrical room.

Photo 6: Chemical storage shipping container

Douglas Partners Geotechnics / Environment / Groundwater	**Site Photographs**	PROJECT:	204635.01
	Preliminary Site Investigation	PLATE No:	3
	100-275 Old Castlereagh Road, Penrith	REV:	1
	CLIENT: Colliers International Pty Ltd	DATE	08/06/2021

Photo 7: Chemical storage drums

Photo 8: Industrial garage with gas cylinders and plant machinery

Douglas Partners Geotechnics / Environment / Groundwater	**Site Photographs**	PROJECT:	204635.01
	Preliminary Site Investigation	PLATE No:	5
	100-275 Old Castlereagh Road, Penrith	REV:	1
	CLIENT: Colliers International Pty Ltd	DATE	08/06/2021

Photo 9: Flammable liquids storage locker

Photo 10: Embankment with a EPA Point notification sign

Douglas Partners Geotechnics / Environment / Groundwater	**Site Photographs**	PROJECT:	204635.01
	Preliminary Site Investigation	PLATE No:	5
	100-275 Old Castlereagh Road, Penrith	REV:	1
	CLIENT: Colliers International Pty Ltd	DATE	08/06/2021

Photo 11: Potential ACM at surface

Photo 12: Suspected ACM telecom pit

Douglas Partners Geotechnics / Environment / Groundwater	**Site Photographs**	PROJECT:	204635.01
	Preliminary Site Investigation	PLATE No:	5
	100-275 Old Castlereagh Road, Penrith	REV:	1
	CLIENT: Colliers International Pty Ltd	DATE	08/06/2021

Appendix I

Data Quality Objectives

Appendix I
Data Quality Objectives
100-275 Old Castlereagh Road, Penrith

I1.0 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 was to confirm the contamination status of the site with respect to the proposed land use. The report was undertaken as the land is to be redeveloped into a helicopter facility. The requirements of the planning authority, Penrith City Council, was also considered by consulting their Local Environment Plan (LEP) and any other requirements based on our recent experience with Council on similar sites. A preliminary conceptual site model (CSM) has been prepared (Section 8) 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. A preliminary site investigation (contamination) (PSI) was undertaken at this time, although it is understood that a detailed site investigation (contamination) (DSI) may be required to address the Standard Secretary's Environmental Assessment Requirements for the development.
2: Identify the decisions / goal of the study	The site history has identified possible contaminating previous uses which are identified in the CSM (Section 8). 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 Section 10. The decision was to establish whether or not the results fall below the SAC. On this basis, an assessment of the site's suitability from a contamination perspective and whether (or not) further assessment and / or remediation was be derived.
3: Identify the information inputs	Inputs to the investigation were the results of analysis of samples to measure the concentration of COPC identified in the CSM (Section 8) at the site using NATA accredited laboratories and methods, where possible. The SAC for each of the COPC are detailed in Section 10. A photoionization detector (PID) was used on-site to screen soils for VOC. PID readings were used to inform sample selection for laboratory analysis.
4: Define the study boundaries	The lateral boundaries of the investigation area are shown on Drawing 1, Appendix A. The vertical boundaries are to the extent of contamination impact as determined from the site history assessment and site observations. The assessment is limited to the timeframe over which the field investigation was undertaken. Constraints to the assessment are identified and discussed in the conclusions of the report, Section 14.

Step	Summary
5: Develop the analytical approach (or decision rule)	The decision rule was to compare all analytical results with SAC (Section 10, based on NEPC (2013)). Where guideline values were absent, other sources of guideline values accepted by NEPC (2013) were adopted where possible. Initial comparisons were with individual results, noting summary statistic were not required for assessment. Quality control results were assessed according to their relative percent difference (RPD) values. For field duplicates, triplicates and laboratory results, RPDs should generally be below 30%; for field blanks and rinsates, results should be at or less than the limits of reporting (NEPC, 2013). The field and laboratory quality assurance assessment are included in Appendix O.
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 was to assess for potential contamination across the site, the sampling program was reliant on professional judgement to identify and sample the potentially affected areas. Further details regarding the sampling plan are presented in Section 9.

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 J

Field Work Methodology

Appendix J
Field Work Methodology
100-275 Old Castlereagh Road, Penrith

J1.0 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).

J2.0 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 excavator bucket at the nominated sample depth;
- Transfer samples in laboratory-prepared glass jars with Teflon lined lids by hand, capping immediately and minimising headspace within the sample jar;
- Collect replicate samples in zip-lock bags for PID screening;
- Collect ~40 g to 50 g samples in zip-lock bags for asbestos (presence / absence) analysis;
- 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.

J2.1 Field Testing

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

PID Field Test

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

- Screen using the PID.

J3.0 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 K

Site Assessment Criteria

Appendix K
Site Assessment Criteria
100-275 Old Castlereagh Road, Penrith

K1.0 Introduction

K1.1 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).

K1.2 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: commercial
  - Corresponding to land use category 'D', commercial / industrial such as shops, offices, factories and industrial sites.
  - Soil type: sand and clay
    - A variety of soil types including gravel, sand, silt and clay were observed at test locations. A sand soil type was adopted for the derivation of the SAC as a conservative input parameter.

K2.0 Soils

K2.1 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 **Error! Reference source not found.**.

Table 1: Health Investigation Levels (mg/kg)

Contaminant	HIL-D
Metals	
Arsenic	3000
Cadmium	900
Chromium (VI)	3600
Copper	240 000
Lead	1500
Mercury (inorganic)	730
Nickel	6000
Zinc	400 000
PAH	
B(a)P TEQ	40
Total PAH	4000
Phenols	
Phenol	240 000
OCP	
DDT+DDE+DDD	3600
Aldrin and dieldrin	45
Chlordane	530
Endosulfan	2000
Endrin	100
Heptachlor	50
HCB	80
Methoxychlor	2500
OPP	
Chlorpyrifos	2000
PCB	
PCB	7

Table 2: Health Screening Levels (mg/kg)

Contaminant	HSL-D
SAND	**1 m to <2 m**
Benzene	3
Toluene	NL
Ethylbenzene	NL
Xylenes	NL
Naphthalene	NL
TRH F1	370
TRH F2	NL

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

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

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

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

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

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

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

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

IMW intrusive maintenance worker

K2.2 Asbestos in Soil

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

K2.3 Ecological Investigation Levels

Ecological investigation levels (EIL) and added contaminant limits (ACL), where appropriate, have been derived in NEPC (2013) for arsenic, copper, chromium (III), nickel, lead, zinc, DDT and naphthalene. The adopted EIL, derived using the interactive (excel) calculation spreadsheet on the NEPM toolbox website are shown in Table 5, with inputs into their derivation shown in Table 4.

Table 4: Inputs to the Derivation of the Ecological Investigation Levels

Variable	Input	Rationale
Age of contaminants	"Aged" (>2 years)	Fill at the soil is understood to be >2 years old
pH	4.00	Assumed
CEC	5.00 $cmol_c/kg$	Assumed
Clay content	25 %	Based on encountered conditions at test locations, considered a conservative input parameter
Traffic volumes	high	Site is trafficked and located beside a busy road
State / Territory	NSW	Site is in Penrith, NSW

Table 5: Ecological Investigation Levels (mg/kg)

Contaminant	EIL-D
Metals	
Arsenic	160
Copper	85
Nickel	60
Chromium III	910
Lead	1800
Zinc	230
PAH	
Naphthalene	370

Contaminant	EIL-D
OCP	
DDT	640

Notes: EIL-AES area of ecological significance

K2.4 Ecological Screening Levels

Ecological screening levels (ESL) are used to assess the risk of selected petroleum hydrocarbon compounds, BTEX and benzo(a)pyrene to terrestrial ecosystems. The adopted ESL are shown in Table 6.

Table 6: Ecological Screening Levels (mg/kg)

Contaminant	Soil Type	EIL-D
Benzene	Coarse	75
Toluene	Coarse	135
Ethylbenzene	Coarse	165
Xylenes	Coarse	180
TRH F1	Coarse/ Fine	215*
TRH F2	Coarse/ Fine	170*
TRH F3	Coarse	1700
TRH F4	Coarse	3300
B(a)P	Coarse	1.4

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

K2.5 Management Limits

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

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

The adopted management limits are in Table 7.

Table 7: Management Limits (mg/kg)

Contaminant	Soil Type	ML-D
TRH F1	Coarse	700
TRH F2	Coarse	1000
TRH F3	Coarse	3500
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

K3.0 References

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

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

Douglas Partners Pty Ltd

Appendix L

Test Pit Logs

TEST PIT LOG

CLIENT: Colliers International Pty Ltd
PROJECT: Proposed Helicopter Facility
LOCATION: 100-275 Old Castlereagh Road, Penrith

SURFACE LEVEL: 19.0 AHD
EASTING: 285359
NORTHING: 6265779

PIT No: TP31
PROJECT No: 204635.01
DATE: 25/5/2021
SHEET 1 OF 1

RL	Depth (m)	Description of Strata	Graphic Log	Sampling & In Situ Testing: Type	Depth	Sample	Results & Comments	Water	Dynamic Penetrometer Test (blows per mm)
19	0.0	FILL/Silty SAND/TOPSOIL: fine to medium, brown, trace rootlets, moist		E	0.0 - 0.1		PID<1 ppm		
	0.2	FILL/Clayey SAND: fine to medium, orange-brown, with gravel and cobbles, moist		E	0.5 - 0.6		PID<1 ppm		
	0.8	FILL/Sandy CLAY: low to medium plasticity, orange, trace silt, gravel and cobbles, w<PL		E	1.0 - 1.1		PID<1 ppm		
18	1								1
	1.3	FILL/Clayey SAND: fine to medium, orange, trace silt, gravel, cobbles, moist		E	1.5 - 1.6		PID<1 ppm		
17	2								2
	2.2	Pit discontinued at 2.2m - Limit of Investigation							
16	3								3
15	4								4

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

RIG: 8.0 Tonne Excavator with 300mm tooth bucket

LOGGED: HD

SURVEY DATUM: MGA94 Zone 56

WATER OBSERVATIONS: No free groundwater observed

REMARKS:

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

SAMPLING & IN SITU TESTING LEGEND

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

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TEST PIT LOG

CLIENT: Colliers International Pty Ltd
PROJECT: Proposed Helicopter Facility
LOCATION: 100-275 Old Castlereagh Road, Penrith

SURFACE LEVEL: 18.3 AHD
EASTING: 285291
NORTHING: 6265775

PIT No: TP32
PROJECT No: 204635.01
DATE: 25/5/2021
SHEET 1 OF 1

RL	Depth (m)	Description of Strata	Graphic Log	Sampling & In Situ Testing: Type	Depth	Sample	Results & Comments	Water	Dynamic Penetrometer Test (blows per mm)
									5 10 15 20
		FILL/Silty SAND/TOPSOIL: fine to medium, brown, trace rootlets, moist		E	0.0 0.1		PID<1 ppm		
18	0.2	FILL/Clayey SAND: fine to medium, orange, with silt, moist		E	0.5 0.6		PID<1 ppm		
	1			E	1.0 1.1		PID<1 ppm		1
17	1.2	FILL/Silty CLAY: low to medium plasticity, red, w~PL		E*	1.5 1.6		PID<1 ppm		
		From 1.8m: red mottled orange-grey, dark grey staining							
	2			E	2.0 2.1		PID<1 ppm		2
16				E	2.5 2.6		PID<1 ppm		
	2.8	Pit discontinued at 2.8m - Limit of Investigation							
	3								3
15									
	4								4
14									

RIG: 8.0 Tonne Excavator with 300mm tooth bucket

LOGGED: HD

SURVEY DATUM: MGA94 Zone 56

WATER OBSERVATIONS: No free groundwater observed

REMARKS: *Replicate sample BD6/20210525 taken at 1.5-1.6m

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

SAMPLING & IN SITU TESTING LEGEND

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

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TEST PIT LOG

CLIENT: Colliers International Pty Ltd
PROJECT: Proposed Helicopter Facility
LOCATION: 100-275 Old Castlereagh Road, Penrith

SURFACE LEVEL: 23.5 AHD
EASTING: 285246
NORTHING: 6265635

PIT No: TP33
PROJECT No: 204635.01
DATE: 25/5/2021
SHEET 1 OF 1

RL	Depth (m)	Description of Strata	Graphic Log	Sampling & In Situ Testing: Type	Depth	Sample	Results & Comments	Water	Dynamic Penetrometer Test (blows per mm)
									5 10 15 20
		FILL/Silty SAND/TOPSOIL: fine to medium, brown, trace rootlets and clay, moist		E	0.0 0.1		PID<1 ppm		
	0.2	FILL/Sandy CLAY: low to medium plasticity, orange-red, with silt, w<PL		E	0.3 0.4		PID<1 ppm		
23	1	From 1.0m: mottled grey		E	1.0 1.1		PID<1 ppm		1
	1.2	Pit discontinued at 1.2m - Limit of Investigation							
22	2								2
21	3								3
20	4								4
19									

RIG: 8.0 Tonne Excavator with 300mm tooth bucket

LOGGED: HD

SURVEY DATUM: MGA94 Zone 56

WATER OBSERVATIONS: No free groundwater observed

REMARKS:

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

SAMPLING & IN SITU TESTING LEGEND

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

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TEST PIT LOG

CLIENT: Colliers International Pty Ltd
PROJECT: Proposed Helicopter Facility
LOCATION: 100-275 Old Castlereagh Road, Penrith

SURFACE LEVEL: 25.0 AHD
EASTING: 285209
NORTHING: 6265600

PIT No: TP34
PROJECT No: 204635.01
DATE: 24/5/2021
SHEET 1 OF 1

RL	Depth (m)	Description of Strata	Graphic Log	Sampling & In Situ Testing: Type	Depth	Sample	Results & Comments	Water	Dynamic Penetrometer Test (blows per mm)
25	0.0	FILL/Silty SAND/TOPSOIL: fine to medium, brown, trace rootlets, moist		E	0.0 - 0.1		PID<1 ppm		
	0.2	FILL/Silty SAND: fine to medium, brown, trace clay, moist		E	0.4 - 0.5		PID<1 ppm		
	0.7	FILL/Silty CLAY: medium to high plasticity, grey mottled red-orange, trace rootlets, w<PL, possibly reworked natural		E	0.9 - 1.0		PID<1 ppm		
24	1								1
	1.3	FILL/Sandy CLAY: low to medium plasticity, red mottled grey-yellow, w<PL		E	1.4 - 1.5		PID<1 ppm		
	1.9	Pit discontinued at 1.9m - Limit of Investigation							
23	2								2
22	3								3
21	4								4

5 10 15 20

RIG: 8.0 Tonne Excavator with 300mm tooth bucket

LOGGED: HD

SURVEY DATUM: MGA94 Zone 56

WATER OBSERVATIONS: No free groundwater observed

REMARKS:

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

SAMPLING & IN SITU TESTING LEGEND

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

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TEST PIT LOG

CLIENT: Colliers International Pty Ltd
PROJECT: Proposed Helicopter Facility
LOCATION: 100-275 Old Castlereagh Road, Penrith

SURFACE LEVEL: 21.1 AHD
EASTING: 285196
NORTHING: 6265655

PIT No: TP35
PROJECT No: 204635.01
DATE: 24/5/2021
SHEET 1 OF 1

RL	Depth (m)	Description of Strata	Graphic Log	Sampling & In Situ Testing: Type	Depth	Sample	Results & Comments	Water	Dynamic Penetrometer Test (blows per mm)
21	0.0	FILL/Silty SAND/TOPSOIL: fine to medium, brown, trace rootlets, moist		E	0.0		PID<1 ppm		
					0.1				
	0.2	FILL/Silty SAND: fine to medium, orange, with clay nodules, moist							
				E	0.4		PID<1 ppm		
					0.5				
	0.6	FILL/Sandy CLAY: low to medium plasticity, orange mottled grey and yellow, trace rounded gravel and cobbles, w~PL							
				E	0.8		PID<1 ppm		
20	1				0.9				1
				E	1.3		PID<1 ppm		
					1.4				
	1.7	Pit discontinued at 1.7m - Limit of Investigation							
19	2								2
18	3								3
17	4								4

RIG: 8.0 Tonne Excavator with 300mm tooth bucket

LOGGED: HD

SURVEY DATUM: MGA94 Zone 56

WATER OBSERVATIONS: No free groundwater observed

REMARKS:

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

SAMPLING & IN SITU TESTING LEGEND

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

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TEST PIT LOG

CLIENT: Colliers International Pty Ltd
PROJECT: Proposed Helicopter Facility
LOCATION: 100-275 Old Castlereagh Road, Penrith

SURFACE LEVEL: 17.7 AHD
EASTING: 285197
NORTHING: 6265691

PIT No: TP36
PROJECT No: 204635.01
DATE: 25/5/2021
SHEET 1 OF 1

RL	Depth (m)	Description of Strata	Graphic Log	Sampling & In Situ Testing: Type	Depth	Sample	Results & Comments	Water	Dynamic Penetrometer Test (blows per mm)
17	0.0	FILL/Silty SAND/TOPSOIL: fine to medium, brown, trace rootlets and rounded gravel, moist		E	0.1		PID<1 ppm		
					0.2				
	0.3	FILL/Silty SAND: medium to coarse, yellow-brown, with rounded gravel, cobbles and boulders, moist		E	0.4		PID<1 ppm		
		0.3-0.6m: dark grey staining			0.5				
				E	0.8		PID<1 ppm		
1	1.0	FILL/Silty CLAY: low to medium plasticity, red mottled grey, w<PL			0.9				1
				E	1.2		PID<1 ppm		
					1.3				
	1.5	Pit discontinued at 1.5m - Limit of Investigation							
16	2								2
15	3								3
14	4								4
13									

RIG: 8.0 Tonne Excavator with 300mm tooth bucket

LOGGED: HD

SURVEY DATUM: MGA94 Zone 56

WATER OBSERVATIONS: No free groundwater observed

REMARKS:

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

SAMPLING & IN SITU TESTING LEGEND

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

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TEST PIT LOG

CLIENT: Colliers International Pty Ltd
PROJECT: Proposed Helicopter Facility
LOCATION: 100-275 Old Castlereagh Road, Penrith

SURFACE LEVEL: 16.5 AHD
EASTING: 285163
NORTHING: 6265695

PIT No: TP37
PROJECT No: 204635.01
DATE: 25/5/2021
SHEET 1 OF 1

RL	Depth (m)	Description of Strata	Graphic Log	Sampling & In Situ Testing: Type	Depth	Sample	Results & Comments	Water	Dynamic Penetrometer Test (blows per mm)
16	0.4	FILL/Silty SAND/TOPSOIL: fine to medium, brown, trace rootlets and rounded gravel, moist		E	0.1 0.2		PID<1 ppm		
		FILL/Silty SAND: medium to coarse, yellow-brown and grey, with rounded gravel, cobbles and boulders, moist		E*	0.6 0.7		PID<1 ppm		
	0.9	FILL/Silty CLAY: low to medium plasticity, red mottled grey, trace gravel, w<PL		E	1.1 1.2		PID<1 ppm		
15	1.5	Pit discontinued at 1.5m - Limit of Investigation							

RIG: 8.0 Tonne Excavator with 300mm tooth bucket

LOGGED: HD

SURVEY DATUM: MGA94 Zone 56

WATER OBSERVATIONS: No free groundwater observed

REMARKS: *Replicate sample BD5/20210525 taken at 0.6-0.7m

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

SAMPLING & IN SITU TESTING LEGEND

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

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TEST PIT LOG

CLIENT: Colliers International Pty Ltd
PROJECT: Proposed Helicopter Facility
LOCATION: 100-275 Old Castlereagh Road, Penrith

SURFACE LEVEL: 20.7 AHD
EASTING: 285158
NORTHING: 6265655

PIT No: TP38
PROJECT No: 204635.01
DATE: 24/5/2021
SHEET 1 OF 1

RL	Depth (m)	Description of Strata	Graphic Log	Sampling & In Situ Testing: Type	Depth	Sample	Results & Comments	Water	Dynamic Penetrometer Test (blows per mm)
20	0.3	FILL/Silty SAND/TOPSOIL: fine to medium, brown, trace rootlets, moist		E	0.1 0.2		PID<1 ppm		
		FILL/Sandy CLAY: low to medium plasticity, red mottled grey, w~PL		E*	0.5 0.6		PID<1 ppm		
	0.8	FILL/Silty SAND: medium to coarse, orange, trace rounded gravel and cobbles, moist		E	1.0 1.1		PID<1 ppm		
19	1.5	Pit discontinued at 1.5m - Limit of Investigation							

RIG: 8.0 Tonne Excavator with 300mm tooth bucket

LOGGED: HD

SURVEY DATUM: MGA94 Zone 56

WATER OBSERVATIONS: No free groundwater observed

REMARKS: *Replicate sample BD2/20210524 taken at 0.5-0.6m

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

SAMPLING & IN SITU TESTING LEGEND

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

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TEST PIT LOG

CLIENT: Colliers International Pty Ltd
PROJECT: Proposed Helicopter Facility
LOCATION: 100-275 Old Castlereagh Road, Penrith

SURFACE LEVEL: 25.2 AHD
EASTING: 285162
NORTHING: 6265608

PIT No: TP39
PROJECT No: 204635.01
DATE: 24/5/2021
SHEET 1 OF 1

RL	Depth (m)	Description of Strata	Graphic Log	Sampling & In Situ Testing: Type	Depth	Sample	Results & Comments	Water	Dynamic Penetrometer Test (blows per mm)
25	0.0	FILL/Silty SAND/TOPSOIL: fine to medium, brown, trace clay and rootlets, moist		E	0.0 0.1		PID<1 ppm		
	0.2	FILL/Clayey SAND: fine to medium, brown, with silt, moist		E	0.4 0.5		PID<1 ppm		
	0.7	FILL/Sandy CLAY: low to medium plasticity, red, with silt, trace rounded cobbles, w<PL		E	1.0 1.1		PID<1 ppm		
24	1.4	Pit discontinued at 1.4m - Limit of Investigation							
23	2								
22	3								
21	4								

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

RIG: 8.0 Tonne Excavator with 300mm tooth bucket

LOGGED: HD

SURVEY DATUM: MGA94 Zone 56

WATER OBSERVATIONS: No free groundwater observed

REMARKS:

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

SAMPLING & IN SITU TESTING LEGEND

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

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TEST PIT LOG

CLIENT: Colliers International Pty Ltd
PROJECT: Proposed Helicopter Facility
LOCATION: 100-275 Old Castlereagh Road, Penrith

SURFACE LEVEL: 25.4 AHD
EASTING: 285103
NORTHING: 6265598

PIT No: TP40
PROJECT No: 204635.01
DATE: 24/5/2021
SHEET 1 OF 1

RL	Depth (m)	Description of Strata	Graphic Log	Sampling & In Situ Testing: Type	Depth	Sample	Results & Comments	Water	Dynamic Penetrometer Test (blows per mm)
25	0	FILL/Silty SAND: medium to coarse, brown-yellow, trace rootlets, moist		E	0.0		PID<1 ppm		
					0.1				
	0.2	Silty SAND SM: fine to medium, dark brown, moist							
				E	0.3		PID<1 ppm		
					0.4				
					0.9		PID<1 ppm		
	1	From 1.0m: brown		E	1.0				1
24					1.5		PID<1 ppm		
				E*	1.6				
	2								2
	2.1	Pit discontinued at 2.1m - Limit of Investigation							
23									
	3								3
22									
	4								4
21									

RIG: 8.0 Tonne Excavator with 300mm tooth bucket

LOGGED: HD

SURVEY DATUM: MGA94 Zone 56

WATER OBSERVATIONS: No free groundwater observed

REMARKS: *Replicate sample BD1/20210524 taken at 1.5-1.6m

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

SAMPLING & IN SITU TESTING LEGEND

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

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Geotechnics / Environment / Groundwater

TEST PIT LOG

CLIENT: Colliers International Pty Ltd
PROJECT: Proposed Helicopter Facility
LOCATION: 100-275 Old Castlereagh Road, Penrith

SURFACE LEVEL: 24.9 AHD
EASTING: 285104
NORTHING: 6265630

PIT No: TP41
PROJECT No: 204635.01
DATE: 24/5/2021
SHEET 1 OF 1

RL	Depth (m)	Description of Strata	Graphic Log	Sampling & In Situ Testing: Type	Depth	Sample	Results & Comments	Water	Dynamic Penetrometer Test (blows per mm)
24	0.3	FILL/Silty SAND/TOPSOIL: fine to medium, brown, trace rootlets, dry		E	0.1 0.2		PID<1 ppm		
		FILL/Clayey SAND: fine to medium, brown mottled red, trace rootlets and gravel, moist		E	0.6 0.7		PID<1 ppm		
	0.9	FILL/Clayey SAND: low to medium plasticity, red mottled grey, w<PL From 1.1m: orange-brown		E	1.1 1.2		PID<1 ppm		
	1.4	Pit discontinued at 1.4m - Limit of Investigation							

RIG: 8.0 Tonne Excavator with 300mm tooth bucket

LOGGED: HD

SURVEY DATUM: MGA94 Zone 56

WATER OBSERVATIONS: No free groundwater observed

REMARKS:

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

SAMPLING & IN SITU TESTING LEGEND

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

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TEST PIT LOG

CLIENT: Colliers International Pty Ltd
PROJECT: Proposed Helicopter Facility
LOCATION: 100-275 Old Castlereagh Road, Penrith

SURFACE LEVEL: 17.4 AHD
EASTING: 285120
NORTHING: 6265691

PIT No: TP42
PROJECT No: 204635.01
DATE: 24/5/2021
SHEET 1 OF 1

RL	Depth (m)	Description of Strata	Graphic Log	Sampling & In Situ Testing: Type	Depth	Sample	Results & Comments	Water	Dynamic Penetrometer Test (blows per mm)
17	0.3	FILL/Silty SAND/TOPSOIL: fine to medium, brown, trace rootlets and rounded gravel, dry		E	0.1 0.2		PID<1 ppm		
	0.5	FILL/SAND: medium to coarse, pale grey, moist		E	0.4 0.5		PID<1 ppm		
	0.8	FILL/Silty SAND: medium to coarse, yellow-brown, with rounded gravel, cobbles and bounders, moist, dark grey staining		E	0.6 0.7		PID<1 ppm		
16	1	FILL/Silty CLAY: low to medium plasticity, red, w<PL		E*	1.1 1.2		PID<1 ppm		1
	1.5	Pit discontinued at 1.5m - Limit of Investigation							
15	2								2
14	3								3
13	4								4

RIG: 8.0 Tonne Excavator with 300mm tooth bucket

LOGGED: HD

SURVEY DATUM: MGA94 Zone 56

WATER OBSERVATIONS: No free groundwater observed

REMARKS: *Replicate sample BD4/20210524 taken at 1.1-1.2m

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

SAMPLING & IN SITU TESTING LEGEND

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

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TEST PIT LOG

CLIENT: Colliers International Pty Ltd
PROJECT: Proposed Helicopter Facility
LOCATION: 100-275 Old Castlereagh Road, Penrith

SURFACE LEVEL: 17.6 AHD
EASTING: 285068
NORTHING: 6265766

PIT No: TP43
PROJECT No: 204635.01
DATE: 24/5/2021
SHEET 1 OF 1

RL	Depth (m)	Description of Strata	Graphic Log	Sampling & In Situ Testing: Type	Depth	Sample	Results & Comments	Water	Dynamic Penetrometer Test (blows per mm)
17	0.0	FILL/Silty SAND/TOPSOIL: fine to medium, brown, trace rootlets and gravel, moist		E*	0.1 0.2		PID<1 ppm		
	0.3	FILL/Silty SAND: medium to coarse, yellow-brown, with rounded gravel and cobbles, moist From 0.3-0.5m: dark grey staining		E	0.4 0.5		PID<1 ppm		
	1	From 1.2-1.3m: dark grey staining		E	1.0 1.1		PID<1 ppm		1
16	1.5	FILL/Silty CLAY: low to medium plasticity, red, w~PL		E	1.6 1.7		PID<1 ppm		
	2								2
	2.1	Pit discontinued at 2.1m - Limit of Investigation							
15	3								3
14	4								4
13									

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

RIG: 8.0 Tonne Excavator with 300mm tooth bucket

LOGGED: HD

SURVEY DATUM: MGA94 Zone 56

WATER OBSERVATIONS: No free groundwater observed

REMARKS: *Replicate sample BD3/20210524 taken at 0.1-0.2m

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

SAMPLING & IN SITU TESTING LEGEND

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

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TEST PIT LOG

CLIENT: Colliers International Pty Ltd
PROJECT: Proposed Helicopter Facility
LOCATION: 100-275 Old Castlereagh Road, Penrith

SURFACE LEVEL: 19.3 AHD
EASTING: 285061
NORTHING: 6265692

PIT No: TP44
PROJECT No: 204635.01
DATE: 24/5/2021
SHEET 1 OF 1

RL	Depth (m)	Description of Strata	Graphic Log	Sampling & In Situ Testing: Type	Depth	Sample	Results & Comments	Water	Dynamic Penetrometer Test (blows per mm)
19	0.3	FILL/Silty SAND/TOPSOIL: fine to medium, brown, trace rootlets, moist		E	0.1 0.2		PID<1 ppm		
		FILL/Silty SAND: medium to coarse, yellow-brown, with rounded gravel and cobbles, moist From 0.3-0.8m: dark grey staining		E	0.4 0.5		PID<1 ppm		
				E	0.8 0.9		PID<1 ppm		
18	1.0	FILL/Silty CLAY: low to medium plasticity, red mottled grey, w<PL		E	1.4		PID<1 ppm		
	1.5	Pit discontinued at 1.5m - Limit of Investigation			1.5				
17	2								2
16	3								3
15	4								4

RIG: 8.0 Tonne Excavator with 300mm tooth bucket

LOGGED: HD

SURVEY DATUM: MGA94 Zone 56

WATER OBSERVATIONS: No free groundwater observed

REMARKS:

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

SAMPLING & IN SITU TESTING LEGEND

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

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TEST PIT LOG

CLIENT: Colliers International Pty Ltd
PROJECT: Proposed Helicopter Facility
LOCATION: 100-275 Old Castlereagh Road, Penrith

SURFACE LEVEL: 25.0 AHD
EASTING: 285053
NORTHING: 6265634

PIT No: TP45
PROJECT No: 204635.01
DATE: 24/5/2021
SHEET 1 OF 1

RL	Depth (m)	Description of Strata	Graphic Log	Sampling & In Situ Testing: Type	Depth	Sample	Results & Comments	Water	Dynamic Penetrometer Test (blows per mm)
25		FILL/Silty SAND/TOPSOIL: fine to medium, brown, trace clay and rootlets, moist		E	0.0 0.1		PID<1 ppm		
	0.2	FILL/Sandy CLAY: low to medium plasticity, orange-brown, with silt, gravel and cobbles, w<PL		E	0.3 0.4		PID<1 ppm		
24	1			E	0.9 1.0		PID<1 ppm		1
	1.2	Pit discontinued at 1.2m - Limit of Investigation							
23	2								2
22	3								3
21	4								4

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

RIG: 8.0 Tonne Excavator with 300mm tooth bucket

LOGGED: HD

SURVEY DATUM: MGA94 Zone 56

WATER OBSERVATIONS: No free groundwater observed

REMARKS:

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

SAMPLING & IN SITU TESTING LEGEND

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

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TEST PIT LOG

CLIENT: Colliers International Pty Ltd
PROJECT: Proposed Helicopter Facility
LOCATION: 100-275 Old Castlereagh Road, Penrith

SURFACE LEVEL: 24.9 AHD
EASTING: 284953
NORTHING: 6265625

PIT No: TP46
PROJECT No: 204635.01
DATE: 24/5/2021
SHEET 1 OF 1

RL	Depth (m)	Description of Strata	Graphic Log	Sampling & In Situ Testing: Type	Depth	Sample	Results & Comments	Water	Dynamic Penetrometer Test (blows per mm)
24	0.1	FILL/Silty SAND/TOPSOIL: fine to medium, brown, trace rootlets, moist		E	0.0 0.1		PID<1 ppm		
		FILL/Sandy CLAY: low to medium plasticity, orange-brown, with silt, rounded gravel and cobbles, w~PL		E	0.2 0.3		PID<1 ppm		
	1			E	1.0 1.1		PID<1 ppm		1
	1.2	Pit discontinued at 1.2m - Limit of Investigation							
23	2								2
22	3								3
21	4								4
20									

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

RIG: 8.0 Tonne Excavator with 300mm tooth bucket

LOGGED: HD

SURVEY DATUM: MGA94 Zone 56

WATER OBSERVATIONS: No free groundwater observed

REMARKS:

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

SAMPLING & IN SITU TESTING LEGEND

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

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TEST PIT LOG

CLIENT: Colliers International Pty Ltd
PROJECT: Proposed Helicopter Facility
LOCATION: 100-275 Old Castlereagh Road, Penrith

SURFACE LEVEL: 18.6 AHD
EASTING: 285416
NORTHING: 6265741

PIT No: TP47
PROJECT No: 204635.01
DATE: 25/5/2021
SHEET 1 OF 1

RL	Depth (m)	Description of Strata	Graphic Log	Sampling & In Situ Testing: Type	Depth	Sample	Results & Comments	Water	Dynamic Penetrometer Test (blows per mm)
18	0.0	FILL/Silty SAND/TOPSOIL: fine to medium, brown, trace rootlets, moist		E	0.0 0.1		PID<1 ppm		
	0.2	FILL/SAND: fine to medium, orange, with clay and silt, moist`		E*	0.5 0.6		PID<1 ppm		
	0.7	FILL/Clayey SAND: fine to medium, orange and red, trace silt, moist		E	1.0 1.1		PID<1 ppm		
17	1			E	1.8 1.9		PID<1 ppm		
	2								
	2.2	Pit discontinued at 2.2m - Limit of Investigation							
16	3								
15	4								
14									

RIG: 8.0 Tonne Excavator with 300mm tooth bucket

LOGGED: HD

SURVEY DATUM: MGA94 Zone 56

WATER OBSERVATIONS: No free groundwater observed

REMARKS: *Replicate sample BD7/20210525 taken at 0.5-0.6m

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

SAMPLING & IN SITU TESTING LEGEND

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

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TEST PIT LOG

CLIENT: Colliers International Pty Ltd
PROJECT: Proposed Helicopter Facility
LOCATION: 100-275 Old Castlereagh Road, Penrith

SURFACE LEVEL: 19.9 AHD
EASTING: 285499
NORTHING: 6265661

PIT No: TP48
PROJECT No: 204635.01
DATE: 25/5/2021
SHEET 1 OF 1

RL	Depth (m)	Description of Strata	Graphic Log	Sampling & In Situ Testing: Type	Depth	Sample	Results & Comments	Water	Dynamic Penetrometer Test (blows per mm)
19	0.0	FILL/Silty SAND/TOPSOIL: fine to medium, brown, trace rootlets, moist		E	0.0 0.1		PID<1 ppm		
	0.2	FILL/Clayey SAND: fine to medium, brown, trace silt, rounded gravel and cobbles, moist		E	0.5 0.6		PID<1 ppm		
	1			E	1.1 1.2		PID<1 ppm		1
	1.4	FILL/Sandy CLAY: medium to high plasticity, red mottled grey, w<PL		E*	1.6 1.7		PID<1 ppm		
18	1.9	FILL/CLAY: medium to high plasticity, dark grey, w~PL		E	2.0 2.1		PID<1 ppm		
	2								2
	2.3	Pit discontinued at 2.3m - Limit of Investigation							
17	3								3
16	4								4
15									

RIG: 8.0 Tonne Excavator with 300mm tooth bucket

LOGGED: HD

SURVEY DATUM: MGA94 Zone 56

WATER OBSERVATIONS: No free groundwater observed

REMARKS: *Replicate sample BD8/20210525 taken at 1.6-1.7m

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

SAMPLING & IN SITU TESTING LEGEND

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

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TEST PIT LOG

CLIENT: Colliers International Pty Ltd
PROJECT: Proposed Helicopter Facility
LOCATION: 100-275 Old Castlereagh Road, Penrith

SURFACE LEVEL: 23.6 AHD
EASTING: 285439
NORTHING: 6265595

PIT No: TP49
PROJECT No: 204635.01
DATE: 25/5/2021
SHEET 1 OF 1

RL	Depth (m)	Description of Strata	Graphic Log	Sampling & In Situ Testing: Type	Depth	Sample	Results & Comments	Water	Dynamic Penetrometer Test (blows per mm)
23	0.0	FILL/Silty SAND/TOPSOIL: fine to medium, brown, trace rootlets, moist		E	0.0 - 0.1		PID<1 ppm		
	0.2	FILL/Silty SAND: fine to medium, brown, trace rounded gravel, cobbles and clay, moist		E	0.4 - 0.5		PID<1 ppm		
	0.7	FILL/CLAY: medium to high plasticity, grey mottled orange, w<PL		E	0.9 - 1.0		PID<1 ppm		
22	1	From 1.2m: orange mottled grey		E*	1.4 - 1.5		PID<1 ppm		
	2								
	2.1	Pit discontinued at 2.1m - Limit of Investigation							
21	3								
20	4								
19									

RIG: 8.0 Tonne Excavator with 300mm tooth bucket

LOGGED: HD

SURVEY DATUM: MGA94 Zone 56

WATER OBSERVATIONS: No free groundwater observed

REMARKS: *Replicate sample BD9/20210525 taken at 1.4-1.5m

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

SAMPLING & IN SITU TESTING LEGEND

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

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TEST PIT LOG

CLIENT: Colliers International Pty Ltd
PROJECT: Proposed Helicopter Facility
LOCATION: 100-275 Old Castlereagh Road, Penrith

SURFACE LEVEL: 25.1 AHD
EASTING: 285494
NORTHING: 6265560

PIT No: TP50
PROJECT No: 204635.01
DATE: 25/5/2021
SHEET 1 OF 1

RL	Depth (m)	Description of Strata	Graphic Log	Sampling & In Situ Testing: Type	Depth	Sample	Results & Comments	Water	Dynamic Penetrometer Test (blows per mm)
25	0.2	FILL/Silty SAND/TOPSOIL: fine to medium, brown, trace rootlets, moist		E	0.0 0.1		PID<1 ppm		
		FILL/CLAY: medium to high plasticity, dark grey, trace rootlets, w~PL		E	0.5 0.6		PID<1 ppm		
24	0.9 1	FILL/Clayey SAND: fine to medium, orange-brown mottled pale grey, with sandstone gravel and cobbles, moist		E	1.3 1.4		PID<1 ppm		
23	2 2.0	Pit discontinued at 2.0m - Limit of Investigation							
22	3								
21	4								

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

RIG: 8.0 Tonne Excavator with 300mm tooth bucket

LOGGED: HD

SURVEY DATUM: MGA94 Zone 56

WATER OBSERVATIONS: No free groundwater observed

REMARKS:

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

SAMPLING & IN SITU TESTING LEGEND

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

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Sampling Methods

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Sampling

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

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

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

Test Pits

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

Large Diameter Augers

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

Continuous Spiral Flight Augers

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

Non-core Rotary Drilling

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

Continuous Core Drilling

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

Standard Penetration Tests

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

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

The test results are reported in the following form.

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

  4,6,7
  N=13

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

  15, 30/40 mm

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

Dynamic Cone Penetrometer Tests / Perth Sand Penetrometer Tests

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

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

Description and Classification Methods

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

Soil Types

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

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

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

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

Definitions of grading terms used are:

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

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

In fine grained soils (>35% fines)

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

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

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

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

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

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

Soil Descriptions

Cohesive Soils

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

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

Cohesionless Soils

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

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

Soil Origin

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

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

Moisture Condition – Coarse Grained Soils

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

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

Moisture Condition – Fine Grained Soils

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

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

Rock Strength

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

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

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

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

Degree of Weathering

The degree of weathering of rock is classified as follows:

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

Rock Descriptions

Degree of Fracturing

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

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

Rock Quality Designation

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

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

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

Stratification Spacing

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

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

Symbols & Abbreviations

Douglas Partners

Introduction

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

Drilling or Excavation Methods

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

Water

▷	Water seep
▽	Water level

Sampling and Testing

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

Description of Defects in Rock

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

Defect Type

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

Orientation

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

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

Coating or Infilling Term

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

Coating Descriptor

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

Shape

cu	curved
ir	irregular
pl	planar
st	stepped
un	undulating

Roughness

po	polished
ro	rough
sl	slickensided
sm	smooth
vr	very rough

Other

fg	fragmented
bnd	band
qtz	quartz

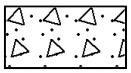
Symbols & Abbreviations

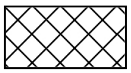
Graphic Symbols for Soil and Rock

General

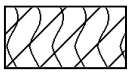

Asphalt

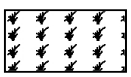

Road base

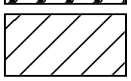

Concrete


Filling

Soils


Topsoil

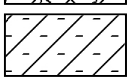

Peat


Clay


Silty clay

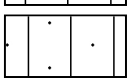

Sandy clay

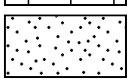

Gravelly clay

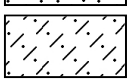

Shaly clay

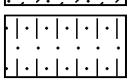

Silt


Clayey silt


Sandy silt

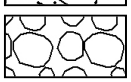

Sand


Clayey sand


Silty sand


Gravel

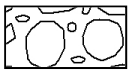

Sandy gravel


Cobbles, boulders

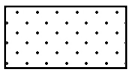

Talus

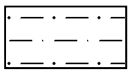
Sedimentary Rocks

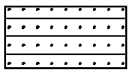

Boulder conglomerate

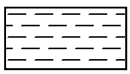

Conglomerate


Conglomeratic sandstone

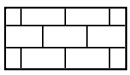

Sandstone


Siltstone

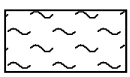

Laminite

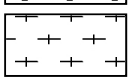

Mudstone, claystone, shale

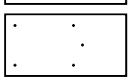

Coal


Limestone

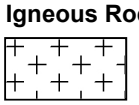
Metamorphic Rocks

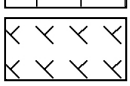

Slate, phyllite, schist

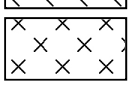

Gneiss

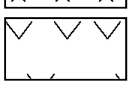

Quartzite

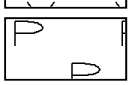
Igneous Rocks


Granite


Dolerite, basalt, andesite


Dacite, epidote


Tuff, breccia


Porphyry

Appendix M

Laboratory Results Tables

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Geotechnics / Environment / Groundwater

