Douglas PARTNERS

GROUNDED EXPERTISE

Report on Detailed Site Investigation (Contamination)

New High School for Googong

200 Wellsvale Drive, Googong

Prepared for NSW Department of Education

Project 224779.00

29 January 2025

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Reviewer		29 January 2025

Executive Summary

Douglas Partners Pty Ltd (Douglas) has been engaged by NSW Department of Education (DoE) to prepare this detailed site investigation for contamination (DSIC) report to inform a Review of Environment Factors (REF) for the proposed construction of a new high school for Googong located at 200 Wellsvale Drive, Googong. The 'site' for the new high school for Googong is part of Lot 829 Deposited Plan 1277372.

The methodology, data and findings presented in this report are based on that obtained for a larger land area (Lot 829 DP1277372) (reported in Douglas, 2024). Douglas has also previously completed a preliminary site investigation (PSI) for Lot 829 DP1277372 (referred to herein as the Lot). The PSI identified two potential sources of contamination at the site comprising: possible contaminated fill / residual impacted soil; and activities associated with the (recent) use of the site as a construction compound.

The objective of the DSIC is to assess the contamination status of the site and the suitability of its use for the proposed development and comment whether further investigation and/or management of contamination is required with regard to the proposed development. This report also presents preliminary waste classification comments to inform planning for future civil and construction works.

Based on the review of available site history information, it was considered that the Lot had historically been used for grazing from the mid to late 1800's until sometime around 2017, when development of the broader Googong Township commenced in the surrounding area. Aerial photography indicated that it was around this time that various sections of the Lot began to be used as a construction compound to support the surrounding developments. The compound areas appeared to be used for storage of various construction materials, earthwork machinery, vehicles and soil stockpiling.

Douglas reviewed a Site Audit Report (SAR) and Site Audit Statement (SAS) previously prepared for the Lot (HEC, 2023). Previous investigation reports were reviewed by the Auditor for the site audit. Of particular note:

- A contamination report, acknowledged as Geotechnique (2016), identified two areas of environmental concern (AECs) at land adjacent to the north of the site, comprising a naturally occurring hematite outcrop and a waste material zone. Elevated heavy metal concentrations (specifically arsenic, lead, manganese and zinc) were recorded in soil samples from test pits at adjacent land to the north of the site. The elevated heavy metals were considered to be associated with the hematite zone.
- A detailed contamination investigation, acknowledged as Geotechnique (2017), was conducted to delineate concentrations of contaminants in soil identified at the hematite zone to the north through the excavation of 226 test pits (17 of which were located within the site). Laboratory analysis confirmed that soils impacted with metals at the hematite zone extended into the northern portion of the site.
- A remediation action plan (RAP), acknowledged as Geotechnique (2018), was prepared to remediate the impacted soils located within the site boundary and adjacent land to the north.

- The reported remediation and validation works, acknowledged as Geotechnique (2021), were carried out in several stages between May 2019 to April 2021. The remediation works in 'Area 2' which was partially within the site boundary, included the excavation of arsenic, lead and manganese contaminated soil for off-site disposal to landfill. Further remediation at 'Area 3' included the excavation of arsenic, lead, manganese and zinc impacted soil for reuse at commercial and road areas in the surrounding land. The area of remediated land located within the Lot boundary was estimated to be 5950 m^2, with the depth of excavations ranging from 0.5 m to 2.0 m below ground level (bgl).
- The report acknowledged as Terravale Consulting (2021) was a health risk assessment of the elevated metals in soil to determine if the soil was suitable to remain at its location; and to determine if the material was suitable for beneficial re-use under public roadways. Based on bioavailability test results for arsenic and manganese in soil, revised arsenic and manganese (site-specific) screening criteria were determined to be above the maximum reported concentrations of these metals, and further assessment of arsenic and manganese was not required. Site-specific screening criteria for lead were also determined. Based on the available soil sampling data at the time, it was stated that the site-specific lead criteria had not been exceeded.

The Auditor considered that the site investigation, remediation and validation was undertaken appropriately and had confirmed that the Lot had been rendered suitable for the proposed land uses as a primary and secondary school, and that no further investigation or remediation is required.

During an initial site walkover for the PSI (27 September 2023), Douglas observed that the Lot was mostly vacant, except for a construction compound present in the south western corner. Minor amounts of construction materials were sporadically observed on the ground surface. Douglas conducted a subsequent walkover (8 November 2023), following the removal of the compound in the south western corner of the Lot. The overall condition of the Lot appeared generally consistent with the previous walkover, and the recently demobilised compound area appeared vacant except for minor amounts of remaining construction items / materials.

Field work for the DSIC comprised soil sampling from six boreholes (Bores 201 to 206) and 20 test pits excavated using hand tools (Pits 207 and 226) at the Lot.

Selected soil samples were analysed for combinations of: metals; total recoverable hydrocarbons (TRH); benzene, toluene, ethylbenzene and xylene (BTEX); polycyclic aromatic hydrocarbons (PAH), organochlorine pesticides (OCP), organophosphorus pesticides (OPP), polychlorinated biphenyls (PCB), total phenolics and asbestos. Analytical results for samples collected from the site were within the adopted site assessment criteria (SAC) except for:

- Arsenic concentrations in excess of EIL for the following samples:
  - Bore 201, depth 0.1 m (100 mg/kg and 67 mg/kg);
  - Bore 201, depth 0.5 m (57 mg/kg);
  - Bore 201, depth 0.5 m (57 mg/kg);
  - Bore 202, depth 0.5 m (59 mg/kg);
  - Bore 203, depth 0.1 m (53 mg/kg)
  - Bore 206, depth 0.1 m (97 mg/kg);

  - Bore 206, depth 0.5 m (180 mg/kg);
  - Pit 207, depth 0.1 m (66 mg/kg);
  - Pit 208, depth 0.1 m (93 mg/kg); and
  - Pit 220, depth 0.25 – 0.3 m (82 mg/kg);
- The lead concentration for the primary analysis of the sample from Bore 201 at depth 0.1 m (370 mg/kg) which exceeded the EIL for fresh contaminants;
- Zinc concentrations in the following samples which exceeded the EIL for fresh contaminants:
  - Bore 202, depth 1.0 m (340 mg/kg);
  - Bore 206, depth 0.5 m (490 mg/kg); and
  - Pit 208, depth 0.1 m (290 mg/kg).

Somewhat elevated concentrations of metals were recorded with respect to EIL (as listed above), however, the recorded metals concentrations are considered to be as a result of the local natural soil / bedrock and not indicative of contamination. The recorded concentrations of metals above the EIL are considered to not to be of significance with respect to the protection of local terrestrial organisms (i.e. flora and fauna). As such, it is considered that the site has a low risk to identified ecological receptors (flora and fauna) and is suitable for the proposed development.

Recorded concentrations of contaminants for the site were within health-based criteria.

Based on the results of the investigation, whilst incorporating information presented in the SAR, it is considered that the site is suitable for the proposed development of a new high school from a contaminated land perspective.

Results presented in this investigation, when considering the information presented in the SAR, indicate that site remediation is not required. It is noted, however, that high concentrations of naturally-occurring metals (at concentrations above health-based assessment criteria) may be associated with bedrock (at untested locations / depths). Therefore, it may be appropriate (for an environmental consultant) to conduct check sampling and analysis for metals on excavated bedrock that is proposed to be reused at the site as fill, to confirm (or otherwise) the suitability of the material.

Given the presence of widespread fill at the site, albeit assessed to be at a low contamination risk, it is recommended that an unexpected finds protocol (UFP) be developed and implemented during future civil and construction works such that any unexpected finds of contamination (or potential contamination) is appropriately assessed and managed.

Glossary of Terms

ACM	asbestos-containing materials
AEC	area of environmental concern
AF	asbestos fines
AHD	Australian height datum
ANZECC	Australian and New Zealand Environmental & Conservation Council
AS	Australian Standard
As	arsenic
ASS	acid sulfate soils
B(a)P	benzo(a)pyrene
bgl	below ground level
BTEX	benzene, toluene, ethylbenzene, total xylenes (monocyclic aromatic hydrocarbons)
CEC	cation exchange capacity
CoPC	contaminants of potential concern
CSM	conceptual site model
Cr	chromium
CT1	contaminant threshold 1
CT2	contaminant threshold 2
Cu	copper
DA	development application
dGPS	differential global positioning system
DQI	data quality indicators
DQO	data quality objectives
DSIC	detailed site investigation for contamination
Douglas	Douglas Partners Pty Ltd
e.g.	for example

EIL	ecological investigation levels
EP&A Act	*Environmental Planning and Assessment Act 1979*
EPA	Environment Protection Authority
etc	et cetera
FA	friable asbestos
ha	hectare
Hg	Mercury
HIL	health investigation level
HSL	health screening level
i.e.	that is
IAA	interim audit advice
Ltd	limited
m	metre
m^2	square meter
Mn	manganese
mg/kg	milligrams per kilogram (or parts per million)
NATA	National Association of Testing Authorities
NEPC	National Environmental Protection Council
NEPM	National Environment Protection Measure
Ni	nickel
NSW	New South Wales
OCP	organochlorine pesticides
OEH	Office of Environment and Heritage
OPP	organophosphorus pesticides
P1-P5	pathway in the conceptual site model
PAH	polycyclic aromatic hydrocarbons

Pb	Lead
PCB	polychlorinated biphenyls
pH	power of hydrogen
POEO	Protection of the Environment Operations
PQL	practical quantitation limit
PSI	preliminary site investigation
QA	quality assurance
QC	quality control
QPRC	Queanbeyan-Palerang Regional Council
R1-R7	receptor in the conceptual site model
RAP	remedial action plan
REF	Review of Environment Factors
RL	reduced level
RPD	relative percentage difference
RRO	Resource Recovery Order
S1-S2	source in the conceptual site model
SAC	site assessment criteria
SAR	Site Audit Report
SAS	Site Audit Statement
SCC1	specific contaminant concentration 1
TCLP1	toxicity characteristics leaching procedure 1
TPH	total petroleum hydrocarbons
TRH	total recoverable hydrocarbons (a screening test for TPH)
UCL	upper confidence limit
UFP	unexpected finds protocol
VOC	volatile organic compounds

Zn	zinc
%	percent
<	less than
>	greater than

Table of Contents

Report on Detailed Site Investigation (Contamination)
New High School for Googong
200 Wellsvale Drive, Googong

1. Introduction

Douglas Partners Pty Ltd (Douglas) has been engaged by NSW Department of Education (DoE) to prepare this detailed site investigation for contamination (DSIC) report to inform a Review of Environment Factors (REF) for the proposed construction of a new high school for Googong located at 200 Wellsvale Drive, Googong (hereinafter referred to as 'the site'). The site is shown on Drawing R.005.D.001, Appendix A. It is understood that DoE is the determining authority for the project under Part 5 of the *Environmental Planning and Assessment Act 1979* (EP&A Act).

The methodology, data and findings presented in this report are based on that obtained for: Douglas, *Report on Detailed Site Investigation (Contamination), Proposed New Public School, 200 Wellsvale Drive, Googong*, Prepared for School Infrastructure, reference 224779.00.R.003.Rev2, 16 February 2024 (Douglas, 2024) which was conducted for a larger land area (Lot 829 Deposited Plan 1277372) for due diligence purposes and potentially for a development application (DA). Douglas has also previously completed a preliminary site investigation for the larger land area as reported in Douglas, *Report on Preliminary Site Investigation (Contamination), Proposed New Public School, 200 Wellsvale Drive, Googong*, Prepared for School Infrastructure, reference 224779.00.R.001.Rev0, 15 November 2023 (Douglas, 2023). The PSI identified two potential sources of contamination at the site comprising: possible contaminated fill / residual impacted soil; and activities associated with the (recent) use of the site as a construction compound.

The objective of the DSIC is to assess the contamination status of the site and the suitability of its use for the proposed development and comment whether further investigation and/or management of contamination is required with regard to the proposed development. This report also presents preliminary waste classification comments to inform planning for future civil and construction works.

The field work for this DSIC was undertaken concurrently with a geotechnical investigation which is provided under a separate cover (reference 224779.00.R.004.Rev2).

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

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

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

2. Proposed development

It is understood that the proposed development at the site will comprise construction of a high school (years 7 to 12) to accommodate up to 700 students. A site plan for the proposed development is provided in Appendix A. The proposed development of the site includes:

- Building A: a three to four-storey building in the north-western portion of the site, fronting Glenrock Drive to accommodate learning spaces and administrative functions of the school;
- Building B: a three-storey building in the northern portion of the site, fronting Observer Street, to accommodate learning spaces and administrative functions of the school;
- Building C: to accommodate a school hall / gymnasium and canteen at the western portion of the site;
- Outdoor recreation areas, cricket nets, a playing court and a playing field;
- Main pedestrian entry from Glenrock Drive;
- A car parking area at the eastern portion of the site, accessed from Wellsvale Drive;
- An on-site stormwater detention (OSD) tank beneath the northern portion of the car parking area;
- Accessible pedestrian entry from Wellsvale Drive;
- Service entry from Observer Street; and
- Areas of landscaping.

The southern portion of the site is designated as an area for potential future school expansion.

According to the bulk earthworks plan (reference sheet CV-2100 rev G, project No. PS140230, 5 May 2024):

- Stripping will result in the excavation of approximately 8200 m^3 of material;
- Several areas of the site will be subject to bulk excavation including at the south-eastern, central, and north-western portions of the site, as well as for the OSD tank at the eastern portion of the site. These bulk excavations will be to depths of up to approximately 3 m and result in the excavation of approximately 24, 838 m^3 of material;
- Approximately 24, 823 m^3 of material from bulk excavations will be used onsite as fill. Large portions of the site will be filled with the deepest fill (up to 4 m) to be placed at the north-eastern and western portions of the site.

3. Scope of work

The scope of work for this DSIC was to report on the components of Douglas (2024) relevant to the new high school for Googong project. The scope of works for Douglas (2024) comprised:

- Drilling of six boreholes (Bores 201 to 206) using a track-mounted drilling rig to termination depths of between 5.6 m and 7.0 m bgl;
- Excavation of 20 test pits (Pits 207 to 226) using hand tools to termination depths of between 0.1 and 0.5 m bgl;

- Collection of soil samples from each borehole and test pit at regular depth intervals, changes in strata or at points of potential environmental concern;
- Collection of replicate soil samples for field screening with a calibrated photo-ionisation detector (PID) to detect for the presence or absence of volatile organic compounds (VOC) and to assist with the selection of samples for analysis;
- Logging of soil and rock conditions encountered at each investigation location;
- Laboratory analysis of selected soil samples at a National Association of Testing Authorities (NATA) accredited laboratory for various combinations of the following:
    - Metals (arsenic, cadmium, chromium, copper, lead, manganese, mercury, nickel and zinc);
    - Polycyclic aromatic hydrocarbons (PAH);
    - Total recoverable hydrocarbons (TRH)
    - Benzene, toluene, ethylbenzene and xylene (BTEX);
    - Total phenolics;
    - Organochlorine pesticides (OCP) and organophosphorus pesticides (OPP);
    - Polychlorinated biphenyls (PCB); and
    - Asbestos;
- Analysis of selected samples for pH and cation exchange capacity (CEC) for the purposes of determining site specific ecological investigation levels (EIL);
- Preparation of the Douglas (2024) report.

4. Site information

Site information is summarised below.

Site Address	200 Wellsvale Drive, Googong
Legal Description	Part of Lot 829 Deposited Plan 1277372
Approximate Area	5.84 ha
Zoning	R1 General Residential under the Queanbeyan-Palerang Regional Local Environmental Plan 2022
Local Council Area	Queanbeyan-Palerang Regional Council (QPRC)
Current Site Use	Vacant undeveloped land
Surrounding Land Uses	North – Observer Street, then undeveloped land beyond East – Wellsvale Drive, then (new) residential and sports fields South – Harvey Street, then (new) residential beyond West – Glenrock Drive, then (new) residential beyond

The site boundary is shown on Figure 1.

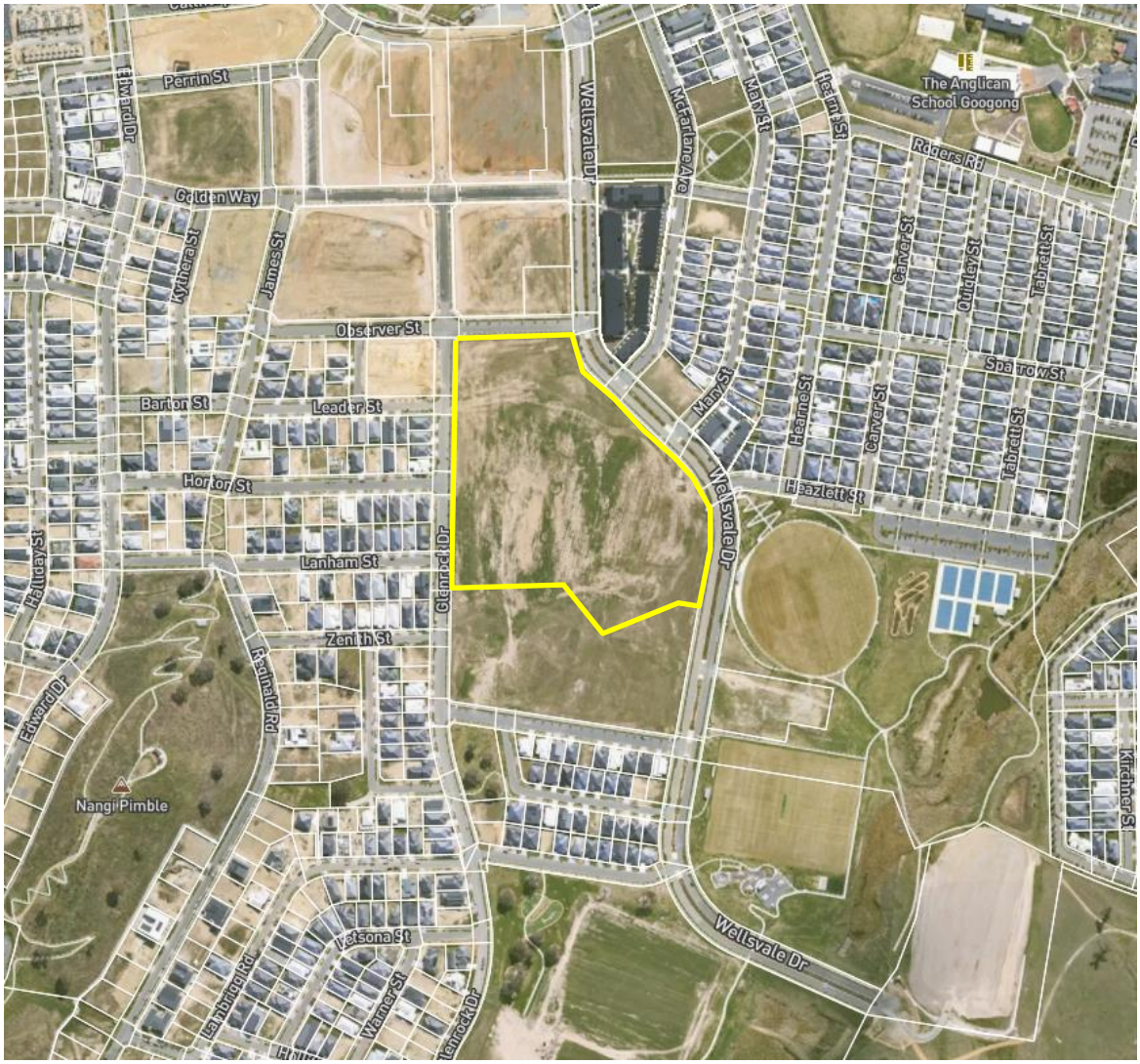

Figure 1: Site boundary (yellow) and layout (image dated 5 September 2024 from MetroMap)

5. Environmental setting

5.1 Topography

The general topography of the surrounding area has slopes down in a general easterly direction towards the Queanbeyan River and its tributaries.

Surface levels at the site generally fall in easterly and northerly directions at approximate grades of 1 in 15 to 1 in 20. The overall difference in elevation across the site is approximately 12 m, ranging from RL ~763.6 m relative to Australian Height Datum (AHD) in the south-western portion of the site to RL ~751.6 m AHD at the north-eastern portion of the site.

5.2 Site geology

Reference to the NSW Seamless Geology (GSNSW, 2019) digital mapping indicates the site is underlain by both Colinton Volcanics comprising tuffaceous shale (Sbro_x) and dacitic tuff

(Sbro_d) of Silurian age as shown on Figure 2. These volcanics generally comprise foliated dacite and tuff, with interbedded siltstone lenses. A fault is mapped as running through the site orientated in a north-east to south-west direction.

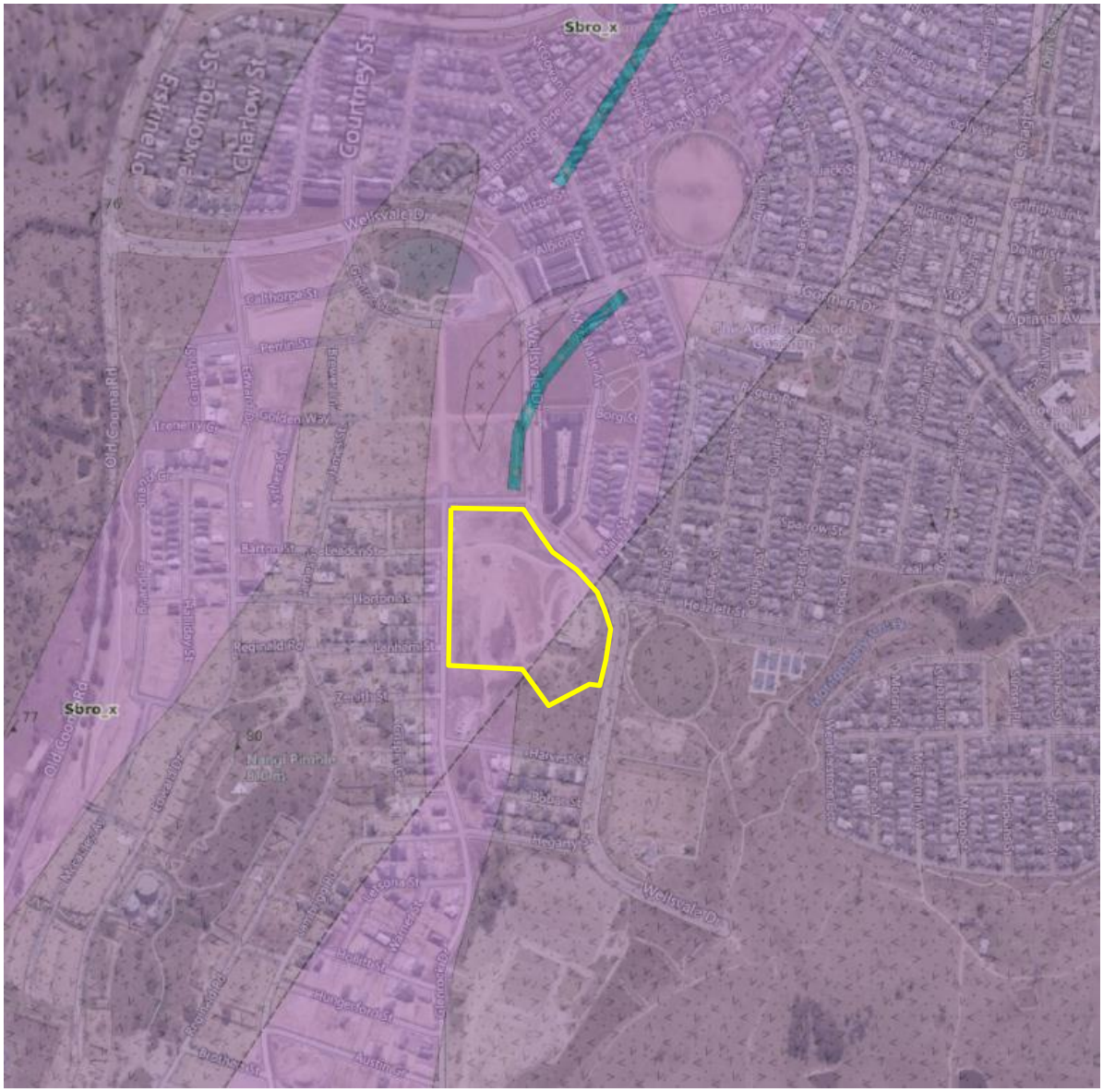

Figure 2: Geological setting (GSNSW, 2019)

Reference to the Soil Landscapes of Eastern and Central Australia v2 Map (Office of Environment and Heritage, 2019) indicates that the site is located within the Burra Soil Landscape which is characterised by undulating to rolling hills and alluvial fans formed on Silurian volcanics.

5.3 Acid sulfate soils

Reference to the NSW Department of Environment and Climate Change Acid Sulfate Soil Risk Mapping digital dataset (NSW DECC, 2008) indicates that the site is located in an area mapped as "*No known occurrence*" of acid sulfate soils (ASS).

5.4 Surface water and groundwater

The nearest surface water body is Montgomery Creek line located approximately 320 m south east of the site. The creek line flows in a general north-easterly direction into Queanbeyan River which is located approximately 3 km north-east of the site. Old farm dams are also located in land surrounding the site.

A search of the WaterNSW groundwater boreholes database on 26 September 2023 indicated that there were no registered groundwater bores within 500 m of the site or within the site boundary.

Given the local geology (shale and tuff belonging to the Colinton Volcanics), regional groundwater is considered to most likely be hosted in low-permeability fractured rock aquifers. Based on the regional topography and the inferred flow direction of nearby water courses, the anticipated flow direction of shallow groundwater is to the east or north-east, towards the Queanbeyan River, the likely receiving surface water body for the groundwater flow path.

6. Previous reports

6.1 Previous Douglas geotechnical works

Previous to works for Douglas (2024), Douglas conducted geotechnical investigations and controlled fill earthworks for the broader Googong Township development area of which the current site is part of.

The subsurface conditions encountered at Lot 829 DP1277372 (also referred to herein as the Lot, as shown on Drawing R.005.D.001 in Appendix A) during intrusive works generally comprised topsoil, silt and clay to depths of between 0.3 m and 1.4 m bgl, underlain by high strength shale and low strength tuff to refusal depths of between 1.2 m and 5.0 m bgl.

Between February 2021 and September 2022, Douglas supervised the placement of controlled fill in the south western, western and northwestern portion of Lot 829 DP 1277372. The material used for the controlled filling was sourced from existing onsite material and mainly comprised rock of varying strength and fracturing, with some residual / alluvial soils.

6.2 Site Audit Report and Site Audit Statement

Robert Harwood, an EPA Accredited Site Auditor (hereinafter referred to as 'the Auditor'), was commissioned by Googong Township Pty Limited to conduct a site audit for various locations within the greater Googong Township development area, including for Lot 829 DP1277372 as reported in:

- Harwood Environmental Consultants (HEC), *Site Audit Report for SAS 439, Googong Neighbourhood 2 – School Site – LOT 829 DP1277372,* 18 July 2023 (HEC, 2023a) (the 'SAR'); and
- HEC, *Site Audit Statement, Googong Neighbourhood 2 – School Site – LOT 829 DP1277372*, 18 July 2023 (HEC, 2023b) (the 'SAS');

The objective of the statutory audit was to provide a statement on the suitability of the Lot for a proposed school development as required by QPRC under DA 123-2017 (approved 10 January 2018).

The scope of works for the audit included a review and evaluation of previous site investigation reports and data, site visits by the Auditor, and preparation of the SAR and SAS. The SAS is provided in Appendix C. The Auditor's key findings from a review and evaluation of relevant previous investigations are summarised below. It is noted that Douglas has not reviewed the investigation reports referred to in the SAR.

The contamination report acknowledged as Coffey (2004) identified that the site had been part of larger grazing (sheep and cattle) property from the mid to late 1800s. It was noted that land in the Googong Township had historically been treated with fertilisers and potentially undergone application of herbicides, pesticides and insecticides.

For a contamination assessment of the site and surrounding land, the report acknowledged as Geotechnique (2016) identified two areas of environmental concern (AECs) at land adjacent to the north of the site, comprising a naturally occurring hematite outcrop and a waste material zone (i.e., rubbish pits of metal sheeting, brick, glass and concrete). No AECs were identified within the Lot boundary. The intrusive investigation included the excavation of test pits (including four positioned within Lot) and laboratory analysis for total petroleum hydrocarbons (TPH), benzene, toluene, ethylene and xylene (BTEX), metals, polycyclic aromatic hydrocarbons (PAH), pesticides and asbestos. The soil profile was reported as topsoil silty clay over natural silty clay to a depth of 2 m below ground level (bgl). Elevated heavy metal concentrations (specifically arsenic, lead, manganese and zinc) were recorded in soil samples from test pits at adjacent land to the north of the site. The elevated heavy metals were considered to be associated with the hematite zone.

A detailed contamination investigation, acknowledged as Geotechnique (2017), was conducted to delineate concentrations of contaminants in soil identified at the hematite zone to the north through the excavation of 226 test pits (17 of which were located within the site). Laboratory analysis confirmed that soils impacted with metals at the hematite zone extended into the northern portion of the site with exceedances of the adopted NEPC (2013) health investigation levels (HIL) for residential land use with access to soils (HIL A) at six of the pit locations. A surface water sample was collected from a dam located in the north eastern corner of the site which recorded a copper concentration that marginally exceeded the ANZECC freshwater guidelines. A groundwater monitoring well was also installed upgradient of the hematite zone (approximately 80m north east of the site) to a depth of 14.5 m bgl to assess the impact on groundwater (if any), however the well was dry which precluded sampling.

A remediation action plan (RAP), acknowledged as Geotechnique (2018), was prepared to remediate the impacted soils located within the site boundary and adjacent land to the north. The reported remediation and validation works, acknowledged as Geotechnique (2021), were carried out in several stages between May 2019 to April 2021. The remediation works in 'Area 2' which was partially within the site boundary, included the excavation of arsenic, lead and manganese contaminated soil for off-site disposal to landfill under the classification of "Restricted Solid Waste". The estimated volume of waste material removed from Area 2 was approximately 1250 m^3, however, the Auditor noted that only a small portion of Area 2 was located within the school site boundary. Further remediation at 'Area 3' included the excavation of arsenic, lead, manganese and zinc impacted soil for reuse at commercial and road areas in the surrounding land. The area of remediated land located within the Lot boundary was estimated to be 5950 m^2,

with the depth of excavations ranging from 0.5 m to 2.0 m bgl. The approximate location and extent of Area 2 and Area 3 are shown on Drawing R.005.D.001, Appendix A. Validation sampling was undertaken at the excavations. The results of validation sampling and analysis across Area 2A (a sub-area of Area 2) and Area 3 (a sub-area of Area 3) indicated that the 95% UCL for concentrations of arsenic, manganese, lead and zinc were within the site assessment criteria (for residential land use 'A'); the standard deviations for arsenic, manganese, lead and zinc were below 50% of the assessment criteria; and no individual sample result exceeded 250% of the applicable criteria. Areas 2A and 3 are shown on the attached Drawing R.005.D.001, Appendix A.

The report acknowledged as Terravale Consulting (2021) was a health risk assessment of the elevated metals in soil to determine if the soil was suitable to remain at its location; and to determine if the material was suitable for beneficial re-use under public roadways. Based on bioavailability test results for arsenic and manganese in soil, revised arsenic and manganese (site-specific) screening criteria were determined to be above the maximum reported concentrations of these metals, and further assessment of arsenic and manganese was not required. Site-specific screening criteria for lead were also determined. Based on the available soil sampling data at the time, it was stated that the site-specific lead criteria had not been exceeded.

At the request of the Auditor, as part of Geotechnique (2021), six additional boreholes were installed to collect data on the naturally occurring metals within the deeper layer of the hematite zone. One of the boreholes was at the site. The general soil profile was described as:

- 0 – 0.2 m: topsoil;
- 0.2 – 1.5 m: silty clay;
- 1.5 – 2.5 m: weathered slate; and
- 2.5 m: slate.

Soil samples were analysed for arsenic, cadmium, chromium, copper, lead, manganese, mercury, nickel and zinc. Arsenic concentrations were recorded to be above the adopted EIL in two samples. A zinc concentration was above the EIL in one sample.

A contaminated stockpile was temporarily placed at the Lot until the commercial zone to the north was ready to receive the stockpile material. Soil samples were collected by Geotechnique (October 2022) from ten boreholes which were advanced through the stockpile footprint and a total of 36 samples were analysed for 13 metals including arsenic, beryllium, boron, cadmium, chromium, cobalt, copper, lead, manganese, mercury, nickel, selenium and zinc. These samples supplemented previously collected samples from Lanterra Consulting in March 2022. Elevated concentrations of manganese were identified in some of the soil samples with the highest concentration at depths below 3 m. It was considered by Geotechnique, with the use of statistical analysis, that the residual soil within the stockpile footprint was suitable for the future school land use.

Following a request from the Auditor, for the report acknowledged as Geotechnique (2023), seven boreholes were drilled in the central and southern extent of Lot to assess the potential for metals contamination. The general soil profile was recorded as:

- 0 – 0.2 m: topsoil;
- 0.2 – 4 m: silty clay, medium plasticity, brown; underlain by
- Slate bedrock.

Soil samples were analysed for arsenic, cadmium, chromium, copper, lead, manganese, mercury, nickel and zinc, as well as pH and CEC. Concentration of metals were within the assessment criteria (for residential land use 'A').

The Auditor considered that the site investigation, remediation and validation was undertaken appropriately and has confirmed that Lot 829 DP1277372 had been rendered suitable for the proposed land uses as a primary and secondary school, and that no further investigation or remediation is required.

6.3 **PSI (Douglas, 2023)**

Douglas conducted a PSI at Lot 829 DP1277372 in 2023 to provide preliminary information on the contamination status. The PSI included a review of readily available site information, previous reports relevant to the site (as summarised in Sections 6.1 and 6.2), two site walkovers and preparation of a report.

Based on the review of available site history information, it was considered that the Lot had historically been used for grazing from the mid to late 1800s until sometime around 2017, when development of the broader Googong Township commenced in the surrounding area. Aerial photography indicated that it was around this time that various sections of the Lot began to be used as a construction compound to support the surrounding developments. The compound areas appeared to be used for storage of various construction materials, earthwork machinery, vehicles and soil stockpiling.

During an initial site walkover on 27 September 2023, Douglas observed that the Lot was mostly vacant, except for a construction compound present in the south western corner. Minor amounts of construction materials were sporadically observed on the ground surface. Douglas conducted a subsequent walkover on 8 November 2023, following the removal of the compound in the south western corner of the Lot. The overall condition of the Lot appeared generally consistent with the previous walkover, and the recently demobilised compound area appeared vacant except for minor amounts of remaining construction items / materials (ie, a wheelbarrow, bin and timber pallets).

Based on the site history review and site walkover, Douglas identified two main sources of potential contamination (refer Section 7) comprising fill or residual impacted soil and the recent use of the Lot as a construction compound. It was considered that the potential for contamination from these sources is low.

It was recommended that an intrusive soil investigation including soil sampling and laboratory analysis be conducted to assess the identified potential sources.

7. Preliminary conceptual site model

A conceptual site model (CSM) is a representation of site-related information regarding contamination sources, receptors and exposure pathways between those sources and receptors. The CSM provides the framework for identifying how the site may have become 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 (S)

Based on the PSI, the following potential sources of contamination and associated contaminants of potential concern (CoPC) have been identified:

- S1: Fill / residual impacted soil (i.e., undetected contamination between and beyond previous test locations). The site has been subject to controlled filling and so the potential for contaminated fill is considered to be low.
  - Various CoPC may be associated with fill and may include metals, TRH, BTEX, PAH, polychlorinated biphenyls (PCB), organochlorine pesticides (OCP), phenols and asbestos.
- S2: Activities associated with recent use of the site as a construction compound (e.g., storage of fuels / oils, materials, construction equipment, transient stockpiling of soils).
  - CoPC may include TRH, BTEX and metals.

Potential receptors (R)

The following potential receptors have been identified:

- R1: Construction workers;
- R2: Future maintenance workers;
- R3: End users [students, teachers, visitors];
- R4: Adjacent site users [residential, recreational];
- R5: Groundwater;
- R6: Local terrestrial ecosystems / organisms (i.e., flora and fauna); and
- R7: In-ground Structures.

Potential exposure pathways (P)

The following potential exposure pathways between sources and receptors have been identified:

- P1: Ingestion and dermal contact;
- P2: Inhalation of dust, fibres and/or vapours;
- P3: Leaching of contaminants and vertical migration into groundwater;
- P4: Inhalation, ingestion and absorption; and
- P5: Contact with in-ground structures.

Summary of potentially complete exposure pathways

A 'source–pathway–receptor' approach has been used to assess the potential risks of harm being caused to human or environmental receptors from contamination sources on or in the vicinity of the site, via exposure pathways (potential complete pathways). The possible pathways between the above sources (S1 and S2) and receptors (R1 to R7) are provided in Table 1**.**

Table 1: Summary of potentially complete exposure pathways

Source and CoPC	Transport Pathway	Receptor
S1: Fill / residual impacted soil S2: Recent construction compound land use	P1: Ingestion and dermal contact P2: Inhalation of dust and/or vapours	R1: Construction workers R2: Future maintenance workers R3: End users [students, teachers, visitors]
	P2: Inhalation of dust and/or vapours	R4: Adjacent site users [residential, recreational]
	P3: Leaching of contaminants and vertical migration into groundwater	R5: Groundwater
	P4: Inhalation, ingestion and absorption	R6: Terrestrial ecosystems
	P5: Contact with in-ground structures	R7: In-ground structures

8. Sampling and analysis quality plan

8.1 Data quality objectives

Douglas (2024) was devised with reference to the seven-step data quality objective process which is provided in Appendix B Schedule B2, NEPC (2013). The data quality objective process is outlined in Appendix D.

8.2 Soil sampling rationale

Based on the CSM and data quality objectives (DQO), the following sampling rationale was adopted for Douglas (2024).

For a site area of approximately 9 ha, Table 2 of NSW EPA *Sampling design part 1 – application, Contaminated Land Guidelines* (NSW EPA, 2022) suggests that a minimum of 99 sample locations on a systematic grid pattern are required for site characterisation. Given the generally low potential for contamination at the Lot, the previous remediation work undertaken at the Lot, and the SAS which stated that the Lot is suitable for primary and secondary school use (see Section 6.2), a reduced number of test locations was considered appropriate as a 'check' of the contamination status of the Lot.

A total of 26 test locations were positioned across the Lot. The boreholes (Bores 201 to 206), drilled using a drilling rig, were positioned across the northern portion of the Lot, targeting the proposed high school building footprints primarily for the geotechnical investigation purposes.

The test pit locations (Pits 207 to 226), excavated using hand tools, were positioned to provide coverage of the Lot in addition to the boreholes, with Pits 207 to 210 at the general area of previous

remediation works (see Section 6.2) and Pits 217 to 220 at the most recent construction compound location. The borehole and test pit locations are shown on Drawing R.005.D.001, in Appendix A. As shown in the drawing, Bores 201 to 206, Pits 207 to 213 and Pits 221 to 225 were located at the site.

Soil samples were collected from each borehole at depths of approximately 0.15 m, 0.5 m, 1.0 m and every 0.5 m thereafter, and changes in lithology or signs of contamination. Sampling from test pits was generally limited to shallow depths given refusal was commonly encountered at shallow depths.

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

8.3 Analytical rationale

The majority of soil samples selected for analysis of the CoPC were from fill and surface soils as fill and surface soils were more likely to be contaminated than underlying natural soil (based on the CSM).

9. Site assessment criteria

The site assessment criteria (SAC) applied to the investigation are informed by the CSM (Section 7) which identified human and environmental receptors to potential contamination on the site.

Analytical results are assessed (as a Tier 1 assessment) against the SAC comprising primarily the investigation and screening levels of Schedule B1 of NEPC (2013). Given the proposed secondary school use and with reference to NEPC (2013), the adopted investigation and screening levels are those for a Category C land use scenario (applicable to various land uses including secondary schools) except for health screening levels for petroleum hydrocarbons where levels for a Category A land use scenario have been adopted.

The derivation of the SAC is included in Appendix F and adopted SAC are listed on the summary analytical results tables in Appendix I.

10. Results

10.1 Field work results

Field work for the investigation was conducted between 26 and 29 September 2023 (Bores 201 to 206 and Pits 207 to 216) and on 8 November 2023 (Pits 217 to 226).

The borehole and test pit logs for sample locations at the site (Bores 201 to 206, Pits 207 to 213 and Pits 221 to 225) are included in Appendix G. The logs recorded the following general sub-surface profile:

Topsoil / Fill:	Typically comprising silty clay and sandy silt topsoil and fill from the surface to depths of between 0.1 m and 1.1 m bgl.
Residual Clay:	Silty and sandy clays encountered between 0.3 and 6.5 m bgl in Bores 201 to 204 and between 0.1 m and 0.2 m bgl in Pits 207, 209, 210, 212, 222 and 223.
Shale:	Variably very low to high strength, extremely to slightly weathered shale in all boreholes.

No non-soil anthropogenic materials were observed in the boreholes or test pits at the site.

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

The PID screening indicated an absence of VOC with all recorded values of less than 1 ppm except for the sample from Pit 213 at depth 0.1 m which detected a value of 1.4 ppm.

No free groundwater was observed during excavation of test pits or drilling of boreholes. It should be noted that groundwater levels are affected by climatic conditions and soil permeability and will therefore vary with time.

Representative photographs of the Lot and subsurface conditions taken during the investigation are provided in Appendix G.

10.2 Laboratory analytical results

The results of laboratory analysis for sample locations at the site are summarised in the following tables in Appendix I:

- Table I1: Summary of Laboratory Results - Metals, TRH, BTEX and PAH;
- Table I2: Summary of Laboratory Results - Phenols, OCP, OPP, PCB, and Asbestos; and
- Table I3: Summary of Laboratory Results for Preliminary Waste Classification – Metals, TRH, BTEX, PAH, Phenol, OCP, OPP, PCB and Asbestos.

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

11. Discussion

11.1 Soils

The analytical results for all contaminants tested in analysed samples collected from the site were below the adopted SAC except for those summarised below (refer to Table 2 for a tabulated summary):

Arsenic

- The arsenic concentration in the sample from Bore 206 at depth 0.5 m (180 mg/kg) exceeded the EIL for fresh contaminants (50 mg/kg) and the EIL for aged contaminants (100 mg/kg).

The sample was collected from fill which appears to be sourced locally. Therefore, the origin of the arsenic is considered to be the local natural bedrock (see Section 6.2). Given that the arsenic is of local natural origin and not as a result of a contaminating source, the exceedances of the EIL criterion is not considered to be of significance with respect to the protection of local terrestrial organisms (i.e., flora and fauna);

- The arsenic concentrations exceeded the EIL for fresh contamination in the samples from:
  - Bore 201, depth 0.1 m (100 mg/kg and 67 mg/kg);
  - Bore 201, depth 0.5 m (57 mg/kg);
  - Bore 201, depth 0.5 m (57 mg/kg);
  - Bore 202, depth 0.5 m (59 mg/kg);
  - Bore 203, depth 0.1 m (53 mg/kg)
  - Bore 206, depth 0.1 m (97 mg/kg);
  - Pit 207, depth 0.1 m (66 mg/kg);
  - Pit 208, depth 0.1 m (93 mg/kg); and
  - Pit 224, depth 0.05 – 0.1 m (76 mg/kg).

  The above samples were collected from shale or fill which appears to have been sourced locally. As discussed above, it is considered that the recorded arsenic concentrations are due to the natural composition of the native soil / bedrock shale and are not indicative of contamination. The concentrations above did not exceed the EIL for aged contaminants which is considered to be more applicable than the EIL for fresh contaminants given that the detected arsenic is not likely to be fresh. Given this, the exceedance of the EIL for fresh contaminants is not to be of significance with respect to the protection of local terrestrial organisms;

Lead

- The lead concentration for the primary analysis of the sample from Bore 201 at depth 0.1 m (370 mg/kg) exceeded the EIL for fresh contaminants (270 mg/kg) but was within the EIL for aged contaminants (1100 mg/kg). As discussed above, the lead concentrations are considered to be a result of the composition of the natural soil/rock and not as a result of contamination. Given this, it is considered that the EIL for aged contaminants is more appropriate than that for fresh contaminants. Therefore, the exceedance of the EIL for fresh contaminants for lead is not considered to be of significance with respect to the protection of local terrestrial organisms;

Zinc

- Zinc concentrations in the following samples exceeded the EIL for fresh contaminants (240 mg/kg) but were below the EIL (680 mg/kg) for aged contaminants:
  - Bore 202, depth 1.0 m (340 mg/kg);
  - Bore 206, depth 0.5 m (490 mg/kg); and
  - Pit 208, depth 0.1 m (290 mg/kg);

The two highest recorded zinc concentrations above were from bedrock samples and, hence, it is considered that the zinc is naturally sourced from the bedrock and not from a contaminating source. Although the sample from Pit 208, depth 0.1 m, was from fill, the fill appears to have been locally sourced and, hence, the zinc is in this sample is considered to also be from the natural soil/bedrock. Given this, the EIL for aged contaminants is considered to be more appropriate than that for fresh contaminants. Therefore, the exceedance of the EIL for fresh contaminants is considered to not be of significance with respect to the protection of local terrestrial organisms.

Asbestos was not detected in any analysed samples.

The above discussion is further summarised in Table 2.