Table M1A: Summary of Laboratory Results – Metals, TRH, BTEX, PAH

			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	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
TP17	0 - 0.08 m	19/05/2021	<4	<0.4	14	17	14	<0.1	9	50	<25	<50	<25	<50	<100	<100	<0.2	<0.5	<1	<1	<1	0.98	1.4	13
			3000 160 900 -		3600 910 240000 85		1500 1800 730 -		6000 60 400000 230		- - - 170 260 215 NL -				1700 - 3300		3 75 NL 135 NL 165 230 180				NL 370 - 1.4 40 - 4000 -			
TP17	0.2 - 0.3 m	19/05/2021	<4	<0.4	12	9	12	<0.1	9	30	<25	<50	<25	<50	<100	<100	<0.2	<0.5	<1	<1	<1	0.3	<0.5	3.1
			3000 160 900 -		3600 910 240000 85		1500 1800 730 -		6000 60 400000 230		- - - 170 260 215 NL -				1700 - 3300		3 75 NL 135 NL 165 230 180				NL 370 - 1.4 40 - 4000 -			
TP18	0 - 0.1 m	19/05/2021	<4	<0.4	11	10	11	<0.1	9	48	<25	<50	<25	<50	<100	<100	<0.2	<0.5	<1	<1	<1	0.07	<0.5	0.3
			3000 160 900 -		3600 910 240000 85		1500 1800 730 -		6000 60 400000 230		- - - 170 260 215 NL -				1700 - 3300		3 75 NL 135 NL 165 230 180				NL 370 - 1.4 40 - 4000 -			
TP19	0.4 - 0.5 m	19/05/2021	<4	<0.4	13	7	9	<0.1	7	17	<25	<50	<25	<50	<100	<100	<0.2	<0.5	<1	<1	<1	<0.05	<0.5	<0.05
			3000 160 900 -		3600 910 240000 85		1500 1800 730 -		6000 60 400000 230		- - - 170 260 215 NL -				1700 - 3300		3 75 NL 135 NL 165 230 180				NL 370 - 1.4 40 - 4000 -			
TP19	0 - 0.1 m	19/05/2021	<4	<0.4	9	5	9	<0.1	5	21	<25	<50	<25	<50	<100	<100	<0.2	<0.5	<1	<1	<1	<0.05	<0.5	<0.05
			3000 160 900 -		3600 910 240000 85		1500 1800 730 -		6000 60 400000 230		- - - 170 260 215 NL -				1700 - 3300		3 75 NL 135 NL 165 230 180				NL 370 - 1.4 40 - 4000 -			
TP20	0.2 - 0.3 m	19/05/2021	<4	<0.4	10	6	7	<0.1	6	120	<25	<50	<25	<50	<100	<100	<0.2	<0.5	<1	<1	<1	<0.05	<0.5	<0.05
			3000 160 900 -		3600 910 240000 85		1500 1800 730 -		6000 60 400000 230		- - - 170 260 215 NL -				1700 - 3300		3 75 NL 135 NL 165 230 180				NL 370 - 1.4 40 - 4000 -			
BD1/190521	0.2 - 0.3 m	19/05/2021	<4	<0.4	10	6	9	<0.1	5	69	<25	<50	<25	<50	<100	<100	<0.2	<0.5	<1	<1	<1	<0.05	<0.5	<0.05
			3000 160 900 -		3600 910 240000 85		1500 1800 730 -		6000 60 400000 230		- - - 170 260 215 NL -				1700 - 3300		3 75 NL 135 NL 165 230 180				NL 370 - 1.4 40 - 4000 -			
TP21	0.1 - 0.15 m	19/05/2021	<4	<0.4	8	7	15	<0.1	5	37	<25	<50	<25	<50	<100	<100	<0.2	<0.5	<1	<1	<1	0.06	<0.5	0.4
			3000 160 900 -		3600 910 240000 85		1500 1800 730 -		6000 60 400000 230		- - - 170 260 215 NL -				1700 - 3300		3 75 NL 135 NL 165 230 180				NL 370 - 1.4 40 - 4000 -			
TP22	0.3 - 0.4 m	19/05/2021	<4	<0.4	11	9	9	<0.1	6	40	<25	<50	<25	<50	<100	<100	<0.2	<0.5	<1	<1	<1	<0.05	<0.5	<0.05
			3000 160 900 -		3600 910 240000 85		1500 1800 730 -		6000 60 400000 230		- - - 170 260 215 NL -				1700 - 3300		3 75 NL 135 NL 165 230 180				NL 370 - 1.4 40 - 4000 -			
TP22	0.5 - 0.6 m	19/05/2021	6	<0.4	22	36	33	<0.1	17	99	<25	<50	<25	<50	<100	<100	<0.2	<0.5	<1	<1	<1	0.4	0.6	4.8
			3000 160 900 -		3600 910 240000 85		1500 1800 730 -		6000 60 400000 230		- - - 170 260 215 NL -				1700 - 3300		3 75 NL 135 NL 165 230 180				NL 370 - 1.4 40 - 4000 -			
TP23	0 - 0.1 m	19/05/2021	<4	<0.4	8	11	6	<0.1	6	25	<25	<50	<25	<50	<100	<100	<0.2	<0.5	<1	<1	<1	<0.05	<0.5	<0.05
			3000 160 900 -		3600 910 240000 85		1500 1800 730 -		6000 60 400000 230		- - - 170 260 215 NL -				1700 - 3300		3 75 NL 135 NL 165 230 180				NL 370 - 1.4 40 - 4000 -			
TP24	0.1 - 0.2 m	20/05/2021	<4	<0.4	10	7	10	<0.1	6	20	<25	<50	<25	<50	<100	<100	<0.2	<0.5	<1	<1	<1	<0.05	<0.5	<0.05
			3000 160 900 -		3600 910 240000 85		1500 1800 730 -		6000 60 400000 230		- - - 170 260 215 NL -				1700 - 3300		3 75 NL 135 NL 165 230 180				NL 370 - 1.4 40 - 4000 -			
TP24	0.4 - 0.5 m	20/05/2021	5	<0.4	17	9	12	<0.1	7	22	<25	<50	<25	<50	<100	<100	<0.2	<0.5	<1	<1	<1	<0.05	<0.5	<0.05
			3000 160 900 -		3600 910 240000 85		1500 1800 730 -		6000 60 400000 230		- - - 170 260 215 NL -				1700 - 3300		3 75 NL 135 NL 165 230 180				NL 370 - 1.4 40 - 4000 -			
TP25	0.5 - 0.6 m	20/05/2021	<4	<0.4	12	7	15	<0.1	7	26	<25	<50	<25	<50	<100	<100	<0.2	<0.5	<1	<1	<1	<0.05	<0.5	<0.05
			3000 160 900 -		3600 910 240000 85		1500 1800 730 -		6000 60 400000 230		- - - 170 260 215 NL -				1700 - 3300		3 75 NL 135 NL 165 230 180				NL 370 - 1.4 40 - 4000 -			
TP26	0.3 - 0.4 m	20/05/2021	<4	<0.4	13	8	10	<0.1	8	25	<25	<50	<25	<50	<100	<100	<0.2	<0.5	<1	<1	<1	<0.05	<0.5	<0.05
			3000 160 900 -		3600 910 240000 85		1500 1800 730 -		6000 60 400000 230		- - - 170 260 215 NL -				1700 - 3300		3 75 NL 135 NL 165 230 180				NL 370 - 1.4 40 - 4000 -			
TP26	0.9 - 1 m	20/05/2021	<4	<0.4	13	10	12	<0.1	10	33	<25	<50	<25	<50	<100	<100	<0.2	<0.5	<1	<1	<1	<0.05	<0.5	<0.05
			3000 160 900 -		3600 910 240000 85		1500 1800 730 -		6000 60 400000 230		- - - 170 260 215 NL -				1700 - 3300		3 75 NL 135 NL 165 230 180				NL 370 - 1.4 40 - 4000 -			
TP27	0.2 - 0.3 m	20/05/2021	<4	<0.4	11	9	10	<0.1	7	31	<25	<50	<25	<50	<100	<100	<0.2	<0.5	<1	<1	<1	<0.05	<0.5	<0.05
			3000 160 900 -		3600 910 240000 85		1500 1800 730 -		6000 60 400000 230		- - - 170 260 215 NL -				1700 - 3300		3 75 NL 135 NL 165 230 180				NL 370 - 1.4 40 - 4000 -			
TP28	0 - 0.05 m	20/05/2021	<4	<0.4	9	7	7	<0.1	5	57	<25	<50	<25	<50	<100	<100	<0.2	<0.5	<1	<1	<1	<0.05	<0.5	<0.05
			3000 160 900 -		3600 910 240000 85		1500 1800 730 -		6000 60 400000 230		- - - 170 260 215 NL -				1700 - 3300		3 75 NL 135 NL 165 230 180				NL 370 - 1.4 40 - 4000 -			
TP28	1 - 1.1 m	20/05/2021	<4	<0.4	15	13	13	<0.1	7	22	<25	<50	<25	<50	<100	<100	<0.2	<0.5	<1	<1	<1	<0.05	<0.5	<0.05
			3000 160 900 -		3600 910 240000 85		1500 1800 730 -		6000 60 400000 230		- - - 170 370 215 NL -				1700 - 3300		3 75 NL 135 NL 165 NL 180				NL 370 - 1.4 40 - 4000 -			
TP29	0.4 - 0.5 m	20/05/2021	<4	<0.4	19	9	10	<0.1	8	25	<25	<50	<25	<50	<100	<100	<0.2	<0.5	<1	<1	<1	<0.05	<0.5	<0.05
			3000 160 900 -		3600 910 240000 85		1500 1800 730 -		6000 60 400000 230		- - - 170 260 215 NL -				1700 - 3300		3 75 NL 135 NL 165 230 180				NL 370 - 1.4 40 - 4000 -			
TP29 - [TRIPLICATE]	0.4 - 0.5 m	20/05/2021	<4	<0.4	19	9	11	<0.1	8	25	-	-	-	-	-	-	-	-	-	-	-	-	-	-
			3000 160 900 -		3600 910 240000 85		1500 1800 730 -		6000 60 400000 230		- - - 170 260 215 NL -				1700 - 3300		3 75 NL 135 NL 165 230 180				NL 370 - 1.4 40 - 4000 -			
TP29	1.4 - 1.5 m	20/05/2021	5	<0.4	19	8	11	<0.1	7	22	<25	<50	<25	<50	<100	<100	<0.2	<0.5	<1	<1	<1	<0.05	<0.5	<0.05
			3000 160 900 -		3600 910 240000 85		1500 1800 730 -		6000 60 400000 230		- - - 170 370 215 NL -				1700 - 3300		3 75 NL 135 NL 165 NL 180				NL 370 - 1.4 40 - 4000 -			
TP30	0.9 - 1 m	20/05/2021	<4	<0.4	14	9	13	<0.1	11	38	<25	<50	<25	<50	<100	<100	<0.2	<0.5	<1	<1	<1	<0.05	<0.5	<0.05
			3000 160 900 -		3600 910 240000 85		1500 1800 730 -		6000 60 400000 230		- - - 170 260 215 NL -				1700 - 3300		3 75 NL 135 NL 165 230 180				NL 370 - 1.4 40 - 4000 -			
TP31	0 - 0.1 m	25/05/2021	<4	<0.4	12	13	11	<0.1	8	38	<25	<50	<25	<50	<100	<100	<0.2	<0.5	<1	<1	<1	<0.05	<0.5	<0.05
			3000 160 900 -		3600 910 240000 85		1500 1800 730 -		6000 60 400000 230		- - - 170 260 215 NL -				1700 - 3300		3 75 NL 135 NL 165 230 180				NL 370 - 1.4 40 - 4000 -			
TP32	0 - 0.1 m	25/05/2021	<4	<0.4	12	16	13	<0.1	11	36	<25	<50	<25	<50	<100	<100	<0.2	<0.5	<1	<1	<1	<0.05	<0.5	<0.05
			3000 160 900 -		3600 910 240000 85		1500 1800 730 -		6000 60 400000 230		- - - 170 260 215 NL -				1700 - 3300		3 75 NL 135 NL 165 230 180				NL 370 - 1.4 40 - 4000 -			
TP32	1.5 - 1.6 m	25/05/2021	<4	<0.4	15	7	10	<0.1	6	18	<25	<50	<25	<50	<100	<100	<0.2	<0.5	<1	<1	<1	<0.05	<0.5	<0.05
			3000 160 900 -		3600 910 240000 85		1500 1800 730 -		6000 60 400000 230		- - - 170 370 215 NL -				1700 - 3300		3 75 NL 135 NL 165 NL 180				NL 370 - 1.4 40 - 4000 -			
BD6/20210525	1.5 - 1.6 m	25/05/2021	<4	<0.4	15	7	10	<0.1	6	18	<25	<50	<25	<50	<100	<100	<0.2	<0.5	<1	<1	<1	<0.05	<0.5	<0.05
			3000 160 900 -		3600 910 240000 85		1500 1800 730 -		6000 60 400000 230		- - - 170 260 215 NL -				1700 - 3300		3 75 NL 135 NL 165 230 180				NL 370 - 1.4 40 - 4000 -			
TP33	0 - 0.1 m	25/05/2021	<4	<0.4	11	9	13	<0.1	8	43	<25	<50	<25	<50	100	<100	<0.2	<0.5	<1	<1	<1	<0.05	<0.5	<0.05
			3000 160 900 -		3600 910 240000 85		1500 1800 730 -		6000 60 400000 230		- - - 170 260 215 NL -				1700 - 3300		3 75 NL 135 NL 165 230 180				NL 370 - 1.4 40 - 4000 -			
TP34	0 - 0.1 m	24/05/2021	4	<0.4	13	12	13	<0.1	11	35	<25	<50	<25	<50	<100	<100	<0.2	<0.5	<1	<1	<1	<0.05	<0.5	<0.05
			3000 160 900 -		3600 910 240000 85		1500 1800 730 -		6000 60 400000 230		- - - 170 260 215 NL -				1700 - 3300		3 75 NL 135 NL 165 230 180				NL 370 - 1.4 40 - 4000 -			
TP34	0.4 - 0.5 m	24/05/2021	<4	<0.4	9	7	10	<0.1	6	18	<25	<50	<25	<50	<100	<100	<0.2	<0.5	<1	<1	<1	<0.05	<0.5	<0.05
			3000 160 900 -		3600 910 240000 85		1500 1800 730 -		6000 60 400000 230		- - - 170 260 215 NL -				1700 - 3300		3 75 NL 135 NL 165 230 180				NL 370 - 1.4 40 - 4000 -			
TP35	0 - 0.1 m	24/05/2021	<4	<0.4	11	10	19	<0.1	7	39	<25	<50	<25	<50	<100	<100	<0.2	<0.5	<1	<1	<1	<0.05	<0.5	<0.05
			3000 160 900 -		3600 910 240000 85		1500 1800 730 -		6000 60 400000 230		- - - 170 260 215 NL -				1700 - 3300		3 75 NL 135 NL 165 230 180				NL 370 - 1.4 40 - 4000 -			
TP36	0.1 - 0.2 m	25/05/2021	<4	<0.4	9	8	10	<0.1	6	23	<25	<50	<25	<50	<100	<100	<0.2	<0.5	<1	<1	<1	<0.05	<0.5	<0.05
			3000 160 900 -		3600 910 240000 85		1500 1800 730 -		6000 60 400000 230		- - - 170 260 215 NL -				1700 - 3300		3 75 NL 135 NL 165 230 180				NL 370 - 1.4 40 - 4000 -			
TP36	0.4 - 0.5 m	25/05/2021	<4	<0.4	6	5	4	<0.1	4	20	<25	<50	<25	<50	<100	<100	<0.2	<0.5	<1	<1	<1	<0.05	<0.5	<0.05
			3000 160 900 -		3600 910 240000 85		1500 1800 730 -		6000 60 400000 230		- - - 170 260 215 NL -				1700 - 3300		3 75 NL 135 NL 165 230 180				NL 370 - 1.4 40 - 4000 -			

Douglas Partners
Geotechnics / Environment / Groundwater

Table M1A: Summary of Laboratory Results – Metals, TRH, BTEX, PAH

			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	1	0.05	0.5	0.05
TP37	0.1 - 0.2 m	25/05/2021	<4	<0.4	10	9	13	<0.1	6	28	<25	<50	<25	<50	<100	<100	<0.2	<0.5	<1	<1	<1	<0.05	<0.5	<0.05
			3000 160	900 -	3600 910	240000 85	1500 1800	730 -	6000 60	400000 230	- -	- 170	260 215	NL -	- 1700	- 3300	3 75	NL 135	NL 165	230 180	NL 370	- 1.4	40 -	4000 -
TP38	0.1 - 0.2 m	24/05/2021	<4	<0.4	11	8	13	<0.1	7	29	<25	<50	<25	<50	<100	<100	<0.2	<0.5	<1	<1	<1	<0.05	<0.5	<0.05
			3000 160	900 -	3600 910	240000 85	1500 1800	730 -	6000 60	400000 230	- -	- 170	260 215	NL -	- 1700	- 3300	3 75	NL 135	NL 165	230 180	NL 370	- 1.4	40 -	4000 -
TP38	0.5 - 0.6 m	24/05/2021	<4	<0.4	10	5	9	<0.1	4	11	<25	<50	<25	<50	<100	<100	<0.2	<0.5	<1	<1	<1	<0.05	<0.5	<0.05
			3000 160	900 -	3600 910	240000 85	1500 1800	730 -	6000 60	400000 230	- -	- 170	260 215	NL -	- 1700	- 3300	3 75	NL 135	NL 165	230 180	NL 370	- 1.4	40 -	4000 -
BD2/20210524	0.5 - 0.6 m	24/05/2021	<4	<0.4	16	9	12	<0.1	8	21	<25	<50	<25	<50	<100	<100	<0.2	<0.5	<1	<1	<1	<0.05	<0.5	<0.05
			3000 160	900 -	3600 910	240000 85	1500 1800	730 -	6000 60	400000 230	- -	- 170	260 215	NL -	- 1700	- 3300	3 75	NL 135	NL 165	230 180	NL 370	- 1.4	40 -	4000 -
TP39	0 - 0.1 m	24/05/2021	<4	<0.4	12	10	12	<0.1	6	28	<25	<50	<25	<50	<100	<100	<0.2	<0.5	<1	<1	<1	<0.05	<0.5	<0.05
			3000 160	900 -	3600 910	240000 85	1500 1800	730 -	6000 60	400000 230	- -	- 170	260 215	NL -	- 1700	- 3300	3 75	NL 135	NL 165	230 180	NL 370	- 1.4	40 -	4000 -
TP40	0 - 0.1 m	24/05/2021	<4	<0.4	6	7	8	<0.1	6	21	<25	<50	<25	<50	<100	<100	<0.2	<0.5	<1	<1	<1	<0.05	<0.5	<0.05
			3000 160	900 -	3600 910	240000 85	1500 1800	730 -	6000 60	400000 230	- -	- 170	260 215	NL -	- 1700	- 3300	3 75	NL 135	NL 165	230 180	NL 370	- 1.4	40 -	4000 -
TP40	1.5 - 1.6 m	24/05/2021	<4	<0.4	10	7	8	<0.1	7	24	<25	<50	<25	<50	<100	<100	<0.2	<0.5	<1	<1	<1	<0.05	<0.5	<0.05
			3000 160	900 -	3600 910	240000 85	1500 1800	730 -	6000 60	400000 230	- -	- 170	370 215	NL -	- 1700	- 3300	3 75	NL 135	NL 165	NL 180	NL 370	- 1.4	40 -	4000 -
BD1/20210524	1.5 - 1.6 m	24/05/2021	<5	<1	9	6	8	<0.1	7	24	<10	<50	<10	<50	<100	<100	<0.2	<0.5	<0.5	<0.5	<1	-	-	-
			3000 160	900 -	3600 910	240000 85	1500 1800	730 -	6000 60	400000 230	- -	- 170	370 215	NL -	- 1700	- 3300	3 75	NL 135	NL 165	NL 180	NL 370	- 1.4	40 -	4000 -
TP41	0.1 - 0.2 m	24/05/2021	<4	<0.4	11	11	12	<0.1	7	32	<25	<50	<25	<50	<100	<100	<0.2	<0.5	<1	<1	<1	<0.05	<0.5	<0.05
			3000 160	900 -	3600 910	240000 85	1500 1800	730 -	6000 60	400000 230	- -	- 170	260 215	NL -	- 1700	- 3300	3 75	NL 135	NL 165	230 180	NL 370	- 1.4	40 -	4000 -
TP42	0.4 - 0.5 m	24/05/2021	<4	<0.4	3	2	3	<0.1	1	11	<25	<50	<25	<50	<100	<100	<0.2	<0.5	<1	<1	<1	<0.05	<0.5	<0.05
			3000 160	900 -	3600 910	240000 85	1500 1800	730 -	6000 60	400000 230	- -	- 170	260 215	NL -	- 1700	- 3300	3 75	NL 135	NL 165	230 180	NL 370	- 1.4	40 -	4000 -
TP42	0.6 - 0.7 m	24/05/2021	<4	<0.4	8	6	6	<0.1	5	25	<25	<50	<25	<50	<100	<100	<0.2	<0.5	<1	<1	<1	<0.05	<0.5	<0.05
			3000 160	900 -	3600 910	240000 85	1500 1800	730 -	6000 60	400000 230	- -	- 170	260 215	NL -	- 1700	- 3300	3 75	NL 135	NL 165	230 180	NL 370	- 1.4	40 -	4000 -
TP43	0.1 - 0.2 m	24/05/2021	<4	<0.4	11	7	12	<0.1	6	20	<25	<50	<25	<50	<100	<100	<0.2	<0.5	<1	<1	<1	<0.05	<0.5	<0.05
			3000 160	900 -	3600 910	240000 85	1500 1800	730 -	6000 60	400000 230	- -	- 170	260 215	NL -	- 1700	- 3300	3 75	NL 135	NL 165	230 180	NL 370	- 1.4	40 -	4000 -
BD3/20210524	0.1 - 0.2 m	24/05/2021	<5	<1	8	6	13	<0.1	8	24	<10	<50	<10	<50	<100	<100	<0.2	<0.5	<0.5	<0.5	<1	-	-	-
			3000 160	900 -	3600 910	240000 85	1500 1800	730 -	6000 60	400000 230	- -	- 170	260 215	NL -	- 1700	- 3300	3 75	NL 135	NL 165	230 180	NL 370	- 1.4	40 -	4000 -
TP44	0.1 - 0.2 m	24/05/2021	<4	<0.4	11	7	11	<0.1	6	23	<25	<50	<25	<50	<100	<100	<0.2	<0.5	<1	<1	<1	<0.05	<0.5	<0.05
			3000 160	900 -	3600 910	240000 85	1500 1800	730 -	6000 60	400000 230	- -	- 170	260 215	NL -	- 1700	- 3300	3 75	NL 135	NL 165	230 180	NL 370	- 1.4	40 -	4000 -
TP44	0.8 - 0.9 m	24/05/2021	<4	<0.4	7	5	5	<0.1	4	19	<25	<50	<25	<50	<100	<100	<0.2	<0.5	<1	<1	<1	<0.05	<0.5	<0.05
			3000 160	900 -	3600 910	240000 85	1500 1800	730 -	6000 60	400000 230	- -	- 170	260 215	NL -	- 1700	- 3300	3 75	NL 135	NL 165	230 180	NL 370	- 1.4	40 -	4000 -
TP45	0 - 0.1 m	24/05/2021	<4	<0.4	8	6	9	<0.1	6	16	<25	<50	<25	<50	<100	<100	<0.2	<0.5	<1	<1	<1	<0.05	<0.5	<0.05
			3000 160	900 -	3600 910	240000 85	1500 1800	730 -	6000 60	400000 230	- -	- 170	260 215	NL -	- 1700	- 3300	3 75	NL 135	NL 165	230 180	NL 370	- 1.4	40 -	4000 -
TP46	0 - 0.1 m	24/05/2021	<4	<0.4	6	38	8	<0.1	5	29	<25	<50	<25	<50	<100	<100	<0.2	<0.5	<1	<1	<1	<0.05	<0.5	<0.05
			3000 160	900 -	3600 910	240000 85	1500 1800	730 -	6000 60	400000 230	- -	- 170	260 215	NL -	- 1700	- 3300	3 75	NL 135	NL 165	230 180	NL 370	- 1.4	40 -	4000 -
TP46	1 - 1.1 m	24/05/2021	<4	<0.4	12	7	9	<0.1	6	18	<25	<50	<25	<50	<100	<100	<0.2	<0.5	<1	<1	<1	<0.05	<0.5	<0.05
			3000 160	900 -	3600 910	240000 85	1500 1800	730 -	6000 60	400000 230	- -	- 170	370 215	NL -	- 1700	- 3300	3 75	NL 135	NL 165	NL 180	NL 370	- 1.4	40 -	4000 -
TP47	0 - 0.1 m	25/05/2021	<4	<0.4	13	8	8	<0.1	4	17	<25	<50	<25	<50	<100	<100	<0.2	<0.5	<1	<1	<1	<0.05	<0.5	<0.05
			3000 160	900 -	3600 910	240000 85	1500 1800	730 -	6000 60	400000 230	- -	- 170	260 215	NL -	- 1700	- 3300	3 75	NL 135	NL 165	230 180	NL 370	- 1.4	40 -	4000 -
TP48	0 - 0.1 m	25/05/2021	<4	<0.4	10	8	10	<0.1	7	25	<25	<50	<25	<50	<100	<100	<0.2	<0.5	<1	<1	<1	<0.05	<0.5	<0.05
			3000 160	900 -	3600 910	240000 85	1500 1800	730 -	6000 60	400000 230	- -	- 170	260 215	NL -	- 1700	- 3300	3 75	NL 135	NL 165	230 180	NL 370	- 1.4	40 -	4000 -
TP48	1.1 - 1.2 m	25/05/2021	<4	<0.4	15	9	10	<0.1	7	22	<25	<50	<25	<50	<100	<100	<0.2	<0.5	<1	<1	<1	<0.05	<0.5	<0.05
			3000 160	900 -	3600 910	240000 85	1500 1800	730 -	6000 60	400000 230	- -	- 170	370 215	NL -	- 1700	- 3300	3 75	NL 135	NL 165	NL 180	NL 370	- 1.4	40 -	4000 -
TP49	0 - 0.1 m	25/05/2021	<4	<0.4	10	10	9	<0.1	7	23	<25	<50	<25	<50	<100	<100	<0.2	<0.5	<1	<1	<1	<0.05	<0.5	<0.05
			3000 160	900 -	3600 910	240000 85	1500 1800	730 -	6000 60	400000 230	- -	- 170	260 215	NL -	- 1700	- 3300	3 75	NL 135	NL 165	230 180	NL 370	- 1.4	40 -	4000 -
TP50	0 - 0.1 m	25/05/2021	<4	<0.4	8	7	8	<0.1	5	17	<25	<50	<25	<50	<100	<100	<0.2	<0.5	<1	<1	<1	<0.05	<0.5	<0.05
			3000 160	900 -	3600 910	240000 85	1500 1800	730 -	6000 60	400000 230	- -	- 170	260 215	NL -	- 1700	- 3300	3 75	NL 135	NL 165	230 180	NL 370	- 1.4	40 -	4000 -
A01	-	25/05/2021	- -	- -	- -	- -	- -	- -	- -	- -	- -	- -	- -	- -	- -	- -	- -	- -	- -	- -	- -	- -	- -	- -
			3000 160	900 -	3600 910	240000 85	1500 1800	730 -	6000 60	400000 230	- -	- 170	260 215	NL -	- 1700	- 3300	3 75	NL 135	NL 165	230 180	NL 370	- 1.4	40 -	4000 -

Lab result
HIL/HSL value EIL/ESL value

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

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

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

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

Notes:

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

b Reported naphthalene laboratory result obtained from BTEXN suite

c Criteria applies to DDT only

Site Assessment Criteria (SAC):

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

SAC based on generic land use thresholds for Commercial/ industrial D

HIL D Commercial / Industrial (NEPC, 2013)

HSL D Commercial / Industrial (vapour intrusion) (NEPC, 2013)

DC HSL D Direct contact HSL D Commercial/Industrial (direct contact) (CRC CARE, 2011)

EIL/ESL C/Ind Commercial and Industrial (NEPC, 2013)

ML C/Ind Commercial and Industrial (NEPC, 2013)

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Table M1B: Summary of Laboratory Results – Phenol, OCP, OPP, PCB, Asbestos

			Phenol	OCP												OPP	PCB	Asbestos		
			Phenol	DDD	DDT+DDE+DDD [c]	DDE	DDT	Aldrin & Dieldrin	Total Chlordane	Endrin	Total Endosulfan	Heptachlor	Hexachlorobenzene	Methoxychlor	Chlorpyrifos	Total PCB	Asbestos ID in soil >0.1g/kg	Trace Analysis	Asbestos (50 g)
		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			
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	-	-	-
TP17	0 - 0.08 m	19/05/2021	<5	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	NAD	NAD	NAD
			660 - -	- -	3600 640	- -	- 640	45 -	530 -	100 -	2000 -	50 -	80 -	2500 -	2000 -	7 -			
TP17	0.2 - 0.3 m	19/05/2021	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
			660 - -	- -	3600 640	- -	- 640	45 -	530 -	100 -	2000 -	50 -	80 -	2500 -	2000 -	7 -			
TP18	0 - 0.1 m	19/05/2021	<5	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	NAD	NAD	NAD
			660 - -	- -	3600 640	- -	- 640	45 -	530 -	100 -	2000 -	50 -	80 -	2500 -	2000 -	7 -			
TP19	0.4 - 0.5 m	19/05/2021	<5	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	NAD	NAD	NAD
			660 - -	- -	3600 640	- -	- 640	45 -	530 -	100 -	2000 -	50 -	80 -	2500 -	2000 -	7 -			
TP19	0 - 0.1 m	19/05/2021	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
			660 - -	- -	3600 640	- -	- 640	45 -	530 -	100 -	2000 -	50 -	80 -	2500 -	2000 -	7 -			
TP20	0.2 - 0.3 m	19/05/2021	<5	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	NAD	NAD	NAD
			660 - -	- -	3600 640	- -	- 640	45 -	530 -	100 -	2000 -	50 -	80 -	2500 -	2000 -	7 -			
BD1/190521	0.2 - 0.3 m	19/05/2021	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	-	-	-
			660 - -	- -	3600 640	- -	- 640	45 -	530 -	100 -	2000 -	50 -	80 -	2500 -	2000 -	7 -			
TP21	0.1 - 0.15 m	19/05/2021	<5	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	NAD	NAD	NAD
			660 - -	- -	3600 640	- -	- 640	45 -	530 -	100 -	2000 -	50 -	80 -	2500 -	2000 -	7 -			
TP22	0.3 - 0.4 m	19/05/2021	<5	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	NAD	NAD	NAD
			660 - -	- -	3600 640	- -	- 640	45 -	530 -	100 -	2000 -	50 -	80 -	2500 -	2000 -	7 -			
TP22	0.5 - 0.6 m	19/05/2021	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
			660 - -	- -	3600 640	- -	- 640	45 -	530 -	100 -	2000 -	50 -	80 -	2500 -	2000 -	7 -			
TP23	0 - 0.1 m	19/05/2021	<5	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	NAD	NAD	NAD
			660 - -	- -	3600 640	- -	- 640	45 -	530 -	100 -	2000 -	50 -	80 -	2500 -	2000 -	7 -			
TP24	0.1 - 0.2 m	20/05/2021	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
			660 - -	- -	3600 640	- -	- 640	45 -	530 -	100 -	2000 -	50 -	80 -	2500 -	2000 -	7 -			
TP24	0.4 - 0.5 m	20/05/2021	<5	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	NAD	NAD	NAD
			660 - -	- -	3600 640	- -	- 640	45 -	530 -	100 -	2000 -	50 -	80 -	2500 -	2000 -	7 -			
TP25	0.5 - 0.6 m	20/05/2021	<5	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	NAD	NAD	NAD
			660 - -	- -	3600 640	- -	- 640	45 -	530 -	100 -	2000 -	50 -	80 -	2500 -	2000 -	7 -			
TP26	0.3 - 0.4 m	20/05/2021	<5	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	NAD	NAD	NAD
			660 - -	- -	3600 640	- -	- 640	45 -	530 -	100 -	2000 -	50 -	80 -	2500 -	2000 -	7 -			
TP26	0.9 - 1 m	20/05/2021	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
			660 - -	- -	3600 640	- -	- 640	45 -	530 -	100 -	2000 -	50 -	80 -	2500 -	2000 -	7 -			
TP27	0.2 - 0.3 m	20/05/2021	<5	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	NAD	NAD	NAD
			660 - -	- -	3600 640	- -	- 640	45 -	530 -	100 -	2000 -	50 -	80 -	2500 -	2000 -	7 -			
TP28	0 - 0.05 m	20/05/2021	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
			660 - -	- -	3600 640	- -	- 640	45 -	530 -	100 -	2000 -	50 -	80 -	2500 -	2000 -	7 -			
TP28	1 - 1.1 m	20/05/2021	<5	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	NAD	NAD	NAD
			660 - -	- -	3600 640	- -	- 640	45 -	530 -	100 -	2000 -	50 -	80 -	2500 -	2000 -	7 -			
TP29	0.4 - 0.5 m	20/05/2021	<5	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	NAD	NAD	NAD
			660 - -	- -	3600 640	- -	- 640	45 -	530 -	100 -	2000 -	50 -	80 -	2500 -	2000 -	7 -			
TP29 - [TRIPLICATE]	0.4 - 0.5 m	20/05/2021	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
			660 - -	- -	3600 640	- -	- 640	45 -	530 -	100 -	2000 -	50 -	80 -	2500 -	2000 -	7 -			
TP29	1.4 - 1.5 m	20/05/2021	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
			660 - -	- -	3600 640	- -	- 640	45 -	530 -	100 -	2000 -	50 -	80 -	2500 -	2000 -	7 -			
TP30	0.9 - 1 m	20/05/2021	<5	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	NAD	NAD	NAD
			660 - -	- -	3600 640	- -	- 640	45 -	530 -	100 -	2000 -	50 -	80 -	2500 -	2000 -	7 -			
TP31	0 - 0.1 m	25/05/2021	<5	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	NAD	NAD	NAD
			660 - -	- -	3600 640	- -	- 640	45 -	530 -	100 -	2000 -	50 -	80 -	2500 -	2000 -	7 -			
TP32	0 - 0.1 m	25/05/2021	<5	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	NAD	NAD	NAD
			660 - -	- -	3600 640	- -	- 640	45 -	530 -	100 -	2000 -	50 -	80 -	2500 -	2000 -	7 -			
TP32	1.5 - 1.6 m	25/05/2021	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	-	-	-
			660 - -	- -	3600 640	- -	- 640	45 -	530 -	100 -	2000 -	50 -	80 -	2500 -	2000 -	7 -			
BD6/20210525	1.5 - 1.6 m	25/05/2021	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	-	-	-
			660 - -	- -	3600 640	- -	- 640	45 -	530 -	100 -	2000 -	50 -	80 -	2500 -	2000 -	7 -			
TP33	0 - 0.1 m	25/05/2021	<5	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	NAD	NAD	NAD
			660 - -	- -	3600 640	- -	- 640	45 -	530 -	100 -	2000 -	50 -	80 -	2500 -	2000 -	7 -			
TP34	0 - 0.1 m	24/05/2021	<5	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	NAD	NAD	NAD
			660 - -	- -	3600 640	- -	- 640	45 -	530 -	100 -	2000 -	50 -	80 -	2500 -	2000 -	7 -			
TP34	0.4 - 0.5 m	24/05/2021	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
			660 - -	- -	3600 640	- -	- 640	45 -	530 -	100 -	2000 -	50 -	80 -	2500 -	2000 -	7 -			

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Table M1B: Summary of Laboratory Results – Phenol, OCP, OPP, PCB, Asbestos

			Phenol	OCP												OPP	PCB	Asbestos		
			Phenol	DDD	DDT+DDE+DDD [c]	DDE	DDT	Aldrin & Dieldrin	Total Chlordane	Endrin	Total Endosulfan	Heptachlor	Hexachlorobenzene	Methoxychlor	Chlorpyrifos	Total PCB	Asbestos ID in soil >≥1.0g/kg	Trace Analysis	Asbestos (50 g)
		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			
TP35	0 - 0.1 m	24/05/2021	<5	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	NAD	NAD	NAD
			660	-	-	3600	640	-	-	640	45	-	530	-	100	-	2000	-	50	-	80	-	2500	-	2000	-	7	-			
TP36	0.1 - 0.2 m	25/05/2021	<5	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	NAD	NAD	NAD
			660	-	-	3600	640	-	-	640	45	-	530	-	100	-	2000	-	50	-	80	-	2500	-	2000	-	7	-			
TP36	0.4 - 0.5 m	25/05/2021	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
			660	-	-	3600	640	-	-	640	45	-	530	-	100	-	2000	-	50	-	80	-	2500	-	2000	-	7	-			
TP37	0.1 - 0.2 m	25/05/2021	<5	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	NAD	NAD	NAD
			660	-	-	3600	640	-	-	640	45	-	530	-	100	-	2000	-	50	-	80	-	2500	-	2000	-	7	-			
TP38	0.1 - 0.2 m	24/05/2021	<5	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	NAD	NAD	NAD
			660	-	-	3600	640	-	-	640	45	-	530	-	100	-	2000	-	50	-	80	-	2500	-	2000	-	7	-			
TP38	0.5 - 0.6 m	24/05/2021	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	-	-	-
			660	-	-	3600	640	-	-	640	45	-	530	-	100	-	2000	-	50	-	80	-	2500	-	2000	-	7	-			
BD2/20210524	0.5 - 0.6 m	24/05/2021	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	-	-	-
			660	-	-	3600	640	-	-	640	45	-	530	-	100	-	2000	-	50	-	80	-	2500	-	2000	-	7	-			
TP39	0 - 0.1 m	24/05/2021	<5	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	NAD	NAD	NAD
			660	-	-	3600	640	-	-	640	45	-	530	-	100	-	2000	-	50	-	80	-	2500	-	2000	-	7	-			
TP40	0 - 0.1 m	24/05/2021	<5	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	NAD	NAD	NAD
			660	-	-	3600	640	-	-	640	45	-	530	-	100	-	2000	-	50	-	80	-	2500	-	2000	-	7	-			
TP40	1.5 - 1.6 m	24/05/2021	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
			660	-	-	3600	640	-	-	640	45	-	530	-	100	-	2000	-	50	-	80	-	2500	-	2000	-	7	-			
BD1/20210524	1.5 - 1.6 m	24/05/2021	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
			660	-	-	3600	640	-	-	640	45	-	530	-	100	-	2000	-	50	-	80	-	2500	-	2000	-	7	-			
TP41	0.1 - 0.2 m	24/05/2021	<5	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	NAD	NAD	NAD
			660	-	-	3600	640	-	-	640	45	-	530	-	100	-	2000	-	50	-	80	-	2500	-	2000	-	7	-			
TP42	0.4 - 0.5 m	24/05/2021	<5	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	NAD	NAD	NAD
			660	-	-	3600	640	-	-	640	45	-	530	-	100	-	2000	-	50	-	80	-	2500	-	2000	-	7	-			
TP42	0.6 - 0.7 m	24/05/2021	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
			660	-	-	3600	640	-	-	640	45	-	530	-	100	-	2000	-	50	-	80	-	2500	-	2000	-	7	-			
TP43	0.1 - 0.2 m	24/05/2021	<5	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	NAD	NAD	NAD
			660	-	-	3600	640	-	-	640	45	-	530	-	100	-	2000	-	50	-	80	-	2500	-	2000	-	7	-			
BD3/20210524	0.1 - 0.2 m	24/05/2021	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
			660	-	-	3600	640	-	-	640	45	-	530	-	100	-	2000	-	50	-	80	-	2500	-	2000	-	7	-			
TP44	0.1 - 0.2 m	24/05/2021	<5	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	NAD	NAD	NAD
			660	-	-	3600	640	-	-	640	45	-	530	-	100	-	2000	-	50	-	80	-	2500	-	2000	-	7	-			
TP44	0.8 - 0.9 m	24/05/2021	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
			660	-	-	3600	640	-	-	640	45	-	530	-	100	-	2000	-	50	-	80	-	2500	-	2000	-	7	-			
TP45	0 - 0.1 m	24/05/2021	<5	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	NAD	NAD	NAD
			660	-	-	3600	640	-	-	640	45	-	530	-	100	-	2000	-	50	-	80	-	2500	-	2000	-	7	-			
TP46	0 - 0.1 m	24/05/2021	<5	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	NAD	NAD	NAD
			660	-	-	3600	640	-	-	640	45	-	530	-	100	-	2000	-	50	-	80	-	2500	-	2000	-	7	-			
TP46	1 - 1.1 m	24/05/2021	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
			660	-	-	3600	640	-	-	640	45	-	530	-	100	-	2000	-	50	-	80	-	2500	-	2000	-	7	-			
TP47	0 - 0.1 m	25/05/2021	<5	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	NAD	NAD	NAD
			660	-	-	3600	640	-	-	640	45	-	530	-	100	-	2000	-	50	-	80	-	2500	-	2000	-	7	-			
TP48	0 - 0.1 m	25/05/2021	<5	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	NAD	NAD	NAD
			660	-	-	3600	640	-	-	640	45	-	530	-	100	-	2000	-	50	-	80	-	2500	-	2000	-	7	-			
TP48	1.1 - 1.2 m	25/05/2021	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
			660	-	-	3600	640	-	-	640	45	-	530	-	100	-	2000	-	50	-	80	-	2500	-	2000	-	7	-			
TP49	0 - 0.1 m	25/05/2021	<5	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	NAD	NAD	NAD
			660	-	-	3600	640	-	-	640	45	-	530	-	100	-	2000	-	50	-	80	-	2500	-	2000	-	7	-			
TP50	0 - 0.1 m	25/05/2021	<5	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	NAD	NAD	NAD
			660	-	-	3600	640	-	-	640	45	-	530	-	100	-	2000	-	50	-	80	-	2500	-	2000	-	7	-			
A01	-	25/05/2021	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
			660	-	-	3600	640	-	-	640	45	-	530	-	100	-	2000	-	50	-	80	-	2500	-	2000	-	7	-			

Lab result

HIL/HSL value EIL/ESL value

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

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

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

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

Notes:

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

b Reported naphthalene laboratory result obtained from BTEXN suite

c Criteria applies to DDT only

Site Assessment Criteria (SAC):

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

SAC based on generic land use thresholds for Commercial/ industrial D

HIL D	Commercial / Industrial (NEPC, 2013)
HSL D	Commercial / Industrial (vapour intrusion) (NEPC, 2013)
DC HSL D	Direct contact HSL D Commercial/Industrial (direct contact) (CRC CARE, 2011)
EIL/ESL C/Ind	Commercial and Industrial (NEPC, 2013)
ML C/Ind	Commercial and Industrial (NEPC, 2013)

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Table M2: Summary of Laboratory Results – Metals, TRH, BTEX, PAH, Phenol, OCP, OPP, PCB, Asbestos

			Metals								TRH		BTEX									
			Arsenic	Cadmium	Total Chromium	Copper	Lead	Mercury (inorganic)	Nickel	Zinc	TRH C6 - C9	C10 C36 (total) (fractionated hydrocarbons	Benzene	Toluene	Ethylbenzene	meta- & para-Xylene	ortho-Xylene	Xylenes (total)	Benzo(a)pyrene (BaP)	Benzo(a)pyrene (BaP) TEQ*	Acenaphthene	Acenaphthylene
		PQL	4	0.4	1	1	1	0.1	1	1	25	50	0.2	0.5	1	2	1	3	0.05	0.001	0.1	0.1
Sample ID	Depth	Sample Date	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/L	mg/kg	mg/kg
TP17	0 - 0.08 m	19/05/2021	<4	<0.4	14	17	14	<0.1	9	50	<25	<50	<0.2	<0.5	<1	<2	<1	<3	0.68	<0.001	0.1	<0.1
TP17	0.2 - 0.3 m	19/05/2021	<4	<0.4	12	9	12	<0.1	9	30	<25	<50	<0.2	<0.5	<1	<2	<1	<3	0.3	-	<0.1	<0.1
TP18	0 - 0.1 m	19/05/2021	<4	<0.4	11	10	11	<0.1	9	48	<25	<50	<0.2	<0.5	<1	<2	<1	<3	0.07	-	<0.1	<0.1
TP19	0.4 - 0.5 m	19/05/2021	<4	<0.4	13	7	9	<0.1	7	17	<25	<50	<0.2	<0.5	<1	<2	<1	<3	<0.05	-	<0.1	<0.1
TP19	0 - 0.1 m	19/05/2021	<4	<0.4	9	5	9	<0.1	5	21	<25	<50	<0.2	<0.5	<1	<2	<1	<3	<0.05	-	<0.1	<0.1
TP20	0.2 - 0.3 m	19/05/2021	<4	<0.4	10	6	7	<0.1	6	120	<25	<50	<0.2	<0.5	<1	<2	<1	<3	<0.05	-	<0.1	<0.1
BD1/190521	0.2 - 0.3 m	19/05/2021	<4	<0.4	10	6	9	<0.1	5	69	<25	<50	<0.2	<0.5	<1	<2	<1	<3	<0.05	-	<0.1	<0.1
TP21	0.1 - 0.15 m	19/05/2021	<4	<0.4	8	7	15	<0.1	5	37	<25	<50	<0.2	<0.5	<1	<2	<1	<3	0.06	-	<0.1	<0.1
TP22	0.3 - 0.4 m	19/05/2021	<4	<0.4	11	9	9	<0.1	6	40	<25	<50	<0.2	<0.5	<1	<2	<1	<3	<0.05	-	<0.1	<0.1
TP22	0.5 - 0.6 m	19/05/2021	6	<0.4	22	36	33	<0.1	17	99	<25	<50	<0.2	<0.5	<1	<2	<1	<3	0.4	-	<0.1	<0.1
TP23	0 - 0.1 m	19/05/2021	<4	<0.4	8	11	6	<0.1	6	25	<25	<50	<0.2	<0.5	<1	<2	<1	<3	<0.05	-	<0.1	<0.1
TP24	0.1 - 0.2 m	20/05/2021	<4	<0.4	10	7	10	<0.1	6	20	<25	<50	<0.2	<0.5	<1	<2	<1	<3	<0.05	-	<0.1	<0.1
TP24	0.4 - 0.5 m	20/05/2021	5	<0.4	17	9	12	<0.1	7	22	<25	<50	<0.2	<0.5	<1	<2	<1	<3	<0.05	-	<0.1	<0.1
TP25	0.5 - 0.6 m	20/05/2021	<4	<0.4	12	7	15	<0.1	7	26	<25	<50	<0.2	<0.5	<1	<2	<1	<3	<0.05	-	<0.1	<0.1
TP26	0.3 - 0.4 m	20/05/2021	<4	<0.4	13	8	10	<0.1	8	25	<25	<50	<0.2	<0.5	<1	<2	<1	<3	<0.05	-	<0.1	<0.1
TP26	0.9 - 1 m	20/05/2021	<4	<0.4	13	10	12	<0.1	10	33	<25	<50	<0.2	<0.5	<1	<2	<1	<3	<0.05	-	<0.1	<0.1
TP27	0.2 - 0.3 m	20/05/2021	<4	<0.4	11	9	10	<0.1	7	31	<25	<50	<0.2	<0.5	<1	<2	<1	<3	<0.05	-	<0.1	<0.1
TP28	0 - 0.05 m	20/05/2021	<4	<0.4	9	7	7	<0.1	5	57	<25	<50	<0.2	<0.5	<1	<2	<1	<3	<0.05	-	<0.1	<0.1
TP28	1 - 1.1 m	20/05/2021	<4	<0.4	15	13	13	<0.1	7	22	<25	<50	<0.2	<0.5	<1	<2	<1	<3	<0.05	-	<0.1	<0.1
TP29	0.4 - 0.5 m	20/05/2021	<4	<0.4	19	9	10	<0.1	8	25	<25	<50	<0.2	<0.5	<1	<2	<1	<3	<0.05	-	<0.1	<0.1
TP29 - [TRIPLICATE]	0.4 - 0.5 m	20/05/2021	<4	<0.4	19	9	11	<0.1	8	25	-	-	-	-	-	-	-	-	-	-	-	-
TP29	1.4 - 1.5 m	20/05/2021	5	<0.4	19	8	11	<0.1	7	22	<25	<50	<0.2	<0.5	<1	<2	<1	<3	<0.05	-	<0.1	<0.1
TP30	0.9 - 1 m	20/05/2021	<4	<0.4	14	9	13	<0.1	11	38	<25	<50	<0.2	<0.5	<1	<2	<1	<3	<0.05	-	<0.1	<0.1
TP31	0 - 0.1 m	25/05/2021	<4	<0.4	12	13	11	<0.1	8	38	<25	<50	<0.2	<0.5	<1	<2	<1	<3	<0.05	-	<0.1	<0.1
TP32	0 - 0.1 m	25/05/2021	<4	<0.4	12	16	13	<0.1	11	36	<25	<50	<0.2	<0.5	<1	<2	<1	<3	<0.05	-	<0.1	<0.1
TP32	1.5 - 1.6 m	25/05/2021	<4	<0.4	15	7	10	<0.1	6	18	<25	<50	<0.2	<0.5	<1	<2	<1	<3	<0.05	-	<0.1	<0.1
BD6/20210525	1.5 - 1.6 m	25/05/2021	<4	<0.4	15	7	10	<0.1	6	18	<25	<50	<0.2	<0.5	<1	<2	<1	<3	<0.05	-	<0.1	<0.1
TP33	0 - 0.1 m	25/05/2021	<4	<0.4	11	9	13	<0.1	8	43	<25	110	<0.2	<0.5	<1	<2	<1	<3	<0.05	-	<0.1	<0.1
TP34	0 - 0.1 m	24/05/2021	4	<0.4	13	12	13	<0.1	11	35	<25	<50	<0.2	<0.5	<1	<2	<1	<3	<0.05	-	<0.1	<0.1
TP34	0.4 - 0.5 m	24/05/2021	<4	<0.4	9	7	10	<0.1	6	18	<25	<50	<0.2	<0.5	<1	<2	<1	<3	<0.05	-	<0.1	<0.1
TP35	0 - 0.1 m	24/05/2021	<4	<0.4	11	10	19	<0.1	7	39	<25	<50	<0.2	<0.5	<1	<2	<1	<3	<0.05	-	<0.1	<0.1
TP36	0.1 - 0.2 m	25/05/2021	<4	<0.4	9	8	10	<0.1	6	23	<25	<50	<0.2	<0.5	<1	<2	<1	<3	<0.05	-	<0.1	<0.1
TP36	0.4 - 0.5 m	25/05/2021	<4	<0.4	6	5	4	<0.1	4	20	<25	<50	<0.2	<0.5	<1	<2	<1	<3	<0.05	-	<0.1	<0.1
TP37	0.1 - 0.2 m	25/05/2021	<4	<0.4	10	9	13	<0.1	6	28	<25	<50	<0.2	<0.5	<1	<2	<1	<3	<0.05	-	<0.1	<0.1
TP38	0.1 - 0.2 m	24/05/2021	<4	<0.4	11	8	13	<0.1	7	29	<25	<50	<0.2	<0.5	<1	<2	<1	<3	<0.05	-	<0.1	<0.1
TP38	0.5 - 0.6 m	24/05/2021	<4	<0.4	10	5	9	<0.1	4	11	<25	<50	<0.2	<0.5	<1	<2	<1	<3	<0.05	-	<0.1	<0.1
BD2/20210524	0.5 - 0.6 m	24/05/2021	<4	<0.4	16	9	12	<0.1	8	21	<25	<50	<0.2	<0.5	<1	<2	<1	<3	<0.05	-	<0.1	<0.1
TP39	0 - 0.1 m	24/05/2021	<4	<0.4	12	10	12	<0.1	6	28	<25	<50	<0.2	<0.5	<1	<2	<1	<3	<0.05	-	<0.1	<0.1
TP40	0 - 0.1 m	24/05/2021	<4	<0.4	6	7	8	<0.1	6	21	<25	<50	<0.2	<0.5	<1	<2	<1	<3	<0.05	-	<0.1	<0.1
TP40	1.5 - 1.6 m	24/05/2021	<4	<0.4	10	7	8	<0.1	7	24	<25	<50	<0.2	<0.5	<1	<2	<1	<3	<0.05	-	<0.1	<0.1
BD1/20210524	1.5 - 1.6 m	24/05/2021	<5	<1	9	6	8	<0.1	7	24	<10	<50	-	-	-	-	-	-	-	-	-	-
TP41	0.1 - 0.2 m	24/05/2021	<4	<0.4	11	11	12	<0.1	7	32	<25	<50	<0.2	<0.5	<1	<2	<1	<3	<0.05	-	<0.1	<0.1
TP42	0.4 - 0.5 m	24/05/2021	<4	<0.4	3	2	3	<0.1	1	11	<25	<50	<0.2	<0.5	<1	<2	<1	<3	<0.05	-	<0.1	<0.1
TP42	0.6 - 0.7 m	24/05/2021	<4	<0.4	8	6	6	<0.1	5	25	<25	<50	<0.2	<0.5	<1	<2	<1	<3	<0.05	-	<0.1	<0.1
TP43	0.1 - 0.2 m	24/05/2021	<4	<0.4	11	7	12	<0.1	6	20	<25	<50	<0.2	<0.5	<1	<2	<1	<3	<0.05	-	<0.1	<0.1
BD3/20210524	0.1 - 0.2 m	24/05/2021	<5	<1	8	6	13	<0.1	8	24	<10	<50	-	-	-	-	-	-	-	-	-	-
TP44	0.1 - 0.2 m	24/05/2021	<4	<0.4	11	7	11	<0.1	6	23	<25	<50	<0.2	<0.5	<1	<2	<1	<3	<0.05	-	<0.1	<0.1
TP44	0.8 - 0.9 m	24/05/2021	<4	<0.4	7	5	5	<0.1	4	19	<25	<50	<0.2	<0.5	<1	<2	<1	<3	<0.05	-	<0.1	<0.1
TP45	0 - 0.1 m	24/05/2021	<4	<0.4	8	6	9	<0.1	6	16	<25	<50	<0.2	<0.5	<1	<2	<1	<3	<0.05	-	<0.1	<0.1
TP46	0 - 0.1 m	24/05/2021	<4	<0.4	6	38	8	<0.1	5	29	<25	<50	<0.2	<0.5	<1	<2	<1	<3	<0.05	-	<0.1	<0.1
TP46	1 - 1.1 m	24/05/2021	<4	<0.4	12	7	9	<0.1	6	18	<25	<50	<0.2	<0.5	<1	<2	<1	<3	<0.05	-	<0.1	<0.1
TP47	0 - 0.1 m	25/05/2021	<4	<0.4	7	13	8	<0.1	4	17	<25	<50	<0.2	<0.5	<1	<2	<1	<3	<0.05	-	<0.1	<0.1
TP48	0 - 0.1 m	25/05/2021	<4	<0.4	10	8	10	<0.1	7	25	<25	<50	<0.2	<0.5	<1	<2	<1	<3	<0.05	-	<0.1	<0.1
TP48	1.1 - 1.2 m	25/05/2021	<4	<0.4	15	9	10	<0.1	7	22	<25	<50	<0.2	<0.5	<1	<2	<1	<3	<0.05	-	<0.1	<0.1
TP49	0 - 0.1 m	25/05/2021	<4	<0.4	10	10	9	<0.1	7	23	<25	<50	<0.2	<0.5	<1	<2	<1	<3	<0.05	-	<0.1	<0.1
TP50	0 - 0.1 m	25/05/2021	<4	<0.4	8	7	8	<0.1	5	17	<25	<50	<0.2	<0.5	<1	<2	<1	<3	<0.05	-	<0.1	<0.1
A01	-	25/05/2021	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
																						Waste Classification Criteria
CT1			100	20	100	NC	100	4	40	NC	650	10000	10	288	600	NC	NC	1000	0.8	0.8	NC	NC
SCC1			500	100	1900	NC	1500	50	1050	NC	650	10000	18	518	1080	NC	NC	1800	10	10	NC	NC
TCLP1			N/A	N/A	N/A	NC	N/A	N/A	N/A	NC	N/A	N/A	N/A	N/A	N/A	NC	NC	N/A	N/A	N/A	NC	NC
CT2			400	80	400	NC	400	16	160	NC	2600	40000	40	1152	2400	NC	NC	4000	3.2	3.2	NC	NC
SCC2			2000	400	7600	NC	6000	200	4200	NC	2600	40000	72	2073	4320	NC	NC	7200	23	23	NC	NC
TCLP2			N/A	N/A	N/A	NC	N/A	N/A	N/A	NC	N/A	N/A	N/A	N/A	N/A	NC	NC	N/A	N/A	N/A	NC	NC