Table 2: Summary of results

Contaminant of Potential Concern (CoPC)	Range of Results (mg/kg)	Ecological Investigation Level (EIL)		Health Investigation Levels (HIL)		Comment	Conclusion
		EIL Criteria (Fresh / Aged, mg/kg)	Recorded EIL Exceedances	HIL C (mg/kg)	HIL C Exceedances		
Arsenic	12 - 180	50 / 100	Bore 201, depth 0.1 m (100 & 67 mg/kg) Bore 201, depth 0.5 m (57 mg/kg) Bore 201, depth 0.5 m (57 mg/kg) Bore 202, depth 0.5 m (59 mg/kg) Bore 203, depth 0.1 m (53 mg/kg) Bore 206, depth 0.1 m (97 mg/kg) Bore 206, depth 0.5 m (180 mg/kg) Pit 207, depth 0.1 m (66 mg/kg) Pit 208, depth 0.1 m (93 mg/kg) Pit 224, depth 0.05 – 0.1 m (76 mg/kg)	300	Nil	The exceedances of the EIL criteria for arsenic are not considered to be of significance with respect to the protection of local flora and fauna.(1)	It is considered that the recorded concentrations are suitable for the proposed land use comprising a high school. It is considered that the elevated metals are associated with the natural minerology of the area, including hematite. Some check testing may be warranted during excavation works and an unexpected finds protocol (UFP) should be implemented. Refer to Section 12.2. It is considered that the site has a low contamination risk and is suitable for the proposed development. No site remediation is recommended.
Cadmium	<PQL - 2	-	Nil	90	Nil	No exceedances of relevant investigation levels.	
Chromium	18 – 50	180 / 410 for Cr (III)	Nil	300 for Cr (VI)	Nil	No exceedances of relevant investigation levels.	
Copper	8 - 100	110 / 220	Nil	17, 000	Nil	No exceedances of relevant investigation levels.	
Lead	6 - 370	270 / 1,100	Bore 201, depth 0.1 m (370 mg/kg)	600	Nil	The exceedance of the EIL for fresh contaminants for lead is not considered to of significance with respect to the protection of local flora and fauna.(1)	

Manganese	73 – 6,000	-	Nil	19, 000	Nil	No exceedances of relevant investigation levels.	
Mercury	<PQL - 0.2	-	Nil	80	Nil	No exceedances of relevant investigation levels.	
Nickel	10 - 69	80 / 240	Nil	1200	Nil	No exceedances of relevant investigation levels.	
Zinc	35 - 490	240 / 680	Bore 202, depth 1.0 m (340 mg/kg) Bore 206, depth 0.5 m (490 mg/kg) Pit 208, depth 0.1 m (290 mg/kg)	30, 000	Nil	The exceedances of the EIL for fresh contamination for zinc are not considered to be of significance with respect to the protection of local flora and fauna.(1)	
PAH	All <PQL	-	Nil	-	Nil	No detection of the CoPC.	
TRH	All <PQL	-	Nil	-	Nil	No detection of the CoPC.	
BTEX	All <PQL	-	Nil	-	Nil	No detection of the CoPC.	
Total Phenolics	All <PQL	-	Nil	-	Nil	No detection of the CoPC.	
OCP, OPP, PCB	All <PQL	-	Nil	-	Nil	No detection of the CoPC.	
Asbestos	No asbestos detected by laboratory analysis or observed during field work	-	Nil	-	Nil	No detection of the CoPC.	

Notes:

PQL = Practical Quantification Limit i.e., minimum concentration that can be reported by the laboratory under their NATA Accreditation.

"-" indicates the investigation levels are not relevant and / or not available for this contaminant.

(1) Given the origin of the elevated arsenic, lead and zinc is considered to be the local natural bedrock (see Section 6.2), the elevated metals are considered to be of local natural origin and not as a result of a contaminating source. Therefore the recorded exceedances of the EIL criteria are not considered to be of significance with respect to the protection of local flora and fauna.

11.2 Preliminary waste classification comments

11.2.1 Fill

For the purpose of providing preliminary waste classification comments, Table I3, Appendix I, provides a comparison of analytical results for the site with criteria sourced from NSW EPA, *Waste Classification Guidelines, Part 1: Classifying waste*, 2014 (NSW EPA, 2014). Contaminant concentrations for the analysed fill samples were within CT1 thresholds for general solid waste with the exception of:

- Lead concentrations in the following samples which exceeded the CT1 threshold of 100 mg/kg:
  - Bore 201, depth 0.1 m (370 mg/kg and 150 mg/kg);
  - Bore 202, depth 0.1 m (120 mg/kg);
  - Bore 203, depth 1.0 m (130 mg/kg);
  - Bore 204, depth 0.1 m (140 mg/kg);
  - Pit 208, depth 0.1 m (160 mg/kg);
  - Pit 224, depth 0.05 – 0.1 m (210 mg/kg);
- The nickel concentration in the sample from Bore 203, depth 1.0 m (69 mg/kg) which exceeded the CT1 threshold of 40 mg/kg.

Asbestos was not detected in any analysed samples.

Results indicate that the fill at the site would likely be classifiable as general solid waste depending on toxicity characteristics leaching procedure (TCLP) testing and appropriate statistical analysis. A standalone waste classification would be required for any specific material requiring off-site disposal. The standalone waste classification(s) would incorporate existing data and may require further analysis on the specific material being disposed.

11.3 Natural soil and rock

For natural soil/rock samples collected from the site, concentrations of TRH, BTEX and PAH were less than laboratory practical quantitation limits and concentrations of metals were within what are considered to be local background levels. These results indicate that the natural soil / bedrock may be classifiable as Virgin Excavated Natural Material (VENM) as per the definition in the *Protection of the Environment Operations Act 1997* (POEO Act). Further sampling and analysis would need to be undertaken in order to provide a VENM classification for soil or rock that is designated to be disposed off-site.

It is noted that material classified as VENM from the site may not be accepted at some potential receival sites due to the relatively high naturally occurring concentrations of metals in the material (i.e. the metals concentrations may exceed the criteria adopted at the potential receival sites).

11.4 Data quality assurance and quality control

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

12. Conclusions and recommendations

12.1 Site suitability

Somewhat elevated concentrations of metals (arsenic, lead and zinc) were recorded with respect to EIL, however, the recorded metals concentrations are considered to be as a result of the local natural soil / bedrock and not indicative of contamination. The recorded concentrations of metals above the EIL are considered to not to be of significance with respect to the protection of local terrestrial organisms (i.e. flora and fauna). As such, it is considered that the site has a low risk to identified ecological receptors (flora and fauna) and is suitable for the proposed development.

Recorded concentrations of contaminants for the site were within health-based criteria.

Based on the results of the investigation, whilst incorporating information presented in the SAR, it is considered that the site is suitable for the proposed development of a new high school from a contaminated land perspective.

12.2 Recommendations and mitigation measures

Results presented in this investigation, when considering the information presented in the SAR, indicate that site remediation is not required. It is noted, however, that high concentrations of naturally-occurring metals (at concentrations above health-based assessment criteria) may be associated with bedrock (at untested locations / depths). Therefore, it may be appropriate (for an environmental consultant) to conduct check sampling and analysis for metals on excavated bedrock that is proposed to be reused at the site as fill, to confirm (or otherwise) the suitability of the material.

Given the presence of widespread fill at the site, albeit assessed to be at a low contamination risk, it is recommended that an unexpected finds protocol (UFP) be developed and implemented during future civil and construction works such that any unexpected finds of contamination (or potential contamination) is appropriately assessed and managed.

13. References

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NSW EPA. (2022). *Sampling Design, Part 1: Application; Part 2: Interpretation*. NSW Environment Protection Authority.

Office of Environment and Heritage. (2019). Soil Landscapes of Central and Eastern NSW - v2. Sydney: NSW Office of Environment and Heritage.

14. **Limitations**

Douglas Partners Pty Ltd (Douglas) has prepared this report (or services) for this project at 200 Wellsvale Drive, Googong. This report is provided for the exclusive use of NSW Department of Education for this project only and for the purposes as described in the report. It should not be used by or relied upon for other projects or purposes on the same or other site or by a third party. Any party so relying upon this report beyond its exclusive use and purpose as stated above, and without the express written consent of Douglas, does so entirely at its own risk and without recourse to Douglas for any loss or damage. In preparing this report Douglas 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 Douglas' field testing has been completed.

Douglas' advice is based upon the conditions encountered during this investigation. The accuracy of the advice provided by Douglas 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.

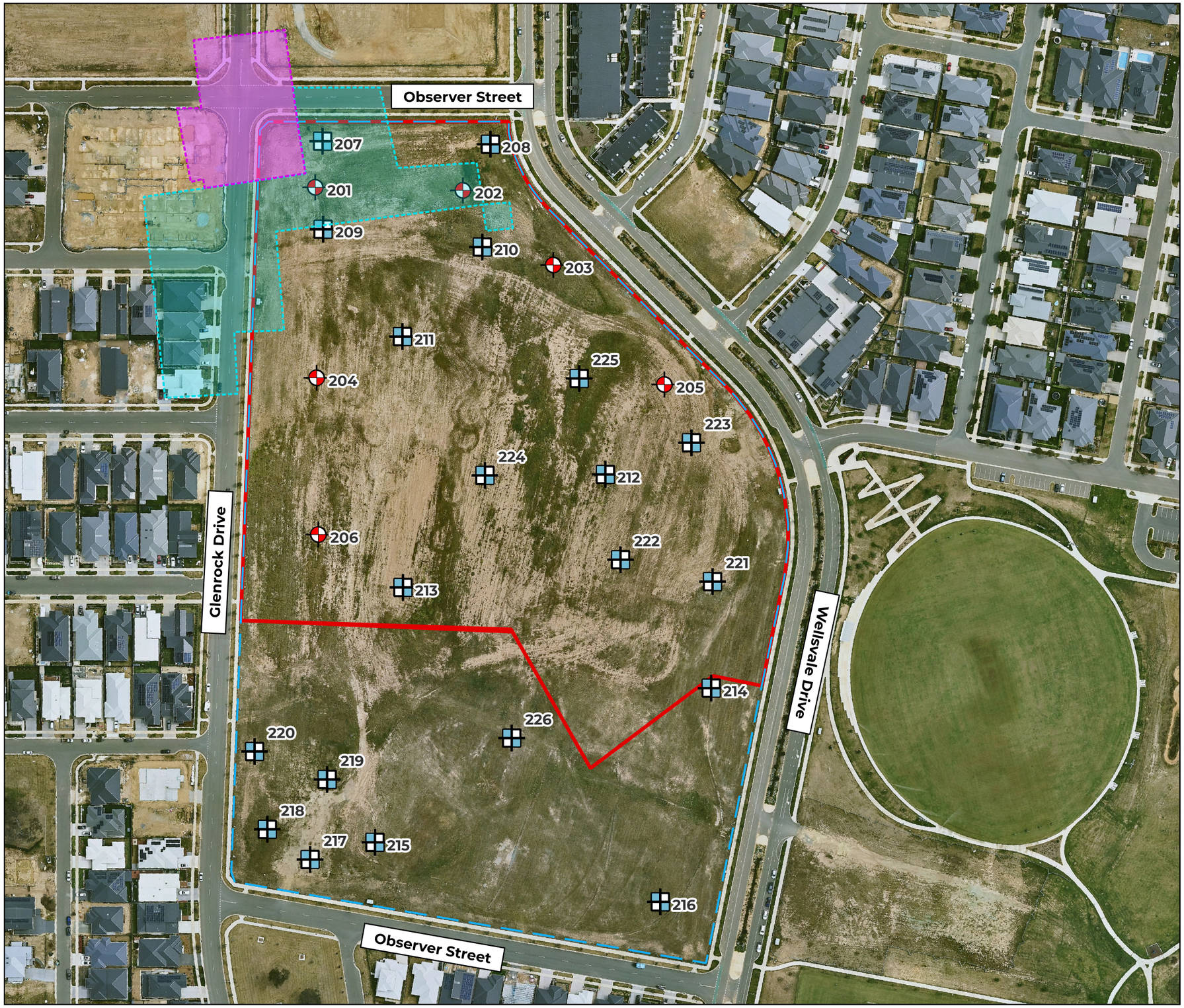
The assessment of atypical safety hazards arising from this advice is restricted to the environmental components set out in this report and based on known project conditions and stated design advice and assumptions. While some recommendations for safe controls may be provided, detailed 'safety in design'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

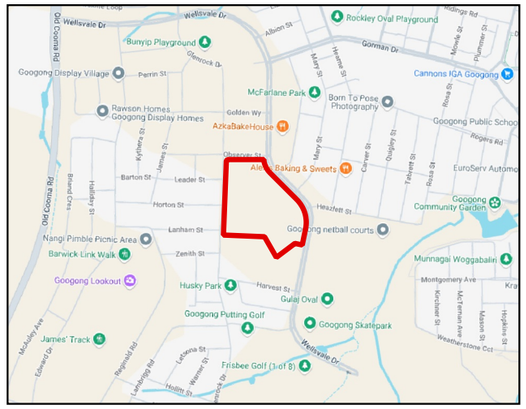
This report must be read in conjunction with all of the attached and should be kept in its entirety without separation of individual pages or sections. Douglas cannot be held responsible for interpretations or conclusions made by others unless they are supported by an expressed statement, interpretation, 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 Douglas. This is because this report has been written as advice and opinion rather than instructions for construction.

Appendix A

Drawings





LOCALITY PLAN

Legend

- Site Boundary
- Lot Boundary
- Borehole Location
- Test Pit Location

Previous Remediation Areas (HEC, 2023)

- Area 2 - Excavation and off-site disposal to landfill
- Area 3 - Excavation and re-use in surrounding residential and commercial land

REV	DESCRIPTION/COMMENT	DATE	DRAWN BY
0	224779.00.R.005.Rev2	23.01.2025	EB

SCALE: 0 20 40 60 80 100 m — 1:2000 @ A3

Douglas PARTNERS
OFFICE: WOLLONGONG
1 Luso Drive, Unanderra 2526
(02)4271 1836

CLIENT: **NSW Department of Education**

PROJECT NAME: **New High School for Googong**

PROJECT ADDRESS: **200 Wellsvale Drive, Googong**

COORDINATE REFERENCE SYSTEM: GDA94 / MGA zone 55

DRAWING TITLE: **Detailed Site Investigation (Contamination)**

NOTE:
1: Basemap from MetroMap.com (Dated 24.11.2024)

PROJECT NO: **224779.00**

DRAWING NO: **R.005.D.001**

REVISION: **2**

NBRS

LEGEND

- MAIN ACCESS
- SECONDARY ACCESS
- SELU ACCESS
- VEHICLE ACCESS
- STUDENT ACCESS
- PRIMARY SCHOOL ACCESS
- FENCE LINE
- BOUNDARY
- 6m SETBACK
- SCHOOL BOUNDARY
- TOP OF EXISTING KERB
- PICK UP AND DROP OFF
- ACCESSIBLE PARKING
- BUS ZONE
- BUS STOP
- BICYCLE PARKING
- CAR PARK
- WASTE AREA
- PUMP ROOM 5mx3mx2.3m
- BOOSTER VALVE 2.5mx1mx1.6m
- OSD TANK — OSD TANK

DRAFT REF

Issue

No.	Date	Description	Chkd
1	29.11.2024	ISSUE FOR DRAFT REF	RS

Changes to this Revision

NBRS
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Nominated Architects:
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Jonathan West NSW 9899
NBRS & Partners Pty Ltd VIC 51197 ABN 16 002 247 565

Project
24136 - Googong High school

at
200 Wellsvale Drive, Googong NSW 2620

NSW GOVERNMENT Education

Drawing Title
SITE PLAN

Date 29/11/2024 1:34:54 PM
Scale 1 : 500 @ A1
NBRS Project # 24136
Drawing Reference GGHS-NBRS-ZZ-ZZ-DR-A-000201
Revision 1

0 10 20 30 40 50 60 70 80 90 100

Appendix B

About this Report

About this Report

October 2024

Introduction

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

Douglas' 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, Douglas 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, Douglas 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, Douglas 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, Douglas 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. Douglas 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.

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Appendix C

Site Audit Statement

NSW Site Auditor Scheme

Site Audit Statement

A site audit statement summarises the findings of a site audit. For full details of the site auditor's findings, evaluations and conclusions, refer to the associated site audit report.

This form was approved under the *Contaminated Land Management Act 1997* on 12 October 2017.

For information about completing this form, go to Part IV.

Part I: Site audit identification

Site audit statement no. **439**

This site audit is a:

☒ statutory audit

~~☐ non-statutory audit~~

within the meaning of the *Contaminated Land Management Act 1997*.

Site auditor details

(As accredited under the *Contaminated Land Management Act 1997*)

Name	**Rod Harwood**	
Company	**Harwood Environmental Consultants**	
Address	**Suite F, Building 38, Suakin Drive,**	
	Mosman, NSW	Postcode **2088**
Phone	**0438 200 055**	
Email	**rod@harwoodenviro.com.au**	

Site details

Address	**Wellsvale Drive, Googong NSW**	
Postcode		**2620**

Property description

(Attach a separate list if several properties are included in the site audit.)

Lot 829 DP1277372

Local government area **Queanbeyan-Palerang Regional Council**

Area of site (include units, e.g. hectares) **Total Audit area: 71.112ha**

School Site: 90,010 m^2

Current zoning **R1 – Local Centre under Queanbeyan City Council LEP 2012**

Amendment No 10

Regulation and notification

To the best of my knowledge:

☐ ~~**the site is** the subject of a declaration, order, agreement, proposal or notice under the *Contaminated Land Management Act 1997* or the *Environmentally Hazardous Chemicals Act 1985,* as follows: (provide the no. if applicable)~~

- ☐ ~~Declaration no.~~
- ☐ ~~Order no.~~
- ☐ ~~Proposal no.~~
- ☐ ~~Notice no.~~

☒ **the site is not** the subject of a declaration, order, proposal or notice under the Contaminated *Land Management Act 1997* or the *Environmentally Hazardous Chemicals Act 1985*.

To the best of my knowledge:

☐ ~~the site **has** been notified to the EPA under section 60 of the *Contaminated Land Management Act 1997*~~

☒ the site **has not** been notified to the EPA under section 60 of the *Contaminated Land Management Act 1997*.

Site audit commissioned by

Name **Mitchell Alexander**

Company **Googong Township Pty Limited**

Address **L3, 64 Allara Street, Canberra ACT** Postcode **2600**

Phone **0413 432 440**

Email **Mitchell.alexander@peet.com.au**

Contact details for contact person (if different from above)

~~Name~~

~~Phone~~

~~Email~~

Nature of statutory requirements (not applicable for non-statutory audits)

☐ ~~Requirements under the *Contaminated Land Management Act* 1997 (e.g. management order; please specify, including date of issue)~~

☐ ~~Requirements imposed by an environmental planning instrument (please specify, including date of issue)~~

☒ Development consent requirements under the *Environmental Planning and Assessment Act 1979* (please specify consent authority and date of issue)

The SAS and SAR are required as a condition of consent for Queanbeyan Palerang Regional Council Development Application 123-2017 (approved 10 Jan 2018):

PRIOR TO ISSUE OF SUBDIVISION CERTIFICATE (TORRENS)

38. SITE AUDIT STATEMENT

Prior to the issue of a Subdivision Certificate for each stage of works covered by this application a Site Audit Statement (SAS) and Site Audit Report (SAR) must be prepared by an accredited site auditor and be submitted to Council for that stage. The SAS must state that the site has been remediated and validated to permit the use of the site for its designated landuse.

Any recommendations or conditions contained within the SAS must be implemented and evidence of their implementation must be submitted to Council prior to the issue of a Subdivision Certificate. Any ongoing management conditions will become enforceable under this consent.

If the applicant intends to release the subdivision in stages the Site Auditor may issue an SAS for each stage of the development prior to the release of the subdivision certificate for that stage.

☐ ~~Requirements under other legislation (please specify, including date of issue)~~

Purpose of site audit

☒ **A1** To determine land use suitability:

Intended uses of the land: **The Audit site is proposed as part of the Googong township residential development. The Audit area has been reserved for a future primary and high school, understood to include classrooms and supporting administration buildings, playgrounds and school ovals, and carparks and access roads.**

~~OR~~

☐ ~~**A2** To determine land use suitability subject to compliance with either an active or passive environmental management plan~~

~~Intended uses of the land:~~

~~OR~~

~~(Tick all that apply)~~

☐ ~~**B1** To determine the nature and extent of contamination~~

☐ ~~**B2** To determine the appropriateness of:~~

- ☐ ~~an investigation plan~~
- ☐ ~~a remediation plan~~
- ☐ ~~a management plan~~

☐ ~~**B3** To determine the appropriateness of a **site testing plan** to determine if groundwater is safe and suitable for its intended use as required by the *Temporary Water Restrictions Order for the Botany Sands Groundwater Resource 2017*~~

☐ ~~**B4** To determine the compliance with an approved:~~

- ☐ ~~**voluntary management proposal** or~~
- ☐ ~~**management order** under the *Contaminated Land Management Act 1997*~~

☐ ~~**B5** To determine if the land can be made suitable for a particular use (or uses) if the site is remediated or managed in accordance with a specified plan.~~

~~Intended uses of the land:~~

Information sources for site audit

Consultancies which conducted the site investigations and/or remediation:

Coffey Geosciences Pty Ltd, C.M. Jewell & Associates Pty Ltd, Geotechnique Pty Ltd, SMEC Pty Ltd, Terravale Consulting Pty Ltd, ADE Consulting Group Pty Ltd

Titles of reports reviewed:

- **Coffey Geosciences Pty Ltd (July 2004) 'Googong Local Environment Study, Phase 1 Environmental Site Assessment' Ref C7552/1-AC**
- **C.M Jewell & Associates Pty Ltd (CMJA), 'Sampling, Analytical and Quality Plan for the Remediation of Googong Township Residential Development, Googong Dam Road, Googong'. Report Ref. J1526.2R-rev0, dated April 2012**
- **Geotechnique Pty Ltd, 'Contamination Assessment, Neighbourhood 1A Stage 7 & Neighbourhood 2, Googong Road, Googong'. Report Ref. 126875/4-AA, dated May 2016**
- **SMEC (2016) May 2016 Monitoring Report (ref 30011525-AQ) date June 2016**
- **Geotechnique Pty Ltd, 'Detailed Contamination Assessment, Neighbourhood 1A Stage 7 & Neighbourhood 2, Googong Road, Googong'. Report Ref. 12675/4-AB, dated 16 May 2017**
- **Geotechnique Pty Ltd, 'Remedial Action Plan, Neighbourhood 2, Googong Road, Googong'. Report Ref. 12675/4-AC), dated 27 April 2018**
- **Terravale Consulting Pty Ltd (2021) 'Health Risk Assessment: Naturally Occurring Metals in Soil, Googong Residential Development, Googong Township, NSW' (reference 20019_01b) dated 8 February 2021**
- **Geotechnique Pty Ltd (2021) 'Site Remediation and Validation, Neighbourhood (NH) 2, Old Cooma Road, Googong' (Report No: 12675/6-AA) dated June 2021**
- **Geotechnique Pty Ltd (2022) 'Site Remediation and Validation Addendum (2nd Version), Stages 12 – 14, 16C & 16D of Neighbourhood (NH) 2 – Old Cooma Road, Googong' dated 21 March 2022.**
- **Geotechnique Pty Ltd (2022) 'Laboratory test results for additional validation samples in stockpile footprint – Googong NH2 School Site' email dated 13 September 2022.**
- **ADE Consulting Group Pty Ltd (2018) 'Waste Analysis and Classification Report' (reference HIQ-12-14658).**
- **Geotechnique Pty Ltd (2021) 'Remediation and Validation, School Site of Neighbourhood (NH) 2, Glenrock Drive, Googong' (Report No: 12675/12-AA) dated June 2023**

Other information reviewed, including previous site audit reports and statements relating to the site:

NA

Site audit report details

Title: **Site Audit Report for SAS 439, Googong Neighbourhood 2– School Site – Lot 829 DP1277372**

Report no.: **23023_SAR_v00** Date: **18/07/2023**

Part II: Auditor's findings

Please complete either Section A1, Section A2 or Section B, not more than one section. (Strike out the irrelevant sections.)

- Use **Section A1** where site investigation and/or remediation has been completed and a conclusion can be drawn on the suitability of land uses **without the implementation** of an environmental management plan.
- Use **Section A2** where site investigation and/or remediation has been completed and a conclusion can be drawn on the suitability of land uses **with the implementation** of an active or passive environmental management plan.
- Use **Section B** where the audit is to determine:
    - (B1) the nature and extent of contamination, and/or
    - (B2) the appropriateness of an investigation, remediation or management plan[1], and/or
    - (B3) the appropriateness of a site testing plan in accordance with the *Temporary Water Restrictions Order for the Botany Sands Groundwater Source 2017*, and/or
    - (B4) whether the terms of the approved voluntary management proposal or management order have been complied with, and/or
    - (B5) whether the site can be made suitable for a specified land use (or uses) if the site is remediated or managed in accordance with the implementation of a specified plan.

[1] For simplicity, this statement uses the term 'plan' to refer to both plans and reports.

Section A1

I certify that, in my opinion:

The **site is suitable** for the following uses:

(Tick all appropriate uses and strike out those not applicable.)

☐ ~~Residential, including substantial vegetable garden and poultry~~

☐ ~~Residential, including substantial vegetable garden, excluding poultry~~

☐ ~~Residential with accessible soil, including garden (minimal home-grown produce contributing less than 10% fruit and vegetable intake), excluding poultry~~

☒ Day care centre, preschool, primary school

☐ ~~Residential with minimal opportunity for soil access, including units~~

☒ Secondary school

☐ ~~Park, recreational open space, playing field~~

☐ ~~Commercial/industrial~~

☐ ~~Other (please specify):~~

OR

☐ ~~I certify that, in my opinion, the **site is not suitable** for any use due to the risk of harm from contamination.~~

Overall comments:

The Auditor considers that the site investigation, remediation and validation was undertaken appropriately and has confirmed that the site has been rendered suitable for the proposed land uses (comprising of a primary and secondary school) and that no further investigation or remediation of the area under the Audit is required.

Section A2

I certify that, in my opinion:

Subject to compliance with the **attached** environmental management plan[2] (EMP), the site is suitable for the following uses:

(Tick all appropriate uses and strike out those not applicable.)

☐ Residential, including substantial vegetable garden and poultry

☐ Residential, including substantial vegetable garden, excluding poultry

☐ Residential with accessible soil, including garden (minimal home-grown produce contributing less than 10% fruit and vegetable intake), excluding poultry

☐ Day care centre, preschool, primary school

☐ Residential with minimal opportunity for soil access, including units

☐ Secondary school

☐ Park, recreational open space, playing field

☐ Commercial/industrial

☐ Other (please specify):

_____

EMP details

Title: _____

Author: _____

Date: _____ No. of pages: _____

EMP summary

This EMP (attached) is required to be implemented to address residual contamination on the site.

The EMP: (Tick appropriate box and strike out the other option.)

☐ requires operation and/or maintenance of **active** control systems[3]

☐ requires maintenance of **passive** control systems only[3].

[2] Refer to Part IV for an explanation of an environmental management plan.
[3] Refer to Part IV for definitions of active and passive control systems.

Purpose of the EMP:

Description of the nature of the residual contamination:

Summary of the actions required by the EMP:

How the EMP can reasonably be made to be legally enforceable:

How there will be appropriate public notification:

Overall comments:

Section B

Purpose of the plan[4] which is the subject of this audit:

_____

_____

_____

I certify that, in my opinion:

(B1)

☐ The nature and extent of the contamination **has** been appropriately determined

☐ The nature and extent of the contamination **has not** been appropriately determined

AND/OR (B2)

☐ The investigation, remediation or management plan **is** appropriate for the purpose stated above

☐ The investigation, remediation or management plan **is not** appropriate for the purpose stated above

AND/OR (B3)

❑ The site testing plan:

- ❑ **is** appropriate to determine
- ❑ **is not** appropriate to determine

if groundwater is safe and suitable for its intended use as required by the *Temporary Water Restrictions Order for the Botany Sands Groundwater Resource 2017*

AND/OR (B4)

❑ The terms of the approved voluntary management proposal* or management order** (strike out as appropriate):

- ❑ **have** been complied with
- ❑ **have not** been complied with.

*voluntary management proposal no. _____

**management order no. _____

AND/OR (B5)

❑ The site **can be made suitable** for the following uses:

(Tick all appropriate uses and strike out those not applicable.)

- ☐ Residential, including substantial vegetable garden and poultry
- ☐ Residential, including substantial vegetable garden, excluding poultry

[4] For simplicity, this statement uses the term 'plan' to refer to both plans and reports.

- ☐ Residential with accessible soil, including garden (minimal home-grown produce contributing less than 10% fruit and vegetable intake), excluding poultry
- ☐ Day care centre, preschool, primary school
- ☐ Residential with minimal opportunity for soil access, including units
- ☐ Secondary school
- ☐ Park, recreational open space, playing field
- ☐ Commercial/industrial
- ☐ Other (please specify):

IF the site is remediated/managed* in accordance with the following plan (**attached**):

*Strike out as appropriate

Plan title

Plan author

Plan date No. of pages

SUBJECT to compliance with the following condition(s):

Overall comments:

Part III: Auditor's declaration

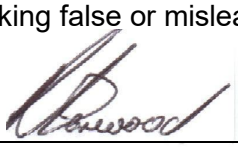
I am accredited as a site auditor by the NSW Environment Protection Authority (EPA) under the *Contaminated Land Management Act 1997.*

Accreditation no. **03-04**

I certify that:

- I have completed the site audit free of any conflicts of interest as defined in the *Contaminated Land Management Act 1997,* and
- with due regard to relevant laws and guidelines, I have examined and am familiar with the reports and information referred to in Part I of this site audit, and
- on the basis of inquiries I have made of those individuals immediately responsible for making those reports and obtaining the information referred to in this statement, those reports and that information are, to the best of my knowledge, true, accurate and complete, and
- this statement is, to the best of my knowledge, true, accurate and complete.

I am aware that there are penalties under the *Contaminated Land Management Act 1997* for wilfully making false or misleading statements.

Signed 

Date **18/07/2023**

Part IV: Explanatory notes

To be complete, a site audit statement form must be issued with all four parts.

How to complete this form

Part I

Part I identifies the auditor, the site, the purpose of the audit and the information used by the auditor in making the site audit findings.

Part II

Part II contains the auditor's opinion of the suitability of the site for specified uses or of the appropriateness of an investigation, or remediation plan or management plan which may enable a particular use. It sets out succinct and definitive information to assist decision-making about the use or uses of the site or a plan or proposal to manage or remediate the site.

The auditor is to complete either Section A1 or Section A2 or Section B of Part II, **not** more than one section.

Section A1

In Section A1 the auditor may conclude that the land is *suitable* for a specified use or uses OR *not suitable* for any beneficial use due to the risk of harm from contamination.

By certifying that the site is *suitable*, an auditor declares that, at the time of completion of the site audit, no further investigation or remediation or management of the site was needed to render the site fit for the specified use(s). **Conditions must not be** imposed on a Section A1 site audit statement. Auditors may include **comments** which are key observations in light of the audit which are not directly related to the suitability of the site for the use(s). These observations may cover aspects relating to the broader environmental context to aid decision-making in relation to the site.

Section A2

In Section A2 the auditor may conclude that the land is *suitable* for a specified use(s) subject to a condition for implementation of an environmental management plan (EMP).

Environmental management plan

Within the context of contaminated sites management, an EMP (sometimes also called a 'site management plan') means a plan which addresses the integration of environmental mitigation and monitoring measures for soil, groundwater and/or hazardous ground gases throughout an existing or proposed land use. An EMP succinctly describes the nature and location of contamination remaining on site and states what the objectives of the plan are, how contaminants will be managed, who will be responsible for the plan's implementation and over what time frame actions specified in the plan will take place.

By certifying that the site is suitable subject to implementation of an EMP, an auditor declares that, at the time of completion of the site audit, there was sufficient information satisfying guidelines made or approved under the *Contaminated Land Management Act 1997*

(CLM Act) to determine that implementation of the EMP was feasible and would enable the specified use(s) of the site and no further investigation or remediation of the site was needed to render the site fit for the specified use(s).

Implementation of an EMP is required to ensure the site remains suitable for the specified use(s). The plan should be legally enforceable: for example, a requirement of a notice under the CLM Act or a development consent condition issued by a planning authority. There should also be appropriate public notification of the plan, e.g. on a certificate issued under s.149 of *the Environmental Planning and Assessment Act 1979*.

Active or passive control systems

Auditors must specify whether the EMP requires operation and/or maintenance of active control systems or requires maintenance of passive control systems only. Active management systems usually incorporate mechanical components and/or require monitoring and, because of this, regular maintenance and inspection are necessary. Most active management systems are applied at sites where if the systems are not implemented an unacceptable risk may occur. Passive management systems usually require minimal management and maintenance and do not usually incorporate mechanical components.

Auditor's comments

Auditors may also include **comments** which are key observations in light of the audit which are not directly related to the suitability of the site for the use(s). These observations may cover aspects relating to the broader environmental context to aid decision-making in relation to the site.

Section B

In Section B the auditor draws conclusions on the nature and extent of contamination, and/or suitability of plans relating to the investigation, remediation or management of the land, and/or the appropriateness of a site testing plan in accordance with the *Temporary Water Restrictions Order for the Botany Sands Groundwater Source 2017*, and/or whether the terms of an approved voluntary management proposal or management order made under the CLM Act have been complied with, and/or whether the site can be made suitable for a specified land use or uses if the site is remediated or managed in accordance with the implementation of a specified plan.

By certifying that a site *can be made suitable* for a use or uses if remediated or managed in accordance with a specified plan, the auditor declares that, at the time the audit was completed, there was sufficient information satisfying guidelines made or approved under the CLM Act to determine that implementation of the plan was feasible and would enable the specified use(s) of the site in the future.

For a site that *can be made suitable*, any **conditions** specified by the auditor in Section B should be limited to minor modifications or additions to the specified plan. However, if the auditor considers that further audits of the site (e.g. to validate remediation) are required, the auditor must note this as a condition in the site audit statement. The condition must not specify an individual auditor, only that further audits are required.

Auditors may also include **comments** which are observations in light of the audit which provide a more complete understanding of the environmental context to aid decision-making in relation to the site.

Part III

In **Part III** the auditor certifies their standing as an accredited auditor under the CLM Act and makes other relevant declarations.

Where to send completed forms

In addition to furnishing a copy of the audit statement to the person(s) who commissioned the site audit, statutory site audit statements must be sent to

- the **NSW Environment Protection Authority**:
  nswauditors@epa.nsw.gov.au or as specified by the EPA

  AND
- the **local council** for the land which is the subject of the audit.

Appendix D

Data Quality Objectives

1. Data quality objectives

Douglas (2024) was devised broadly in accordance with the seven-step data quality objectives (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).

Table 1: Data quality objectives

Step	Summary
1: State the problem	The objective of the investigation is to assess the suitability of the site, from a contamination perspective, with respect to the proposed land use. The report is being undertaken as development of a new high school is proposed at the site. A preliminary conceptual site model (CSM) has been prepared (Section 7) for the site. The project team consisted of experienced environmental engineers and scientists working in the roles of Project Principal, Project Reviewer, Project Manager, field staff.
2: Identify the decisions / goal of the study	The site history has identified possible contaminating previous uses which are identified in the CSM (Section 7). The CSM identifies the associated contaminants of potential concern (CoPC) and the likely impacted media. The site assessment criteria (SAC) for each of the CoPC are detailed in Appendix F. The decision is to establish whether or not the results fall below the adopted SAC or whether or not the 95% upper confidence limit of the sample population falls below the SAC. On this basis, an assessment of the site's suitability from a contamination perspective will be derived and a decision made on whether (or not) further assessment and / or remediation will be required.
3: Identify the information inputs	Inputs to the investigation were the results of analysis of samples to measure the concentrations of CoPC identified in the CSM (Section 7) at the site using National Association of Testing Authorities (NATA) accredited laboratories and methods, where possible. The SAC for each of the CoPC are detailed in Appendix F. A photoionisation detector (PID) was used on-site to screen soils for VOC. PID readings will be used to inform sample selection for laboratory analysis.
4: Define the study boundaries	The lateral boundaries of the investigation area are shown on Drawing R.005.D.001, Appendix A. The vertical boundaries are to the extent of contamination impact as determined from the site history assessment and site observations. The assessment is limited to the timeframe over which the field investigation was undertaken. Constraints to the assessment are identified and discussed in the conclusions of the report, Section 12.

Step	Summary
5: Develop the analytical approach (or decision rule)	The decision rule is to compare all analytical results with the adopted SAC (Appendix F), based on NEPC (2013). Where guideline values are absent, other sources of guideline values accepted by NEPC (2013) shall be adopted where possible. Where a sample result exceeds the adopted criterion, a further site-specific assessment will be made as to the risk posed by the presence of that contaminant(s). Initial comparisons will be with individual results then, where required, summary statistics (including mean, standard deviation and 95% upper confidence limit (UCL) of the arithmetic mean (95% UCL)) to assess potential risks posed by the site contamination. Quality control results are to be assessed according to their relative percent difference (RPD) values. For field duplicates, triplicates and laboratory results, RPDs should generally be below 30%; for field blanks and rinsates, results should be at or less than the limits of reporting (NEPC, 2013). The field and laboratory quality assurance assessment is included in Appendix K.
6: Specify the performance or acceptance criteria	Baseline condition: Contaminants at the site and/or statistical analysis of data (in line with NEPC (2013)) exceed human health and environmental SAC and pose a potentially unacceptable risk to receptors (null hypothesis). Alternative condition: Contaminants at the site and statistical analysis of data (in line with NEPC (2013)) 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. Uncertainty that may exist due to the above potential decision errors shall be mitigated as follows: As well as a primary screening exercise, the use of the 95% UCL as per NEPC (2013) may be applied, i.e.: 95% is the defined confidence level associated with the UCL on the geometric mean for contaminant data. The resultant 95% UCL shall subsequently be screened against the corresponding SAC. The statistical assessment will only be able to be applied to certain data-sets, such as those obtained via systematic sampling.
7: Optimise the design for obtaining data	As the purpose of the sampling program is to assess for potential contamination across the site, the sampling program is reliant on professional judgement to identify and sample the potentially affected areas. Further details regarding the proposed sampling plan are presented in Section 8.2.

2. References

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

Appendix E

Field Work Methodology

1. 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).

2. Soil sampling

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

- Boreholes 201 to 206 were drilled using a Scout 6 truck-mounted drill rig with 125 mm auger.
- Test Pits 207 to 226 were excavated using hand tools;
- Soil samples were collected directly from the hand tools or from the solid flight auger at the nominated sample depth;
- Samples were transferred into laboratory-prepared glass jars with Teflon lined lids by hand, capping immediately and minimising headspace within the sample jar;
- Replicate samples were collected in zip-lock bags for PID screening;
- New disposable nitrile gloves for each sample point were used thereby minimising potential for cross-contamination;
- Labelling of sample containers with individual and unique identification details, including project number, sample location and sample depth (where applicable);
- Placing samples into a cooled, insulated and sealed container for transport to the laboratory; and
- Use chain of custody documentation.

The procedure for the PID field testing is as follows:

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

3. References

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

Appendix F

Site Assessment Criteria

1. Introduction

1.1 Guidelines

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

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

1.2 General

The SAC applied are informed by the conceptual site model (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:

- Secondary school land use which corresponds to land use category 'C' (public open space such as parks, playgrounds, playing fields, secondary schools and footpaths).
- Soil type: silt and clay.

2. Soils

2.1 Health investigation and screening levels

The generic health investigation levels (HIL) and health screening levels (HSL) are considered to be appropriate for the assessment of human health risk via all relevant pathways of exposure associated with contamination at the site. The adopted soil HIL and HSL for the contaminants of concern are in Table 1 to 3. Note that HSL for vapour intrusion for land use category 'A' have been adopted instead of those for category C given the proposed secondary school buildings (as recommended in NEPC, 2013). HSL for category A are more conservative than those for category C. Similarly, the more conservative HSL for direct contact (land use category A) have also been adopted.

Table 1: Health investigation levels (mg/kg)

Contaminant	HIL-C
Metals	
Arsenic	300
Cadmium	90
Chromium (VI)	300
Copper	17 000

Contaminant	HIL-C
Lead	600
Manganese	19 000
Mercury (inorganic)	80
Nickel	1200
Zinc	30 000
PAH	
B(a)P TEQ	3
Total PAH	300
Phenols	
Phenol	40 000
Pentachlorophenol	120
OCP	
DDT+DDE+DDD	400
Aldrin and dieldrin	10
Chlordane	70
Endosulfan	340
Endrin	20
Heptachlor	10
HCB	10
Methoxychlor	400
OPP	
Chlorpyrifos	250
PCB	
PCB	1

Table 2: Health screening levels for vapour intrusion (mg/kg)

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

Contaminant	HSL-A&B
TRH F1	45
TRH F2	110
SILT	**0 m to <1 m**
Benzene	0.6
Toluene	390
Ethylbenzene	NL
Xylenes	95
Naphthalene	4
TRH F1	40
TRH F2	230
CLAY	**0 m to <1 m**
Benzene	0.7
Toluene	480
Ethylbenzene	NL
Xylenes	110
Naphthalene	5
TRH F1	50
TRH F2	280

Notes: TRH F1 is TRH C_6-C_{10} minus BTEX
TRH F2 is TRH >C_{10}-C_{16} minus naphthalene
The soil saturation concentration (Csat) is defined as the soil concentration at which the porewater phase cannot dissolve any more of an individual chemical. The soil vapour that is in equilibrium with the porewater will be at its maximum. If the derived soil HSL exceeds Csat, a soil vapour source concentration for a petroleum mixture could not exceed a level that would results in the maximum allowable vapour risk for the given scenario. For these scenarios, no HSL is presented for these chemicals and the HSL is shown as 'not limiting' or 'NL'

Table 3: Health screening levels for direct contact (mg/kg)

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

Contaminant	DC HSL-A
TRH F4	6300

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

2.2 Asbestos in soil

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

2.3 Ecological investigation levels

Ecological investigation levels (EIL) and added contaminant limits (ACL), where appropriate, have been derived in NEPC (2013) for arsenic, copper, chromium (III), nickel, lead, zinc, DDT and naphthalene. The adopted EIL, derived using the interactive (excel) calculation spreadsheet on the NEPM toolbox website, are shown in Table 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	Potentially "Aged" (>2 years) or Fresh (<2 years)	The site was used as a contractor compound in the previous two years so contaminants may be 'fresh', however, fill is more likely to have contaminants which are more than two years old ('aged').
pH	6.53	Average of site-specific test results
CEC	16.57 $cmol_c/kg$	Average of site-specific test results
Clay content	10%	Assumed based on field observations
Organic carbon content	Low	Conservative (default value)
Traffic volumes	Low	Based on site location
State / Territory	NSW	Based on site location
Iron Content	1%	Conservative (default value)

Table 5: Ecological investigation levels (mg/kg)

Contaminant	EIL-A-B-C - Fresh	EIL-A-B-C - Aged
Metals		
Arsenic	50	100
Copper	110	220

Contaminant	EIL-A-B-C - Fresh	EIL-A-B-C - Aged
Nickel	80	240
Chromium III	180	410
Lead	270	1100
Zinc	240	680
PAH		
Naphthalene	170	170
OCP		
DDT	180	180

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

2.4 Ecological screening levels

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

Table 6: Ecological screening levels (mg/kg)

Contaminant	Soil Type	ESL-A-B-C
TRH F1	Coarse/ Fine	180*
TRH F2	Coarse/ Fine	120*
B(a)P	Coarse/ Fine	0.7
Benzene	Fine	65
Toluene	Fine	105
Ethylbenzene	Fine	125
Xylenes	Fine	45
TRH F3	Fine	1300
TRH F4	Fine	5600

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

2.5 Management limits

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

- Formation of observable light non-aqueous phase liquids (LNAPL);
- Fire and explosion hazards;

- 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-A-B-C
TRH F1	Fine	800
TRH F2	Fine	1000
TRH F3	Fine	3500
TRH F4	Fine	10 000

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

3. 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.

Harwood Environmental Consultants (HEC). (2023). *Site Audit Report for SAS 439, Googong Neighbourhood 2 – School site – LOT 829 DP1277372*, dated 18 July 2023.

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

Appendix G

Photographs

Photo 1: General view of northern portion of Lot 829 Deposited Plan 1277372, looking east (26 September 2023).

Photo 2: General view of central portion of Lot 829 Deposited Plan 1277372, looking south (26 September 2023).

Photo 3: View of various construction materials (corrugated metal roofing, wheelbarrow, timber palette) stored in the eastern portion of Lot 829 Deposited Plan 1277372, looking north west (26 September 2023).

Photo 4: View of metal fence poles and earthworks rigs in the eastern portion of Lot 829 Deposited Plan 1277372, looking north east (26 September 2023).

Douglas Partners Geotechnics / Environment / Groundwater	CLIENT: NSW Department of Education	**Photographs 1 to 4**	PROJECT No: 224779.00
	OFFICE: Wollongong / Prepared By: EB / DW	**Detailed Site Investigation Contamination**	PLATE No: 1
	SCALE: NTS / DATE: 28 Jan 2025	**200 Wellsvale Drive, Googong**	REVISION: 1

Photo 5: General view of western portion of Lot 829 Deposited Plan 1277372 looking south (26 September 2023).

Photo 6: View of rubber pipe segments (dredging) and timber power poles being stored on the surface in the western portion of Lot 829 Deposited Plan 1277372, looking south (26 September 2023).

Photo 7: General view of southern portion of the Lot 829 Deposited Plan 1277372, looking east (26 September 2023).

Photo 8: General view of construction compound in south western corner of the Lot 829 Deposited Plan 1277372, looking west (26 September 2023).

Douglas Partners Geotechnics / Environment / Groundwater	CLIENT: NSW Department of Education		**Photographs 5 to 8**	PROJECT No: 224779.00
	OFFICE: Wollongong	Prepared By: EB / DW	**Detailed Site Investigation Contamination**	PLATE No: 2
	SCALE: NTS	DATE: 28 Jan 2025	**200 Wellsvale Drive, Googong**	REVISION: 1

Photo 9: View of Bore 204 (28 September 2023).

Photo 10: Photo of subsurface conditions encountered at Pit 211
(26 September 2023).

Photo 11: Photo of subsurface conditions encountered at Pit 207
(26 September 2023).