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

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

Notes:

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

b Total chromium used as initial screen for chromium(VI).

c Total recoverable hydrocarbons (TRH) used as an initial screen for total petroleum hydrocarbons (TPH)

d Criteria for scheduled chemicals used as an initial screen

e Criteria for Chlorpyrifos used as initial screen

f All criteria are in the same units as the reported results

PQL Practical quantitation limit

CT1 NSW EPA, 2014, Waste Classification Guidelines Part 1; Classifying Waste, Maximum values of specific contaminant concentration (SCC) for classification without TCLP: General solid waste

SCC1 NSW EPA, 2014, Waste Classification Guidelines Part 1; Classifying Waste, Maximum values for leachable concentration (TCLP) and specific contaminant concentration (SCC) when used together: General solid waste

TCLP1 NSW EPA, 2014, Waste Classification Guidelines Part 1; Classifying Waste, Maximum values for leachable concentration (TCLP) and specific contaminant concentration (SCC) when used together: General solid waste

CT2 NSW EPA, 2014, Waste Classification Guidelines Part 1; Classifying Waste, Maximum values of specific contaminant concentration (SCC) for classification without TCLP: Restricted solid waste

SCC2 NSW EPA, 2014, Waste Classification Guidelines Part 1; Classifying Waste, Maximum values for leachable concentration (TCLP) and specific contaminant concentration (SCC) when used together: Restricted solid waste

TCLP2 NSW EPA, 2014, Waste Classification Guidelines Part 1; Classifying Waste, Maximum values for leachable concentration (TCLP) and specific contaminant concentration (SCC) when used together: Restricted solid waste

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Table M2: Summary of Laboratory Results – Metals, TRH, BTEX, PAH, Phenol, OCP, OPP, PCB, Asbestos

PAH													Phenol	OCP		OPP	PCB	Asbestos			
Anthracene	Benzo(a)anthracene	Benzo(b,j+k)fluoranthene	Benzo(g,h,i)perylene	Chrysene	Dibenzo(a,h)anthracene	Fluoranthene	Fluorene	Indeno(1,2,3-c,d)pyrene	Naphthalene	Phenanthrene	Pyrene	Total PAHs	Phenol	Total Endosulfan	Total Analysed OCP	Total Analysed OPP	Total PCB	Asbestos ID in soil >0.1g/kg	Trace Analysis	Asbestos ID in materials	Total Asbestos
0.1	0.1	0.2	0.1	0.1	0.1	0.1	0.1	0.1	1	0.1	0.1	0.05	5	0.1	0.1	0.1	0.1				
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	-	-	-	-
0.2	1	2	0.6	0.9	0.1	2.8	<0.1	0.5	<1	1.8	2.5	13	<5	<0.1	<0.1	<0.1	<0.1	NAD	NAD	-	NAD
<0.1	0.3	0.4	0.2	0.3	<0.1	0.6	<0.1	0.1	<1	0.3	0.6	3.1	-	-	-	-	-	-	-	-	-
<0.1	<0.1	<0.2	<0.1	<0.1	<0.1	0.1	<0.1	<0.1	<1	<0.1	0.1	0.3	<5	<0.1	<0.1	<0.1	<0.1	NAD	NAD	-	NAD
<0.1	<0.1	<0.2	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<1	<0.1	<0.1	<0.05	<5	<0.1	<0.1	<0.1	<0.1	NAD	NAD	-	NAD
<0.1	<0.1	<0.2	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<1	<0.1	<0.1	<0.05	-	-	-	-	-	-	-	-	-
<0.1	<0.1	<0.2	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<1	<0.1	<0.1	<0.05	<5	<0.1	<0.1	<0.1	<0.1	NAD	NAD	-	NAD
<0.1	<0.1	<0.2	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<1	<0.1	<0.1	<0.05	NT	NT	NT	NT	NT	-	-	-	-
<0.1	<0.1	<0.2	<0.1	<0.1	<0.1	0.2	<0.1	<0.1	<1	<0.1	0.2	0.4	<5	<0.1	<0.1	<0.1	<0.1	NAD	NAD	-	NAD
<0.1	<0.1	<0.2	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<1	<0.1	<0.1	<0.05	<5	<0.1	<0.1	<0.1	<0.1	NAD	NAD	-	NAD
<0.1	0.4	0.7	0.3	0.5	<0.1	0.9	<0.1	0.2	<1	0.4	0.9	4.8	-	-	-	-	-	-	-	-	-
<0.1	<0.1	<0.2	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<1	<0.1	<0.1	<0.05	<5	<0.1	<0.1	<0.1	<0.1	NAD	NAD	-	NAD
<0.1	<0.1	<0.2	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<1	<0.1	<0.1	<0.05	-	-	-	-	-	-	-	-	-
<0.1	<0.1	<0.2	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<1	<0.1	<0.1	<0.05	<5	<0.1	<0.1	<0.1	<0.1	NAD	NAD	-	NAD
<0.1	<0.1	<0.2	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<1	<0.1	<0.1	<0.05	<5	<0.1	<0.1	<0.1	<0.1	NAD	NAD	-	NAD
<0.1	<0.1	<0.2	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<1	<0.1	<0.1	<0.05	<5	<0.1	<0.1	<0.1	<0.1	NAD	NAD	-	NAD
<0.1	<0.1	<0.2	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<1	<0.1	<0.1	<0.05	-	-	-	-	-	-	-	-	-
<0.1	<0.1	<0.2	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<1	<0.1	<0.1	<0.05	<5	<0.1	<0.1	<0.1	<0.1	NAD	NAD	-	NAD
<0.1	<0.1	<0.2	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<1	<0.1	<0.1	<0.05	-	-	-	-	-	-	-	-	-
<0.1	<0.1	<0.2	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<1	<0.1	<0.1	<0.05	<5	<0.1	<0.1	<0.1	<0.1	NAD	NAD	-	NAD
<0.1	<0.1	<0.2	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<1	<0.1	<0.1	<0.05	<5	<0.1	<0.1	<0.1	<0.1	NAD	NAD	-	NAD
-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
<0.1	<0.1	<0.2	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<1	<0.1	<0.1	<0.05	-	-	-	-	-	-	-	-	-
<0.1	<0.1	<0.2	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<1	<0.1	<0.1	<0.05	<5	<0.1	<0.1	<0.1	<0.1	NAD	NAD	-	NAD
<0.1	<0.1	<0.2	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<1	<0.1	<0.1	<0.05	<5	<0.1	<0.1	<0.1	<0.1	NAD	NAD	-	NAD
<0.1	<0.1	<0.2	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<1	<0.1	<0.1	<0.05	<5	<0.1	<0.1	<0.1	<0.1	NAD	NAD	-	NAD
<0.1	<0.1	<0.2	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<1	<0.1	<0.1	<0.05	NT	NT	NT	NT	NT	-	-	-	-
<0.1	<0.1	<0.2	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<1	<0.1	<0.1	<0.05	NT	NT	NT	NT	NT	-	-	-	-
<0.1	<0.1	<0.2	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<1	<0.1	<0.1	<0.05	<5	<0.1	<0.1	<0.1	<0.1	NAD	NAD	-	NAD
<0.1	<0.1	<0.2	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<1	<0.1	<0.1	<0.05	<5	<0.1	<0.1	<0.1	<0.1	NAD	NAD	-	NAD
<0.1	<0.1	<0.2	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<1	<0.1	<0.1	<0.05	-	-	-	-	-	-	-	-	-
<0.1	<0.1	<0.2	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<1	<0.1	<0.1	<0.05	<5	<0.1	<0.1	<0.1	<0.1	NAD	NAD	-	NAD
<0.1	<0.1	<0.2	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<1	<0.1	<0.1	<0.05	<5	<0.1	<0.1	<0.1	<0.1	NAD	NAD	-	NAD
<0.1	<0.1	<0.2	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<1	<0.1	<0.1	<0.05	-	-	-	-	-	-	-	-	-
<0.1	<0.1	<0.2	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<1	<0.1	<0.1	<0.05	<5	<0.1	<0.1	<0.1	<0.1	NAD	NAD	-	NAD
<0.1	<0.1	<0.2	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<1	<0.1	<0.1	<0.05	<5	<0.1	<0.1	<0.1	<0.1	NAD	NAD	-	NAD
<0.1	<0.1	<0.2	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<1	<0.1	<0.1	<0.05	NT	NT	NT	NT	NT	-	-	-	-
<0.1	<0.1	<0.2	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<1	<0.1	<0.1	<0.05	NT	NT	NT	NT	NT	-	-	-	-
<0.1	<0.1	<0.2	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<1	<0.1	<0.1	<0.05	<5	<0.1	<0.1	<0.1	<0.1	NAD	NAD	-	NAD
<0.1	<0.1	<0.2	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<1	<0.1	<0.1	<0.05	<5	<0.1	<0.1	<0.1	<0.1	NAD	NAD	-	NAD
<0.1	<0.1	<0.2	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<1	<0.1	<0.1	<0.05	-	-	-	-	-	-	-	-	-
-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
<0.1	<0.1	<0.2	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<1	<0.1	<0.1	<0.05	<5	<0.1	<0.1	<0.1	<0.1	NAD	NAD	-	NAD
<0.1	<0.1	<0.2	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<1	<0.1	<0.1	<0.05	<5	<0.1	<0.1	<0.1	<0.1	NAD	NAD	-	NAD
<0.1	<0.1	<0.2	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<1	<0.1	<0.1	<0.05	-	-	-	-	-	-	-	-	-
<0.1	<0.1	<0.2	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<1	<0.1	<0.1	<0.05	<5	<0.1	<0.1	<0.1	<0.1	NAD	NAD	-	NAD
-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
<0.1	<0.1	<0.2	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<1	<0.1	<0.1	<0.05	<5	<0.1	<0.1	<0.1	<0.1	NAD	NAD	-	NAD
<0.1	<0.1	<0.2	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<1	<0.1	<0.1	<0.05	-	-	-	-	-	-	-	-	-
<0.1	<0.1	<0.2	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<1	<0.1	<0.1	<0.05	<5	<0.1	<0.1	<0.1	<0.1	NAD	NAD	-	NAD
<0.1	<0.1	<0.2	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<1	<0.1	<0.1	<0.05	<5	<0.1	<0.1	<0.1	<0.1	NAD	NAD	-	NAD
<0.1	<0.1	<0.2	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<1	<0.1	<0.1	<0.05	-	-	-	-	-	-	-	-	-
<0.1	<0.1	<0.2	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<1	<0.1	<0.1	<0.05	<5	<0.1	<0.1	<0.1	<0.1	NAD	NAD	-	NAD
<0.1	<0.1	<0.2	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<1	<0.1	<0.1	<0.05	<5	<0.1	<0.1	<0.1	<0.1	NAD	NAD	-	NAD
<0.1	<0.1	<0.2	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<1	<0.1	<0.1	<0.05	-	-	-	-	-	-	-	-	-
<0.1	<0.1	<0.2	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<1	<0.1	<0.1	<0.05	<5	<0.1	<0.1	<0.1	<0.1	NAD	NAD	-	NAD
<0.1	<0.1	<0.2	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<1	<0.1	<0.1	<0.05	<5	<0.1	<0.1	<0.1	<0.1	NAD	NAD	-	NAD
-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	NAD	NAD
f																					
NC	NC	NC	NC	NC	NC	NC	NC	NC	NC	NC	NC	200	288	60	<50	4	<50	NC	NC	NC	NC
NC	NC	NC	NC	NC	NC	NC	NC	NC	NC	NC	NC	200	518	108	<50	7.5	<50	NC	NC	NC	NC
NC	NC	NC	NC	NC	NC	NC	NC	NC	NC	NC	NC	N/A	N/A	N/A	N/A	N/A	N/A	NC	NC	NC	NC
NC	NC	NC	NC	NC	NC	NC	NC	NC	NC	NC	NC	800	1152	240	<50	16	<50	NC	NC	NC	NC
NC	NC	NC	NC	NC	NC	NC	NC	NC	NC	NC	NC	800	2073	432	<50	30	<50	NC	NC	NC	NC
NC	NC	NC	NC	NC	NC	NC	NC	NC	NC	NC	NC	N/A	N/A	N/A	N/A	N/A	N/A	NC	NC	NC	NC

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

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

Notes:

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

Appendix N

Laboratory Chain of Custody, Sample Receipt Advice

and Certificate of Analysis Documentation

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 269788

Client Details

Client	Douglas Partners Pty Ltd
Attention	Nizam Ahamed
Address	96 Hermitage Rd, West Ryde, NSW, 2114

Sample Details

Your Reference	**204635.01, 100-275 Castlereagh Road Penrith**
Number of Samples	22 Soil
Date samples received	24/05/2021
Date completed instructions received	24/05/2021

Analysis Details

Please refer to the following pages for results, methodology summary and quality control data.

Samples were analysed as received from the client. Results relate specifically to the samples as received.

Results are reported on a dry weight basis for solids and on an as received basis for other matrices.

Please refer to the last page of this report for any comments relating to the results.

Report Details

Date results requested by	31/05/2021
Date of Issue	31/05/2021

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

Asbestos Approved By
Analysed by Asbestos Approved Identifier: Nyovan Moonean
Authorised by Asbestos Approved Signatory: Lucy Zhu

Results Approved By
Diego Bigolin, Team Leader, Inorganics
Dragana Tomas, Senior Chemist
Hannah Nguyen, Senior Chemist
Lucy Zhu, Asbestos Supervisor
Steven Luong, Organics Supervisor

Authorised By

Nancy Zhang, Laboratory Manager

vTRH(C6-C10)/BTEXN in Soil						
Our Reference		269788-1	269788-2	269788-3	269788-4	269788-5
Your Reference	UNITS	TP17	TP17	TP18	TP19	TP19
Depth		0-0.08	0.2-0.3	0-0.1	0.4-0.5	0-0.1
Date Sampled		19/05/2021	19/05/2021	19/05/2021	19/05/2021	19/05/2021
Type of sample		Soil	Soil	Soil	Soil	Soil
Date extracted	-	25/05/2021	25/05/2021	25/05/2021	25/05/2021	25/05/2021
Date analysed	-	26/05/2021	26/05/2021	26/05/2021	26/05/2021	26/05/2021
TRH C_6 - C_9	mg/kg	<25	<25	<25	<25	<25
TRH C_6 - C_{10}	mg/kg	<25	<25	<25	<25	<25
vTPH C_6 - C_{10} less BTEX (F1)	mg/kg	<25	<25	<25	<25	<25
Benzene	mg/kg	<0.2	<0.2	<0.2	<0.2	<0.2
Toluene	mg/kg	<0.5	<0.5	<0.5	<0.5	<0.5
Ethylbenzene	mg/kg	<1	<1	<1	<1	<1
m+p-xylene	mg/kg	<2	<2	<2	<2	<2
o-Xylene	mg/kg	<1	<1	<1	<1	<1
naphthalene	mg/kg	<1	<1	<1	<1	<1
Total +ve Xylenes	mg/kg	<3	<3	<3	<3	<3
Surrogate aaa-Trifluorotoluene	%	97	106	109	102	111

vTRH(C6-C10)/BTEXN in Soil						
Our Reference		269788-6	269788-7	269788-8	269788-9	269788-10
Your Reference	UNITS	TP20	TP21	TP22	TP22	TP23
Depth		0.2-0.3	0.1-0.15	0.3-0.4	0.5-0.6	0-0.1
Date Sampled		19/05/2021	19/05/2021	19/05/2021	19/05/2021	19/05/2021
Type of sample		Soil	Soil	Soil	Soil	Soil
Date extracted	-	25/05/2021	25/05/2021	25/05/2021	25/05/2021	25/05/2021
Date analysed	-	26/05/2021	26/05/2021	26/05/2021	26/05/2021	26/05/2021
TRH C_6 - C_9	mg/kg	<25	<25	<25	<25	<25
TRH C_6 - C_{10}	mg/kg	<25	<25	<25	<25	<25
vTPH C_6 - C_{10} less BTEX (F1)	mg/kg	<25	<25	<25	<25	<25
Benzene	mg/kg	<0.2	<0.2	<0.2	<0.2	<0.2
Toluene	mg/kg	<0.5	<0.5	<0.5	<0.5	<0.5
Ethylbenzene	mg/kg	<1	<1	<1	<1	<1
m+p-xylene	mg/kg	<2	<2	<2	<2	<2
o-Xylene	mg/kg	<1	<1	<1	<1	<1
naphthalene	mg/kg	<1	<1	<1	<1	<1
Total +ve Xylenes	mg/kg	<3	<3	<3	<3	<3
Surrogate aaa-Trifluorotoluene	%	111	96	110	106	115

vTRH(C6-C10)/BTEXN in Soil						
Our Reference		269788-11	269788-12	269788-13	269788-14	269788-15
Your Reference	UNITS	TP24	TP24	TP25	TP26	TP26
Depth		0.1-0.2	0.4-0.5	0.5-0.6	0.3-0.4	0.9-1
Date Sampled		20/05/2021	20/05/2021	20/05/2021	20/05/2021	20/05/2021
Type of sample		Soil	Soil	Soil	Soil	Soil
Date extracted	-	25/05/2021	25/05/2021	25/05/2021	25/05/2021	25/05/2021
Date analysed	-	26/05/2021	26/05/2021	26/05/2021	26/05/2021	26/05/2021
TRH C_6 - C_9	mg/kg	<25	<25	<25	<25	<25
TRH C_6 - C_{10}	mg/kg	<25	<25	<25	<25	<25
vTPH C_6 - C_{10} less BTEX (F1)	mg/kg	<25	<25	<25	<25	<25
Benzene	mg/kg	<0.2	<0.2	<0.2	<0.2	<0.2
Toluene	mg/kg	<0.5	<0.5	<0.5	<0.5	<0.5
Ethylbenzene	mg/kg	<1	<1	<1	<1	<1
m+p-xylene	mg/kg	<2	<2	<2	<2	<2
o-Xylene	mg/kg	<1	<1	<1	<1	<1
naphthalene	mg/kg	<1	<1	<1	<1	<1
Total +ve Xylenes	mg/kg	<3	<3	<3	<3	<3
Surrogate aaa-Trifluorotoluene	%	111	106	99	110	110

vTRH(C6-C10)/BTEXN in Soil						
Our Reference		269788-16	269788-17	269788-18	269788-19	269788-20
Your Reference	UNITS	TP27	TP28	TP28	TP29	TP29
Depth		0.2-0.3	0-0.05	1-1.1	0.4-0.5	1.4-1.5
Date Sampled		20/05/2021	20/05/2021	20/05/2021	20/05/2021	20/05/2021
Type of sample		Soil	Soil	Soil	Soil	Soil
Date extracted	-	25/05/2021	25/05/2021	25/05/2021	25/05/2021	25/05/2021
Date analysed	-	26/05/2021	26/05/2021	26/05/2021	26/05/2021	26/05/2021
TRH C_6 - C_9	mg/kg	<25	<25	<25	<25	<25
TRH C_6 - C_{10}	mg/kg	<25	<25	<25	<25	<25
vTPH C_6 - C_{10} less BTEX (F1)	mg/kg	<25	<25	<25	<25	<25
Benzene	mg/kg	<0.2	<0.2	<0.2	<0.2	<0.2
Toluene	mg/kg	<0.5	<0.5	<0.5	<0.5	<0.5
Ethylbenzene	mg/kg	<1	<1	<1	<1	<1
m+p-xylene	mg/kg	<2	<2	<2	<2	<2
o-Xylene	mg/kg	<1	<1	<1	<1	<1
naphthalene	mg/kg	<1	<1	<1	<1	<1
Total +ve Xylenes	mg/kg	<3	<3	<3	<3	<3
Surrogate aaa-Trifluorotoluene	%	112	113	103	108	98

vTRH(C6-C10)/BTEXN in Soil			
Our Reference		269788-21	269788-22
Your Reference	UNITS	TP30	BD1/190521
Depth		0.9-1	-
Date Sampled		20/05/2021	19/05/2021
Type of sample		Soil	Soil
Date extracted	-	25/05/2021	25/05/2021
Date analysed	-	26/05/2021	26/05/2021
TRH C_6 - C_9	mg/kg	<25	<25
TRH C_6 - C_{10}	mg/kg	<25	<25
vTPH C_6 - C_{10} less BTEX (F1)	mg/kg	<25	<25
Benzene	mg/kg	<0.2	<0.2
Toluene	mg/kg	<0.5	<0.5
Ethylbenzene	mg/kg	<1	<1
m+p-xylene	mg/kg	<2	<2
o-Xylene	mg/kg	<1	<1
naphthalene	mg/kg	<1	<1
Total +ve Xylenes	mg/kg	<3	<3
Surrogate aaa-Trifluorotoluene	%	89	101

svTRH (C10-C40) in Soil						
Our Reference		269788-1	269788-2	269788-3	269788-4	269788-5
Your Reference	UNITS	TP17	TP17	TP18	TP19	TP19
Depth		0-0.08	0.2-0.3	0-0.1	0.4-0.5	0-0.1
Date Sampled		19/05/2021	19/05/2021	19/05/2021	19/05/2021	19/05/2021
Type of sample		Soil	Soil	Soil	Soil	Soil
Date extracted	-	25/05/2021	25/05/2021	25/05/2021	25/05/2021	25/05/2021
Date analysed	-	25/05/2021	25/05/2021	26/05/2021	26/05/2021	26/05/2021
TRH C_{10} - C_{14}	mg/kg	<50	<50	<50	<50	<50
TRH C_{15} - C_{28}	mg/kg	<100	<100	<100	<100	<100
TRH C_{29} - C_{36}	mg/kg	<100	<100	<100	<100	<100
TRH >C_{10} -C_{16}	mg/kg	<50	<50	<50	<50	<50
TRH >C_{10} - C_{16} less Naphthalene (F2)	mg/kg	<50	<50	<50	<50	<50
TRH >C_{16} -C_{34}	mg/kg	<100	<100	<100	<100	<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	%	68	76	77	82	70

svTRH (C10-C40) in Soil						
Our Reference		269788-6	269788-7	269788-8	269788-9	269788-10
Your Reference	UNITS	TP20	TP21	TP22	TP22	TP23
Depth		0.2-0.3	0.1-0.15	0.3-0.4	0.5-0.6	0-0.1
Date Sampled		19/05/2021	19/05/2021	19/05/2021	19/05/2021	19/05/2021
Type of sample		Soil	Soil	Soil	Soil	Soil
Date extracted	-	25/05/2021	25/05/2021	25/05/2021	25/05/2021	25/05/2021
Date analysed	-	26/05/2021	26/05/2021	26/05/2021	26/05/2021	26/05/2021
TRH C_{10} - C_{14}	mg/kg	<50	<50	<50	<50	<50
TRH C_{15} - C_{28}	mg/kg	<100	<100	<100	<100	<100
TRH C_{29} - C_{36}	mg/kg	<100	<100	<100	<100	<100
TRH >C_{10} -C_{16}	mg/kg	<50	<50	<50	<50	<50
TRH >C_{10} - C_{16} less Naphthalene (F2)	mg/kg	<50	<50	<50	<50	<50
TRH >C_{16} -C_{34}	mg/kg	<100	<100	<100	<100	<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	%	82	69	69	71	83

svTRH (C10-C40) in Soil						
Our Reference		269788-11	269788-12	269788-13	269788-14	269788-15
Your Reference	UNITS	TP24	TP24	TP25	TP26	TP26
Depth		0.1-0.2	0.4-0.5	0.5-0.6	0.3-0.4	0.9-1
Date Sampled		20/05/2021	20/05/2021	20/05/2021	20/05/2021	20/05/2021
Type of sample		Soil	Soil	Soil	Soil	Soil
Date extracted	-	25/05/2021	25/05/2021	25/05/2021	25/05/2021	25/05/2021
Date analysed	-	26/05/2021	26/05/2021	26/05/2021	26/05/2021	26/05/2021
TRH C_{10} - C_{14}	mg/kg	<50	<50	<50	<50	<50
TRH C_{15} - C_{28}	mg/kg	<100	<100	<100	<100	<100
TRH C_{29} - C_{36}	mg/kg	<100	<100	<100	<100	<100
TRH >C_{10} -C_{16}	mg/kg	<50	<50	<50	<50	<50
TRH >C_{10} - C_{16} less Naphthalene (F2)	mg/kg	<50	<50	<50	<50	<50
TRH >C_{16} -C_{34}	mg/kg	<100	<100	<100	<100	<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	%	70	69	69	79	79

svTRH (C10-C40) in Soil						
Our Reference		269788-16	269788-17	269788-18	269788-19	269788-20
Your Reference	UNITS	TP27	TP28	TP28	TP29	TP29
Depth		0.2-0.3	0-0.05	1-1.1	0.4-0.5	1.4-1.5
Date Sampled		20/05/2021	20/05/2021	20/05/2021	20/05/2021	20/05/2021
Type of sample		Soil	Soil	Soil	Soil	Soil
Date extracted	-	25/05/2021	25/05/2021	25/05/2021	25/05/2021	25/05/2021
Date analysed	-	26/05/2021	26/05/2021	26/05/2021	26/05/2021	26/05/2021
TRH C_{10} - C_{14}	mg/kg	<50	<50	<50	<50	<50
TRH C_{15} - C_{28}	mg/kg	<100	<100	<100	<100	<100
TRH C_{29} - C_{36}	mg/kg	<100	<100	<100	<100	<100
TRH >C_{10} -C_{16}	mg/kg	<50	<50	<50	<50	<50
TRH >C_{10} - C_{16} less Naphthalene (F2)	mg/kg	<50	<50	<50	<50	<50
TRH >C_{16} -C_{34}	mg/kg	<100	<100	<100	<100	<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	%	79	80	75	71	82

svTRH (C10-C40) in Soil			
Our Reference		269788-21	269788-22
Your Reference	UNITS	TP30	BD1/190521
Depth		0.9-1	-
Date Sampled		20/05/2021	19/05/2021
Type of sample		Soil	Soil
Date extracted	-	25/05/2021	25/05/2021
Date analysed	-	26/05/2021	26/05/2021
TRH C_{10} - C_{14}	mg/kg	<50	<50
TRH C_{15} - C_{28}	mg/kg	<100	<100
TRH C_{29} - C_{36}	mg/kg	<100	<100
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	%	83	83

PAHs in Soil						
Our Reference		269788-1	269788-2	269788-3	269788-4	269788-5
Your Reference	UNITS	TP17	TP17	TP18	TP19	TP19
Depth		0-0.08	0.2-0.3	0-0.1	0.4-0.5	0-0.1
Date Sampled		19/05/2021	19/05/2021	19/05/2021	19/05/2021	19/05/2021
Type of sample		Soil	Soil	Soil	Soil	Soil
Date extracted	-	25/05/2021	25/05/2021	25/05/2021	25/05/2021	25/05/2021
Date analysed	-	28/05/2021	28/05/2021	28/05/2021	28/05/2021	28/05/2021
Naphthalene	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Acenaphthylene	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Acenaphthene	mg/kg	0.1	<0.1	<0.1	<0.1	<0.1
Fluorene	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Phenanthrene	mg/kg	1.8	0.3	<0.1	<0.1	<0.1
Anthracene	mg/kg	0.2	<0.1	<0.1	<0.1	<0.1
Fluoranthene	mg/kg	2.8	0.6	0.1	<0.1	<0.1
Pyrene	mg/kg	2.5	0.6	0.1	<0.1	<0.1
Benzo(a)anthracene	mg/kg	1.0	0.3	<0.1	<0.1	<0.1
Chrysene	mg/kg	0.9	0.3	<0.1	<0.1	<0.1
Benzo(b,j+k)fluoranthene	mg/kg	2	0.4	<0.2	<0.2	<0.2
Benzo(a)pyrene	mg/kg	0.98	0.3	0.07	<0.05	<0.05
Indeno(1,2,3-c,d)pyrene	mg/kg	0.5	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	0.6	0.2	<0.1	<0.1	<0.1
Total +ve PAH's	mg/kg	13	3.1	0.3	<0.05	<0.05
Benzo(a)pyrene TEQ calc (zero)	mg/kg	1.4	<0.5	<0.5	<0.5	<0.5
Benzo(a)pyrene TEQ calc(half)	mg/kg	1.4	<0.5	<0.5	<0.5	<0.5
Benzo(a)pyrene TEQ calc(PQL)	mg/kg	1.4	<0.5	<0.5	<0.5	<0.5
Surrogate p-Terphenyl-d14	%	128	106	103	104	96

PAHs in Soil						
Our Reference		269788-6	269788-7	269788-8	269788-9	269788-10
Your Reference	UNITS	TP20	TP21	TP22	TP22	TP23
Depth		0.2-0.3	0.1-0.15	0.3-0.4	0.5-0.6	0-0.1
Date Sampled		19/05/2021	19/05/2021	19/05/2021	19/05/2021	19/05/2021
Type of sample		Soil	Soil	Soil	Soil	Soil
Date extracted	-	25/05/2021	25/05/2021	25/05/2021	25/05/2021	25/05/2021
Date analysed	-	28/05/2021	28/05/2021	28/05/2021	28/05/2021	28/05/2021
Naphthalene	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Acenaphthylene	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Acenaphthene	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Fluorene	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Phenanthrene	mg/kg	<0.1	<0.1	<0.1	0.4	<0.1
Anthracene	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Fluoranthene	mg/kg	<0.1	0.2	<0.1	0.9	<0.1
Pyrene	mg/kg	<0.1	0.2	<0.1	0.9	<0.1
Benzo(a)anthracene	mg/kg	<0.1	<0.1	<0.1	0.4	<0.1
Chrysene	mg/kg	<0.1	<0.1	<0.1	0.5	<0.1
Benzo(b,j+k)fluoranthene	mg/kg	<0.2	<0.2	<0.2	0.7	<0.2
Benzo(a)pyrene	mg/kg	<0.05	0.06	<0.05	0.4	<0.05
Indeno(1,2,3-c,d)pyrene	mg/kg	<0.1	<0.1	<0.1	0.2	<0.1
Dibenzo(a,h)anthracene	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Benzo(g,h,i)perylene	mg/kg	<0.1	<0.1	<0.1	0.3	<0.1
Total +ve PAH's	mg/kg	<0.05	0.4	<0.05	4.8	<0.05
Benzo(a)pyrene TEQ calc (zero)	mg/kg	<0.5	<0.5	<0.5	0.6	<0.5
Benzo(a)pyrene TEQ calc(half)	mg/kg	<0.5	<0.5	<0.5	0.6	<0.5
Benzo(a)pyrene TEQ calc(PQL)	mg/kg	<0.5	<0.5	<0.5	0.7	<0.5
Surrogate p-Terphenyl-d14	%	114	103	106	109	100

PAHs in Soil						
Our Reference		269788-11	269788-12	269788-13	269788-14	269788-15
Your Reference	UNITS	TP24	TP24	TP25	TP26	TP26
Depth		0.1-0.2	0.4-0.5	0.5-0.6	0.3-0.4	0.9-1
Date Sampled		20/05/2021	20/05/2021	20/05/2021	20/05/2021	20/05/2021
Type of sample		Soil	Soil	Soil	Soil	Soil
Date extracted	-	25/05/2021	25/05/2021	25/05/2021	25/05/2021	25/05/2021
Date analysed	-	28/05/2021	28/05/2021	28/05/2021	28/05/2021	28/05/2021
Naphthalene	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Acenaphthylene	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Acenaphthene	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Fluorene	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Phenanthrene	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Anthracene	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Fluoranthene	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Pyrene	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Benzo(a)anthracene	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Chrysene	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Benzo(b,j+k)fluoranthene	mg/kg	<0.2	<0.2	<0.2	<0.2	<0.2
Benzo(a)pyrene	mg/kg	<0.05	<0.05	<0.05	<0.05	<0.05
Indeno(1,2,3-c,d)pyrene	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Dibenzo(a,h)anthracene	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Benzo(g,h,i)perylene	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Total +ve PAH's	mg/kg	<0.05	<0.05	<0.05	<0.05	<0.05
Benzo(a)pyrene TEQ calc (zero)	mg/kg	<0.5	<0.5	<0.5	<0.5	<0.5
Benzo(a)pyrene TEQ calc(half)	mg/kg	<0.5	<0.5	<0.5	<0.5	<0.5
Benzo(a)pyrene TEQ calc(PQL)	mg/kg	<0.5	<0.5	<0.5	<0.5	<0.5
Surrogate p-Terphenyl-d14	%	105	104	94	101	98

PAHs in Soil						
Our Reference		269788-16	269788-17	269788-18	269788-19	269788-20
Your Reference	UNITS	TP27	TP28	TP28	TP29	TP29
Depth		0.2-0.3	0-0.05	1-1.1	0.4-0.5	1.4-1.5
Date Sampled		20/05/2021	20/05/2021	20/05/2021	20/05/2021	20/05/2021
Type of sample		Soil	Soil	Soil	Soil	Soil
Date extracted	-	25/05/2021	25/05/2021	25/05/2021	25/05/2021	25/05/2021
Date analysed	-	28/05/2021	28/05/2021	28/05/2021	28/05/2021	28/05/2021
Naphthalene	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Acenaphthylene	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Acenaphthene	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Fluorene	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Phenanthrene	mg/kg	<0.1	<0.1	<0.1	<0.1	<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	%	111	98	104	95	92

PAHs in Soil			
Our Reference		269788-21	269788-22
Your Reference	UNITS	TP30	BD1/190521
Depth		0.9-1	-
Date Sampled		20/05/2021	19/05/2021
Type of sample		Soil	Soil
Date extracted	-	25/05/2021	25/05/2021
Date analysed	-	28/05/2021	28/05/2021
Naphthalene	mg/kg	<0.1	<0.1
Acenaphthylene	mg/kg	<0.1	<0.1
Acenaphthene	mg/kg	<0.1	<0.1
Fluorene	mg/kg	<0.1	<0.1
Phenanthrene	mg/kg	<0.1	<0.1
Anthracene	mg/kg	<0.1	<0.1
Fluoranthene	mg/kg	<0.1	<0.1
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	%	113	99

Organochlorine Pesticides in soil						
Our Reference		269788-1	269788-3	269788-4	269788-6	269788-7
Your Reference	UNITS	TP17	TP18	TP19	TP20	TP21
Depth		0-0.08	0-0.1	0.4-0.5	0.2-0.3	0.1-0.15
Date Sampled		19/05/2021	19/05/2021	19/05/2021	19/05/2021	19/05/2021
Type of sample		Soil	Soil	Soil	Soil	Soil
Date extracted	-	25/05/2021	25/05/2021	25/05/2021	25/05/2021	25/05/2021
Date analysed	-	28/05/2021	28/05/2021	28/05/2021	28/05/2021	28/05/2021
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	%	111	96	93	98	94

Organochlorine Pesticides in soil						
Our Reference		269788-8	269788-10	269788-12	269788-13	269788-14
Your Reference	UNITS	TP22	TP23	TP24	TP25	TP26
Depth		0.3-0.4	0-0.1	0.4-0.5	0.5-0.6	0.3-0.4
Date Sampled		19/05/2021	19/05/2021	20/05/2021	20/05/2021	20/05/2021
Type of sample		Soil	Soil	Soil	Soil	Soil
Date extracted	-	25/05/2021	25/05/2021	25/05/2021	25/05/2021	25/05/2021
Date analysed	-	28/05/2021	28/05/2021	28/05/2021	28/05/2021	28/05/2021
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	%	93	94	92	92	101

Organochlorine Pesticides in soil					
Our Reference		269788-16	269788-18	269788-19	269788-21
Your Reference	UNITS	TP27	TP28	TP29	TP30
Depth		0.2-0.3	1-1.1	0.4-0.5	0.9-1
Date Sampled		20/05/2021	20/05/2021	20/05/2021	20/05/2021
Type of sample		Soil	Soil	Soil	Soil
Date extracted	-	25/05/2021	25/05/2021	25/05/2021	25/05/2021
Date analysed	-	28/05/2021	28/05/2021	28/05/2021	28/05/2021
alpha-BHC	mg/kg	<0.1	<0.1	<0.1	<0.1
HCB	mg/kg	<0.1	<0.1	<0.1	<0.1
beta-BHC	mg/kg	<0.1	<0.1	<0.1	<0.1
gamma-BHC	mg/kg	<0.1	<0.1	<0.1	<0.1
Heptachlor	mg/kg	<0.1	<0.1	<0.1	<0.1
delta-BHC	mg/kg	<0.1	<0.1	<0.1	<0.1
Aldrin	mg/kg	<0.1	<0.1	<0.1	<0.1
Heptachlor Epoxide	mg/kg	<0.1	<0.1	<0.1	<0.1
gamma-Chlordane	mg/kg	<0.1	<0.1	<0.1	<0.1
alpha-chlordane	mg/kg	<0.1	<0.1	<0.1	<0.1
Endosulfan I	mg/kg	<0.1	<0.1	<0.1	<0.1
pp-DDE	mg/kg	<0.1	<0.1	<0.1	<0.1
Dieldrin	mg/kg	<0.1	<0.1	<0.1	<0.1
Endrin	mg/kg	<0.1	<0.1	<0.1	<0.1
Endosulfan II	mg/kg	<0.1	<0.1	<0.1	<0.1
pp-DDD	mg/kg	<0.1	<0.1	<0.1	<0.1
Endrin Aldehyde	mg/kg	<0.1	<0.1	<0.1	<0.1
pp-DDT	mg/kg	<0.1	<0.1	<0.1	<0.1
Endosulfan Sulphate	mg/kg	<0.1	<0.1	<0.1	<0.1
Methoxychlor	mg/kg	<0.1	<0.1	<0.1	<0.1
Total +ve DDT+DDD+DDE	mg/kg	<0.1	<0.1	<0.1	<0.1
Surrogate TCMX	%	94	93	91	87

Organophosphorus Pesticides in Soil						
Our Reference		269788-1	269788-3	269788-4	269788-6	269788-7
Your Reference	UNITS	TP17	TP18	TP19	TP20	TP21
Depth		0-0.08	0-0.1	0.4-0.5	0.2-0.3	0.1-0.15
Date Sampled		19/05/2021	19/05/2021	19/05/2021	19/05/2021	19/05/2021
Type of sample		Soil	Soil	Soil	Soil	Soil
Date extracted	-	25/05/2021	25/05/2021	25/05/2021	25/05/2021	25/05/2021
Date analysed	-	28/05/2021	28/05/2021	28/05/2021	28/05/2021	28/05/2021
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	%	111	96	93	98	94

Organophosphorus Pesticides in Soil						
Our Reference		269788-8	269788-10	269788-12	269788-13	269788-14
Your Reference	UNITS	TP22	TP23	TP24	TP25	TP26
Depth		0.3-0.4	0-0.1	0.4-0.5	0.5-0.6	0.3-0.4
Date Sampled		19/05/2021	19/05/2021	20/05/2021	20/05/2021	20/05/2021
Type of sample		Soil	Soil	Soil	Soil	Soil
Date extracted	-	25/05/2021	25/05/2021	25/05/2021	25/05/2021	25/05/2021
Date analysed	-	28/05/2021	28/05/2021	28/05/2021	28/05/2021	28/05/2021
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	%	93	94	92	92	101

Organophosphorus Pesticides in Soil					
Our Reference		269788-16	269788-18	269788-19	269788-21
Your Reference	UNITS	TP27	TP28	TP29	TP30
Depth		0.2-0.3	1-1.1	0.4-0.5	0.9-1
Date Sampled		20/05/2021	20/05/2021	20/05/2021	20/05/2021
Type of sample		Soil	Soil	Soil	Soil
Date extracted	-	25/05/2021	25/05/2021	25/05/2021	25/05/2021
Date analysed	-	28/05/2021	28/05/2021	28/05/2021	28/05/2021
Dichlorvos	mg/kg	<0.1	<0.1	<0.1	<0.1
Dimethoate	mg/kg	<0.1	<0.1	<0.1	<0.1
Diazinon	mg/kg	<0.1	<0.1	<0.1	<0.1
Chlorpyriphos-methyl	mg/kg	<0.1	<0.1	<0.1	<0.1
Ronnel	mg/kg	<0.1	<0.1	<0.1	<0.1
Fenitrothion	mg/kg	<0.1	<0.1	<0.1	<0.1
Malathion	mg/kg	<0.1	<0.1	<0.1	<0.1
Chlorpyriphos	mg/kg	<0.1	<0.1	<0.1	<0.1
Parathion	mg/kg	<0.1	<0.1	<0.1	<0.1
Bromophos-ethyl	mg/kg	<0.1	<0.1	<0.1	<0.1
Ethion	mg/kg	<0.1	<0.1	<0.1	<0.1
Azinphos-methyl (Guthion)	mg/kg	<0.1	<0.1	<0.1	<0.1
Surrogate TCMX	%	94	93	91	87

PCBs in Soil						
Our Reference		269788-1	269788-3	269788-4	269788-6	269788-7
Your Reference	UNITS	TP17	TP18	TP19	TP20	TP21
Depth		0-0.08	0-0.1	0.4-0.5	0.2-0.3	0.1-0.15
Date Sampled		19/05/2021	19/05/2021	19/05/2021	19/05/2021	19/05/2021
Type of sample		Soil	Soil	Soil	Soil	Soil
Date extracted	-	25/05/2021	25/05/2021	25/05/2021	25/05/2021	25/05/2021
Date analysed	-	28/05/2021	28/05/2021	28/05/2021	28/05/2021	28/05/2021
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	%	111	96	93	98	94

PCBs in Soil						
Our Reference		269788-8	269788-10	269788-12	269788-13	269788-14
Your Reference	UNITS	TP22	TP23	TP24	TP25	TP26
Depth		0.3-0.4	0-0.1	0.4-0.5	0.5-0.6	0.3-0.4
Date Sampled		19/05/2021	19/05/2021	20/05/2021	20/05/2021	20/05/2021
Type of sample		Soil	Soil	Soil	Soil	Soil
Date extracted	-	25/05/2021	25/05/2021	25/05/2021	25/05/2021	25/05/2021
Date analysed	-	28/05/2021	28/05/2021	28/05/2021	28/05/2021	28/05/2021
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	%	93	94	92	92	101

PCBs in Soil					
Our Reference		269788-16	269788-18	269788-19	269788-21
Your Reference	UNITS	TP27	TP28	TP29	TP30
Depth		0.2-0.3	1-1.1	0.4-0.5	0.9-1
Date Sampled		20/05/2021	20/05/2021	20/05/2021	20/05/2021
Type of sample		Soil	Soil	Soil	Soil
Date extracted	-	25/05/2021	25/05/2021	25/05/2021	25/05/2021
Date analysed	-	28/05/2021	28/05/2021	28/05/2021	28/05/2021
Aroclor 1016	mg/kg	<0.1	<0.1	<0.1	<0.1
Aroclor 1221	mg/kg	<0.1	<0.1	<0.1	<0.1
Aroclor 1232	mg/kg	<0.1	<0.1	<0.1	<0.1
Aroclor 1242	mg/kg	<0.1	<0.1	<0.1	<0.1
Aroclor 1248	mg/kg	<0.1	<0.1	<0.1	<0.1
Aroclor 1254	mg/kg	<0.1	<0.1	<0.1	<0.1
Aroclor 1260	mg/kg	<0.1	<0.1	<0.1	<0.1
Total +ve PCBs (1016-1260)	mg/kg	<0.1	<0.1	<0.1	<0.1
Surrogate TCMX	%	94	93	91	87

Acid Extractable metals in soil						
Our Reference		269788-1	269788-2	269788-3	269788-4	269788-5
Your Reference	UNITS	TP17	TP17	TP18	TP19	TP19
Depth		0-0.08	0.2-0.3	0-0.1	0.4-0.5	0-0.1
Date Sampled		19/05/2021	19/05/2021	19/05/2021	19/05/2021	19/05/2021
Type of sample		Soil	Soil	Soil	Soil	Soil
Date prepared	-	27/05/2021	27/05/2021	27/05/2021	27/05/2021	27/05/2021
Date analysed	-	27/05/2021	27/05/2021	27/05/2021	27/05/2021	27/05/2021
Arsenic	mg/kg	<4	<4	<4	<4	<4
Cadmium	mg/kg	<0.4	<0.4	<0.4	<0.4	<0.4
Chromium	mg/kg	14	12	11	13	9
Copper	mg/kg	17	9	10	7	5
Lead	mg/kg	14	12	11	9	9
Mercury	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Nickel	mg/kg	9	9	9	7	5
Zinc	mg/kg	50	30	48	17	21

Acid Extractable metals in soil						
Our Reference		269788-6	269788-7	269788-8	269788-9	269788-10
Your Reference	UNITS	TP20	TP21	TP22	TP22	TP23
Depth		0.2-0.3	0.1-0.15	0.3-0.4	0.5-0.6	0-0.1
Date Sampled		19/05/2021	19/05/2021	19/05/2021	19/05/2021	19/05/2021
Type of sample		Soil	Soil	Soil	Soil	Soil
Date prepared	-	27/05/2021	27/05/2021	27/05/2021	27/05/2021	27/05/2021
Date analysed	-	27/05/2021	27/05/2021	27/05/2021	27/05/2021	27/05/2021
Arsenic	mg/kg	<4	<4	<4	6	<4
Cadmium	mg/kg	<0.4	<0.4	<0.4	<0.4	<0.4
Chromium	mg/kg	10	8	11	22	8
Copper	mg/kg	6	7	9	36	11
Lead	mg/kg	7	15	9	33	6
Mercury	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Nickel	mg/kg	6	5	6	17	6
Zinc	mg/kg	120	37	40	99	25

Acid Extractable metals in soil						
Our Reference		269788-11	269788-12	269788-13	269788-14	269788-15
Your Reference	UNITS	TP24	TP24	TP25	TP26	TP26
Depth		0.1-0.2	0.4-0.5	0.5-0.6	0.3-0.4	0.9-1
Date Sampled		20/05/2021	20/05/2021	20/05/2021	20/05/2021	20/05/2021
Type of sample		Soil	Soil	Soil	Soil	Soil
Date prepared	-	27/05/2021	27/05/2021	27/05/2021	27/05/2021	27/05/2021
Date analysed	-	27/05/2021	27/05/2021	27/05/2021	27/05/2021	27/05/2021
Arsenic	mg/kg	<4	5	<4	<4	<4
Cadmium	mg/kg	<0.4	<0.4	<0.4	<0.4	<0.4
Chromium	mg/kg	10	17	12	13	13
Copper	mg/kg	7	9	7	8	10
Lead	mg/kg	10	12	15	10	12
Mercury	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Nickel	mg/kg	6	7	7	8	10
Zinc	mg/kg	20	22	26	25	33

Acid Extractable metals in soil						
Our Reference		269788-16	269788-17	269788-18	269788-19	269788-20
Your Reference	UNITS	TP27	TP28	TP28	TP29	TP29
Depth		0.2-0.3	0-0.05	1-1.1	0.4-0.5	1.4-1.5
Date Sampled		20/05/2021	20/05/2021	20/05/2021	20/05/2021	20/05/2021
Type of sample		Soil	Soil	Soil	Soil	Soil
Date prepared	-	27/05/2021	27/05/2021	27/05/2021	27/05/2021	27/05/2021
Date analysed	-	27/05/2021	27/05/2021	27/05/2021	27/05/2021	27/05/2021
Arsenic	mg/kg	<4	<4	<4	<4	5
Cadmium	mg/kg	<0.4	<0.4	<0.4	<0.4	<0.4
Chromium	mg/kg	11	9	15	19	19
Copper	mg/kg	9	7	13	9	8
Lead	mg/kg	10	7	13	10	11
Mercury	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Nickel	mg/kg	7	5	7	8	7
Zinc	mg/kg	31	57	22	25	22

Acid Extractable metals in soil				
Our Reference		269788-21	269788-22	269788-23
Your Reference	UNITS	TP30	BD1/190521	TP29 - [TRIPLICATE]
Depth		0.9-1	-	0.4-0.5
Date Sampled		20/05/2021	19/05/2021	20/05/2021
Type of sample		Soil	Soil	Soil
Date prepared	-	27/05/2021	27/05/2021	27/05/2021
Date analysed	-	27/05/2021	27/05/2021	27/05/2021
Arsenic	mg/kg	<4	<4	<4
Cadmium	mg/kg	<0.4	<0.4	<0.4
Chromium	mg/kg	14	10	19
Copper	mg/kg	9	6	9
Lead	mg/kg	13	9	11
Mercury	mg/kg	<0.1	<0.1	<0.1
Nickel	mg/kg	11	5	8
Zinc	mg/kg	38	69	25

Misc Soil - Inorg						
Our Reference		269788-1	269788-3	269788-4	269788-6	269788-7
Your Reference	UNITS	TP17	TP18	TP19	TP20	TP21
Depth		0-0.08	0-0.1	0.4-0.5	0.2-0.3	0.1-0.15
Date Sampled		19/05/2021	19/05/2021	19/05/2021	19/05/2021	19/05/2021
Type of sample		Soil	Soil	Soil	Soil	Soil
Date prepared	-	25/05/2021	25/05/2021	25/05/2021	25/05/2021	25/05/2021
Date analysed	-	25/05/2021	25/05/2021	25/05/2021	25/05/2021	25/05/2021
Total Phenolics (as Phenol)	mg/kg	<5	<5	<5	<5	<5

Misc Soil - Inorg						
Our Reference		269788-8	269788-10	269788-12	269788-13	269788-14
Your Reference	UNITS	TP22	TP23	TP24	TP25	TP26
Depth		0.3-0.4	0-0.1	0.4-0.5	0.5-0.6	0.3-0.4
Date Sampled		19/05/2021	19/05/2021	20/05/2021	20/05/2021	20/05/2021
Type of sample		Soil	Soil	Soil	Soil	Soil
Date prepared	-	25/05/2021	25/05/2021	25/05/2021	25/05/2021	25/05/2021
Date analysed	-	25/05/2021	25/05/2021	25/05/2021	25/05/2021	25/05/2021
Total Phenolics (as Phenol)	mg/kg	<5	<5	<5	<5	<5

Misc Soil - Inorg					
Our Reference		269788-16	269788-18	269788-19	269788-21
Your Reference	UNITS	TP27	TP28	TP29	TP30
Depth		0.2-0.3	1-1.1	0.4-0.5	0.9-1
Date Sampled		20/05/2021	20/05/2021	20/05/2021	20/05/2021
Type of sample		Soil	Soil	Soil	Soil
Date prepared	-	25/05/2021	25/05/2021	25/05/2021	25/05/2021
Date analysed	-	25/05/2021	25/05/2021	25/05/2021	25/05/2021
Total Phenolics (as Phenol)	mg/kg	<5	<5	<5	<5

Moisture						
Our Reference		269788-1	269788-2	269788-3	269788-4	269788-5
Your Reference	UNITS	TP17	TP17	TP18	TP19	TP19
Depth		0-0.08	0.2-0.3	0-0.1	0.4-0.5	0-0.1
Date Sampled		19/05/2021	19/05/2021	19/05/2021	19/05/2021	19/05/2021
Type of sample		Soil	Soil	Soil	Soil	Soil
Date prepared	-	25/05/2021	25/05/2021	25/05/2021	25/05/2021	25/05/2021
Date analysed	-	26/05/2021	26/05/2021	26/05/2021	26/05/2021	26/05/2021
Moisture	%	17	16	14	11	11

Moisture						
Our Reference		269788-6	269788-7	269788-8	269788-9	269788-10
Your Reference	UNITS	TP20	TP21	TP22	TP22	TP23
Depth		0.2-0.3	0.1-0.15	0.3-0.4	0.5-0.6	0-0.1
Date Sampled		19/05/2021	19/05/2021	19/05/2021	19/05/2021	19/05/2021
Type of sample		Soil	Soil	Soil	Soil	Soil
Date prepared	-	25/05/2021	25/05/2021	25/05/2021	25/05/2021	25/05/2021
Date analysed	-	26/05/2021	26/05/2021	26/05/2021	26/05/2021	26/05/2021
Moisture	%	5.2	13	12	25	0.7

Moisture						
Our Reference		269788-11	269788-12	269788-13	269788-14	269788-15
Your Reference	UNITS	TP24	TP24	TP25	TP26	TP26
Depth		0.1-0.2	0.4-0.5	0.5-0.6	0.3-0.4	0.9-1
Date Sampled		20/05/2021	20/05/2021	20/05/2021	20/05/2021	20/05/2021
Type of sample		Soil	Soil	Soil	Soil	Soil
Date prepared	-	25/05/2021	25/05/2021	25/05/2021	25/05/2021	25/05/2021
Date analysed	-	26/05/2021	26/05/2021	26/05/2021	26/05/2021	26/05/2021
Moisture	%	12	11	10	9.5	11

Moisture						
Our Reference		269788-16	269788-17	269788-18	269788-19	269788-20
Your Reference	UNITS	TP27	TP28	TP28	TP29	TP29
Depth		0.2-0.3	0-0.05	1-1.1	0.4-0.5	1.4-1.5
Date Sampled		20/05/2021	20/05/2021	20/05/2021	20/05/2021	20/05/2021
Type of sample		Soil	Soil	Soil	Soil	Soil
Date prepared	-	25/05/2021	25/05/2021	25/05/2021	25/05/2021	25/05/2021
Date analysed	-	26/05/2021	26/05/2021	26/05/2021	26/05/2021	26/05/2021
Moisture	%	6.8	3.3	16	12	10

Moisture			
Our Reference		269788-21	269788-22
Your Reference	UNITS	TP30	BD1/190521
Depth		0.9-1	-
Date Sampled		20/05/2021	19/05/2021
Type of sample		Soil	Soil
Date prepared	-	25/05/2021	25/05/2021
Date analysed	-	26/05/2021	26/05/2021
Moisture	%	8.0	5.9

Asbestos ID - soils						
Our Reference		269788-1	269788-3	269788-4	269788-6	269788-7
Your Reference	UNITS	TP17	TP18	TP19	TP20	TP21
Depth		0-0.08	0-0.1	0.4-0.5	0.2-0.3	0.1-0.15
Date Sampled		19/05/2021	19/05/2021	19/05/2021	19/05/2021	19/05/2021
Type of sample		Soil	Soil	Soil	Soil	Soil
Date analysed	-	31/05/2021	31/05/2021	31/05/2021	31/05/2021	31/05/2021
Sample mass tested	g	Approx. 25g	Approx. 30g	Approx. 35g	Approx. 45g	Approx. 40g
Sample Description	-	Brown clayey soil & rocks	Brown clayey soil & rocks	Brown clayey soil & rocks	Brown clayey soil & rocks	Brown clayey soil & rocks
Asbestos ID in soil	-	No asbestos detected at reporting limit of 0.1g/kg Organic fibres detected	No asbestos detected at reporting limit of 0.1g/kg Organic fibres detected	No asbestos detected at reporting limit of 0.1g/kg Organic fibres detected	No asbestos detected at reporting limit of 0.1g/kg Organic fibres detected	No asbestos detected at reporting limit of 0.1g/kg Organic fibres detected
Trace Analysis	-	No asbestos detected	No asbestos detected	No asbestos detected	No asbestos detected	No asbestos detected

Asbestos ID - soils						
Our Reference		269788-8	269788-10	269788-12	269788-13	269788-14
Your Reference	UNITS	TP22	TP23	TP24	TP25	TP26
Depth		0.3-0.4	0-0.1	0.4-0.5	0.5-0.6	0.3-0.4
Date Sampled		19/05/2021	19/05/2021	20/05/2021	20/05/2021	20/05/2021
Type of sample		Soil	Soil	Soil	Soil	Soil
Date analysed	-	31/05/2021	31/05/2021	31/05/2021	31/05/2021	31/05/2021
Sample mass tested	g	Approx. 40g	Approx. 45g	Approx. 30g	Approx. 35g	Approx. 55g
Sample Description	-	Brown clayey soil & rocks	Brown clayey soil & rocks	Brown clayey soil & rocks	Brown clayey soil & rocks	Brown clayey soil & rocks
Asbestos ID in soil	-	No asbestos detected at reporting limit of 0.1g/kg Organic fibres detected	No asbestos detected at reporting limit of 0.1g/kg Organic fibres detected	No asbestos detected at reporting limit of 0.1g/kg Organic fibres detected	No asbestos detected at reporting limit of 0.1g/kg Organic fibres detected	No asbestos detected at reporting limit of 0.1g/kg Organic fibres detected
Trace Analysis	-	No asbestos detected	No asbestos detected	No asbestos detected	No asbestos detected	No asbestos detected

Asbestos ID - soils					
Our Reference		269788-16	269788-18	269788-19	269788-21
Your Reference	UNITS	TP27	TP28	TP29	TP30
Depth		0.2-0.3	1-1.1	0.4-0.5	0.9-1
Date Sampled		20/05/2021	20/05/2021	20/05/2021	20/05/2021
Type of sample		Soil	Soil	Soil	Soil
Date analysed	-	31/05/2021	31/05/2021	31/05/2021	31/05/2021
Sample mass tested	g	Approx. 35g	Approx. 45g	Approx. 30g	Approx. 25g
Sample Description	-	Brown clayey soil & rocks	Brown clayey soil & rocks	Brown clayey soil & rocks	Brown clayey soil & rocks
Asbestos ID in soil	-	No asbestos detected at reporting limit of 0.1g/kg Organic fibres detected	No asbestos detected at reporting limit of 0.1g/kg Organic fibres detected	No asbestos detected at reporting limit of 0.1g/kg Organic fibres detected	No asbestos detected at reporting limit of 0.1g/kg Organic fibres detected
Trace Analysis	-	No asbestos detected	No asbestos detected	No asbestos detected	No asbestos detected

Method ID	Methodology Summary
ASB-001	Asbestos ID - Qualitative identification of asbestos in bulk samples using Polarised Light Microscopy and Dispersion Staining Techniques including Synthetic Mineral Fibre and Organic Fibre as per Australian Standard 4964-2004.
Inorg-008	Moisture content determined by heating at 105+/-5 °C for a minimum of 12 hours.
Inorg-031	Total Phenolics by segmented flow analyser (in line distillation with colourimetric finish). Solids are extracted in a caustic media prior to analysis.
Metals-020	Determination of various metals by ICP-AES.
Metals-021	Determination of Mercury by Cold Vapour AAS.
Org-020	Soil samples are extracted with Dichloromethane/Acetone and waters with Dichloromethane and analysed by GC-FID. F2 = (>C10-C16)-Naphthalene as per NEPM B1 Guideline on Investigation Levels for Soil and Groundwater (HSLs Tables 1A (3, 4)). Note Naphthalene is determined from the VOC analysis.
Org-020	Soil samples are extracted with Dichloromethane/Acetone and waters with Dichloromethane and analysed by GC-FID. F2 = (>C10-C16)-Naphthalene as per NEPM B1 Guideline on Investigation Levels for Soil and Groundwater (HSLs Tables 1A (3, 4)). Note Naphthalene is determined from the VOC analysis. Note, the Total +ve TRH PQL is reflective of the lowest individual PQL and is therefore "Total +ve TRH" is simply a sum of the positive individual TRH fractions (>C10-C40).
Org-021	Soil samples are extracted with dichloromethane/acetone and waters with dichloromethane and analysed by GC-ECD.
Org-021	Soil samples are extracted with dichloromethane/acetone and waters with dichloromethane and analysed by GC-ECD. Note, the Total +ve PCBs PQL is reflective of the lowest individual PQL and is therefore" Total +ve PCBs" is simply a sum of the positive individual PCBs.
Org-022	Determination of VOCs sampled onto coconut shell charcoal sorbent tubes, that can be desorbed using carbon disulphide, and analysed by GC-MS.
Org-022/025	Soil samples are extracted with Dichloromethane/Acetone and waters with Dichloromethane and analysed by GC-MS/GC-MSMS.
Org-022/025	Soil samples are extracted with dichloromethane/acetone and waters with dichloromethane and analysed by GC-MS/GC-MSMS. Note, the Total +ve reported DDD+DDE+DDT PQL is reflective of the lowest individual PQL and is therefore simply a sum of the positive individually report DDD+DDE+DDT.

Method ID	Methodology Summary
Org-022/025	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-6	269788-3
Date extracted	-			25/05/2021	1	25/05/2021	25/05/2021		25/05/2021	25/05/2021
Date analysed	-			26/05/2021	1	26/05/2021	26/05/2021		26/05/2021	26/05/2021
TRH C_6 - C_9	mg/kg	25	Org-023	<25	1	<25	<25	0	104	104
TRH C_6 - C_{10}	mg/kg	25	Org-023	<25	1	<25	<25	0	104	104
Benzene	mg/kg	0.2	Org-023	<0.2	1	<0.2	<0.2	0	127	124
Toluene	mg/kg	0.5	Org-023	<0.5	1	<0.5	<0.5	0	112	109
Ethylbenzene	mg/kg	1	Org-023	<1	1	<1	<1	0	107	117
m+p-xylene	mg/kg	2	Org-023	<2	1	<2	<2	0	88	84
o-Xylene	mg/kg	1	Org-023	<1	1	<1	<1	0	74	76
naphthalene	mg/kg	1	Org-023	<1	1	<1	<1	0	[NT]	[NT]
Surrogate aaa-Trifluorotoluene	%		Org-023	116	1	97	108	11	123	112

QUALITY CONTROL: vTRH(C6-C10)/BTEXN in Soil						Duplicate			Spike Recovery %	
Test Description	Units	PQL	Method	Blank	#	Base	Dup.	RPD	LCS-7	269788-21
Date extracted	-			[NT]	12	25/05/2021	25/05/2021		25/05/2021	25/05/2021
Date analysed	-			[NT]	12	26/05/2021	26/05/2021		26/05/2021	26/05/2021
TRH C_6 - C_9	mg/kg	25	Org-023	[NT]	12	<25	<25	0	111	102
TRH C_6 - C_{10}	mg/kg	25	Org-023	[NT]	12	<25	<25	0	111	102
Benzene	mg/kg	0.2	Org-023	[NT]	12	<0.2	<0.2	0	126	134
Toluene	mg/kg	0.5	Org-023	[NT]	12	<0.5	<0.5	0	117	92
Ethylbenzene	mg/kg	1	Org-023	[NT]	12	<1	<1	0	119	110
m+p-xylene	mg/kg	2	Org-023	[NT]	12	<2	<2	0	96	88
o-Xylene	mg/kg	1	Org-023	[NT]	12	<1	<1	0	98	90
naphthalene	mg/kg	1	Org-023	[NT]	12	<1	<1	0	[NT]	[NT]
Surrogate aaa-Trifluorotoluene	%		Org-023	[NT]	12	106	107	1	122	126

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]	19	25/05/2021	25/05/2021		[NT]	[NT]
Date analysed	-			[NT]	19	26/05/2021	26/05/2021		[NT]	[NT]
TRH C_6 - C_9	mg/kg	25	Org-023	[NT]	19	<25	<25	0	[NT]	[NT]
TRH C_6 - C_{10}	mg/kg	25	Org-023	[NT]	19	<25	<25	0	[NT]	[NT]
Benzene	mg/kg	0.2	Org-023	[NT]	19	<0.2	<0.2	0	[NT]	[NT]
Toluene	mg/kg	0.5	Org-023	[NT]	19	<0.5	<0.5	0	[NT]	[NT]
Ethylbenzene	mg/kg	1	Org-023	[NT]	19	<1	<1	0	[NT]	[NT]
m+p-xylene	mg/kg	2	Org-023	[NT]	19	<2	<2	0	[NT]	[NT]
o-Xylene	mg/kg	1	Org-023	[NT]	19	<1	<1	0	[NT]	[NT]
naphthalene	mg/kg	1	Org-023	[NT]	19	<1	<1	0	[NT]	[NT]
Surrogate aaa-Trifluorotoluene	%		Org-023	[NT]	19	108	104	4	[NT]	[NT]

QUALITY CONTROL: svTRH (C10-C40) in Soil						Duplicate			Spike Recovery %	
Test Description	Units	PQL	Method	Blank	#	Base	Dup.	RPD	LCS-5	269788-3
Date extracted	-			25/05/2021	1	25/05/2021	25/05/2021		25/05/2021	25/05/2021
Date analysed	-			26/05/2021	1	25/05/2021	25/05/2021		26/05/2021	26/05/2021
TRH C_{10} - C_{14}	mg/kg	50	Org-020	<50	1	<50	<50	0	130	112
TRH C_{15} - C_{28}	mg/kg	100	Org-020	<100	1	<100	<100	0	97	96
TRH C_{29} - C_{36}	mg/kg	100	Org-020	<100	1	<100	<100	0	103	100
TRH >C_{10} -C_{16}	mg/kg	50	Org-020	<50	1	<50	<50	0	130	112
TRH >C_{16} -C_{34}	mg/kg	100	Org-020	<100	1	<100	<100	0	97	96
TRH >C_{34} -C_{40}	mg/kg	100	Org-020	<100	1	<100	<100	0	103	100
Surrogate o-Terphenyl	%		Org-020	81	1	68	79	15	112	83

QUALITY CONTROL: svTRH (C10-C40) in Soil						Duplicate			Spike Recovery %	
Test Description	Units	PQL	Method	Blank	#	Base	Dup.	RPD	LCS-6	269788-21
Date extracted	-			[NT]	12	25/05/2021	25/05/2021		25/05/2021	25/05/2021
Date analysed	-			[NT]	12	26/05/2021	26/05/2021		26/05/2021	26/05/2021
TRH C_{10} - C_{14}	mg/kg	50	Org-020	[NT]	12	<50	<50	0	113	107
TRH C_{15} - C_{28}	mg/kg	100	Org-020	[NT]	12	<100	<100	0	82	79
TRH C_{29} - C_{36}	mg/kg	100	Org-020	[NT]	12	<100	<100	0	95	120
TRH >C_{10} -C_{16}	mg/kg	50	Org-020	[NT]	12	<50	<50	0	113	107
TRH >C_{16} -C_{34}	mg/kg	100	Org-020	[NT]	12	<100	<100	0	82	79
TRH >C_{34} -C_{40}	mg/kg	100	Org-020	[NT]	12	<100	<100	0	95	120
Surrogate o-Terphenyl	%		Org-020	[NT]	12	69	69	0	92	80

QUALITY CONTROL: svTRH (C10-C40) in Soil						Duplicate			Spike Recovery %	
Test Description	Units	PQL	Method	Blank	#	Base	Dup.	RPD	[NT]	[NT]
Date extracted	-			[NT]	19	25/05/2021	25/05/2021		[NT]	[NT]
Date analysed	-			[NT]	19	26/05/2021	26/05/2021		[NT]	[NT]
TRH C_{10} - C_{14}	mg/kg	50	Org-020	[NT]	19	<50	<50	0	[NT]	[NT]
TRH C_{15} - C_{28}	mg/kg	100	Org-020	[NT]	19	<100	<100	0	[NT]	[NT]
TRH C_{29} - C_{36}	mg/kg	100	Org-020	[NT]	19	<100	<100	0	[NT]	[NT]
TRH >C_{10} -C_{16}	mg/kg	50	Org-020	[NT]	19	<50	<50	0	[NT]	[NT]
TRH >C_{16} -C_{34}	mg/kg	100	Org-020	[NT]	19	<100	<100	0	[NT]	[NT]
TRH >C_{34} -C_{40}	mg/kg	100	Org-020	[NT]	19	<100	<100	0	[NT]	[NT]
Surrogate o-Terphenyl	%		Org-020	[NT]	19	71	73	3	[NT]	[NT]

QUALITY CONTROL: PAHs in Soil						Duplicate			Spike Recovery %	
Test Description	Units	PQL	Method	Blank	#	Base	Dup.	RPD	LCS-6	269788-3
Date extracted	-			25/05/2021	1	25/05/2021	25/05/2021		25/05/2021	25/05/2021
Date analysed	-			28/05/2021	1	28/05/2021	28/05/2021		28/05/2021	28/05/2021
Naphthalene	mg/kg	0.1	Org-022/025	<0.1	1	<0.1	<0.1	0	112	108
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	82	87
Fluorene	mg/kg	0.1	Org-022/025	<0.1	1	<0.1	<0.1	0	93	98
Phenanthrene	mg/kg	0.1	Org-022/025	<0.1	1	1.8	0.8	77	133	102
Anthracene	mg/kg	0.1	Org-022/025	<0.1	1	0.2	<0.1	67	[NT]	[NT]
Fluoranthene	mg/kg	0.1	Org-022/025	<0.1	1	2.8	1.5	60	112	90
Pyrene	mg/kg	0.1	Org-022/025	<0.1	1	2.5	1.4	56	118	93
Benzo(a)anthracene	mg/kg	0.1	Org-022/025	<0.1	1	1.0	0.6	50	[NT]	[NT]
Chrysene	mg/kg	0.1	Org-022/025	<0.1	1	0.9	0.6	40	71	78
Benzo(b,j+k)fluoranthene	mg/kg	0.2	Org-022/025	<0.2	1	2	1	67	[NT]	[NT]
Benzo(a)pyrene	mg/kg	0.05	Org-022/025	<0.05	1	0.98	0.62	45	93	88
Indeno(1,2,3-c,d)pyrene	mg/kg	0.1	Org-022/025	<0.1	1	0.5	0.3	50	[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	0.6	0.4	40	[NT]	[NT]
Surrogate p-Terphenyl-d14	%		Org-022/025	103	1	128	121	6	128	100

QUALITY CONTROL: PAHs in Soil						Duplicate			Spike Recovery %	
Test Description	Units	PQL	Method	Blank	#	Base	Dup.	RPD	LCS-7	269788-21
Date extracted	-			[NT]	12	25/05/2021	25/05/2021		25/05/2021	25/05/2021
Date analysed	-			[NT]	12	28/05/2021	28/05/2021		28/05/2021	28/05/2021
Naphthalene	mg/kg	0.1	Org-022/025	[NT]	12	<0.1	<0.1	0	98	92
Acenaphthylene	mg/kg	0.1	Org-022/025	[NT]	12	<0.1	<0.1	0	[NT]	[NT]
Acenaphthene	mg/kg	0.1	Org-022/025	[NT]	12	<0.1	<0.1	0	89	82
Fluorene	mg/kg	0.1	Org-022/025	[NT]	12	<0.1	<0.1	0	96	89
Phenanthrene	mg/kg	0.1	Org-022/025	[NT]	12	<0.1	<0.1	0	91	139
Anthracene	mg/kg	0.1	Org-022/025	[NT]	12	<0.1	<0.1	0	[NT]	[NT]
Fluoranthene	mg/kg	0.1	Org-022/025	[NT]	12	<0.1	<0.1	0	85	114
Pyrene	mg/kg	0.1	Org-022/025	[NT]	12	<0.1	<0.1	0	85	121
Benzo(a)anthracene	mg/kg	0.1	Org-022/025	[NT]	12	<0.1	<0.1	0	[NT]	[NT]
Chrysene	mg/kg	0.1	Org-022/025	[NT]	12	<0.1	<0.1	0	67	70
Benzo(b,j+k)fluoranthene	mg/kg	0.2	Org-022/025	[NT]	12	<0.2	<0.2	0	[NT]	[NT]
Benzo(a)pyrene	mg/kg	0.05	Org-022/025	[NT]	12	<0.05	<0.05	0	100	90
Indeno(1,2,3-c,d)pyrene	mg/kg	0.1	Org-022/025	[NT]	12	<0.1	<0.1	0	[NT]	[NT]
Dibenzo(a,h)anthracene	mg/kg	0.1	Org-022/025	[NT]	12	<0.1	<0.1	0	[NT]	[NT]
Benzo(g,h,i)perylene	mg/kg	0.1	Org-022/025	[NT]	12	<0.1	<0.1	0	[NT]	[NT]
Surrogate p-Terphenyl-d14	%		Org-022/025	[NT]	12	104	108	4	94	130

QUALITY CONTROL: PAHs in Soil					Duplicate				Spike Recovery %	
Test Description	Units	PQL	Method	Blank	#	Base	Dup.	RPD	[NT]	[NT]
Date extracted	-			[NT]	19	25/05/2021	25/05/2021		[NT]	[NT]
Date analysed	-			[NT]	19	28/05/2021	28/05/2021		[NT]	[NT]
Naphthalene	mg/kg	0.1	Org-022/025	[NT]	19	<0.1	<0.1	0	[NT]	[NT]
Acenaphthylene	mg/kg	0.1	Org-022/025	[NT]	19	<0.1	<0.1	0	[NT]	[NT]
Acenaphthene	mg/kg	0.1	Org-022/025	[NT]	19	<0.1	<0.1	0	[NT]	[NT]
Fluorene	mg/kg	0.1	Org-022/025	[NT]	19	<0.1	<0.1	0	[NT]	[NT]
Phenanthrene	mg/kg	0.1	Org-022/025	[NT]	19	<0.1	<0.1	0	[NT]	[NT]
Anthracene	mg/kg	0.1	Org-022/025	[NT]	19	<0.1	<0.1	0	[NT]	[NT]
Fluoranthene	mg/kg	0.1	Org-022/025	[NT]	19	<0.1	<0.1	0	[NT]	[NT]
Pyrene	mg/kg	0.1	Org-022/025	[NT]	19	<0.1	<0.1	0	[NT]	[NT]
Benzo(a)anthracene	mg/kg	0.1	Org-022/025	[NT]	19	<0.1	<0.1	0	[NT]	[NT]
Chrysene	mg/kg	0.1	Org-022/025	[NT]	19	<0.1	<0.1	0	[NT]	[NT]
Benzo(b,j+k)fluoranthene	mg/kg	0.2	Org-022/025	[NT]	19	<0.2	<0.2	0	[NT]	[NT]
Benzo(a)pyrene	mg/kg	0.05	Org-022/025	[NT]	19	<0.05	<0.05	0	[NT]	[NT]
Indeno(1,2,3-c,d)pyrene	mg/kg	0.1	Org-022/025	[NT]	19	<0.1	<0.1	0	[NT]	[NT]
Dibenzo(a,h)anthracene	mg/kg	0.1	Org-022/025	[NT]	19	<0.1	<0.1	0	[NT]	[NT]
Benzo(g,h,i)perylene	mg/kg	0.1	Org-022/025	[NT]	19	<0.1	<0.1	0	[NT]	[NT]
Surrogate p-Terphenyl-d14	%		Org-022/025	[NT]	19	95	99	4	[NT]	[NT]

QUALITY CONTROL: Organochlorine Pesticides in soil						Duplicate			Spike Recovery %	
Test Description	Units	PQL	Method	Blank	#	Base	Dup.	RPD	LCS-6	269788-3
Date extracted	-			25/05/2021	1	25/05/2021	25/05/2021		25/05/2021	25/05/2021
Date analysed	-			28/05/2021	1	28/05/2021	28/05/2021		28/05/2021	28/05/2021
alpha-BHC	mg/kg	0.1	Org-022/025	<0.1	1	<0.1	<0.1	0	92	106
HCB	mg/kg	0.1	Org-022/025	<0.1	1	<0.1	<0.1	0	[NT]	[NT]
beta-BHC	mg/kg	0.1	Org-022/025	<0.1	1	<0.1	<0.1	0	98	104
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	93
delta-BHC	mg/kg	0.1	Org-022/025	<0.1	1	<0.1	<0.1	0	[NT]	[NT]
Aldrin	mg/kg	0.1	Org-022/025	<0.1	1	<0.1	<0.1	0	126	101
Heptachlor Epoxide	mg/kg	0.1	Org-022/025	<0.1	1	<0.1	<0.1	0	122	110
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	128	103
Dieldrin	mg/kg	0.1	Org-022/025	<0.1	1	<0.1	<0.1	0	129	103
Endrin	mg/kg	0.1	Org-022/025	<0.1	1	<0.1	<0.1	0	132	107
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	110	97
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	93	97
Methoxychlor	mg/kg	0.1	Org-022/025	<0.1	1	<0.1	<0.1	0	[NT]	[NT]
Surrogate TCMX	%		Org-022/025	90	1	111	109	2	93	95

QUALITY CONTROL: Organochlorine Pesticides in soil					Duplicate				Spike Recovery %	
Test Description	Units	PQL	Method	Blank	#	Base	Dup.	RPD	LCS-7	269788-21
Date extracted	-			[NT]	12	25/05/2021	25/05/2021		25/05/2021	25/05/2021
Date analysed	-			[NT]	12	28/05/2021	28/05/2021		28/05/2021	28/05/2021
alpha-BHC	mg/kg	0.1	Org-022/025	[NT]	12	<0.1	<0.1	0	102	94
HCB	mg/kg	0.1	Org-022/025	[NT]	12	<0.1	<0.1	0	[NT]	[NT]
beta-BHC	mg/kg	0.1	Org-022/025	[NT]	12	<0.1	<0.1	0	89	94
gamma-BHC	mg/kg	0.1	Org-022/025	[NT]	12	<0.1	<0.1	0	[NT]	[NT]
Heptachlor	mg/kg	0.1	Org-022/025	[NT]	12	<0.1	<0.1	0	93	123
delta-BHC	mg/kg	0.1	Org-022/025	[NT]	12	<0.1	<0.1	0	[NT]	[NT]
Aldrin	mg/kg	0.1	Org-022/025	[NT]	12	<0.1	<0.1	0	93	132
Heptachlor Epoxide	mg/kg	0.1	Org-022/025	[NT]	12	<0.1	<0.1	0	89	128
gamma-Chlordane	mg/kg	0.1	Org-022/025	[NT]	12	<0.1	<0.1	0	[NT]	[NT]
alpha-chlordane	mg/kg	0.1	Org-022/025	[NT]	12	<0.1	<0.1	0	[NT]	[NT]
Endosulfan I	mg/kg	0.1	Org-022/025	[NT]	12	<0.1	<0.1	0	[NT]	[NT]
pp-DDE	mg/kg	0.1	Org-022/025	[NT]	12	<0.1	<0.1	0	100	132
Dieldrin	mg/kg	0.1	Org-022/025	[NT]	12	<0.1	<0.1	0	78	129
Endrin	mg/kg	0.1	Org-022/025	[NT]	12	<0.1	<0.1	0	96	127
Endosulfan II	mg/kg	0.1	Org-022/025	[NT]	12	<0.1	<0.1	0	[NT]	[NT]
pp-DDD	mg/kg	0.1	Org-022/025	[NT]	12	<0.1	<0.1	0	84	126
Endrin Aldehyde	mg/kg	0.1	Org-022/025	[NT]	12	<0.1	<0.1	0	[NT]	[NT]
pp-DDT	mg/kg	0.1	Org-022/025	[NT]	12	<0.1	<0.1	0	[NT]	[NT]
Endosulfan Sulphate	mg/kg	0.1	Org-022/025	[NT]	12	<0.1	<0.1	0	116	69
Methoxychlor	mg/kg	0.1	Org-022/025	[NT]	12	<0.1	<0.1	0	[NT]	[NT]
Surrogate TCMX	%		Org-022/025	[NT]	12	92	98	6	91	81

QUALITY CONTROL: Organochlorine Pesticides in soil					Duplicate				Spike Recovery %	
Test Description	Units	PQL	Method	Blank	#	Base	Dup.	RPD	[NT]	[NT]
Date extracted	-			[NT]	19	25/05/2021	25/05/2021		[NT]	[NT]
Date analysed	-			[NT]	19	28/05/2021	28/05/2021		[NT]	[NT]
alpha-BHC	mg/kg	0.1	Org-022/025	[NT]	19	<0.1	<0.1	0	[NT]	[NT]
HCB	mg/kg	0.1	Org-022/025	[NT]	19	<0.1	<0.1	0	[NT]	[NT]
beta-BHC	mg/kg	0.1	Org-022/025	[NT]	19	<0.1	<0.1	0	[NT]	[NT]
gamma-BHC	mg/kg	0.1	Org-022/025	[NT]	19	<0.1	<0.1	0	[NT]	[NT]
Heptachlor	mg/kg	0.1	Org-022/025	[NT]	19	<0.1	<0.1	0	[NT]	[NT]
delta-BHC	mg/kg	0.1	Org-022/025	[NT]	19	<0.1	<0.1	0	[NT]	[NT]
Aldrin	mg/kg	0.1	Org-022/025	[NT]	19	<0.1	<0.1	0	[NT]	[NT]
Heptachlor Epoxide	mg/kg	0.1	Org-022/025	[NT]	19	<0.1	<0.1	0	[NT]	[NT]
gamma-Chlordane	mg/kg	0.1	Org-022/025	[NT]	19	<0.1	<0.1	0	[NT]	[NT]
alpha-chlordane	mg/kg	0.1	Org-022/025	[NT]	19	<0.1	<0.1	0	[NT]	[NT]
Endosulfan I	mg/kg	0.1	Org-022/025	[NT]	19	<0.1	<0.1	0	[NT]	[NT]
pp-DDE	mg/kg	0.1	Org-022/025	[NT]	19	<0.1	<0.1	0	[NT]	[NT]
Dieldrin	mg/kg	0.1	Org-022/025	[NT]	19	<0.1	<0.1	0	[NT]	[NT]
Endrin	mg/kg	0.1	Org-022/025	[NT]	19	<0.1	<0.1	0	[NT]	[NT]
Endosulfan II	mg/kg	0.1	Org-022/025	[NT]	19	<0.1	<0.1	0	[NT]	[NT]
pp-DDD	mg/kg	0.1	Org-022/025	[NT]	19	<0.1	<0.1	0	[NT]	[NT]
Endrin Aldehyde	mg/kg	0.1	Org-022/025	[NT]	19	<0.1	<0.1	0	[NT]	[NT]
pp-DDT	mg/kg	0.1	Org-022/025	[NT]	19	<0.1	<0.1	0	[NT]	[NT]
Endosulfan Sulphate	mg/kg	0.1	Org-022/025	[NT]	19	<0.1	<0.1	0	[NT]	[NT]
Methoxychlor	mg/kg	0.1	Org-022/025	[NT]	19	<0.1	<0.1	0	[NT]	[NT]
Surrogate TCMX	%		Org-022/025	[NT]	19	91	90	1	[NT]	[NT]

QUALITY CONTROL: Organophosphorus Pesticides in Soil						Duplicate			Spike Recovery %	
Test Description	Units	PQL	Method	Blank	#	Base	Dup.	RPD	LCS-6	269788-3
Date extracted	-			25/05/2021	1	25/05/2021	25/05/2021		25/05/2021	25/05/2021
Date analysed	-			28/05/2021	1	28/05/2021	28/05/2021		28/05/2021	28/05/2021
Dichlorvos	mg/kg	0.1	Org-022/025	<0.1	1	<0.1	<0.1	0	71	80
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	100	95
Fenitrothion	mg/kg	0.1	Org-022/025	<0.1	1	<0.1	<0.1	0	99	97
Malathion	mg/kg	0.1	Org-022/025	<0.1	1	<0.1	<0.1	0	90	108
Chlorpyriphos	mg/kg	0.1	Org-022/025	<0.1	1	<0.1	<0.1	0	118	103
Parathion	mg/kg	0.1	Org-022/025	<0.1	1	<0.1	<0.1	0	98	90
Bromophos-ethyl	mg/kg	0.1	Org-022	<0.1	1	<0.1	<0.1	0	[NT]	[NT]
Ethion	mg/kg	0.1	Org-022/025	<0.1	1	<0.1	<0.1	0	105	93
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	90	1	111	109	2	93	95

QUALITY CONTROL: Organophosphorus Pesticides in Soil						Duplicate			Spike Recovery %	
Test Description	Units	PQL	Method	Blank	#	Base	Dup.	RPD	LCS-7	269788-21
Date extracted	-			[NT]	12	25/05/2021	25/05/2021		25/05/2021	25/05/2021
Date analysed	-			[NT]	12	28/05/2021	28/05/2021		28/05/2021	28/05/2021
Dichlorvos	mg/kg	0.1	Org-022/025	[NT]	12	<0.1	<0.1	0	65	60
Dimethoate	mg/kg	0.1	Org-022/025	[NT]	12	<0.1	<0.1	0	[NT]	[NT]
Diazinon	mg/kg	0.1	Org-022/025	[NT]	12	<0.1	<0.1	0	[NT]	[NT]
Chlorpyriphos-methyl	mg/kg	0.1	Org-022/025	[NT]	12	<0.1	<0.1	0	[NT]	[NT]
Ronnel	mg/kg	0.1	Org-022/025	[NT]	12	<0.1	<0.1	0	89	107
Fenitrothion	mg/kg	0.1	Org-022/025	[NT]	12	<0.1	<0.1	0	71	103
Malathion	mg/kg	0.1	Org-022/025	[NT]	12	<0.1	<0.1	0	96	100
Chlorpyriphos	mg/kg	0.1	Org-022/025	[NT]	12	<0.1	<0.1	0	84	128
Parathion	mg/kg	0.1	Org-022/025	[NT]	12	<0.1	<0.1	0	71	94
Bromophos-ethyl	mg/kg	0.1	Org-022	[NT]	12	<0.1	<0.1	0	[NT]	[NT]
Ethion	mg/kg	0.1	Org-022/025	[NT]	12	<0.1	<0.1	0	75	113
Azinphos-methyl (Guthion)	mg/kg	0.1	Org-022/025	[NT]	12	<0.1	<0.1	0	[NT]	[NT]
Surrogate TCMX	%		Org-022/025	[NT]	12	92	98	6	91	81

QUALITY CONTROL: Organophosphorus Pesticides in Soil					Duplicate				Spike Recovery %	
Test Description	Units	PQL	Method	Blank	#	Base	Dup.	RPD	[NT]	[NT]
Date extracted	-			[NT]	19	25/05/2021	25/05/2021		[NT]	[NT]
Date analysed	-			[NT]	19	28/05/2021	28/05/2021		[NT]	[NT]
Dichlorvos	mg/kg	0.1	Org-022/025	[NT]	19	<0.1	<0.1	0	[NT]	[NT]
Dimethoate	mg/kg	0.1	Org-022/025	[NT]	19	<0.1	<0.1	0	[NT]	[NT]
Diazinon	mg/kg	0.1	Org-022/025	[NT]	19	<0.1	<0.1	0	[NT]	[NT]
Chlorpyriphos-methyl	mg/kg	0.1	Org-022/025	[NT]	19	<0.1	<0.1	0	[NT]	[NT]
Ronnel	mg/kg	0.1	Org-022/025	[NT]	19	<0.1	<0.1	0	[NT]	[NT]
Fenitrothion	mg/kg	0.1	Org-022/025	[NT]	19	<0.1	<0.1	0	[NT]	[NT]
Malathion	mg/kg	0.1	Org-022/025	[NT]	19	<0.1	<0.1	0	[NT]	[NT]
Chlorpyriphos	mg/kg	0.1	Org-022/025	[NT]	19	<0.1	<0.1	0	[NT]	[NT]
Parathion	mg/kg	0.1	Org-022/025	[NT]	19	<0.1	<0.1	0	[NT]	[NT]
Bromophos-ethyl	mg/kg	0.1	Org-022	[NT]	19	<0.1	<0.1	0	[NT]	[NT]
Ethion	mg/kg	0.1	Org-022/025	[NT]	19	<0.1	<0.1	0	[NT]	[NT]
Azinphos-methyl (Guthion)	mg/kg	0.1	Org-022/025	[NT]	19	<0.1	<0.1	0	[NT]	[NT]
Surrogate TCMX	%		Org-022/025	[NT]	19	91	90	1	[NT]	[NT]

QUALITY CONTROL: PCBs in Soil						Duplicate			Spike Recovery %	
Test Description	Units	PQL	Method	Blank	#	Base	Dup.	RPD	LCS-6	269788-3
Date extracted	-			25/05/2021	1	25/05/2021	25/05/2021		25/05/2021	25/05/2021
Date analysed	-			28/05/2021	1	28/05/2021	28/05/2021		28/05/2021	28/05/2021
Aroclor 1016	mg/kg	0.1	Org-021	<0.1	1	<0.1	<0.1	0	[NT]	[NT]
Aroclor 1221	mg/kg	0.1	Org-021	<0.1	1	<0.1	<0.1	0	[NT]	[NT]
Aroclor 1232	mg/kg	0.1	Org-021	<0.1	1	<0.1	<0.1	0	[NT]	[NT]
Aroclor 1242	mg/kg	0.1	Org-021	<0.1	1	<0.1	<0.1	0	[NT]	[NT]
Aroclor 1248	mg/kg	0.1	Org-021	<0.1	1	<0.1	<0.1	0	[NT]	[NT]
Aroclor 1254	mg/kg	0.1	Org-021	<0.1	1	<0.1	<0.1	0	70	100
Aroclor 1260	mg/kg	0.1	Org-021	<0.1	1	<0.1	<0.1	0	[NT]	[NT]
Surrogate TCMX	%		Org-021	90	1	111	109	2	93	95

QUALITY CONTROL: PCBs in Soil						Duplicate			Spike Recovery %	
Test Description	Units	PQL	Method	Blank	#	Base	Dup.	RPD	LCS-7	269788-21
Date extracted	-			[NT]	12	25/05/2021	25/05/2021		25/05/2021	25/05/2021
Date analysed	-			[NT]	12	28/05/2021	28/05/2021		28/05/2021	28/05/2021
Aroclor 1016	mg/kg	0.1	Org-021	[NT]	12	<0.1	<0.1	0	[NT]	[NT]
Aroclor 1221	mg/kg	0.1	Org-021	[NT]	12	<0.1	<0.1	0	[NT]	[NT]
Aroclor 1232	mg/kg	0.1	Org-021	[NT]	12	<0.1	<0.1	0	[NT]	[NT]
Aroclor 1242	mg/kg	0.1	Org-021	[NT]	12	<0.1	<0.1	0	[NT]	[NT]
Aroclor 1248	mg/kg	0.1	Org-021	[NT]	12	<0.1	<0.1	0	[NT]	[NT]
Aroclor 1254	mg/kg	0.1	Org-021	[NT]	12	<0.1	<0.1	0	80	70
Aroclor 1260	mg/kg	0.1	Org-021	[NT]	12	<0.1	<0.1	0	[NT]	[NT]
Surrogate TCMX	%		Org-021	[NT]	12	92	98	6	91	81

QUALITY CONTROL: PCBs in Soil						Duplicate			Spike Recovery %	
Test Description	Units	PQL	Method	Blank	#	Base	Dup.	RPD	[NT]	[NT]
Date extracted	-			[NT]	19	25/05/2021	25/05/2021		[NT]	[NT]
Date analysed	-			[NT]	19	28/05/2021	28/05/2021		[NT]	[NT]
Aroclor 1016	mg/kg	0.1	Org-021	[NT]	19	<0.1	<0.1	0	[NT]	[NT]
Aroclor 1221	mg/kg	0.1	Org-021	[NT]	19	<0.1	<0.1	0	[NT]	[NT]
Aroclor 1232	mg/kg	0.1	Org-021	[NT]	19	<0.1	<0.1	0	[NT]	[NT]
Aroclor 1242	mg/kg	0.1	Org-021	[NT]	19	<0.1	<0.1	0	[NT]	[NT]
Aroclor 1248	mg/kg	0.1	Org-021	[NT]	19	<0.1	<0.1	0	[NT]	[NT]
Aroclor 1254	mg/kg	0.1	Org-021	[NT]	19	<0.1	<0.1	0	[NT]	[NT]
Aroclor 1260	mg/kg	0.1	Org-021	[NT]	19	<0.1	<0.1	0	[NT]	[NT]
Surrogate TCMX	%		Org-021	[NT]	19	91	90	1	[NT]	[NT]

QUALITY CONTROL: Acid Extractable metals in soil						Duplicate			Spike Recovery %	
Test Description	Units	PQL	Method	Blank	#	Base	Dup.	RPD	LCS-6	269788-3
Date prepared	-			27/05/2021	1	27/05/2021	27/05/2021		27/05/2021	27/05/2021
Date analysed	-			27/05/2021	1	27/05/2021	27/05/2021		27/05/2021	27/05/2021
Arsenic	mg/kg	4	Metals-020	<4	1	<4	<4	0	101	101
Cadmium	mg/kg	0.4	Metals-020	<0.4	1	<0.4	<0.4	0	109	102
Chromium	mg/kg	1	Metals-020	<1	1	14	12	15	108	100
Copper	mg/kg	1	Metals-020	<1	1	17	13	27	86	81
Lead	mg/kg	1	Metals-020	<1	1	14	12	15	113	95
Mercury	mg/kg	0.1	Metals-021	<0.1	1	<0.1	<0.1	0	93	95
Nickel	mg/kg	1	Metals-020	<1	1	9	8	12	102	97
Zinc	mg/kg	1	Metals-020	<1	1	50	43	15	105	96

QUALITY CONTROL: Acid Extractable metals in soil						Duplicate			Spike Recovery %	
Test Description	Units	PQL	Method	Blank	#	Base	Dup.	RPD	LCS-7	269788-21
Date prepared	-			[NT]	12	27/05/2021	27/05/2021		27/05/2021	27/05/2021
Date analysed	-			[NT]	12	27/05/2021	27/05/2021		27/05/2021	27/05/2021
Arsenic	mg/kg	4	Metals-020	[NT]	12	5	5	0	101	97
Cadmium	mg/kg	0.4	Metals-020	[NT]	12	<0.4	<0.4	0	103	105
Chromium	mg/kg	1	Metals-020	[NT]	12	17	17	0	104	97
Copper	mg/kg	1	Metals-020	[NT]	12	9	9	0	87	83
Lead	mg/kg	1	Metals-020	[NT]	12	12	12	0	115	104
Mercury	mg/kg	0.1	Metals-021	[NT]	12	<0.1	<0.1	0	96	101
Nickel	mg/kg	1	Metals-020	[NT]	12	7	7	0	98	92
Zinc	mg/kg	1	Metals-020	[NT]	12	22	22	0	100	100

QUALITY CONTROL: Acid Extractable metals in soil						Duplicate			Spike Recovery %	
Test Description	Units	PQL	Method	Blank	#	Base	Dup.	RPD	[NT]	[NT]
Date prepared	-			[NT]	19	27/05/2021	27/05/2021		[NT]	[NT]
Date analysed	-			[NT]	19	27/05/2021	27/05/2021		[NT]	[NT]
Arsenic	mg/kg	4	Metals-020	[NT]	19	<4	<4	0	[NT]	[NT]
Cadmium	mg/kg	0.4	Metals-020	[NT]	19	<0.4	<0.4	0	[NT]	[NT]
Chromium	mg/kg	1	Metals-020	[NT]	19	19	21	10	[NT]	[NT]
Copper	mg/kg	1	Metals-020	[NT]	19	9	32	112	[NT]	[NT]
Lead	mg/kg	1	Metals-020	[NT]	19	10	10	0	[NT]	[NT]
Mercury	mg/kg	0.1	Metals-021	[NT]	19	<0.1	<0.1	0	[NT]	[NT]
Nickel	mg/kg	1	Metals-020	[NT]	19	8	8	0	[NT]	[NT]
Zinc	mg/kg	1	Metals-020	[NT]	19	25	32	25	[NT]	[NT]

QUALITY CONTROL: Misc Soil - Inorg						Duplicate			Spike Recovery %	
Test Description	Units	PQL	Method	Blank	#	Base	Dup.	RPD	LCS-1	269788-3
Date prepared	-			25/05/2021	1	25/05/2021	25/05/2021		25/05/2021	25/05/2021
Date analysed	-			25/05/2021	1	25/05/2021	25/05/2021		25/05/2021	25/05/2021
Total Phenolics (as Phenol)	mg/kg	5	Inorg-031	<5	1	<5	<5	0	100	101

QUALITY CONTROL: Misc Soil - Inorg						Duplicate			Spike Recovery %	
Test Description	Units	PQL	Method	Blank	#	Base	Dup.	RPD	[NT]	[NT]
Date prepared	-			[NT]	12	25/05/2021	25/05/2021		[NT]	[NT]
Date analysed	-			[NT]	12	25/05/2021	25/05/2021		[NT]	[NT]
Total Phenolics (as Phenol)	mg/kg	5	Inorg-031	[NT]	12	<5	<5	0	[NT]	[NT]

Result Definitions

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

Quality Control Definitions

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

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

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

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

Laboratory Acceptance Criteria

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

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

Spikes for Physical and Aggregate Tests are not applicable.