Douglas Partnerss Geotechnics / Environment / Groundwaterter	CLIENT: NSW Department of Education		**Photographs 9 to 11**	PROJECT No: 224779.00
	OFFICE: Wollongong	Prepared By: EB / DW	**Detailed Site Investigation Contamination**	PLATE No: 3
	SCALE: NTS	DATE: 28 Jan 2025	**200 Wellsvale Drive, Googong**	REVISION: 1

Appendix H

Borehole Logs and Test Pit Logs

Terminology, Symbols and Abbreviations

November 2020

Introduction to Terminology, Symbols and Abbreviations

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

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

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

Abbreviation Codes

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

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

Data Integrity Codes

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

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

Graphic Symbols

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

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Soil Descriptions

September 2023

Introduction

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

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

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

Particle size designation and Behaviour Model

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

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

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

[1] – refer grain size subdivision descriptions below

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

Component proportions

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

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

[1] As defined in AS1726-2017 6.1.4.4

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

Composite Materials

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

Classification

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

Soil Name

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

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

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

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

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

Materials of "fill" or "topsoil" origin are generally assigned a name derived from the primary/secondary component (where appropriate). In log descriptions this is preceded by uppercase "FILL" or "TOPSOIL". Origin uncertainty is indicated in the description by the characters `(?)`, with the degree of uncertainty described (using the terms "probably" or "possibly" in the origin column, or at the end of the description).

Identification of minor components

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

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

The terms "with" and "trace" generally apply only to gravel or fine particle fractions. Where cobbles/boulders are encountered in minor proportions (generally less than about 12%) the term "occasional" may be used. This term describes the sporadic distribution of the material within the confines of the investigation excavation only, and there may be considerable variation in proportion over a wider area which is difficult to factually characterise due to the relative size of the particles and the investigation methods.

Soil Composition

Plasticity

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

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

Grain Size

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

Grading

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

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

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Soil Condition

Moisture

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

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

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

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

Consistency/Density/Compaction/Cementation/Extremely Weathered Material

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

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

Quantitative engineering performance of these materials may be determined by laboratory testing or estimated by correlated field tests (for example penetration or shear vane testing). In some cases, performance may be assessed by tactile or other subjective methods, in which case investigation logs will show the estimated value enclosed in round brackets, for example (VS).

Consistency (fine grained soils)

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

Relative Density (coarse grained soils)

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

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

Compaction (anthropogenically modified soil)

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

Cementation (natural and anthropogenic)

Cementation Term	Abbreviation Code
Moderately cemented	MOD
Weakly cemented	WEK

Extremely Weathered Material

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

Soil Origin

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

Cobbles and Boulders

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

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

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Rock Strength

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

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

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

[1] Rock strength classification is based on UCS. The UCS to $I_{s(50)}$ ratio varies significantly for different rock types and specific ratios may be required for each site. The point load Index ranges shown above are as suggested in AS1726 and should not be relied upon without supporting evidence.

The following abbreviation codes are used for soil layers or seams of material "within rock" but for which the equivalent UCS strength is less than 0.6 MPa.

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

Degree of Weathering

The degree of weathering of rock is classified as follows:

Weathering Term	Description	Abbreviation Code
Residual Soil[1]	Material is weathered to such an extent that it has soil properties. Mass structure and material texture and fabric of original rock are no longer visible, but the soil has not been significantly transported.	RS
Extremely weathered[1]	Material is weathered to such an extent that it has soil properties. Mass structure and material texture and fabric of original rock are still visible	XW
Highly weathered	The whole of the rock material is discoloured, usually by iron staining or bleaching to the extent that the colour of the original rock is not recognisable. Rock strength is significantly changed by weathering. Some primary minerals have weathered to clay minerals. Porosity may be increased by leaching or may be decreased due to deposition of weathering products in pores.	HW
Moderately weathered	The whole of the rock material is discoloured, usually by iron staining or bleaching to the extent that the colour of the original rock is not recognisable but shows little or no change of strength from fresh rock.	MW
Slightly weathered	Rock is partially discoloured with staining or bleaching along joints but shows little or no change of strength from fresh rock.	SW
Fresh	No signs of decomposition or staining.	FR
Note: If HW and MW cannot be differentiated use DW (see below)		
Distinctly weathered	Rock strength usually changed by weathering. The rock may be highly discoloured, usually by iron staining. Porosity may be increased by leaching or may be decreased due to deposition of weathered products in pores.	DW

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

Degree of Alteration

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

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

Degree of Fracturing

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

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

Rock Quality Designation

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

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

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

Stratification Spacing

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

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

Defect Descriptions

Defect Type

Term	Abbreviation Code
Bedding plane	B
Infilled seam	IS
Cleavage	CV
Crushed zone	CZ
Decomposed seam	DS
Fault	F
Joint	JT
Lamination	LAM
Parting	P
Shear zone	SZ
Vein	VN
Drilling/handling break	DB , HB
Fracture	FC

Rock Defect Orientation

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

Rock Defect Coating

Term	Abbreviation Code
Clean	CN
Coating	CT
Healed	HE
Infilled	INF
Stained	SN
Tight	TI
Veneer	VNR

Rock Defect Infill

Term	Abbreviation Code
Calcite	CA
Carbonaceous	CBS
Clay	CLAY
Iron oxide	FE
Manganese	MN

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Rock Defect Shape/Planarity

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

Rock Defect Roughness

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

Defect Orientation

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

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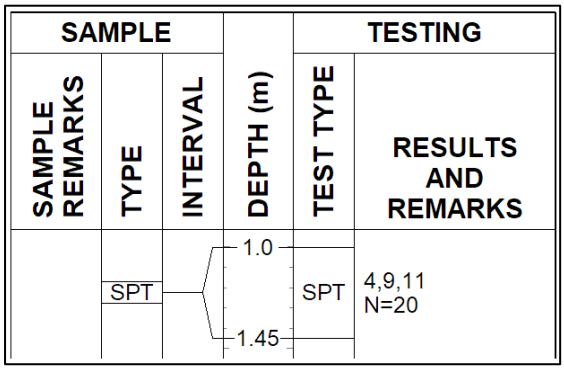
Sampling, Testing and Excavation Methodology

Terminology
Symbols
Abbreviations

September 2023

Sampling and Testing

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



Sampling

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

Sample Type	Code
Auger sample	A
Bulk sample	B
Core sample	C
Disturbed sample	D
Sample from SPT test	SPT
Environmental sample	ES
Gas sample	G
Undisturbed tube sample	U[1]
Water sample	W
Piston sample	P
Core sample for unconfined compressive strength testing	UCS
Material Sample	MT

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

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

Field and Laboratory Testing

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

Test Type	Code
Pocket penetrometer (kPa)	PP
Photo ionisation detector (ppm)	PID
Standard Penetration Test x/y =*x* blows for *y* mm penetration HB = hammer bouncing HW = fell under weight of hammer	SPT
Shear vane (kPa)	V
Unconfined compressive strength, (MPa)	UCS

Field and laboratory testing (continued)

Test Type	Code
Point load test, (MPa), axial (A), diametric (D), irregular (I)	PLT(_)
Dynamic cone penetrometer, followed by blow count penetration increment in mm (cone tip, generally in accordance with AS1289.6.3.2)	DCP/150
Perth sand penetrometer, followed by blow count penetration increment in mm (flat tip, generally in accordance with AS1289.6.3.3)	PSP/150

Groundwater Observations

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

Drilling or Excavation Methods/Tools

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

Method	Abbreviation Code
Toothed bucket	TB[1]
Mud/blade bucket	MB[1]
Ripping tyne/ripper	R
Rock breaker/hydraulic hammer	RB
Hand auger	HA[1]
NMLC series coring	NMLC
HMLC series coring	HMLC
NQ coring	NQ3
HQ coring	HQ3
PQ coring	PQ3
Push tube	PT[1]
Rock roller	RR[1]
Solid flight auger. Suffixes: /T = tungsten carbide tip, /V = v-shaped tip	AD[1]
Sonic drilling	SON[1]
Vibrocore	VC[1]
Wash bore (unspecified bit type)	WB[1]
Existing exposure	X
Hand tools (unspecified)	HAND
Predrilled	PD
Diatube	DT[1]
Hollow flight auger	HSA[1]
Vacuum excavation	VE

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

BOREHOLE LOG

CLIENT: School Infrastructure NSW
PROJECT: Proposed New Public School
LOCATION: 200 Wellsvale Drive, Googong

SURFACE LEVEL: 755 AHD
COORDINATE E:702169 **N:** 6077526
DATUM/GRID: MGA94 Zone 55
DIP/AZIMUTH: 90°/---

LOCATION ID: 201
PROJECT No: 224779.00
DATE: 27/09/23
SHEET: 1 of 2

GROUNDWATER	RL (m)	DEPTH (m)	DESCRIPTION OF STRATA	GRAPHIC	SOIL ORIGIN(#)	SOIL CONSIS.(*) DENSITY.(*)	SOIL MOISTURE	ROCK WEATH.	ROCK DEPTH (m)	ROCK STRENGTH	ROCK RECOVERY (%)	ROCK RQD	ROCK FRACTURE SPACING (m)	ROCK DEFECTS & REMARKS	SAMPLE REMARKS	SAMPLE TYPE	SAMPLE INTERVAL	DEPTH (m)	TEST TYPE	RESULTS AND REMARKS
27/09/23, No free groundwater observed		0.0	TOPSOIL/FILL/ (ML) Sandy SILT, with clay, with gravel; brown; sand fraction fine to coarse; gravel fraction fine to medium		TOP and FILL	NA	<PL									E		0.1	PID	0.2
		0.3	(CH) Silty CLAY, trace sand; pale yellow brown; clay fraction high plasticity; sand fraction fine		RES becoming XWM	VST	<PL to =PL									A E		0.4 0.5	PID	0.1
																SPT			SPT	5,7,9 N=16
		0.8	SHALE; orange pink brown; fine; highly fractured, dry to moist						0.8									0.95		
	754	1						XW-HW		VL						E		1.0	PID	0.1
																A E		1.4 1.5	PID	0.1
	753	2														A E		1.9 2.0	PID	0.1
																SPT			SPT	12,17,20 N=37
		2.5	CORE LOSS						2.5									2.45		
	752	3									61	0						3		
		3.67	(CI) Silty CLAY, trace sand; orange brown; clay fraction medium plasticity; sand fraction fine		XWM	XWR	NDF	XW	3.67	SOIL			SOIL							
		3.84	SHALE; orange brown; fine; highly fractured, dry to moist					XW-HW	3.84	VL				3.84-4.0m; fragmented						

DCP/150

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

PLANT: Scout 6
OPERATOR: RMX Drilling
LOGGED: HS

METHOD: SFA to 2.5m, then NMLC to 7.0m
CASING: HQ to 2.5m

REMARKS: Surface levels and coordinates are approximate only and must not be relied upon.

EXPORTED 02/11/23 15:36. TEMPLATE ID: DP_103.02.00_COMBINED

BOREHOLE LOG

CLIENT: School Infrastructure NSW
PROJECT: Proposed New Public School
LOCATION: 200 Wellsvale Drive, Googong

SURFACE LEVEL: 755 AHD
COORDINATE E:702169 **N:** 6077526
DATUM/GRID: MGA94 Zone 55
DIP/AZIMUTH: 90°/---

LOCATION ID: 201
PROJECT No: 224779.00
DATE: 27/09/23
SHEET: 2 of 2

GROUNDWATER	RL (m)	DEPTH (m)	DESCRIPTION OF STRATA	GRAPHIC	SOIL ORIGIN(#)	SOIL CONSIS.(*) DENSITY.(*)	SOIL MOISTURE	ROCK WEATH.	ROCK DEPTH (m)	ROCK STRENGTH	ROCK RECOVERY (%)	ROCK RQD	ROCK FRACTURE SPACING (m)	ROCK DEFECTS & REMARKS	SAMPLE REMARKS	SAMPLE TYPE	SAMPLE INTERVAL	DEPTH (m)	TESTING TEST TYPE	TESTING RESULTS AND REMARKS
	750	5	SHALE; orange brown; fine; highly fractured, dry to moist *(continued)*					XW-HW		VL	61	0		4.0-4.12m: fragmented 4.12-4.25m: J 80°-85°, PL, SM, CLY CO 4.25-4.37m: fragmented 4.37-4.42m: PL, SM, FE STN, fragmented 4.42-5.5m: fragmented				5		
		5.5	(Cl) Silty CLAY, trace sand; orange brown; clay fraction medium plasticity; sand fraction fine		XWM	XWR	NDF	XW	5.5	SOIL			SOIL							
		5.74	SHALE; orange brown; fine; highly fractured, dry to moist					XW	5.74	VL				5.74-6.0m: fragmented						
	749	6.0	(Cl) Silty CLAY, trace sand; orange brown; clay fraction medium plasticity; sand fraction fine		XWM	XWR	NDF	XW-HW	6.0	SOIL			SOIL					6		
		6.1	SHALE; orange brown; fine; highly fractured, dry to moist					XW	6.1	VL				6.1-6.13m: J 10°-15°, IR, RO, FE STN 6.13-6.23m: fragmented						
		6.23	(Cl) Silty CLAY, trace sand; orange brown; clay fraction medium plasticity; sand fraction fine		XWM	XWR	NDF	XW-HW	6.23	SOIL	58	0	SOIL							
		6.34	SHALE; orange brown; fine; highly fractured, dry to moist					XW	6.34	VL				6.34-6.42m: J 85°-90°, PL, SM, FE STN						
		6.42	CORE LOSS						6.42											
	748	7.0	Borehole discontinued at 7.00m depth Limit of investigation						7.0									7		

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

PLANT: Scout 6
METHOD: SFA to 2.5m, then NMLC to 7.0m
REMARKS: Surface levels and coordinates are approximate only and must not be relied upon.

OPERATOR: RMX Drilling
CASING: HQ to 2.5m

LOGGED: HS

BOREHOLE LOG

CLIENT: School Infrastructure NSW
PROJECT: Proposed New Public School
LOCATION: 200 Wellsvale Drive, Googong

SURFACE LEVEL: 752.2 AHD
COORDINATE E:702242 **N:** 6077524
DATUM/GRID: MGA94 Zone 55
DIP/AZIMUTH: 90°/---

LOCATION ID: 202
PROJECT No: 224779.00
DATE: 27/09/23
SHEET: 1 of 2

GROUNDWATER	RL (m)	DEPTH (m)	DESCRIPTION OF STRATA	GRAPHIC	SOIL ORIGIN(#)	SOIL CONSIS.(*) DENSITY.(*)	SOIL MOISTURE	ROCK WEATH.	ROCK DEPTH (m)	ROCK STRENGTH	ROCK RECOVERY (%)	ROCK RQD	FRACTURE SPACING (m)	DEFECTS & REMARKS	SAMPLE REMARKS	SAMPLE TYPE	SAMPLE INTERVAL	DEPTH (m)	TESTING TEST TYPE	TESTING RESULTS AND REMARKS
27/09/23, No free groundwater observed	752	0.0	TOPSOIL/FILL/ (CL) Silty CLAY, with sand, with gravel; brown; clay fraction low plasticity; sand fraction fine to coarse; gravel fraction fine to medium; with rootlets		TOP and FILL	NA	<PL									E		0.1	PID	0.2
		0.3	FILL(?)/ (CI-CH) Silty CLAY, with sand, trace gravel; grey brown mottled orange mottled grey; clay fraction medium to high plasticity; sand fraction fine to medium; gravel fraction fine; trace rootlets		possibly FILL	ST	=PL									A		0.4		
																E		0.5	PID	0.1
																SPT			SPT	3,5,6 N=11
		0.8	SHALE; yellow brown; fine; dry; highly fractured					XW-HW	0.8	VL								0.95		
	751	1														E		1.0	PID	0.1
																A		1.4		
																E		1.5	PID	0.2
		2														E		2.0	PID	0.2
	750															SPT			SPT	14,11,25 N=36
		2.5	(CL-CI) Silty CLAY, trace gravel; orange brown; clay fraction low to medium plasticity; gravel fraction fine		XWM	XWR	NDF	XW	2.5	SOIL			SOIL					2.45		
		2.71	SHALE; yellow brown; fine; dry; highly fractured						2.71					2.71-2.76m: J 10°-15° PL, RO, FE STN 2.76-2.8m: J 10°-15° PL, RO, FE STN 2.8-3.09m: HB			E		2.5		
		3						HW		VL	100	18		3.09m: J x2 60°-80° PL, UN/RO, CLY/FE INF/STN 3.12m: J 10°-20° PL, UN/RO, CLY/FE INF/STN 3.2-3.27m: J fragmented					3		
	749	3.54	(CL-CI) Silty CLAY, trace gravel, trace sand; orange brown; clay fraction low to medium plasticity; gravel fraction fine; sand fraction fine		XWM	XWR	NDF	XW	3.54	SOIL			SOIL							
		3.93	SHALE; yellow brown; fine; dry;					HW	3.93	VL				3.93-4.0m:							

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

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PLANT: Scout 6
METHOD: SFA to 2.5m, then NMLC to 6.0m
REMARKS: Surface levels and coordinates are approximate only and must not be relied upon.

OPERATOR: RMX Drilling
CASING: HQ to 2.5m

LOGGED: SK/HS

BOREHOLE LOG

CLIENT: School Infrastructure NSW
PROJECT: Proposed New Public School
LOCATION: 200 Wellsvale Drive, Googong

SURFACE LEVEL: 752.2 AHD
COORDINATE E:702242 **N:** 6077524
DATUM/GRID: MGA94 Zone 55
DIP/AZIMUTH: 90°/---

LOCATION ID: 202
PROJECT No: 224779.00
DATE: 27/09/23
SHEET: 2 of 2

GROUNDWATER	RL (m)	DEPTH (m)	DESCRIPTION OF STRATA	GRAPHIC	SOIL ORIGIN(#)	SOIL CONSIS.(*) DENSITY.(*)	SOIL MOISTURE	ROCK WEATH.	ROCK DEPTH (m)	ROCK STRENGTH VL L M H VH EH	ROCK RECOVERY (%)	ROCK RQD	ROCK FRACTURE SPACING (m) 0.01 0.05 0.10 0.50 1.00 5.00	ROCK DEFECTS & REMARKS	SAMPLE SAMPLE REMARKS	SAMPLE TYPE	SAMPLE INTERVAL	DEPTH (m)	TESTING TEST TYPE	TESTING RESULTS AND REMARKS
		4.0	highly fractured						4.0					fragmented						
	748		(CL-CI) Silty CLAY, trace gravel, trace sand; yellow brown; clay fraction low to medium plasticity; gravel fraction fine; sand fraction fine		XWM	XWR	NDF	XW		SOIL			SOIL							
		4.49	SHALE; yellow brown; fine; dry; highly fractured					HW	4.49	VL				4.49-4.63m: fragmented						
		4.63	(CL-CI) Silty CLAY, trace gravel, trace sand; yellow brown; clay fraction low to medium plasticity; gravel fraction fine; sand fraction fine		XWM	XWR	NDF	XW	4.63	SOIL	57	0	SOIL							
		4.87	CORE LOSS						4.87					4.87-5.5m: core loss						
	747	5																5		
		5.5	(CL-CI) Silty CLAY, trace gravel, trace sand; orange brown; clay fraction low to medium plasticity; gravel fraction fine; sand fraction fine		XWM	XWR	NDF	XW	5.5	SOIL	33	0	SOIL							
		6.0	Borehole discontinued at 6.00m depth Limit of investigation						6.0											
	746																	6		
	745	7																7		

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

PLANT: Scout 6
OPERATOR: RMX Drilling
LOGGED: SK/HS

METHOD: SFA to 2.5m, then NMLC to 6.0m
CASING: HQ to 2.5m

REMARKS: Surface levels and coordinates are approximate only and must not be relied upon.

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BOREHOLE LOG

CLIENT: School Infrastructure NSW
PROJECT: Proposed New Public School
LOCATION: 200 Wellsvale Drive, Googong

SURFACE LEVEL: 752.1 AHD
COORDINATE E:702286 **N:** 6077486
DATUM/GRID: MGA94 Zone 55
DIP/AZIMUTH: 90°/---

LOCATION ID: 203
PROJECT No: 224779.00
DATE: 28/09/23
SHEET: 1 of 2

GROUNDWATER	RL (m)	DEPTH (m)	DESCRIPTION OF STRATA	GRAPHIC	SOIL ORIGIN(#)	SOIL CONSIS.(*) DENSITY.(*)	SOIL MOISTURE	ROCK WEATH.	ROCK DEPTH (m)	ROCK STRENGTH	ROCK RECOVERY (%)	ROCK RQD	FRACTURE SPACING (m)	DEFECTS & REMARKS	SAMPLE REMARKS	SAMPLE TYPE	SAMPLE INTERVAL	DEPTH (m)	TEST TYPE	RESULTS AND REMARKS
27/09/23, No free groundwater observed	752	0.0	TOPSOIL/FILL/ (CL-CI) Silty CLAY, with sand, trace gravel; brown; clay fraction low to medium plasticity; sand fraction fine to coarse; gravel fraction fine; with rootlets		TOP and FILL	NA	<PL									E		0.1	PID	0.3
		0.2	FILL(?)/ (CH) Silty CLAY, trace sand, trace gravel; brown mottled orange; clay fraction high plasticity; sand fraction fine to coarse; gravel fraction fine		possibly FILL possibly RES	VST	<PL to =PL									A		0.4		
																E		0.5	PID	>400
																SPT			SPT	5,7,7 N=14
		1																0.95		
	751	1.1	SHALE; yellow brown mottled orange; fine					XW-HW	1.1	VL						E		1.0	PID	0.2
																A		1.4		
																E		1.5	PID	0.1
		2														E		2.0		
	750															SPT			SPT	6,12,22 N=34
																		2.45		
		2.5	(CI) Silty CLAY, trace sand, trace gravel; yellow brown; clay fraction medium plasticity; sand fraction fine; gravel fraction fine						2.5							E		2.5		
		3			XWM	XWR	NDF	XW		SOIL	100	0	SOIL						3		
	749													3.5m: DB						
		3.7	SHALE; yellow brown mottled orange; fine					XW-HW	3.7	VL	100	0								

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

EXPORTED 02/11/23 15:36. TEMPLATE ID: DP_103.02.00_COMBINED

PLANT: Scout 6
OPERATOR: RMX Drilling
LOGGED: HS

METHOD: SFA to 2.5m, then NMLC to 6.5m
CASING: HQ to 2.5m

REMARKS: Surface levels and coordinates are approximate only and must not be relied upon.

BOREHOLE LOG

CLIENT: School Infrastructure NSW
PROJECT: Proposed New Public School
LOCATION: 200 Wellsvale Drive, Googong

SURFACE LEVEL: 752.1 AHD
COORDINATE E:702286 **N:** 6077486
DATUM/GRID: MGA94 Zone 55
DIP/AZIMUTH: 90°/---

LOCATION ID: 203
PROJECT No: 224779.00
DATE: 28/09/23
SHEET: 2 of 2

GROUNDWATER	RL (m)	DEPTH (m)	DESCRIPTION OF STRATA	GRAPHIC	SOIL ORIGIN(#)	SOIL CONSIS.(*) DENSITY.(*)	SOIL MOISTURE	ROCK WEATH.	ROCK DEPTH (m)	ROCK STRENGTH	ROCK RECOVERY (%)	ROCK RQD	ROCK FRACTURE SPACING (m)	DEFECTS & REMARKS	SAMPLE REMARKS	SAMPLE TYPE	SAMPLE INTERVAL	DEPTH (m)	TESTING TEST TYPE	TESTING RESULTS AND REMARKS
	748	4.14	SHALE; yellow brown mottled orange; fine *(continued)*					XW-HW	4.14	VL				4.0m: HB						
			(CL-CI) Silty CLAY, trace sand, trace gravel; orange brown; clay fraction low to medium plasticity; sand fraction fine; gravel fraction fine		XWM	XWR	NDF	XW		SOIL	100	0	SOIL							
		4.5	SHALE; yellow brown mottled orange; fine					XW-HW	4.5	VL				4.5m: DB						
		4.65	(CL-CI) Silty CLAY, trace sand, trace gravel; orange brown; clay fraction low to medium plasticity; sand fraction fine; gravel fraction fine						4.65											
	747	5			XWM	XWR	NDF	XW		SOIL	100	0	SOIL					5		
		5.5	CORE LOSS						5.5					5.5-5.85m: core loss						
		5.85	(CL-CI) Silty CLAY, trace sand, trace gravel; orange brown; clay fraction low to medium plasticity; sand fraction fine; gravel fraction fine		XWM	XWR	NDF	XW	5.85	SOIL			SOIL							
	746	6.0	SHALE; yellow brown mottled orange; fine					XW-HW	6.0	VL	65	0						6		
		6.23	(CL-CI) Silty CLAY, trace sand, trace gravel; orange brown; clay fraction low to medium plasticity; sand fraction fine; gravel fraction fine		XWM	XWR	NDF	XW	6.23	SOIL			SOIL							
		6.5	Borehole discontinued at 6.50m depth Limit of investigation						6.5											
	745	7																7		

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

PLANT: Scout 6
OPERATOR: RMX Drilling
LOGGED: HS

METHOD: SFA to 2.5m, then NMLC to 6.5m
CASING: HQ to 2.5m

REMARKS: Surface levels and coordinates are approximate only and must not be relied upon.

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BOREHOLE LOG

CLIENT: School Infrastructure NSW
PROJECT: Proposed New Public School
LOCATION: 200 Wellsvale Drive, Googong

SURFACE LEVEL: 756.9 AHD
COORDINATE E:702170 **N:** 6077431
DATUM/GRID: MGA94 Zone 55
DIP/AZIMUTH: 90°/---

LOCATION ID: 204
PROJECT No: 224779.00
DATE: 28/09/23
SHEET: 1 of 2

GROUNDWATER	RL (m)	DEPTH (m)	DESCRIPTION OF STRATA	GRAPHIC	SOIL ORIGIN(#)	SOIL CONSIS.(*) DENSITY.(*)	SOIL MOISTURE	ROCK WEATH.	ROCK DEPTH (m)	ROCK STRENGTH	ROCK RECOVERY (%)	ROCK RQD	FRACTURE SPACING (m)	DEFECTS & REMARKS	SAMPLE REMARKS	SAMPLE TYPE	SAMPLE INTERVAL	DEPTH (m)	TEST TYPE	RESULTS AND REMARKS
27/09/23, No free groundwater observed		0.0	TOPSOIL/FILL/ (ML) Sandy Clayey SILT, trace gravel; brown; silt fraction low plasticity; sand fraction fine to coarse; gravel fraction fine to coarse		TOP and FILL	ST	<PL									E		0.1	PID	0.1
						H	<PL									E		0.5	PID	0.2
		0.7	SHALE; orange brown; fine; dry to moist; highly fractured					XW-HW	0.7	VL						A		0.9		
	756	1														E		1.0	PID	0.1
																SPT			SPT	7,15,25/140 refusal
																		1.44		
	755	2														A		1.9		
																E		2.0	PID	0.1
		2.63	(CL-CI) Silty CLAY, trace sand; orange brown; clay fraction low to medium plasticity; sand fraction fine		XWM	XWR	NDF	XW	2.63	SOIL			SOIL			E		2.5	PID	0.1
																SPT		2.62	SPT	25/120 refusal
	754	2.9	SHALE; orange brown; fine; dry to moist; highly fractured						2.9					2.9-2.91m: fragmented						
		3						MW		M	100	34		2.91-3.0m: J 80° PL, SM, CLY CO, FE STN				3		
														75°-80° PL, SM, FE STN						
														3.16m: J 65°-70° PL, RO/VR, FE STN						
														3.16-3.18m: J fragmented						
														3.18m: J 55°-60° PL, UN/SM, FE STN						
														3.25m: J IR, VUN/RO, FE STN						
														3.32m: J 50° PL, SM, CLY/STN						
									3.5					3.43-3.48m: fragmented						
								HW-MW		L-M	68	0		3.57m: J 45° PL/IR, SM, FE STN						
														3.57-3.6m: fragmented						
														3.6m: DB						
	753								3.9					3.6-3.75m: fragmented						
								MW		M				3.81m: J 10°-20° UN, SM/RO, FE STN						

DCP 150 5 10 15 — 17/70mm ref

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

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PLANT: Scout 6
OPERATOR: RMX Drilling
LOGGED: SK/HS

METHOD: SFA to 2.63m, then NMLC to 5.62m
CASING: HQ to 2.63m

REMARKS: Surface levels and coordinates are approximate only and must not be relied upon.

BOREHOLE LOG

CLIENT: School Infrastructure NSW
PROJECT: Proposed New Public School
LOCATION: 200 Wellsvale Drive, Googong

SURFACE LEVEL: 756.9 AHD
COORDINATE E:702170 **N:** 6077431
DATUM/GRID: MGA94 Zone 55
DIP/AZIMUTH: 90°/---

LOCATION ID: 204
PROJECT No: 224779.00
DATE: 28/09/23
SHEET: 2 of 2

CONDITIONS ENCOUNTERED																				SAMPLE				TESTING	
				SOIL			ROCK																		
GROUNDWATER	RL (m)	DEPTH (m)	DESCRIPTION OF STRATA	GRAPHIC	ORIGIN(#)	CONSIS.(*) DENSITY.(*)	MOISTURE	WEATH.	DEPTH (m)	STRENGTH VL L M H VH EH	RECOVERY (%)	RQD	FRACTURE SPACING (m) 0.01 0.05 0.10 0.50 1.00 5.00	DEFECTS & REMARKS	SAMPLE REMARKS	TYPE	INTERVAL	DEPTH (m)	TEST TYPE	RESULTS AND REMARKS
			SHALE; orange brown; fine; dry to moist; highly fractured *(continued)*					MW	4.07	M				3.83m: FCT 43°-H PL, SM, CLY/FE VN/STN						
								HW		VL-L				3.84m: J x2 50°-60° IR, RO, FE STN						
		4.25	CORE LOSS						4.25		68	0		4.0m: HB 4.04m: HB 4.05m: J 40°-45° IR, RO, FE STN 4.13m: J 30°-40° IR/UN, RO, FE STN 4.13-4.25m: fragmented fragmented 4.25-4.63m: core loss						
		4.63	SHALE; orange brown; fine; dry to moist; highly fractured						4.63					4.63m: DB 4.73m: J 30°-45° UN/IR, RO, FE STN						
	752	5						MW		M	100	28		4.93m: J x2 45°-50° SM, CLY INF, FE STN 5.0-5.06m: fragmented 5.06m: J 45°-50° PL, SM, CLY/FE VN/STN 5.17m: J 10°-20° UN, RO, CLY/FE CO/STN 5.3m: FCT 20°-30° UN, RO, FE STN				5		
		5.62	Borehole discontinued at 5.62m depth Limit of investigation						5.62					5.47m: J 60°-70° PL, SM, FE STN 5.62m: J 10°-20° UN/IR, RO, CLY/FE CO/STN						
	751	6																6		
	750	7																7		
	749																			

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

PLANT: Scout 6
OPERATOR: RMX Drilling
LOGGED: SK/HS

METHOD: SFA to 2.63m, then NMLC to 5.62m
CASING: HQ to 2.63m

REMARKS: Surface levels and coordinates are approximate only and must not be relied upon.

EXPORTED 02/11/23 15:36. TEMPLATE ID: DP_103.02.00_COMBINED

BOREHOLE LOG

CLIENT: School Infrastructure NSW
PROJECT: Proposed New Public School
LOCATION: 200 Wellsvale Drive, Googong

SURFACE LEVEL: 753.3 AHD
COORDINATE E:702341 **N:** 6077427
DATUM/GRID: MGA94 Zone 55
DIP/AZIMUTH: 90°/---

LOCATION ID: 205
PROJECT No: 224779.00
DATE: 28/09/23
SHEET: 1 of 2

GROUNDWATER	RL (m)	DEPTH (m)	DESCRIPTION OF STRATA	GRAPHIC	SOIL ORIGIN(#)	SOIL CONSIS.(*) DENSITY.(*)	SOIL MOISTURE	ROCK WEATH.	ROCK DEPTH (m)	ROCK STRENGTH	ROCK RECOVERY (%)	ROCK RQD	FRACTURE SPACING (m)	DEFECTS & REMARKS	SAMPLE REMARKS	SAMPLE TYPE	SAMPLE INTERVAL	SAMPLE DEPTH (m)	TESTING TEST TYPE	TESTING RESULTS AND REMARKS
27/09/23, No free groundwater observed	753	0.0	FILL/ (CL-CI) Silty CLAY, with sand, trace gravel; brown; clay fraction low to medium plasticity; sand fraction fine to coarse; gravel fraction fine to coarse		FILL	VST TO H	<PL									E		0.1	PID	0.1
			0.7m: grey brown													A		0.4		
		1														E		0.5	PID	0.1
		1.1	SHALE; grey; fine; dry to moist; highly fractured					XW-HW	1.1	VL						E		1.0	PID	0.2
	752															SPT			SPT	8,13,16 N=29
																		1.45		
																E		1.5		
		2														A		1.9		
																E		2.0	PID	0.1
	751															E		2.5	PID	0.2
																SPT			SPT	8,15,21 N=36
																		2.95		
		3.0	SHALE; grey; fine					HW	3.0	VL	100	33		3.0-3.02m: CS SEAM; 3.06-3.09m: CS SEAM; 3.09m: J 60°-70° PL, RO; 3.3m: J 80°-85° PL, SM, CLY CO; 3.42m: J 80°-85° IR, SM, CLY VN; 3.5m: J 80°-85° PL, SM, FE STN; 3.58m: J 80°-85° PL, SM; 3.63m: J 80°-85° PL, SM, CLY CO; 3.66m: J 80°-85° PL/IR, SM, CLY INF; 3.73m: J 80°-85° PL, SM; 3.81m: J 80°-85° PL, SM; 3.86m: J 80°-85° PL, SM		E		3.0		
	750																			

DCP/150: 5 10 15

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

EXPORTED 02/11/23 15:36. TEMPLATE ID: DP_103.02.00_COMBINED

PLANT: Scout 6
OPERATOR: RMX Drilling
LOGGED: SK/HS

METHOD: SFA to 3.0m, then NMLC to 5.9m
CASING: HQ to 3.0m

REMARKS: Surface levels and coordinates are approximate only and must not be relied upon.

BOREHOLE LOG

CLIENT: School Infrastructure NSW
PROJECT: Proposed New Public School
LOCATION: 200 Wellsvale Drive, Googong

SURFACE LEVEL: 753.3 AHD
COORDINATE E:702341 **N:** 6077427
DATUM/GRID: MGA94 Zone 55
DIP/AZIMUTH: 90°/---

LOCATION ID: 205
PROJECT No: 224779.00
DATE: 28/09/23
SHEET: 2 of 2

GROUNDWATER	RL (m)	DEPTH (m)	DESCRIPTION OF STRATA	GRAPHIC	SOIL: ORIGIN(#)	SOIL: CONSIS.(*) DENSITY.(*)	SOIL: MOISTURE	ROCK: WEATH.	ROCK: DEPTH (m)	ROCK: STRENGTH	ROCK: RECOVERY (%)	ROCK: RQD	ROCK: FRACTURE SPACING (m)	ROCK: DEFECTS & REMARKS	SAMPLE: SAMPLE REMARKS	SAMPLE: TYPE	SAMPLE: INTERVAL	DEPTH (m)	TESTING: TEST TYPE	TESTING: RESULTS AND REMARKS
	749		SHALE; grey; fine *(continued)*						4.0					4.0m: J x3 80°-80° PL, SM 4.13m: J 50°-60° PL/IR, RO 4.24m: J 50°-60° PL/IR, SM, FE STN 4.31m: J 60°-70° RO/UN, SM, FE STN 4.33m: J 70°-75° PL, SM, FE STN 4.38m: J 70°-75° IR, SM, FE 4.46m: J 70°-75° IR, RO, CLY VN 4.52m: J 70°-80° IR/UN, SM/RO, FE STN fragmented 4.75m: J 70°-80° IR/PL, SM/RO, FE STN 4.8m: DB 4.9m: J 40°-45° PL/IR, SM/RO, FE STN 5.0m: HB					
								HW-MW		L	100	16								
	748	5							4.8					5.18m: HB				5		
								HW		H	100	75		5.34m: J 30°-40° IR, RO, FE STN 5.37m: J 75°-80° IR, RO, FE STN 5.63m: FCT 40°-80° IR, RO, FE STN						
		5.9	Borehole discontinued at 5.90m depth						5.9					5.9m: J 45°-50° IR, RO, FE STN						
		6	Limit of investigation															6		
	747																			
		7																7		
	746																			

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

PLANT: Scout 6
OPERATOR: RMX Drilling
LOGGED: SK/HS

METHOD: SFA to 3.0m, then NMLC to 5.9m
CASING: HQ to 3.0m

REMARKS: Surface levels and coordinates are approximate only and must not be relied upon.

EXPORTED 02/11/23 15:36. TEMPLATE ID: DP_103.02.00_COMBINED

BOREHOLE LOG

CLIENT: School Infrastructure NSW
PROJECT: Proposed New Public School
LOCATION: 200 Wellsvale Drive, Googong

SURFACE LEVEL: 760.2 AHD
COORDINATE E:702169 **N:** 6077353
DATUM/GRID: MGA94 Zone 55
DIP/AZIMUTH: 90°/---

LOCATION ID: 206
PROJECT No: 224779.00
DATE: 29/09/23
SHEET: 1 of 2

GROUNDWATER	RL (m)	DEPTH (m)	DESCRIPTION OF STRATA	GRAPHIC	SOIL ORIGIN(#)	SOIL CONSIS.(*) DENSITY.(*)	SOIL MOISTURE	ROCK WEATH.	ROCK DEPTH (m)	ROCK STRENGTH	RECOVERY (%)	RQD	FRACTURE SPACING (m)	DEFECTS & REMARKS	SAMPLE REMARKS	SAMPLE TYPE	SAMPLE INTERVAL	DEPTH (m)	TESTING TEST TYPE	TESTING RESULTS AND REMARKS
27/09/23, No free groundwater observed	760	0.0	TOPSOIL/FILL/ (ML) Clayey SILT, with sand, trace gravel; pale grey brown; gravel fraction fine to coarse; sand fraction fine to coarse		TOP and FILL	NA	<PL									E		0.1	PID	0.1
		0.3	SHALE; grey brown mottled yellow; fine; highly fractured; dry to moist					XW-HW	0.3	VL						A		0.4		
																E		0.5	PID	0.1
																SPT			SPT	8,13,24 N=37
	759	1																0.95		
																E		1.0	PID	0.1
																A		1.4		
																E		1.5	PID	0.3
	758	2														E		2.0	PID	0.1
																SPT		2.07	SPT	25/70 refusal
																A		2.4		
									2.5					SEAM	2.5-2.52m: CS	E		2.5	PID	0.2
															2.63m: J 70° PL, SM, CLY/FE INF/STN					
								HW		L-M	100	0		SEAM	2.71m: J 60° PL/IR, RO, FE STN					
															2.8-2.83m: CS					
															2.83-2.88m: fragmented					
		3							3.01						2.88m: J 70°-80° PL, SM, CLY/FE INF/STN			3		
										VL-L					3.0m: J x2 10°-75° PL, SM/RO, CLY/FE CO/STN					
		3.1	CORE LOSS						3.1						2.49-3.56m: fragmented					
	757														3.1m: DB					
															3.1-3.35m: KL fragmented					
		3.35	SHALE; grey brown mottled yellow; fine; dry to moist						3.35											
															3.46m: J CU, RO, FE STN					
											79	0			3.49m: J 60° PL, SM, FE STN					
															3.56m: J 50°-60° PL, RO, CLY/FE CO/STN					
								HW		VL-L					3.65m: J 15°-20° PL/IR, RO, FE STN					
															3.73-3.8m: fragmented					
														SEAM	3.8-3.9m: extremely weathered material					

DCP/150 ▶ 5 10 15 — 0.1 — 20/100mm

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

EXPORTED 02/11/23 15:36. TEMPLATE ID: DP_103.02.00_COMBINED

PLANT: Scout 6
METHOD: SFA to 2.5m, then NMLC to 5.7m
REMARKS: Surface levels and coordinates are approximate only and must not be relied upon.

OPERATOR: RMX drilling
CASING: HQ to 2.5m

LOGGED: HS

BOREHOLE LOG

CLIENT: School Infrastructure NSW
PROJECT: Proposed New Public School
LOCATION: 200 Wellsvale Drive, Googong

SURFACE LEVEL: 760.2 AHD
COORDINATE E:702169 **N:** 6077353
DATUM/GRID: MGA94 Zone 55
DIP/AZIMUTH: 90°/---

LOCATION ID: 206
PROJECT No: 224779.00
DATE: 29/09/23
SHEET: 2 of 2

GROUNDWATER	RL (m)	DEPTH (m)	DESCRIPTION OF STRATA	GRAPHIC	SOIL: ORIGIN(#)	SOIL: CONSIS.(*) DENSITY.(*)	SOIL: MOISTURE	ROCK: WEATH.	ROCK: DEPTH (m)	ROCK: STRENGTH (VL L M H VH EH)	ROCK: RECOVERY (%)	ROCK: RQD	ROCK: FRACTURE SPACING (m) (0.01 0.05 0.1 0.3 0.5 1.00 5.00)	ROCK: DEFECTS & REMARKS	SAMPLE: SAMPLE REMARKS	SAMPLE: TYPE	SAMPLE: INTERVAL	DEPTH (m)	TESTING: TEST TYPE	TESTING: RESULTS AND REMARKS
	756	5	SHALE; grey brown mottled yellow; fine; dry to moist *(continued)*					HW	4.3	VL-L	79	0		3.9-4.0m: fragmented 4.0m: J 70°-80° PL, RO, CLY/FE INF/STN 4.1m: J 70°-80° PL, SM, FE STN 4.1-4.13m: fragmented 4.13m: J 70°-80° PL, RO, FE STN 4.19m: J 70°-80° PL, SM, FE/CLY STN/CO 4.3m: DB fragmented 4.52-4.53m: CS 4.6m: J 60°-65° PL, SM, FE STN				5		
								SW		L-M										
	755								4.9		100	25		4.71m: J 70°-80° PL, RO, FE STN 4.77m: J 45°-55° PL/UN, RO, FE STN						
								HW		VL				4.9-5.3m: fragmented						
									5.3					5.3m: DB						
								SW		H	100	100		5.59m: J 45°-50° PL, RO, FE STN						
			5.7 Borehole discontinued at 5.70m depth Limit of investigation						5.7											
	754	6																6		
	753	7																7		

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

PLANT: Scout 6
OPERATOR: RMX drilling
LOGGED: HS

METHOD: SFA to 2.5m, then NMLC to 5.7m
CASING: HQ to 2.5m

REMARKS: Surface levels and coordinates are approximate only and must not be relied upon.

EXPORTED 02/11/23 15:36. TEMPLATE ID: DP_103.02.00_COMBINED

TEST PIT LOG

CLIENT: School Infrastructure NSW
PROJECT: Proposed New Public School
LOCATION: 200 Wellsvale Drive, Googong

SURFACE LEVEL: 755 AHD
COORDINATE E:702173 **N:** 6077548
DATUM/GRID: MGA94 Zone 55

LOCATION ID: 207
PROJECT No: 224779.00
DATE: 26/09/23
SHEET: 1 of 1

GROUNDWATER	RL (m)	DEPTH (m)	DESCRIPTION OF STRATA	GRAPHIC	SOIL ORIGIN(#)	SOIL CONSIS.(*) DENSITY.(*)	SOIL MOISTURE	ROCK WEATH.	ROCK DEPTH (m)	ROCK STRENGTH	ROCK RECOVERY (%)	ROCK RQD	ROCK FRACTURE SPACING (m)	ROCK DEFECTS & REMARKS	SAMPLE REMARKS	SAMPLE TYPE	SAMPLE INTERVAL	DEPTH (m)	TESTING TEST TYPE	TESTING RESULTS AND REMARKS
26/09/23, No free groundwater observed		0.0	FILL/ (ML) Sandy SILT, trace gravel; pale grey brown; gravel fraction fine to medium; trace rootlets, regrade		FILL	NA	<PL													
		0.1	(CL-Cl) Sandy Gravelly CLAY, with silt; pale yellow brown; sand fraction fine to coarse; gravel fraction fine to coarse		XWM	H	<PL to =PL									E	0.1	0.1	PID	0.9
		0.2	Test pit discontinued at 0.20m depth Limit of investigation													E	0.2	0.2	PID	0.6
	754	1																1	DCP/150	5/40mm ref

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

PLANT: Hand Tools
OPERATOR: Douglas Partners
LOGGED: HS

METHOD: Hand Tools

REMARKS: Surface levels and coordinates are approximate only and must not be relied upon.

EXPORTED 02/11/23 15:42. TEMPLATE ID: DP_103.02.00_COMBINED

TEST PIT LOG

CLIENT: School Infrastructure NSW
PROJECT: Proposed New Public School
LOCATION: 200 Wellsvale Drive, Googong

SURFACE LEVEL: 751.8 AHD
COORDINATE E:702255 **N:** 6077547
DATUM/GRID: MGA94 Zone 55

LOCATION ID: 208
PROJECT No: 224779.00
DATE: 26/09/23
SHEET: 1 of 1

CONDITIONS ENCOUNTERED																		SAMPLE				TESTING	
				SOIL			ROCK																
GROUNDWATER	RL (m)	DEPTH (m)	DESCRIPTION OF STRATA	GRAPHIC	ORIGIN(#)	CONSIS.(*) DENSITY.(*)	MOISTURE	WEATH.	DEPTH (m)	STRENGTH VL L M H VH EH	RECOVERY (%)	RQD	FRACTURE SPACING (m) 0.01 0.05 0.10 0.50 1.00 5.00	DEFECTS & REMARKS	SAMPLE REMARKS	TYPE	INTERVAL	DEPTH (m)	TEST TYPE	RESULTS AND REMARKS
26/09/23, No free groundwater observed		0.0	FILL/ (Cl) Gravelly Silty CLAY, with sand; brown; clay fraction medium plasticity; sand fraction fine to coarse		FILL	NA	<PL									E		0.1		
		0.2	Test pit discontinued at 0.20m depth Limit of investigation													E		0.2	PID	1.2
	751																		DCP/150	5 10 15
		1																1		
	750																			

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

PLANT: Hand Tools
OPERATOR: Douglas Partners
LOGGED: HS

METHOD: Hand Tools

REMARKS: Surface levels and coordinates are approximate only and must not be relied upon.