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

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

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

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

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

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

Measurement Uncertainty estimates are available for most tests upon request.

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

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

Report Comments

Acid Extractable Metals in Soil: The laboratory RPD acceptance criteria has been exceeded for 269788-19 for Cu. Therefore a triplicate result has been issued as laboratory sample number 269788-23.

Asbestos: A portion of the supplied sample was sub-sampled for asbestos analysis according to Envirolab procedures.
We cannot guarantee that this sub-sample is indicative of the entire sample. Envirolab recommends supplying 40-50g of sample in its own container.
Note: Samples 269788-1, 3, 4, 6, 7, 8, 12, 19 were sub-sampled from jars provided by the client.

Asbestos: Excessive sample volume was provided for asbestos analysis. A portion of the supplied sample was sub-sampled according to Envirolab procedures. We cannot guarantee that this sub-sample is indicative of the entire sample. Envirolab recommends supplying 40-50g (50mL) of sample in its own container as per AS4964-2004.
Note: Samples 269788-10, 13, 14, 16, 18, 21 were sub-sampled from bags provided by the client.

PAHs in Soil - The RPD for duplicate results is accepted due to the non homogenous nature of sample 269788-1.

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CHAIN OF CUSTODY DESPATCH SHEET

Project No:	204635.01	**Suburb:**	100-275 Castlereagh Road, Penrith	**To:**	*Envirolab Services*
Project Manager:	Nizam Ahamed	**Order Number:**		**Sampler:** JS	*12 Ashley St, Chatswood NSW 2067*
Email:	catherine.trinh; Nizam.Ahamed@douglaspartners.com.au			**Attn:**	*Sample Receipt*
Turnaround time:	☑ Standard ☐ 72 hour ☐ 48 hour ☐ 24 hour ☐ Same day			**Contact:**	*(02) 9910 6200 samplereceipt@envirolab.com.au*
Prior Storage:	☑ Fridge ☐ Freezer ☐ Shelf	**Do samples contain 'potential' HBM?**	☑ No ☐ Yes (If YES, then handle, transport and store in accordance with FPM HAZID)		

Lab ID	Sample ID: Location / Other ID	Depth From	Depth To	Date Sampled	Sample Type: S - soil W - water	Container Type: G - glass P - plastic	Analytes: Combo 8a	Combo 3	phenoxy acid herbicides	triazine herbicides	ASS Field Test	pH and CEC	Rinsate	BTEX				Notes/ Preservation/ Additional Requirements
1	TP17	0	0.08	19/05/21	S	G	X											
2	TP17	0.2	0.3	19/05/21	S	G		X										
3	TP18	0	0.1	19/05/21	S	G	X											
4	TP19	0.4	0.5	19/05/21	S	G	X											
5	TP19	0	0.1	19/05/21	S	G		X										
6	TP20	0.2	0.3	19/05/21	S	G	X											
7	TP21	0.1	0.15	19/05/21	S	G	X											
~~8~~ 24/5/21																		
8	TP22	0.3	0.4	19/05/21	S	G	X											
9	TP22	0.5	0.6	19/05/21	S	G		X										
10 X	TP23	0	0.1	19/05/21	S	G/P	X											
11	TP24	0.1	0.2	20/05/21	S	G		X										
12	TP24	0.4	0.5	20/05/21	S	G	X											
13 X	TP25	0.5	0.6	20/05/21	S	G/P	X											

Envirolab Services
12 Ashley St
Chatswood NSW 2067
Ph: (02) 9910 6200

Job No: 269788
Date Received: 24/5/21
Time Received: 16:00
Received By: ~~BLS~~ SUD K.LEE
Temp: Cool/Ambient none
Cooling: Ice/Icepack
Security: Intact/Broken/None

Metals to analyse:		**LAB RECEIPT**	269788
Number of samples in container:	**Transported to laboratory by:**	**Lab Ref. No:**	
Send results to:	Douglas Partners Pty Ltd	**Received by:**	24/5/21 16:00 K.LEE
Address:	96 Hermitage Road, West Ryde NSW 2114 **Phone:** (02) 9809 0666	**Date & Time:**	//
Relinquished by:	**Date:** **Signed:**	**Signed:**	KL

Douglas Partners
Geotechnics | Environment | Groundwater

CHAIN OF CUSTODY DESPATCH SHEET

Project No:	204635.01	**Suburb:**	100-275 Castlereagh Road, Penrith	**To:**	*Envirolab Services*
Project Manager:	Nizam Ahamed	**Order Number:**		**Dispatch date:**	*12 Ashley St, 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: Combo 8a	Combo 3	phenoxy acid herbicides	triazine herbicides	ASS Field Test	pH and CEC	Rinsate	BTEX				Notes/ Preservation/ Additional Requirements
14	TP26	0.3	0.4	20/05/21	S	G/P	X											
15	TP26	0.9	1	20/05/21	S	G/P		X										
16 X	TP27	0.2	0.3	20/05/21	S	G/P	X											
17	TP28	0	0.05	20/05/21	S	G/P		X										
18	TP28	1	1.1	20/05/21	S	G/P	X											
19	TP29	0.4	0.5	20/05/21	S	G	X											
20	TP29	1.4	1.5	20/05/21	S	G		X										
21	X TP30	0.9	1	20/05/21	S	G/P	X											
22	BD1/190521			19/05/21	S	G		X										

ENVIROLAB GROUP

Envirolab Services
12 Ashley St
Chatswood NSW 2067
Ph: (02) 9910 6200

Job No: 269788

Date Received: 24/5/21
Time Received: 16:00
Received By: E LEE
Temp: Cool/Ambient
Cooling: Ice/Icepack none
Security: Intact/Broken

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	Nizam Ahamed

Sample Login Details

Your reference	204635.01, 100-275 Castlereagh Road Penrith
Envirolab Reference	269788
Date Sample Received	24/05/2021
Date Instructions Received	24/05/2021
Date Results Expected to be Reported	31/05/2021

Sample Condition

Samples received in appropriate condition for analysis	Yes
No. of Samples Provided	22 Soil
Turnaround Time Requested	Standard
Temperature on Receipt (°C)	19
Cooling Method	None
Sampling Date Provided	YES

Comments

Nil

Please direct any queries to:

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

Analysis Underway, details on the following page:

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

Sample ID	vTRH(C6-C10)/BTEXN in Soil	svTRH (C10-C40) in Soil	PAHs in Soil	Organochlorine Pesticides in soil	Organophosphorus Pesticides in Soil	PCBsin Soil	Acid Extractable metalsin soil	Misc Soil - Inorg	Asbestos ID - soils
TP17-0-0.08	✓	✓	✓	✓	✓	✓	✓	✓	✓
TP17-0.2-0.3	✓	✓	✓				✓		
TP18-0-0.1	✓	✓	✓	✓	✓	✓	✓	✓	✓
TP19-0.4-0.5	✓	✓	✓	✓	✓	✓	✓	✓	✓
TP19-0-0.1	✓	✓	✓				✓		
TP20-0.2-0.3	✓	✓	✓	✓	✓	✓	✓	✓	✓
TP21-0.1-0.15	✓	✓	✓	✓	✓	✓	✓	✓	✓
TP22-0.3-0.4	✓	✓	✓	✓	✓	✓	✓	✓	✓
TP22-0.5-0.6	✓	✓	✓				✓		
TP23-0-0.1	✓	✓	✓	✓	✓	✓	✓	✓	✓
TP24-0.1-0.2	✓	✓	✓				✓		
TP24-0.4-0.5	✓	✓	✓	✓	✓	✓	✓	✓	✓
TP25-0.5-0.6	✓	✓	✓	✓	✓	✓	✓	✓	✓
TP26-0.3-0.4	✓	✓	✓	✓	✓	✓	✓	✓	✓
TP26-0.9-1	✓	✓	✓				✓		
TP27-0.2-0.3	✓	✓	✓	✓	✓	✓	✓	✓	✓
TP28-0-0.05	✓	✓	✓				✓		
TP28-1-1.1	✓	✓	✓	✓	✓	✓	✓	✓	✓
TP29-0.4-0.5	✓	✓	✓	✓	✓	✓	✓	✓	✓
TP29-1.4-1.5	✓	✓	✓				✓		
TP30-0.9-1	✓	✓	✓	✓	✓	✓	✓	✓	✓
BD1/190521	✓	✓	✓				✓		

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

Additional Info

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

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12 Ashley St Chatswood NSW 2067
ph 02 9910 6200 fax 02 9910 6201
customerservice@envirolab.com.au
www.envirolab.com.au

CERTIFICATE OF ANALYSIS 269788-A

Client Details

Client	Douglas Partners Pty Ltd
Attention	Alyssa Spencer
Address	96 Hermitage Rd, West Ryde, NSW, 2114

Sample Details

Your Reference	**204635.01, 100-275 Castlereagh Road Penrith**
Number of Samples	additional analyses on 1 soil
Date samples received	24/05/2021
Date completed instructions received	08/06/2021

Analysis Details

Please refer to the following pages for results, methodology summary and quality control data.

Samples were analysed as received from the client. Results relate specifically to the samples as received.

Results are reported on a dry weight basis for solids and on an as received basis for other matrices.

Please refer to the last page of this report for any comments relating to the results.

Report Details

Date results requested by	16/06/2021
Date of Issue	10/06/2021

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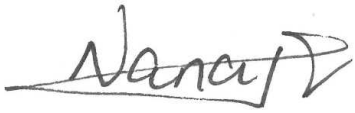
Results Approved By
Steven Luong, Organics Supervisor

Authorised By



Nancy Zhang, Laboratory Manager

PAHs in TCLP (USEPA 1311)		
Our Reference		269788-A-1
Your Reference	UNITS	TP17
Depth		0-0.08
Date Sampled		19/05/2021
Type of sample		Soil
pH of soil for fluid# determ.	pH units	5.7
pH of soil TCLP (after HCl)	pH units	1.7
Extraction fluid used	-	1
pH of final Leachate	pH units	4.9
Date extracted	-	09/06/2021
Date analysed	-	09/06/2021
Naphthalene in TCLP	mg/L	<0.001
Acenaphthylene in TCLP	mg/L	<0.001
Acenaphthene in TCLP	mg/L	<0.001
Fluorene in TCLP	mg/L	<0.001
Phenanthrene in TCLP	mg/L	<0.001
Anthracene in TCLP	mg/L	<0.001
Fluoranthene in TCLP	mg/L	<0.001
Pyrene in TCLP	mg/L	<0.001
Benzo(a)anthracene in TCLP	mg/L	<0.001
Chrysene in TCLP	mg/L	<0.001
Benzo(bjk)fluoranthene in TCLP	mg/L	<0.002
Benzo(a)pyrene in TCLP	mg/L	<0.001
Indeno(1,2,3-c,d)pyrene - TCLP	mg/L	<0.001
Dibenzo(a,h)anthracene in TCLP	mg/L	<0.001
Benzo(g,h,i)perylene in TCLP	mg/L	<0.001
Total +ve PAH's	mg/L	NIL (+)VE
Surrogate p-Terphenyl-d14	%	130

Method ID	Methodology Summary
EXTRACT.7	Toxicity Characteristic Leaching Procedure (TCLP) using Zero Headspace Extraction (zHE) using AS4439 and USEPA 1311.
Inorg-001	pH - Measured using pH meter and electrode in accordance with APHA latest edition, 4500-H+. Please note that the results for water analyses are indicative only, as analysis outside of the APHA storage times.
Inorg-004	Toxicity Characteristic Leaching Procedure (TCLP) using in house method INORG-004. Please note that the mass used may be scaled down from the default based on sample mass available.
Org-022/025	Leachates are extracted with Dichloromethane and analysed by GC-MS/GC-MSMS.

QUALITY CONTROL: PAHs in TCLP (USEPA 1311)						Duplicate			Spike Recovery %	
Test Description	Units	PQL	Method	Blank	#	Base	Dup.	RPD	LCS-W2	[NT]
Date extracted	-			09/06/2021	1	09/06/2021	09/06/2021		09/06/2021	[NT]
Date analysed	-			09/06/2021	1	09/06/2021	09/06/2021		09/06/2021	[NT]
Naphthalene in TCLP	mg/L	0.001	Org-022/025	<0.001	1	<0.001	<0.001	0	106	[NT]
Acenaphthylene in TCLP	mg/L	0.001	Org-022/025	<0.001	1	<0.001	<0.001	0	[NT]	[NT]
Acenaphthene in TCLP	mg/L	0.001	Org-022/025	<0.001	1	<0.001	<0.001	0	88	[NT]
Fluorene in TCLP	mg/L	0.001	Org-022/025	<0.001	1	<0.001	<0.001	0	100	[NT]
Phenanthrene in TCLP	mg/L	0.001	Org-022/025	<0.001	1	<0.001	<0.001	0	116	[NT]
Anthracene in TCLP	mg/L	0.001	Org-022/025	<0.001	1	<0.001	<0.001	0	[NT]	[NT]
Fluoranthene in TCLP	mg/L	0.001	Org-022/025	<0.001	1	<0.001	<0.001	0	100	[NT]
Pyrene in TCLP	mg/L	0.001	Org-022/025	<0.001	1	<0.001	<0.001	0	105	[NT]
Benzo(a)anthracene in TCLP	mg/L	0.001	Org-022/025	<0.001	1	<0.001	<0.001	0	[NT]	[NT]
Chrysene in TCLP	mg/L	0.001	Org-022/025	<0.001	1	<0.001	<0.001	0	82	[NT]
Benzo(bjk)fluoranthene in TCLP	mg/L	0.002	Org-022/025	<0.002	1	<0.002	<0.002	0	[NT]	[NT]
Benzo(a)pyrene in TCLP	mg/L	0.001	Org-022/025	<0.001	1	<0.001	<0.001	0	95	[NT]
Indeno(1,2,3-c,d)pyrene - TCLP	mg/L	0.001	Org-022/025	<0.001	1	<0.001	<0.001	0	[NT]	[NT]
Dibenzo(a,h)anthracene in TCLP	mg/L	0.001	Org-022/025	<0.001	1	<0.001	<0.001	0	[NT]	[NT]
Benzo(g,h,i)perylene in TCLP	mg/L	0.001	Org-022/025	<0.001	1	<0.001	<0.001	0	[NT]	[NT]
Surrogate p-Terphenyl-d14	%		Org-022/025	121	1	130	126	3	121	[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

Samples received in good order: Holding time exceedance

Ming To

Subject: FW: TCLP for ELS Job 269788

Ref: 269788-A
TAT: Standard.
Due: 18/06/2021
MT.

From: Alyssa Spencer <Alyssa.Spencer@douglaspartners.com.au>
Sent: Tuesday, 8 June 2021 2:49 PM
To: Nick Sarlamis <NSarlamis@envirolab.com.au>
Cc: SydneyMailbox <Sydney@envirolab.com.au>
Subject: TCLP for ELS Job 269788

Hey Nick,

For job 269788, can I please schedule TCLP analysis on Benzo(a)Pyrene for sample TP17/0-0.08? Standard TAT is fine.

Thanks,

Alyssa Spencer | Environmental Geologist
Douglas Partners Pty Ltd | ABN 75 053 980 117 | www.douglaspartners.com.au
96 Hermitage Road West Ryde NSW 2114 | PO Box 472 West Ryde NSW 1685
P: 02 9809 0666 | M: 0448 370 069 | E: Alyssa.Spencer@douglaspartners.com.au

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

CLIENT
2020 VI

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	Alyssa Spencer

Sample Login Details

Your reference	204635.01, 100-275 Castlereagh Road Penrith
Envirolab Reference	269788-A
Date Sample Received	24/05/2021
Date Instructions Received	08/06/2021
Date Results Expected to be Reported	16/06/2021

Sample Condition

Samples received in appropriate condition for analysis	Holding time exceedance
No. of Samples Provided	additional analyses on 1 soil
Turnaround Time Requested	Standard
Temperature on Receipt (°C)	19
Cooling Method	None
Sampling Date Provided	YES

Comments

Please contact the laboratory within 24 hours if you wish to cancel the aformentioned testing. Otherwise testing will proceed as per the COC and hence invoice accordingly.

Please direct any queries to:

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

Analysis Underway, details on the following page:

Envirolab Services Pty Ltd
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12 Ashley St Chatswood NSW 2067
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www.envirolab.com.au

Sample ID	pH of soil for fluid#determ.	pH of soil TCLP (after HCl)	Extraction fluid used	pH of final Leachate	Naphthalene in TCLP	Acenaphthylene in TCLP	Acenaphthene in TCLP	Fluorene in TCLP	Phenanthrene in TCLP	Anthracene in TCLP	Fluoranthene in TCLP	Pyrene in TCLP	Benzo(a)anthracene in TCLP	Chrysene in TCLP	Benzo(bjk)fluoranthene in TCLP	Benzo(a)pyrene in TCLP	Indeno(1,2,3-c,d)pyrene - TCLP	Dibenzo(a,h)anthracene in TCLP	Benzo(g,h,i)perylene in TCLP	Total +vePAH's	Surrogate p-Terphenyl-d14	On Hold
TP17-0-0.08	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	
TP17-0.2-0.3																						✓
TP18-0-0.1																						✓
TP19-0.4-0.5																						✓
TP19-0-0.1																						✓
TP20-0.2-0.3																						✓
TP21-0.1-0.15																						✓
TP22-0.3-0.4																						✓
TP22-0.5-0.6																						✓
TP23-0-0.1																						✓
TP24-0.1-0.2																						✓
TP24-0.4-0.5																						✓
TP25-0.5-0.6																						✓
TP26-0.3-0.4																						✓
TP26-0.9-1																						✓
TP27-0.2-0.3																						✓
TP28-0-0.05																						✓
TP28-1-1.1																						✓
TP29-0.4-0.5																						✓
TP29-1.4-1.5																						✓

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12 Ashley St Chatswood NSW 2067
ph 02 9910 6200 fax 02 9910 6201
customerservice@envirolab.com.au
www.envirolab.com.au

Sample ID	pH of soil for fluid#determ.	pH of soil TCLP (after HCl)	Extraction fluid used	pH of final Leachate	Naphthalene in TCLP	Acenaphthylene in TCLP	Acenaphthene in TCLP	Fluorene in TCLP	Phenanthrene in TCLP	Anthracene in TCLP	Fluoranthene in TCLP	Pyrene in TCLP	Benzo(a)anthracene in TCLP	Chrysene in TCLP	Benzo(bjk)fluoranthene in TCLP	Benzo(a)pyrene in TCLP	Indeno(1,2,3-c,d)pyrene - TCLP	Dibenzo(a,h)anthracene in TCLP	Benzo(g,h,i)perylene in TCLP	Total +vePAH's	Surrogate p-Terphenyl-d14	On Hold
TP30-0.9-1																						✓
BD1/190521																						✓
TP29 - [TRIPLICATE]-0.4-0.5																						✓
TP17 - [TRIPLICATE]-0-0.08																						✓

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

Additional Info

Sample storage - Waters are routinely disposed of approximately 1 month and soils approximately 2 months from receipt.

Requests for longer term sample storage must be received in writing.

Please contact the laboratory immediately if observed settled sediment present in water samples is to be included in the extraction and/or analysis (exceptions include certain Physical Tests (pH/EC/BOD/COD/Apparent Colour etc.), Solids testing, Total Recoverable metals and PFAS analysis where solids are included by default.

TAT for Micro is dependent on incubation. This varies from 3 to 6 days.

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CERTIFICATE OF ANALYSIS 270252

Client Details

Client	Douglas Partners Pty Ltd
Attention	Nizam Ahamed
Address	96 Hermitage Rd, West Ryde, NSW, 2114

Sample Details

Your Reference	**204635.01, Penrith**
Number of Samples	33 Soil, 1 Material
Date samples received	28/05/2021
Date completed instructions received	28/05/2021

Analysis Details

Please refer to the following pages for results, methodology summary and quality control data.

Samples were analysed as received from the client. Results relate specifically to the samples as received.

Results are reported on a dry weight basis for solids and on an as received basis for other matrices.

Please refer to the last page of this report for any comments relating to the results.

Report Details

Date results requested by	04/06/2021
Date of Issue	04/06/2021

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

Results Approved By
Diego Bigolin, Team Leader, Inorganics
Dragana Tomas, Senior Chemist
Giovanni Agosti, Group Technical Manager
Lucy Zhu, Asbestos Supervisor
Steven Luong, Organics Supervisor

Authorised By

Nancy Zhang, Laboratory Manager

vTRH(C6-C10)/BTEXN in Soil						
Our Reference		270252-1	270252-2	270252-3	270252-4	270252-5
Your Reference	UNITS	31	32	32	33	34
Depth		0-0.1	0-0.1	1.5-1.6	0-0.1	0-0.1
Date Sampled		25/05/2021	25/05/2021	25/05/2021	25/05/2021	24/05/2021
Type of sample		Soil	Soil	Soil	Soil	Soil
Date extracted	-	31/05/2021	31/05/2021	31/05/2021	31/05/2021	31/05/2021
Date analysed	-	01/06/2021	01/06/2021	01/06/2021	01/06/2021	01/06/2021
TRH C_6 - C_9	mg/kg	<25	<25	<25	<25	<25
TRH C_6 - C_{10}	mg/kg	<25	<25	<25	<25	<25
vTPH C_6 - C_{10} less BTEX (F1)	mg/kg	<25	<25	<25	<25	<25
Benzene	mg/kg	<0.2	<0.2	<0.2	<0.2	<0.2
Toluene	mg/kg	<0.5	<0.5	<0.5	<0.5	<0.5
Ethylbenzene	mg/kg	<1	<1	<1	<1	<1
m+p-xylene	mg/kg	<2	<2	<2	<2	<2
o-Xylene	mg/kg	<1	<1	<1	<1	<1
naphthalene	mg/kg	<1	<1	<1	<1	<1
Total +ve Xylenes	mg/kg	<3	<3	<3	<3	<3
Surrogate aaa-Trifluorotoluene	%	80	81	94	98	95

vTRH(C6-C10)/BTEXN in Soil						
Our Reference		270252-6	270252-7	270252-8	270252-9	270252-10
Your Reference	UNITS	34	35	36	36	37
Depth		0.4-0.5	0-0.1	0.1-0.2	0.4-0.5	0.1-0.2
Date Sampled		24/05/2021	24/05/2021	25/05/2021	25/05/2021	25/05/2021
Type of sample		Soil	Soil	Soil	Soil	Soil
Date extracted	-	31/05/2021	31/05/2021	31/05/2021	31/05/2021	31/05/2021
Date analysed	-	01/06/2021	01/06/2021	01/06/2021	01/06/2021	01/06/2021
TRH C_6 - C_9	mg/kg	<25	<25	<25	<25	<25
TRH C_6 - C_{10}	mg/kg	<25	<25	<25	<25	<25
vTPH C_6 - C_{10} less BTEX (F1)	mg/kg	<25	<25	<25	<25	<25
Benzene	mg/kg	<0.2	<0.2	<0.2	<0.2	<0.2
Toluene	mg/kg	<0.5	<0.5	<0.5	<0.5	<0.5
Ethylbenzene	mg/kg	<1	<1	<1	<1	<1
m+p-xylene	mg/kg	<2	<2	<2	<2	<2
o-Xylene	mg/kg	<1	<1	<1	<1	<1
naphthalene	mg/kg	<1	<1	<1	<1	<1
Total +ve Xylenes	mg/kg	<3	<3	<3	<3	<3
Surrogate aaa-Trifluorotoluene	%	75	95	90	108	91

vTRH(C6-C10)/BTEXN in Soil						
Our Reference		270252-11	270252-12	270252-13	270252-14	270252-15
Your Reference	UNITS	38	38	39	40	40
Depth		0.1-0.2	0.5-0.6	0-0.1	0-0.1	1.5-1.6
Date Sampled		24/05/2021	24/05/2021	24/05/2021	24/05/2021	24/05/2021
Type of sample		Soil	Soil	Soil	Soil	Soil
Date extracted	-	31/05/2021	31/05/2021	31/05/2021	31/05/2021	31/05/2021
Date analysed	-	01/06/2021	01/06/2021	01/06/2021	01/06/2021	01/06/2021
TRH C_6 - C_9	mg/kg	<25	<25	<25	<25	<25
TRH C_6 - C_{10}	mg/kg	<25	<25	<25	<25	<25
vTPH C_6 - C_{10} less BTEX (F1)	mg/kg	<25	<25	<25	<25	<25
Benzene	mg/kg	<0.2	<0.2	<0.2	<0.2	<0.2
Toluene	mg/kg	<0.5	<0.5	<0.5	<0.5	<0.5
Ethylbenzene	mg/kg	<1	<1	<1	<1	<1
m+p-xylene	mg/kg	<2	<2	<2	<2	<2
o-Xylene	mg/kg	<1	<1	<1	<1	<1
naphthalene	mg/kg	<1	<1	<1	<1	<1
Total +ve Xylenes	mg/kg	<3	<3	<3	<3	<3
Surrogate aaa-Trifluorotoluene	%	90	92	103	98	110

vTRH(C6-C10)/BTEXN in Soil						
Our Reference		270252-16	270252-17	270252-18	270252-19	270252-20
Your Reference	UNITS	41	42	42	43	44
Depth		0.1-0.2	0.4-0.5	0.6-0.7	0.1-0.2	0.1-0.2
Date Sampled		24/05/2021	24/05/2021	24/05/2021	24/05/2021	24/05/2021
Type of sample		Soil	Soil	Soil	Soil	Soil
Date extracted	-	31/05/2021	31/05/2021	31/05/2021	31/05/2021	31/05/2021
Date analysed	-	01/06/2021	01/06/2021	01/06/2021	01/06/2021	01/06/2021
TRH C_6 - C_9	mg/kg	<25	<25	<25	<25	<25
TRH C_6 - C_{10}	mg/kg	<25	<25	<25	<25	<25
vTPH C_6 - C_{10} less BTEX (F1)	mg/kg	<25	<25	<25	<25	<25
Benzene	mg/kg	<0.2	<0.2	<0.2	<0.2	<0.2
Toluene	mg/kg	<0.5	<0.5	<0.5	<0.5	<0.5
Ethylbenzene	mg/kg	<1	<1	<1	<1	<1
m+p-xylene	mg/kg	<2	<2	<2	<2	<2
o-Xylene	mg/kg	<1	<1	<1	<1	<1
naphthalene	mg/kg	<1	<1	<1	<1	<1
Total +ve Xylenes	mg/kg	<3	<3	<3	<3	<3
Surrogate aaa-Trifluorotoluene	%	103	86	93	77	85

vTRH(C6-C10)/BTEXN in Soil						
Our Reference		270252-21	270252-22	270252-23	270252-24	270252-25
Your Reference	UNITS	44	45	46	46	47
Depth		0.8-0.9	0-0.1	0-0.1	1-1.1	0-0.1
Date Sampled		24/05/2021	24/05/2021	24/05/2021	24/05/2021	25/05/2021
Type of sample		Soil	Soil	Soil	Soil	Soil
Date extracted	-	31/05/2021	31/05/2021	31/05/2021	31/05/2021	31/05/2021
Date analysed	-	01/06/2021	01/06/2021	01/06/2021	01/06/2021	01/06/2021
TRH C_6 - C_9	mg/kg	<25	<25	<25	<25	<25
TRH C_6 - C_{10}	mg/kg	<25	<25	<25	<25	<25
vTPH C_6 - C_{10} less BTEX (F1)	mg/kg	<25	<25	<25	<25	<25
Benzene	mg/kg	<0.2	<0.2	<0.2	<0.2	<0.2
Toluene	mg/kg	<0.5	<0.5	<0.5	<0.5	<0.5
Ethylbenzene	mg/kg	<1	<1	<1	<1	<1
m+p-xylene	mg/kg	<2	<2	<2	<2	<2
o-Xylene	mg/kg	<1	<1	<1	<1	<1
naphthalene	mg/kg	<1	<1	<1	<1	<1
Total +ve Xylenes	mg/kg	<3	<3	<3	<3	<3
Surrogate aaa-Trifluorotoluene	%	73	86	86	120	90

vTRH(C6-C10)/BTEXN in Soil						
Our Reference		270252-26	270252-27	270252-28	270252-29	270252-30
Your Reference	UNITS	48	48	49	50	TS1
Depth		0-0.1	1.1-1.2	0-0.1	0-0.1	-
Date Sampled		25/05/2021	25/05/2021	25/05/2021	25/05/2021	25/05/2021
Type of sample		Soil	Soil	Soil	Soil	Soil
Date extracted	-	31/05/2021	31/05/2021	31/05/2021	31/05/2021	31/05/2021
Date analysed	-	01/06/2021	01/06/2021	01/06/2021	01/06/2021	01/06/2021
TRH C_6 - C_9	mg/kg	<25	<25	<25	<25	[NA]
TRH C_6 - C_{10}	mg/kg	<25	<25	<25	<25	[NA]
vTPH C_6 - C_{10} less BTEX (F1)	mg/kg	<25	<25	<25	<25	[NA]
Benzene	mg/kg	<0.2	<0.2	<0.2	<0.2	72%
Toluene	mg/kg	<0.5	<0.5	<0.5	<0.5	72%
Ethylbenzene	mg/kg	<1	<1	<1	<1	71%
m+p-xylene	mg/kg	<2	<2	<2	<2	75%
o-Xylene	mg/kg	<1	<1	<1	<1	73%
naphthalene	mg/kg	<1	<1	<1	<1	[NA]
Total +ve Xylenes	mg/kg	<3	<3	<3	<3	[NA]
Surrogate aaa-Trifluorotoluene	%	75	103	104	106	118

vTRH(C6-C10)/BTEXN in Soil				
Our Reference		270252-31	270252-33	270252-34
Your Reference	UNITS	TB1	BD6/20210525	BD2/20210524
Depth		-	-	-
Date Sampled		25/05/2021	25/05/2021	24/05/2021
Type of sample		Soil	Soil	Soil
Date extracted	-	31/05/2021	31/05/2021	31/05/2021
Date analysed	-	01/06/2021	01/06/2021	01/06/2021
TRH C_6 - C_9	mg/kg	<25	<25	<25
TRH C_6 - C_{10}	mg/kg	<25	<25	<25
vTPH C_6 - C_{10} less BTEX (F1)	mg/kg	<25	<25	<25
Benzene	mg/kg	<0.2	<0.2	<0.2
Toluene	mg/kg	<0.5	<0.5	<0.5
Ethylbenzene	mg/kg	<1	<1	<1
m+p-xylene	mg/kg	<2	<2	<2
o-Xylene	mg/kg	<1	<1	<1
naphthalene	mg/kg	<1	<1	<1
Total +ve Xylenes	mg/kg	<3	<3	<3
Surrogate aaa-Trifluorotoluene	%	81	79	103

svTRH (C10-C40) in Soil						
Our Reference		270252-1	270252-2	270252-3	270252-4	270252-5
Your Reference	UNITS	31	32	32	33	34
Depth		0-0.1	0-0.1	1.5-1.6	0-0.1	0-0.1
Date Sampled		25/05/2021	25/05/2021	25/05/2021	25/05/2021	24/05/2021
Type of sample		Soil	Soil	Soil	Soil	Soil
Date extracted	-	31/05/2021	31/05/2021	31/05/2021	31/05/2021	31/05/2021
Date analysed	-	01/06/2021	01/06/2021	01/06/2021	01/06/2021	01/06/2021
TRH C_{10} - C_{14}	mg/kg	<50	<50	<50	<50	<50
TRH C_{15} - C_{28}	mg/kg	<100	<100	<100	<100	<100
TRH C_{29} - C_{36}	mg/kg	<100	<100	<100	110	<100
TRH >C_{10} -C_{16}	mg/kg	<50	<50	<50	<50	<50
TRH >C_{10} - C_{16} less Naphthalene (F2)	mg/kg	<50	<50	<50	<50	<50
TRH >C_{16} -C_{34}	mg/kg	<100	<100	<100	100	<100
TRH >C_{34} -C_{40}	mg/kg	<100	<100	<100	<100	<100
Total +ve TRH (>C10-C40)	mg/kg	<50	<50	<50	100	<50
Surrogate o-Terphenyl	%	89	86	86	98	86

svTRH (C10-C40) in Soil						
Our Reference		270252-6	270252-7	270252-8	270252-9	270252-10
Your Reference	UNITS	34	35	36	36	37
Depth		0.4-0.5	0-0.1	0.1-0.2	0.4-0.5	0.1-0.2
Date Sampled		24/05/2021	24/05/2021	25/05/2021	25/05/2021	25/05/2021
Type of sample		Soil	Soil	Soil	Soil	Soil
Date extracted	-	31/05/2021	31/05/2021	31/05/2021	31/05/2021	31/05/2021
Date analysed	-	01/06/2021	01/06/2021	02/06/2021	02/06/2021	03/06/2021
TRH C_{10} - C_{14}	mg/kg	<50	<50	<50	<50	<50
TRH C_{15} - C_{28}	mg/kg	<100	<100	<100	<100	<100
TRH C_{29} - C_{36}	mg/kg	<100	<100	<100	<100	<100
TRH >C_{10} -C_{16}	mg/kg	<50	<50	<50	<50	<50
TRH >C_{10} - C_{16} less Naphthalene (F2)	mg/kg	<50	<50	<50	<50	<50
TRH >C_{16} -C_{34}	mg/kg	<100	<100	<100	<100	<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	%	95	85	106	106	105

svTRH (C10-C40) in Soil						
Our Reference		270252-11	270252-12	270252-13	270252-14	270252-15
Your Reference	UNITS	38	38	39	40	40
Depth		0.1-0.2	0.5-0.6	0-0.1	0-0.1	1.5-1.6
Date Sampled		24/05/2021	24/05/2021	24/05/2021	24/05/2021	24/05/2021
Type of sample		Soil	Soil	Soil	Soil	Soil
Date extracted	-	31/05/2021	31/05/2021	31/05/2021	31/05/2021	31/05/2021
Date analysed	-	03/06/2021	03/06/2021	03/06/2021	03/06/2021	03/06/2021
TRH C_{10} - C_{14}	mg/kg	<50	<50	<50	<50	<50
TRH C_{15} - C_{28}	mg/kg	<100	<100	<100	<100	<100
TRH C_{29} - C_{36}	mg/kg	<100	<100	<100	<100	<100
TRH >C_{10} -C_{16}	mg/kg	<50	<50	<50	<50	<50
TRH >C_{10} - C_{16} less Naphthalene (F2)	mg/kg	<50	<50	<50	<50	<50
TRH >C_{16} -C_{34}	mg/kg	<100	<100	<100	<100	<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	%	104	106	108	108	104

svTRH (C10-C40) in Soil						
Our Reference		270252-16	270252-17	270252-18	270252-19	270252-20
Your Reference	UNITS	41	42	42	43	44
Depth		0.1-0.2	0.4-0.5	0.6-0.7	0.1-0.2	0.1-0.2
Date Sampled		24/05/2021	24/05/2021	24/05/2021	24/05/2021	24/05/2021
Type of sample		Soil	Soil	Soil	Soil	Soil
Date extracted	-	31/05/2021	31/05/2021	31/05/2021	31/05/2021	31/05/2021
Date analysed	-	03/06/2021	03/06/2021	03/06/2021	03/06/2021	03/06/2021
TRH C_{10} - C_{14}	mg/kg	<50	<50	<50	<50	<50
TRH C_{15} - C_{28}	mg/kg	<100	<100	<100	<100	<100
TRH C_{29} - C_{36}	mg/kg	<100	<100	<100	<100	<100
TRH >C_{10} -C_{16}	mg/kg	<50	<50	<50	<50	<50
TRH >C_{10} - C_{16} less Naphthalene (F2)	mg/kg	<50	<50	<50	<50	<50
TRH >C_{16} -C_{34}	mg/kg	<100	<100	<100	<100	<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	%	109	104	105	105	108

svTRH (C10-C40) in Soil						
Our Reference		270252-21	270252-22	270252-23	270252-24	270252-25
Your Reference	UNITS	44	45	46	46	47
Depth		0.8-0.9	0-0.1	0-0.1	1-1.1	0-0.1
Date Sampled		24/05/2021	24/05/2021	24/05/2021	24/05/2021	25/05/2021
Type of sample		Soil	Soil	Soil	Soil	Soil
Date extracted	-	31/05/2021	31/05/2021	31/05/2021	31/05/2021	31/05/2021
Date analysed	-	03/06/2021	03/06/2021	03/06/2021	03/06/2021	03/06/2021
TRH C_{10} - C_{14}	mg/kg	<50	<50	<50	<50	<50
TRH C_{15} - C_{28}	mg/kg	<100	<100	<100	<100	<100
TRH C_{29} - C_{36}	mg/kg	<100	<100	<100	<100	<100
TRH >C_{10} -C_{16}	mg/kg	<50	<50	<50	<50	<50
TRH >C_{10} - C_{16} less Naphthalene (F2)	mg/kg	<50	<50	<50	<50	<50
TRH >C_{16} -C_{34}	mg/kg	<100	<100	<100	<100	<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	%	108	106	106	104	105

svTRH (C10-C40) in Soil						
Our Reference		270252-26	270252-27	270252-28	270252-29	270252-33
Your Reference	UNITS	48	48	49	50	BD6/20210525
Depth		0-0.1	1.1-1.2	0-0.1	0-0.1	-
Date Sampled		25/05/2021	25/05/2021	25/05/2021	25/05/2021	25/05/2021
Type of sample		Soil	Soil	Soil	Soil	Soil
Date extracted	-	31/05/2021	31/05/2021	31/05/2021	31/05/2021	31/05/2021
Date analysed	-	03/06/2021	03/06/2021	03/06/2021	02/06/2021	02/06/2021
TRH C_{10} - C_{14}	mg/kg	<50	<50	<50	<50	<50
TRH C_{15} - C_{28}	mg/kg	<100	<100	<100	<100	<100
TRH C_{29} - C_{36}	mg/kg	<100	<100	<100	<100	<100
TRH >C_{10} -C_{16}	mg/kg	<50	<50	<50	<50	<50
TRH >C_{10} - C_{16} less Naphthalene (F2)	mg/kg	<50	<50	<50	<50	<50
TRH >C_{16} -C_{34}	mg/kg	<100	<100	<100	<100	<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	%	104	107	106	85	85

svTRH (C10-C40) in Soil		
Our Reference		270252-34
Your Reference	UNITS	BD2/20210524
Depth		-
Date Sampled		24/05/2021
Type of sample		Soil
Date extracted	-	31/05/2021
Date analysed	-	02/06/2021
TRH C_{10} - C_{14}	mg/kg	<50
TRH C_{15} - C_{28}	mg/kg	<100
TRH C_{29} - C_{36}	mg/kg	<100
TRH >C_{10} -C_{16}	mg/kg	<50
TRH >C_{10} - C_{16} less Naphthalene (F2)	mg/kg	<50
TRH >C_{16} -C_{34}	mg/kg	<100
TRH >C_{34} -C_{40}	mg/kg	<100
Total +ve TRH (>C10-C40)	mg/kg	<50
Surrogate o-Terphenyl	%	92

PAHs in Soil						
Our Reference		270252-1	270252-2	270252-3	270252-4	270252-5
Your Reference	UNITS	31	32	32	33	34
Depth		0-0.1	0-0.1	1.5-1.6	0-0.1	0-0.1
Date Sampled		25/05/2021	25/05/2021	25/05/2021	25/05/2021	24/05/2021
Type of sample		Soil	Soil	Soil	Soil	Soil
Date extracted	-	31/05/2021	31/05/2021	31/05/2021	31/05/2021	31/05/2021
Date analysed	-	02/06/2021	02/06/2021	02/06/2021	02/06/2021	02/06/2021
Naphthalene	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Acenaphthylene	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Acenaphthene	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Fluorene	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Phenanthrene	mg/kg	<0.1	<0.1	<0.1	<0.1	<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
Dibenzo(a,h)anthracene	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Indeno(1,2,3-c,d)pyrene	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
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
Total +ve PAH's	mg/kg	<0.05	<0.05	<0.05	<0.05	<0.05
Surrogate p-Terphenyl-d14	%	118	118	117	112	121

PAHs in Soil						
Our Reference		270252-6	270252-7	270252-8	270252-9	270252-10
Your Reference	UNITS	34	35	36	36	37
Depth		0.4-0.5	0-0.1	0.1-0.2	0.4-0.5	0.1-0.2
Date Sampled		24/05/2021	24/05/2021	25/05/2021	25/05/2021	25/05/2021
Type of sample		Soil	Soil	Soil	Soil	Soil
Date extracted	-	31/05/2021	31/05/2021	31/05/2021	31/05/2021	31/05/2021
Date analysed	-	02/06/2021	02/06/2021	02/06/2021	02/06/2021	02/06/2021
Naphthalene	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Acenaphthylene	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Acenaphthene	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Fluorene	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Phenanthrene	mg/kg	<0.1	<0.1	<0.1	<0.1	<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
Dibenzo(a,h)anthracene	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Indeno(1,2,3-c,d)pyrene	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
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
Total +ve PAH's	mg/kg	<0.05	<0.05	<0.05	<0.05	<0.05
Surrogate p-Terphenyl-d14	%	112	121	119	121	98

PAHs in Soil						
Our Reference		270252-11	270252-12	270252-13	270252-14	270252-15
Your Reference	UNITS	38	38	39	40	40
Depth		0.1-0.2	0.5-0.6	0-0.1	0-0.1	1.5-1.6
Date Sampled		24/05/2021	24/05/2021	24/05/2021	24/05/2021	24/05/2021
Type of sample		Soil	Soil	Soil	Soil	Soil
Date extracted	-	31/05/2021	31/05/2021	31/05/2021	31/05/2021	31/05/2021
Date analysed	-	02/06/2021	02/06/2021	02/06/2021	02/06/2021	02/06/2021
Naphthalene	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Acenaphthylene	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Acenaphthene	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Fluorene	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Phenanthrene	mg/kg	<0.1	<0.1	<0.1	<0.1	<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
Dibenzo(a,h)anthracene	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Indeno(1,2,3-c,d)pyrene	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
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
Total +ve PAH's	mg/kg	<0.05	<0.05	<0.05	<0.05	<0.05
Surrogate p-Terphenyl-d14	%	120	122	121	124	116

PAHs in Soil						
Our Reference		270252-16	270252-17	270252-18	270252-19	270252-20
Your Reference	UNITS	41	42	42	43	44
Depth		0.1-0.2	0.4-0.5	0.6-0.7	0.1-0.2	0.1-0.2
Date Sampled		24/05/2021	24/05/2021	24/05/2021	24/05/2021	24/05/2021
Type of sample		Soil	Soil	Soil	Soil	Soil
Date extracted	-	31/05/2021	31/05/2021	31/05/2021	31/05/2021	31/05/2021
Date analysed	-	02/06/2021	02/06/2021	02/06/2021	02/06/2021	02/06/2021
Naphthalene	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Acenaphthylene	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Acenaphthene	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Fluorene	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Phenanthrene	mg/kg	<0.1	<0.1	<0.1	<0.1	<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
Dibenzo(a,h)anthracene	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Indeno(1,2,3-c,d)pyrene	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
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
Total +ve PAH's	mg/kg	<0.05	<0.05	<0.05	<0.05	<0.05
Surrogate p-Terphenyl-d14	%	131	115	120	119	118

PAHs in Soil						
Our Reference		270252-21	270252-22	270252-23	270252-24	270252-25
Your Reference	UNITS	44	45	46	46	47
Depth		0.8-0.9	0-0.1	0-0.1	1-1.1	0-0.1
Date Sampled		24/05/2021	24/05/2021	24/05/2021	24/05/2021	25/05/2021
Type of sample		Soil	Soil	Soil	Soil	Soil
Date extracted	-	31/05/2021	31/05/2021	31/05/2021	31/05/2021	31/05/2021
Date analysed	-	02/06/2021	02/06/2021	03/06/2021	03/06/2021	03/06/2021
Naphthalene	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Acenaphthylene	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Acenaphthene	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Fluorene	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Phenanthrene	mg/kg	<0.1	<0.1	<0.1	<0.1	<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
Dibenzo(a,h)anthracene	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Indeno(1,2,3-c,d)pyrene	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
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
Total +ve PAH's	mg/kg	<0.05	<0.05	<0.05	<0.05	<0.05
Surrogate p-Terphenyl-d14	%	127	116	124	120	119

PAHs in Soil						
Our Reference		270252-26	270252-27	270252-28	270252-29	270252-33
Your Reference	UNITS	48	48	49	50	BD6/20210525
Depth		0-0.1	1.1-1.2	0-0.1	0-0.1	-
Date Sampled		25/05/2021	25/05/2021	25/05/2021	25/05/2021	25/05/2021
Type of sample		Soil	Soil	Soil	Soil	Soil
Date extracted	-	31/05/2021	31/05/2021	31/05/2021	31/05/2021	31/05/2021
Date analysed	-	03/06/2021	03/06/2021	03/06/2021	03/06/2021	03/06/2021
Naphthalene	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Acenaphthylene	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Acenaphthene	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Fluorene	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Phenanthrene	mg/kg	<0.1	<0.1	<0.1	<0.1	<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
Dibenzo(a,h)anthracene	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Indeno(1,2,3-c,d)pyrene	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
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
Total +ve PAH's	mg/kg	<0.05	<0.05	<0.05	<0.05	<0.05
Surrogate p-Terphenyl-d14	%	116	120	123	119	118

PAHs in Soil		
Our Reference		270252-34
Your Reference	UNITS	BD2/20210524
Depth		-
Date Sampled		24/05/2021
Type of sample		Soil
Date extracted	-	31/05/2021
Date analysed	-	03/06/2021
Naphthalene	mg/kg	<0.1
Acenaphthylene	mg/kg	<0.1
Acenaphthene	mg/kg	<0.1
Fluorene	mg/kg	<0.1
Phenanthrene	mg/kg	<0.1
Anthracene	mg/kg	<0.1
Fluoranthene	mg/kg	<0.1
Pyrene	mg/kg	<0.1
Benzo(a)anthracene	mg/kg	<0.1
Chrysene	mg/kg	<0.1
Benzo(b,j+k)fluoranthene	mg/kg	<0.2
Benzo(a)pyrene	mg/kg	<0.05
Dibenzo(a,h)anthracene	mg/kg	<0.1
Indeno(1,2,3-c,d)pyrene	mg/kg	<0.1
Benzo(g,h,i)perylene	mg/kg	<0.1
Benzo(a)pyrene TEQ calc (zero)	mg/kg	<0.5
Benzo(a)pyrene TEQ calc(half)	mg/kg	<0.5
Benzo(a)pyrene TEQ calc(PQL)	mg/kg	<0.5
Total +ve PAH's	mg/kg	<0.05
Surrogate p-Terphenyl-d14	%	123

Organochlorine Pesticides in soil						
Our Reference		270252-1	270252-2	270252-4	270252-5	270252-7
Your Reference	UNITS	31	32	33	34	35
Depth		0-0.1	0-0.1	0-0.1	0-0.1	0-0.1
Date Sampled		25/05/2021	25/05/2021	25/05/2021	24/05/2021	24/05/2021
Type of sample		Soil	Soil	Soil	Soil	Soil
Date extracted	-	31/05/2021	31/05/2021	31/05/2021	31/05/2021	31/05/2021
Date analysed	-	02/06/2021	02/06/2021	02/06/2021	02/06/2021	02/06/2021
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	%	117	128	121	125	136

Organochlorine Pesticides in soil						
Our Reference		270252-8	270252-10	270252-11	270252-13	270252-14
Your Reference	UNITS	36	37	38	39	40
Depth		0.1-0.2	0.1-0.2	0.1-0.2	0-0.1	0-0.1
Date Sampled		25/05/2021	25/05/2021	24/05/2021	24/05/2021	24/05/2021
Type of sample		Soil	Soil	Soil	Soil	Soil
Date extracted	-	31/05/2021	31/05/2021	31/05/2021	31/05/2021	31/05/2021
Date analysed	-	02/06/2021	02/06/2021	02/06/2021	02/06/2021	02/06/2021
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	%	119	95	126	134	132

Organochlorine Pesticides in soil						
Our Reference		270252-16	270252-17	270252-19	270252-20	270252-22
Your Reference	UNITS	41	42	43	44	45
Depth		0.1-0.2	0.4-0.5	0.1-0.2	0.1-0.2	0-0.1
Date Sampled		24/05/2021	24/05/2021	24/05/2021	24/05/2021	24/05/2021
Type of sample		Soil	Soil	Soil	Soil	Soil
Date extracted	-	31/05/2021	31/05/2021	31/05/2021	31/05/2021	31/05/2021
Date analysed	-	02/06/2021	02/06/2021	02/06/2021	02/06/2021	02/06/2021
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	%	131	133	113	130	132

Organochlorine Pesticides in soil						
Our Reference		270252-23	270252-25	270252-26	270252-28	270252-29
Your Reference	UNITS	46	47	48	49	50
Depth		0-0.1	0-0.1	0-0.1	0-0.1	0-0.1
Date Sampled		24/05/2021	25/05/2021	25/05/2021	25/05/2021	25/05/2021
Type of sample		Soil	Soil	Soil	Soil	Soil
Date extracted	-	31/05/2021	31/05/2021	31/05/2021	31/05/2021	31/05/2021
Date analysed	-	03/06/2021	03/06/2021	03/06/2021	03/06/2021	03/06/2021
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	%	104	103	102	100	107

Organophosphorus Pesticides in Soil						
Our Reference		270252-1	270252-2	270252-4	270252-5	270252-7
Your Reference	UNITS	31	32	33	34	35
Depth		0-0.1	0-0.1	0-0.1	0-0.1	0-0.1
Date Sampled		25/05/2021	25/05/2021	25/05/2021	24/05/2021	24/05/2021
Type of sample		Soil	Soil	Soil	Soil	Soil
Date extracted	-	31/05/2021	31/05/2021	31/05/2021	31/05/2021	31/05/2021
Date analysed	-	02/06/2021	02/06/2021	02/06/2021	02/06/2021	02/06/2021
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	%	117	128	121	125	136

Organophosphorus Pesticides in Soil						
Our Reference		270252-8	270252-10	270252-11	270252-13	270252-14
Your Reference	UNITS	36	37	38	39	40
Depth		0.1-0.2	0.1-0.2	0.1-0.2	0-0.1	0-0.1
Date Sampled		25/05/2021	25/05/2021	24/05/2021	24/05/2021	24/05/2021
Type of sample		Soil	Soil	Soil	Soil	Soil
Date extracted	-	31/05/2021	31/05/2021	31/05/2021	31/05/2021	31/05/2021
Date analysed	-	02/06/2021	02/06/2021	02/06/2021	02/06/2021	02/06/2021
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	%	119	95	126	134	132

Organophosphorus Pesticides in Soil						
Our Reference		270252-16	270252-17	270252-19	270252-20	270252-22
Your Reference	UNITS	41	42	43	44	45
Depth		0.1-0.2	0.4-0.5	0.1-0.2	0.1-0.2	0-0.1
Date Sampled		24/05/2021	24/05/2021	24/05/2021	24/05/2021	24/05/2021
Type of sample		Soil	Soil	Soil	Soil	Soil
Date extracted	-	31/05/2021	31/05/2021	31/05/2021	31/05/2021	31/05/2021
Date analysed	-	02/06/2021	02/06/2021	02/06/2021	02/06/2021	02/06/2021
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	%	131	133	113	130	132

Organophosphorus Pesticides in Soil						
Our Reference		270252-23	270252-25	270252-26	270252-28	270252-29
Your Reference	UNITS	46	47	48	49	50
Depth		0-0.1	0-0.1	0-0.1	0-0.1	0-0.1
Date Sampled		24/05/2021	25/05/2021	25/05/2021	25/05/2021	25/05/2021
Type of sample		Soil	Soil	Soil	Soil	Soil
Date extracted	-	31/05/2021	31/05/2021	31/05/2021	31/05/2021	31/05/2021
Date analysed	-	03/06/2021	03/06/2021	03/06/2021	03/06/2021	03/06/2021
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	%	104	103	102	100	107

PCBs in Soil						
Our Reference		270252-1	270252-2	270252-4	270252-5	270252-7
Your Reference	UNITS	31	32	33	34	35
Depth		0-0.1	0-0.1	0-0.1	0-0.1	0-0.1
Date Sampled		25/05/2021	25/05/2021	25/05/2021	24/05/2021	24/05/2021
Type of sample		Soil	Soil	Soil	Soil	Soil
Date extracted	-	31/05/2021	31/05/2021	31/05/2021	31/05/2021	31/05/2021
Date analysed	-	02/06/2021	02/06/2021	02/06/2021	02/06/2021	02/06/2021
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	%	117	128	121	125	136

PCBs in Soil						
Our Reference		270252-8	270252-10	270252-11	270252-13	270252-14
Your Reference	UNITS	36	37	38	39	40
Depth		0.1-0.2	0.1-0.2	0.1-0.2	0-0.1	0-0.1
Date Sampled		25/05/2021	25/05/2021	24/05/2021	24/05/2021	24/05/2021
Type of sample		Soil	Soil	Soil	Soil	Soil
Date extracted	-	31/05/2021	31/05/2021	31/05/2021	31/05/2021	31/05/2021
Date analysed	-	02/06/2021	02/06/2021	02/06/2021	02/06/2021	02/06/2021
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	%	119	95	126	134	132

PCBs in Soil						
Our Reference		270252-16	270252-17	270252-19	270252-20	270252-22
Your Reference	UNITS	41	42	43	44	45
Depth		0.1-0.2	0.4-0.5	0.1-0.2	0.1-0.2	0-0.1
Date Sampled		24/05/2021	24/05/2021	24/05/2021	24/05/2021	24/05/2021
Type of sample		Soil	Soil	Soil	Soil	Soil
Date extracted	-	31/05/2021	31/05/2021	31/05/2021	31/05/2021	31/05/2021
Date analysed	-	02/06/2021	02/06/2021	02/06/2021	02/06/2021	02/06/2021
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	%	131	133	113	130	132

PCBs in Soil						
Our Reference		270252-23	270252-25	270252-26	270252-28	270252-29
Your Reference	UNITS	46	47	48	49	50
Depth		0-0.1	0-0.1	0-0.1	0-0.1	0-0.1
Date Sampled		24/05/2021	25/05/2021	25/05/2021	25/05/2021	25/05/2021
Type of sample		Soil	Soil	Soil	Soil	Soil
Date extracted	-	31/05/2021	31/05/2021	31/05/2021	31/05/2021	31/05/2021
Date analysed	-	03/06/2021	03/06/2021	03/06/2021	03/06/2021	03/06/2021
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	%	104	103	102	100	107

Misc Soil - Inorg						
Our Reference		270252-1	270252-2	270252-4	270252-5	270252-7
Your Reference	UNITS	31	32	33	34	35
Depth		0-0.1	0-0.1	0-0.1	0-0.1	0-0.1
Date Sampled		25/05/2021	25/05/2021	25/05/2021	24/05/2021	24/05/2021
Type of sample		Soil	Soil	Soil	Soil	Soil
Date prepared	-	01/06/2021	01/06/2021	01/06/2021	01/06/2021	01/06/2021
Date analysed	-	01/06/2021	01/06/2021	01/06/2021	01/06/2021	01/06/2021
Total Phenolics (as Phenol)	mg/kg	<5	<5	<5	<5	<5

Misc Soil - Inorg						
Our Reference		270252-8	270252-10	270252-11	270252-13	270252-14
Your Reference	UNITS	36	37	38	39	40
Depth		0.1-0.2	0.1-0.2	0.1-0.2	0-0.1	0-0.1
Date Sampled		25/05/2021	25/05/2021	24/05/2021	24/05/2021	24/05/2021
Type of sample		Soil	Soil	Soil	Soil	Soil
Date prepared	-	01/06/2021	01/06/2021	01/06/2021	01/06/2021	01/06/2021
Date analysed	-	01/06/2021	01/06/2021	01/06/2021	01/06/2021	01/06/2021
Total Phenolics (as Phenol)	mg/kg	<5	<5	<5	<5	<5

Misc Soil - Inorg						
Our Reference		270252-16	270252-17	270252-19	270252-20	270252-22
Your Reference	UNITS	41	42	43	44	45
Depth		0.1-0.2	0.4-0.5	0.1-0.2	0.1-0.2	0-0.1
Date Sampled		24/05/2021	24/05/2021	24/05/2021	24/05/2021	24/05/2021
Type of sample		Soil	Soil	Soil	Soil	Soil
Date prepared	-	01/06/2021	01/06/2021	01/06/2021	01/06/2021	01/06/2021
Date analysed	-	01/06/2021	01/06/2021	01/06/2021	01/06/2021	01/06/2021
Total Phenolics (as Phenol)	mg/kg	<5	<5	<5	<5	<5

Misc Soil - Inorg						
Our Reference		270252-23	270252-25	270252-26	270252-28	270252-29
Your Reference	UNITS	46	47	48	49	50
Depth		0-0.1	0-0.1	0-0.1	0-0.1	0-0.1
Date Sampled		24/05/2021	25/05/2021	25/05/2021	25/05/2021	25/05/2021
Type of sample		Soil	Soil	Soil	Soil	Soil
Date prepared	-	01/06/2021	01/06/2021	01/06/2021	01/06/2021	01/06/2021
Date analysed	-	01/06/2021	01/06/2021	01/06/2021	01/06/2021	01/06/2021
Total Phenolics (as Phenol)	mg/kg	<5	<5	<5	<5	<5

Acid Extractable metals in soil						
Our Reference		270252-1	270252-2	270252-3	270252-4	270252-5
Your Reference	UNITS	31	32	32	33	34
Depth		0-0.1	0-0.1	1.5-1.6	0-0.1	0-0.1
Date Sampled		25/05/2021	25/05/2021	25/05/2021	25/05/2021	24/05/2021
Type of sample		Soil	Soil	Soil	Soil	Soil
Date prepared	-	03/06/2021	03/06/2021	03/06/2021	03/06/2021	03/06/2021
Date analysed	-	03/06/2021	03/06/2021	03/06/2021	03/06/2021	03/06/2021
Arsenic	mg/kg	<4	<4	<4	<4	4
Cadmium	mg/kg	<0.4	<0.4	<0.4	<0.4	<0.4
Chromium	mg/kg	12	12	15	11	13
Copper	mg/kg	13	16	7	9	12
Lead	mg/kg	11	13	10	13	13
Mercury	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Nickel	mg/kg	8	11	6	8	11
Zinc	mg/kg	38	36	18	43	35

Acid Extractable metals in soil						
Our Reference		270252-6	270252-7	270252-8	270252-9	270252-10
Your Reference	UNITS	34	35	36	36	37
Depth		0.4-0.5	0-0.1	0.1-0.2	0.4-0.5	0.1-0.2
Date Sampled		24/05/2021	24/05/2021	25/05/2021	25/05/2021	25/05/2021
Type of sample		Soil	Soil	Soil	Soil	Soil
Date prepared	-	03/06/2021	03/06/2021	03/06/2021	03/06/2021	03/06/2021
Date analysed	-	03/06/2021	03/06/2021	03/06/2021	03/06/2021	03/06/2021
Arsenic	mg/kg	<4	<4	<4	<4	<4
Cadmium	mg/kg	<0.4	<0.4	<0.4	<0.4	<0.4
Chromium	mg/kg	9	11	9	6	10
Copper	mg/kg	7	10	8	5	9
Lead	mg/kg	10	19	10	4	13
Mercury	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Nickel	mg/kg	6	7	6	4	6
Zinc	mg/kg	18	39	23	20	28

Acid Extractable metals in soil						
Our Reference		270252-11	270252-12	270252-13	270252-14	270252-15
Your Reference	UNITS	38	38	39	40	40
Depth		0.1-0.2	0.5-0.6	0-0.1	0-0.1	1.5-1.6
Date Sampled		24/05/2021	24/05/2021	24/05/2021	24/05/2021	24/05/2021
Type of sample		Soil	Soil	Soil	Soil	Soil
Date prepared	-	03/06/2021	03/06/2021	03/06/2021	03/06/2021	03/06/2021
Date analysed	-	03/06/2021	03/06/2021	03/06/2021	03/06/2021	03/06/2021
Arsenic	mg/kg	<4	<4	<4	<4	<4
Cadmium	mg/kg	<0.4	<0.4	<0.4	<0.4	<0.4
Chromium	mg/kg	11	10	12	6	10
Copper	mg/kg	8	5	10	7	7
Lead	mg/kg	13	9	12	8	8
Mercury	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Nickel	mg/kg	7	4	6	6	7
Zinc	mg/kg	29	11	28	21	24

Acid Extractable metals in soil						
Our Reference		270252-16	270252-17	270252-18	270252-19	270252-20
Your Reference	UNITS	41	42	42	43	44
Depth		0.1-0.2	0.4-0.5	0.6-0.7	0.1-0.2	0.1-0.2
Date Sampled		24/05/2021	24/05/2021	24/05/2021	24/05/2021	24/05/2021
Type of sample		Soil	Soil	Soil	Soil	Soil
Date prepared	-	03/06/2021	03/06/2021	03/06/2021	03/06/2021	03/06/2021
Date analysed	-	03/06/2021	03/06/2021	03/06/2021	03/06/2021	03/06/2021
Arsenic	mg/kg	<4	<4	<4	<4	<4
Cadmium	mg/kg	<0.4	<0.4	<0.4	<0.4	<0.4
Chromium	mg/kg	11	3	8	11	11
Copper	mg/kg	11	2	6	7	7
Lead	mg/kg	12	3	6	12	11
Mercury	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Nickel	mg/kg	7	1	5	6	6
Zinc	mg/kg	32	11	25	20	23

Acid Extractable metals in soil						
Our Reference		270252-21	270252-22	270252-23	270252-24	270252-25
Your Reference	UNITS	44	45	46	46	47
Depth		0.8-0.9	0-0.1	0-0.1	1-1.1	0-0.1
Date Sampled		24/05/2021	24/05/2021	24/05/2021	24/05/2021	25/05/2021
Type of sample		Soil	Soil	Soil	Soil	Soil
Date prepared	-	03/06/2021	03/06/2021	03/06/2021	03/06/2021	03/06/2021
Date analysed	-	03/06/2021	03/06/2021	03/06/2021	03/06/2021	03/06/2021
Arsenic	mg/kg	<4	<4	<4	<4	<4
Cadmium	mg/kg	<0.4	<0.4	<0.4	<0.4	<0.4
Chromium	mg/kg	7	8	6	12	7
Copper	mg/kg	5	6	38	7	13
Lead	mg/kg	5	9	8	9	8
Mercury	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Nickel	mg/kg	4	6	5	6	4
Zinc	mg/kg	19	16	29	18	17

Acid Extractable metals in soil						
Our Reference		270252-26	270252-27	270252-28	270252-29	270252-33
Your Reference	UNITS	48	48	49	50	BD6/20210525
Depth		0-0.1	1.1-1.2	0-0.1	0-0.1	-
Date Sampled		25/05/2021	25/05/2021	25/05/2021	25/05/2021	25/05/2021
Type of sample		Soil	Soil	Soil	Soil	Soil
Date prepared	-	03/06/2021	03/06/2021	03/06/2021	03/06/2021	03/06/2021
Date analysed	-	03/06/2021	03/06/2021	03/06/2021	03/06/2021	03/06/2021
Arsenic	mg/kg	<4	<4	<4	<4	<4
Cadmium	mg/kg	<0.4	<0.4	<0.4	<0.4	<0.4
Chromium	mg/kg	10	15	10	8	15
Copper	mg/kg	8	9	10	7	7
Lead	mg/kg	10	10	9	8	10
Mercury	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Nickel	mg/kg	7	7	7	5	6
Zinc	mg/kg	25	22	23	17	18

Acid Extractable metals in soil		
Our Reference		270252-34
Your Reference	UNITS	BD2/20210524
Depth		-
Date Sampled		24/05/2021
Type of sample		Soil
Date prepared	-	03/06/2021
Date analysed	-	03/06/2021
Arsenic	mg/kg	<4
Cadmium	mg/kg	<0.4
Chromium	mg/kg	16
Copper	mg/kg	9
Lead	mg/kg	12
Mercury	mg/kg	<0.1
Nickel	mg/kg	8
Zinc	mg/kg	21

Moisture						
Our Reference		270252-1	270252-2	270252-3	270252-4	270252-5
Your Reference	UNITS	31	32	32	33	34
Depth		0-0.1	0-0.1	1.5-1.6	0-0.1	0-0.1
Date Sampled		25/05/2021	25/05/2021	25/05/2021	25/05/2021	24/05/2021
Type of sample		Soil	Soil	Soil	Soil	Soil
Date prepared	-	31/05/2021	31/05/2021	31/05/2021	31/05/2021	31/05/2021
Date analysed	-	01/06/2021	01/06/2021	01/06/2021	01/06/2021	01/06/2021
Moisture	%	13	14	14	18	13

Moisture						
Our Reference		270252-6	270252-7	270252-8	270252-9	270252-10
Your Reference	UNITS	34	35	36	36	37
Depth		0.4-0.5	0-0.1	0.1-0.2	0.4-0.5	0.1-0.2
Date Sampled		24/05/2021	24/05/2021	25/05/2021	25/05/2021	25/05/2021
Type of sample		Soil	Soil	Soil	Soil	Soil
Date prepared	-	31/05/2021	31/05/2021	31/05/2021	31/05/2021	31/05/2021
Date analysed	-	01/06/2021	01/06/2021	01/06/2021	01/06/2021	01/06/2021
Moisture	%	14	16	9.5	6.4	15

Moisture						
Our Reference		270252-11	270252-12	270252-13	270252-14	270252-15
Your Reference	UNITS	38	38	39	40	40
Depth		0.1-0.2	0.5-0.6	0-0.1	0-0.1	1.5-1.6
Date Sampled		24/05/2021	24/05/2021	24/05/2021	24/05/2021	24/05/2021
Type of sample		Soil	Soil	Soil	Soil	Soil
Date prepared	-	31/05/2021	31/05/2021	31/05/2021	31/05/2021	31/05/2021
Date analysed	-	01/06/2021	01/06/2021	01/06/2021	01/06/2021	01/06/2021
Moisture	%	14	9.3	13	9.7	12

Moisture						
Our Reference		270252-16	270252-17	270252-18	270252-19	270252-20
Your Reference	UNITS	41	42	42	43	44
Depth		0.1-0.2	0.4-0.5	0.6-0.7	0.1-0.2	0.1-0.2
Date Sampled		24/05/2021	24/05/2021	24/05/2021	24/05/2021	24/05/2021
Type of sample		Soil	Soil	Soil	Soil	Soil
Date prepared	-	31/05/2021	31/05/2021	31/05/2021	31/05/2021	31/05/2021
Date analysed	-	01/06/2021	01/06/2021	01/06/2021	01/06/2021	01/06/2021
Moisture	%	7.2	9.6	7.3	20	12

Moisture						
Our Reference		270252-21	270252-22	270252-23	270252-24	270252-25
Your Reference	UNITS	44	45	46	46	47
Depth		0.8-0.9	0-0.1	0-0.1	1-1.1	0-0.1
Date Sampled		24/05/2021	24/05/2021	24/05/2021	24/05/2021	25/05/2021
Type of sample		Soil	Soil	Soil	Soil	Soil
Date prepared	-	31/05/2021	31/05/2021	31/05/2021	31/05/2021	31/05/2021
Date analysed	-	01/06/2021	01/06/2021	01/06/2021	01/06/2021	01/06/2021
Moisture	%	5.9	11	13	10	13

Moisture						
Our Reference		270252-26	270252-27	270252-28	270252-29	270252-33
Your Reference	UNITS	48	48	49	50	BD6/20210525
Depth		0-0.1	1.1-1.2	0-0.1	0-0.1	-
Date Sampled		25/05/2021	25/05/2021	25/05/2021	25/05/2021	25/05/2021
Type of sample		Soil	Soil	Soil	Soil	Soil
Date prepared	-	31/05/2021	31/05/2021	31/05/2021	31/05/2021	31/05/2021
Date analysed	-	01/06/2021	01/06/2021	01/06/2021	01/06/2021	01/06/2021
Moisture	%	12	13	9.6	8.5	13

Moisture		
Our Reference		270252-34
Your Reference	UNITS	BD2/20210524
Depth		-
Date Sampled		24/05/2021
Type of sample		Soil
Date prepared	-	31/05/2021
Date analysed	-	01/06/2021
Moisture	%	29

Asbestos ID - soils						
Our Reference		270252-1	270252-2	270252-4	270252-5	270252-7
Your Reference	UNITS	31	32	33	34	35
Depth		0-0.1	0-0.1	0-0.1	0-0.1	0-0.1
Date Sampled		25/05/2021	25/05/2021	25/05/2021	24/05/2021	24/05/2021
Type of sample		Soil	Soil	Soil	Soil	Soil
Date analysed	-	03/06/2021	03/06/2021	03/06/2021	03/06/2021	03/06/2021
Sample mass tested	g	Approx. 35g	Approx. 30g	Approx. 35g	Approx. 30g	Approx. 20g
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		270252-8	270252-10	270252-11	270252-13	270252-14
Your Reference	UNITS	36	37	38	39	40
Depth		0.1-0.2	0.1-0.2	0.1-0.2	0-0.1	0-0.1
Date Sampled		25/05/2021	25/05/2021	24/05/2021	24/05/2021	24/05/2021
Type of sample		Soil	Soil	Soil	Soil	Soil
Date analysed	-	03/06/2021	03/06/2021	03/06/2021	03/06/2021	03/06/2021
Sample mass tested	g	Approx. 50g	Approx. 35g	Approx. 30g	Approx. 35g	Approx. 30g
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		270252-16	270252-17	270252-19	270252-20	270252-22
Your Reference	UNITS	41	42	43	44	45
Depth		0.1-0.2	0.4-0.5	0.1-0.2	0.1-0.2	0-0.1
Date Sampled		24/05/2021	24/05/2021	24/05/2021	24/05/2021	24/05/2021
Type of sample		Soil	Soil	Soil	Soil	Soil
Date analysed	-	03/06/2021	03/06/2021	03/06/2021	03/06/2021	03/06/2021
Sample mass tested	g	Approx. 30g	Approx. 30g	Approx. 35g	Approx. 40g	Approx. 30g
Sample Description	-	Brown coarse-grained soil & rocks	Beige sandy soil	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		270252-23	270252-25	270252-26	270252-28	270252-29
Your Reference	UNITS	46	47	48	49	50
Depth		0-0.1	0-0.1	0-0.1	0-0.1	0-0.1
Date Sampled		24/05/2021	25/05/2021	25/05/2021	25/05/2021	25/05/2021
Type of sample		Soil	Soil	Soil	Soil	Soil
Date analysed	-	03/06/2021	03/06/2021	03/06/2021	03/06/2021	03/06/2021
Sample mass tested	g	Approx. 30g	Approx. 35g	Approx. 40g	Approx. 50g	Approx. 35g
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 - materials		
Our Reference		270252-32
Your Reference	UNITS	A01
Depth		-
Date Sampled		25/05/2021
Type of sample		Material
Date analysed	-	04/06/2021
Mass / Dimension of Sample	-	80x60x5mm
Sample Description	-	Beige fibre cement material
Asbestos ID in materials	-	No asbestos detected Organic fibres detected
Trace Analysis	-	No asbestos detected

Method ID	Methodology Summary
ASB-001	Asbestos ID - Qualitative identification of asbestos in bulk samples using Polarised Light Microscopy and Dispersion Staining Techniques including Synthetic Mineral Fibre and Organic Fibre as per Australian Standard 4964-2004.
Inorg-008	Moisture content determined by heating at 105+/-5 °C for a minimum of 12 hours.
Inorg-031	Total Phenolics by segmented flow analyser (in line distillation with colourimetric finish). Solids are extracted in a caustic media prior to analysis.
Metals-020	Determination of various metals by ICP-AES.
Metals-021	Determination of Mercury by Cold Vapour AAS.
Org-020	Soil samples are extracted with Dichloromethane/Acetone and waters with Dichloromethane and analysed by GC-FID. F2 = (>C10-C16)-Naphthalene as per NEPM B1 Guideline on Investigation Levels for Soil and Groundwater (HSLs Tables 1A (3, 4)). Note Naphthalene is determined from the VOC analysis.
Org-020	Soil samples are extracted with Dichloromethane/Acetone and waters with Dichloromethane and analysed by GC-FID. F2 = (>C10-C16)-Naphthalene as per NEPM B1 Guideline on Investigation Levels for Soil and Groundwater (HSLs Tables 1A (3, 4)). Note Naphthalene is determined from the VOC analysis. Note, the Total +ve TRH PQL is reflective of the lowest individual PQL and is therefore "Total +ve TRH" is simply a sum of the positive individual TRH fractions (>C10-C40).
Org-021	Soil samples are extracted with dichloromethane/acetone and waters with dichloromethane and analysed by GC-ECD.
Org-021	Soil samples are extracted with dichloromethane/acetone and waters with dichloromethane and analysed by GC-ECD. Note, the Total +ve PCBs PQL is reflective of the lowest individual PQL and is therefore" Total +ve PCBs" is simply a sum of the positive individual PCBs.
Org-022	Determination of VOCs sampled onto coconut shell charcoal sorbent tubes, that can be desorbed using carbon disulphide, and analysed by GC-MS.
Org-022/025	Soil samples are extracted with Dichloromethane/Acetone and waters with Dichloromethane and analysed by GC-MS/GC-MSMS.
Org-022/025	Soil samples are extracted with dichloromethane/acetone and waters with dichloromethane and analysed by GC-MS/GC-MSMS. Note, the Total +ve reported DDD+DDE+DDT PQL is reflective of the lowest individual PQL and is therefore simply a sum of the positive individually report DDD+DDE+DDT.

Method ID	Methodology Summary
Org-022/025	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-10	270252-2
Date extracted	-			31/05/2021	1	31/05/2021	31/05/2021		31/05/2021	31/05/2021
Date analysed	-			02/06/2021	1	01/06/2021	01/06/2021		02/06/2021	01/06/2021
TRH C_6 - C_9	mg/kg	25	Org-023	<25	1	<25	<25	0	90	91
TRH C_6 - C_{10}	mg/kg	25	Org-023	<25	1	<25	<25	0	90	91
Benzene	mg/kg	0.2	Org-023	<0.2	1	<0.2	<0.2	0	99	95
Toluene	mg/kg	0.5	Org-023	<0.5	1	<0.5	<0.5	0	88	87
Ethylbenzene	mg/kg	1	Org-023	<1	1	<1	<1	0	108	110
m+p-xylene	mg/kg	2	Org-023	<2	1	<2	<2	0	78	82
o-Xylene	mg/kg	1	Org-023	<1	1	<1	<1	0	86	89
naphthalene	mg/kg	1	Org-023	<1	1	<1	<1	0	[NT]	[NT]
Surrogate aaa-Trifluorotoluene	%		Org-023	104	1	80	111	32	108	98

QUALITY CONTROL: vTRH(C6-C10)/BTEXN in Soil						Duplicate			Spike Recovery %	
Test Description	Units	PQL	Method	Blank	#	Base	Dup.	RPD	LCS-11	270252-23
Date extracted	-			[NT]	11	31/05/2021	31/05/2021		31/05/2021	31/05/2021
Date analysed	-			[NT]	11	01/06/2021	01/06/2021		01/06/2021	01/06/2021
TRH C_6 - C_9	mg/kg	25	Org-023	[NT]	11	<25	<25	0	99	70
TRH C_6 - C_{10}	mg/kg	25	Org-023	[NT]	11	<25	<25	0	99	70
Benzene	mg/kg	0.2	Org-023	[NT]	11	<0.2	<0.2	0	108	80
Toluene	mg/kg	0.5	Org-023	[NT]	11	<0.5	<0.5	0	102	76
Ethylbenzene	mg/kg	1	Org-023	[NT]	11	<1	<1	0	118	62
m+p-xylene	mg/kg	2	Org-023	[NT]	11	<2	<2	0	84	65
o-Xylene	mg/kg	1	Org-023	[NT]	11	<1	<1	0	90	64
naphthalene	mg/kg	1	Org-023	[NT]	11	<1	<1	0	[NT]	[NT]
Surrogate aaa-Trifluorotoluene	%		Org-023	[NT]	11	90	75	18	126	76

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]	22	31/05/2021	31/05/2021		[NT]	[NT]
Date analysed	-			[NT]	22	01/06/2021	01/06/2021		[NT]	[NT]
TRH C_6 - C_9	mg/kg	25	Org-023	[NT]	22	<25	<25	0	[NT]	[NT]
TRH C_6 - C_{10}	mg/kg	25	Org-023	[NT]	22	<25	<25	0	[NT]	[NT]
Benzene	mg/kg	0.2	Org-023	[NT]	22	<0.2	<0.2	0	[NT]	[NT]
Toluene	mg/kg	0.5	Org-023	[NT]	22	<0.5	<0.5	0	[NT]	[NT]
Ethylbenzene	mg/kg	1	Org-023	[NT]	22	<1	<1	0	[NT]	[NT]
m+p-xylene	mg/kg	2	Org-023	[NT]	22	<2	<2	0	[NT]	[NT]
o-Xylene	mg/kg	1	Org-023	[NT]	22	<1	<1	0	[NT]	[NT]
naphthalene	mg/kg	1	Org-023	[NT]	22	<1	<1	0	[NT]	[NT]
Surrogate aaa-Trifluorotoluene	%		Org-023	[NT]	22	86	88	2	[NT]	[NT]

QUALITY CONTROL: vTRH(C6-C10)/BTEXN in Soil					Duplicate				Spike Recovery %	
Test Description	Units	PQL	Method	Blank	#	Base	Dup.	RPD	[NT]	[NT]
Date extracted	-			[NT]	29	31/05/2021	31/05/2021		[NT]	[NT]
Date analysed	-			[NT]	29	01/06/2021	01/06/2021		[NT]	[NT]
TRH C_6 - C_9	mg/kg	25	Org-023	[NT]	29	<25	<25	0	[NT]	[NT]
TRH C_6 - C_{10}	mg/kg	25	Org-023	[NT]	29	<25	<25	0	[NT]	[NT]
Benzene	mg/kg	0.2	Org-023	[NT]	29	<0.2	<0.2	0	[NT]	[NT]
Toluene	mg/kg	0.5	Org-023	[NT]	29	<0.5	<0.5	0	[NT]	[NT]
Ethylbenzene	mg/kg	1	Org-023	[NT]	29	<1	<1	0	[NT]	[NT]
m+p-xylene	mg/kg	2	Org-023	[NT]	29	<2	<2	0	[NT]	[NT]
o-Xylene	mg/kg	1	Org-023	[NT]	29	<1	<1	0	[NT]	[NT]
naphthalene	mg/kg	1	Org-023	[NT]	29	<1	<1	0	[NT]	[NT]
Surrogate aaa-Trifluorotoluene	%		Org-023	[NT]	29	106	106	0	[NT]	[NT]

QUALITY CONTROL: svTRH (C10-C40) in Soil						Duplicate			Spike Recovery %	
Test Description	Units	PQL	Method	Blank	#	Base	Dup.	RPD	LCS-10	270252-2
Date extracted	-			31/05/2021	1	31/05/2021	31/05/2021		31/05/2021	31/05/2021
Date analysed	-			01/06/2021	1	01/06/2021	01/06/2021		01/06/2021	01/06/2021
TRH C_{10} - C_{14}	mg/kg	50	Org-020	<50	1	<50	<50	0	92	103
TRH C_{15} - C_{28}	mg/kg	100	Org-020	<100	1	<100	<100	0	77	101
TRH C_{29} - C_{36}	mg/kg	100	Org-020	<100	1	<100	<100	0	125	93
TRH >C_{10} -C_{16}	mg/kg	50	Org-020	<50	1	<50	<50	0	92	103
TRH >C_{16} -C_{34}	mg/kg	100	Org-020	<100	1	<100	<100	0	77	101
TRH >C_{34} -C_{40}	mg/kg	100	Org-020	<100	1	<100	<100	0	125	93
Surrogate o-Terphenyl	%		Org-020	68	1	89	87	2	96	86

QUALITY CONTROL: svTRH (C10-C40) in Soil						Duplicate			Spike Recovery %	
Test Description	Units	PQL	Method	Blank	#	Base	Dup.	RPD	LCS-11	270252-23
Date extracted	-			[NT]	11	31/05/2021	31/05/2021		31/05/2021	31/05/2021
Date analysed	-			[NT]	11	03/06/2021	03/06/2021		01/06/2021	03/06/2021
TRH C_{10} - C_{14}	mg/kg	50	Org-020	[NT]	11	<50	<50	0	122	87
TRH C_{15} - C_{28}	mg/kg	100	Org-020	[NT]	11	<100	<100	0	92	72
TRH C_{29} - C_{36}	mg/kg	100	Org-020	[NT]	11	<100	<100	0	81	70
TRH >C_{10} -C_{16}	mg/kg	50	Org-020	[NT]	11	<50	<50	0	122	87
TRH >C_{16} -C_{34}	mg/kg	100	Org-020	[NT]	11	<100	<100	0	92	72
TRH >C_{34} -C_{40}	mg/kg	100	Org-020	[NT]	11	<100	<100	0	81	70
Surrogate o-Terphenyl	%		Org-020	[NT]	11	104	104	0	127	95

QUALITY CONTROL: svTRH (C10-C40) in Soil						Duplicate			Spike Recovery %	
Test Description	Units	PQL	Method	Blank	#	Base	Dup.	RPD	[NT]	[NT]
Date extracted	-			[NT]	22	31/05/2021	31/05/2021		[NT]	[NT]
Date analysed	-			[NT]	22	03/06/2021	03/06/2021		[NT]	[NT]
TRH C_{10} - C_{14}	mg/kg	50	Org-020	[NT]	22	<50	<50	0	[NT]	[NT]
TRH C_{15} - C_{28}	mg/kg	100	Org-020	[NT]	22	<100	<100	0	[NT]	[NT]
TRH C_{29} - C_{36}	mg/kg	100	Org-020	[NT]	22	<100	<100	0	[NT]	[NT]
TRH >C_{10} -C_{16}	mg/kg	50	Org-020	[NT]	22	<50	<50	0	[NT]	[NT]
TRH >C_{16} -C_{34}	mg/kg	100	Org-020	[NT]	22	<100	<100	0	[NT]	[NT]
TRH >C_{34} -C_{40}	mg/kg	100	Org-020	[NT]	22	<100	<100	0	[NT]	[NT]
Surrogate o-Terphenyl	%		Org-020	[NT]	22	106	105	1	[NT]	[NT]

QUALITY CONTROL: svTRH (C10-C40) in Soil					Duplicate				Spike Recovery %	
Test Description	Units	PQL	Method	Blank	#	Base	Dup.	RPD	[NT]	[NT]
Date extracted	-			[NT]	29	31/05/2021	31/05/2021		[NT]	[NT]
Date analysed	-			[NT]	29	02/06/2021	02/06/2021		[NT]	[NT]
TRH C_{10} - C_{14}	mg/kg	50	Org-020	[NT]	29	<50	<50	0	[NT]	[NT]
TRH C_{15} - C_{28}	mg/kg	100	Org-020	[NT]	29	<100	<100	0	[NT]	[NT]
TRH C_{29} - C_{36}	mg/kg	100	Org-020	[NT]	29	<100	<100	0	[NT]	[NT]
TRH >C_{10} -C_{16}	mg/kg	50	Org-020	[NT]	29	<50	<50	0	[NT]	[NT]
TRH >C_{16} -C_{34}	mg/kg	100	Org-020	[NT]	29	<100	<100	0	[NT]	[NT]
TRH >C_{34} -C_{40}	mg/kg	100	Org-020	[NT]	29	<100	<100	0	[NT]	[NT]
Surrogate o-Terphenyl	%		Org-020	[NT]	29	85	79	7	[NT]	[NT]

QUALITY CONTROL: PAHs in Soil						Duplicate			Spike Recovery %	
Test Description	Units	PQL	Method	Blank	#	Base	Dup.	RPD	LCS-10	270252-2
Date extracted	-			31/05/2021	1	31/05/2021	31/05/2021		31/05/2021	31/05/2021
Date analysed	-			02/06/2021	1	02/06/2021	02/06/2021		02/06/2021	02/06/2021
Naphthalene	mg/kg	0.1	Org-022/025	<0.1	1	<0.1	<0.1	0	103	105
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	94	103
Fluorene	mg/kg	0.1	Org-022/025	<0.1	1	<0.1	<0.1	0	104	111
Phenanthrene	mg/kg	0.1	Org-022/025	<0.1	1	<0.1	<0.1	0	111	103
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	96	96
Pyrene	mg/kg	0.1	Org-022/025	<0.1	1	<0.1	<0.1	0	100	98
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	80	76
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	95	90
Dibenzo(a,h)anthracene	mg/kg	0.1	Org-022/025	<0.1	1	<0.1	<0.1	0	[NT]	[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]
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	124	1	118	117	1	113	113

QUALITY CONTROL: PAHs in Soil						Duplicate			Spike Recovery %	
Test Description	Units	PQL	Method	Blank	#	Base	Dup.	RPD	LCS-11	270252-23
Date extracted	-			[NT]	11	31/05/2021	31/05/2021		03/06/2021	03/06/2021
Date analysed	-			[NT]	11	02/06/2021	02/06/2021		03/06/2021	03/06/2021
Naphthalene	mg/kg	0.1	Org-022/025	[NT]	11	<0.1	<0.1	0	92	114
Acenaphthylene	mg/kg	0.1	Org-022/025	[NT]	11	<0.1	<0.1	0	[NT]	[NT]
Acenaphthene	mg/kg	0.1	Org-022/025	[NT]	11	<0.1	<0.1	0	106	102
Fluorene	mg/kg	0.1	Org-022/025	[NT]	11	<0.1	<0.1	0	125	109
Phenanthrene	mg/kg	0.1	Org-022/025	[NT]	11	<0.1	<0.1	0	111	117
Anthracene	mg/kg	0.1	Org-022/025	[NT]	11	<0.1	<0.1	0	[NT]	[NT]
Fluoranthene	mg/kg	0.1	Org-022/025	[NT]	11	<0.1	<0.1	0	104	110
Pyrene	mg/kg	0.1	Org-022/025	[NT]	11	<0.1	<0.1	0	104	110
Benzo(a)anthracene	mg/kg	0.1	Org-022/025	[NT]	11	<0.1	<0.1	0	[NT]	[NT]
Chrysene	mg/kg	0.1	Org-022/025	[NT]	11	<0.1	<0.1	0	84	87
Benzo(b,j+k)fluoranthene	mg/kg	0.2	Org-022/025	[NT]	11	<0.2	<0.2	0	[NT]	[NT]
Benzo(a)pyrene	mg/kg	0.05	Org-022/025	[NT]	11	<0.05	<0.05	0	73	75
Dibenzo(a,h)anthracene	mg/kg	0.1	Org-022/025	[NT]	11	<0.1	<0.1	0	[NT]	[NT]
Indeno(1,2,3-c,d)pyrene	mg/kg	0.1	Org-022/025	[NT]	11	<0.1	<0.1	0	[NT]	[NT]
Benzo(g,h,i)perylene	mg/kg	0.1	Org-022/025	[NT]	11	<0.1	<0.1	0	[NT]	[NT]
Surrogate p-Terphenyl-d14	%		Org-022/025	[NT]	11	120	117	3	121	126

QUALITY CONTROL: PAHs in Soil						Duplicate			Spike Recovery %	
Test Description	Units	PQL	Method	Blank	#	Base	Dup.	RPD	[NT]	[NT]
Date extracted	-			[NT]	22	31/05/2021	31/05/2021		[NT]	[NT]
Date analysed	-			[NT]	22	02/06/2021	02/06/2021		[NT]	[NT]
Naphthalene	mg/kg	0.1	Org-022/025	[NT]	22	<0.1	<0.1	0	[NT]	[NT]
Acenaphthylene	mg/kg	0.1	Org-022/025	[NT]	22	<0.1	<0.1	0	[NT]	[NT]
Acenaphthene	mg/kg	0.1	Org-022/025	[NT]	22	<0.1	<0.1	0	[NT]	[NT]
Fluorene	mg/kg	0.1	Org-022/025	[NT]	22	<0.1	<0.1	0	[NT]	[NT]
Phenanthrene	mg/kg	0.1	Org-022/025	[NT]	22	<0.1	<0.1	0	[NT]	[NT]
Anthracene	mg/kg	0.1	Org-022/025	[NT]	22	<0.1	<0.1	0	[NT]	[NT]
Fluoranthene	mg/kg	0.1	Org-022/025	[NT]	22	<0.1	<0.1	0	[NT]	[NT]
Pyrene	mg/kg	0.1	Org-022/025	[NT]	22	<0.1	<0.1	0	[NT]	[NT]
Benzo(a)anthracene	mg/kg	0.1	Org-022/025	[NT]	22	<0.1	<0.1	0	[NT]	[NT]
Chrysene	mg/kg	0.1	Org-022/025	[NT]	22	<0.1	<0.1	0	[NT]	[NT]
Benzo(b,j+k)fluoranthene	mg/kg	0.2	Org-022/025	[NT]	22	<0.2	<0.2	0	[NT]	[NT]
Benzo(a)pyrene	mg/kg	0.05	Org-022/025	[NT]	22	<0.05	<0.05	0	[NT]	[NT]
Dibenzo(a,h)anthracene	mg/kg	0.1	Org-022/025	[NT]	22	<0.1	<0.1	0	[NT]	[NT]
Indeno(1,2,3-c,d)pyrene	mg/kg	0.1	Org-022/025	[NT]	22	<0.1	<0.1	0	[NT]	[NT]
Benzo(g,h,i)perylene	mg/kg	0.1	Org-022/025	[NT]	22	<0.1	<0.1	0	[NT]	[NT]
Surrogate p-Terphenyl-d14	%		Org-022/025	[NT]	22	116	115	1	[NT]	[NT]