EXPORTED 02/11/23 15:42. TEMPLATE ID: DP_103.02.00_COMBINED

TEST PIT LOG

CLIENT: School Infrastructure NSW
PROJECT: Proposed New Public School
LOCATION: 200 Wellsvale Drive, Googong

SURFACE LEVEL: 755.4 AHD
COORDINATE E:702173 **N:** 6077505
DATUM/GRID: MGA94 Zone 55

LOCATION ID: 209
PROJECT No: 224779.00
DATE: 26/09/23
SHEET: 1 of 1

GROUNDWATER	RL (m)	DEPTH (m)	DESCRIPTION OF STRATA	GRAPHIC	SOIL ORIGIN(#)	SOIL CONSIS.(*) DENSITY.(*)	SOIL MOISTURE	ROCK WEATH.	ROCK DEPTH (m)	ROCK STRENGTH	ROCK RECOVERY (%)	ROCK RQD	ROCK FRACTURE SPACING (m)	ROCK DEFECTS & REMARKS	SAMPLE REMARKS	SAMPLE TYPE	SAMPLE INTERVAL	SAMPLE DEPTH (m)	TESTING TEST TYPE	TESTING RESULTS AND REMARKS
26/09/23, No free groundwater observed	755	0.0	FILL/ (ML) Sandy SILT, trace gravel; grey brown; silt fraction low plasticity; sand fraction fine to coarse; gravel fraction fine to coarse; cemented sand		FILL	NA	<PL												DCP/150	16/50mm ref
		0.1	(SC) Clayey Silty SAND, with gravel; pale brown; sand fraction fine to coarse; gravel fraction fine to coarse		ALV	D	D to M									E		0.15	PID	0.5
		0.2	Test pit discontinued at 0.20m depth Limit of investigation																	
	754	1																1		

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

PLANT: Hand Tools
METHOD: Hand Tools
OPERATOR: Douglas Partners
LOGGED: HS

REMARKS: Surface levels and coordinates are approximate only and must not be relied upon.

TEST PIT LOG

CLIENT: School Infrastructure NSW
PROJECT: Proposed New Public School
LOCATION: 200 Wellsvale Drive, Googong

SURFACE LEVEL: 752.7 AHD
COORDINATE E:702251 **N:** 6077496
DATUM/GRID: MGA94 Zone 55

LOCATION ID: 210
PROJECT No: 224779.00
DATE: 26/09/23
SHEET: 1 of 1

CONDITIONS ENCOUNTERED																				SAMPLE				TESTING	
					SOIL			ROCK																		
GROUNDWATER	RL (m)	DEPTH (m)	DESCRIPTION OF STRATA	GRAPHIC	ORIGIN(#)	CONSIS.(*) DENSITY.(*)	MOISTURE	WEATH.	DEPTH (m)	STRENGTH VL L M H VH EH	RECOVERY (%)	RQD	FRACTURE SPACING (m) 0.01 0.05 0.10 0.50 1.00 5.00	DEFECTS & REMARKS	SAMPLE REMARKS	TYPE	INTERVAL	DEPTH (m)	TEST TYPE	RESULTS AND REMARKS
26/09/23, No free groundwater observed		0.0	FILL/ (ML) Sandy SILT, trace gravel; pale grey brown; silt fraction low plasticity; sand fraction fine to coarse; gravel fraction fine to medium		FILL	NA	<PL														
		0.1	(CI-CH) Silty CLAY, with gravel, trace sand; yellow brown mottled orange; clay fraction medium to high plasticity; gravel fraction fine to coarse; sand fraction fine to coarse; trace rootlets		XWM	ST TO VST	<PL to =PL										E	0.1	PID	0.2
		0.2	Test pit discontinued at 0.20m depth Limit of investigation														E	0.2	PID	0.9
	752																		DCP/150	5 10 15
	751	1																1		

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

PLANT: Hand Tools
METHOD: Hand Tools
OPERATOR: Douglas Partners
LOGGED: HS

REMARKS: Surface levels and coordinates are approximate only and must not be relied upon.

EXPORTED 02/11/23 15:42. TEMPLATE ID: DP_103.02.00_COMBINED

TEST PIT LOG

CLIENT: School Infrastructure NSW
PROJECT: Proposed New Public School
LOCATION: 200 Wellsvale Drive, Googong

SURFACE LEVEL: 755 AHD
COORDINATE E:702212 **N:** 6077452
DATUM/GRID: MGA94 Zone 55

LOCATION ID: 211
PROJECT No: 224779.00
DATE: 26/09/23
SHEET: 1 of 1

CONDITIONS ENCOUNTERED																		SAMPLE				TESTING	
				SOIL			ROCK																
GROUNDWATER	RL (m)	DEPTH (m)	DESCRIPTION OF STRATA	GRAPHIC	ORIGIN(#)	CONSIS.(*) DENSITY.(*)	MOISTURE	WEATH.	DEPTH (m)	STRENGTH VL L M H VH EH	RECOVERY (%)	RQD	FRACTURE SPACING (m) 0.01 0.05 0.10 0.50 1.00 5.00	DEFECTS & REMARKS	SAMPLE REMARKS	TYPE	INTERVAL	DEPTH (m)	TEST TYPE	RESULTS AND REMARKS
26/09/23, No free groundwater observed		0.0	FILL/ (CL) Silty Sandy CLAY, trace gravel; pale brown; clay fraction low plasticity; sand fraction fine to coarse; gravel fraction fine to coarse; trace rootlets		FILL	NA	<PL									E	0.15	PID	0.5	DCP/150 5 10 15 25ref
		0.2	Test pit discontinued at 0.20m depth Limit of investigation																		
	754	1																1			

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

PLANT: Hand Tools
METHOD: Hand Tools
OPERATOR: Douglas Partners
LOGGED: HS

REMARKS: Surface levels and coordinates are approximate only and must not be relied upon.

EXPORTED 02/11/23 15:42. TEMPLATE ID: DP_103.02.00_COMBINED

TEST PIT LOG

CLIENT: School Infrastructure NSW
PROJECT: Proposed New Public School
LOCATION: 200 Wellsvale Drive, Googong

SURFACE LEVEL: 754.7 AHD
COORDINATE E:702312 **N:** 6077384
DATUM/GRID: MGA94 Zone 55

LOCATION ID: 212
PROJECT No: 224779.00
DATE: 26/09/23
SHEET: 1 of 1

GROUNDWATER	RL (m)	DEPTH (m)	DESCRIPTION OF STRATA	GRAPHIC	SOIL ORIGIN(#)	SOIL CONSIS.(*) DENSITY.(*)	SOIL MOISTURE	ROCK WEATH.	ROCK DEPTH (m)	ROCK STRENGTH	ROCK RECOVERY (%)	ROCK RQD	ROCK FRACTURE SPACING (m)	ROCK DEFECTS & REMARKS	SAMPLE REMARKS	SAMPLE TYPE	SAMPLE INTERVAL	DEPTH (m)	TESTING TEST TYPE	TESTING RESULTS AND REMARKS
26/09/23, No free groundwater observed		0.0	FILL/ (ML) Sandy SILT, trace gravel; grey brown; silt fraction low plasticity; sand fraction fine to coarse; gravel fraction fine to coarse		FILL	NA	<PL													
		0.1	(CL) Sandy Gravelly CLAY; yellow brown mottled orange mottled grey; clay fraction low plasticity; sand fraction fine to coarse; gravel fraction fine to coarse		XWM	VST	<PL									E		0.1		
		0.2	Test pit discontinued at 0.20m depth Limit of investigation												R2	E		0.2	PID	0.4
	754																		DCP/150	5 10 15
	753	1																1		

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

PLANT: Hand Tools
OPERATOR: Douglas Partners
LOGGED: HS

METHOD: Hand Tools

REMARKS: Surface levels and coordinates are approximate only and must not be relied upon.

EXPORTED 02/11/23 15:42. TEMPLATE ID: DP_103.02.00_COMBINED

TEST PIT LOG

CLIENT: School Infrastructure NSW
PROJECT: Proposed New Public School
LOCATION: 200 Wellsvale Drive, Googong

SURFACE LEVEL: 758.7 AHD
COORDINATE **E:**702212 **N:** 6077328
DATUM/GRID: MGA94 Zone 55

LOCATION ID: 213
PROJECT No: 224779.00
DATE: 26/09/23
SHEET: 1 of 1

CONDITIONS ENCOUNTERED																			SAMPLE				TESTING	
				SOIL			ROCK																	
GROUNDWATER	RL (m)	DEPTH (m)	DESCRIPTION OF STRATA	GRAPHIC	ORIGIN(#)	CONSIS.(*) DENSITY.(*)	MOISTURE	WEATH.	DEPTH (m)	STRENGTH VL L M H VH EH	RECOVERY (%)	RQD	FRACTURE SPACING (m) 0.01 0.05 0.10 0.50 1.00 5.00	DEFECTS & REMARKS	SAMPLE REMARKS	TYPE	INTERVAL	DEPTH (m)	TEST TYPE	RESULTS AND REMARKS
observed		0.0	FILL/ (ML) Clayey SILT, with sand; grey brown; silt fraction low plasticity; sand fraction fine to coarse		FILL	NA	<PL									E		0.1	PID	1.4
		0.1	Test pit discontinued at 0.10m depth Limit of investigation																				DCP/150	5 10 15
26/09/23, No free groundwater	758	1																1						
	757																							

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

PLANT: Hand Tools
OPERATOR: Douglas Partners
LOGGED: HS

METHOD: Hand Tools

REMARKS: Surface levels and coordinates are approximate only and must not be relied upon.

EXPORTED 02/11/23 15:42. TEMPLATE ID: DP_103.02.00_COMBINED

TEST PIT LOG

CLIENT: School Infrastructure NSW
PROJECT: Proposed New Public School
LOCATION: 200 Wellsvale Drive, Googong

SURFACE LEVEL: 756.3 AHD
COORDINATE E:702365 **N:** 6077331
DATUM/GRID: MGA94 Zone 55

LOCATION ID: 221
PROJECT No: 224779.00
DATE: 08/11/23
SHEET: 1 of 1

CONDITIONS ENCOUNTERED								SAMPLE				TESTING AND REMARKS	
GROUNDWATER	RL (m)	DEPTH (m)	DESCRIPTION OF STRATA	GRAPHIC	ORIGIN(#)	CONSIS.(*) DENSITY.(*)	MOISTURE	REMARKS	TYPE	INTERVAL	DEPTH (m)	TEST TYPE	RESULTS AND REMARKS
08/11/23, No free groundwater observed	756	0.0	FILL/ (ML) Sandy SILT, with gravel; grey brown; silt fraction low plasticity; sand fraction fine to coarse; gravel fraction fine to coarse; trace cobbles, regrade FILL		FILL	NA	<PL	PID<1	E	0.1 0.2	0.1 0.2		
		0.3	Test pit discontinued at 0.30m depth Possible refusal on cobbles										
	755	1									1		
	754	2									2		
	753	3									3		

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

PLANT: Hand Tools
METHOD: Hand tools
OPERATOR: Douglas Partners Pty Ltd
LOGGED: HS

REMARKS: Surface levels and coordinates are approximate only and must not be relied upon.

EXPORTED 23/11/23 12:05. TEMPLATE ID: DP_101.02.00_SOILLOG

TEST PIT LOG

CLIENT: School Infrastructure NSW
PROJECT: Proposed New Public School
LOCATION: 200 Wellsvale Drive, Googong

SURFACE LEVEL: 756.5 AHD
COORDINATE E:702319.6 **N:** 6077341.8
DATUM/GRID: MGA94 Zone 55

LOCATION ID: 222
PROJECT No: 224779.00
DATE: 08/11/23
SHEET: 1 of 1

CONDITIONS ENCOUNTERED									SAMPLE				TESTING AND REMARKS	
GROUNDWATER	RL (m)	DEPTH (m)	DESCRIPTION OF STRATA	GRAPHIC	ORIGIN(#)	CONSIS.(*) DENSITY.(*)	MOISTURE	REMARKS	TYPE	INTERVAL	DEPTH (m)	TEST TYPE	RESULTS AND REMARKS
observed		0.0	FILL/ (ML) Clayey SILT, trace gravel, trace sand; grey brown; silt fraction low plasticity; gravel fraction fine to coarse; sand fraction fine to medium; regrade FILL		FILL	NA	<PL	PID<1	E		0.05		
		0.1			XWM	MD TO D	D to M				0.1		
08/11/23, No free groundwater		0.2	(SM) Silty Gravelly SAND, trace clay; yellow brown mottled white; sand fraction fine to coarse; gravel fraction fine to coarse										
	756		Test pit discontinued at 0.20m depth Limit of investigation										
	755	1									1		
	754	2									2		
	753	3									3		

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

PLANT: Hand Tools
OPERATOR: Douglas Partners Pty Ltd
LOGGED: HS
METHOD: Hand tools
REMARKS: Surface levels and coordinates are approximate only and must not be relied upon.

EXPORTED 23/11/23 12:05. TEMPLATE ID: DP_101.02.00_SOILLOG

TEST PIT LOG

CLIENT: School Infrastructure NSW
PROJECT: Proposed New Public School
LOCATION: 200 Wellsvale Drive, Googong

SURFACE LEVEL: 755.2 AHD
COORDINATE E:702354.6 **N:** 6077399.5
DATUM/GRID: MGA94 Zone 55

LOCATION ID: 223
PROJECT No: 224779.00
DATE: 08/11/23
SHEET: 1 of 1

CONDITIONS ENCOUNTERED								SAMPLE				TESTING AND REMARKS	
GROUNDWATER	RL (m) / DEPTH (m)	DESCRIPTION OF STRATA	GRAPHIC	ORIGIN(#)	CONSIS.(*) / DENSITY.(*)	MOISTURE	REMARKS	TYPE	INTERVAL	DEPTH (m)	TEST TYPE	RESULTS AND REMARKS
08/11/23, No free groundwater observed	755 / 0.0	FILL/ (CL) Sandy SILT, trace gravel; grey brown; silt fraction low plasticity; sand fraction fine to coarse; gravel fraction fine to coarse; regrade FILL		FILL	NA	<PL	R2 PID<1	E		0.1		
	0.1			XWM	(VST)	<PL to =PL				0.2		
	0.25	(CL) Sandy CLAY, with gravel; yellow brown mottled white; clay fraction low plasticity; sand fraction fine to coarse; gravel fraction fine to coarse										
	1 / 754	Test pit discontinued at 0.25m depth Limit of investigation								1		
	2 / 753									2		
	3 / 752									3		

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

PLANT: Hand Tools
OPERATOR: Douglas Partners Pty Ltd
LOGGED: HS

METHOD: Hand tools

REMARKS: Surface levels and coordinates are approximate only and must not be relied upon.

EXPORTED 23/11/23 12:05. TEMPLATE ID: DP_101.02.00_SOILLOG

TEST PIT LOG

CLIENT: School Infrastructure NSW
PROJECT: Proposed New Public School
LOCATION: 200 Wellsvale Drive, Googong

SURFACE LEVEL: 756.7 AHD
COORDINATE E:702252.7 **N:** 6077383.4
DATUM/GRID: MGA94 Zone 55

LOCATION ID: 224
PROJECT No: 224779.00
DATE: 08/11/23
SHEET: 1 of 1

CONDITIONS ENCOUNTERED									SAMPLE				TESTING AND REMARKS	
GROUNDWATER	RL (m)	DEPTH (m)	DESCRIPTION OF STRATA	GRAPHIC	ORIGIN(#)	CONSIS.(*) DENSITY.(*)	MOISTURE	REMARKS	TYPE	INTERVAL	DEPTH (m)	TEST TYPE	RESULTS AND REMARKS
08/11/23, No free groundwater observed	756	0.0 0.1	FILL/ (ML) Sandy SILT, trace gravel, trace clay; grey brown; silt fraction low plasticity; sand fraction fine to coarse; gravel fraction fine to coarse; regrade FILL		FILL RES becoming XWM	NA (VST TO H)	<PL <PL to =PL	PID<1	E	0.05 0.1	0.05 0.1		
		0.25	(CL-CI) Silty CLAY, trace gravel; orange brown; clay fraction low to medium plasticity; gravel fraction fine to coarse										
			Test pit discontinued at 0.25m depth Limit of investigation										
	755	1									1		
	754	2									2		
	753	3									3		

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

PLANT: Hand Tools
OPERATOR: Douglas Partners Pty Ltd
LOGGED: HS
METHOD: Hand tools
REMARKS: Surface levels and coordinates are approximate only and must not be relied upon.

EXPORTED 23/11/23 12:05. TEMPLATE ID: DP_101.02.00_SOILLOG

TEST PIT LOG

CLIENT: School Infrastructure NSW
PROJECT: Proposed New Public School
LOCATION: 200 Wellsvale Drive, Googong

SURFACE LEVEL: 753 AHD
COORDINATE E:702299.2 **N:** 6077431.2
DATUM/GRID: MGA94 Zone 55

LOCATION ID: 225
PROJECT No: 224779.00
DATE: 08/11/23
SHEET: 1 of 1

CONDITIONS ENCOUNTERED								SAMPLE				TESTING AND REMARKS	
GROUNDWATER	RL (m)	DEPTH (m)	DESCRIPTION OF STRATA	GRAPHIC	ORIGIN(#)	CONSIS.(*) DENSITY.(*)	MOISTURE	REMARKS	TYPE	INTERVAL	DEPTH (m)	TEST TYPE	RESULTS AND REMARKS
08/11/23, No free groundwater observed		0.0	FILL/ (ML) Sandy Clayey SILT, trace gravel; grey brown; silt fraction low plasticity; sand fraction fine to medium; gravel fraction fine to coarse; with rootlets, regrade FILL		FILL	NA	<PL						
		0.1			RES	(VST TO H)	<PL to =PL	PID<1	E		0.2		
		0.3	(CL-CI) Silty CLAY, trace gravel; orange brown mottled yellow; clay fraction low to medium plasticity; gravel fraction fine								0.3		
			Test pit discontinued at 0.30m depth Limit of investigation										
	752	1									1		
	751	2									2		
	750	3									3		

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

PLANT: Hand Tools
OPERATOR: Douglas Partners Pty Ltd
LOGGED: HS

METHOD: Hand tools

REMARKS: Surface levels and coordinates are approximate only and must not be relied upon.

EXPORTED 23/11/23 12:05. TEMPLATE ID: DP_101.02.00_SOILLOG

Appendix I

Summary of Results Tables

Douglas PARTNERS | GROUNDED EXPERTISE

Table I1: Summary of Laboratory Results – Metals, TRH, BTEX and PAH

				Metals									TRH						BTEX				PAH			
				Arsenic	Cadmium	Total Chromium	Copper	Lead	Mercury (inorganic)	Nickel	Zinc	Manganese	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	1	25	50	25	50	100	100	0.2	0.5	1	1	0.1	0.05	0.5	0.05
Sample ID	Depth	Sample Type	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
201	0.1 m	Fill	27/09/23	100	0.6	31	100	370	<0.1	21	230	1500	<25	<50	<25	<50	<100	<100	<0.2	<0.5	<1	<1	<0.1	<0.05	<0.5	<0.05
				300 50	90 -	300 180	17000 110	600 270	80 -	1200 80	30000 240	19000 -	- -	- 120	40 180	230 -	- 130	- 560	0.6 65	390 105	NL 125	95 45	4 170	- 0.7	3 -	300 -
201 - [TRIPLICATE]	0.1 m	Fill	27/09/23	67	0.5	32	37	150	<0.1	14	200	1100	-	-	-	-	-	-	-	-	-	-	-	-	-	-
				300 50	90 -	300 180	17000 110	600 270	80 -	1200 80	30000 240	19000 -	- -	- 120	50 180	280 -	- 130	- 560	0.7 65	480 105	NL 125	110 45	5 170	- 0.7	3 -	300 -
201	0.5 m	Natural	27/09/23	57	<0.4	26	45	35	<0.1	12	200	100	<25	<50	<25	<50	<100	<100	<0.2	<0.5	<1	<1	<0.1	<0.05	<0.5	<0.05
				300 50	90 -	300 180	17000 110	600 270	80 -	1200 80	30000 240	19000 -	- -	- 120	50 180	280 -	- 130	- 560	0.7 65	480 105	NL 125	110 45	5 170	- 0.7	3 -	300 -
202	0.1 m	Fill	27/09/23	59	0.8	38	28	120	<0.1	18	180	1100	<25	<50	<25	<50	<100	<100	<0.2	<0.5	<1	<1	<0.1	<0.05	<0.5	<0.05
				300 50	90 -	300 180	17000 110	600 270	80 -	1200 80	30000 240	19000 -	- -	- 120	50 180	280 -	- 130	- 560	0.7 65	480 105	NL 125	110 45	5 170	- 0.7	3 -	300 -
202	1 m	Natural	27/09/23	27	0.4	35	46	53	<0.1	27	340	73	<25	<50	<25	<50	<100	<100	<0.2	<0.5	<1	<1	<0.1	<0.05	<0.5	<0.05
				300 50	90 -	300 180	17000 110	600 270	80 -	1200 80	30000 240	19000 -	- -	- 120	70 180	240 -	- 300	- 280	0.5 50	220 85	NL 70	60 105	NL 170	- 0.7	3 -	300 -
203	0.1 m	Fill	28/09/23	53	<0.4	35	27	100	<0.1	15	100	3300	<25	<50	<25	<50	<100	<100	<0.2	<0.5	<1	<1	<0.1	<0.05	<0.5	<0.05
				300 50	90 -	300 180	17000 110	600 270	80 -	1200 80	30000 240	19000 -	- -	- 120	50 180	280 -	- 130	- 560	0.7 65	480 105	NL 125	110 45	5 170	- 0.7	3 -	300 -
203	1 m	Fill	28/09/23	16	<0.4	23	91	130	<0.1	69	230	6000	<25	<50	<25	<50	<100	<100	<0.2	<0.5	<1	<1	<0.1	<0.05	<0.5	<0.05
				300 50	90 -	300 180	17000 110	600 270	80 -	1200 80	30000 240	19000 -	- -	- 120	90 180	NL -	- 130	- 560	1 65	NL 105	NL 125	310 45	NL 170	- 0.7	3 -	300 -
204	0.1 m	Fill	28/09/23	30	0.6	29	33	140	0.2	21	120	790	<25	<50	<25	<50	<100	<100	<0.2	<0.5	<1	<1	<0.1	<0.05	<0.5	<0.05
				300 50	90 -	300 180	17000 110	600 270	80 -	1200 80	30000 240	19000 -	- -	- 120	40 180	230 -	- 130	- 560	0.6 65	390 105	NL 125	95 45	4 170	- 0.7	3 -	300 -
205	0.1 m	Fill	28/09/23	19	<0.4	28	28	38	<0.1	19	80	380	<25	<50	<25	<50	<100	<100	<0.2	<0.5	<1	<1	<0.1	<0.05	<0.5	<0.05
				300 50	90 -	300 180	17000 110	600 270	80 -	1200 80	30000 240	19000 -	- -	- 120	50 180	280 -	- 130	- 560	0.7 65	480 105	NL 125	110 45	5 170	- 0.7	3 -	300 -
205	0.5 m	Fill	28/09/23	17	<0.4	37	31	13	<0.1	21	48	300	<25	<50	<25	<50	<100	<100	<0.2	<0.5	<1	<1	<0.1	<0.05	<0.5	<0.05
				300 50	90 -	300 180	17000 110	600 270	80 -	1200 80	30000 240	19000 -	- -	- 120	50 180	280 -	- 130	- 560	0.7 65	480 105	NL 125	110 45	5 170	- 0.7	3 -	300 -
206	0.1 m	Fill	29/09/23	97	<0.4	28	110	94	<0.1	13	180	550	<25	<50	<25	<50	<100	<100	<0.2	<0.5	<1	<1	<0.1	<0.05	<0.5	<0.05
				300 50	90 -	300 180	17000 110	600 270	80 -	1200 80	30000 240	19000 -	- -	- 120	40 180	230 -	- 130	- 560	0.6 65	390 105	NL 125	95 45	4 170	- 0.7	3 -	300 -
206	0.5 m	Natural	29/09/23	180	<0.4	45	100	100	<0.1	21	490	420	<25	<50	<25	<50	<100	<100	<0.2	<0.5	<1	<1	<0.1	<0.05	<0.5	<0.05
				300 50	90 -	300 180	17000 110	600 270	80 -	1200 80	30000 240	19000 -	- -	- 120	45 180	110 -	- 300	- 280	0.5 50	160 85	55 70	40 105	3 170	- 0.7	3 -	300 -
207	0.1 m	Fill	26/09/23	66	0.8	33	33	86	<0.1	22	170	1500	<25	<50	<25	<50	<100	<100	<0.2	<0.5	<1	<1	<0.1	<0.05	<0.5	<0.05
				300 50	90 -	300 180	17000 110	600 270	80 -	1200 80	30000 240	19000 -	- -	- 120	40 180	230 -	- 130	- 560	0.6 65	390 105	NL 125	95 45	4 170	- 0.7	3 -	300 -
207	0.2 m	Natural	26/09/23	32	<0.4	38	14	14	<0.1	18	42	350	<25	<50	<25	<50	<100	<100	<0.2	<0.5	<1	<1	<0.1	<0.05	<0.5	<0.05
				300 50	90 -	300 180	17000 110	600 270	80 -	1200 80	30000 240	19000 -	- -	- 120	50 180	280 -	- 130	- 560	0.7 65	480 105	NL 125	110 45	5 170	- 0.7	3 -	300 -
208	0.1 m	Fill	26/09/23	92	2	26	57	160	<0.1	23	290	2100	<25	<50	<25	<50	<100	<100	<0.2	<0.5	<1	<1	<0.1	<0.05	<0.5	<0.05
				300 50	90 -	300 180	17000 110	600 270	80 -	1200 80	30000 240	19000 -	- -	- 120	50 180	280 -	- 130	- 560	0.7 65	480 105	NL 125	110 45	5 170	- 0.7	3 -	300 -
209	0.15 m	Natural	26/09/23	50	1	19	18	66	<0.1	11	220	1200	<25	<50	<25	<50	<100	<100	<0.2	<0.5	<1	<1	<0.1	<0.05	<0.5	<0.05
				300 50	90 -	300 180	17000 110	600 270	80 -	1200 80	30000 240	19000 -	- -	- 120	45 180	110 -	- 300	- 280	0.5 50	160 85	55 70	40 105	3 170	- 0.7	3 -	300 -
210	0.1 m	Fill	26/09/23	19	<0.4	24	22	66	<0.1	15	56	550	<25	<50	<25	<50	<100	<100	<0.2	<0.5	<1	<1	<0.1	<0.05	<0.5	<0.05
				300 50	90 -	300 180	17000 110	600 270	80 -	1200 80	30000 240	19000 -	- -	- 120	40 180	230 -	- 130	- 560	0.6 65	390 105	NL 125	95 45	4 170	- 0.7	3 -	300 -
210	0.2 m	Natural	26/09/23	12	<0.4	50	24	47	<0.1	18	54	840	<25	<50	<25	<50	<100	<100	<0.2	<0.5	<1	<1	<0.1	<0.05	<0.5	<0.05
				300 50	90 -	300 180	17000 110	600 270	80 -	1200 80	30000 240	19000 -	- -	- 120	50 180	280 -	- 130	- 560	0.7 65	480 105	NL 125	110 45	5 170	- 0.7	3 -	300 -
211	0.15 m	Fill	26/09/23	27	<0.4	29	8	52	<0.1	10	44	450	<25	<50	<25	<50	<100	<100	<0.2	<0.5	<1	<1	<0.1	<0.05	<0.5	<0.05
				300 50	90 -	300 180	17000 110	600 270	80 -	1200 80	30000 240	19000 -	- -	- 120	50 180	280 -	- 130	- 560	0.7 65	480 105	NL 125	110 45	5 170	- 0.7	3 -	300 -
212	0.1 m	Fill	26/09/23	14	<0.4	32	15	19	<0.1	15	50	430	<25	<50	<25	<50	<100	<100	<0.2	<0.5	<1	<1	<0.1	<0.05	<0.5	<0.05
				300 50	90 -	300 180	17000 110	600 270	80 -	1200 80	30000 240	19000 -	- -	- 120	40 180	230 -	- 130	- 560	0.6 65	390 105	NL 125	95 45	4 170	- 0.7	3 -	300 -
212	0.2 m	Natural	26/09/23	16	<0.4	45	48	7	<0.1	21	41	230	<25	<50	<25	<50	<100	<100	<0.2	<0.5	<1	<1	<0.1	<0.05	<0.5	<0.05
				300 50	90 -	300 180	17000 110	600 270	80 -	1200 80	30000 240	19000 -	- -	- 120	50 180	280 -	- 130	- 560	0.7 65	480 105	NL 125	110 45	5 170	- 0.7	3 -	300 -
R2	0.2 m	Natural	26/09/23	15	<0.4	39	38	6	<0.1	18	35	200	<25	<50	<25	<50	<100	<100	<0.2	<0.5	<1	<1	<1	-	-	-
				300 50	90 -	300 180	17000 110	600 270	80 -	1200 80	30000 240	19000 -	- -	- 120	50 180	280 -	- 130	- 560	0.7 65	480 105	NL 125	110 45	5 170	- 0.7	3 -	300 -
213	0.1 m	Fill	26/09/23	26	<0.4	29	28	24	<0.1	18	53	520	<25	<50	<25	<50	<100	<100	<0.2	<0.5	<1	<1	<0.1	<0.05	<0.5	<0.05
				300 50	90 -	300 180	17000 110	600 270	80 -	1200 80	30000 240	19000 -	- -	- 120	40 180	230 -	- 130	- 560	0.6 65	390 105	NL 125	95 45	4 170	- 0.7	3 -	300 -
221	0.1 - 0.2 m	Fill	08/11/23	12	<0.4	18	19	30	<0.1	13	66	530	<25	<50	<25	<50	<100	<100	<0.2	<0.5	<1	<1	<0.1	<0.05	<0.5	<0.05
				300 50	90 -	300 180	17000 110	600 270	80 -	1200 80	30000 240	19000 -	- -	- 120	40 180	230 -	- 130	- 560	0.6 65	390 105	NL 125	95 45	4 170	- 0.7	3 -	300 -
222	0.05 - 0.1 m	Fill	08/11/23	27	<0.4	25	24	53	<0.1	14	110	630	<25	<50	<25	<50	<100	<100	<0.2	<0.5	<1	<1	<0.1	<0.05	<0.5	<0.05
				300 50	90 -	300 180	17000 110	600 270	80 -	1200 80	30000 240	19000 -	- -	- 120	40 180	230 -	- 130	- 560	0.6 65	390 105	NL 125	95 45	4 170	- 0.7	3 -	300 -
223	0.1 - 0.2 m	Natural	08/11/23	20	<0.4	27	61	40	<0.1	14	73	400	<25	<50	<25	<50	<100	<100	<0.2	<0.5	<1	<1	<0.1	<0.05	<0.5	<0.05
				300 50	90 -	300 180	17000 110	600 270	80 -	1200 80	30000 240	19000 -	- -	- 120	50 180	280 -	- 130	- 560	0.7 65	480 105	NL 125	110 45	5 170	- 0.7	3 -	300 -
224	0.05 - 0.1 m	Fill	08/11/23	76	0.7	35	33	210	<0.1	13	230	2100	<25	<50	<25	<50	<100	<100	<0.2	<0.5	<1	<1	<0.1	<0.05	<0.5	<0.05
				300 50	90 -	300 180	17000 110	600 270	80 -	1200 80	30000 240	19000 -	- -	- 120	40 180	230 -	- 130	- 560	0.6 65	390 105	NL 125	95 45	4 170	- 0.7	3 -	300 -
225	0.2 - 0.3 m	Natural	08/11/23	23	<0.4	32	19	75	<0.1	16	110	2000	<25	<50	<25	<50	<100	<100	<0.2	<0.5	<1	<1	<0.1	<0.05	<0.5	<0.05
				300 50	90 -	300 180	17000 110	600 270	80 -	1200 80	30000 240	19000 -	- -	- 120	50 180	280 -	- 130	- 560	0.7 65	480 105	NL 125	110 45	5 170	- 0.7	3 -	300 -

Lab result
HIL/HSL value EIL/ESL value

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

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

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

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

Notes:

a QA/QC replicate of sample listed directly below the primary sample
b Reported naphthalene laboratory result obtained from BTEXN suite
c EIL 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:

HIL C	Public open space such as parks, playgrounds, playing fields, secondary schools and footpaths (NEPC, 2013)
HSL A/B	Residential / Low - High Density (vapour intrusion) (NEPC, 2013)
DC HSL A	Direct contact HSL A Residential (Low density) (direct contact) (CRC CARE, 2011)
EIL/ESL UR/POS	Urban Residential and Public Open Space (NEPC, 2013)
ML R/P/POS	Residential, Parkland and Public Open Space (NEPC, 2013)

Table I2: Summary of Laboratory Results – Phenols, OCP, OPP, PCB and Asbestos

				Phenols	OCP									OPP	PCB	Asbestos	
				Total Phenols	DDT+DDE+DDD [c]	Aldrin & Dieldrin	Total Chlordane	Endrin	Total Endosulfan	Heptachlor	Hexachlorobenzene	Methoxychlor	Chlorpyriphos	Total PCB	Trace Analysis	Asbestos ID
			PQL	5	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0	0
Sample ID	Depth	Material Type	Sample Date	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	-	-
201	0.1 m	Fill	27/09/23	<5	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	NAD	NAD
				120 -	400 180	10 -	70 -	20 -	340 -	10 -	10 -	400 -	250 -	1 -		
201 - [TRIPLICATE]	0.1 m	Fill	27/09/23	-	-	-	-	-	-	-	-	-	-	-	NT	NT
				120 -	400 180	10 -	70 -	20 -	340 -	10 -	10 -	400 -	250 -	1 -		
201	0.5 m	Natural	27/09/23	-	-	-	-	-	-	-	-	-	-	-	NT	NT
				120 -	400 180	10 -	70 -	20 -	340 -	10 -	10 -	400 -	250 -	1 -		
202	0.1 m	Fill	27/09/23	<5	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	NAD	NAD
				120 -	400 180	10 -	70 -	20 -	340 -	10 -	10 -	400 -	250 -	1 -		
202	1 m	Natural	27/09/23	-	-	-	-	-	-	-	-	-	-	-	NT	NT
				120 -	400 180	10 -	70 -	20 -	340 -	10 -	10 -	400 -	250 -	1 -		
203	0.1 m	Fill	28/09/23	<5	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	NAD	NAD
				120 -	400 180	10 -	70 -	20 -	340 -	10 -	10 -	400 -	250 -	1 -		
203	1 m	Fill	28/09/23	-	-	-	-	-	-	-	-	-	-	-	NT	NT
				120 -	400 180	10 -	70 -	20 -	340 -	10 -	10 -	400 -	250 -	1 -		
204	0.1 m	Fill	28/09/23	<5	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	NAD	NAD
				120 -	400 180	10 -	70 -	20 -	340 -	10 -	10 -	400 -	250 -	1 -		
205	0.1 m	Fill	28/09/23	<5	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	NAD	NAD
				120 -	400 180	10 -	70 -	20 -	340 -	10 -	10 -	400 -	250 -	1 -		
205	0.5 m	Fill	28/09/23	-	-	-	-	-	-	-	-	-	-	-	NT	NT
				120 -	400 180	10 -	70 -	20 -	340 -	10 -	10 -	400 -	250 -	1 -		
206	0.1 m	Fill	29/09/23	<5	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	NAD	NAD
				120 -	400 180	10 -	70 -	20 -	340 -	10 -	10 -	400 -	250 -	1 -		
206	0.5 m	Natural	29/09/23	-	-	-	-	-	-	-	-	-	-	-	NT	NT
				120 -	400 180	10 -	70 -	20 -	340 -	10 -	10 -	400 -	250 -	1 -		
207	0.1 m	Fill	26/09/23	<5	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	NAD	NAD
				120 -	400 180	10 -	70 -	20 -	340 -	10 -	10 -	400 -	250 -	1 -		
207	0.2 m	Natural	26/09/23	-	-	-	-	-	-	-	-	-	-	-	NT	NT
				120 -	400 180	10 -	70 -	20 -	340 -	10 -	10 -	400 -	250 -	1 -		
208	0.1 m	Fill	26/09/23	<5	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	NAD	NAD
				120 -	400 180	10 -	70 -	20 -	340 -	10 -	10 -	400 -	250 -	1 -		
209	0.15 m	Natural	26/09/23	-	-	-	-	-	-	-	-	-	-	-	NT	NT
				120 -	400 180	10 -	70 -	20 -	340 -	10 -	10 -	400 -	250 -	1 -		
210	0.1 m	Fill	26/09/23	<5	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	NAD	NAD
				120 -	400 180	10 -	70 -	20 -	340 -	10 -	10 -	400 -	250 -	1 -		
210	0.2 m	Natural	26/09/23	-	-	-	-	-	-	-	-	-	-	-	NT	NT
				120 -	400 180	10 -	70 -	20 -	340 -	10 -	10 -	400 -	250 -	1 -		
211	0.15 m	Fill	26/09/23	<5	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	NAD	NAD
				120 -	400 180	10 -	70 -	20 -	340 -	10 -	10 -	400 -	250 -	1 -		
212	0.1 m	Fill	26/09/23	<5	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	NAD	NAD
				120 -	400 180	10 -	70 -	20 -	340 -	10 -	10 -	400 -	250 -	1 -		
212	0.2 m	Natural	26/09/23	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT
				120 -	400 180	10 -	70 -	20 -	340 -	10 -	10 -	400 -	250 -	1 -		
R2	0 m	Natural	26/09/23	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT
				120 -	400 180	10 -	70 -	20 -	340 -	10 -	10 -	400 -	250 -	1 -		
213	0.1 m	Fill	26/09/23	<5	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	NAD	NAD
				120 -	400 180	10 -	70 -	20 -	340 -	10 -	10 -	400 -	250 -	1 -		
221	0.1 - 0.2 m	Fill	08/11/23	<5	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	NAD	NAD
				120 -	400 180	10 -	70 -	20 -	340 -	10 -	10 -	400 -	250 -	1 -		
222	0.05 - 0.1 m	Fill	08/11/23	<5	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	NAD	NAD
				120 -	400 180	10 -	70 -	20 -	340 -	10 -	10 -	400 -	250 -	1 -		
223	0.1 - 0.2 m	Natural	08/11/23	-	-	-	-	-	-	-	-	-	-	-	NT	NT
				120 -	400 180	10 -	70 -	20 -	340 -	10 -	10 -	400 -	250 -	1 -		
224	0.05 - 0.1 m	Fill	08/11/23	<5	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	NAD	NAD
				120 -	400 180	10 -	70 -	20 -	340 -	10 -	10 -	400 -	250 -	1 -		
225	0.2 - 0.3 m	Natural	08/11/23	-	-	-	-	-	-	-	-	-	-	-	NT	NT
				120 -	400 180	10 -	70 -	20 -	340 -	10 -	10 -	400 -	250 -	1 -		

Lab result
HIL/HSL value EIL/ESL value

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

Indicates that asbestos has been detected by the lab, refer to the lab report **Blue** = DC exceedance HSL 0-<1 Excee
Bold = Lab detections - = Not tested or No HIL/HSL/EIL/ESL (as applicable) or Not applicable NL = Non limiting AD
HIL = Health investigation level HSL = Health screening level (excluding DC) EIL = Ecological investigation level ESL

Notes:

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

b Reported naphthalene laboratory result obtained from BTEXN suite

c EIL 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:

HIL C	Public open space such as parks, playgrounds, playing fields, secondary schools and footpaths (NEPC, 2013)
HSL A/B	Residential / Low - High Density (vapour intrusion) (NEPC, 2013)
DC HSL A	Direct contact HSL A Residential (Low density) (direct contact) (CRC CARE, 2011)
EIL/ESL UR/POS	Urban Residential and Public Open Space (NEPC, 2013)
ML R/P/POS	Residential, Parkland and Public Open Space (NEPC, 2013)

Douglas PARTNERS | GROUNDED EXPERTISE

Table I3: Summary of Laboratory Results for Prelimary Waste Classication – Metals, TRH, BTEX, PAH, Phenol, OCP, OPP, PCB and Asbestos

			Metals									TRH					BTEX				PAH		Phenol	OCP		OPP	PCB	Asbestos		
			Arsenic	Cadmium	Total Chromium	Copper	Lead	Mercury (inorganic)	Nickel	Zinc	Manganese	TRH C6 - C9	TRH C10 - C14	TRH C15 - C28	TRH C29 - C36	C10-C36 recoverable hydrocarbons	Benzene	Toluene	Ethylbenzene	Xylenes (total)	Benzo(a)pyrene (BaP)	Total PAHs	Phenol	Total Endosulfan	Total Analysed OCP	Total Analysed OPP	Total PCB	Asbestos Comment	Asbestos ID in materials	Total Asbestos
		PQL	4	0.4	1	1	1	0.1	1	1	1	25	50	100	100	50	0.2	0.5	1	1	0.05	0.05	5	0.1	0.1	0.1	0.1	0	0	0
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	-	-	-
201	0.1 m	27/09/23	100	0.6	31	100	370	<0.1	21	230	1500	<25	<50	<100	<100	<50	<0.2	<0.5	<1	<1	<0.05	<0.05	<5	<0.1	<0.1	<0.1	<0.1	NAD	NAD	NAD
201 - [TRIPLICATE]	0.1 m	27/09/23	67	0.5	32	37	150	<0.1	14	200	1100	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
201	0.5 m	27/09/23	57	<0.4	26	45	35	<0.1	12	200	100	<25	<50	<100	<100	<50	<0.2	<0.5	<1	<1	<0.05	<0.05	-	-	-	-	-	-	-	-
202	0.1 m	27/09/23	59	0.8	38	28	120	<0.1	18	180	1100	<25	<50	<100	<100	<50	<0.2	<0.5	<1	<1	<0.05	<0.05	<5	<0.1	<0.1	<0.1	<0.1	NAD	NAD	NAD
202	1 m	27/09/23	27	0.4	35	46	53	<0.1	27	340	73	<25	<50	<100	<100	<50	<0.2	<0.5	<1	<1	<0.05	<0.05	-	-	-	-	-	-	-	-
203	0.1 m	28/09/23	53	<0.4	35	27	100	<0.1	15	100	3300	<25	<50	<100	<100	<50	<0.2	<0.5	<1	<1	<0.05	<0.05	<5	<0.1	<0.1	<0.1	<0.1	NAD	NAD	NAD
203	1 m	28/09/23	16	<0.4	23	91	130	<0.1	69	230	6000	<25	<50	<100	<100	<50	<0.2	<0.5	<1	<1	<0.05	<0.05	-	-	-	-	-	-	-	-
204	0.1 m	28/09/23	30	0.6	29	33	140	0.2	21	120	790	<25	<50	<100	<100	<50	<0.2	<0.5	<1	<1	<0.05	<0.05	<5	<0.1	<0.1	<0.1	<0.1	NAD	NAD	NAD
205	0.1 m	28/09/23	19	<0.4	28	28	38	<0.1	19	80	380	<25	<50	<100	<100	<50	<0.2	<0.5	<1	<1	<0.05	<0.05	<5	<0.1	<0.1	<0.1	<0.1	NAD	NAD	NAD
205	0.5 m	28/09/23	17	<0.4	37	31	13	<0.1	21	48	300	<25	<50	<100	<100	<50	<0.2	<0.5	<1	<1	<0.05	<0.05	-	-	-	-	-	-	-	-
206	0.1 m	29/09/23	97	<0.4	28	110	94	<0.1	13	180	550	<25	<50	<100	<100	<50	<0.2	<0.5	<1	<1	<0.05	<0.05	<5	<0.1	<0.1	<0.1	<0.1	NAD	NAD	NAD
206	0.5 m	29/09/23	180	<0.4	45	100	100	<0.1	21	490	420	<25	<50	<100	<100	<50	<0.2	<0.5	<1	<1	<0.05	<0.05	-	-	-	-	-	-	-	-
207	0.1 m	26/09/23	66	0.8	33	33	86	<0.1	22	170	1500	<25	<50	<100	<100	<50	<0.2	<0.5	<1	<1	<0.05	<0.05	<5	<0.1	<0.1	<0.1	<0.1	NAD	NAD	NAD
207	0.2 m	26/09/23	32	<0.4	38	14	14	<0.1	18	42	350	<25	<50	<100	<100	<50	<0.2	<0.5	<1	<1	<0.05	<0.05	-	-	-	-	-	-	-	-
208	0.1 m	26/09/23	92	2	26	57	160	<0.1	23	290	2100	<25	<50	<100	<100	<50	<0.2	<0.5	<1	<1	<0.05	<0.05	<5	<0.1	<0.1	<0.1	<0.1	NAD	NAD	NAD
209	0.15 m	26/09/23	50	1	19	18	66	<0.1	11	220	1200	<25	<50	<100	<100	<50	<0.2	<0.5	<1	<1	<0.05	<0.05	-	-	-	-	-	-	-	-
210	0.1 m	26/09/23	19	<0.4	24	22	66	<0.1	15	56	550	<25	<50	<100	<100	<50	<0.2	<0.5	<1	<1	<0.05	<0.05	<5	<0.1	<0.1	<0.1	<0.1	NAD	NAD	NAD
210	0.2 m	26/09/23	12	<0.4	50	24	47	<0.1	18	54	840	<25	<50	<100	<100	<50	<0.2	<0.5	<1	<1	<0.05	<0.05	-	-	-	-	-	-	-	-
211	0.15 m	26/09/23	27	<0.4	29	8	52	<0.1	10	44	450	<25	<50	<100	<100	<50	<0.2	<0.5	<1	<1	<0.05	<0.05	<5	<0.1	<0.1	<0.1	<0.1	NAD	NAD	NAD
212	0.1 m	26/09/23	14	<0.4	32	15	19	<0.1	15	50	430	<25	<50	<100	<100	<50	<0.2	<0.5	<1	<1	<0.05	<0.05	<5	<0.1	<0.1	<0.1	<0.1	NAD	NAD	NAD
212	0.2 m	26/09/23	16	<0.4	45	48	7	<0.1	21	41	230	<25	<50	<100	<100	<50	<0.2	<0.5	<1	<1	<0.05	<0.05	-	-	-	-	-	-	-	-
R2	0.2 m	26/09/23	15	<0.4	39	38	6	<0.1	18	35	200	<25	<50	<100	<100	<50	<0.2	<0.5	<1	<1	-	-	-	-	-	-	-	-	-	-
213	0.1 m	26/09/23	26	<0.4	29	28	24	<0.1	18	53	520	<25	<50	<100	<100	<50	<0.2	<0.5	<1	<1	<0.05	<0.05	<5	<0.1	<0.1	<0.1	<0.1	NAD	NAD	NAD
221	0.1 - 0.2 m	08/11/23	12	<0.4	18	19	30	<0.1	13	66	530	<25	<50	<100	<100	<50	<0.2	<0.5	<1	<1	<0.05	<0.05	<5	<0.1	<0.1	<0.1	<0.1	-	-	-
222	0.05 - 0.1 m	08/11/23	27	<0.4	25	24	53	<0.1	14	110	630	<25	<50	<100	<100	<50	<0.2	<0.5	<1	<1	<0.05	<0.05	<5	<0.1	<0.1	<0.1	<0.1	-	-	-
223	0.1 - 0.2 m	08/11/23	20	<0.4	27	61	40	<0.1	14	73	400	<25	<50	<100	<100	<50	<0.2	<0.5	<1	<1	<0.05	<0.05	<5	<0.1	<0.1	<0.1	<0.1	NAD	NAD	NAD
224	0.05 - 0.1 m	08/11/23	76	0.7	35	33	210	<0.1	13	230	2100	<25	<50	<100	<100	<50	<0.2	<0.5	<1	<1	<0.05	<0.05	<5	<0.1	<0.1	<0.1	<0.1	-	-	-
225	0.2 - 0.3 m	08/11/23	23	<0.4	32	19	75	<0.1	16	110	2000	<25	<50	<100	<100	<50	<0.2	<0.5	<1	<1	<0.05	<0.05	<5	<0.1	<0.1	<0.1	<0.1	NAD	NAD	NAD
Waste Classification Criteria [f]																														
CT1			100	20	100	NC	100	4	40	NC	NC	650	NC	NC	NC	10000	10	288	600	1000	0.8	200	288	60	<50	4	<50	NC	NC	NC
SCC1			500	100	1900	NC	1500	50	1050	NC	NC	650	NC	NC	NC	10000	18	518	1080	1800	10	200	518	108	<50	7.5	<50	NC	NC	NC
TCLP1			N/A	N/A	N/A	NC	N/A	N/A	N/A	NC	NC	N/A	NC	NC	NC	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	NC	NC	NC
CT2			400	80	400	NC	400	16	160	NC	NC	2600	NC	NC	NC	40000	40	1152	2400	4000	3.2	800	1152	240	<50	16	<50	NC	NC	NC
SCC2			2000	400	7600	NC	6000	200	4200	NC	NC	2600	NC	NC	NC	40000	72	2073	4320	7200	23	800	2073	432	<50	30	<50	NC	NC	NC
TCLP2			N/A	N/A	N/A	NC	N/A	N/A	N/A	NC	NC	N/A	NC	NC	NC	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	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 J

Chain of Custody, Laboratory Sample Receipt Advice and Certificates of Analysis

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

CERTIFICATE OF ANALYSIS 335052

Client Details

Client	Douglas Partners Canberra
Attention	Kenton Horsley
Address	Unit 2, 73 Sheppard St,, HUME, ACT, 2620

Sample Details

Your Reference	**224779.00, Googong**
Number of Samples	51 Soil
Date samples received	11/10/2023
Date completed instructions received	13/10/2023

Analysis Details

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

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

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

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

Report Details

Date results requested by	20/10/2023
Date of Issue	20/10/2023

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

Results Approved By
Diego Bigolin, Inorganics Supervisor
Dragana Tomas, Senior Chemist
Hannah Nguyen, Metals Supervisor
Liam Timmins, Organics Supervisor
Nyovan Moonean, Asbestos Approved Identifier/Counter
Tim Toll, Chemist (FAS)

Authorised By
Nancy Zhang, Laboratory Manager

vTRH(C6-C10)/BTEXN in Soil						
Our Reference		335052-1	335052-2	335052-6	335052-8	335052-12
Your Reference	UNITS	201	201	202	202	203
Depth		0.1	0.5	0.1	1	0.1
Date Sampled		27/09/2023	27/09/2023	27/09/2023	27/09/2023	28/09/2023
Type of sample		Soil	Soil	Soil	Soil	Soil
Date extracted	-	16/10/2023	16/10/2023	16/10/2023	16/10/2023	16/10/2023
Date analysed	-	17/10/2023	17/10/2023	17/10/2023	17/10/2023	17/10/2023
TRH C_6 - C_9	mg/kg	<25	<25	<25	<25	<25
TRH C_6 - C_{10}	mg/kg	<25	<25	<25	<25	<25
vTPH C_6 - C_{10} less BTEX (F1)	mg/kg	<25	<25	<25	<25	<25
Benzene	mg/kg	<0.2	<0.2	<0.2	<0.2	<0.2
Toluene	mg/kg	<0.5	<0.5	<0.5	<0.5	<0.5
Ethylbenzene	mg/kg	<1	<1	<1	<1	<1
m+p-xylene	mg/kg	<2	<2	<2	<2	<2
o-Xylene	mg/kg	<1	<1	<1	<1	<1
Naphthalene	mg/kg	<1	<1	<1	<1	<1
Total +ve Xylenes	mg/kg	<1	<1	<1	<1	<1
Surrogate aaa-Trifluorotoluene	%	95	91	95	99	96

vTRH(C6-C10)/BTEXN in Soil						
Our Reference		335052-14	335052-18	335052-24	335052-25	335052-31
Your Reference	UNITS	203	204	205	205	206
Depth		1	0.1	0.1	0.5	0.1
Date Sampled		28/09/2023	28/09/2023	28/09/2023	28/09/2023	29/09/2023
Type of sample		Soil	Soil	Soil	Soil	Soil
Date extracted	-	16/10/2023	16/10/2023	16/10/2023	16/10/2023	16/10/2023
Date analysed	-	17/10/2023	17/10/2023	17/10/2023	17/10/2023	17/10/2023
TRH C_6 - C_9	mg/kg	<25	<25	<25	<25	<25
TRH C_6 - C_{10}	mg/kg	<25	<25	<25	<25	<25
vTPH C_6 - C_{10} less BTEX (F1)	mg/kg	<25	<25	<25	<25	<25
Benzene	mg/kg	<0.2	<0.2	<0.2	<0.2	<0.2
Toluene	mg/kg	<0.5	<0.5	<0.5	<0.5	<0.5
Ethylbenzene	mg/kg	<1	<1	<1	<1	<1
m+p-xylene	mg/kg	<2	<2	<2	<2	<2
o-Xylene	mg/kg	<1	<1	<1	<1	<1
Naphthalene	mg/kg	<1	<1	<1	<1	<1
Total +ve Xylenes	mg/kg	<1	<1	<1	<1	<1
Surrogate aaa-Trifluorotoluene	%	91	96	99	97	98

vTRH(C6-C10)/BTEXN in Soil						
Our Reference		335052-32	335052-37	335052-38	335052-39	335052-40
Your Reference	UNITS	206	207	207	208	209
Depth		0.5	0.1	0.2	0.1	0.15
Date Sampled		29/09/2023	26/09/2023	26/09/2023	26/09/2023	26/09/2023
Type of sample		Soil	Soil	Soil	Soil	Soil
Date extracted	-	16/10/2023	16/10/2023	16/10/2023	16/10/2023	16/10/2023
Date analysed	-	17/10/2023	17/10/2023	17/10/2023	17/10/2023	17/10/2023
TRH C_6 - C_9	mg/kg	<25	<25	<25	<25	<25
TRH C_6 - C_{10}	mg/kg	<25	<25	<25	<25	<25
vTPH C_6 - C_{10} less BTEX (F1)	mg/kg	<25	<25	<25	<25	<25
Benzene	mg/kg	<0.2	<0.2	<0.2	<0.2	<0.2
Toluene	mg/kg	<0.5	<0.5	<0.5	<0.5	<0.5
Ethylbenzene	mg/kg	<1	<1	<1	<1	<1
m+p-xylene	mg/kg	<2	<2	<2	<2	<2
o-Xylene	mg/kg	<1	<1	<1	<1	<1
Naphthalene	mg/kg	<1	<1	<1	<1	<1
Total +ve Xylenes	mg/kg	<1	<1	<1	<1	<1
Surrogate aaa-Trifluorotoluene	%	103	97	98	98	96

vTRH(C6-C10)/BTEXN in Soil						
Our Reference		335052-41	335052-42	335052-43	335052-44	335052-45
Your Reference	UNITS	210	210	211	212	212
Depth		0.1	0.2	0.15	0.1	0.2
Date Sampled		26/09/2023	26/09/2023	26/09/2023	26/09/2023	26/09/2023
Type of sample		Soil	Soil	Soil	Soil	Soil
Date extracted	-	16/10/2023	16/10/2023	16/10/2023	16/10/2023	16/10/2023
Date analysed	-	17/10/2023	17/10/2023	18/10/2023	18/10/2023	18/10/2023
TRH C_6 - C_9	mg/kg	<25	<25	<25	<25	<25
TRH C_6 - C_{10}	mg/kg	<25	<25	<25	<25	<25
vTPH C_6 - C_{10} less BTEX (F1)	mg/kg	<25	<25	<25	<25	<25
Benzene	mg/kg	<0.2	<0.2	<0.2	<0.2	<0.2
Toluene	mg/kg	<0.5	<0.5	<0.5	<0.5	<0.5
Ethylbenzene	mg/kg	<1	<1	<1	<1	<1
m+p-xylene	mg/kg	<2	<2	<2	<2	<2
o-Xylene	mg/kg	<1	<1	<1	<1	<1
Naphthalene	mg/kg	<1	<1	<1	<1	<1
Total +ve Xylenes	mg/kg	<1	<1	<1	<1	<1
Surrogate aaa-Trifluorotoluene	%	97	99	102	94	100

vTRH(C6-C10)/BTEXN in Soil						
Our Reference		335052-46	335052-47	335052-48	335052-49	335052-50
Your Reference	UNITS	213	214	215	216	R1
Depth		0.1	0.2	0.2	0.1	-
Date Sampled		26/09/2023	26/09/2023	26/09/2023	26/09/2023	26/09/2023
Type of sample		Soil	Soil	Soil	Soil	Soil
Date extracted	-	16/10/2023	16/10/2023	16/10/2023	16/10/2023	16/10/2023
Date analysed	-	18/10/2023	18/10/2023	18/10/2023	18/10/2023	18/10/2023
TRH C_6 - C_9	mg/kg	<25	<25	<25	<25	<25
TRH C_6 - C_{10}	mg/kg	<25	<25	<25	<25	<25
vTPH C_6 - C_{10} less BTEX (F1)	mg/kg	<25	<25	<25	<25	<25
Benzene	mg/kg	<0.2	<0.2	<0.2	<0.2	<0.2
Toluene	mg/kg	<0.5	<0.5	<0.5	<0.5	<0.5
Ethylbenzene	mg/kg	<1	<1	<1	<1	<1
m+p-xylene	mg/kg	<2	<2	<2	<2	<2
o-Xylene	mg/kg	<1	<1	<1	<1	<1
Naphthalene	mg/kg	<1	<1	<1	<1	<1
Total +ve Xylenes	mg/kg	<1	<1	<1	<1	<1
Surrogate aaa-Trifluorotoluene	%	95	95	101	106	107

vTRH(C6-C10)/BTEXN in Soil		
Our Reference		335052-51
Your Reference	UNITS	R2
Depth		-
Date Sampled		26/09/2023
Type of sample		Soil
Date extracted	-	16/10/2023
Date analysed	-	18/10/2023
TRH C_6 - C_9	mg/kg	<25
TRH C_6 - C_{10}	mg/kg	<25
vTPH C_6 - C_{10} less BTEX (F1)	mg/kg	<25
Benzene	mg/kg	<0.2
Toluene	mg/kg	<0.5
Ethylbenzene	mg/kg	<1
m+p-xylene	mg/kg	<2
o-Xylene	mg/kg	<1
Naphthalene	mg/kg	<1
Total +ve Xylenes	mg/kg	<1
Surrogate aaa-Trifluorotoluene	%	110

svTRH (C10-C40) in Soil						
Our Reference		335052-1	335052-2	335052-6	335052-8	335052-12
Your Reference	UNITS	201	201	202	202	203
Depth		0.1	0.5	0.1	1	0.1
Date Sampled		27/09/2023	27/09/2023	27/09/2023	27/09/2023	28/09/2023
Type of sample		Soil	Soil	Soil	Soil	Soil
Date extracted	-	16/10/2023	16/10/2023	16/10/2023	16/10/2023	16/10/2023
Date analysed	-	17/10/2023	17/10/2023	17/10/2023	17/10/2023	17/10/2023
TRH C_{10} - C_{14}	mg/kg	<50	<50	<50	<50	<50
TRH C_{15} - C_{28}	mg/kg	<100	<100	<100	<100	<100
TRH C_{29} - C_{36}	mg/kg	<100	<100	<100	<100	<100
Total +ve TRH (C10-C36)	mg/kg	<50	<50	<50	<50	<50
TRH >C_{10} -C_{16}	mg/kg	<50	<50	<50	<50	<50
TRH >C_{10} - C_{16} less Naphthalene (F2)	mg/kg	<50	<50	<50	<50	<50
TRH >C_{16} -C_{34}	mg/kg	<100	<100	<100	<100	<100
TRH >C_{34} -C_{40}	mg/kg	<100	<100	<100	<100	<100
Total +ve TRH (>C10-C40)	mg/kg	<50	<50	<50	<50	<50
Surrogate o-Terphenyl	%	95	95	93	97	92

svTRH (C10-C40) in Soil						
Our Reference		335052-14	335052-18	335052-24	335052-25	335052-31
Your Reference	UNITS	203	204	205	205	206
Depth		1	0.1	0.1	0.5	0.1
Date Sampled		28/09/2023	28/09/2023	28/09/2023	28/09/2023	29/09/2023
Type of sample		Soil	Soil	Soil	Soil	Soil
Date extracted	-	16/10/2023	16/10/2023	16/10/2023	16/10/2023	16/10/2023
Date analysed	-	17/10/2023	17/10/2023	17/10/2023	17/10/2023	17/10/2023
TRH C_{10} - C_{14}	mg/kg	<50	<50	<50	<50	<50
TRH C_{15} - C_{28}	mg/kg	<100	<100	<100	<100	<100
TRH C_{29} - C_{36}	mg/kg	<100	<100	<100	<100	<100
Total +ve TRH (C10-C36)	mg/kg	<50	<50	<50	<50	<50
TRH >C_{10} -C_{16}	mg/kg	<50	<50	<50	<50	<50
TRH >C_{10} - C_{16} less Naphthalene (F2)	mg/kg	<50	<50	<50	<50	<50
TRH >C_{16} -C_{34}	mg/kg	<100	<100	<100	<100	<100
TRH >C_{34} -C_{40}	mg/kg	<100	<100	<100	<100	<100
Total +ve TRH (>C10-C40)	mg/kg	<50	<50	<50	<50	<50
Surrogate o-Terphenyl	%	92	92	92	94	95

svTRH (C10-C40) in Soil						
Our Reference		335052-32	335052-37	335052-38	335052-39	335052-40
Your Reference	UNITS	206	207	207	208	209
Depth		0.5	0.1	0.2	0.1	0.15
Date Sampled		29/09/2023	26/09/2023	26/09/2023	26/09/2023	26/09/2023
Type of sample		Soil	Soil	Soil	Soil	Soil
Date extracted	-	16/10/2023	16/10/2023	16/10/2023	16/10/2023	16/10/2023
Date analysed	-	17/10/2023	17/10/2023	17/10/2023	17/10/2023	18/10/2023
TRH C_{10} - C_{14}	mg/kg	<50	<50	<50	<50	<50
TRH C_{15} - C_{28}	mg/kg	<100	<100	<100	<100	<100
TRH C_{29} - C_{36}	mg/kg	<100	<100	<100	<100	<100
Total +ve TRH (C10-C36)	mg/kg	<50	<50	<50	<50	<50
TRH >C_{10} -C_{16}	mg/kg	<50	<50	<50	<50	<50
TRH >C_{10} - C_{16} less Naphthalene (F2)	mg/kg	<50	<50	<50	<50	<50
TRH >C_{16} -C_{34}	mg/kg	<100	<100	<100	<100	<100
TRH >C_{34} -C_{40}	mg/kg	<100	<100	<100	<100	<100
Total +ve TRH (>C10-C40)	mg/kg	<50	<50	<50	<50	<50
Surrogate o-Terphenyl	%	95	91	92	94	94

svTRH (C10-C40) in Soil						
Our Reference		335052-41	335052-42	335052-43	335052-44	335052-45
Your Reference	UNITS	210	210	211	212	212
Depth		0.1	0.2	0.15	0.1	0.2
Date Sampled		26/09/2023	26/09/2023	26/09/2023	26/09/2023	26/09/2023
Type of sample		Soil	Soil	Soil	Soil	Soil
Date extracted	-	16/10/2023	16/10/2023	16/10/2023	16/10/2023	16/10/2023
Date analysed	-	18/10/2023	18/10/2023	18/10/2023	18/10/2023	18/10/2023
TRH C_{10} - C_{14}	mg/kg	<50	<50	<50	<50	<50
TRH C_{15} - C_{28}	mg/kg	<100	<100	<100	<100	<100
TRH C_{29} - C_{36}	mg/kg	<100	<100	<100	<100	<100
Total +ve TRH (C10-C36)	mg/kg	<50	<50	<50	<50	<50
TRH >C_{10} -C_{16}	mg/kg	<50	<50	<50	<50	<50
TRH >C_{10} - C_{16} less Naphthalene (F2)	mg/kg	<50	<50	<50	<50	<50
TRH >C_{16} -C_{34}	mg/kg	<100	<100	<100	<100	<100
TRH >C_{34} -C_{40}	mg/kg	<100	<100	<100	<100	<100
Total +ve TRH (>C10-C40)	mg/kg	<50	<50	<50	<50	<50
Surrogate o-Terphenyl	%	91	94	94	97	93

svTRH (C10-C40) in Soil						
Our Reference		335052-46	335052-47	335052-48	335052-49	335052-50
Your Reference	UNITS	213	214	215	216	R1
Depth		0.1	0.2	0.2	0.1	-
Date Sampled		26/09/2023	26/09/2023	26/09/2023	26/09/2023	26/09/2023
Type of sample		Soil	Soil	Soil	Soil	Soil
Date extracted	-	16/10/2023	16/10/2023	16/10/2023	16/10/2023	16/10/2023
Date analysed	-	18/10/2023	18/10/2023	18/10/2023	18/10/2023	18/10/2023
TRH C_{10} - C_{14}	mg/kg	<50	<50	<50	<50	<50
TRH C_{15} - C_{28}	mg/kg	<100	<100	<100	<100	<100
TRH C_{29} - C_{36}	mg/kg	<100	<100	<100	<100	<100
Total +ve TRH (C10-C36)	mg/kg	<50	<50	<50	<50	<50
TRH >C_{10} -C_{16}	mg/kg	<50	<50	<50	<50	<50
TRH >C_{10} - C_{16} less Naphthalene (F2)	mg/kg	<50	<50	<50	<50	<50
TRH >C_{16} -C_{34}	mg/kg	<100	<100	<100	<100	<100
TRH >C_{34} -C_{40}	mg/kg	<100	<100	<100	<100	<100
Total +ve TRH (>C10-C40)	mg/kg	<50	<50	<50	<50	<50
Surrogate o-Terphenyl	%	94	94	91	92	91

svTRH (C10-C40) in Soil		
Our Reference		335052-51
Your Reference	UNITS	R2
Depth		-
Date Sampled		26/09/2023
Type of sample		Soil
Date extracted	-	16/10/2023
Date analysed	-	18/10/2023
TRH C_{10} - C_{14}	mg/kg	<50
TRH C_{15} - C_{28}	mg/kg	<100
TRH C_{29} - C_{36}	mg/kg	<100
Total +ve TRH (C10-C36)	mg/kg	<50
TRH >C_{10} -C_{16}	mg/kg	<50
TRH >C_{10} - C_{16} less Naphthalene (F2)	mg/kg	<50
TRH >C_{16} -C_{34}	mg/kg	<100
TRH >C_{34} -C_{40}	mg/kg	<100
Total +ve TRH (>C10-C40)	mg/kg	<50
Surrogate o-Terphenyl	%	92

PAHs in Soil						
Our Reference		335052-1	335052-2	335052-6	335052-8	335052-12
Your Reference	UNITS	201	201	202	202	203
Depth		0.1	0.5	0.1	1	0.1
Date Sampled		27/09/2023	27/09/2023	27/09/2023	27/09/2023	28/09/2023
Type of sample		Soil	Soil	Soil	Soil	Soil
Date extracted	-	16/10/2023	16/10/2023	16/10/2023	16/10/2023	16/10/2023
Date analysed	-	17/10/2023	17/10/2023	17/10/2023	17/10/2023	17/10/2023
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	%	103	98	111	100	98

PAHs in Soil						
Our Reference		335052-14	335052-18	335052-24	335052-25	335052-31
Your Reference	UNITS	203	204	205	205	206
Depth		1	0.1	0.1	0.5	0.1
Date Sampled		28/09/2023	28/09/2023	28/09/2023	28/09/2023	29/09/2023
Type of sample		Soil	Soil	Soil	Soil	Soil
Date extracted	-	16/10/2023	16/10/2023	16/10/2023	16/10/2023	16/10/2023
Date analysed	-	17/10/2023	17/10/2023	17/10/2023	17/10/2023	17/10/2023
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	%	98	98	103	100	104

PAHs in Soil						
Our Reference		335052-32	335052-37	335052-38	335052-39	335052-40
Your Reference	UNITS	206	207	207	208	209
Depth		0.5	0.1	0.2	0.1	0.15
Date Sampled		29/09/2023	26/09/2023	26/09/2023	26/09/2023	26/09/2023
Type of sample		Soil	Soil	Soil	Soil	Soil
Date extracted	-	16/10/2023	16/10/2023	16/10/2023	16/10/2023	16/10/2023
Date analysed	-	17/10/2023	17/10/2023	17/10/2023	17/10/2023	17/10/2023
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	%	102	100	98	92	100

PAHs in Soil						
Our Reference		335052-41	335052-42	335052-43	335052-44	335052-45
Your Reference	UNITS	210	210	211	212	212
Depth		0.1	0.2	0.15	0.1	0.2
Date Sampled		26/09/2023	26/09/2023	26/09/2023	26/09/2023	26/09/2023
Type of sample		Soil	Soil	Soil	Soil	Soil
Date extracted	-	16/10/2023	16/10/2023	16/10/2023	16/10/2023	16/10/2023
Date analysed	-	17/10/2023	17/10/2023	17/10/2023	17/10/2023	17/10/2023
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	%	99	98	99	102	91

PAHs in Soil					
Our Reference		335052-46	335052-47	335052-48	335052-49
Your Reference	UNITS	213	214	215	216
Depth		0.1	0.2	0.2	0.1
Date Sampled		26/09/2023	26/09/2023	26/09/2023	26/09/2023
Type of sample		Soil	Soil	Soil	Soil
Date extracted	-	16/10/2023	16/10/2023	16/10/2023	16/10/2023
Date analysed	-	17/10/2023	17/10/2023	17/10/2023	17/10/2023
Naphthalene	mg/kg	<0.1	<0.1	<0.1	<0.1
Acenaphthylene	mg/kg	<0.1	<0.1	<0.1	<0.1
Acenaphthene	mg/kg	<0.1	<0.1	<0.1	<0.1
Fluorene	mg/kg	<0.1	<0.1	<0.1	<0.1
Phenanthrene	mg/kg	<0.1	<0.1	<0.1	<0.1
Anthracene	mg/kg	<0.1	<0.1	<0.1	<0.1
Fluoranthene	mg/kg	<0.1	<0.1	<0.1	<0.1
Pyrene	mg/kg	<0.1	<0.1	<0.1	<0.1
Benzo(a)anthracene	mg/kg	<0.1	<0.1	<0.1	<0.1
Chrysene	mg/kg	<0.1	<0.1	<0.1	<0.1
Benzo(b,j+k)fluoranthene	mg/kg	<0.2	<0.2	<0.2	<0.2
Benzo(a)pyrene	mg/kg	<0.05	<0.05	<0.05	<0.05
Indeno(1,2,3-c,d)pyrene	mg/kg	<0.1	<0.1	<0.1	<0.1
Dibenzo(a,h)anthracene	mg/kg	<0.1	<0.1	<0.1	<0.1
Benzo(g,h,i)perylene	mg/kg	<0.1	<0.1	<0.1	<0.1
Total +ve PAH's	mg/kg	<0.05	<0.05	<0.05	<0.05
Benzo(a)pyrene TEQ calc (zero)	mg/kg	<0.5	<0.5	<0.5	<0.5
Benzo(a)pyrene TEQ calc(half)	mg/kg	<0.5	<0.5	<0.5	<0.5
Benzo(a)pyrene TEQ calc(PQL)	mg/kg	<0.5	<0.5	<0.5	<0.5
Surrogate p-Terphenyl-d14	%	93	93	95	97

Organochlorine Pesticides in soil						
Our Reference		335052-1	335052-6	335052-12	335052-18	335052-24
Your Reference	UNITS	201	202	203	204	205
Depth		0.1	0.1	0.1	0.1	0.1
Date Sampled		27/09/2023	27/09/2023	28/09/2023	28/09/2023	28/09/2023
Type of sample		Soil	Soil	Soil	Soil	Soil
Date extracted	-	16/10/2023	16/10/2023	16/10/2023	16/10/2023	16/10/2023
Date analysed	-	17/10/2023	17/10/2023	17/10/2023	17/10/2023	17/10/2023
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
Mirex	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	%	106	107	101	100	103

Organochlorine Pesticides in soil						
Our Reference		335052-31	335052-37	335052-39	335052-41	335052-43
Your Reference	UNITS	206	207	208	210	211
Depth		0.1	0.1	0.1	0.1	0.15
Date Sampled		29/09/2023	26/09/2023	26/09/2023	26/09/2023	26/09/2023
Type of sample		Soil	Soil	Soil	Soil	Soil
Date extracted	-	16/10/2023	16/10/2023	16/10/2023	16/10/2023	16/10/2023
Date analysed	-	17/10/2023	17/10/2023	17/10/2023	17/10/2023	17/10/2023
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
Mirex	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	104	101	100	100

Organochlorine Pesticides in soil						
Our Reference		335052-44	335052-46	335052-47	335052-48	335052-49
Your Reference	UNITS	212	213	214	215	216
Depth		0.1	0.1	0.2	0.2	0.1
Date Sampled		26/09/2023	26/09/2023	26/09/2023	26/09/2023	26/09/2023
Type of sample		Soil	Soil	Soil	Soil	Soil
Date extracted	-	16/10/2023	16/10/2023	16/10/2023	16/10/2023	16/10/2023
Date analysed	-	17/10/2023	17/10/2023	17/10/2023	17/10/2023	17/10/2023
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
Mirex	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	102	104	102	99

Organophosphorus Pesticides in Soil						
Our Reference		335052-1	335052-6	335052-12	335052-18	335052-24
Your Reference	UNITS	201	202	203	204	205
Depth		0.1	0.1	0.1	0.1	0.1
Date Sampled		27/09/2023	27/09/2023	28/09/2023	28/09/2023	28/09/2023
Type of sample		Soil	Soil	Soil	Soil	Soil
Date extracted	-	16/10/2023	16/10/2023	16/10/2023	16/10/2023	16/10/2023
Date analysed	-	17/10/2023	17/10/2023	17/10/2023	17/10/2023	17/10/2023
Dichlorvos	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Mevinphos	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Phorate	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
Disulfoton	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Chlorpyrifos-methyl	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Parathion-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
Fenthion	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
Methidathion	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Fenamiphos	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
Phosalone	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
Coumaphos	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Surrogate TCMX	%	106	107	101	100	103

Organophosphorus Pesticides in Soil						
Our Reference		335052-31	335052-37	335052-39	335052-41	335052-43
Your Reference	UNITS	206	207	208	210	211
Depth		0.1	0.1	0.1	0.1	0.15
Date Sampled		29/09/2023	26/09/2023	26/09/2023	26/09/2023	26/09/2023
Type of sample		Soil	Soil	Soil	Soil	Soil
Date extracted	-	16/10/2023	16/10/2023	16/10/2023	16/10/2023	16/10/2023
Date analysed	-	17/10/2023	17/10/2023	17/10/2023	17/10/2023	17/10/2023
Dichlorvos	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Mevinphos	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Phorate	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
Disulfoton	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Chlorpyrifos-methyl	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Parathion-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
Fenthion	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
Methidathion	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Fenamiphos	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
Phosalone	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
Coumaphos	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Surrogate TCMX	%	104	104	101	100	100

Organophosphorus Pesticides in Soil						
Our Reference		335052-44	335052-46	335052-47	335052-48	335052-49
Your Reference	UNITS	212	213	214	215	216
Depth		0.1	0.1	0.2	0.2	0.1
Date Sampled		26/09/2023	26/09/2023	26/09/2023	26/09/2023	26/09/2023
Type of sample		Soil	Soil	Soil	Soil	Soil
Date extracted	-	16/10/2023	16/10/2023	16/10/2023	16/10/2023	16/10/2023
Date analysed	-	17/10/2023	17/10/2023	17/10/2023	17/10/2023	17/10/2023
Dichlorvos	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Mevinphos	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Phorate	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
Disulfoton	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Chlorpyrifos-methyl	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Parathion-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
Fenthion	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
Methidathion	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Fenamiphos	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
Phosalone	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
Coumaphos	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Surrogate TCMX	%	104	102	104	102	99

PCBs in Soil						
Our Reference		335052-1	335052-6	335052-12	335052-18	335052-24
Your Reference	UNITS	201	202	203	204	205
Depth		0.1	0.1	0.1	0.1	0.1
Date Sampled		27/09/2023	27/09/2023	28/09/2023	28/09/2023	28/09/2023
Type of sample		Soil	Soil	Soil	Soil	Soil
Date extracted	-	16/10/2023	16/10/2023	16/10/2023	16/10/2023	16/10/2023
Date analysed	-	17/10/2023	17/10/2023	17/10/2023	17/10/2023	17/10/2023
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	%	106	107	101	100	103

PCBs in Soil						
Our Reference		335052-31	335052-37	335052-39	335052-41	335052-43
Your Reference	UNITS	206	207	208	210	211
Depth		0.1	0.1	0.1	0.1	0.15
Date Sampled		29/09/2023	26/09/2023	26/09/2023	26/09/2023	26/09/2023
Type of sample		Soil	Soil	Soil	Soil	Soil
Date extracted	-	16/10/2023	16/10/2023	16/10/2023	16/10/2023	16/10/2023
Date analysed	-	17/10/2023	17/10/2023	17/10/2023	17/10/2023	17/10/2023
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	104	101	100	100

PCBs in Soil						
Our Reference		335052-44	335052-46	335052-47	335052-48	335052-49
Your Reference	UNITS	212	213	214	215	216
Depth		0.1	0.1	0.2	0.2	0.1
Date Sampled		26/09/2023	26/09/2023	26/09/2023	26/09/2023	26/09/2023
Type of sample		Soil	Soil	Soil	Soil	Soil
Date extracted	-	16/10/2023	16/10/2023	16/10/2023	16/10/2023	16/10/2023
Date analysed	-	17/10/2023	17/10/2023	17/10/2023	17/10/2023	17/10/2023
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	102	104	102	99

Acid Extractable metals in soil						
Our Reference		335052-1	335052-2	335052-6	335052-8	335052-12
Your Reference	UNITS	201	201	202	202	203
Depth		0.1	0.5	0.1	1	0.1
Date Sampled		27/09/2023	27/09/2023	27/09/2023	27/09/2023	28/09/2023
Type of sample		Soil	Soil	Soil	Soil	Soil
Date prepared	-	16/10/2023	16/10/2023	16/10/2023	16/10/2023	16/10/2023
Date analysed	-	17/10/2023	17/10/2023	17/10/2023	17/10/2023	17/10/2023
Arsenic	mg/kg	100	57	59	27	53
Cadmium	mg/kg	0.6	<0.4	0.8	0.4	<0.4
Chromium	mg/kg	31	26	38	35	35
Copper	mg/kg	100	45	28	46	27
Lead	mg/kg	370	35	120	53	100
Mercury	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Manganese	mg/kg	1,500	100	1,100	73	3,300
Nickel	mg/kg	21	12	18	27	15
Zinc	mg/kg	230	200	180	340	100

Acid Extractable metals in soil						
Our Reference		335052-14	335052-18	335052-24	335052-25	335052-31
Your Reference	UNITS	203	204	205	205	206
Depth		1	0.1	0.1	0.5	0.1
Date Sampled		28/09/2023	28/09/2023	28/09/2023	28/09/2023	29/09/2023
Type of sample		Soil	Soil	Soil	Soil	Soil
Date prepared	-	16/10/2023	16/10/2023	16/10/2023	16/10/2023	16/10/2023
Date analysed	-	17/10/2023	17/10/2023	17/10/2023	17/10/2023	17/10/2023
Arsenic	mg/kg	16	30	19	17	97
Cadmium	mg/kg	<0.4	0.6	<0.4	<0.4	<0.4
Chromium	mg/kg	23	29	28	37	28
Copper	mg/kg	91	33	28	31	110
Lead	mg/kg	130	140	38	13	94
Mercury	mg/kg	<0.1	0.2	<0.1	<0.1	<0.1
Manganese	mg/kg	6,000	790	380	300	550
Nickel	mg/kg	69	21	19	21	13
Zinc	mg/kg	230	120	80	48	180

Acid Extractable metals in soil						
Our Reference		335052-32	335052-37	335052-38	335052-39	335052-40
Your Reference	UNITS	206	207	207	208	209
Depth		0.5	0.1	0.2	0.1	0.15
Date Sampled		29/09/2023	26/09/2023	26/09/2023	26/09/2023	26/09/2023
Type of sample		Soil	Soil	Soil	Soil	Soil
Date prepared	-	16/10/2023	16/10/2023	16/10/2023	16/10/2023	16/10/2023
Date analysed	-	17/10/2023	17/10/2023	17/10/2023	17/10/2023	17/10/2023
Arsenic	mg/kg	180	66	32	92	50
Cadmium	mg/kg	<0.4	0.8	<0.4	2	1
Chromium	mg/kg	45	33	38	26	19
Copper	mg/kg	100	33	14	57	18
Lead	mg/kg	100	86	14	160	66
Mercury	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Manganese	mg/kg	420	1,500	350	2,100	1,200
Nickel	mg/kg	21	22	18	23	11
Zinc	mg/kg	490	170	42	290	220

Acid Extractable metals in soil						
Our Reference		335052-41	335052-42	335052-43	335052-44	335052-45
Your Reference	UNITS	210	210	211	212	212
Depth		0.1	0.2	0.15	0.1	0.2
Date Sampled		26/09/2023	26/09/2023	26/09/2023	26/09/2023	26/09/2023
Type of sample		Soil	Soil	Soil	Soil	Soil
Date prepared	-	16/10/2023	16/10/2023	16/10/2023	16/10/2023	16/10/2023
Date analysed	-	17/10/2023	17/10/2023	17/10/2023	17/10/2023	17/10/2023
Arsenic	mg/kg	19	12	27	14	16
Cadmium	mg/kg	<0.4	<0.4	<0.4	<0.4	<0.4
Chromium	mg/kg	24	50	29	32	45
Copper	mg/kg	22	24	8	15	48
Lead	mg/kg	66	47	52	19	7
Mercury	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Manganese	mg/kg	550	840	450	430	230
Nickel	mg/kg	15	18	10	15	21
Zinc	mg/kg	56	54	44	50	41

Acid Extractable metals in soil						
Our Reference		335052-46	335052-47	335052-48	335052-49	335052-50
Your Reference	UNITS	213	214	215	216	R1
Depth		0.1	0.2	0.2	0.1	-
Date Sampled		26/09/2023	26/09/2023	26/09/2023	26/09/2023	26/09/2023
Type of sample		Soil	Soil	Soil	Soil	Soil
Date prepared	-	16/10/2023	16/10/2023	16/10/2023	16/10/2023	16/10/2023
Date analysed	-	17/10/2023	17/10/2023	17/10/2023	17/10/2023	17/10/2023
Arsenic	mg/kg	26	14	9	27	8
Cadmium	mg/kg	<0.4	<0.4	<0.4	<0.4	<0.4
Chromium	mg/kg	29	30	41	33	46
Copper	mg/kg	28	14	4	23	4
Lead	mg/kg	24	24	10	100	9
Mercury	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Manganese	mg/kg	520	870	410	710	350
Nickel	mg/kg	18	16	16	22	17
Zinc	mg/kg	53	49	31	72	33

Acid Extractable metals in soil			
Our Reference		335052-51	335052-52
Your Reference	UNITS	R2	201 - [TRIPLICATE]
Depth		-	0.1
Date Sampled		26/09/2023	27/09/2023
Type of sample		Soil	Soil
Date prepared	-	16/10/2023	16/10/2023
Date analysed	-	17/10/2023	17/10/2023
Arsenic	mg/kg	15	67
Cadmium	mg/kg	<0.4	0.5
Chromium	mg/kg	39	32
Copper	mg/kg	38	37
Lead	mg/kg	6	150
Mercury	mg/kg	<0.1	<0.1
Manganese	mg/kg	200	1,100
Nickel	mg/kg	18	14
Zinc	mg/kg	35	200

Misc Soil - Inorg						
Our Reference		335052-1	335052-6	335052-12	335052-18	335052-24
Your Reference	UNITS	201	202	203	204	205
Depth		0.1	0.1	0.1	0.1	0.1
Date Sampled		27/09/2023	27/09/2023	28/09/2023	28/09/2023	28/09/2023
Type of sample		Soil	Soil	Soil	Soil	Soil
Date prepared	-	16/10/2023	16/10/2023	16/10/2023	16/10/2023	16/10/2023
Date analysed	-	17/10/2023	17/10/2023	17/10/2023	17/10/2023	17/10/2023
Total Phenolics (as Phenol)	mg/kg	<5	<5	<5	<5	<5

Misc Soil - Inorg						
Our Reference		335052-31	335052-37	335052-39	335052-41	335052-43
Your Reference	UNITS	206	207	208	210	211
Depth		0.1	0.1	0.1	0.1	0.15
Date Sampled		29/09/2023	26/09/2023	26/09/2023	26/09/2023	26/09/2023
Type of sample		Soil	Soil	Soil	Soil	Soil
Date prepared	-	16/10/2023	16/10/2023	16/10/2023	16/10/2023	16/10/2023
Date analysed	-	17/10/2023	17/10/2023	17/10/2023	17/10/2023	17/10/2023
Total Phenolics (as Phenol)	mg/kg	<5	<5	<5	<5	<5

Misc Soil - Inorg						
Our Reference		335052-44	335052-46	335052-47	335052-48	335052-49
Your Reference	UNITS	212	213	214	215	216
Depth		0.1	0.1	0.2	0.2	0.1
Date Sampled		26/09/2023	26/09/2023	26/09/2023	26/09/2023	26/09/2023
Type of sample		Soil	Soil	Soil	Soil	Soil
Date prepared	-	16/10/2023	16/10/2023	16/10/2023	16/10/2023	16/10/2023
Date analysed	-	17/10/2023	17/10/2023	17/10/2023	17/10/2023	17/10/2023
Total Phenolics (as Phenol)	mg/kg	<5	<5	<5	<5	<5

Misc Inorg - Soil				
Our Reference		335052-1	335052-13	335052-34
Your Reference	UNITS	201	203	206
Depth		0.1	0.5	1.5
Date Sampled		27/09/2023	28/09/2023	29/09/2023
Type of sample		Soil	Soil	Soil
Date prepared	-	17/10/2023	17/10/2023	17/10/2023
Date analysed	-	17/10/2023	17/10/2023	17/10/2023
pH 1:5 soil:water	pH Units	5.6	6.5	7.5

CEC				
Our Reference		335052-1	335052-13	335052-34
Your Reference	UNITS	201	203	206
Depth		0.1	0.5	1.5
Date Sampled		27/09/2023	28/09/2023	29/09/2023
Type of sample		Soil	Soil	Soil
Date prepared	-	19/10/2023	19/10/2023	19/10/2023
Date analysed	-	19/10/2023	19/10/2023	19/10/2023
Exchangeable Ca	meq/100g	4.1	6.1	3.8
Exchangeable K	meq/100g	0.3	0.2	0.2
Exchangeable Mg	meq/100g	3.2	5.5	25
Exchangeable Na	meq/100g	<0.1	<0.1	0.4
Cation Exchange Capacity	meq/100g	7.7	12	30

Moisture						
Our Reference		335052-1	335052-2	335052-6	335052-8	335052-12
Your Reference	UNITS	201	201	202	202	203
Depth		0.1	0.5	0.1	1	0.1
Date Sampled		27/09/2023	27/09/2023	27/09/2023	27/09/2023	28/09/2023
Type of sample		Soil	Soil	Soil	Soil	Soil
Date prepared	-	16/10/2023	16/10/2023	16/10/2023	16/10/2023	16/10/2023
Date analysed	-	17/10/2023	17/10/2023	17/10/2023	17/10/2023	17/10/2023
Moisture	%	6.9	16	16	13	10

Moisture						
Our Reference		335052-14	335052-18	335052-24	335052-25	335052-31
Your Reference	UNITS	203	204	205	205	206
Depth		1	0.1	0.1	0.5	0.1
Date Sampled		28/09/2023	28/09/2023	28/09/2023	28/09/2023	29/09/2023
Type of sample		Soil	Soil	Soil	Soil	Soil
Date prepared	-	16/10/2023	16/10/2023	16/10/2023	16/10/2023	16/10/2023
Date analysed	-	17/10/2023	17/10/2023	17/10/2023	17/10/2023	17/10/2023
Moisture	%	19	6.5	7.6	5.2	8.0

Moisture						
Our Reference		335052-32	335052-37	335052-38	335052-39	335052-40
Your Reference	UNITS	206	207	207	208	209
Depth		0.5	0.1	0.2	0.1	0.15
Date Sampled		29/09/2023	26/09/2023	26/09/2023	26/09/2023	26/09/2023
Type of sample		Soil	Soil	Soil	Soil	Soil
Date prepared	-	16/10/2023	16/10/2023	16/10/2023	16/10/2023	16/10/2023
Date analysed	-	17/10/2023	17/10/2023	17/10/2023	17/10/2023	17/10/2023
Moisture	%	15	3.5	9.1	7.5	3.7

Moisture						
Our Reference		335052-41	335052-42	335052-43	335052-44	335052-45
Your Reference	UNITS	210	210	211	212	212
Depth		0.1	0.2	0.15	0.1	0.2
Date Sampled		26/09/2023	26/09/2023	26/09/2023	26/09/2023	26/09/2023
Type of sample		Soil	Soil	Soil	Soil	Soil
Date prepared	-	16/10/2023	16/10/2023	16/10/2023	16/10/2023	16/10/2023
Date analysed	-	17/10/2023	17/10/2023	17/10/2023	17/10/2023	17/10/2023
Moisture	%	7.4	16	3.9	2.3	8.0

Moisture						
Our Reference		335052-46	335052-47	335052-48	335052-49	335052-50
Your Reference	UNITS	213	214	215	216	R1
Depth		0.1	0.2	0.2	0.1	-
Date Sampled		26/09/2023	26/09/2023	26/09/2023	26/09/2023	26/09/2023
Type of sample		Soil	Soil	Soil	Soil	Soil
Date prepared	-	16/10/2023	16/10/2023	16/10/2023	16/10/2023	16/10/2023
Date analysed	-	17/10/2023	17/10/2023	17/10/2023	17/10/2023	17/10/2023
Moisture	%	9.1	8.9	4.3	2.2	4.6

Moisture		
Our Reference		335052-51
Your Reference	UNITS	R2
Depth		-
Date Sampled		26/09/2023
Type of sample		Soil
Date prepared	-	16/10/2023
Date analysed	-	17/10/2023
Moisture	%	8.2

Asbestos ID - soils						
Our Reference		335052-1	335052-6	335052-12	335052-18	335052-24
Your Reference	UNITS	201	202	203	204	205
Depth		0.1	0.1	0.1	0.1	0.1
Date Sampled		27/09/2023	27/09/2023	28/09/2023	28/09/2023	28/09/2023
Type of sample		Soil	Soil	Soil	Soil	Soil
Date analysed	-	20/10/2023	20/10/2023	20/10/2023	20/10/2023	20/10/2023
Sample mass tested	g	Approx. 35g	Approx. 35g	Approx. 30g	Approx. 35g	Approx. 35g
Sample Description	-	Brown coarse-grained soil & rocks	Brown coarse-grained soil & rocks	Red fine-grained soil & rocks	Brown coarse-grained soil & rocks	Brown coarse-grained soil & rocks
Asbestos ID in soil	-	No asbestos detected at reporting limit of 0.1g/kg Organic fibres detected	No asbestos detected at reporting limit of 0.1g/kg Organic fibres detected	No asbestos detected at reporting limit of 0.1g/kg Organic fibres detected	No asbestos detected at reporting limit of 0.1g/kg Organic fibres detected	No asbestos detected at reporting limit of 0.1g/kg Organic fibres detected
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		335052-31	335052-37	335052-39	335052-41	335052-43
Your Reference	UNITS	206	207	208	210	211
Depth		0.1	0.1	0.1	0.1	0.15
Date Sampled		29/09/2023	26/09/2023	26/09/2023	26/09/2023	26/09/2023
Type of sample		Soil	Soil	Soil	Soil	Soil
Date analysed	-	20/10/2023	20/10/2023	20/10/2023	20/10/2023	20/10/2023
Sample mass tested	g	Approx. 30g	Approx. 35g	Approx. 40g	Approx. 35g	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 - soils						
Our Reference		335052-44	335052-46	335052-47	335052-48	335052-49
Your Reference	UNITS	212	213	214	215	216
Depth		0.1	0.1	0.2	0.2	0.1
Date Sampled		26/09/2023	26/09/2023	26/09/2023	26/09/2023	26/09/2023
Type of sample		Soil	Soil	Soil	Soil	Soil
Date analysed	-	20/10/2023	20/10/2023	20/10/2023	20/10/2023	20/10/2023
Sample mass tested	g	Approx. 35g	Approx. 35g	Approx. 35g	Approx. 40g	Approx. 35g
Sample Description	-	Brown fine-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

Method ID	Methodology Summary
ASB-001	Asbestos ID - Qualitative identification of asbestos in bulk samples using Polarised Light Microscopy and Dispersion Staining Techniques including Synthetic Mineral Fibre and Organic Fibre as per Australian Standard 4964-2004.
Inorg-001	pH - Measured using pH meter and electrode in accordance with APHA latest edition, 4500-H+. Please note that the results for water analyses are indicative only, as analysis outside of the APHA storage times.
Inorg-008	Moisture content determined by heating at 105+/-5 °C for a minimum of 12 hours.
Inorg-031	Total Phenolics by segmented flow analyser (in line distillation with colourimetric finish). Solids are extracted in a caustic media prior to analysis.
Metals-020	Determination of various metals by ICP-AES.
Metals-020	Determination of exchangeable cations and cation exchange capacity in soils using 1M Ammonium Chloride exchange and ICP-OES analytical finish.
Metals-021	Determination of Mercury by Cold Vapour AAS.
Org-020	Soil samples are extracted with Dichloromethane/Acetone and waters with Dichloromethane and analysed by GC-FID. F2 = (>C10-C16)-Naphthalene as per NEPM B1 Guideline on Investigation Levels for Soil and Groundwater (HSLs Tables 1A (3, 4)). Note Naphthalene is determined from the VOC analysis.
Org-020	Soil samples are extracted with Dichloromethane/Acetone and waters with Dichloromethane and analysed by GC-FID. F2 = (>C10-C16)-Naphthalene as per NEPM B1 Guideline on Investigation Levels for Soil and Groundwater (HSLs Tables 1A (3, 4)). Note Naphthalene is determined from the VOC analysis. Note, the Total +ve TRH PQL is reflective of the lowest individual PQL and is therefore "Total +ve TRH" is simply a sum of the positive individual TRH fractions (>C10-C40).
Org-021	Soil samples are extracted with dichloromethane/acetone and waters with dichloromethane and analysed by GC-ECD.
Org-021	Soil samples are extracted with dichloromethane/acetone and waters with dichloromethane and analysed by GC-ECD. Note, the Total +ve PCBs PQL is reflective of the lowest individual PQL and is therefore" Total +ve PCBs" is simply a sum of the positive individual PCBs.
Org-022/025	Soil samples are extracted with Dichloromethane/Acetone and waters with Dichloromethane and analysed by GC-MS/GC-MSMS.
Org-022/025	Soil samples are extracted with dichloromethane/acetone and waters with dichloromethane and analysed by GC-MS/GC-MSMS. Note, the Total +ve reported DDD+DDE+DDT PQL is reflective of the lowest individual PQL and is therefore simply a sum of the positive individually report DDD+DDE+DDT.