QUALITY CONTROL: PAHs in Soil						Duplicate			Spike Recovery %	
Test Description	Units	PQL	Method	Blank	#	Base	Dup.	RPD	[NT]	[NT]
Date extracted	-			[NT]	29	31/05/2021	31/05/2021		[NT]	[NT]
Date analysed	-			[NT]	29	03/06/2021	03/06/2021		[NT]	[NT]
Naphthalene	mg/kg	0.1	Org-022/025	[NT]	29	<0.1	<0.1	0	[NT]	[NT]
Acenaphthylene	mg/kg	0.1	Org-022/025	[NT]	29	<0.1	<0.1	0	[NT]	[NT]
Acenaphthene	mg/kg	0.1	Org-022/025	[NT]	29	<0.1	<0.1	0	[NT]	[NT]
Fluorene	mg/kg	0.1	Org-022/025	[NT]	29	<0.1	<0.1	0	[NT]	[NT]
Phenanthrene	mg/kg	0.1	Org-022/025	[NT]	29	<0.1	<0.1	0	[NT]	[NT]
Anthracene	mg/kg	0.1	Org-022/025	[NT]	29	<0.1	<0.1	0	[NT]	[NT]
Fluoranthene	mg/kg	0.1	Org-022/025	[NT]	29	<0.1	<0.1	0	[NT]	[NT]
Pyrene	mg/kg	0.1	Org-022/025	[NT]	29	<0.1	<0.1	0	[NT]	[NT]
Benzo(a)anthracene	mg/kg	0.1	Org-022/025	[NT]	29	<0.1	<0.1	0	[NT]	[NT]
Chrysene	mg/kg	0.1	Org-022/025	[NT]	29	<0.1	<0.1	0	[NT]	[NT]
Benzo(b,j+k)fluoranthene	mg/kg	0.2	Org-022/025	[NT]	29	<0.2	<0.2	0	[NT]	[NT]
Benzo(a)pyrene	mg/kg	0.05	Org-022/025	[NT]	29	<0.05	<0.05	0	[NT]	[NT]
Dibenzo(a,h)anthracene	mg/kg	0.1	Org-022/025	[NT]	29	<0.1	<0.1	0	[NT]	[NT]
Indeno(1,2,3-c,d)pyrene	mg/kg	0.1	Org-022/025	[NT]	29	<0.1	<0.1	0	[NT]	[NT]
Benzo(g,h,i)perylene	mg/kg	0.1	Org-022/025	[NT]	29	<0.1	<0.1	0	[NT]	[NT]
Surrogate p-Terphenyl-d14	%		Org-022/025	[NT]	29	119	115	3	[NT]	[NT]

QUALITY CONTROL: Organochlorine Pesticides in soil						Duplicate			Spike Recovery %	
Test Description	Units	PQL	Method	Blank	#	Base	Dup.	RPD	LCS-10	270252-2
Date extracted	-			31/05/2021	1	31/05/2021	31/05/2021		31/05/2021	31/05/2021
Date analysed	-			02/06/2021	1	02/06/2021	02/06/2021		02/06/2021	02/06/2021
alpha-BHC	mg/kg	0.1	Org-022/025	<0.1	1	<0.1	<0.1	0	106	118
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	104	115
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	99	103
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	106	103
Heptachlor Epoxide	mg/kg	0.1	Org-022/025	<0.1	1	<0.1	<0.1	0	107	105
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	108	106
Dieldrin	mg/kg	0.1	Org-022/025	<0.1	1	<0.1	<0.1	0	103	105
Endrin	mg/kg	0.1	Org-022/025	<0.1	1	<0.1	<0.1	0	96	105
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	103	105
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	112	105
Methoxychlor	mg/kg	0.1	Org-022/025	<0.1	1	<0.1	<0.1	0	[NT]	[NT]
Surrogate TCMX	%		Org-022/025	104	1	117	131	11	95	116

QUALITY CONTROL: Organochlorine Pesticides in soil						Duplicate			Spike Recovery %	
Test Description	Units	PQL	Method	Blank	#	Base	Dup.	RPD	LCS-11	270252-23
Date extracted	-			[NT]	11	31/05/2021	31/05/2021		03/06/2021	03/06/2021
Date analysed	-			[NT]	11	02/06/2021	02/06/2021		03/06/2021	03/06/2021
alpha-BHC	mg/kg	0.1	Org-022/025	[NT]	11	<0.1	<0.1	0	92	96
HCB	mg/kg	0.1	Org-022/025	[NT]	11	<0.1	<0.1	0	[NT]	[NT]
beta-BHC	mg/kg	0.1	Org-022/025	[NT]	11	<0.1	<0.1	0	113	110
gamma-BHC	mg/kg	0.1	Org-022/025	[NT]	11	<0.1	<0.1	0	[NT]	[NT]
Heptachlor	mg/kg	0.1	Org-022/025	[NT]	11	<0.1	<0.1	0	83	91
delta-BHC	mg/kg	0.1	Org-022/025	[NT]	11	<0.1	<0.1	0	[NT]	[NT]
Aldrin	mg/kg	0.1	Org-022/025	[NT]	11	<0.1	<0.1	0	114	117
Heptachlor Epoxide	mg/kg	0.1	Org-022/025	[NT]	11	<0.1	<0.1	0	118	124
gamma-Chlordane	mg/kg	0.1	Org-022/025	[NT]	11	<0.1	<0.1	0	[NT]	[NT]
alpha-chlordane	mg/kg	0.1	Org-022/025	[NT]	11	<0.1	<0.1	0	[NT]	[NT]
Endosulfan I	mg/kg	0.1	Org-022/025	[NT]	11	<0.1	<0.1	0	[NT]	[NT]
pp-DDE	mg/kg	0.1	Org-022/025	[NT]	11	<0.1	<0.1	0	99	126
Dieldrin	mg/kg	0.1	Org-022/025	[NT]	11	<0.1	<0.1	0	115	121
Endrin	mg/kg	0.1	Org-022/025	[NT]	11	<0.1	<0.1	0	111	111
Endosulfan II	mg/kg	0.1	Org-022/025	[NT]	11	<0.1	<0.1	0	[NT]	[NT]
pp-DDD	mg/kg	0.1	Org-022/025	[NT]	11	<0.1	<0.1	0	92	98
Endrin Aldehyde	mg/kg	0.1	Org-022/025	[NT]	11	<0.1	<0.1	0	[NT]	[NT]
pp-DDT	mg/kg	0.1	Org-022/025	[NT]	11	<0.1	<0.1	0	[NT]	[NT]
Endosulfan Sulphate	mg/kg	0.1	Org-022/025	[NT]	11	<0.1	<0.1	0	103	91
Methoxychlor	mg/kg	0.1	Org-022/025	[NT]	11	<0.1	<0.1	0	[NT]	[NT]
Surrogate TCMX	%		Org-022/025	[NT]	11	126	114	10	115	112

QUALITY CONTROL: Organochlorine Pesticides in soil					Duplicate				Spike Recovery %	
Test Description	Units	PQL	Method	Blank	#	Base	Dup.	RPD	[NT]	[NT]
Date extracted	-			[NT]	22	31/05/2021	31/05/2021		[NT]	[NT]
Date analysed	-			[NT]	22	02/06/2021	02/06/2021		[NT]	[NT]
alpha-BHC	mg/kg	0.1	Org-022/025	[NT]	22	<0.1	<0.1	0	[NT]	[NT]
HCB	mg/kg	0.1	Org-022/025	[NT]	22	<0.1	<0.1	0	[NT]	[NT]
beta-BHC	mg/kg	0.1	Org-022/025	[NT]	22	<0.1	<0.1	0	[NT]	[NT]
gamma-BHC	mg/kg	0.1	Org-022/025	[NT]	22	<0.1	<0.1	0	[NT]	[NT]
Heptachlor	mg/kg	0.1	Org-022/025	[NT]	22	<0.1	<0.1	0	[NT]	[NT]
delta-BHC	mg/kg	0.1	Org-022/025	[NT]	22	<0.1	<0.1	0	[NT]	[NT]
Aldrin	mg/kg	0.1	Org-022/025	[NT]	22	<0.1	<0.1	0	[NT]	[NT]
Heptachlor Epoxide	mg/kg	0.1	Org-022/025	[NT]	22	<0.1	<0.1	0	[NT]	[NT]
gamma-Chlordane	mg/kg	0.1	Org-022/025	[NT]	22	<0.1	<0.1	0	[NT]	[NT]
alpha-chlordane	mg/kg	0.1	Org-022/025	[NT]	22	<0.1	<0.1	0	[NT]	[NT]
Endosulfan I	mg/kg	0.1	Org-022/025	[NT]	22	<0.1	<0.1	0	[NT]	[NT]
pp-DDE	mg/kg	0.1	Org-022/025	[NT]	22	<0.1	<0.1	0	[NT]	[NT]
Dieldrin	mg/kg	0.1	Org-022/025	[NT]	22	<0.1	<0.1	0	[NT]	[NT]
Endrin	mg/kg	0.1	Org-022/025	[NT]	22	<0.1	<0.1	0	[NT]	[NT]
Endosulfan II	mg/kg	0.1	Org-022/025	[NT]	22	<0.1	<0.1	0	[NT]	[NT]
pp-DDD	mg/kg	0.1	Org-022/025	[NT]	22	<0.1	<0.1	0	[NT]	[NT]
Endrin Aldehyde	mg/kg	0.1	Org-022/025	[NT]	22	<0.1	<0.1	0	[NT]	[NT]
pp-DDT	mg/kg	0.1	Org-022/025	[NT]	22	<0.1	<0.1	0	[NT]	[NT]
Endosulfan Sulphate	mg/kg	0.1	Org-022/025	[NT]	22	<0.1	<0.1	0	[NT]	[NT]
Methoxychlor	mg/kg	0.1	Org-022/025	[NT]	22	<0.1	<0.1	0	[NT]	[NT]
Surrogate TCMX	%		Org-022/025	[NT]	22	132	128	3	[NT]	[NT]

QUALITY CONTROL: Organochlorine Pesticides in soil					Duplicate				Spike Recovery %	
Test Description	Units	PQL	Method	Blank	#	Base	Dup.	RPD	[NT]	[NT]
Date extracted	-			[NT]	29	31/05/2021	31/05/2021		[NT]	[NT]
Date analysed	-			[NT]	29	03/06/2021	03/06/2021		[NT]	[NT]
alpha-BHC	mg/kg	0.1	Org-022/025	[NT]	29	<0.1	<0.1	0	[NT]	[NT]
HCB	mg/kg	0.1	Org-022/025	[NT]	29	<0.1	<0.1	0	[NT]	[NT]
beta-BHC	mg/kg	0.1	Org-022/025	[NT]	29	<0.1	<0.1	0	[NT]	[NT]
gamma-BHC	mg/kg	0.1	Org-022/025	[NT]	29	<0.1	<0.1	0	[NT]	[NT]
Heptachlor	mg/kg	0.1	Org-022/025	[NT]	29	<0.1	<0.1	0	[NT]	[NT]
delta-BHC	mg/kg	0.1	Org-022/025	[NT]	29	<0.1	<0.1	0	[NT]	[NT]
Aldrin	mg/kg	0.1	Org-022/025	[NT]	29	<0.1	<0.1	0	[NT]	[NT]
Heptachlor Epoxide	mg/kg	0.1	Org-022/025	[NT]	29	<0.1	<0.1	0	[NT]	[NT]
gamma-Chlordane	mg/kg	0.1	Org-022/025	[NT]	29	<0.1	<0.1	0	[NT]	[NT]
alpha-chlordane	mg/kg	0.1	Org-022/025	[NT]	29	<0.1	<0.1	0	[NT]	[NT]
Endosulfan I	mg/kg	0.1	Org-022/025	[NT]	29	<0.1	<0.1	0	[NT]	[NT]
pp-DDE	mg/kg	0.1	Org-022/025	[NT]	29	<0.1	<0.1	0	[NT]	[NT]
Dieldrin	mg/kg	0.1	Org-022/025	[NT]	29	<0.1	<0.1	0	[NT]	[NT]
Endrin	mg/kg	0.1	Org-022/025	[NT]	29	<0.1	<0.1	0	[NT]	[NT]
Endosulfan II	mg/kg	0.1	Org-022/025	[NT]	29	<0.1	<0.1	0	[NT]	[NT]
pp-DDD	mg/kg	0.1	Org-022/025	[NT]	29	<0.1	<0.1	0	[NT]	[NT]
Endrin Aldehyde	mg/kg	0.1	Org-022/025	[NT]	29	<0.1	<0.1	0	[NT]	[NT]
pp-DDT	mg/kg	0.1	Org-022/025	[NT]	29	<0.1	<0.1	0	[NT]	[NT]
Endosulfan Sulphate	mg/kg	0.1	Org-022/025	[NT]	29	<0.1	<0.1	0	[NT]	[NT]
Methoxychlor	mg/kg	0.1	Org-022/025	[NT]	29	<0.1	<0.1	0	[NT]	[NT]
Surrogate TCMX	%		Org-022/025	[NT]	29	107	101	6	[NT]	[NT]

QUALITY CONTROL: Organophosphorus Pesticides in Soil						Duplicate			Spike Recovery %	
Test Description	Units	PQL	Method	Blank	#	Base	Dup.	RPD	LCS-10	270252-2
Date extracted	-			31/05/2021	1	31/05/2021	31/05/2021		31/05/2021	31/05/2021
Date analysed	-			02/06/2021	1	02/06/2021	02/06/2021		02/06/2021	02/06/2021
Dichlorvos	mg/kg	0.1	Org-022/025	<0.1	1	<0.1	<0.1	0	73	67
Dimethoate	mg/kg	0.1	Org-022/025	<0.1	1	<0.1	<0.1	0	[NT]	[NT]
Diazinon	mg/kg	0.1	Org-022/025	<0.1	1	<0.1	<0.1	0	[NT]	[NT]
Chlorpyriphos-methyl	mg/kg	0.1	Org-022/025	<0.1	1	<0.1	<0.1	0	[NT]	[NT]
Ronnel	mg/kg	0.1	Org-022/025	<0.1	1	<0.1	<0.1	0	96	93
Fenitrothion	mg/kg	0.1	Org-022/025	<0.1	1	<0.1	<0.1	0	79	89
Malathion	mg/kg	0.1	Org-022/025	<0.1	1	<0.1	<0.1	0	122	132
Chlorpyriphos	mg/kg	0.1	Org-022/025	<0.1	1	<0.1	<0.1	0	107	107
Parathion	mg/kg	0.1	Org-022/025	<0.1	1	<0.1	<0.1	0	80	86
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	83	89
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	104	1	117	131	11	95	116

QUALITY CONTROL: Organophosphorus Pesticides in Soil						Duplicate			Spike Recovery %	
Test Description	Units	PQL	Method	Blank	#	Base	Dup.	RPD	LCS-11	270252-23
Date extracted	-			[NT]	11	31/05/2021	31/05/2021		03/06/2021	03/06/2021
Date analysed	-			[NT]	11	02/06/2021	02/06/2021		03/06/2021	03/06/2021
Dichlorvos	mg/kg	0.1	Org-022/025	[NT]	11	<0.1	<0.1	0	122	98
Dimethoate	mg/kg	0.1	Org-022/025	[NT]	11	<0.1	<0.1	0	[NT]	[NT]
Diazinon	mg/kg	0.1	Org-022/025	[NT]	11	<0.1	<0.1	0	[NT]	[NT]
Chlorpyriphos-methyl	mg/kg	0.1	Org-022/025	[NT]	11	<0.1	<0.1	0	[NT]	[NT]
Ronnel	mg/kg	0.1	Org-022/025	[NT]	11	<0.1	<0.1	0	72	69
Fenitrothion	mg/kg	0.1	Org-022/025	[NT]	11	<0.1	<0.1	0	71	65
Malathion	mg/kg	0.1	Org-022/025	[NT]	11	<0.1	<0.1	0	100	89
Chlorpyriphos	mg/kg	0.1	Org-022/025	[NT]	11	<0.1	<0.1	0	115	117
Parathion	mg/kg	0.1	Org-022/025	[NT]	11	<0.1	<0.1	0	88	84
Bromophos-ethyl	mg/kg	0.1	Org-022	[NT]	11	<0.1	<0.1	0	[NT]	[NT]
Ethion	mg/kg	0.1	Org-022/025	[NT]	11	<0.1	<0.1	0	111	109
Azinphos-methyl (Guthion)	mg/kg	0.1	Org-022/025	[NT]	11	<0.1	<0.1	0	[NT]	[NT]
Surrogate TCMX	%		Org-022/025	[NT]	11	126	114	10	115	112

QUALITY CONTROL: Organophosphorus Pesticides in Soil					Duplicate				Spike Recovery %	
Test Description	Units	PQL	Method	Blank	#	Base	Dup.	RPD	[NT]	[NT]
Date extracted	-			[NT]	22	31/05/2021	31/05/2021		[NT]	[NT]
Date analysed	-			[NT]	22	02/06/2021	02/06/2021		[NT]	[NT]
Dichlorvos	mg/kg	0.1	Org-022/025	[NT]	22	<0.1	<0.1	0	[NT]	[NT]
Dimethoate	mg/kg	0.1	Org-022/025	[NT]	22	<0.1	<0.1	0	[NT]	[NT]
Diazinon	mg/kg	0.1	Org-022/025	[NT]	22	<0.1	<0.1	0	[NT]	[NT]
Chlorpyriphos-methyl	mg/kg	0.1	Org-022/025	[NT]	22	<0.1	<0.1	0	[NT]	[NT]
Ronnel	mg/kg	0.1	Org-022/025	[NT]	22	<0.1	<0.1	0	[NT]	[NT]
Fenitrothion	mg/kg	0.1	Org-022/025	[NT]	22	<0.1	<0.1	0	[NT]	[NT]
Malathion	mg/kg	0.1	Org-022/025	[NT]	22	<0.1	<0.1	0	[NT]	[NT]
Chlorpyriphos	mg/kg	0.1	Org-022/025	[NT]	22	<0.1	<0.1	0	[NT]	[NT]
Parathion	mg/kg	0.1	Org-022/025	[NT]	22	<0.1	<0.1	0	[NT]	[NT]
Bromophos-ethyl	mg/kg	0.1	Org-022	[NT]	22	<0.1	<0.1	0	[NT]	[NT]
Ethion	mg/kg	0.1	Org-022/025	[NT]	22	<0.1	<0.1	0	[NT]	[NT]
Azinphos-methyl (Guthion)	mg/kg	0.1	Org-022/025	[NT]	22	<0.1	<0.1	0	[NT]	[NT]
Surrogate TCMX	%		Org-022/025	[NT]	22	132	128	3	[NT]	[NT]

QUALITY CONTROL: Organophosphorus Pesticides in Soil					Duplicate				Spike Recovery %	
Test Description	Units	PQL	Method	Blank	#	Base	Dup.	RPD	[NT]	[NT]
Date extracted	-			[NT]	29	31/05/2021	31/05/2021		[NT]	[NT]
Date analysed	-			[NT]	29	03/06/2021	03/06/2021		[NT]	[NT]
Dichlorvos	mg/kg	0.1	Org-022/025	[NT]	29	<0.1	<0.1	0	[NT]	[NT]
Dimethoate	mg/kg	0.1	Org-022/025	[NT]	29	<0.1	<0.1	0	[NT]	[NT]
Diazinon	mg/kg	0.1	Org-022/025	[NT]	29	<0.1	<0.1	0	[NT]	[NT]
Chlorpyriphos-methyl	mg/kg	0.1	Org-022/025	[NT]	29	<0.1	<0.1	0	[NT]	[NT]
Ronnel	mg/kg	0.1	Org-022/025	[NT]	29	<0.1	<0.1	0	[NT]	[NT]
Fenitrothion	mg/kg	0.1	Org-022/025	[NT]	29	<0.1	<0.1	0	[NT]	[NT]
Malathion	mg/kg	0.1	Org-022/025	[NT]	29	<0.1	<0.1	0	[NT]	[NT]
Chlorpyriphos	mg/kg	0.1	Org-022/025	[NT]	29	<0.1	<0.1	0	[NT]	[NT]
Parathion	mg/kg	0.1	Org-022/025	[NT]	29	<0.1	<0.1	0	[NT]	[NT]
Bromophos-ethyl	mg/kg	0.1	Org-022	[NT]	29	<0.1	<0.1	0	[NT]	[NT]
Ethion	mg/kg	0.1	Org-022/025	[NT]	29	<0.1	<0.1	0	[NT]	[NT]
Azinphos-methyl (Guthion)	mg/kg	0.1	Org-022/025	[NT]	29	<0.1	<0.1	0	[NT]	[NT]
Surrogate TCMX	%		Org-022/025	[NT]	29	107	101	6	[NT]	[NT]

QUALITY CONTROL: PCBs in Soil						Duplicate			Spike Recovery %	
Test Description	Units	PQL	Method	Blank	#	Base	Dup.	RPD	LCS-10	270252-2
Date extracted	-			31/05/2021	1	31/05/2021	31/05/2021		31/05/2021	31/05/2021
Date analysed	-			02/06/2021	1	02/06/2021	02/06/2021		02/06/2021	02/06/2021
Aroclor 1016	mg/kg	0.1	Org-021	<0.1	1	<0.1	<0.1	0	[NT]	[NT]
Aroclor 1221	mg/kg	0.1	Org-021	<0.1	1	<0.1	<0.1	0	[NT]	[NT]
Aroclor 1232	mg/kg	0.1	Org-021	<0.1	1	<0.1	<0.1	0	[NT]	[NT]
Aroclor 1242	mg/kg	0.1	Org-021	<0.1	1	<0.1	<0.1	0	[NT]	[NT]
Aroclor 1248	mg/kg	0.1	Org-021	<0.1	1	<0.1	<0.1	0	[NT]	[NT]
Aroclor 1254	mg/kg	0.1	Org-021	<0.1	1	<0.1	<0.1	0	100	120
Aroclor 1260	mg/kg	0.1	Org-021	<0.1	1	<0.1	<0.1	0	[NT]	[NT]
Surrogate TCMX	%		Org-021	104	1	117	131	11	95	116

QUALITY CONTROL: PCBs in Soil						Duplicate			Spike Recovery %	
Test Description	Units	PQL	Method	Blank	#	Base	Dup.	RPD	LCS-11	270252-23
Date extracted	-			[NT]	11	31/05/2021	31/05/2021		03/06/2021	03/06/2021
Date analysed	-			[NT]	11	02/06/2021	02/06/2021		03/06/2021	03/06/2021
Aroclor 1016	mg/kg	0.1	Org-021	[NT]	11	<0.1	<0.1	0	[NT]	[NT]
Aroclor 1221	mg/kg	0.1	Org-021	[NT]	11	<0.1	<0.1	0	[NT]	[NT]
Aroclor 1232	mg/kg	0.1	Org-021	[NT]	11	<0.1	<0.1	0	[NT]	[NT]
Aroclor 1242	mg/kg	0.1	Org-021	[NT]	11	<0.1	<0.1	0	[NT]	[NT]
Aroclor 1248	mg/kg	0.1	Org-021	[NT]	11	<0.1	<0.1	0	[NT]	[NT]
Aroclor 1254	mg/kg	0.1	Org-021	[NT]	11	<0.1	<0.1	0	118	117
Aroclor 1260	mg/kg	0.1	Org-021	[NT]	11	<0.1	<0.1	0	[NT]	[NT]
Surrogate TCMX	%		Org-021	[NT]	11	126	114	10	115	112

QUALITY CONTROL: PCBs in Soil						Duplicate			Spike Recovery %	
Test Description	Units	PQL	Method	Blank	#	Base	Dup.	RPD	[NT]	[NT]
Date extracted	-			[NT]	22	31/05/2021	31/05/2021		[NT]	[NT]
Date analysed	-			[NT]	22	02/06/2021	02/06/2021		[NT]	[NT]
Aroclor 1016	mg/kg	0.1	Org-021	[NT]	22	<0.1	<0.1	0	[NT]	[NT]
Aroclor 1221	mg/kg	0.1	Org-021	[NT]	22	<0.1	<0.1	0	[NT]	[NT]
Aroclor 1232	mg/kg	0.1	Org-021	[NT]	22	<0.1	<0.1	0	[NT]	[NT]
Aroclor 1242	mg/kg	0.1	Org-021	[NT]	22	<0.1	<0.1	0	[NT]	[NT]
Aroclor 1248	mg/kg	0.1	Org-021	[NT]	22	<0.1	<0.1	0	[NT]	[NT]
Aroclor 1254	mg/kg	0.1	Org-021	[NT]	22	<0.1	<0.1	0	[NT]	[NT]
Aroclor 1260	mg/kg	0.1	Org-021	[NT]	22	<0.1	<0.1	0	[NT]	[NT]
Surrogate TCMX	%		Org-021	[NT]	22	132	128	3	[NT]	[NT]

QUALITY CONTROL: PCBs in Soil						Duplicate			Spike Recovery %	
Test Description	Units	PQL	Method	Blank	#	Base	Dup.	RPD	[NT]	[NT]
Date extracted	-			[NT]	29	31/05/2021	31/05/2021		[NT]	[NT]
Date analysed	-			[NT]	29	03/06/2021	03/06/2021		[NT]	[NT]
Aroclor 1016	mg/kg	0.1	Org-021	[NT]	29	<0.1	<0.1	0	[NT]	[NT]
Aroclor 1221	mg/kg	0.1	Org-021	[NT]	29	<0.1	<0.1	0	[NT]	[NT]
Aroclor 1232	mg/kg	0.1	Org-021	[NT]	29	<0.1	<0.1	0	[NT]	[NT]
Aroclor 1242	mg/kg	0.1	Org-021	[NT]	29	<0.1	<0.1	0	[NT]	[NT]
Aroclor 1248	mg/kg	0.1	Org-021	[NT]	29	<0.1	<0.1	0	[NT]	[NT]
Aroclor 1254	mg/kg	0.1	Org-021	[NT]	29	<0.1	<0.1	0	[NT]	[NT]
Aroclor 1260	mg/kg	0.1	Org-021	[NT]	29	<0.1	<0.1	0	[NT]	[NT]
Surrogate TCMX	%		Org-021	[NT]	29	107	101	6	[NT]	[NT]

QUALITY CONTROL: Misc Soil - Inorg						Duplicate			Spike Recovery %	
Test Description	Units	PQL	Method	Blank	#	Base	Dup.	RPD	LCS-1	270252-2
Date prepared	-			01/06/2021	1	01/06/2021	01/06/2021		01/06/2021	01/06/2021
Date analysed	-			01/06/2021	1	01/06/2021	01/06/2021		01/06/2021	01/06/2021
Total Phenolics (as Phenol)	mg/kg	5	Inorg-031	<5	1	<5	<5	0	102	99

QUALITY CONTROL: Misc Soil - Inorg						Duplicate			Spike Recovery %	
Test Description	Units	PQL	Method	Blank	#	Base	Dup.	RPD	LCS-2	270252-23
Date prepared	-			[NT]	11	01/06/2021	01/06/2021		01/06/2021	01/06/2021
Date analysed	-			[NT]	11	01/06/2021	01/06/2021		01/06/2021	01/06/2021
Total Phenolics (as Phenol)	mg/kg	5	Inorg-031	[NT]	11	<5	<5	0	102	105

QUALITY CONTROL: Misc Soil - Inorg						Duplicate			Spike Recovery %	
Test Description	Units	PQL	Method	Blank	#	Base	Dup.	RPD	[NT]	[NT]
Date prepared	-			[NT]	22	01/06/2021	01/06/2021		[NT]	[NT]
Date analysed	-			[NT]	22	01/06/2021	01/06/2021		[NT]	[NT]
Total Phenolics (as Phenol)	mg/kg	5	Inorg-031	[NT]	22	<5	<5	0	[NT]	[NT]

QUALITY CONTROL: Misc Soil - Inorg						Duplicate			Spike Recovery %	
Test Description	Units	PQL	Method	Blank	#	Base	Dup.	RPD	[NT]	[NT]
Date prepared	-			[NT]	29	01/06/2021	01/06/2021		[NT]	[NT]
Date analysed	-			[NT]	29	01/06/2021	01/06/2021		[NT]	[NT]
Total Phenolics (as Phenol)	mg/kg	5	Inorg-031	[NT]	29	<5	<5	0	[NT]	[NT]

QUALITY CONTROL: Acid Extractable metals in soil						Duplicate			Spike Recovery %	
Test Description	Units	PQL	Method	Blank	#	Base	Dup.	RPD	LCS-10	270252-2
Date prepared	-			03/06/2021	1	03/06/2021	03/06/2021		03/06/2021	03/06/2021
Date analysed	-			03/06/2021	1	03/06/2021	03/06/2021		03/06/2021	03/06/2021
Arsenic	mg/kg	4	Metals-020	<4	1	<4	<4	0	108	101
Cadmium	mg/kg	0.4	Metals-020	<0.4	1	<0.4	<0.4	0	96	85
Chromium	mg/kg	1	Metals-020	<1	1	12	12	0	104	100
Copper	mg/kg	1	Metals-020	<1	1	13	16	21	112	129
Lead	mg/kg	1	Metals-020	<1	1	11	11	0	100	91
Mercury	mg/kg	0.1	Metals-021	<0.1	1	<0.1	<0.1	0	98	111
Nickel	mg/kg	1	Metals-020	<1	1	8	8	0	103	95
Zinc	mg/kg	1	Metals-020	<1	1	38	37	3	102	93

QUALITY CONTROL: Acid Extractable metals in soil						Duplicate			Spike Recovery %	
Test Description	Units	PQL	Method	Blank	#	Base	Dup.	RPD	LCS-11	270252-23
Date prepared	-			[NT]	11	03/06/2021	03/06/2021		03/06/2021	03/06/2021
Date analysed	-			[NT]	11	03/06/2021	03/06/2021		03/06/2021	03/06/2021
Arsenic	mg/kg	4	Metals-020	[NT]	11	<4	<4	0	101	92
Cadmium	mg/kg	0.4	Metals-020	[NT]	11	<0.4	<0.4	0	92	78
Chromium	mg/kg	1	Metals-020	[NT]	11	11	10	10	98	89
Copper	mg/kg	1	Metals-020	[NT]	11	8	8	0	106	#
Lead	mg/kg	1	Metals-020	[NT]	11	13	14	7	94	84
Mercury	mg/kg	0.1	Metals-021	[NT]	11	<0.1	<0.1	0	100	90
Nickel	mg/kg	1	Metals-020	[NT]	11	7	7	0	97	84
Zinc	mg/kg	1	Metals-020	[NT]	11	29	31	7	96	80

QUALITY CONTROL: Acid Extractable metals in soil						Duplicate			Spike Recovery %	
Test Description	Units	PQL	Method	Blank	#	Base	Dup.	RPD	[NT]	[NT]
Date prepared	-			[NT]	22	03/06/2021	03/06/2021		[NT]	[NT]
Date analysed	-			[NT]	22	03/06/2021	03/06/2021		[NT]	[NT]
Arsenic	mg/kg	4	Metals-020	[NT]	22	<4	<4	0	[NT]	[NT]
Cadmium	mg/kg	0.4	Metals-020	[NT]	22	<0.4	<0.4	0	[NT]	[NT]
Chromium	mg/kg	1	Metals-020	[NT]	22	8	10	22	[NT]	[NT]
Copper	mg/kg	1	Metals-020	[NT]	22	6	8	29	[NT]	[NT]
Lead	mg/kg	1	Metals-020	[NT]	22	9	10	11	[NT]	[NT]
Mercury	mg/kg	0.1	Metals-021	[NT]	22	<0.1	<0.1	0	[NT]	[NT]
Nickel	mg/kg	1	Metals-020	[NT]	22	6	7	15	[NT]	[NT]
Zinc	mg/kg	1	Metals-020	[NT]	22	16	20	22	[NT]	[NT]

QUALITY CONTROL: Acid Extractable metals in soil					Duplicate				Spike Recovery %	
Test Description	Units	PQL	Method	Blank	#	Base	Dup.	RPD	[NT]	[NT]
Date prepared	-			[NT]	29	03/06/2021	03/06/2021		[NT]	[NT]
Date analysed	-			[NT]	29	03/06/2021	03/06/2021		[NT]	[NT]
Arsenic	mg/kg	4	Metals-020	[NT]	29	<4	<4	0	[NT]	[NT]
Cadmium	mg/kg	0.4	Metals-020	[NT]	29	<0.4	<0.4	0	[NT]	[NT]
Chromium	mg/kg	1	Metals-020	[NT]	29	8	8	0	[NT]	[NT]
Copper	mg/kg	1	Metals-020	[NT]	29	7	7	0	[NT]	[NT]
Lead	mg/kg	1	Metals-020	[NT]	29	8	9	12	[NT]	[NT]
Mercury	mg/kg	0.1	Metals-021	[NT]	29	<0.1	<0.1	0	[NT]	[NT]
Nickel	mg/kg	1	Metals-020	[NT]	29	5	5	0	[NT]	[NT]
Zinc	mg/kg	1	Metals-020	[NT]	29	17	18	6	[NT]	[NT]

Result Definitions

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

Quality Control Definitions

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

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

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

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

Laboratory Acceptance Criteria

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

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

Spikes for Physical and Aggregate Tests are not applicable.

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

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

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

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

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

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

Measurement Uncertainty estimates are available for most tests upon request.

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

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

Report Comments

8 metals in soil - # Percent recovery is not possible to report due to the inhomogeneous nature of the element/s in the sample/s. However an acceptable recovery was obtained for the LCS.

Asbestos: A portion of the supplied samples were sub-sampled for asbestos analysis according to Envirolab procedures.
We cannot guarantee that these sub-samples are indicative of the entire sample.
Envirolab recommends supplying 40-50g of sample in its own container.
Note: Samples 270252-5,7,11,13-14,16,22-23 were sub-sampled from jars provided by the client.

Asbestos: Excessive sample volumes were provided for asbestos analysis.
A portion of the supplied samples were sub-sampled according to Envirolab procedures.
We cannot guarantee that these sub-samples are indicative of the entire sample.
Envirolab recommends supplying 40-50g (50mL) of sample in its own container as per AS4964-2004.
Note: Samples 270252-1-2,4,8,10,17,19-20,25-26,28-29 were sub-sampled from bags provided by the client.

Douglas Partners
Geotechnics | Environment | Groundwater

CHAIN OF CUSTODY DESPATCH SHEET

Project No:	204635.01	**Suburb:**	Penrith	**To:**	*Envirolab Services*
Project Manager:	Nizam Ahamed	**Order Number:**		**Sampler:**	HD		*12 Ashley St, Chatswood NSW 2067*
Email:	Jack.Hinchliffe; Henri.Dubourdieu; Nizam.Ahamed@douglaspartners.com.au				**Attn:**	*Sample Receipt*
Turnaround time:	☑ Standard ☐ 72 hour ☐ 48 hour ☐ 24 hour ☐ Same day				**Contact:**	*(02) 9910 6200 samplereceipt@envirolab.com.au*
Prior Storage:	☑ Fridge ☐ Freezer ☐ Shelf	**Do samples contain 'potential' HBM?**	☐ No ☑ Yes	(If YES, then handle, transport and store in accordance with FPM HAZID)		

Lab ID	Sample ID: Location / Other ID	Depth From	Depth To	Date Sampled	Sample Type: S - soil W - water	Container Type: G - glass P - plastic	Analytes: Combo 8a	Combo 3	BTEX	AF/FA	Asbestos ID	Spike/Blank	Rinsate					Notes/ Preservation/ Additional Requirements
1	31	0	0.1	25/05/21	S	G+P	X											
2	32	0	0.1	25/05/21	S	G+P	X											
3	32	1.5	1.6	25/05/21	S	G		X										
4	33	0	0.1	25/05/21	S	G+P	X											
5	34	0	0.1	24/05/21	S	G+P	X											
6	34	0.4	0.5	24/05/21	S	G		X										
7	35	0	0.1	24/05/21	S	G+P	X											
8	36	0.1	0.2	25/05/21	S	G+P	X											
9	36	0.4	0.5	25/05/21	S	G		X										
10	37	0.1	0.2	25/05/21	S	G+P	X											
11	38	0.1	0.2	24/05/21	S	G+P	X											
12	38	0.5	0.6	24/05/21	S	G		X										
13	39	0	0.1	24/05/21	S	G+P	X											
14	40	0	0.1	24/05/21	S	G+P	X											

ENVIROLAB

Envirolab Services
12 Ashley St
Chatswood NSW 2067
Ph: (02) 9910 6200

Job No: 270252.
Date Received: 28/05/21
Time Received: 1500
Received By: CH
Temp: Cool/Ambient
Cooling: Ice/Icepack
Security: Intact/Broken/None

Metals to analyse:			
Number of samples in container:		**Transported to laboratory by:**	Courier
Send results to:	Douglas Partners Pty Ltd		
Address:	96 Hermitage Road, West Ryde NSW 2114	**Phone:**	(02) 9809 0666
Relinquished by:	JH	**Date:**	28/5/2021
		Signed:	JH

LAB RECEIPT

Lab Ref. No:	270252.
Received by:	CHRISTINE.
Date & Time:	28/05/21 1500
Signed:	

Douglas Partners
Geotechnics | Environment | Groundwater

CHAIN OF CUSTODY DESPATCH SHEET

Project No:	204635.01	**Suburb:**	Penrith	**To:**	*Envirolab Services*
Project Manager:	Nizam Ahamed	**Order Number:**		**Dispatch date:**	28/05/2021
					12 Ashley St, Chatswood NSW 2067

Lab ID	Sample ID			Date Sampled	Sample Type	Container Type	Analytes											Notes/ Preservation/ Additional Requirements
	Location / Other ID	Depth From	Depth To		S - soil W - water	G - glass P - plastic	Combo 8a	Combo 3	BTEX	AF/FA	Asbestos ID	Spike/Blank	Rinsate					
15	40	1.5	1.6	24/05/21	S	G		X										
16	41	0.1	0.2	24/05/21	S	G+P	X											
17	42	0.4	0.5	24/05/21	S	G+P	X											
18	42	0.6	0.7	24/05/21	S	G		X										
19	43	0.1	0.2	24/05/21	S	G+P	X											
20	44	0.1	0.2	24/05/21	S	G+P	X											
21	44	0.8	0.9	24/05/21	S	G		X										
22	45	0	0.1	24/05/21	S	G+P	X											
23	46	0	0.1	24/05/21	S	G+P	X											
24	46	1	1.1	24/05/21	S	G		X										
25	47	0	0.1	25/05/21	S	G+P	X											
26	48	0	0.1	25/05/21	S	G+P	X											
27	48	1.1	1.2	25/05/21	S	G+P		X										
28	49	0	0.1	25/05/21	S	G+P	X											
29	50	0	0.1	25/05/21	S	G+P	X											
30	TS1																	trip spike
31	TB1																	trip blank
32	A01			25/05/21	M	P					X							

#270252

Douglas Partners
Geotechnics | Environment | Groundwater

CHAIN OF CUSTODY DESPATCH SHEET

Project No:	204635.01	**Suburb:** Penrith	**To:** *Envirolab Services*
Project Manager:	Nizam Ahamed		**Dispatch date:** 28/5/2021

Lab ID	Sample ID: Location / Other ID	Sample ID: Depth From	Sample ID: Depth To	Date Sampled	Sample Type: S - soil W - water	Container Type: G - glass P - plastic	Analytes: Combo 8a	Combo 3	BTEX	AF/FA	Asbestos ID	Spike/Blank	Rinsate					Notes/ Preservation/ Additional Requirements
33	BD6/20210525			25/05/21	S	G		X										
34	BD2/20210524			24/05/21	S	G		X										

270252

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	Nizam Ahamed

Sample Login Details

Your reference	204635.01, Penrith
Envirolab Reference	270252
Date Sample Received	28/05/2021
Date Instructions Received	28/05/2021
Date Results Expected to be Reported	04/06/2021

Sample Condition

Samples received in appropriate condition for analysis	Yes
No. of Samples Provided	33 Soil, 1 Material
Turnaround Time Requested	Standard
Temperature on Receipt (°C)	8
Cooling Method	None
Sampling Date Provided	YES

Comments

Nil

Please direct any queries to:

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

Analysis Underway, details on the following page:

Envirolab Services Pty Ltd
ABN 37 112 535 645
12 Ashley St Chatswood NSW 2067
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Sample ID	vTRH(C6-C10)/BTEXN in Soil	svTRH (C10-C40) in Soil	PAHs in Soil	Organochlorine Pesticides in soil	Organophosphorus Pesticides in Soil	PCBsin Soil	Misc Soil - Inorg	Acid Extractable metalsin soil	Asbestos ID - soils	Asbestos ID - materials
31-0-0.1	✓	✓	✓	✓	✓	✓	✓	✓	✓	
32-0-0.1	✓	✓	✓	✓	✓	✓	✓	✓	✓	
32-1.5-1.6	✓	✓	✓					✓		
33-0-0.1	✓	✓	✓	✓	✓	✓	✓	✓	✓	
34-0-0.1	✓	✓	✓	✓	✓	✓	✓	✓	✓	
34-0.4-0.5	✓	✓	✓					✓		
35-0-0.1	✓	✓	✓	✓	✓	✓	✓	✓	✓	
36-0.1-0.2	✓	✓	✓	✓	✓	✓	✓	✓	✓	
36-0.4-0.5	✓	✓	✓					✓		
37-0.1-0.2	✓	✓	✓	✓	✓	✓	✓	✓	✓	
38-0.1-0.2	✓	✓	✓	✓	✓	✓	✓	✓	✓	
38-0.5-0.6	✓	✓	✓					✓		
39-0-0.1	✓	✓	✓	✓	✓	✓	✓	✓	✓	
40-0-0.1	✓	✓	✓	✓	✓	✓	✓	✓	✓	
40-1.5-1.6	✓	✓	✓					✓		
41-0.1-0.2	✓	✓	✓	✓	✓	✓	✓	✓	✓	
42-0.4-0.5	✓	✓	✓	✓	✓	✓	✓	✓	✓	
42-0.6-0.7	✓	✓	✓					✓		
43-0.1-0.2	✓	✓	✓	✓	✓	✓	✓	✓	✓	
44-0.1-0.2	✓	✓	✓	✓	✓	✓	✓	✓	✓	
44-0.8-0.9	✓	✓	✓					✓		
45-0-0.1	✓	✓	✓	✓	✓	✓	✓	✓	✓	
46-0-0.1	✓	✓	✓	✓	✓	✓	✓	✓	✓	
46-1-1.1	✓	✓	✓					✓		
47-0-0.1	✓	✓	✓	✓	✓	✓	✓	✓	✓	
48-0-0.1	✓	✓	✓	✓	✓	✓	✓	✓	✓	
48-1.1-1.2	✓	✓	✓					✓		
49-0-0.1	✓	✓	✓	✓	✓	✓	✓	✓	✓	
50-0-0.1	✓	✓	✓	✓	✓	✓	✓	✓	✓	
TS1	✓									
TB1	✓									
A01										✓

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

Sample ID	vTRH(C6-C10)/BTEXN in Soil	svTRH (C10-C40) in Soil	PAHs in Soil	Organochlorine Pesticides in soil	Organophosphorus Pesticides in Soil	PCBsin Soil	Misc Soil - Inorg	Acid Extractable metalsin soil	Asbestos ID - soils	Asbestos ID - materials
BD6/20210525	✓	✓	✓					✓		
BD2/20210524	✓	✓	✓					✓		

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

Additional Info

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

ALS Environmental

CERTIFICATE OF ANALYSIS

Work Order	: **ES2120220**	Page	: 1 of 5
Client	: **DOUGLAS PARTNERS PTY LTD**	Laboratory	: Environmental Division Sydney
Contact	: NIZAM AHAMED	Contact	: Sepan Mahamad
Address	: 96 HERMITAGE ROAD WEST RYDE NSW, AUSTRALIA 2114	Address	: 277-289 Woodpark Road Smithfield NSW Australia 2164
Telephone	: ----	Telephone	: +61 2 8784 8555
Project	: 204635.01	Date Samples Received	: 28-May-2021 17:50
Order number	: ----	Date Analysis Commenced	: 02-Jun-2021
C-O-C number	: ----	Issue Date	: 07-Jun-2021 19:00
Sampler	: HD		
Site	: Penrith		
Quote number	: EN/222		
No. of samples received	: 2		
No. of samples analysed	: 2		

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

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

This Certificate of Analysis contains the following information:

- General Comments
- Analytical Results
- Surrogate Control Limits

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

Signatories

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

Signatories	*Position*	*Accreditation Category*
Edwandy Fadjar	Organic Coordinator	Sydney Inorganics, Smithfield, NSW
Edwandy Fadjar	Organic Coordinator	Sydney Organics, Smithfield, NSW
Ivan Taylor	Analyst	Sydney Inorganics, Smithfield, NSW

General Comments

The analytical procedures used by ALS have been developed from established internationally recognised procedures such as those published by the USEPA, APHA, AS and NEPM. In house developed procedures are fully validated and are often at the client request.

Where moisture determination has been performed, results are reported on a dry weight basis.

Where a reported less than (<) result is higher than the LOR, this may be due to primary sample extract/digestate dilution and/or insufficient sample for analysis.

Where the LOR of a reported result differs from standard LOR, this may be due to high moisture content, insufficient sample (reduced weight employed) or matrix interference.

When sampling time information is not provided by the client, sampling dates are shown without a time component. In these instances, the time component has been assumed by the laboratory for processing purposes.

Where a result is required to meet compliance limits the associated uncertainty must be considered. Refer to the ALS Contact for details.

Key : CAS Number = CAS registry number from database maintained by Chemical Abstracts Services. The Chemical Abstracts Service is a division of the American Chemical Society.
LOR = Limit of reporting
^ = This result is computed from individual analyte detections at or above the level of reporting
ø = ALS is not NATA accredited for these tests.
~ = Indicates an estimated value.

- EP080: Where reported, Total Xylenes is the sum of the reported concentrations of m&p-Xylene and o-Xylene at or above the LOR.