Method ID	Methodology Summary
Org-022/025	Soil samples are extracted with Dichloromethane/Acetone and waters with Dichloromethane and analysed by GC-MS and/or GC-MS/MS. Benzo(a)pyrene TEQ as per NEPM B1 Guideline on Investigation Levels for Soil and Groundwater - 2013. For soil results:- 1. 'EQ PQL'values are assuming all contributing PAHs reported as <PQL are actually at the PQL. This is the most conservative approach and can give false positive TEQs given that PAHs that contribute to the TEQ calculation may not be present. 2. 'EQ zero'values are assuming all contributing PAHs reported as <PQL are zero. This is the least conservative approach and is more susceptible to false negative TEQs when PAHs that contribute to the TEQ calculation are present but below PQL. 3. 'EQ half PQL'values are assuming all contributing PAHs reported as <PQL are half the stipulated PQL. Hence a mid-point between the most and least conservative approaches above. Note, the Total +ve PAHs PQL is reflective of the lowest individual PQL and is therefore "Total +ve PAHs" is simply a sum of the positive individual PAHs.
Org-023	Soil samples are extracted with methanol and spiked into water prior to analysing by purge and trap GC-MS.
Org-023	Soil samples are extracted with methanol and spiked into water prior to analysing by purge and trap GC-MS. Water samples are analysed directly by purge and trap GC-MS. F1 = (C6-C10)-BTEX as per NEPM B1 Guideline on Investigation Levels for Soil and Groundwater.
Org-023	Soil samples are extracted with methanol and spiked into water prior to analysing by purge and trap GC-MS. Water samples are analysed directly by purge and trap GC-MS. F1 = (C6-C10)-BTEX as per NEPM B1 Guideline on Investigation Levels for Soil and Groundwater. Note, the Total +ve Xylene PQL is reflective of the lowest individual PQL and is therefore "Total +ve Xylenes" is simply a sum of the positive individual Xylenes.

QUALITY CONTROL: vTRH(C6-C10)/BTEXN in Soil						Duplicate			Spike Recovery %	
Test Description	Units	PQL	Method	Blank	#	Base	Dup.	RPD	LCS-7	335052-6
Date extracted	-			16/10/2023	1	16/10/2023	16/10/2023		16/10/2023	16/10/2023
Date analysed	-			17/10/2023	1	17/10/2023	17/10/2023		17/10/2023	17/10/2023
TRH C_6 - C_9	mg/kg	25	Org-023	<25	1	<25	<25	0	127	130
TRH C_6 - C_{10}	mg/kg	25	Org-023	<25	1	<25	<25	0	127	130
Benzene	mg/kg	0.2	Org-023	<0.2	1	<0.2	<0.2	0	130	127
Toluene	mg/kg	0.5	Org-023	<0.5	1	<0.5	<0.5	0	129	121
Ethylbenzene	mg/kg	1	Org-023	<1	1	<1	<1	0	124	134
m+p-xylene	mg/kg	2	Org-023	<2	1	<2	<2	0	125	135
o-Xylene	mg/kg	1	Org-023	<1	1	<1	<1	0	127	137
Naphthalene	mg/kg	1	Org-023	<1	1	<1	<1	0	[NT]	[NT]
Surrogate aaa-Trifluorotoluene	%		Org-023	105	1	95	94	1	112	99

QUALITY CONTROL: vTRH(C6-C10)/BTEXN in Soil						Duplicate			Spike Recovery %	
Test Description	Units	PQL	Method	Blank	#	Base	Dup.	RPD	LCS-8	335052-47
Date extracted	-			[NT]	31	16/10/2023	16/10/2023		16/10/2023	16/10/2023
Date analysed	-			[NT]	31	17/10/2023	17/10/2023		17/10/2023	18/10/2023
TRH C_6 - C_9	mg/kg	25	Org-023	[NT]	31	<25	<25	0	125	124
TRH C_6 - C_{10}	mg/kg	25	Org-023	[NT]	31	<25	<25	0	125	124
Benzene	mg/kg	0.2	Org-023	[NT]	31	<0.2	<0.2	0	128	129
Toluene	mg/kg	0.5	Org-023	[NT]	31	<0.5	<0.5	0	123	122
Ethylbenzene	mg/kg	1	Org-023	[NT]	31	<1	<1	0	124	123
m+p-xylene	mg/kg	2	Org-023	[NT]	31	<2	<2	0	125	124
o-Xylene	mg/kg	1	Org-023	[NT]	31	<1	<1	0	137	128
Naphthalene	mg/kg	1	Org-023	[NT]	31	<1	<1	0	[NT]	[NT]
Surrogate aaa-Trifluorotoluene	%		Org-023	[NT]	31	98	99	1	102	96

QUALITY CONTROL: vTRH(C6-C10)/BTEXN in Soil						Duplicate			Spike Recovery %	
Test Description	Units	PQL	Method	Blank	#	Base	Dup.	RPD	[NT]	[NT]
Date extracted	-			[NT]	46	16/10/2023	16/10/2023		[NT]	[NT]
Date analysed	-			[NT]	46	18/10/2023	18/10/2023		[NT]	[NT]
TRH C_6 - C_9	mg/kg	25	Org-023	[NT]	46	<25	<25	0	[NT]	[NT]
TRH C_6 - C_{10}	mg/kg	25	Org-023	[NT]	46	<25	<25	0	[NT]	[NT]
Benzene	mg/kg	0.2	Org-023	[NT]	46	<0.2	<0.2	0	[NT]	[NT]
Toluene	mg/kg	0.5	Org-023	[NT]	46	<0.5	<0.5	0	[NT]	[NT]
Ethylbenzene	mg/kg	1	Org-023	[NT]	46	<1	<1	0	[NT]	[NT]
m+p-xylene	mg/kg	2	Org-023	[NT]	46	<2	<2	0	[NT]	[NT]
o-Xylene	mg/kg	1	Org-023	[NT]	46	<1	<1	0	[NT]	[NT]
Naphthalene	mg/kg	1	Org-023	[NT]	46	<1	<1	0	[NT]	[NT]
Surrogate aaa-Trifluorotoluene	%		Org-023	[NT]	46	95	109	14	[NT]	[NT]

QUALITY CONTROL: svTRH (C10-C40) in Soil						Duplicate			Spike Recovery %	
Test Description	Units	PQL	Method	Blank	#	Base	Dup.	RPD	LCS-7	335052-6
Date extracted	-			16/10/2023	1	16/10/2023	16/10/2023		16/10/2023	16/10/2023
Date analysed	-			18/10/2023	1	17/10/2023	17/10/2023		18/10/2023	17/10/2023
TRH C_{10} - C_{14}	mg/kg	50	Org-020	<50	1	<50	<50	0	118	126
TRH C_{15} - C_{28}	mg/kg	100	Org-020	<100	1	<100	<100	0	106	112
TRH C_{29} - C_{36}	mg/kg	100	Org-020	<100	1	<100	<100	0	71	114
TRH >C_{10} -C_{16}	mg/kg	50	Org-020	<50	1	<50	<50	0	118	126
TRH >C_{16} -C_{34}	mg/kg	100	Org-020	<100	1	<100	<100	0	106	112
TRH >C_{34} -C_{40}	mg/kg	100	Org-020	<100	1	<100	<100	0	71	114
Surrogate o-Terphenyl	%		Org-020	88	1	95	92	3	94	101

QUALITY CONTROL: svTRH (C10-C40) in Soil						Duplicate			Spike Recovery %	
Test Description	Units	PQL	Method	Blank	#	Base	Dup.	RPD	LCS-8	335052-47
Date extracted	-			[NT]	31	16/10/2023	16/10/2023		16/10/2023	16/10/2023
Date analysed	-			[NT]	31	17/10/2023	17/10/2023		18/10/2023	18/10/2023
TRH C_{10} - C_{14}	mg/kg	50	Org-020	[NT]	31	<50	<50	0	131	129
TRH C_{15} - C_{28}	mg/kg	100	Org-020	[NT]	31	<100	<100	0	114	119
TRH C_{29} - C_{36}	mg/kg	100	Org-020	[NT]	31	<100	<100	0	114	90
TRH >C_{10} -C_{16}	mg/kg	50	Org-020	[NT]	31	<50	<50	0	131	129
TRH >C_{16} -C_{34}	mg/kg	100	Org-020	[NT]	31	<100	<100	0	114	119
TRH >C_{34} -C_{40}	mg/kg	100	Org-020	[NT]	31	<100	<100	0	114	90
Surrogate o-Terphenyl	%		Org-020	[NT]	31	95	96	1	100	104

QUALITY CONTROL: svTRH (C10-C40) in Soil						Duplicate			Spike Recovery %	
Test Description	Units	PQL	Method	Blank	#	Base	Dup.	RPD	[NT]	[NT]
Date extracted	-			[NT]	46	16/10/2023	16/10/2023		[NT]	[NT]
Date analysed	-			[NT]	46	18/10/2023	18/10/2023		[NT]	[NT]
TRH C_{10} - C_{14}	mg/kg	50	Org-020	[NT]	46	<50	<50	0	[NT]	[NT]
TRH C_{15} - C_{28}	mg/kg	100	Org-020	[NT]	46	<100	<100	0	[NT]	[NT]
TRH C_{29} - C_{36}	mg/kg	100	Org-020	[NT]	46	<100	<100	0	[NT]	[NT]
TRH >C_{10} -C_{16}	mg/kg	50	Org-020	[NT]	46	<50	<50	0	[NT]	[NT]
TRH >C_{16} -C_{34}	mg/kg	100	Org-020	[NT]	46	<100	<100	0	[NT]	[NT]
TRH >C_{34} -C_{40}	mg/kg	100	Org-020	[NT]	46	<100	<100	0	[NT]	[NT]
Surrogate o-Terphenyl	%		Org-020	[NT]	46	94	91	3	[NT]	[NT]

QUALITY CONTROL: PAHs in Soil						Duplicate			Spike Recovery %	
Test Description	Units	PQL	Method	Blank	#	Base	Dup.	RPD	LCS-7	335052-6
Date extracted	-			16/10/2023	1	16/10/2023	16/10/2023		16/10/2023	16/10/2023
Date analysed	-			17/10/2023	1	17/10/2023	17/10/2023		17/10/2023	17/10/2023
Naphthalene	mg/kg	0.1	Org-022/025	<0.1	1	<0.1	<0.1	0	92	97
Acenaphthylene	mg/kg	0.1	Org-022/025	<0.1	1	<0.1	<0.1	0	[NT]	[NT]
Acenaphthene	mg/kg	0.1	Org-022/025	<0.1	1	<0.1	<0.1	0	97	101
Fluorene	mg/kg	0.1	Org-022/025	<0.1	1	<0.1	<0.1	0	88	93
Phenanthrene	mg/kg	0.1	Org-022/025	<0.1	1	<0.1	<0.1	0	92	100
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	92	102
Pyrene	mg/kg	0.1	Org-022/025	<0.1	1	<0.1	<0.1	0	93	105
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	91	91
Benzo(b,j+k)fluoranthene	mg/kg	0.2	Org-022/025	<0.2	1	<0.2	<0.2	0	[NT]	[NT]
Benzo(a)pyrene	mg/kg	0.05	Org-022/025	<0.05	1	<0.05	<0.05	0	94	100
Indeno(1,2,3-c,d)pyrene	mg/kg	0.1	Org-022/025	<0.1	1	<0.1	<0.1	0	[NT]	[NT]
Dibenzo(a,h)anthracene	mg/kg	0.1	Org-022/025	<0.1	1	<0.1	<0.1	0	[NT]	[NT]
Benzo(g,h,i)perylene	mg/kg	0.1	Org-022/025	<0.1	1	<0.1	<0.1	0	[NT]	[NT]
Surrogate p-Terphenyl-d14	%		Org-022/025	97	1	103	101	2	83	90

QUALITY CONTROL: PAHs in Soil						Duplicate			Spike Recovery %	
Test Description	Units	PQL	Method	Blank	#	Base	Dup.	RPD	LCS-8	335052-47
Date extracted	-			[NT]	31	16/10/2023	16/10/2023		16/10/2023	16/10/2023
Date analysed	-			[NT]	31	17/10/2023	17/10/2023		17/10/2023	17/10/2023
Naphthalene	mg/kg	0.1	Org-022/025	[NT]	31	<0.1	<0.1	0	97	90
Acenaphthylene	mg/kg	0.1	Org-022/025	[NT]	31	<0.1	<0.1	0	[NT]	[NT]
Acenaphthene	mg/kg	0.1	Org-022/025	[NT]	31	<0.1	<0.1	0	103	91
Fluorene	mg/kg	0.1	Org-022/025	[NT]	31	<0.1	<0.1	0	97	90
Phenanthrene	mg/kg	0.1	Org-022/025	[NT]	31	<0.1	<0.1	0	100	92
Anthracene	mg/kg	0.1	Org-022/025	[NT]	31	<0.1	<0.1	0	[NT]	[NT]
Fluoranthene	mg/kg	0.1	Org-022/025	[NT]	31	<0.1	<0.1	0	106	96
Pyrene	mg/kg	0.1	Org-022/025	[NT]	31	<0.1	<0.1	0	103	101
Benzo(a)anthracene	mg/kg	0.1	Org-022/025	[NT]	31	<0.1	<0.1	0	[NT]	[NT]
Chrysene	mg/kg	0.1	Org-022/025	[NT]	31	<0.1	<0.1	0	93	79
Benzo(b,j+k)fluoranthene	mg/kg	0.2	Org-022/025	[NT]	31	<0.2	<0.2	0	[NT]	[NT]
Benzo(a)pyrene	mg/kg	0.05	Org-022/025	[NT]	31	<0.05	<0.05	0	108	94
Indeno(1,2,3-c,d)pyrene	mg/kg	0.1	Org-022/025	[NT]	31	<0.1	<0.1	0	[NT]	[NT]
Dibenzo(a,h)anthracene	mg/kg	0.1	Org-022/025	[NT]	31	<0.1	<0.1	0	[NT]	[NT]
Benzo(g,h,i)perylene	mg/kg	0.1	Org-022/025	[NT]	31	<0.1	<0.1	0	[NT]	[NT]
Surrogate p-Terphenyl-d14	%		Org-022/025	[NT]	31	104	98	6	91	84

QUALITY CONTROL: PAHs in Soil						Duplicate			Spike Recovery %	
Test Description	Units	PQL	Method	Blank	#	Base	Dup.	RPD	[NT]	[NT]
Date extracted	-			[NT]	46	16/10/2023	16/10/2023		[NT]	[NT]
Date analysed	-			[NT]	46	17/10/2023	17/10/2023		[NT]	[NT]
Naphthalene	mg/kg	0.1	Org-022/025	[NT]	46	<0.1	<0.1	0	[NT]	[NT]
Acenaphthylene	mg/kg	0.1	Org-022/025	[NT]	46	<0.1	<0.1	0	[NT]	[NT]
Acenaphthene	mg/kg	0.1	Org-022/025	[NT]	46	<0.1	<0.1	0	[NT]	[NT]
Fluorene	mg/kg	0.1	Org-022/025	[NT]	46	<0.1	<0.1	0	[NT]	[NT]
Phenanthrene	mg/kg	0.1	Org-022/025	[NT]	46	<0.1	<0.1	0	[NT]	[NT]
Anthracene	mg/kg	0.1	Org-022/025	[NT]	46	<0.1	<0.1	0	[NT]	[NT]
Fluoranthene	mg/kg	0.1	Org-022/025	[NT]	46	<0.1	<0.1	0	[NT]	[NT]
Pyrene	mg/kg	0.1	Org-022/025	[NT]	46	<0.1	<0.1	0	[NT]	[NT]
Benzo(a)anthracene	mg/kg	0.1	Org-022/025	[NT]	46	<0.1	<0.1	0	[NT]	[NT]
Chrysene	mg/kg	0.1	Org-022/025	[NT]	46	<0.1	<0.1	0	[NT]	[NT]
Benzo(b,j+k)fluoranthene	mg/kg	0.2	Org-022/025	[NT]	46	<0.2	<0.2	0	[NT]	[NT]
Benzo(a)pyrene	mg/kg	0.05	Org-022/025	[NT]	46	<0.05	<0.05	0	[NT]	[NT]
Indeno(1,2,3-c,d)pyrene	mg/kg	0.1	Org-022/025	[NT]	46	<0.1	<0.1	0	[NT]	[NT]
Dibenzo(a,h)anthracene	mg/kg	0.1	Org-022/025	[NT]	46	<0.1	<0.1	0	[NT]	[NT]
Benzo(g,h,i)perylene	mg/kg	0.1	Org-022/025	[NT]	46	<0.1	<0.1	0	[NT]	[NT]
Surrogate p-Terphenyl-d14	%		Org-022/025	[NT]	46	93	95	2	[NT]	[NT]

QUALITY CONTROL: Organochlorine Pesticides in soil						Duplicate			Spike Recovery %	
Test Description	Units	PQL	Method	Blank	#	Base	Dup.	RPD	LCS-7	335052-6
Date extracted	-			16/10/2023	1	16/10/2023	16/10/2023		16/10/2023	16/10/2023
Date analysed	-			17/10/2023	1	17/10/2023	17/10/2023		17/10/2023	17/10/2023
alpha-BHC	mg/kg	0.1	Org-022/025	<0.1	1	<0.1	<0.1	0	98	108
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	106
gamma-BHC	mg/kg	0.1	Org-022/025	<0.1	1	<0.1	<0.1	0	[NT]	[NT]
Heptachlor	mg/kg	0.1	Org-022/025	<0.1	1	<0.1	<0.1	0	93	101
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	97	109
Heptachlor Epoxide	mg/kg	0.1	Org-022/025	<0.1	1	<0.1	<0.1	0	88	106
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	98	111
Dieldrin	mg/kg	0.1	Org-022/025	<0.1	1	<0.1	<0.1	0	108	124
Endrin	mg/kg	0.1	Org-022/025	<0.1	1	<0.1	<0.1	0	88	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	92	100
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	140	140
Methoxychlor	mg/kg	0.1	Org-022/025	<0.1	1	<0.1	<0.1	0	[NT]	[NT]
Mirex	mg/kg	0.1	Org-022/025	<0.1	1	<0.1	<0.1	0	[NT]	[NT]
Surrogate TCMX	%		Org-022/025	101	1	106	105	1	94	101

QUALITY CONTROL: Organochlorine Pesticides in soil					Duplicate				Spike Recovery %	
Test Description	Units	PQL	Method	Blank	#	Base	Dup.	RPD	LCS-8	335052-47
Date extracted	-			[NT]	31	16/10/2023	16/10/2023		16/10/2023	16/10/2023
Date analysed	-			[NT]	31	17/10/2023	17/10/2023		17/10/2023	17/10/2023
alpha-BHC	mg/kg	0.1	Org-022/025	[NT]	31	<0.1	<0.1	0	102	100
HCB	mg/kg	0.1	Org-022/025	[NT]	31	<0.1	<0.1	0	[NT]	[NT]
beta-BHC	mg/kg	0.1	Org-022/025	[NT]	31	<0.1	<0.1	0	102	98
gamma-BHC	mg/kg	0.1	Org-022/025	[NT]	31	<0.1	<0.1	0	[NT]	[NT]
Heptachlor	mg/kg	0.1	Org-022/025	[NT]	31	<0.1	<0.1	0	95	91
delta-BHC	mg/kg	0.1	Org-022/025	[NT]	31	<0.1	<0.1	0	[NT]	[NT]
Aldrin	mg/kg	0.1	Org-022/025	[NT]	31	<0.1	<0.1	0	107	105
Heptachlor Epoxide	mg/kg	0.1	Org-022/025	[NT]	31	<0.1	<0.1	0	106	104
gamma-Chlordane	mg/kg	0.1	Org-022/025	[NT]	31	<0.1	<0.1	0	[NT]	[NT]
alpha-chlordane	mg/kg	0.1	Org-022/025	[NT]	31	<0.1	<0.1	0	[NT]	[NT]
Endosulfan I	mg/kg	0.1	Org-022/025	[NT]	31	<0.1	<0.1	0	[NT]	[NT]
pp-DDE	mg/kg	0.1	Org-022/025	[NT]	31	<0.1	<0.1	0	115	111
Dieldrin	mg/kg	0.1	Org-022/025	[NT]	31	<0.1	<0.1	0	120	114
Endrin	mg/kg	0.1	Org-022/025	[NT]	31	<0.1	<0.1	0	103	107
Endosulfan II	mg/kg	0.1	Org-022/025	[NT]	31	<0.1	<0.1	0	[NT]	[NT]
pp-DDD	mg/kg	0.1	Org-022/025	[NT]	31	<0.1	<0.1	0	98	102
Endrin Aldehyde	mg/kg	0.1	Org-022/025	[NT]	31	<0.1	<0.1	0	[NT]	[NT]
pp-DDT	mg/kg	0.1	Org-022/025	[NT]	31	<0.1	<0.1	0	[NT]	[NT]
Endosulfan Sulphate	mg/kg	0.1	Org-022/025	[NT]	31	<0.1	<0.1	0	120	120
Methoxychlor	mg/kg	0.1	Org-022/025	[NT]	31	<0.1	<0.1	0	[NT]	[NT]
Mirex	mg/kg	0.1	Org-022/025	[NT]	31	<0.1	<0.1	0	[NT]	[NT]
Surrogate TCMX	%		Org-022/025	[NT]	31	104	103	1	98	93

QUALITY CONTROL: Organochlorine Pesticides in soil					Duplicate				Spike Recovery %	
Test Description	Units	PQL	Method	Blank	#	Base	Dup.	RPD	[NT]	[NT]
Date extracted	-			[NT]	46	16/10/2023	16/10/2023		[NT]	[NT]
Date analysed	-			[NT]	46	17/10/2023	17/10/2023		[NT]	[NT]
alpha-BHC	mg/kg	0.1	Org-022/025	[NT]	46	<0.1	<0.1	0	[NT]	[NT]
HCB	mg/kg	0.1	Org-022/025	[NT]	46	<0.1	<0.1	0	[NT]	[NT]
beta-BHC	mg/kg	0.1	Org-022/025	[NT]	46	<0.1	<0.1	0	[NT]	[NT]
gamma-BHC	mg/kg	0.1	Org-022/025	[NT]	46	<0.1	<0.1	0	[NT]	[NT]
Heptachlor	mg/kg	0.1	Org-022/025	[NT]	46	<0.1	<0.1	0	[NT]	[NT]
delta-BHC	mg/kg	0.1	Org-022/025	[NT]	46	<0.1	<0.1	0	[NT]	[NT]
Aldrin	mg/kg	0.1	Org-022/025	[NT]	46	<0.1	<0.1	0	[NT]	[NT]
Heptachlor Epoxide	mg/kg	0.1	Org-022/025	[NT]	46	<0.1	<0.1	0	[NT]	[NT]
gamma-Chlordane	mg/kg	0.1	Org-022/025	[NT]	46	<0.1	<0.1	0	[NT]	[NT]
alpha-chlordane	mg/kg	0.1	Org-022/025	[NT]	46	<0.1	<0.1	0	[NT]	[NT]
Endosulfan I	mg/kg	0.1	Org-022/025	[NT]	46	<0.1	<0.1	0	[NT]	[NT]
pp-DDE	mg/kg	0.1	Org-022/025	[NT]	46	<0.1	<0.1	0	[NT]	[NT]
Dieldrin	mg/kg	0.1	Org-022/025	[NT]	46	<0.1	<0.1	0	[NT]	[NT]
Endrin	mg/kg	0.1	Org-022/025	[NT]	46	<0.1	<0.1	0	[NT]	[NT]
Endosulfan II	mg/kg	0.1	Org-022/025	[NT]	46	<0.1	<0.1	0	[NT]	[NT]
pp-DDD	mg/kg	0.1	Org-022/025	[NT]	46	<0.1	<0.1	0	[NT]	[NT]
Endrin Aldehyde	mg/kg	0.1	Org-022/025	[NT]	46	<0.1	<0.1	0	[NT]	[NT]
pp-DDT	mg/kg	0.1	Org-022/025	[NT]	46	<0.1	<0.1	0	[NT]	[NT]
Endosulfan Sulphate	mg/kg	0.1	Org-022/025	[NT]	46	<0.1	<0.1	0	[NT]	[NT]
Methoxychlor	mg/kg	0.1	Org-022/025	[NT]	46	<0.1	<0.1	0	[NT]	[NT]
Mirex	mg/kg	0.1	Org-022/025	[NT]	46	<0.1	<0.1	0	[NT]	[NT]
Surrogate TCMX	%		Org-022/025	[NT]	46	102	101	1	[NT]	[NT]

QUALITY CONTROL: Organophosphorus Pesticides in Soil						Duplicate			Spike Recovery %	
Test Description	Units	PQL	Method	Blank	#	Base	Dup.	RPD	LCS-7	335052-6
Date extracted	-			16/10/2023	1	16/10/2023	16/10/2023		16/10/2023	16/10/2023
Date analysed	-			17/10/2023	1	17/10/2023	17/10/2023		17/10/2023	17/10/2023
Dichlorvos	mg/kg	0.1	Org-022/025	<0.1	1	<0.1	<0.1	0	111	121
Mevinphos	mg/kg	0.1	Org-022/025	<0.1	1	<0.1	<0.1	0	[NT]	[NT]
Phorate	mg/kg	0.1	Org-022/025	<0.1	1	<0.1	<0.1	0	[NT]	[NT]
Dimethoate	mg/kg	0.1	Org-022/025	<0.1	1	<0.1	<0.1	0	[NT]	[NT]
Diazinon	mg/kg	0.1	Org-022/025	<0.1	1	<0.1	<0.1	0	[NT]	[NT]
Disulfoton	mg/kg	0.1	Org-022/025	<0.1	1	<0.1	<0.1	0	[NT]	[NT]
Chlorpyrifos-methyl	mg/kg	0.1	Org-022/025	<0.1	1	<0.1	<0.1	0	[NT]	[NT]
Parathion-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	95	104
Fenitrothion	mg/kg	0.1	Org-022/025	<0.1	1	<0.1	<0.1	0	89	105
Malathion	mg/kg	0.1	Org-022/025	<0.1	1	<0.1	<0.1	0	101	116
Chlorpyriphos	mg/kg	0.1	Org-022/025	<0.1	1	<0.1	<0.1	0	96	108
Fenthion	mg/kg	0.1	Org-022/025	<0.1	1	<0.1	<0.1	0	[NT]	[NT]
Parathion	mg/kg	0.1	Org-022/025	<0.1	1	<0.1	<0.1	0	87	109
Bromophos-ethyl	mg/kg	0.1	Org-022/025	<0.1	1	<0.1	<0.1	0	[NT]	[NT]
Methidathion	mg/kg	0.1	Org-022/025	<0.1	1	<0.1	<0.1	0	[NT]	[NT]
Fenamiphos	mg/kg	0.1	Org-022/025	<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	82	104
Phosalone	mg/kg	0.1	Org-022/025	<0.1	1	<0.1	<0.1	0	[NT]	[NT]
Azinphos-methyl (Guthion)	mg/kg	0.1	Org-022/025	<0.1	1	<0.1	<0.1	0	[NT]	[NT]
Coumaphos	mg/kg	0.1	Org-022/025	<0.1	1	<0.1	<0.1	0	[NT]	[NT]
Surrogate TCMX	%		Org-022/025	101	1	106	105	1	94	101

QUALITY CONTROL: Organophosphorus Pesticides in Soil					Duplicate				Spike Recovery %	
Test Description	Units	PQL	Method	Blank	#	Base	Dup.	RPD	LCS-8	335052-47
Date extracted	-			[NT]	31	16/10/2023	16/10/2023		16/10/2023	16/10/2023
Date analysed	-			[NT]	31	17/10/2023	17/10/2023		17/10/2023	17/10/2023
Dichlorvos	mg/kg	0.1	Org-022/025	[NT]	31	<0.1	<0.1	0	121	109
Mevinphos	mg/kg	0.1	Org-022/025	[NT]	31	<0.1	<0.1	0	[NT]	[NT]
Phorate	mg/kg	0.1	Org-022/025	[NT]	31	<0.1	<0.1	0	[NT]	[NT]
Dimethoate	mg/kg	0.1	Org-022/025	[NT]	31	<0.1	<0.1	0	[NT]	[NT]
Diazinon	mg/kg	0.1	Org-022/025	[NT]	31	<0.1	<0.1	0	[NT]	[NT]
Disulfoton	mg/kg	0.1	Org-022/025	[NT]	31	<0.1	<0.1	0	[NT]	[NT]
Chlorpyrifos-methyl	mg/kg	0.1	Org-022/025	[NT]	31	<0.1	<0.1	0	[NT]	[NT]
Parathion-Methyl	mg/kg	0.1	Org-022/025	[NT]	31	<0.1	<0.1	0	[NT]	[NT]
Ronnel	mg/kg	0.1	Org-022/025	[NT]	31	<0.1	<0.1	0	97	97
Fenitrothion	mg/kg	0.1	Org-022/025	[NT]	31	<0.1	<0.1	0	101	105
Malathion	mg/kg	0.1	Org-022/025	[NT]	31	<0.1	<0.1	0	105	106
Chlorpyriphos	mg/kg	0.1	Org-022/025	[NT]	31	<0.1	<0.1	0	104	102
Fenthion	mg/kg	0.1	Org-022/025	[NT]	31	<0.1	<0.1	0	[NT]	[NT]
Parathion	mg/kg	0.1	Org-022/025	[NT]	31	<0.1	<0.1	0	93	111
Bromophos-ethyl	mg/kg	0.1	Org-022/025	[NT]	31	<0.1	<0.1	0	[NT]	[NT]
Methidathion	mg/kg	0.1	Org-022/025	[NT]	31	<0.1	<0.1	0	[NT]	[NT]
Fenamiphos	mg/kg	0.1	Org-022/025	[NT]	31	<0.1	<0.1	0	[NT]	[NT]
Ethion	mg/kg	0.1	Org-022/025	[NT]	31	<0.1	<0.1	0	94	96
Phosalone	mg/kg	0.1	Org-022/025	[NT]	31	<0.1	<0.1	0	[NT]	[NT]
Azinphos-methyl (Guthion)	mg/kg	0.1	Org-022/025	[NT]	31	<0.1	<0.1	0	[NT]	[NT]
Coumaphos	mg/kg	0.1	Org-022/025	[NT]	31	<0.1	<0.1	0	[NT]	[NT]
Surrogate TCMX	%		Org-022/025	[NT]	31	104	103	1	98	93

QUALITY CONTROL: Organophosphorus Pesticides in Soil					Duplicate				Spike Recovery %	
Test Description	Units	PQL	Method	Blank	#	Base	Dup.	RPD	[NT]	[NT]
Date extracted	-			[NT]	46	16/10/2023	16/10/2023		[NT]	[NT]
Date analysed	-			[NT]	46	17/10/2023	17/10/2023		[NT]	[NT]
Dichlorvos	mg/kg	0.1	Org-022/025	[NT]	46	<0.1	<0.1	0	[NT]	[NT]
Mevinphos	mg/kg	0.1	Org-022/025	[NT]	46	<0.1	<0.1	0	[NT]	[NT]
Phorate	mg/kg	0.1	Org-022/025	[NT]	46	<0.1	<0.1	0	[NT]	[NT]
Dimethoate	mg/kg	0.1	Org-022/025	[NT]	46	<0.1	<0.1	0	[NT]	[NT]
Diazinon	mg/kg	0.1	Org-022/025	[NT]	46	<0.1	<0.1	0	[NT]	[NT]
Disulfoton	mg/kg	0.1	Org-022/025	[NT]	46	<0.1	<0.1	0	[NT]	[NT]
Chlorpyrifos-methyl	mg/kg	0.1	Org-022/025	[NT]	46	<0.1	<0.1	0	[NT]	[NT]
Parathion-Methyl	mg/kg	0.1	Org-022/025	[NT]	46	<0.1	<0.1	0	[NT]	[NT]
Ronnel	mg/kg	0.1	Org-022/025	[NT]	46	<0.1	<0.1	0	[NT]	[NT]
Fenitrothion	mg/kg	0.1	Org-022/025	[NT]	46	<0.1	<0.1	0	[NT]	[NT]
Malathion	mg/kg	0.1	Org-022/025	[NT]	46	<0.1	<0.1	0	[NT]	[NT]
Chlorpyriphos	mg/kg	0.1	Org-022/025	[NT]	46	<0.1	<0.1	0	[NT]	[NT]
Fenthion	mg/kg	0.1	Org-022/025	[NT]	46	<0.1	<0.1	0	[NT]	[NT]
Parathion	mg/kg	0.1	Org-022/025	[NT]	46	<0.1	<0.1	0	[NT]	[NT]
Bromophos-ethyl	mg/kg	0.1	Org-022/025	[NT]	46	<0.1	<0.1	0	[NT]	[NT]
Methidathion	mg/kg	0.1	Org-022/025	[NT]	46	<0.1	<0.1	0	[NT]	[NT]
Fenamiphos	mg/kg	0.1	Org-022/025	[NT]	46	<0.1	<0.1	0	[NT]	[NT]
Ethion	mg/kg	0.1	Org-022/025	[NT]	46	<0.1	<0.1	0	[NT]	[NT]
Phosalone	mg/kg	0.1	Org-022/025	[NT]	46	<0.1	<0.1	0	[NT]	[NT]
Azinphos-methyl (Guthion)	mg/kg	0.1	Org-022/025	[NT]	46	<0.1	<0.1	0	[NT]	[NT]
Coumaphos	mg/kg	0.1	Org-022/025	[NT]	46	<0.1	<0.1	0	[NT]	[NT]
Surrogate TCMX	%		Org-022/025	[NT]	46	102	101	1	[NT]	[NT]

QUALITY CONTROL: PCBs in Soil						Duplicate			Spike Recovery %	
Test Description	Units	PQL	Method	Blank	#	Base	Dup.	RPD	LCS-7	335052-6
Date extracted	-			16/10/2023	1	16/10/2023	16/10/2023		16/10/2023	16/10/2023
Date analysed	-			17/10/2023	1	17/10/2023	17/10/2023		17/10/2023	17/10/2023
Aroclor 1016	mg/kg	0.1	Org-021	<0.1	1	<0.1	<0.1	0	[NT]	[NT]
Aroclor 1221	mg/kg	0.1	Org-021	<0.1	1	<0.1	<0.1	0	[NT]	[NT]
Aroclor 1232	mg/kg	0.1	Org-021	<0.1	1	<0.1	<0.1	0	[NT]	[NT]
Aroclor 1242	mg/kg	0.1	Org-021	<0.1	1	<0.1	<0.1	0	[NT]	[NT]
Aroclor 1248	mg/kg	0.1	Org-021	<0.1	1	<0.1	<0.1	0	[NT]	[NT]
Aroclor 1254	mg/kg	0.1	Org-021	<0.1	1	<0.1	<0.1	0	110	100
Aroclor 1260	mg/kg	0.1	Org-021	<0.1	1	<0.1	<0.1	0	[NT]	[NT]
Surrogate TCMX	%		Org-021	101	1	106	105	1	94	101

QUALITY CONTROL: PCBs in Soil						Duplicate			Spike Recovery %	
Test Description	Units	PQL	Method	Blank	#	Base	Dup.	RPD	LCS-8	335052-47
Date extracted	-			[NT]	31	16/10/2023	16/10/2023		16/10/2023	16/10/2023
Date analysed	-			[NT]	31	17/10/2023	17/10/2023		17/10/2023	17/10/2023
Aroclor 1016	mg/kg	0.1	Org-021	[NT]	31	<0.1	<0.1	0	[NT]	[NT]
Aroclor 1221	mg/kg	0.1	Org-021	[NT]	31	<0.1	<0.1	0	[NT]	[NT]
Aroclor 1232	mg/kg	0.1	Org-021	[NT]	31	<0.1	<0.1	0	[NT]	[NT]
Aroclor 1242	mg/kg	0.1	Org-021	[NT]	31	<0.1	<0.1	0	[NT]	[NT]
Aroclor 1248	mg/kg	0.1	Org-021	[NT]	31	<0.1	<0.1	0	[NT]	[NT]
Aroclor 1254	mg/kg	0.1	Org-021	[NT]	31	<0.1	<0.1	0	121	80
Aroclor 1260	mg/kg	0.1	Org-021	[NT]	31	<0.1	<0.1	0	[NT]	[NT]
Surrogate TCMX	%		Org-021	[NT]	31	104	103	1	98	93

QUALITY CONTROL: PCBs in Soil						Duplicate			Spike Recovery %	
Test Description	Units	PQL	Method	Blank	#	Base	Dup.	RPD	[NT]	[NT]
Date extracted	-			[NT]	46	16/10/2023	16/10/2023		[NT]	[NT]
Date analysed	-			[NT]	46	17/10/2023	17/10/2023		[NT]	[NT]
Aroclor 1016	mg/kg	0.1	Org-021	[NT]	46	<0.1	<0.1	0	[NT]	[NT]
Aroclor 1221	mg/kg	0.1	Org-021	[NT]	46	<0.1	<0.1	0	[NT]	[NT]
Aroclor 1232	mg/kg	0.1	Org-021	[NT]	46	<0.1	<0.1	0	[NT]	[NT]
Aroclor 1242	mg/kg	0.1	Org-021	[NT]	46	<0.1	<0.1	0	[NT]	[NT]
Aroclor 1248	mg/kg	0.1	Org-021	[NT]	46	<0.1	<0.1	0	[NT]	[NT]
Aroclor 1254	mg/kg	0.1	Org-021	[NT]	46	<0.1	<0.1	0	[NT]	[NT]
Aroclor 1260	mg/kg	0.1	Org-021	[NT]	46	<0.1	<0.1	0	[NT]	[NT]
Surrogate TCMX	%		Org-021	[NT]	46	102	101	1	[NT]	[NT]

QUALITY CONTROL: Acid Extractable metals in soil						Duplicate			Spike Recovery %	
Test Description	Units	PQL	Method	Blank	#	Base	Dup.	RPD	LCS-7	335052-6
Date prepared	-			16/10/2023	1	16/10/2023	16/10/2023		16/10/2023	16/10/2023
Date analysed	-			17/10/2023	1	17/10/2023	17/10/2023		17/10/2023	17/10/2023
Arsenic	mg/kg	4	Metals-020	<4	1	100	62	47	107	92
Cadmium	mg/kg	0.4	Metals-020	<0.4	1	0.6	0.5	18	98	84
Chromium	mg/kg	1	Metals-020	<1	1	31	28	10	120	84
Copper	mg/kg	1	Metals-020	<1	1	100	39	88	105	103
Lead	mg/kg	1	Metals-020	<1	1	370	160	79	99	97
Mercury	mg/kg	0.1	Metals-021	<0.1	1	<0.1	<0.1	0	113	121
Manganese	mg/kg	1	Metals-020	<1	1	1500	1000	40	102	#
Nickel	mg/kg	1	Metals-020	<1	1	21	15	33	102	85
Zinc	mg/kg	1	Metals-020	<1	1	230	200	14	105	108

QUALITY CONTROL: Acid Extractable metals in soil						Duplicate			Spike Recovery %	
Test Description	Units	PQL	Method	Blank	#	Base	Dup.	RPD	LCS-8	335052-47
Date prepared	-			[NT]	31	16/10/2023	16/10/2023		16/10/2023	16/10/2023
Date analysed	-			[NT]	31	17/10/2023	17/10/2023		17/10/2023	17/10/2023
Arsenic	mg/kg	4	Metals-020	[NT]	31	97	100	3	105	102
Cadmium	mg/kg	0.4	Metals-020	[NT]	31	<0.4	<0.4	0	99	83
Chromium	mg/kg	1	Metals-020	[NT]	31	28	26	7	108	94
Copper	mg/kg	1	Metals-020	[NT]	31	110	130	17	103	108
Lead	mg/kg	1	Metals-020	[NT]	31	94	93	1	109	90
Mercury	mg/kg	0.1	Metals-021	[NT]	31	<0.1	<0.1	0	119	115
Manganese	mg/kg	1	Metals-020	[NT]	31	550	540	2	102	#
Nickel	mg/kg	1	Metals-020	[NT]	31	13	13	0	102	85
Zinc	mg/kg	1	Metals-020	[NT]	31	180	220	20	98	84

QUALITY CONTROL: Acid Extractable metals in soil						Duplicate			Spike Recovery %	
Test Description	Units	PQL	Method	Blank	#	Base	Dup.	RPD	[NT]	[NT]
Date prepared	-			[NT]	46	16/10/2023	16/10/2023		[NT]	[NT]
Date analysed	-			[NT]	46	17/10/2023	17/10/2023		[NT]	[NT]
Arsenic	mg/kg	4	Metals-020	[NT]	46	26	27	4	[NT]	[NT]
Cadmium	mg/kg	0.4	Metals-020	[NT]	46	<0.4	<0.4	0	[NT]	[NT]
Chromium	mg/kg	1	Metals-020	[NT]	46	29	31	7	[NT]	[NT]
Copper	mg/kg	1	Metals-020	[NT]	46	28	33	16	[NT]	[NT]
Lead	mg/kg	1	Metals-020	[NT]	46	24	27	12	[NT]	[NT]
Mercury	mg/kg	0.1	Metals-021	[NT]	46	<0.1	<0.1	0	[NT]	[NT]
Manganese	mg/kg	1	Metals-020	[NT]	46	520	460	12	[NT]	[NT]
Nickel	mg/kg	1	Metals-020	[NT]	46	18	19	5	[NT]	[NT]
Zinc	mg/kg	1	Metals-020	[NT]	46	53	58	9	[NT]	[NT]

QUALITY CONTROL: Misc Soil - Inorg					Duplicate				Spike Recovery %	
Test Description	Units	PQL	Method	Blank	#	Base	Dup.	RPD	LCS-7	335052-6
Date prepared	-			17/10/2023	1	16/10/2023	16/10/2023		17/10/2023	17/10/2023
Date analysed	-			17/10/2023	1	17/10/2023	17/10/2023		17/10/2023	17/10/2023
Total Phenolics (as Phenol)	mg/kg	5	Inorg-031	<5	1	<5	<5	0	104	88

QUALITY CONTROL: Misc Soil - Inorg					Duplicate				Spike Recovery %	
Test Description	Units	PQL	Method	Blank	#	Base	Dup.	RPD	[NT]	[NT]
Date prepared	-			[NT]	41	16/10/2023	16/10/2023		[NT]	[NT]
Date analysed	-			[NT]	41	17/10/2023	17/10/2023		[NT]	[NT]
Total Phenolics (as Phenol)	mg/kg	5	Inorg-031	[NT]	41	<5	<5	0	[NT]	[NT]

QUALITY CONTROL: Misc Inorg - Soil						Duplicate			Spike Recovery %	
Test Description	Units	PQL	Method	Blank	#	Base	Dup.	RPD	LCS-7	[NT]
Date prepared	-			17/10/2023	[NT]	[NT]	[NT]	[NT]	17/10/2023	[NT]
Date analysed	-			17/10/2023	[NT]	[NT]	[NT]	[NT]	17/10/2023	[NT]
pH 1:5 soil:water	pH Units		Inorg-001	[NT]	[NT]	[NT]	[NT]	[NT]	100	[NT]

QUALITY CONTROL: CEC						Duplicate			Spike Recovery %	
Test Description	Units	PQL	Method	Blank	#	Base	Dup.	RPD	LCS-W1	[NT]
Date prepared	-			19/10/2023	[NT]	[NT]	[NT]	[NT]	19/10/2023	[NT]
Date analysed	-			19/10/2023	[NT]	[NT]	[NT]	[NT]	19/10/2023	[NT]
Exchangeable Ca	meq/100g	0.1	Metals-020	<0.1	[NT]	[NT]	[NT]	[NT]	101	[NT]
Exchangeable K	meq/100g	0.1	Metals-020	<0.1	[NT]	[NT]	[NT]	[NT]	104	[NT]
Exchangeable Mg	meq/100g	0.1	Metals-020	<0.1	[NT]	[NT]	[NT]	[NT]	95	[NT]
Exchangeable Na	meq/100g	0.1	Metals-020	<0.1	[NT]	[NT]	[NT]	[NT]	112	[NT]

Result Definitions

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

Quality Control Definitions

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

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

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

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

Laboratory Acceptance Criteria

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

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

Spikes for Physical and Aggregate Tests are not applicable.