Analytical Results

Sub-Matrix: SOIL (Matrix: SOIL)			Sample ID	BD1/20210524	BD3/20210524	----	----	----
			Sampling date / time	24-May-2021 00:00	24-May-2021 00:00	----	----	----
Compound	CAS Number	LOR	Unit	ES2120220-001	ES2120220-002	--------	--------	--------
				Result	Result	----	----	----
EA055: Moisture Content								
Moisture Content	----	1.0	%	**22.0**	**18.8**	----	----	----
EG005(ED093)T: Total Metals by ICP-AES								
Arsenic	7440-38-2	5	mg/kg	<5	<5	----	----	----
Cadmium	7440-43-9	1	mg/kg	<1	<1	----	----	----
Chromium	7440-47-3	2	mg/kg	**9**	**8**	----	----	----
Copper	7440-50-8	5	mg/kg	**6**	**6**	----	----	----
Lead	7439-92-1	5	mg/kg	**8**	**13**	----	----	----
Nickel	7440-02-0	2	mg/kg	**7**	**8**	----	----	----
Zinc	7440-66-6	5	mg/kg	**24**	**24**	----	----	----
EG035T: Total Recoverable Mercury by FIMS								
Mercury	7439-97-6	0.1	mg/kg	<0.1	<0.1	----	----	----
EP080/071: Total Petroleum Hydrocarbons								
C6 - C9 Fraction	----	10	mg/kg	<10	<10	----	----	----
C10 - C14 Fraction	----	50	mg/kg	<50	<50	----	----	----
C15 - C28 Fraction	----	100	mg/kg	<100	<100	----	----	----
C29 - C36 Fraction	----	100	mg/kg	<100	<100	----	----	----
^ C10 - C36 Fraction (sum)	----	50	mg/kg	<50	<50	----	----	----
EP080/071: Total Recoverable Hydrocarbons - NEPM 2013 Fractions								
C6 - C10 Fraction	C6_C10	10	mg/kg	<10	<10	----	----	----
^ C6 - C10 Fraction minus BTEX (F1)	C6_C10-BTEX	10	mg/kg	<10	<10	----	----	----
>C10 - C16 Fraction	----	50	mg/kg	<50	<50	----	----	----
>C16 - C34 Fraction	----	100	mg/kg	<100	<100	----	----	----
>C34 - C40 Fraction	----	100	mg/kg	<100	<100	----	----	----
^ >C10 - C40 Fraction (sum)	----	50	mg/kg	<50	<50	----	----	----
^ >C10 - C16 Fraction minus Naphthalene (F2)	----	50	mg/kg	<50	<50	----	----	----
EP080: BTEXN								
Benzene	71-43-2	0.2	mg/kg	<0.2	<0.2	----	----	----
Toluene	108-88-3	0.5	mg/kg	<0.5	<0.5	----	----	----
Ethylbenzene	100-41-4	0.5	mg/kg	<0.5	<0.5	----	----	----
meta- & para-Xylene	108-38-3 106-42-3	0.5	mg/kg	<0.5	<0.5	----	----	----
ortho-Xylene	95-47-6	0.5	mg/kg	<0.5	<0.5	----	----	----
^ Sum of BTEX	----	0.2	mg/kg	<0.2	<0.2	----	----	----

Analytical Results

Sub-Matrix: SOIL (Matrix: SOIL)			Sample ID	BD1/20210524	BD3/20210524	----	----	----
			Sampling date / time	24-May-2021 00:00	24-May-2021 00:00	----	----	----
Compound	CAS Number	LOR	Unit	ES2120220-001	ES2120220-002	--------	--------	--------
				Result	Result	----	----	----
EP080: BTEXN - Continued								
^ **Total Xylenes**	----	0.5	mg/kg	<0.5	<0.5	**----**	**----**	**----**
Naphthalene	91-20-3	1	mg/kg	<1	<1	**----**	**----**	**----**
EP080S: TPH(V)/BTEX Surrogates								
1.2-Dichloroethane-D4	17060-07-0	0.2	%	**87.1**	**87.0**	**----**	**----**	**----**
Toluene-D8	2037-26-5	0.2	%	**100**	**100**	**----**	**----**	**----**
4-Bromofluorobenzene	460-00-4	0.2	%	**102**	**102**	**----**	**----**	**----**

Surrogate Control Limits

Sub-Matrix: **SOIL**		Recovery Limits (%)	
Compound	*CAS Number*	*Low*	*High*
EP080S: TPH(V)/BTEX Surrogates			
1.2-Dichloroethane-D4	17060-07-0	73	133
Toluene-D8	2037-26-5	74	132
4-Bromofluorobenzene	460-00-4	72	130

ALS Environmental

QUALITY CONTROL REPORT

Work Order	: **ES2120220**	Page	: 1 of 5
Client	: **DOUGLAS PARTNERS PTY LTD**	Laboratory	: Environmental Division Sydney
Contact	: NIZAM AHAMED	Contact	: Sepan Mahamad
Address	: 96 HERMITAGE ROAD WEST RYDE NSW, AUSTRALIA 2114	Address	: 277-289 Woodpark Road Smithfield NSW Australia 2164
Telephone	: ----	Telephone	: +61 2 8784 8555
Project	: 204635.01	Date Samples Received	: 28-May-2021
Order number	: ----	Date Analysis Commenced	: 02-Jun-2021
C-O-C number	: ----	Issue Date	: 07-Jun-2021
Sampler	: HD		
Site	: Penrith		
Quote number	: EN/222		
No. of samples received	: 2		
No. of samples analysed	: 2		

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

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

This Quality Control Report contains the following information:

- Laboratory Duplicate (DUP) Report; Relative Percentage Difference (RPD) and Acceptance Limits
- Method Blank (MB) and Laboratory Control Spike (LCS) Report; Recovery and Acceptance Limits
- Matrix Spike (MS) Report; Recovery and Acceptance Limits

Signatories

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

Signatories	*Position*	*Accreditation Category*
Edwandy Fadjar	Organic Coordinator	Sydney Inorganics, Smithfield, NSW
Edwandy Fadjar	Organic Coordinator	Sydney Organics, Smithfield, NSW
Ivan Taylor	Analyst	Sydney Inorganics, Smithfield, NSW

General Comments

The analytical procedures used by ALS have been developed from established internationally recognised procedures such as those published by the USEPA, APHA, AS and NEPM. In house developed procedures are fully validated and are often at the client request.

Where moisture determination has been performed, results are reported on a dry weight basis.

Where a reported less than (<) result is higher than the LOR, this may be due to primary sample extract/digestate dilution and/or insufficient sample for analysis. Where the LOR of a reported result differs from standard LOR, this may be due to high

Key : Anonymous = Refers to samples which are not specifically part of this work order but formed part of the QC process lot
CAS Number = CAS registry number from database maintained by Chemical Abstracts Services. The Chemical Abstracts Service is a division of the American Chemical Society.
LOR = Limit of reporting
RPD = Relative Percentage Difference
# = Indicates failed QC

Laboratory Duplicate (DUP) Report

The quality control term Laboratory Duplicate refers to a randomly selected intralaboratory split. Laboratory duplicates provide information regarding method precision and sample heterogeneity. The permitted ranges for the Relative Percent Deviation (RPD) of Laboratory Duplicates are specified in ALS Method QWI-EN/38 and are dependent on the magnitude of results in comparison to the level of reporting: Result < 10 times LOR: No Limit; Result between 10 and 20 times LOR: 0% - 50%; Result > 20 times LOR: 0% - 20%.

Sub-Matrix: **SOIL**

				Laboratory Duplicate (DUP) Report					
Laboratory sample ID	*Sample ID*	*Method: Compound*	*CAS Number*	*LOR*	*Unit*	*Original Result*	*Duplicate Result*	*RPD (%)*	*Acceptable RPD (%)*
EG005(ED093)T: Total Metals by ICP-AES (QC Lot: 3717869)									
ES2120032-042	Anonymous	EG005T: Cadmium	7440-43-9	1	mg/kg	<1	<1	0.0	No Limit
		EG005T: Chromium	7440-47-3	2	mg/kg	<2	<2	0.0	No Limit
		EG005T: Nickel	7440-02-0	2	mg/kg	<2	<2	0.0	No Limit
		EG005T: Arsenic	7440-38-2	5	mg/kg	<5	<5	0.0	No Limit
		EG005T: Copper	7440-50-8	5	mg/kg	<5	<5	0.0	No Limit
		EG005T: Lead	7439-92-1	5	mg/kg	<5	<5	0.0	No Limit
		EG005T: Zinc	7440-66-6	5	mg/kg	5	6	19.3	No Limit
ES2120188-006	Anonymous	EG005T: Cadmium	7440-43-9	1	mg/kg	<1	<1	0.0	No Limit
		EG005T: Chromium	7440-47-3	2	mg/kg	10	11	10.6	No Limit
		EG005T: Nickel	7440-02-0	2	mg/kg	6	7	0.0	No Limit
		EG005T: Arsenic	7440-38-2	5	mg/kg	<5	<5	0.0	No Limit
		EG005T: Copper	7440-50-8	5	mg/kg	6	6	0.0	No Limit
		EG005T: Lead	7439-92-1	5	mg/kg	33	41	20.5	No Limit
		EG005T: Zinc	7440-66-6	5	mg/kg	34	34	0.0	No Limit
EA055: Moisture Content (Dried @ 105-110°C) (QC Lot: 3717871)									
ES2120032-044	Anonymous	EA055: Moisture Content	----	0.1	%	2.4	2.5	4.6	0% - 20%
ES2120188-007	Anonymous	EA055: Moisture Content	----	0.1	%	8.6	8.2	4.3	No Limit
EG035T: Total Recoverable Mercury by FIMS (QC Lot: 3717868)									
ES2120032-042	Anonymous	EG035T: Mercury	7439-97-6	0.1	mg/kg	<0.1	<0.1	0.0	No Limit
ES2120188-006	Anonymous	EG035T: Mercury	7439-97-6	0.1	mg/kg	<0.1	<0.1	0.0	No Limit
EP080/071: Total Petroleum Hydrocarbons (QC Lot: 3710473)									
ES2120146-002	Anonymous	EP071: C15 - C28 Fraction	----	100	mg/kg	<100	<100	0.0	No Limit
		EP071: C29 - C36 Fraction	----	100	mg/kg	<100	<100	0.0	No Limit
		EP071: C10 - C14 Fraction	----	50	mg/kg	<50	<50	0.0	No Limit

Sub-Matrix: **SOIL**

				Laboratory Duplicate (DUP) Report					
Laboratory sample ID	*Sample ID*	*Method: Compound*	*CAS Number*	*LOR*	*Unit*	*Original Result*	*Duplicate Result*	*RPD (%)*	*Acceptable RPD (%)*
EP080/071: Total Petroleum Hydrocarbons (QC Lot: 3710473) - continued									
ES2120206-001	Anonymous	EP071: C15 - C28 Fraction	----	100	mg/kg	<100	<100	0.0	No Limit
		EP071: C29 - C36 Fraction	----	100	mg/kg	<100	<100	0.0	No Limit
		EP071: C10 - C14 Fraction	----	50	mg/kg	<50	<50	0.0	No Limit
EP080/071: Total Petroleum Hydrocarbons (QC Lot: 3712657)									
ES2120032-021	Anonymous	EP080: C6 - C9 Fraction	----	10	mg/kg	<10	<10	0.0	No Limit
ES2120188-003	Anonymous	EP080: C6 - C9 Fraction	----	10	mg/kg	<10	<10	0.0	No Limit
EP080/071: Total Recoverable Hydrocarbons - NEPM 2013 Fractions (QC Lot: 3710473)									
ES2120146-002	Anonymous	EP071: >C16 - C34 Fraction	----	100	mg/kg	<100	<100	0.0	No Limit
		EP071: >C34 - C40 Fraction	----	100	mg/kg	<100	<100	0.0	No Limit
		EP071: >C10 - C16 Fraction	----	50	mg/kg	<50	<50	0.0	No Limit
ES2120206-001	Anonymous	EP071: >C16 - C34 Fraction	----	100	mg/kg	<100	<100	0.0	No Limit
		EP071: >C34 - C40 Fraction	----	100	mg/kg	<100	<100	0.0	No Limit
		EP071: >C10 - C16 Fraction	----	50	mg/kg	<50	<50	0.0	No Limit
EP080/071: Total Recoverable Hydrocarbons - NEPM 2013 Fractions (QC Lot: 3712657)									
ES2120032-021	Anonymous	EP080: C6 - C10 Fraction	C6_C10	10	mg/kg	<10	<10	0.0	No Limit
ES2120188-003	Anonymous	EP080: C6 - C10 Fraction	C6_C10	10	mg/kg	<10	<10	0.0	No Limit
EP080: BTEXN (QC Lot: 3712657)									
ES2120032-021	Anonymous	EP080: Benzene	71-43-2	0.2	mg/kg	<0.2	<0.2	0.0	No Limit
		EP080: Toluene	108-88-3	0.5	mg/kg	<0.5	<0.5	0.0	No Limit
		EP080: Ethylbenzene	100-41-4	0.5	mg/kg	<0.5	<0.5	0.0	No Limit
		EP080: meta- & para-Xylene	108-38-3 106-42-3	0.5	mg/kg	<0.5	<0.5	0.0	No Limit
		EP080: ortho-Xylene	95-47-6	0.5	mg/kg	<0.5	<0.5	0.0	No Limit
		EP080: Naphthalene	91-20-3	1	mg/kg	<1	<1	0.0	No Limit
ES2120188-003	Anonymous	EP080: Benzene	71-43-2	0.2	mg/kg	<0.2	<0.2	0.0	No Limit
		EP080: Toluene	108-88-3	0.5	mg/kg	<0.5	<0.5	0.0	No Limit
		EP080: Ethylbenzene	100-41-4	0.5	mg/kg	<0.5	<0.5	0.0	No Limit
		EP080: meta- & para-Xylene	108-38-3 106-42-3	0.5	mg/kg	<0.5	<0.5	0.0	No Limit
		EP080: ortho-Xylene	95-47-6	0.5	mg/kg	<0.5	<0.5	0.0	No Limit
		EP080: Naphthalene	91-20-3	1	mg/kg	<1	<1	0.0	No Limit

Method Blank (MB) and Laboratory Control Sample (LCS) Report

The quality control term Method / Laboratory Blank refers to an analyte free matrix to which all reagents are added in the same volumes or proportions as used in standard sample preparation. The purpose of this QC parameter is to monitor potential laboratory contamination. The quality control term Laboratory Control Sample (LCS) refers to a certified reference material, or a known interference free matrix spiked with target analytes. The purpose of this QC parameter is to monitor method precision and accuracy independent of sample matrix. Dynamic Recovery Limits are based on statistical evaluation of processed LCS.

Sub-Matrix: **SOIL**

				Method Blank (MB) Report	Laboratory Control Spike (LCS) Report			
					Spike	Spike Recovery (%)	Acceptable Limits (%)	
Method: Compound	CAS Number	LOR	Unit	Result	Concentration	LCS	Low	High
EG005(ED093)T: Total Metals by ICP-AES (QCLot: 3717869)								
EG005T: Arsenic	7440-38-2	5	mg/kg	<5	121.1 mg/kg	88.5	88.0	113
EG005T: Cadmium	7440-43-9	1	mg/kg	<1	0.74 mg/kg	89.8	70.0	130
EG005T: Chromium	7440-47-3	2	mg/kg	<2	19.6 mg/kg	88.4	68.0	132
EG005T: Copper	7440-50-8	5	mg/kg	<5	52.9 mg/kg	95.9	89.0	111
EG005T: Lead	7439-92-1	5	mg/kg	<5	60.8 mg/kg	90.5	82.0	119
EG005T: Nickel	7440-02-0	2	mg/kg	<2	15.3 mg/kg	85.5	80.0	120
EG005T: Zinc	7440-66-6	5	mg/kg	<5	139.3 mg/kg	80.8	66.0	133
EG035T: Total Recoverable Mercury by FIMS (QCLot: 3717868)								
EG035T: Mercury	7439-97-6	0.1	mg/kg	<0.1	0.087 mg/kg	91.4	70.0	125
EP080/071: Total Petroleum Hydrocarbons (QCLot: 3710473)								
EP071: C10 - C14 Fraction	----	50	mg/kg	<50	300 mg/kg	90.9	75.0	129
EP071: C15 - C28 Fraction	----	100	mg/kg	<100	450 mg/kg	105	77.0	131
EP071: C29 - C36 Fraction	----	100	mg/kg	<100	300 mg/kg	93.3	71.0	129
EP080/071: Total Petroleum Hydrocarbons (QCLot: 3712657)								
EP080: C6 - C9 Fraction	----	10	mg/kg	<10	26 mg/kg	89.5	68.4	128
EP080/071: Total Recoverable Hydrocarbons - NEPM 2013 Fractions (QCLot: 3710473)								
EP071: >C10 - C16 Fraction	----	50	mg/kg	<50	375 mg/kg	91.7	77.0	125
EP071: >C16 - C34 Fraction	----	100	mg/kg	<100	525 mg/kg	89.7	74.0	138
EP071: >C34 - C40 Fraction	----	100	mg/kg	<100	225 mg/kg	105	63.0	131
EP080/071: Total Recoverable Hydrocarbons - NEPM 2013 Fractions (QCLot: 3712657)								
EP080: C6 - C10 Fraction	C6_C10	10	mg/kg	<10	31 mg/kg	91.1	68.4	128
EP080: BTEXN (QCLot: 3712657)								
EP080: Benzene	71-43-2	0.2	mg/kg	<0.2	1 mg/kg	96.9	62.0	116
EP080: Toluene	108-88-3	0.5	mg/kg	<0.5	1 mg/kg	104	67.0	121
EP080: Ethylbenzene	100-41-4	0.5	mg/kg	<0.5	1 mg/kg	100	65.0	117
EP080: meta- & para-Xylene	108-38-3 106-42-3	0.5	mg/kg	<0.5	2 mg/kg	102	66.0	118
EP080: ortho-Xylene	95-47-6	0.5	mg/kg	<0.5	1 mg/kg	101	68.0	120
EP080: Naphthalene	91-20-3	1	mg/kg	<1	1 mg/kg	101	63.0	119

Matrix Spike (MS) Report

The quality control term Matrix Spike (MS) refers to an intralaboratory split sample spiked with a representative set of target analytes. The purpose of this QC parameter is to monitor potential matrix effects on analyte recoveries. Static Recovery Limits as per laboratory Data Quality Objectives (DQOs). Ideal recovery ranges stated may be waived in the event of sample matrix interference.

Sub-Matrix: **SOIL**

				Matrix Spike (MS) Report			
				Spike	SpikeRecovery(%)	Acceptable Limits (%)	
Laboratory sample ID	*Sample ID*	*Method: Compound*	*CAS Number*	*Concentration*	*MS*	*Low*	*High*
EG005(ED093)T: Total Metals by ICP-AES (QCLot: 3717869)							
ES2120032-042	Anonymous	EG005T: Arsenic	7440-38-2	50 mg/kg	87.0	70.0	130
		EG005T: Cadmium	7440-43-9	50 mg/kg	86.4	70.0	130
		EG005T: Chromium	7440-47-3	50 mg/kg	87.3	68.0	132
		EG005T: Copper	7440-50-8	250 mg/kg	87.2	70.0	130
		EG005T: Lead	7439-92-1	250 mg/kg	88.0	70.0	130
		EG005T: Nickel	7440-02-0	50 mg/kg	86.1	70.0	130
		EG005T: Zinc	7440-66-6	250 mg/kg	85.8	66.0	133
EG035T: Total Recoverable Mercury by FIMS (QCLot: 3717868)							
ES2120032-042	Anonymous	EG035T: Mercury	7439-97-6	5 mg/kg	75.9	70.0	130
EP080/071: Total Petroleum Hydrocarbons (QCLot: 3710473)							
ES2120146-002	Anonymous	EP071: C10 - C14 Fraction	----	480 mg/kg	95.0	73.0	137
		EP071: C15 - C28 Fraction	----	3100 mg/kg	98.7	53.0	131
		EP071: C29 - C36 Fraction	----	2060 mg/kg	112	52.0	132
EP080/071: Total Petroleum Hydrocarbons (QCLot: 3712657)							
ES2120032-021	Anonymous	EP080: C6 - C9 Fraction	----	32.5 mg/kg	92.3	70.0	130
EP080/071: Total Recoverable Hydrocarbons - NEPM 2013 Fractions (QCLot: 3710473)							
ES2120146-002	Anonymous	EP071: >C10 - C16 Fraction	----	900 mg/kg	108	73.0	137
		EP071: >C16 - C34 Fraction	----	4320 mg/kg	110	53.0	131
		EP071: >C34 - C40 Fraction	----	890 mg/kg	108	52.0	132
EP080/071: Total Recoverable Hydrocarbons - NEPM 2013 Fractions (QCLot: 3712657)							
ES2120032-021	Anonymous	EP080: C6 - C10 Fraction	C6_C10	37.5 mg/kg	91.1	70.0	130
EP080: BTEXN (QCLot: 3712657)							
ES2120032-021	Anonymous	EP080: Benzene	71-43-2	2.5 mg/kg	89.3	70.0	130
		EP080: Toluene	108-88-3	2.5 mg/kg	94.7	70.0	130
		EP080: Ethylbenzene	100-41-4	2.5 mg/kg	94.9	70.0	130
		EP080: meta- & para-Xylene	108-38-3 106-42-3	2.5 mg/kg	93.6	70.0	130
		EP080: ortho-Xylene	95-47-6	2.5 mg/kg	96.6	70.0	130
		EP080: Naphthalene	91-20-3	2.5 mg/kg	85.3	70.0	130

ALS Environmental

QA/QC Compliance Assessment to assist with Quality Review

Work Order	: **ES2120220**	Page	: 1 of 4
Client	: **DOUGLAS PARTNERS PTY LTD**	Laboratory	: Environmental Division Sydney
Contact	: NIZAM AHAMED	Telephone	: +61 2 8784 8555
Project	: 204635.01	Date Samples Received	: 28-May-2021
Site	: Penrith	Issue Date	: 07-Jun-2021
Sampler	: HD	No. of samples received	: 2
Order number	: ----	No. of samples analysed	: 2

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

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

Summary of Outliers

Outliers : Quality Control Samples

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

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

Outliers : Analysis Holding Time Compliance

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

Outliers : Frequency of Quality Control Samples

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

Analysis Holding Time Compliance

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

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

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

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

Matrix: **SOIL**

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

Method / Container / Client Sample ID(s)		Sample Date	Extraction / Preparation			Analysis		
			Date extracted	Due for extraction	Evaluation	Date analysed	Due for analysis	Evaluation
EA055: Moisture Content								
Soil Glass Jar - Unpreserved (EA055)								
BD1/20210524,	BD3/20210524	**24-May-2021**	**----**	----	----	**04-Jun-2021**	07-Jun-2021	✓
EG005(ED093)T: Total Metals by ICP-AES								
Soil Glass Jar - Unpreserved (EG005T)								
BD1/20210524,	BD3/20210524	**24-May-2021**	**04-Jun-2021**	20-Nov-2021	✓	**04-Jun-2021**	20-Nov-2021	✓
EG035T: Total Recoverable Mercury by FIMS								
Soil Glass Jar - Unpreserved (EG035T)								
BD1/20210524,	BD3/20210524	**24-May-2021**	**04-Jun-2021**	21-Jun-2021	✓	**07-Jun-2021**	21-Jun-2021	✓
EP080/071: Total Petroleum Hydrocarbons								
Soil Glass Jar - Unpreserved (EP080)								
BD1/20210524,	BD3/20210524	**24-May-2021**	**02-Jun-2021**	07-Jun-2021	✓	**04-Jun-2021**	07-Jun-2021	✓
Soil Glass Jar - Unpreserved (EP071)								
BD1/20210524,	BD3/20210524	**24-May-2021**	**04-Jun-2021**	07-Jun-2021	✓	**04-Jun-2021**	14-Jul-2021	✓
EP080/071: Total Recoverable Hydrocarbons - NEPM 2013 Fractions								
Soil Glass Jar - Unpreserved (EP080)								
BD1/20210524,	BD3/20210524	**24-May-2021**	**02-Jun-2021**	07-Jun-2021	✓	**04-Jun-2021**	07-Jun-2021	✓
Soil Glass Jar - Unpreserved (EP071)								
BD1/20210524,	BD3/20210524	**24-May-2021**	**04-Jun-2021**	07-Jun-2021	✓	**04-Jun-2021**	14-Jul-2021	✓
EP080: BTEXN								
Soil Glass Jar - Unpreserved (EP080)								
BD1/20210524,	BD3/20210524	**24-May-2021**	**02-Jun-2021**	07-Jun-2021	✓	**04-Jun-2021**	07-Jun-2021	✓

Quality Control Parameter Frequency Compliance

The following report summarises the frequency of laboratory QC samples analysed within the analytical lot(s) in which the submitted sample(s) was(were) processed. Actual rate should be greater than or equal to the expected rate. A listing of breaches is provided in the Summary of Outliers.

Matrix: **SOIL**

Evaluation: × = Quality Control frequency not within specification ; ✓ = Quality Control frequency within specification.

Quality Control Sample Type		Count		Rate (%)			Quality Control Specification
Analytical Methods	*Method*	*QC*	*Regular*	***Actual***	***Expected***	*Evaluation*	
Laboratory Duplicates (DUP)							
Moisture Content	EA055	2	20	**10.00**	**10.00**	✓	NEPM 2013 B3 & ALS QC Standard
Total Mercury by FIMS	EG035T	2	19	**10.53**	**10.00**	✓	NEPM 2013 B3 & ALS QC Standard
Total Metals by ICP-AES	EG005T	2	20	**10.00**	**10.00**	✓	NEPM 2013 B3 & ALS QC Standard
TRH - Semivolatile Fraction	EP071	2	18	**11.11**	**10.00**	✓	NEPM 2013 B3 & ALS QC Standard
TRH Volatiles/BTEX	EP080	2	20	**10.00**	**10.00**	✓	NEPM 2013 B3 & ALS QC Standard
Laboratory Control Samples (LCS)							
Total Mercury by FIMS	EG035T	1	19	**5.26**	**5.00**	✓	NEPM 2013 B3 & ALS QC Standard
Total Metals by ICP-AES	EG005T	1	20	**5.00**	**5.00**	✓	NEPM 2013 B3 & ALS QC Standard
TRH - Semivolatile Fraction	EP071	1	18	**5.56**	**5.00**	✓	NEPM 2013 B3 & ALS QC Standard
TRH Volatiles/BTEX	EP080	1	20	**5.00**	**5.00**	✓	NEPM 2013 B3 & ALS QC Standard
Method Blanks (MB)							
Total Mercury by FIMS	EG035T	1	19	**5.26**	**5.00**	✓	NEPM 2013 B3 & ALS QC Standard
Total Metals by ICP-AES	EG005T	1	20	**5.00**	**5.00**	✓	NEPM 2013 B3 & ALS QC Standard
TRH - Semivolatile Fraction	EP071	1	18	**5.56**	**5.00**	✓	NEPM 2013 B3 & ALS QC Standard
TRH Volatiles/BTEX	EP080	1	20	**5.00**	**5.00**	✓	NEPM 2013 B3 & ALS QC Standard
Matrix Spikes (MS)							
Total Mercury by FIMS	EG035T	1	19	**5.26**	**5.00**	✓	NEPM 2013 B3 & ALS QC Standard
Total Metals by ICP-AES	EG005T	1	20	**5.00**	**5.00**	✓	NEPM 2013 B3 & ALS QC Standard
TRH - Semivolatile Fraction	EP071	1	18	**5.56**	**5.00**	✓	NEPM 2013 B3 & ALS QC Standard
TRH Volatiles/BTEX	EP080	1	20	**5.00**	**5.00**	✓	NEPM 2013 B3 & ALS QC Standard

Brief Method Summaries

The analytical procedures used by the Environmental Division have been developed from established internationally recognized procedures such as those published by the US EPA, APHA, AS and NEPM. In house developed procedures are employed in the absence of documented standards or by client request. The following report provides brief descriptions of the analytical procedures employed for results reported in the Certificate of Analysis. Sources from which ALS methods have been developed are provided within the Method Descriptions.

Analytical Methods	Method	Matrix	Method Descriptions
Moisture Content	EA055	SOIL	In house: A gravimetric procedure based on weight loss over a 12 hour drying period at 105-110 degrees C. This method is compliant with NEPM Schedule B(3).
Total Metals by ICP-AES	EG005T	SOIL	In house: Referenced to APHA 3120; USEPA SW 846 - 6010. Metals are determined following an appropriate acid digestion of the soil. The ICPAES technique ionises samples in a plasma, emitting a characteristic spectrum based on metals present. Intensities at selected wavelengths are compared against those of matrix matched standards. This method is compliant with NEPM Schedule B(3)
Total Mercury by FIMS	EG035T	SOIL	In house: Referenced to AS 3550, APHA 3112 Hg - B (Flow-injection (SnCl2) (Cold Vapour generation) AAS) FIM-AAS is an automated flameless atomic absorption technique. Mercury in solids are determined following an appropriate acid digestion. Ionic mercury is reduced online to atomic mercury vapour by SnCl2 which is then purged into a heated quartz cell. Quantification is by comparing absorbance against a calibration curve. This method is compliant with NEPM Schedule B(3)
TRH - Semivolatile Fraction	EP071	SOIL	In house: Referenced to USEPA SW 846 - 8015 Sample extracts are analysed by Capillary GC/FID and quantified against alkane standards over the range C10 - C40. Compliant with NEPM Schedule B(3).
TRH Volatiles/BTEX	EP080	SOIL	In house: Referenced to USEPA SW 846 - 8260. Extracts are analysed by Purge and Trap, Capillary GC/MS. Quantification is by comparison against an established 5 point calibration curve. Compliant with NEPM Schedule B(3) amended.

Preparation Methods	Method	Matrix	Method Descriptions
Hot Block Digest for metals in soils sediments and sludges	EN69	SOIL	In house: Referenced to USEPA 200.2. Hot Block Acid Digestion 1.0g of sample is heated with Nitric and Hydrochloric acids, then cooled. Peroxide is added and samples heated and cooled again before being filtered and bulked to volume for analysis. Digest is appropriate for determination of selected metals in sludge, sediments, and soils. This method is compliant with NEPM Schedule B(3).
Methanolic Extraction of Soils for Purge and Trap	ORG16	SOIL	In house: Referenced to USEPA SW 846 - 5030A. 5g of solid is shaken with surrogate and 10mL methanol prior to analysis by Purge and Trap - GC/MS.
Tumbler Extraction of Solids	ORG17	SOIL	In house: Mechanical agitation (tumbler). 10g of sample, Na2SO4 and surrogate are extracted with 30mL 1:1 DCM/Acetone by end over end tumble. The solvent is decanted, dehydrated and concentrated (by KD) to the desired volume for analysis.

SAMPLE RECEIPT NOTIFICATION (SRN)

Work Order : **ES2120220**

Client	: **DOUGLAS PARTNERS PTY LTD**	Laboratory	: Environmental Division Sydney
Contact	: NIZAM AHAMED	Contact	: Sepan Mahamad
Address	: 96 HERMITAGE ROAD WEST RYDE NSW, AUSTRALIA 2114	Address	: 277-289 Woodpark Road Smithfield NSW Australia 2164
E-mail	: nizam.ahamed@douglaspartners.com.au	E-mail	: Sepan.Mahamad@ALSGlobal.com
Telephone	: ----	Telephone	: +61 2 8784 8555
Facsimile	: ----	Facsimile	: +61-2-8784 8500
Project	: 204635.01	Page	: 1 of 3
Order number	: ----	Quote number	: EM2017DOUPAR0002 (EN/222)
C-O-C number	: ----	QC Level	: NEPM 2013 B3 & ALS QC Standard
Site	: Penrith		
Sampler	: HD		

Dates

Date Samples Received	: 28-May-2021 17:50	Issue Date	: 31-May-2021
Client Requested Due Date	: 07-Jun-2021	Scheduled Reporting Date	: **07-Jun-2021**

Delivery Details

Mode of Delivery	: Carrier	Security Seal	: Intact.
No. of coolers/boxes	: 1	Temperature	: 3.1 - Ice present
Receipt Detail	:	No. of samples received / analysed	: 2 / 2

General Comments

- This report contains the following information:
  - Sample Container(s)/Preservation Non-Compliances
  - Summary of Sample(s) and Requested Analysis
  - Proactive Holding Time Report
  - Requested Deliverables
- **Please refer to the Proactive Holding Time Report table below which summarises breaches of recommended holding times that have occurred prior to samples/instructions being received at the laboratory. The absence of this summary table indicates that all samples have been received within the recommended holding times for the analysis requested.**
- Please direct any queries you have regarding this work order to the above ALS laboratory contact.
- Analytical work for this work order will be conducted at ALS Sydney.
- Sample Disposal - Aqueous (3 weeks), Solid (2 months ± 1 week) from receipt of samples.
- Please be aware that APHA/NEPM recommends water and soil samples be chilled to less than or equal to 6°C for chemical analysis, and less than or equal to 10°C but unfrozen for Microbiological analysis. Where samples are received above this temperature, it should be taken into consideration when interpreting results. Refer to ALS EnviroMail 85 for ALS recommendations of the best practice for chilling samples after sampling and for maintaining a cool temperature during transit.

Sample Container(s)/Preservation Non-Compliances

All comparisons are made against pretreatment/preservation AS, APHA, USEPA standards.

- **No sample container / preservation non-compliance exists.**

Summary of Sample(s) and Requested Analysis

Some items described below may be part of a laboratory process necessary for the execution of client requested tasks. Packages may contain additional analyses, such as the determination of moisture content and preparation tasks, that are included in the package.
If no sampling time is provided, the sampling time will default 00:00 on the date of sampling. If no sampling date is provided, the sampling date will be assumed by the laboratory and displayed in brackets without a time component

Matrix: **SOIL**

Laboratory sample ID	Sampling date / time	Sample ID	SOIL - EA055-103 Moisture Content	SOIL - S-05 TRH/BTEXN/8 Metals
ES2120220-001	24-May-2021 00:00	BD1/20210524	✓	✓
ES2120220-002	24-May-2021 00:00	BD3/20210524	✓	✓

Proactive Holding Time Report

Sample(s) have been received within the recommended holding times for the requested analysis.

Requested Deliverables

ACCOUNTS PAYABLE INVOICES

- A4 - AU Tax Invoice (INV)	Email	apinvoices@douglaspartners.com.au

HENRI DUBOURDIEU

- *AU Certificate of Analysis - NATA (COA)	Email	henri.dubourdieu@douglaspartners.com.au
- *AU Interpretive QC Report - DEFAULT (Anon QCI Rep) (QCI)	Email	henri.dubourdieu@douglaspartners.com.au
- *AU QC Report - DEFAULT (Anon QC Rep) - NATA (QC)	Email	henri.dubourdieu@douglaspartners.com.au
- A4 - AU Sample Receipt Notification - Environmental HT (SRN)	Email	henri.dubourdieu@douglaspartners.com.au
- Chain of Custody (CoC) (COC)	Email	henri.dubourdieu@douglaspartners.com.au
- EDI Format - ESDAT (ESDAT)	Email	henri.dubourdieu@douglaspartners.com.au
- EDI Format - XTab (XTAB)	Email	henri.dubourdieu@douglaspartners.com.au

JACK HINCHLIFFE

- *AU Certificate of Analysis - NATA (COA)	Email	Jack.Hinchliffe@douglaspartners.com.au
- *AU Interpretive QC Report - DEFAULT (Anon QCI Rep) (QCI)	Email	Jack.Hinchliffe@douglaspartners.com.au
- *AU QC Report - DEFAULT (Anon QC Rep) - NATA (QC)	Email	Jack.Hinchliffe@douglaspartners.com.au
- A4 - AU Sample Receipt Notification - Environmental HT (SRN)	Email	Jack.Hinchliffe@douglaspartners.com.au
- Chain of Custody (CoC) (COC)	Email	Jack.Hinchliffe@douglaspartners.com.au
- EDI Format - ESDAT (ESDAT)	Email	Jack.Hinchliffe@douglaspartners.com.au
- EDI Format - XTab (XTAB)	Email	Jack.Hinchliffe@douglaspartners.com.au

NIZAM AHAMED

- *AU Certificate of Analysis - NATA (COA)	Email	nizam.ahamed@douglaspartners.com.au
- *AU Interpretive QC Report - DEFAULT (Anon QCI Rep) (QCI)	Email	nizam.ahamed@douglaspartners.com.au
- *AU QC Report - DEFAULT (Anon QC Rep) - NATA (QC)	Email	nizam.ahamed@douglaspartners.com.au
- A4 - AU Sample Receipt Notification - Environmental HT (SRN)	Email	nizam.ahamed@douglaspartners.com.au
- Chain of Custody (CoC) (COC)	Email	nizam.ahamed@douglaspartners.com.au
- EDI Format - ESDAT (ESDAT)	Email	nizam.ahamed@douglaspartners.com.au
- EDI Format - XTab (XTAB)	Email	nizam.ahamed@douglaspartners.com.au

Douglas Partners
Geotechnics | Environment | Groundwater

CHAIN OF CUSTODY DESPATCH SHEET

Project No:	204635.01	**Suburb:**	Penrith	**To:**	*ALS Pty Ltd*
Project Manager:	Nizam Ahamed	**Order Number:**		**Sampler:**	HD		*277-289 Woodpark Rd, Smithfield*
Email:	Jack.Hinchliffe; Henri.Dubourdieu; Nizam.Ahamed@douglaspartners.com.au					**Attn:**	*Tyler Cachia*
Turnaround time:	☑ Standard ☐ 72 hour ☐ 48 hour ☐ 24 hour ☐ Same day					**Contact:**	*ALSEnviro.Sydney@ALSGlobal.com*
Prior Storage:	☑ Fridge ☐ Freezer ☐ Shelf	**Do samples contain 'potential' HBM?**	☐ No ☑ Yes (If YES, then handle, transport and store in accordance with FPM HAZID)				

Lab ID	Sample ID: Location / Other ID	Depth From	Depth To	Date Sampled	Sample Type: S - soil W - water	Container Type: G - glass P - plastic	Analytes: Metals	TRH	BTEX								Notes/ Preservation/ Additional Requirements
	BD1/20210524			24/05/21	S	G	X	X	X								
	BD3/20210524			24/05/21	S	G	X	X	X								

Environmental Division
Sydney
Work Order Reference
ES2120220

Telephone : +61-2-8784 8555

Metals to analyse:				**LAB RECEIPT**	
Number of samples in container:		**Transported to laboratory by:**	Courier	**Lab Ref. No:**	
Send results to:	Douglas Partners Pty Ltd			**Received by:**	
Address:	96 Hermitage Road, West Ryde NSW 2114	**Phone:**	(02) 9809 0666	**Date & Time:**	28/5/21 1750
Relinquished by:	JH	**Date:**	28/5/2021	**Signed:**	JH

Appendix O

Data Quality Assurance and Quality Control

Appendix O
Data Quality Assurance and Quality Control
100-275 Old Castlereagh Road, Penrith

O1.0 Field and Laboratory Data Quality Assurance and Quality Control

The field and laboratory data quality assurance and quality control (QA / QC) procedures and results are summarised in the following Table 1. Reference should be made to the field work methodology and the laboratory results / certificates of analysis for further details. The relative percentage difference (RPD) results, along with the other filed QC samples are included in the summary results tables at the end of this appendix.

Table 1: Field and Laboratory Quality Control

Item	Evaluation / Acceptance Criteria	Compliance
Analytical laboratories used	NATA accreditation	C
Holding times	Various based on type of analysis	C
Intra-laboratory replicates	5% of primary samples; <30% RPD	PC
Inter-laboratory replicates	5% of primary samples; <30% RPD	PC
Trip Spikes	1 per sampling event; 60-140% recovery	C
Trip Blanks	1 per sampling event; <PQL	C
Laboratory / Reagent Blanks	1 per batch; <PQL	C
Matrix Spikes	1 per lab batch; 70-130% recovery (inorganics); 60-140% recovery (organics)	C
Surrogate Spikes	All organics analysis; 70-130% recovery (inorganics); 60-140% recovery (organics)	C
Control Samples	1 per lab batch; 70-130% recovery (inorganics); 60-140% recovery (organics)	C
Standard Operating Procedures (SOP)	Adopting SOP for all aspects of the sampling field work	C

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

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

- The typically low actual differences in the concentrations of the replicate pairs where some RPD exceedances occurred, such as total chromium in BD3/20210524 and TP43/0.1-0.2 with concentrations of 8 mg/kg and 11 mg/kg respectively;
- The number of replicate pairs being collected from fill soils which by its nature is heterogeneous;
- Replicates, rather than homogenised duplicates, were used to minimise risk of volatile loss, hence greater variability can be expected;
- Most of the recorded concentrations being relatively close to the PQL;
- The majority of RPDs within a replicate pair being within the acceptable limits; and
- All other QA/QC parameters met the DQIs.

In summary, the QC data is determined to be of sufficient quality to be considered acceptable for the assessment.

O2.0 Data Quality Indicators

The reliability of field procedures and analytical results was assessed against the following data quality indicators (DQIs) as outlined in NEPC *National Environment Protection (Assessment of Site Contamination) Measure 1999 (as amended 2013) [NEPM]* (NEPC, 2013):

- Completeness: a measure of the amount of usable data from a data collection activity;
- Comparability: the confidence (qualitative) that data may be considered to be equivalent for each sampling and analytical event;
- Representativeness: the confidence (qualitative) of data representativeness of media present on-site;
- Precision: a measure of variability or reproducibility of data; and
- Accuracy: a measure of closeness of the data to the 'true' value.

Table 2: Data Quality Indicators

Data Quality Indicator	Method(s) of Achievement
Completeness	Systematic and selected target locations sampled.
	Preparation of test pit logs, sample location plan and chain of custody records.
	Laboratory sample receipt information received confirming receipt of samples intact and appropriateness of the chain of custody.
	Samples analysed for contaminants of potential concern (COPC) identified in the Conceptual Site Model (CSM).
	Completion of chain of custody (COC) documentation.
	NATA accredited laboratory results certificates provided by the laboratory.
	Satisfactory frequency and results for field and laboratory quality control (QC) samples as discussed in Section 1.
Comparability	Using appropriate techniques for sample recovery, storage and transportation, which were the same for the duration of the project.
	Experienced samplers used.
	Use of NATA registered laboratories, with test methods the same or similar between laboratories.
	Satisfactory results for field and laboratory QC samples.
Representativeness	Target media sampled.
	Sample numbers recovered and analysed are considered to be representative of the target media and complying with DQOs.
	Samples were extracted and analysed within holding times.
	Samples were analysed in accordance with the COC.
Precision	Field staff followed standard operating procedures.
	Acceptable RPD between original samples and replicates.
	Satisfactory results for all other field and laboratory QC samples.
Accuracy	Field staff followed standard operating procedures.
	Satisfactory results for all field and laboratory QC samples.

Based on the above, it is considered that the DQIs have been generally complied with.

O3.0 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.

O4.0 References

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

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Table QA1: Relative Percentage Difference Results – Intra-laboratory Replicates

			Metals								TRH						BTEX				PAH				Phenol	OCP											OPP	PCB	Asbestos		
			Arsenic	Cadmium	Total Chromium	Copper	Lead	Mercury (inorganic)	Nickel	Zinc	TRH C6 - C10	TRH >C10-C16	F1 ((C6-C10)-BTEX)	F2 (>C10-C16 less Naphthalene)	F3 (>C16-C34)	F4 (>C34-C40)	Benzene	Toluene	Ethylbenzene	Total Xylenes	Naphthalene [b]	Benzo(a)pyrene (BaP)	Benzo(a)pyrene TEQ	Total PAHs	Phenol	DDD	DDT+DDE+DDD [c]	DDE	DDT	Aldrin & Dieldrin	Total Chlordane	Endrin	Total Endosulfan	Heptachlor	Hexachlorobenzene	Methoxychlor	Chlorpyrifos	Total PCB	Asbestos ID in soil >0.1g/kg	Trace Analysis	Asbestos ID/g
Sample ID	Depth	Sample Date	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	-	-	-
BD1/190521	0.2 - 0.3 m	19/05/2021	<4	<0.4	10	6	9	<0.1	5	69	<25	<50	<25	<50	<100	<100	<0.2	<0.5	<1	<1	<1	<0.05	<0.5	<0.05	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	-	-	-
TP20	0.2 - 0.3 m	19/05/2021	<4	<0.4	10	6	7	<0.1	6	120	<25	<50	<25	<50	<100	<100	<0.2	<0.5	<1	<1	<1	<0.05	<0.5	<0.05	<5	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	NAD	NAD	NAD
		Difference	0	0	0	0	2	0	1	51	0	0	0	0	0	0	0	0	0	0	0	0	0	0	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
		RPD	0%	0%	0%	0%	25%	0%	18%	**54%**	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
BD6/20210525	1.5 - 1.6 m	25/05/2021	<4	<0.4	15	7	10	<0.1	6	18	<25	<50	<25	<50	<100	<100	<0.2	<0.5	<1	<1	<1	<0.05	<0.5	<0.05	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	-	-	-
TP32	1.5 - 1.6 m	25/05/2021	<4	<0.4	15	7	10	<0.1	6	18	<25	<50	<25	<50	<100	<100	<0.2	<0.5	<1	<1	<1	<0.05	<0.5	<0.05	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	-	-	-
		Difference	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
		RPD	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
BD2/20210524	0.5 - 0.6 m	24/05/2021	<4	<0.4	16	9	12	<0.1	8	21	<25	<50	<25	<50	<100	<100	<0.2	<0.5	<1	<1	<1	<0.05	<0.5	<0.05	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	-	-	-
TP38	0.5 - 0.6 m	24/05/2021	<4	<0.4	10	5	9	<0.1	4	11	<25	<50	<25	<50	<100	<100	<0.2	<0.5	<1	<1	<1	<0.05	<0.5	<0.05	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	-	-	-
		Difference	0	0	6	4	3	0	4	10	0	0	0	0	0	0	0	0	0	0	0	0	0	0	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
		RPD	0%	0%	**46%**	**57%**	29%	0%	**67%**	**63%**	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-

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Table QA2: Relative Percentage Difference Results – Inter-laboratory Replicates

			Metals								TRH						BTEX					PAH					Phenol	OCP												OPP	PCB	Asbestos		
			Arsenic	Cadmium	Total Chromium	Copper	Lead	Mercury (inorganic)	Nickel	Zinc	TRH C6 - C10	TRH >C10-C16	F1 ((EC>C6-EC>C10)-BTEX)	F2 (>C10-C16 less Naphthalene)	F3 (>C16-C34)	F4 (>C34-C40)	Benzene	Toluene	Ethylbenzene	Total Xylenes	Naphthalene [b]	Benzo(a)pyrene (BAP)	Benzo(a)pyrene TEQ	Total PAHs	Phenol	DDD	DDT+DDE+DDD [c]	DDE	DDT	Aldrin & Dieldrin	Total Chlordane	Endrin	Total Endosulfan	Heptachlor	Hexachlorobenzene	Methoxychlor	Chlorpyrifos	Total PCB	Asbestos ID in soil >0.1g/kg	Trace Analysis	Asbestos ID/g
Sample ID	Depth	Sample Date	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	-	-	-
BD1/20210524	1.5 - 1.6 m	24/05/2021	<5	<1	9	6	8	<0.1	7	24	<10	<50	<10	<50	<100	<100	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT
TP40	1.5 - 1.6 m	24/05/2021	<4	<0.4	10	7	8	<0.1	7	24	<25	<50	<25	<50	<100	<100	<0.2	<0.5	<1	<1	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT
		Difference	0	0	1	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
		RPD	0%	0%	11%	15%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
BD3/20210524	0.1 - 0.2 m	24/05/2021	<5	<1	8	6	13	<0.1	8	24	<10	<50	<10	<50	<100	<100	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT
TP43	0.1 - 0.2 m	24/05/2021	<4	<0.4	11	7	12	<0.1	6	20	<25	<50	<25	<50	<100	<100	<0.2	<0.5	<1	<1	<1	<0.05	<0.5	<0.05	<5	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	NAD	NAD	NAD
		Difference	0	0	3	1	1	0	2	4	0	0	0	0	0	0	0	0	0	0	0	0	0	0	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
		RPD	0%	0%	**32%**	15%	8%	0%	29%	18%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-

Table QA3: Trip Blank Results - Soils (mg/kg)

Sample ID	Benzene	Toluene	Ethylbenzene	o-Xylene	m+p-Xylene
TB1	<0.2	<0.5	<1	<1	<2

Table QA4: Trip Spike Results – Soils (% Recovery)

Sample ID	Benzene	Toluene	Ethylbenzene	o-Xylene	m+p-Xylene
TS1	72	72	71	73	75