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

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

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

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

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

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

Where matrix spike recoveries fall below the lower limit of the acceptance criteria (e.g. for non-labile or standard Organics <60%), positive result(s) in the parent sample will subsequently have a higher than typical estimated uncertainty (MU estimates supplied on request) and in these circumstances the sample result is likely biased significantly low.

Measurement Uncertainty estimates are available for most tests upon request.

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

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

Report Comments

MISC_INORG_DRY:
Samples were out of the recommended holding time for this analysis pH.

Acid Extractable Metals in Soil:
- The laboratory RPD acceptance criteria has been exceeded for 335052-1 for As, Cu, Pb and Mn. Therefore a triplicate result has been issued as laboratory sample number 335052-52.
- # Percent recovery is not applicable due to the high concentration of the element/s in the sample/s. However an acceptable recovery was obtained for the LCS.

Asbestos: A portion of the supplied sample was sub-sampled for asbestos according to ASB-001 asbestos subsampling procedure. We cannot guarantee that this sub-sample is indicative of the entire sample. Envirolab/MPL recommends supplying 40-60g or 500ml of sample in its own container.
Note: Samples requested for testing were sub-sampled from jars provided by the client.

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 Canberra
Attention	Kenton Horsley

Sample Login Details

Your reference	224779.00, Googong
Envirolab Reference	335052
Date Sample Received	11/10/2023
Date Instructions Received	13/10/2023
Date Results Expected to be Reported	20/10/2023

Sample Condition

Samples received in appropriate condition for analysis	Yes
No. of Samples Provided	51 Soil
Turnaround Time Requested	Standard
Temperature on Receipt (°C)	15
Cooling Method	Ice Pack
Sampling Date Provided	YES

Comments

Updated COC received: 13/10/2023, 1040

Please direct any queries to:

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

Analysis Underway, details on the following page:

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Sample ID	vTRH(C6-C10)/BTEXN in Soil	svTRH (C10-C40) in Soil	PAHs in Soil	Organochlorine Pesticides in soil	Organophosphorus Pesticides in Soil	PCBs in Soil	Acid Extractable metalsin soil	Misc Soil - Inorg	Misc Inorg - Soil	CEC	Asbestos ID - soils	On Hold
201-0.1	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	
201-0.5	✓	✓	✓				✓					
201-1												✓
201-1.5												✓
201-2												✓
202-0.1	✓	✓	✓	✓	✓	✓	✓	✓			✓	
202-0.5												✓
202-1	✓	✓	✓				✓				✓	
202-1.5												✓
202-2												✓
202-2.5												✓
203-0.1	✓	✓	✓	✓	✓	✓	✓	✓			✓	
203-0.5									✓	✓		
203-1	✓	✓	✓				✓					
203-1.5												✓
203-2												✓
203-2.5												✓
204-0.1	✓	✓	✓	✓	✓	✓	✓	✓			✓	
204-0.5												✓
204-1												✓
204-1.5												✓
204-2												✓
204-2.5												✓
205-0.1	✓	✓	✓	✓	✓	✓	✓	✓			✓	
205-0.5	✓	✓	✓				✓					
205-1												✓
205-1.5												✓
205-2												✓
205-2.5												✓
205-3												✓
206-0.1	✓	✓	✓	✓	✓	✓	✓	✓			✓	
206-0.5	✓	✓	✓				✓					

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Sample ID	vTRH(C6-C10)/BTEXN in Soil	svTRH (C10-C40) in Soil	PAHs in Soil	Organochlorine Pesticides in soil	Organophosphorus Pesticides in Soil	PCBs in Soil	Acid Extractable metalsin soil	Misc Soil - Inorg	Misc Inorg - Soil	CEC	Asbestos ID - soils	On Hold
206-1												✓
206-1.5									✓	✓		
206-2												✓
206-2.5												✓
207-0.1	✓	✓	✓	✓	✓	✓	✓	✓			✓	
207-0.2	✓	✓	✓				✓					
208-0.1	✓	✓	✓	✓	✓	✓	✓	✓			✓	
209-0.15	✓	✓	✓				✓					
210-0.1	✓	✓	✓	✓	✓	✓	✓	✓			✓	
210-0.2	✓	✓	✓				✓					
211-0.15	✓	✓	✓	✓	✓	✓	✓	✓			✓	
212-0.1	✓	✓	✓	✓	✓	✓	✓	✓			✓	
212-0.2	✓	✓	✓				✓					
213-0.1	✓	✓	✓	✓	✓	✓	✓	✓			✓	
214-0.2	✓	✓	✓	✓	✓	✓	✓	✓			✓	
215-0.2	✓	✓	✓	✓	✓	✓	✓	✓			✓	
216-0.1	✓	✓	✓	✓	✓	✓	✓	✓			✓	
R1	✓	✓					✓					
R2	✓	✓					✓					

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.

Updated : 13/10/23, 1040

Douglas Partners
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CHAIN OF CUSTODY DESPATCH SHEET

Project No:	224779.00	**Suburb:**	Googong	**To:**	Envirolab Services
Project Manager:	Kenton Horsley	**Order Number:**		**Sampler:**	12 Ashley St, Chatswood NSW 2067
Email:	kenton.horsley@douglaspartners.com.au			**Attn:**	Sample Receipt
Turnaround time:	☑ Standard ☐ 72 hour ☐ 48 hour ☐ 24 hour ☐ Same day				(02) 9910 6200 samplereceipt@envirolab.com.au
Prior Storage:	☑ Fridge ☐ Freezer ☐ Esky ☐ Shelf	**Do samples contain 'potential' HBM?**	☑ No ☐ Yes		(If YES, then handle, transport and store in accordance with FPM HAZID)

Lab ID	Sample ID: Location / Other ID	Sample ID: Depth From	Sample ID: Depth To	Date Sampled	Sample Type: S - soil W - water M - Material	Container Type: G - glass P - plastic	Analytes: Combo 8A (incl. Mn	Combo 3 (incl. Mn(	pH, CEC	Combo 1m								Notes/ Preservation/ Additional Requirements
1	201	0.1		27/09/23	S	G	X		X									
2	201	0.5		27/09/23	S	G												
3	201	1		27/09/23	S	G		X										
4	201	1.5		27/09/23	S	G												
5	201	2		27/09/23	S	G												
6	202	0.1		27/09/23	S	G	X											
7	202	0.5		27/09/23	S	G												
8	202	1		27/09/23	S	G		X										
9	202	1.5		27/09/23	S	G												
10	202	2		27/09/23	S	G												
11	202	2.5		27/09/23	S	G												
12	203	0.1		28/09/23	S	G	X											
13	203	0.5		28/09/23	S	G			X									
14	203	1		28/09/23	S	G		X										
15	203	1.5		28/09/23	S	G												

Metals to analyse:	8hm + Mn				
Number of samples in container:		**Transported to laboratory by:**	FedX		
Send results to:	Douglas Partners Pty Ltd				
Address:	Unit 2, 73 Sheppard Street, Hume ACT 262	**Phone:**	(02) 6260 2788		
Relinquished by:	HS	**Date:**	10/10/2023	**Signed:**	HS

LAB RECEIPT

Lab Ref. No:	335052
Received by:	KW
Date & Time:	11/10/23, 1045
Signed:	KW

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CHAIN OF CUSTODY DESPATCH SHEET

Project No:	224779.00	**Suburb:** Googong	**To:** Envirolab Services
Project Manager:	Kenton Horsley		**Dispatch date:** 10/10/2023

Lab ID	Sample ID: Location / Other ID	Sample ID: Depth From	Sample ID: Depth To	Date Sampled	Sample Type: S - soil W - water M -	Container Type: G - glass P - plastic	Analytes: Combo 8A (incl. Mn	Combo 3 (incl. Mn(	pH, CEC	Combo 1m								Notes/ Preservation/ Additional Requirements
16	203	2		28/09/23	S	G												
17	203	2.5		28/09/23	S	G												
18	204	0.1		28/09/23	S	G	X											
19	204	0.5		28/09/23	S	G												
20	204	1		28/09/23	S	G												
21	204	1.5		28/09/23	S	G												
22	204	2		28/09/23	S	G												
23	204	2.5		28/09/23	S	G												
24	205	0.1		28/09/23	S	G	X											
25	205	0.5		28/09/23	S	G		X										
26	205	1		28/09/23	S	G												
27	205	1.5		28/09/23	S	G												
28	205	2		28/09/23	S	G												
29	205	2.5		28/09/23	S	G												
30	205	3		28/09/23	S	G												
31	206	0.1		29/09/23	S	G	X											
32	206	0.5		29/09/23	S	G		X										
33	206	1		29/09/23	S	G												
34	206	1.5		29/09/23	S	G			X									#335052 11/10/23
35	206	2		29/09/23	S	G												
36	206	2.5		29/09/23	S	G												

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CHAIN OF CUSTODY DESPATCH SHEET

Project No:	224779.00	**Suburb:** Googong	**To:** Envirolab Services
Project Manager:	Kenton Horsley		**Dispatch date:** 10/10/2023

Lab ID	Sample ID: Location / Other ID	Sample ID: Depth From	Sample ID: Depth To	Date Sampled	Sample Type: S - soil W - water M -	Container Type: G - glass P - plastic	Analytes: Combo 8A (incl. Mn	Combo 3 (incl. Mn(	pH, CEC	Combo 1m								Notes/ Preservation/ Additional Requirements
37	207	0.1		26/09/23	S	G	X											
38	207	0.2		26/09/23	S	G		X										
39	208	0.1		26/09/23	S	G	X											
40	209	0.15		26/09/23	S	G		X										
41	210	0.1		26/09/23	S	G	X											
42	210	0.2		26/09/23	S	G		X										
43	211	0.15		26/09/23	S	G	X											
44	212	0.1		26/09/23	S	G	X											
45	212	0.2		26/09/23	S	G		X										
~~46~~	213	0.1		26/09/23	S	G	X											
47	214	0.2		26/09/23	S	G	X											
48	215	0.2		26/09/23	S	G	X											
49	216	0.1		26/09/23	S	G	X											
50	R1			26/09/23	S	G				X								
51	R2			26/09/23	S	G				X								
~~52~~	R3			29/09/23	S	G				X								Please send ALS (TRH/BTEX 9HM (8 HM + Mn))
																		#335052
																		11/10/23

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CERTIFICATE OF ANALYSIS 337513

Client Details

Client	Douglas Partners Canberra
Attention	Kenton Horsley
Address	Unit 2, 73 Sheppard St,, HUME, ACT, 2620

Sample Details

Your Reference	**224779.00, Googong**
Number of Samples	10 Soil
Date samples received	10/11/2023
Date completed instructions received	10/11/2023

Analysis Details

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

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

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

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

Report Details

Date results requested by	17/11/2023
Date of Issue	17/11/2023

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Asbestos Approved By
Analysed by Asbestos Approved Analyst: Lucy Zhu
Authorised by Asbestos Approved Signatory: Lucy Zhu

Results Approved By
Diana Korniewicz, Chemist
Diego Bigolin, Inorganics Supervisor
Liam Timmins, Organics Supervisor
Lucy Zhu, Asbestos Supervisor
Tim Toll, Chemist (FAS)

Authorised By
Nancy Zhang, Laboratory Manager

vTRH(C6-C10)/BTEXN in Soil						
Our Reference		337513-1	337513-2	337513-3	337513-4	337513-5
Your Reference	UNITS	217	218	219	220	221
Depth		0.1-0.2	0.1-0.2	0.1-0.2	0.1-0.2	0.1-0.2
Date Sampled		08/11/2023	08/11/2023	08/11/2023	08/11/2023	08/11/2023
Type of sample		Soil	Soil	Soil	Soil	Soil
Date extracted	-	13/11/2023	13/11/2023	13/11/2023	13/11/2023	13/11/2023
Date analysed	-	17/11/2023	17/11/2023	17/11/2023	17/11/2023	17/11/2023
TRH C_6 - C_9	mg/kg	<25	<25	<25	<25	<25
TRH C_6 - C_{10}	mg/kg	<25	<25	<25	<25	<25
vTPH C_6 - C_{10} less BTEX (F1)	mg/kg	<25	<25	<25	<25	<25
Benzene	mg/kg	<0.2	<0.2	<0.2	<0.2	<0.2
Toluene	mg/kg	<0.5	<0.5	<0.5	<0.5	<0.5
Ethylbenzene	mg/kg	<1	<1	<1	<1	<1
m+p-xylene	mg/kg	<2	<2	<2	<2	<2
o-Xylene	mg/kg	<1	<1	<1	<1	<1
Naphthalene	mg/kg	<1	<1	<1	<1	<1
Total +ve Xylenes	mg/kg	<1	<1	<1	<1	<1
Surrogate aaa-Trifluorotoluene	%	85	81	78	86	84

vTRH(C6-C10)/BTEXN in Soil						
Our Reference		337513-6	337513-7	337513-8	337513-9	337513-10
Your Reference	UNITS	222	223	224	225	226
Depth		0.05-0.1	0.1-0.2	0.05-0.1	0.2-0.3	0.1-0.15
Date Sampled		08/11/2023	08/11/2023	08/11/2023	08/11/2023	08/11/2023
Type of sample		Soil	Soil	Soil	Soil	Soil
Date extracted	-	13/11/2023	13/11/2023	13/11/2023	13/11/2023	13/11/2023
Date analysed	-	17/11/2023	17/11/2023	17/11/2023	17/11/2023	17/11/2023
TRH C_6 - C_9	mg/kg	<25	<25	<25	<25	<25
TRH C_6 - C_{10}	mg/kg	<25	<25	<25	<25	<25
vTPH C_6 - C_{10} less BTEX (F1)	mg/kg	<25	<25	<25	<25	<25
Benzene	mg/kg	<0.2	<0.2	<0.2	<0.2	<0.2
Toluene	mg/kg	<0.5	<0.5	<0.5	<0.5	<0.5
Ethylbenzene	mg/kg	<1	<1	<1	<1	<1
m+p-xylene	mg/kg	<2	<2	<2	<2	<2
o-Xylene	mg/kg	<1	<1	<1	<1	<1
Naphthalene	mg/kg	<1	<1	<1	<1	<1
Total +ve Xylenes	mg/kg	<1	<1	<1	<1	<1
Surrogate aaa-Trifluorotoluene	%	81	86	82	82	83

svTRH (C10-C40) in Soil						
Our Reference		337513-1	337513-2	337513-3	337513-4	337513-5
Your Reference	UNITS	217	218	219	220	221
Depth		0.1-0.2	0.1-0.2	0.1-0.2	0.1-0.2	0.1-0.2
Date Sampled		08/11/2023	08/11/2023	08/11/2023	08/11/2023	08/11/2023
Type of sample		Soil	Soil	Soil	Soil	Soil
Date extracted	-	13/11/2023	13/11/2023	13/11/2023	13/11/2023	13/11/2023
Date analysed	-	15/11/2023	15/11/2023	15/11/2023	15/11/2023	15/11/2023
TRH C_{10} - C_{14}	mg/kg	<50	<50	<50	<50	<50
TRH C_{15} - C_{28}	mg/kg	<100	<100	<100	<100	<100
TRH C_{29} - C_{36}	mg/kg	<100	<100	<100	<100	<100
Total +ve TRH (C10-C36)	mg/kg	<50	<50	<50	<50	<50
TRH >C_{10} -C_{16}	mg/kg	<50	<50	<50	<50	<50
TRH >C_{10} - C_{16} less Naphthalene (F2)	mg/kg	<50	<50	<50	<50	<50
TRH >C_{16} -C_{34}	mg/kg	<100	<100	<100	<100	<100
TRH >C_{34} -C_{40}	mg/kg	<100	<100	<100	<100	<100
Total +ve TRH (>C10-C40)	mg/kg	<50	<50	<50	<50	<50
Surrogate o-Terphenyl	%	91	90	91	92	93

svTRH (C10-C40) in Soil						
Our Reference		337513-6	337513-7	337513-8	337513-9	337513-10
Your Reference	UNITS	222	223	224	225	226
Depth		0.05-0.1	0.1-0.2	0.05-0.1	0.2-0.3	0.1-0.15
Date Sampled		08/11/2023	08/11/2023	08/11/2023	08/11/2023	08/11/2023
Type of sample		Soil	Soil	Soil	Soil	Soil
Date extracted	-	13/11/2023	13/11/2023	13/11/2023	13/11/2023	13/11/2023
Date analysed	-	15/11/2023	15/11/2023	15/11/2023	15/11/2023	15/11/2023
TRH C_{10} - C_{14}	mg/kg	<50	<50	<50	<50	<50
TRH C_{15} - C_{28}	mg/kg	<100	<100	<100	<100	<100
TRH C_{29} - C_{36}	mg/kg	<100	<100	<100	<100	<100
Total +ve TRH (C10-C36)	mg/kg	<50	<50	<50	<50	<50
TRH >C_{10} -C_{16}	mg/kg	<50	<50	<50	<50	<50
TRH >C_{10} - C_{16} less Naphthalene (F2)	mg/kg	<50	<50	<50	<50	<50
TRH >C_{16} -C_{34}	mg/kg	<100	<100	<100	<100	<100
TRH >C_{34} -C_{40}	mg/kg	<100	<100	<100	<100	<100
Total +ve TRH (>C10-C40)	mg/kg	<50	<50	<50	<50	<50
Surrogate o-Terphenyl	%	93	90	90	91	94

PAHs in Soil						
Our Reference		337513-1	337513-2	337513-3	337513-4	337513-5
Your Reference	UNITS	217	218	219	220	221
Depth		0.1-0.2	0.1-0.2	0.1-0.2	0.1-0.2	0.1-0.2
Date Sampled		08/11/2023	08/11/2023	08/11/2023	08/11/2023	08/11/2023
Type of sample		Soil	Soil	Soil	Soil	Soil
Date extracted	-	13/11/2023	13/11/2023	13/11/2023	13/11/2023	13/11/2023
Date analysed	-	16/11/2023	16/11/2023	16/11/2023	16/11/2023	16/11/2023
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	%	112	113	112	112	112

PAHs in Soil						
Our Reference		337513-6	337513-7	337513-8	337513-9	337513-10
Your Reference	UNITS	222	223	224	225	226
Depth		0.05-0.1	0.1-0.2	0.05-0.1	0.2-0.3	0.1-0.15
Date Sampled		08/11/2023	08/11/2023	08/11/2023	08/11/2023	08/11/2023
Type of sample		Soil	Soil	Soil	Soil	Soil
Date extracted	-	13/11/2023	13/11/2023	13/11/2023	13/11/2023	13/11/2023
Date analysed	-	16/11/2023	16/11/2023	16/11/2023	16/11/2023	16/11/2023
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	%	113	113	109	110	112

Organochlorine Pesticides in soil						
Our Reference		337513-2	337513-4	337513-5	337513-6	337513-8
Your Reference	UNITS	218	220	221	222	224
Depth		0.1-0.2	0.1-0.2	0.1-0.2	0.05-0.1	0.05-0.1
Date Sampled		08/11/2023	08/11/2023	08/11/2023	08/11/2023	08/11/2023
Type of sample		Soil	Soil	Soil	Soil	Soil
Date extracted	-	13/11/2023	13/11/2023	13/11/2023	13/11/2023	13/11/2023
Date analysed	-	16/11/2023	16/11/2023	16/11/2023	16/11/2023	16/11/2023
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
Mirex	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	%	124	123	122	120	119

Organochlorine Pesticides in soil		
Our Reference		337513-10
Your Reference	UNITS	226
Depth		0.1-0.15
Date Sampled		08/11/2023
Type of sample		Soil
Date extracted	-	13/11/2023
Date analysed	-	16/11/2023
alpha-BHC	mg/kg	<0.1
HCB	mg/kg	<0.1
beta-BHC	mg/kg	<0.1
gamma-BHC	mg/kg	<0.1
Heptachlor	mg/kg	<0.1
delta-BHC	mg/kg	<0.1
Aldrin	mg/kg	<0.1
Heptachlor Epoxide	mg/kg	<0.1
gamma-Chlordane	mg/kg	<0.1
alpha-chlordane	mg/kg	<0.1
Endosulfan I	mg/kg	<0.1
pp-DDE	mg/kg	<0.1
Dieldrin	mg/kg	<0.1
Endrin	mg/kg	<0.1
Endosulfan II	mg/kg	<0.1
pp-DDD	mg/kg	<0.1
Endrin Aldehyde	mg/kg	<0.1
pp-DDT	mg/kg	<0.1
Endosulfan Sulphate	mg/kg	<0.1
Methoxychlor	mg/kg	<0.1
Mirex	mg/kg	<0.1
Total +ve DDT+DDD+DDE	mg/kg	<0.1
Surrogate TCMX	%	123

Organophosphorus Pesticides in Soil						
Our Reference		337513-2	337513-4	337513-5	337513-6	337513-8
Your Reference	UNITS	218	220	221	222	224
Depth		0.1-0.2	0.1-0.2	0.1-0.2	0.05-0.1	0.05-0.1
Date Sampled		08/11/2023	08/11/2023	08/11/2023	08/11/2023	08/11/2023
Type of sample		Soil	Soil	Soil	Soil	Soil
Date extracted	-	13/11/2023	13/11/2023	13/11/2023	13/11/2023	13/11/2023
Date analysed	-	16/11/2023	16/11/2023	16/11/2023	16/11/2023	16/11/2023
Dichlorvos	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Mevinphos	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Phorate	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
Disulfoton	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Chlorpyrifos-methyl	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Parathion-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
Fenthion	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
Methidathion	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Fenamiphos	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
Phosalone	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
Coumaphos	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Surrogate TCMX	%	124	123	122	120	119

Organophosphorus Pesticides in Soil		
Our Reference		337513-10
Your Reference	UNITS	226
Depth		0.1-0.15
Date Sampled		08/11/2023
Type of sample		Soil
Date extracted	-	13/11/2023
Date analysed	-	16/11/2023
Dichlorvos	mg/kg	<0.1
Mevinphos	mg/kg	<0.1
Phorate	mg/kg	<0.1
Dimethoate	mg/kg	<0.1
Diazinon	mg/kg	<0.1
Disulfoton	mg/kg	<0.1
Chlorpyrifos-methyl	mg/kg	<0.1
Parathion-Methyl	mg/kg	<0.1
Ronnel	mg/kg	<0.1
Fenitrothion	mg/kg	<0.1
Malathion	mg/kg	<0.1
Chlorpyriphos	mg/kg	<0.1
Fenthion	mg/kg	<0.1
Parathion	mg/kg	<0.1
Bromophos-ethyl	mg/kg	<0.1
Methidathion	mg/kg	<0.1
Fenamiphos	mg/kg	<0.1
Ethion	mg/kg	<0.1
Phosalone	mg/kg	<0.1
Azinphos-methyl (Guthion)	mg/kg	<0.1
Coumaphos	mg/kg	<0.1
Surrogate TCMX	%	123

PCBs in Soil						
Our Reference		337513-2	337513-4	337513-5	337513-6	337513-8
Your Reference	UNITS	218	220	221	222	224
Depth		0.1-0.2	0.1-0.2	0.1-0.2	0.05-0.1	0.05-0.1
Date Sampled		08/11/2023	08/11/2023	08/11/2023	08/11/2023	08/11/2023
Type of sample		Soil	Soil	Soil	Soil	Soil
Date extracted	-	13/11/2023	13/11/2023	13/11/2023	13/11/2023	13/11/2023
Date analysed	-	16/11/2023	16/11/2023	16/11/2023	16/11/2023	16/11/2023
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	%	124	123	122	120	119

PCBs in Soil		
Our Reference		337513-10
Your Reference	UNITS	226
Depth		0.1-0.15
Date Sampled		08/11/2023
Type of sample		Soil
Date extracted	-	13/11/2023
Date analysed	-	16/11/2023
Aroclor 1016	mg/kg	<0.1
Aroclor 1221	mg/kg	<0.1
Aroclor 1232	mg/kg	<0.1
Aroclor 1242	mg/kg	<0.1
Aroclor 1248	mg/kg	<0.1
Aroclor 1254	mg/kg	<0.1
Aroclor 1260	mg/kg	<0.1
Total +ve PCBs (1016-1260)	mg/kg	<0.1
Surrogate TCMX	%	123

Acid Extractable metals in soil						
Our Reference		337513-1	337513-2	337513-3	337513-4	337513-5
Your Reference	UNITS	217	218	219	220	221
Depth		0.1-0.2	0.1-0.2	0.1-0.2	0.1-0.2	0.1-0.2
Date Sampled		08/11/2023	08/11/2023	08/11/2023	08/11/2023	08/11/2023
Type of sample		Soil	Soil	Soil	Soil	Soil
Date prepared	-	13/11/2023	13/11/2023	13/11/2023	13/11/2023	13/11/2023
Date analysed	-	14/11/2023	14/11/2023	14/11/2023	14/11/2023	14/11/2023
Arsenic	mg/kg	17	120	15	26	12
Cadmium	mg/kg	<0.4	<0.4	<0.4	<0.4	<0.4
Chromium	mg/kg	20	23	19	27	18
Copper	mg/kg	15	160	10	22	19
Lead	mg/kg	19	910	26	43	30
Mercury	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Nickel	mg/kg	24	14	10	16	13
Manganese	mg/kg	350	540	240	430	530
Zinc	mg/kg	57	140	47	70	66

Acid Extractable metals in soil						
Our Reference		337513-6	337513-7	337513-8	337513-9	337513-10
Your Reference	UNITS	222	223	224	225	226
Depth		0.05-0.1	0.1-0.2	0.05-0.1	0.2-0.3	0.1-0.15
Date Sampled		08/11/2023	08/11/2023	08/11/2023	08/11/2023	08/11/2023
Type of sample		Soil	Soil	Soil	Soil	Soil
Date prepared	-	13/11/2023	13/11/2023	13/11/2023	13/11/2023	13/11/2023
Date analysed	-	14/11/2023	14/11/2023	14/11/2023	14/11/2023	14/11/2023
Arsenic	mg/kg	27	20	76	23	5
Cadmium	mg/kg	<0.4	<0.4	0.7	<0.4	<0.4
Chromium	mg/kg	25	27	35	32	26
Copper	mg/kg	24	61	33	19	7
Lead	mg/kg	53	40	210	75	12
Mercury	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Nickel	mg/kg	14	14	13	16	18
Manganese	mg/kg	630	400	2,100	2,000	640
Zinc	mg/kg	110	73	230	110	47

Acid Extractable metals in soil		
Our Reference		337513-11
Your Reference	UNITS	218 - [TRIPLICATE]
Depth		0.1-0.2
Date Sampled		08/11/2023
Type of sample		Soil
Date prepared	-	13/11/2023
Date analysed	-	14/11/2023
Arsenic	mg/kg	99
Cadmium	mg/kg	0.4
Chromium	mg/kg	27
Copper	mg/kg	51
Lead	mg/kg	310
Mercury	mg/kg	<0.1
Nickel	mg/kg	14
Manganese	mg/kg	530
Zinc	mg/kg	150

Misc Soil - Inorg						
Our Reference		337513-2	337513-4	337513-5	337513-6	337513-8
Your Reference	UNITS	218	220	221	222	224
Depth		0.1-0.2	0.1-0.2	0.1-0.2	0.05-0.1	0.05-0.1
Date Sampled		08/11/2023	08/11/2023	08/11/2023	08/11/2023	08/11/2023
Type of sample		Soil	Soil	Soil	Soil	Soil
Date prepared	-	13/11/2023	13/11/2023	13/11/2023	13/11/2023	13/11/2023
Date analysed	-	13/11/2023	13/11/2023	13/11/2023	13/11/2023	13/11/2023
Total Phenolics (as Phenol)	mg/kg	<5	<5	<5	<5	<5

Misc Soil - Inorg		
Our Reference		337513-10
Your Reference	UNITS	226
Depth		0.1-0.15
Date Sampled		08/11/2023
Type of sample		Soil
Date prepared	-	13/11/2023
Date analysed	-	13/11/2023
Total Phenolics (as Phenol)	mg/kg	<5

Moisture						
Our Reference		337513-1	337513-2	337513-3	337513-4	337513-5
Your Reference	UNITS	217	218	219	220	221
Depth		0.1-0.2	0.1-0.2	0.1-0.2	0.1-0.2	0.1-0.2
Date Sampled		08/11/2023	08/11/2023	08/11/2023	08/11/2023	08/11/2023
Type of sample		Soil	Soil	Soil	Soil	Soil
Date prepared	-	10/11/2023	10/11/2023	10/11/2023	10/11/2023	10/11/2023
Date analysed	-	13/11/2023	13/11/2023	13/11/2023	13/11/2023	13/11/2023
Moisture	%	4.3	15	12	5.1	4.0

Moisture						
Our Reference		337513-6	337513-7	337513-8	337513-9	337513-10
Your Reference	UNITS	222	223	224	225	226
Depth		0.05-0.1	0.1-0.2	0.05-0.1	0.2-0.3	0.1-0.15
Date Sampled		08/11/2023	08/11/2023	08/11/2023	08/11/2023	08/11/2023
Type of sample		Soil	Soil	Soil	Soil	Soil
Date prepared	-	10/11/2023	10/11/2023	10/11/2023	10/11/2023	10/11/2023
Date analysed	-	13/11/2023	13/11/2023	13/11/2023	13/11/2023	13/11/2023
Moisture	%	4.6	8.2	14	14	3.0

Asbestos ID - soils						
Our Reference		337513-2	337513-4	337513-5	337513-6	337513-8
Your Reference	UNITS	218	220	221	222	224
Depth		0.1-0.2	0.1-0.2	0.1-0.2	0.05-0.1	0.05-0.1
Date Sampled		08/11/2023	08/11/2023	08/11/2023	08/11/2023	08/11/2023
Type of sample		Soil	Soil	Soil	Soil	Soil
Date analysed	-	17/11/2023	17/11/2023	17/11/2023	17/11/2023	17/11/2023
Sample mass tested	g	Approx. 75g	Approx. 60g	Approx. 85g	Approx. 65g	Approx. 65g
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		337513-10
Your Reference	UNITS	226
Depth		0.1-0.15
Date Sampled		08/11/2023
Type of sample		Soil
Date analysed	-	17/11/2023
Sample mass tested	g	Approx. 65g
Sample Description	-	Brown coarse-grained soil & rocks
Asbestos ID in soil	-	No asbestos detected at reporting limit of 0.1g/kg Organic fibres detected
Asbestos comments	-	NO
Trace Analysis	-	No asbestos detected

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-021/022/025	Soil samples are extracted with dichloromethane/acetone and waters with dichloromethane and analysed by GC-ECD and/or GC-MS/GC-MSMS.
Org-021/022/025	Soil samples are extracted with dichloromethane/acetone and waters with dichloromethane and analysed by GC-ECD and/or GC-MS/GC-MSMS. 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-022/025	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	[NT]
Date extracted	-			13/11/2023	2	13/11/2023	13/11/2023		13/11/2023	[NT]
Date analysed	-			17/11/2023	2	17/11/2023	17/11/2023		17/11/2023	[NT]
TRH C_6 - C_9	mg/kg	25	Org-023	<25	2	<25	<25	0	97	[NT]
TRH C_6 - C_{10}	mg/kg	25	Org-023	<25	2	<25	<25	0	97	[NT]
Benzene	mg/kg	0.2	Org-023	<0.2	2	<0.2	<0.2	0	93	[NT]
Toluene	mg/kg	0.5	Org-023	<0.5	2	<0.5	<0.5	0	90	[NT]
Ethylbenzene	mg/kg	1	Org-023	<1	2	<1	<1	0	95	[NT]
m+p-xylene	mg/kg	2	Org-023	<2	2	<2	<2	0	103	[NT]
o-Xylene	mg/kg	1	Org-023	<1	2	<1	<1	0	96	[NT]
Naphthalene	mg/kg	1	Org-023	<1	2	<1	<1	0	[NT]	[NT]
Surrogate aaa-Trifluorotoluene	%		Org-023	86	2	81	81	0	85	[NT]

QUALITY CONTROL: svTRH (C10-C40) in Soil						Duplicate			Spike Recovery %	
Test Description	Units	PQL	Method	Blank	#	Base	Dup.	RPD	LCS-6	[NT]
Date extracted	-			13/11/2023	2	13/11/2023	13/11/2023		13/11/2023	[NT]
Date analysed	-			15/11/2023	2	15/11/2023	15/11/2023		15/11/2023	[NT]
TRH C_{10} - C_{14}	mg/kg	50	Org-020	<50	2	<50	<50	0	138	[NT]
TRH C_{15} - C_{28}	mg/kg	100	Org-020	<100	2	<100	<100	0	125	[NT]
TRH C_{29} - C_{36}	mg/kg	100	Org-020	<100	2	<100	<100	0	129	[NT]
TRH >C_{10} -C_{16}	mg/kg	50	Org-020	<50	2	<50	<50	0	138	[NT]
TRH >C_{16} -C_{34}	mg/kg	100	Org-020	<100	2	<100	<100	0	125	[NT]
TRH >C_{34} -C_{40}	mg/kg	100	Org-020	<100	2	<100	<100	0	129	[NT]
Surrogate o-Terphenyl	%		Org-020	97	2	90	92	2	103	[NT]

QUALITY CONTROL: PAHs in Soil						Duplicate			Spike Recovery %	
Test Description	Units	PQL	Method	Blank	#	Base	Dup.	RPD	LCS-6	[NT]
Date extracted	-			13/11/2023	2	13/11/2023	13/11/2023		13/11/2023	[NT]
Date analysed	-			16/11/2023	2	16/11/2023	16/11/2023		16/11/2023	[NT]
Naphthalene	mg/kg	0.1	Org-022/025	<0.1	2	<0.1	<0.1	0	118	[NT]
Acenaphthylene	mg/kg	0.1	Org-022/025	<0.1	2	<0.1	<0.1	0	[NT]	[NT]
Acenaphthene	mg/kg	0.1	Org-022/025	<0.1	2	<0.1	<0.1	0	131	[NT]
Fluorene	mg/kg	0.1	Org-022/025	<0.1	2	<0.1	<0.1	0	113	[NT]
Phenanthrene	mg/kg	0.1	Org-022/025	<0.1	2	<0.1	<0.1	0	122	[NT]
Anthracene	mg/kg	0.1	Org-022/025	<0.1	2	<0.1	<0.1	0	[NT]	[NT]
Fluoranthene	mg/kg	0.1	Org-022/025	<0.1	2	<0.1	<0.1	0	129	[NT]
Pyrene	mg/kg	0.1	Org-022/025	<0.1	2	<0.1	<0.1	0	123	[NT]
Benzo(a)anthracene	mg/kg	0.1	Org-022/025	<0.1	2	<0.1	<0.1	0	[NT]	[NT]
Chrysene	mg/kg	0.1	Org-022/025	<0.1	2	<0.1	<0.1	0	109	[NT]
Benzo(b,j+k)fluoranthene	mg/kg	0.2	Org-022/025	<0.2	2	<0.2	<0.2	0	[NT]	[NT]
Benzo(a)pyrene	mg/kg	0.05	Org-022/025	<0.05	2	<0.05	<0.05	0	86	[NT]
Indeno(1,2,3-c,d)pyrene	mg/kg	0.1	Org-022/025	<0.1	2	<0.1	<0.1	0	[NT]	[NT]
Dibenzo(a,h)anthracene	mg/kg	0.1	Org-022/025	<0.1	2	<0.1	<0.1	0	[NT]	[NT]
Benzo(g,h,i)perylene	mg/kg	0.1	Org-022/025	<0.1	2	<0.1	<0.1	0	[NT]	[NT]
Surrogate p-Terphenyl-d14	%		Org-022/025	118	2	113	111	2	118	[NT]

QUALITY CONTROL: Organochlorine Pesticides in soil					Duplicate				Spike Recovery %	
Test Description	Units	PQL	Method	Blank	#	Base	Dup.	RPD	LCS-6	[NT]
Date extracted	-			13/11/2023	2	13/11/2023	13/11/2023		13/11/2023	[NT]
Date analysed	-			16/11/2023	2	16/11/2023	16/11/2023		16/11/2023	[NT]
alpha-BHC	mg/kg	0.1	Org-022/025	<0.1	2	<0.1	<0.1	0	128	[NT]
HCB	mg/kg	0.1	Org-022/025	<0.1	2	<0.1	<0.1	0	[NT]	[NT]
beta-BHC	mg/kg	0.1	Org-022/025	<0.1	2	<0.1	<0.1	0	120	[NT]
gamma-BHC	mg/kg	0.1	Org-022/025	<0.1	2	<0.1	<0.1	0	[NT]	[NT]
Heptachlor	mg/kg	0.1	Org-022/025	<0.1	2	<0.1	<0.1	0	123	[NT]
delta-BHC	mg/kg	0.1	Org-022/025	<0.1	2	<0.1	<0.1	0	[NT]	[NT]
Aldrin	mg/kg	0.1	Org-022/025	<0.1	2	<0.1	<0.1	0	105	[NT]
Heptachlor Epoxide	mg/kg	0.1	Org-022/025	<0.1	2	<0.1	<0.1	0	118	[NT]
gamma-Chlordane	mg/kg	0.1	Org-022/025	<0.1	2	<0.1	<0.1	0	[NT]	[NT]
alpha-chlordane	mg/kg	0.1	Org-022/025	<0.1	2	<0.1	<0.1	0	[NT]	[NT]
Endosulfan I	mg/kg	0.1	Org-022/025	<0.1	2	<0.1	<0.1	0	[NT]	[NT]
pp-DDE	mg/kg	0.1	Org-022/025	<0.1	2	<0.1	<0.1	0	133	[NT]
Dieldrin	mg/kg	0.1	Org-022/025	<0.1	2	<0.1	<0.1	0	128	[NT]
Endrin	mg/kg	0.1	Org-022/025	<0.1	2	<0.1	<0.1	0	61	[NT]
Endosulfan II	mg/kg	0.1	Org-022/025	<0.1	2	<0.1	<0.1	0	[NT]	[NT]
pp-DDD	mg/kg	0.1	Org-022/025	<0.1	2	<0.1	<0.1	0	110	[NT]
Endrin Aldehyde	mg/kg	0.1	Org-022/025	<0.1	2	<0.1	<0.1	0	[NT]	[NT]
pp-DDT	mg/kg	0.1	Org-022/025	<0.1	2	<0.1	<0.1	0	[NT]	[NT]
Endosulfan Sulphate	mg/kg	0.1	Org-022/025	<0.1	2	<0.1	<0.1	0	124	[NT]
Methoxychlor	mg/kg	0.1	Org-022/025	<0.1	2	<0.1	<0.1	0	[NT]	[NT]
Mirex	mg/kg	0.1	Org-022/025	<0.1	2	<0.1	<0.1	0	[NT]	[NT]
Surrogate TCMX	%		Org-022/025	129	2	124	121	2	126	[NT]

QUALITY CONTROL: Organophosphorus Pesticides in Soil					Duplicate				Spike Recovery %	
Test Description	Units	PQL	Method	Blank	#	Base	Dup.	RPD	LCS-6	[NT]
Date extracted	-			13/11/2023	2	13/11/2023	13/11/2023		13/11/2023	[NT]
Date analysed	-			16/11/2023	2	16/11/2023	16/11/2023		16/11/2023	[NT]
Dichlorvos	mg/kg	0.1	Org-022/025	<0.1	2	<0.1	<0.1	0	77	[NT]
Mevinphos	mg/kg	0.1	Org-022/025	<0.1	2	<0.1	<0.1	0	[NT]	[NT]
Phorate	mg/kg	0.1	Org-022/025	<0.1	2	<0.1	<0.1	0	[NT]	[NT]
Dimethoate	mg/kg	0.1	Org-022/025	<0.1	2	<0.1	<0.1	0	[NT]	[NT]
Diazinon	mg/kg	0.1	Org-022/025	<0.1	2	<0.1	<0.1	0	[NT]	[NT]
Disulfoton	mg/kg	0.1	Org-022/025	<0.1	2	<0.1	<0.1	0	[NT]	[NT]
Chlorpyrifos-methyl	mg/kg	0.1	Org-022/025	<0.1	2	<0.1	<0.1	0	[NT]	[NT]
Parathion-Methyl	mg/kg	0.1	Org-022/025	<0.1	2	<0.1	<0.1	0	[NT]	[NT]
Ronnel	mg/kg	0.1	Org-022/025	<0.1	2	<0.1	<0.1	0	110	[NT]
Fenitrothion	mg/kg	0.1	Org-022/025	<0.1	2	<0.1	<0.1	0	87	[NT]
Malathion	mg/kg	0.1	Org-022/025	<0.1	2	<0.1	<0.1	0	77	[NT]
Chlorpyriphos	mg/kg	0.1	Org-022/025	<0.1	2	<0.1	<0.1	0	110	[NT]
Fenthion	mg/kg	0.1	Org-022/025	<0.1	2	<0.1	<0.1	0	[NT]	[NT]
Parathion	mg/kg	0.1	Org-022/025	<0.1	2	<0.1	<0.1	0	91	[NT]
Bromophos-ethyl	mg/kg	0.1	Org-022/025	<0.1	2	<0.1	<0.1	0	[NT]	[NT]
Methidathion	mg/kg	0.1	Org-022/025	<0.1	2	<0.1	<0.1	0	[NT]	[NT]
Fenamiphos	mg/kg	0.1	Org-022/025	<0.1	2	<0.1	<0.1	0	[NT]	[NT]
Ethion	mg/kg	0.1	Org-022/025	<0.1	2	<0.1	<0.1	0	92	[NT]
Phosalone	mg/kg	0.1	Org-022/025	<0.1	2	<0.1	<0.1	0	[NT]	[NT]
Azinphos-methyl (Guthion)	mg/kg	0.1	Org-022/025	<0.1	2	<0.1	<0.1	0	[NT]	[NT]
Coumaphos	mg/kg	0.1	Org-022/025	<0.1	2	<0.1	<0.1	0	[NT]	[NT]
Surrogate TCMX	%		Org-022/025	129	2	124	121	2	126	[NT]

QUALITY CONTROL: PCBs in Soil						Duplicate			Spike Recovery %	
Test Description	Units	PQL	Method	Blank	#	Base	Dup.	RPD	LCS-6	[NT]
Date extracted	-			13/11/2023	2	13/11/2023	13/11/2023		13/11/2023	[NT]
Date analysed	-			16/11/2023	2	16/11/2023	16/11/2023		16/11/2023	[NT]
Aroclor 1016	mg/kg	0.1	Org-021/022/025	<0.1	2	<0.1	<0.1	0	[NT]	[NT]
Aroclor 1221	mg/kg	0.1	Org-021/022/025	<0.1	2	<0.1	<0.1	0	[NT]	[NT]
Aroclor 1232	mg/kg	0.1	Org-021/022/025	<0.1	2	<0.1	<0.1	0	[NT]	[NT]
Aroclor 1242	mg/kg	0.1	Org-021/022/025	<0.1	2	<0.1	<0.1	0	[NT]	[NT]
Aroclor 1248	mg/kg	0.1	Org-021/022/025	<0.1	2	<0.1	<0.1	0	[NT]	[NT]
Aroclor 1254	mg/kg	0.1	Org-021/022/025	<0.1	2	<0.1	<0.1	0	125	[NT]
Aroclor 1260	mg/kg	0.1	Org-021/022/025	<0.1	2	<0.1	<0.1	0	[NT]	[NT]
Surrogate TCMX	%		Org-021/022/025	129	2	124	121	2	126	[NT]

QUALITY CONTROL: Acid Extractable metals in soil						Duplicate			Spike Recovery %	
Test Description	Units	PQL	Method	Blank	#	Base	Dup.	RPD	LCS-6	[NT]
Date prepared	-			13/11/2023	2	13/11/2023	13/11/2023		13/11/2023	[NT]
Date analysed	-			14/11/2023	2	14/11/2023	14/11/2023		14/11/2023	[NT]
Arsenic	mg/kg	4	Metals-020	<4	2	120	47	87	107	[NT]
Cadmium	mg/kg	0.4	Metals-020	<0.4	2	<0.4	<0.4	0	100	[NT]
Chromium	mg/kg	1	Metals-020	<1	2	23	26	12	103	[NT]
Copper	mg/kg	1	Metals-020	<1	2	160	27	142	104	[NT]
Lead	mg/kg	1	Metals-020	<1	2	910	250	114	104	[NT]
Mercury	mg/kg	0.1	Metals-021	<0.1	2	<0.1	<0.1	0	106	[NT]
Nickel	mg/kg	1	Metals-020	<1	2	14	14	0	103	[NT]
Manganese	mg/kg	1	Metals-020	<1	2	540	500	8	118	[NT]
Zinc	mg/kg	1	Metals-020	<1	2	140	110	24	101	[NT]

QUALITY CONTROL: Misc Soil - Inorg						Duplicate			Spike Recovery %	
Test Description	Units	PQL	Method	Blank	#	Base	Dup.	RPD	LCS-1	[NT]
Date prepared	-			13/11/2023	2	13/11/2023	13/11/2023		13/11/2023	[NT]
Date analysed	-			13/11/2023	2	13/11/2023	13/11/2023		13/11/2023	[NT]
Total Phenolics (as Phenol)	mg/kg	5	Inorg-031	<5	2	<5	<5	0	103	[NT]

Result Definitions

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

Quality Control Definitions

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

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

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

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

Laboratory Acceptance Criteria

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

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

Spikes for Physical and Aggregate Tests are not applicable.

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

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

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

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

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

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

Where matrix spike recoveries fall below the lower limit of the acceptance criteria (e.g. for non-labile or standard Organics <60%), positive result(s) in the parent sample will subsequently have a higher than typical estimated uncertainty (MU estimates supplied on request) and in these circumstances the sample result is likely biased significantly low.

Measurement Uncertainty estimates are available for most tests upon request.

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

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

Report Comments

Acid Extractable Metals in Soil: The laboratory RPD acceptance criteria has been exceeded for 337513-2 for As, Cu and Pb. Therefore a triplicate result has been issued as laboratory sample number 337513-11.

Asbestos: A portion of the supplied sample was sub-sampled for asbestos according to ASB-001 asbestos subsampling procedure. We cannot guarantee that this sub-sample is indicative of the entire sample. Envirolab/MPL recommends supplying 40-60g or 500ml of sample in its own container.
Note: Samples 337513-2, 4, 5, 6, 8, 10 were sub-sampled from bags provided by the client.

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 Canberra
Attention	Kenton Horsley

Sample Login Details

Your reference	224779.00, Googong
Envirolab Reference	337513
Date Sample Received	10/11/2023
Date Instructions Received	10/11/2023
Date Results Expected to be Reported	17/11/2023

Sample Condition

Samples received in appropriate condition for analysis	Yes
No. of Samples Provided	10 Soil
Turnaround Time Requested	Standard
Temperature on Receipt (°C)	12
Cooling Method	Ice Pack
Sampling Date Provided	YES

Comments

Nil

Please direct any queries to:

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

Analysis Underway, details on the following page:

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

Sample ID	vTRH(C6-C10)/BTEXN in Soil	svTRH (C10-C40) in Soil	PAHs in Soil	Organochlorine Pesticides in soil	Organophosphorus Pesticides in Soil	PCBs in Soil	Acid Extractable metalsin soil	Misc Soil - Inorg	Asbestos ID - soils
217-0.1-0.2	✓	✓	✓				✓		
218-0.1-0.2	✓	✓	✓	✓	✓	✓	✓	✓	✓
219-0.1-0.2	✓	✓	✓				✓		
220-0.1-0.2	✓	✓	✓	✓	✓	✓	✓	✓	✓
221-0.1-0.2	✓	✓	✓	✓	✓	✓	✓	✓	✓
222-0.05-0.1	✓	✓	✓	✓	✓	✓	✓	✓	✓
223-0.1-0.2	✓	✓	✓				✓		
224-0.05-0.1	✓	✓	✓	✓	✓	✓	✓	✓	✓
225-0.2-0.3	✓	✓	✓				✓		
226-0.1-0.15	✓	✓	✓	✓	✓	✓	✓	✓	✓

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

Additional Info

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

Douglas Partners
Geotechnics / Environment / Groundwater

CHAIN OF CUSTODY DESPATCH SHEET

Project No:	224779.00	**Suburb:**	Googong	**To:**	Envirolab Services
Project Manager:	Kenton Horsley	**Order Number:**		**Sampler:** HS	12 Ashley St, Chatswood NSW 2067
Email:	kenton.horsley@douglaspartners.com.au; david.walker@douglaspartners.com.au			**Attn:**	Sample Receipt
Turnaround time:	☑ Standard ☐ 72 hour ☐ 48 hour ☐ 24 hour ☐ Same day				(02) 9910 6200 samplereceipt@envirolab.com.au
Prior Storage:	☑ Fridge ☐ Freezer ☐ Esky ☐ Shelf	**Do samples contain 'potential' HBM?**	☑ No ☐ Yes		(If YES, then handle, transport and store in accordance with FPM HAZID)

Lab ID	Sample ID: Location / Other ID	Depth From	Depth To	Date Sampled	Sample Type: S - soil W - water M - Material	Container Type: G - glass P - plastic	Analytes: Comb 8A (include Mn)	Comb 3 (include Mn)									Notes/ Preservation/ Additional Requirements
1	217	0.1	0.2	8/11/23	S	G,P		x									(50 g asbestos analysis)
2	218	0.1	0.2	8/11/23	S	G,P	x										
NR	218	0.4	0.5	8/11/23	S	G,P											
3	219	0.1	0.2	8/11/23	S	G,P		x									
4	220	0.1	0.2	8/11/23	S	G,P	x										
NR	220	0.25	0.3	8/11/23	S	G,P											
5	221	0.1	0.2	8/11/23	S	G,P	x										
6	222	0.05	0.1	8/11/23	S	G,P	x										
7	223	0.1	0.2	8/11/23	S	G,P		x									
8	224	0.05	1	8/11/23	S	G,P	x										
9	225	0.2	0.3	8/11/23	S	G,P		x									
10	226	0.1	0.15	8/11/23	S	G,P	x										
	R1-081123			8/11/23	S	G,P											Send to ALS for analysis: 9 metals, TRH, BTEX

Envirolab Services
12 Ashley St
Chatswood NSW 2067
Ph: (02) 9910 6200
Job No: 337513
Date Received: 10/11/23
Time Received: 1040
Received By:
Temp: Cool/Ambient
Cooling: Ice/Icepack
Security: Intact/Broken/None

Metals to analyse:			**LAB RECEIPT**
Number of samples in container:		**Transported to laboratory by:** FEDx/TNT	**Lab Ref. No:** 337513
Send results to:	Douglas Partners Pty Ltd		**Received by:**
Address:	Unit 2, 73 Sheppard Street, Hume ACT 26	**Phone:** (02) 6260 2788	**Date & Time:** 10/11/23 1040
Relinquished by:		**Date:** **Signed:**	**Signed:**

SAMPLE RECEIPT NOTIFICATION (SRN)

Work Order : **ES2339220**

Client	: **DOUGLAS PARTNERS PTY LTD**	Laboratory	: Environmental Division Sydney
Contact	: MR KENTON HORSLEY	Contact	: Customer Services EM
Address	: Unit 2, 73 Sheppard Street, Hume 2620	Address	: 277-289 Woodpark Road Smithfield NSW Australia 2164
E-mail	: kenton.horsley@douglaspartners.com.au	E-mail	: ALSEnviro.Melbourne@alsglobal.com
Telephone	: +61 02 4271 1836	Telephone	: +61 3 8549 9600
Facsimile	: +61 02 4271 1897	Facsimile	: +61-2-8784 8500
Project	: 224779.00	Page	: 1 of 2
Order number	: ----	Quote number	: EM2017DOUPAR0002 (EN/222)
C-O-C number	: ----	QC Level	: NEPM 2013 B3 & ALS QC Standard
Site	: Googong		
Sampler	: HS		

Dates

Date Samples Received	: 13-Nov-2023 15:45	Issue Date	: 13-Nov-2023
Client Requested Due Date	: 20-Nov-2023	Scheduled Reporting Date	: **20-Nov-2023**

Delivery Details

Mode of Delivery	: Carrier	Security Seal	: Not Available
No. of coolers/boxes	: 1	Temperature	: 11.3, 11.6, 13.1'C - Ice Bricks present
Receipt Detail	:	No. of samples received / analysed	: 1 / 1

General Comments

- This report contains the following information:
  - Sample Container(s)/Preservation Non-Compliances
  - Summary of Sample(s) and Requested Analysis
  - Proactive Holding Time Report
  - Requested Deliverables
- **Please refer to the Proactive Holding Time Report table below which summarises breaches of recommended holding times that have occurred prior to samples/instructions being received at the laboratory. The laboratory will process these samples unless instructions are received from you indicating you do not wish to proceed. The absence of this summary table indicates that all samples have been received within the recommended holding times for the analysis requested.**
- **Sample(s) requiring volatile organic compound analysis received in airtight containers (ZHE).**
- 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
ES2339220-001	08-Nov-2023 00:00	R1-081123	✓	✓

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

DAVID WALKER

- *AU Certificate of Analysis - NATA (COA)	Email	david.walker@douglaspartners.com.au
- *AU Interpretive QC Report - DEFAULT (Anon QCI Rep) (QCI)	Email	david.walker@douglaspartners.com.au
- *AU QC Report - DEFAULT (Anon QC Rep) - NATA (QC)	Email	david.walker@douglaspartners.com.au
- A4 - AU Sample Receipt Notification - Environmental HT (SRN)	Email	david.walker@douglaspartners.com.au
- Chain of Custody (CoC) (COC)	Email	david.walker@douglaspartners.com.au
- EDI Format - XTab (XTAB)	Email	david.walker@douglaspartners.com.au

KENTON HORSLEY

- *AU Certificate of Analysis - NATA (COA)	Email	kenton.horsley@douglaspartners.com.au
- *AU Interpretive QC Report - DEFAULT (Anon QCI Rep) (QCI)	Email	kenton.horsley@douglaspartners.com.au
- *AU QC Report - DEFAULT (Anon QC Rep) - NATA (QC)	Email	kenton.horsley@douglaspartners.com.au
- A4 - AU Sample Receipt Notification - Environmental HT (SRN)	Email	kenton.horsley@douglaspartners.com.au
- Chain of Custody (CoC) (COC)	Email	kenton.horsley@douglaspartners.com.au
- EDI Format - XTab (XTAB)	Email	kenton.horsley@douglaspartners.com.au

Douglas Partners
Geotechnics | Environment | Groundwater

CHAIN OF CUSTODY DESPATCH SHEET

Project No:	224779.00	**Suburb:**	Googong	**To:**	Envirolab Services
Project Manager:	Kenton Horsley	**Order Number:**		**Sampler:** HS	12 Ashley St, Chatswood NSW 2067
Email:	kenton.horsley@douglaspartners.com.au; david.walker@douglaspartners.com.au			**Attn:**	Sample Receipt
Turnaround time:	☑ Standard ☐ 72 hour ☐ 48 hour ☐ 24 hour ☐ Same day				(02) 9910 6200 samplereceipt@envirolab.com.au
Prior Storage:	☑ Fridge ☐ Freezer ☐ Esky ☐ Shelf	**Do samples contain 'potential' HBM?**	☑ No ☐ Yes	(If YES, then handle, transport and store in accordance with FPM HAZID)	

Lab ID	Sample ID: Location / Other ID	Depth From	Depth To	Date Sampled	Sample Type: S - soil W - water M - Material	Container Type: G - glass P - plastic	Analytes: Comb 8A (include Mn)	Comb 3 (include Mn)							Notes/ Preservation/ Additional Requirements
1	217	0.1	0.2	8/11/23	S	G,P		x							(50 g asbestos analysis)
2	218	0.1	0.2	8/11/23	S	G,P	x								Relinquished by ELS SYD
NR	218	0.4	0.5	8/11/23	S	G,P									Grace Zhang
3	219	0.1	0.2	8/11/23	S	G,P		x							13/11/23 1100
4	220	0.1	0.2	8/11/23	S	G,P	x								
NR	220	0.25	0.3	8/11/23	S	G,P									
5	221	0.1	0.2	8/11/23	S	G,P	x								
6	222	0.05	0.1	8/11/23	S	G,P	x								
7	223	0.1	0.2	8/11/23	S	G,P		x							
8	224	0.05	1	8/11/23	S	G,P	x								
9	225	0.2	0.3	8/11/23	S	G,P		x							
10	226	0.1	0.15	8/11/23	S	G,P	x								
11	R1-081123			8/11/23	S	G,P									Send to ALS for analysis: 9 metals, TRH, BTEX

Environmental Division Sydney
Work Order Reference
ES2339220

Telephone : +61-2-8784 8555

Envirolab Services
12 Ashley St
Chatswood NSW 2067
Ph: (02) 9910 6200

Job No: 337513
Date Received: 10/11/23
Time Received: 1040
Received By:
Temp: Cool/Ambient
Cooling: Ice/Icepack
Security: Intact/Broken/None

Metals to analyse:			
Number of samples in container:		**Transported to laboratory by:**	FEDx/TNT
Send results to:	Douglas Partners Pty Ltd		
Address:	Unit 2, 73 Sheppard Street, Hume ACT 26	**Phone:**	(02) 6260 2788
Relinquished by:		**Date:**	**Signed:**

LAB RECEIPT
Lab Ref. No: 337513
Received by:
Date & Time: 10/11/23 1040
Signed:

Rec: ZRW 13/11/23 1545

CERTIFICATE OF ANALYSIS

Work Order	: **ES2339220**	Page	: 1 of 5
Client	: **DOUGLAS PARTNERS PTY LTD**	Laboratory	: Environmental Division Sydney
Contact	: MR KENTON HORSLEY	Contact	: Customer Services EM
Address	: Unit 2, 73 Sheppard Street, Hume 2620	Address	: 277-289 Woodpark Road Smithfield NSW Australia 2164
Telephone	: +61 02 4271 1836	Telephone	: +61 3 8549 9600
Project	: 224779.00	Date Samples Received	: 13-Nov-2023 15:45
Order number	: ----	Date Analysis Commenced	: 15-Nov-2023
C-O-C number	: ----	Issue Date	: 20-Nov-2023 17:39
Sampler	: HS		
Site	: Googong		
Quote number	: EN/222		
No. of samples received	: 1		
No. of samples analysed	: 1		

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

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

This Certificate of Analysis contains the following information:

- General Comments
- Analytical Results
- Surrogate Control Limits

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

Signatories

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

Signatories	*Position*	*Accreditation Category*
Ankit Joshi	Senior Chemist - Inorganics	Sydney Inorganics, Smithfield, NSW
Edwandy Fadjar	Organic Coordinator	Sydney Organics, Smithfield, NSW

General Comments

The analytical procedures used by ALS have been developed from established internationally recognised procedures such as those published by the USEPA, APHA, AS and NEPM. In house developed procedures are fully validated and are often at the client request.

Where moisture determination has been performed, results are reported on a dry weight basis.

Where a reported less than (<) result is higher than the LOR, this may be due to primary sample extract/digestate dilution and/or insufficient sample for analysis.

Where the LOR of a reported result differs from standard LOR, this may be due to high moisture content, insufficient sample (reduced weight employed) or matrix interference.

When sampling time information is not provided by the client, sampling dates are shown without a time component. In these instances, the time component has been assumed by the laboratory for processing purposes.

Where a result is required to meet compliance limits the associated uncertainty must be considered. Refer to the ALS Contract 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.
- EG005T: Poor precision was obtained for Nickel on sample ES2339194 # 009. Confirmed by re-digestion and reanalysis.

Analytical Results

Sub-Matrix: SOIL (Matrix: SOIL)				Sample ID	R1-081123	----	----	----	----
				Sampling date / time	08-Nov-2023 00:00	----	----	----	----
Compound	CAS Number	LOR	Unit		ES2339220-001	--------	--------	--------	--------
					Result	----	----	----	----
EA055: Moisture Content									
Moisture Content	----	1.0	%		**10.9**	----	----	----	----
EG005(ED093)T: Total Metals by ICP-AES									
Arsenic	7440-38-2	5	mg/kg		**15**	----	----	----	----
Cadmium	7440-43-9	1	mg/kg		<1	----	----	----	----
Chromium	7440-47-3	2	mg/kg		**18**	----	----	----	----
Copper	7440-50-8	5	mg/kg		**8**	----	----	----	----
Lead	7439-92-1	5	mg/kg		**22**	----	----	----	----
Nickel	7440-02-0	2	mg/kg		**8**	----	----	----	----
Zinc	7440-66-6	5	mg/kg		**47**	----	----	----	----
EG035T: Total Recoverable Mercury by FIMS									
Mercury	7439-97-6	0.1	mg/kg		<0.1	----	----	----	----
EP080/071: Total Petroleum Hydrocarbons									
C6 - C9 Fraction	----	10	mg/kg		<10	----	----	----	----
C10 - C14 Fraction	----	50	mg/kg		<50	----	----	----	----
C15 - C28 Fraction	----	100	mg/kg		<100	----	----	----	----
C29 - C36 Fraction	----	100	mg/kg		<100	----	----	----	----
^ **C10 - C36 Fraction (sum)**	----	50	mg/kg		<50	----	----	----	----
EP080/071: Total Recoverable Hydrocarbons - NEPM 2013 Fractions									
C6 - C10 Fraction	C6_C10	10	mg/kg		<10	----	----	----	----
^ **C6 - C10 Fraction minus BTEX (F1)**	C6_C10-BTEX	10	mg/kg		<10	----	----	----	----
>C10 - C16 Fraction	----	50	mg/kg		<50	----	----	----	----
>C16 - C34 Fraction	----	100	mg/kg		<100	----	----	----	----
>C34 - C40 Fraction	----	100	mg/kg		<100	----	----	----	----
^ **>C10 - C40 Fraction (sum)**	----	50	mg/kg		<50	----	----	----	----
^ **>C10 - C16 Fraction minus Naphthalene (F2)**	----	50	mg/kg		<50	----	----	----	----
EP080: BTEXN									

Analytical Results

Sub-Matrix: SOIL (Matrix: SOIL)				Sample ID	R1-081123	----	----	----	----
				Sampling date / time	08-Nov-2023 00:00	----	----	----	----
Compound	CAS Number	LOR	Unit		ES2339220-001	--------	--------	--------	--------
					Result	----	----	----	----
EP080: BTEXN - Continued									
Benzene	71-43-2	0.2	mg/kg		<0.2	----	----	----	----
Toluene	108-88-3	0.5	mg/kg		<0.5	----	----	----	----
Ethylbenzene	100-41-4	0.5	mg/kg		<0.5	----	----	----	----
meta- & para-Xylene	108-38-3 106-42-3	0.5	mg/kg		<0.5	----	----	----	----
ortho-Xylene	95-47-6	0.5	mg/kg		<0.5	----	----	----	----
^ **Sum of BTEX**	----	0.2	mg/kg		<0.2	----	----	----	----
^ **Total Xylenes**	----	0.5	mg/kg		<0.5	----	----	----	----
Naphthalene	91-20-3	1	mg/kg		<1	----	----	----	----
EP080S: TPH(V)/BTEX Surrogates									
1.2-Dichloroethane-D4	17060-07-0	0.2	%		**90.9**	----	----	----	----
Toluene-D8	2037-26-5	0.2	%		**94.6**	----	----	----	----
4-Bromofluorobenzene	460-00-4	0.2	%		**108**	----	----	----	----

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	63	125
Toluene-D8	2037-26-5	67	124
4-Bromofluorobenzene	460-00-4	66	131

QUALITY CONTROL REPORT

Work Order	: **ES2339220**	Page	: 1 of 5
Client	: **DOUGLAS PARTNERS PTY LTD**	Laboratory	: Environmental Division Sydney
Contact	: MR KENTON HORSLEY	Contact	: Customer Services EM
Address	: Unit 2, 73 Sheppard Street, Hume 2620	Address	: 277-289 Woodpark Road Smithfield NSW Australia 2164
Telephone	: +61 02 4271 1836	Telephone	: +61 3 8549 9600
Project	: 224779.00	Date Samples Received	: 13-Nov-2023
Order number	: ----	Date Analysis Commenced	: 15-Nov-2023
C-O-C number	: ----	Issue Date	: 20-Nov-2023
Sampler	: HS		
Site	: Googong		
Quote number	: EN/222		
No. of samples received	: 1		
No. of samples analysed	: 1		

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

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

This Quality Control Report contains the following information:

- Laboratory Duplicate (DUP) Report; Relative Percentage Difference (RPD) and Acceptance Limits
- Method Blank (MB) and Laboratory Control Spike (LCS) Report; Recovery and Acceptance Limits
- Matrix Spike (MS) Report; Recovery and Acceptance Limits

Signatories

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

Signatories	*Position*	*Accreditation Category*
Ankit Joshi	Senior Chemist - Inorganics	Sydney Inorganics, Smithfield, NSW
Edwandy Fadjar	Organic Coordinator	Sydney Organics, Smithfield, NSW

General Comments

The analytical procedures used by ALS have been developed from established internationally recognised procedures such as those published by the USEPA, APHA, AS and NEPM. In house developed procedures are fully validated and are often at the client request.

Where moisture determination has been performed, results are reported on a dry weight basis.

Where a reported less than (<) result is higher than the LOR, this may be due to primary sample extract/digestate dilution and/or insufficient sample for analysis. Where the LOR of a reported result differs from standard LOR, this may be due to high moisture content, insufficient sample (reduced weight employed) or matrix interference.

Key : Anonymous = Refers to samples which are not specifically part of this work order but formed part of the QC process lot
CAS Number = CAS registry number from database maintained by Chemical Abstracts Services. The Chemical Abstracts Service is a division of the American Chemical Society.
LOR = Limit of reporting
RPD = Relative Percentage Difference
# = Indicates failed QC
* = The final LOR has been raised due to dilution or other sample specific cause; adjusted LOR is shown in brackets. The duplicate ranges for Acceptable RPD% are applied to the final LOR where applicable.

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: 5429371)									
ES2339194-009	Anonymous	EG005T: Cadmium	7440-43-9	1	mg/kg	<1	<1	0.0	No Limit
		EG005T: Chromium	7440-47-3	2	mg/kg	13	11	21.6	No Limit
		EG005T: Nickel	7440-02-0	2	mg/kg	48	# 61	23.8	0% - 20%
		EG005T: Arsenic	7440-38-2	5	mg/kg	<5	<5	0.0	No Limit
		EG005T: Copper	7440-50-8	5	mg/kg	22	19	18.3	No Limit
		EG005T: Lead	7439-92-1	5	mg/kg	12	11	9.1	No Limit
		EG005T: Zinc	7440-66-6	5	mg/kg	75	64	15.4	0% - 50%
ES2339275-003	Anonymous	EG005T: Cadmium	7440-43-9	1	mg/kg	<1	<1	0.0	No Limit
		EG005T: Chromium	7440-47-3	2	mg/kg	12	10	17.1	No Limit
		EG005T: Nickel	7440-02-0	2	mg/kg	37	34	6.7	0% - 50%
		EG005T: Arsenic	7440-38-2	5	mg/kg	<5	<5	0.0	No Limit
		EG005T: Copper	7440-50-8	5	mg/kg	26	25	3.9	No Limit
		EG005T: Lead	7439-92-1	5	mg/kg	17	12	37.6	No Limit
		EG005T: Zinc	7440-66-6	5	mg/kg	44	36	21.6	No Limit
EA055: Moisture Content (Dried @ 105-110°C) (QC Lot: 5429383)									
ES2339194-013	Anonymous	EA055: Moisture Content	----	0.1 (1.0)*	%	2.5	2.8	8.6	No Limit
ES2339275-003	Anonymous	EA055: Moisture Content	----	0.1 (1.0)*	%	7.8	7.8	0.0	No Limit
EG035T: Total Recoverable Mercury by FIMS (QC Lot: 5429370)									
ES2339194-009	Anonymous	EG035T: Mercury	7439-97-6	0.1	mg/kg	0.1	<0.1	0.0	No Limit
ES2339275-003	Anonymous	EG035T: Mercury	7439-97-6	0.1	mg/kg	<0.1	<0.1	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: 5424754)									
ES2339219-001	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: 5425896)									
ES2339219-001	Anonymous	EP080: C6 - C9 Fraction	----	10	mg/kg	<10	<10	0.0	No Limit
ES2339416-001	Anonymous	EP080: C6 - C9 Fraction	----	10	mg/kg	<10	<10	0.0	No Limit
EP080/071: Total Recoverable Hydrocarbons - NEPM 2013 Fractions (QC Lot: 5424754)									
ES2339219-001	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: 5425896)									
ES2339219-001	Anonymous	EP080: C6 - C10 Fraction	C6_C10	10	mg/kg	<10	<10	0.0	No Limit
ES2339416-001	Anonymous	EP080: C6 - C10 Fraction	C6_C10	10	mg/kg	<10	<10	0.0	No Limit
EP080: BTEXN (QC Lot: 5425896)									
ES2339219-001	Anonymous	EP080: Benzene	71-43-2	0.2	mg/kg	<0.2	<0.2	0.0	No Limit
		EP080: Toluene	108-88-3	0.5	mg/kg	<0.5	<0.5	0.0	No Limit
		EP080: Ethylbenzene	100-41-4	0.5	mg/kg	<0.5	<0.5	0.0	No Limit
		EP080: meta- & para-Xylene	108-38-3 106-42-3	0.5	mg/kg	<0.5	<0.5	0.0	No Limit
		EP080: ortho-Xylene	95-47-6	0.5	mg/kg	<0.5	<0.5	0.0	No Limit
		EP080: Naphthalene	91-20-3	1	mg/kg	<1	<1	0.0	No Limit
ES2339416-001	Anonymous	EP080: Benzene	71-43-2	0.2	mg/kg	<0.2	<0.2	0.0	No Limit
		EP080: Toluene	108-88-3	0.5	mg/kg	<0.5	<0.5	0.0	No Limit
		EP080: Ethylbenzene	100-41-4	0.5	mg/kg	<0.5	<0.5	0.0	No Limit
		EP080: meta- & para-Xylene	108-38-3 106-42-3	0.5	mg/kg	<0.5	<0.5	0.0	No Limit
		EP080: ortho-Xylene	95-47-6	0.5	mg/kg	<0.5	<0.5	0.0	No Limit
		EP080: Naphthalene	91-20-3	1	mg/kg	<1	<1	0.0	No Limit

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: 5429371)								
EG005T: Arsenic	7440-38-2	5	mg/kg	<5	121.1 mg/kg	110	88.0	113
EG005T: Cadmium	7440-43-9	1	mg/kg	<1	0.74 mg/kg	102	70.0	130
EG005T: Chromium	7440-47-3	2	mg/kg	<2	19.6 mg/kg	116	68.0	132
EG005T: Copper	7440-50-8	5	mg/kg	<5	52.9 mg/kg	111	89.0	111
EG005T: Lead	7439-92-1	5	mg/kg	<5	60.8 mg/kg	101	82.0	119
EG005T: Nickel	7440-02-0	2	mg/kg	<2	15.3 mg/kg	91.6	80.0	120
EG005T: Zinc	7440-66-6	5	mg/kg	<5	139.3 mg/kg	89.5	66.0	133
EG035T: Total Recoverable Mercury by FIMS (QCLot: 5429370)								
EG035T: Mercury	7439-97-6	0.1	mg/kg	<0.1	0.087 mg/kg	96.0	70.0	125
EP080/071: Total Petroleum Hydrocarbons (QCLot: 5424754)								
EP071: C10 - C14 Fraction	----	50	mg/kg	<50	300 mg/kg	104	75.0	129
EP071: C15 - C28 Fraction	----	100	mg/kg	<100	450 mg/kg	99.1	77.0	131
EP071: C29 - C36 Fraction	----	100	mg/kg	<100	300 mg/kg	100	71.0	129
EP080/071: Total Petroleum Hydrocarbons (QCLot: 5425896)								
EP080: C6 - C9 Fraction	----	10	mg/kg	<10	26 mg/kg	95.3	72.2	131
EP080/071: Total Recoverable Hydrocarbons - NEPM 2013 Fractions (QCLot: 5424754)								
EP071: >C10 - C16 Fraction	----	50	mg/kg	<50	375 mg/kg	106	77.0	125
EP071: >C16 - C34 Fraction	----	100	mg/kg	<100	525 mg/kg	100	74.0	138
EP071: >C34 - C40 Fraction	----	100	mg/kg	<100	225 mg/kg	99.6	63.0	131
EP080/071: Total Recoverable Hydrocarbons - NEPM 2013 Fractions (QCLot: 5425896)								
EP080: C6 - C10 Fraction	C6_C10	10	mg/kg	<10	31 mg/kg	84.2	72.4	133
EP080: BTEXN (QCLot: 5425896)								
EP080: Benzene	71-43-2	0.2	mg/kg	<0.2	1 mg/kg	95.1	76.0	124
EP080: Toluene	108-88-3	0.5	mg/kg	<0.5	1 mg/kg	93.6	78.5	121
EP080: Ethylbenzene	100-41-4	0.5	mg/kg	<0.5	1 mg/kg	97.2	77.4	121
EP080: meta- & para-Xylene	108-38-3 106-42-3	0.5	mg/kg	<0.5	2 mg/kg	88.4	78.2	121
EP080: ortho-Xylene	95-47-6	0.5	mg/kg	<0.5	1 mg/kg	97.9	81.3	121
EP080: Naphthalene	91-20-3	1	mg/kg	<1	1 mg/kg	104	78.8	122

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: 5429371)							
ES2339194-009	Anonymous	EG005T: Arsenic	7440-38-2	50 mg/kg	100.0	70.0	130
		EG005T: Cadmium	7440-43-9	50 mg/kg	94.7	70.0	130
		EG005T: Chromium	7440-47-3	50 mg/kg	103	68.0	132
		EG005T: Copper	7440-50-8	250 mg/kg	97.7	70.0	130
		EG005T: Lead	7439-92-1	250 mg/kg	93.6	70.0	130
		EG005T: Nickel	7440-02-0	50 mg/kg	127	70.0	130
		EG005T: Zinc	7440-66-6	250 mg/kg	85.7	66.0	133
EG035T: Total Recoverable Mercury by FIMS (QCLot: 5429370)							
ES2339194-009	Anonymous	EG035T: Mercury	7439-97-6	5 mg/kg	97.2	70.0	130
EP080/071: Total Petroleum Hydrocarbons (QCLot: 5424754)							
ES2339219-001	Anonymous	EP071: C10 - C14 Fraction	----	480 mg/kg	118	73.0	137
		EP071: C15 - C28 Fraction	----	3100 mg/kg	110	53.0	131
		EP071: C29 - C36 Fraction	----	2060 mg/kg	117	52.0	132
EP080/071: Total Petroleum Hydrocarbons (QCLot: 5425896)							
ES2339219-001	Anonymous	EP080: C6 - C9 Fraction	----	32.5 mg/kg	83.2	60.4	142
EP080/071: Total Recoverable Hydrocarbons - NEPM 2013 Fractions (QCLot: 5424754)							
ES2339219-001	Anonymous	EP071: >C10 - C16 Fraction	----	860 mg/kg	106	73.0	137
		EP071: >C16 - C34 Fraction	----	4320 mg/kg	117	53.0	131
		EP071: >C34 - C40 Fraction	----	890 mg/kg	111	52.0	132
EP080/071: Total Recoverable Hydrocarbons - NEPM 2013 Fractions (QCLot: 5425896)							
ES2339219-001	Anonymous	EP080: C6 - C10 Fraction	C6_C10	37.5 mg/kg	81.5	61.1	142
EP080: BTEXN (QCLot: 5425896)							
ES2339219-001	Anonymous	EP080: Benzene	71-43-2	2.5 mg/kg	102	62.1	122
		EP080: Toluene	108-88-3	2.5 mg/kg	98.9	66.6	119
		EP080: Ethylbenzene	100-41-4	2.5 mg/kg	104	67.4	123
		EP080: meta- & para-Xylene	108-38-3 106-42-3	2.5 mg/kg	92.2	66.4	121
		EP080: ortho-Xylene	95-47-6	2.5 mg/kg	102	70.7	121
		EP080: Naphthalene	91-20-3	2.5 mg/kg	89.2	61.1	115

QA/QC Compliance Assessment to assist with Quality Review

Work Order	: **ES2339220**	Page	: 1 of 4
Client	: **DOUGLAS PARTNERS PTY LTD**	Laboratory	: Environmental Division Sydney
Contact	: MR KENTON HORSLEY	Telephone	: +61 3 8549 9600
Project	: 224779.00	Date Samples Received	: 13-Nov-2023
Site	: Googong	Issue Date	: 20-Nov-2023
Sampler	: HS	No. of samples received	: 1
Order number	: ----	No. of samples analysed	: 1

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

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

Summary of Outliers

Outliers : Quality Control Samples

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

- **NO Method Blank value outliers occur.**
- **NO Laboratory Control outliers occur.**
- **NO Matrix Spike outliers occur.**
- **Duplicate outliers exist - please see following pages for full details.**
- **For all regular sample matrices, NO surrogate recovery outliers occur.**

Outliers : Analysis Holding Time Compliance

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

Outliers : Frequency of Quality Control Samples

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

Outliers : Quality Control Samples

Duplicates, Method Blanks, Laboratory Control Samples and Matrix Spikes

Matrix: **SOIL**

Compound Group Name	Laboratory Sample ID	Client Sample ID	Analyte	CAS Number	Data	Limits	Comment
Duplicate (DUP) RPDs							
EG005(ED093)T: Total Metals by ICP-AES	ES2339194--009	Anonymous	**Nickel**	7440-02-0	23.8 %	0% - 20%	**RPD exceeds LOR based limits**

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) R1-081123	**08-Nov-2023**	**----**	----	**----**	**16-Nov-2023**	22-Nov-2023	✓
EG005(ED093)T: Total Metals by ICP-AES							
Soil Glass Jar - Unpreserved (EG005T) R1-081123	**08-Nov-2023**	**16-Nov-2023**	06-May-2024	✓	**17-Nov-2023**	06-May-2024	✓
EG035T: Total Recoverable Mercury by FIMS							
Soil Glass Jar - Unpreserved (EG035T) R1-081123	**08-Nov-2023**	**16-Nov-2023**	06-Dec-2023	✓	**20-Nov-2023**	06-Dec-2023	✓
EP080/071: Total Petroleum Hydrocarbons							
Soil Glass Jar - Unpreserved (EP071) R1-081123	**08-Nov-2023**	**15-Nov-2023**	22-Nov-2023	✓	**16-Nov-2023**	25-Dec-2023	✓
Soil Glass Jar - Unpreserved (EP080) R1-081123	**08-Nov-2023**	**15-Nov-2023**	22-Nov-2023	✓	**17-Nov-2023**	22-Nov-2023	✓
EP080/071: Total Recoverable Hydrocarbons - NEPM 2013 Fractions							
Soil Glass Jar - Unpreserved (EP071) R1-081123	**08-Nov-2023**	**15-Nov-2023**	22-Nov-2023	✓	**16-Nov-2023**	25-Dec-2023	✓
Soil Glass Jar - Unpreserved (EP080) R1-081123	**08-Nov-2023**	**15-Nov-2023**	22-Nov-2023	✓	**17-Nov-2023**	22-Nov-2023	✓
EP080: BTEXN							
Soil Glass Jar - Unpreserved (EP080) R1-081123	**08-Nov-2023**	**15-Nov-2023**	22-Nov-2023	✓	**17-Nov-2023**	22-Nov-2023	✓

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	20	**10.00**	**10.00**	✓	NEPM 2013 B3 & ALS QC Standard
Total Metals by ICP-AES	EG005T	2	20	**10.00**	**10.00**	✓	NEPM 2013 B3 & ALS QC Standard
TRH - Semivolatile Fraction	EP071	1	7	**14.29**	**10.00**	✓	NEPM 2013 B3 & ALS QC Standard
TRH Volatiles/BTEX	EP080	2	13	**15.38**	**10.00**	✓	NEPM 2013 B3 & ALS QC Standard
Laboratory Control Samples (LCS)							
Total Mercury by FIMS	EG035T	1	20	**5.00**	**5.00**	✓	NEPM 2013 B3 & ALS QC Standard
Total Metals by ICP-AES	EG005T	1	20	**5.00**	**5.00**	✓	NEPM 2013 B3 & ALS QC Standard
TRH - Semivolatile Fraction	EP071	1	7	**14.29**	**5.00**	✓	NEPM 2013 B3 & ALS QC Standard
TRH Volatiles/BTEX	EP080	1	13	**7.69**	**5.00**	✓	NEPM 2013 B3 & ALS QC Standard
Method Blanks (MB)							
Total Mercury by FIMS	EG035T	1	20	**5.00**	**5.00**	✓	NEPM 2013 B3 & ALS QC Standard
Total Metals by ICP-AES	EG005T	1	20	**5.00**	**5.00**	✓	NEPM 2013 B3 & ALS QC Standard
TRH - Semivolatile Fraction	EP071	1	7	**14.29**	**5.00**	✓	NEPM 2013 B3 & ALS QC Standard
TRH Volatiles/BTEX	EP080	1	13	**7.69**	**5.00**	✓	NEPM 2013 B3 & ALS QC Standard
Matrix Spikes (MS)							
Total Mercury by FIMS	EG035T	1	20	**5.00**	**5.00**	✓	NEPM 2013 B3 & ALS QC Standard
Total Metals by ICP-AES	EG005T	1	20	**5.00**	**5.00**	✓	NEPM 2013 B3 & ALS QC Standard
TRH - Semivolatile Fraction	EP071	1	7	**14.29**	**5.00**	✓	NEPM 2013 B3 & ALS QC Standard
TRH Volatiles/BTEX	EP080	1	13	**7.69**	**5.00**	✓	NEPM 2013 B3 & ALS QC Standard

Brief Method Summaries

The analytical procedures used by the Environmental Division have been developed from established internationally recognized procedures such as those published by the US EPA, APHA, AS and NEPM. In house developed procedures are employed in the absence of documented standards or by client request. The following report provides brief descriptions of the analytical procedures employed for results reported in the Certificate of Analysis. Sources from which ALS methods have been developed are provided within the Method Descriptions.

Analytical Methods	Method	Matrix	Method Descriptions
Moisture Content	EA055	SOIL	In house: A gravimetric procedure based on weight loss over a 12 hour drying period at 105-110 degrees C. This method is compliant with NEPM Schedule B(3).
Total Metals by ICP-AES	EG005T	SOIL	In house: Referenced to APHA 3120; USEPA SW 846 - 6010. Metals are determined following an appropriate acid digestion of the soil. The ICPAES technique ionises samples in a plasma, emitting a characteristic spectrum based on metals present. Intensities at selected wavelengths are compared against those of matrix matched standards. This method is compliant with NEPM Schedule B(3)
Total Mercury by FIMS	EG035T	SOIL	In house: Referenced to APHA 3112 Hg - B (Flow-injection (SnCl2) (Cold Vapour generation) AAS) FIM-AAS is an automated flameless atomic absorption technique. Mercury in solids are determined following an appropriate acid digestion. Ionic mercury is reduced online to atomic mercury vapour by SnCl2 which is then purged into a heated quartz cell. Quantification is by comparing absorbance against a calibration curve. This method is compliant with NEPM Schedule B(3)
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.

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CERTIFICATE OF ANALYSIS 338375

Client Details

Client	Douglas Partners Canberra
Attention	Kenton Horsley
Address	Unit 2, 73 Sheppard St,, HUME, ACT, 2620

Sample Details

Your Reference	**224779.00 Googong**
Number of Samples	2 Soil
Date samples received	22/11/2023
Date completed instructions received	22/11/2023

Analysis Details

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

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

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

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

Report Details

Date results requested by	23/11/2023
Date of Issue	23/11/2023

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

Results Approved By
Hannah Nguyen, Metals Supervisor
Tim Toll, Chemist (FAS)

Authorised By
Nancy Zhang, Laboratory Manager

Acid Extractable metals in soil				
Our Reference		338375-1	338375-2	338375-3
Your Reference	UNITS	218	220	218 - [TRIPLICATE]
Depth		0.4-0.5	0.25-0.3	0.4-0.5
Date Sampled		08/11/2023	08/11/2023	08/11/2023
Type of sample		Soil	Soil	Soil
Date prepared	-	23/11/2023	23/11/2023	23/11/2023
Date analysed	-	23/11/2023	23/11/2023	23/11/2023
Arsenic	mg/kg	17	93	20
Cadmium	mg/kg	<0.4	<0.4	<0.4
Chromium	mg/kg	28	54	44
Copper	mg/kg	97	33	120
Lead	mg/kg	11	230	15
Mercury	mg/kg	<0.1	<0.1	<0.1
Nickel	mg/kg	21	10	25
Zinc	mg/kg	49	120	57
Manganese	mg/kg	320	1,100	360

Moisture			
Our Reference		338375-1	338375-2
Your Reference	UNITS	218	220
Depth		0.4-0.5	0.25-0.3
Date Sampled		08/11/2023	08/11/2023
Type of sample		Soil	Soil
Date prepared	-	22/11/2023	22/11/2023
Date analysed	-	23/11/2023	23/11/2023
Moisture	%	10	18

Method ID	Methodology Summary
Inorg-008	Moisture content determined by heating at 105+/-5 °C for a minimum of 12 hours.
Metals-020	Determination of various metals by ICP-AES.
Metals-021	Determination of Mercury by Cold Vapour AAS.

QUALITY CONTROL: Acid Extractable metals in soil						Duplicate			Spike Recovery %	
Test Description	Units	PQL	Method	Blank	#	Base	Dup.	RPD	LCS-1	[NT]
Date prepared	-			23/11/2023	1	23/11/2023	23/11/2023		23/11/2023	[NT]
Date analysed	-			23/11/2023	1	23/11/2023	23/11/2023		23/11/2023	[NT]
Arsenic	mg/kg	4	Metals-020	<4	1	17	22	26	103	[NT]
Cadmium	mg/kg	0.4	Metals-020	<0.4	1	<0.4	<0.4	0	98	[NT]
Chromium	mg/kg	1	Metals-020	<1	1	28	37	28	102	[NT]
Copper	mg/kg	1	Metals-020	<1	1	97	120	21	97	[NT]
Lead	mg/kg	1	Metals-020	<1	1	11	31	95	108	[NT]
Mercury	mg/kg	0.1	Metals-021	<0.1	1	<0.1	<0.1	0	127	[NT]
Nickel	mg/kg	1	Metals-020	<1	1	21	26	21	97	[NT]
Zinc	mg/kg	1	Metals-020	<1	1	49	67	31	100	[NT]
Manganese	mg/kg	1	Metals-020	<1	1	320	390	20	93	[NT]

Result Definitions

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

Quality Control Definitions

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

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

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

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

Laboratory Acceptance Criteria

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

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

Spikes for Physical and Aggregate Tests are not applicable.

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

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

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

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

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

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

Where matrix spike recoveries fall below the lower limit of the acceptance criteria (e.g. for non-labile or standard Organics <60%), positive result(s) in the parent sample will subsequently have a higher than typical estimated uncertainty (MU estimates supplied on request) and in these circumstances the sample result is likely biased significantly low.

Measurement Uncertainty estimates are available for most tests upon request.

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

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

Report Comments

Acid Extractable Metals in Soil: The laboratory RPD acceptance criteria has been exceeded for 338375-1 for Pb. Therefore a triplicate result has been issued as laboratory sample number 338375-3.

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SAMPLE RECEIPT ADVICE

Client Details

Client	Douglas Partners Canberra
Attention	Kenton Horsley

Sample Login Details

Your reference	224779.00 Googong
Envirolab Reference	338375
Date Sample Received	22/11/2023
Date Instructions Received	22/11/2023
Date Results Expected to be Reported	23/11/2023

Sample Condition

Samples received in appropriate condition for analysis	Yes
No. of Samples Provided	2 Soil
Turnaround Time Requested	1 day
Temperature on Receipt (°C)	11
Cooling Method	Ice Pack
Sampling Date Provided	YES

Comments

Nil

Please direct any queries to:

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

Analysis Underway, details on the following page:

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Sample ID	Acid Extractable metalsin soil
218-0.4-0.5	✓
220-0.25-0.3	✓

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

Additional Info

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

Douglas Partners
Geotechnics | Environment | Groundwater

CHAIN OF CUSTODY DESPATCH SHEET

Project No:	224779.00	**Suburb:**	Googong	**To:**	Envirolab Services
Project Manager:	Kenton Horsley	**Order Number:**		**Sampler:** HS	12 Ashley St, Chatswood NSW 2067
Email:	kenton.horsley@douglaspartners.com.au \ emily.bodel@douglaspartners.com.au			**Attn:**	Sample Receipt
Turnaround time:	☐ Standard ☐ 72 hour ☐ 48 hour ☑ 24 hour ☐ Same day				(02) 9910 6200 samplereceipt@envirolab.com.au
Prior Storage:	☑ Fridge ☐ Freezer ☐ Esky ☐ Shelf	**Do samples contain 'potential' HBM?**	☑ No ☐ Yes	(If YES, then handle, transport and store in accordance with FPM HAZID)	

Lab ID	Sample ID: Location / Other ID	Depth From	Depth To	Date Sampled	Sample Type: S - soil W - water M - Material	Container Type: G - glass P - plastic	Analytes: Heavy metals (include Mn)										Notes/ Preservation/ Additional Requirements
1	218	0.4	0.5	8/11/23	S	G&P	X										
2	220	0.25	0.3	8/11/23	S	G&P	X										

ENVIROLAB
Envirolab Services
12 Ashley St
Chatswood NSW 2067
Ph: (02) 9910 6200

Job No: 338375
Date Received: 23/11/22 1000 22/11/23
Time Received:
Received By:
Temp: Cool/Ambient
Cooling: Ice/Icepack
Security: Intact/Broken/None

Metals to analyse:	As, Cd, Cr, Cu, Pb, Hg, Mn, Ni, Zn		
Number of samples in container:	2	**Transported to laboratory by:**	FEDx/TNT
Send results to:	Douglas Partners Pty Ltd		
Address:	Unit 2, 73 Sheppard Street, Hume ACT 26	**Phone:**	(02) 6260 2788
Relinquished by:		**Date:**	**Signed:**

LAB RECEIPT

Lab Ref. No:	338375
Received by:	Paul ELS
Date & Time:	23/11/22 1000 22/11/23
Signed:	

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CERTIFICATE OF ANALYSIS 337513-A

Client Details

Client	Douglas Partners Canberra
Attention	Emily Bodel
Address	Unit 2, 73 Sheppard St,, HUME, ACT, 2620

Sample Details

Your Reference	**224779.00, Googong**
Number of Samples	Additional TCLP analysis
Date samples received	10/11/2023
Date completed instructions received	20/11/2023

Analysis Details

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

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

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

Report Details

Date results requested by	21/11/2023
Date of Issue	21/11/2023

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Results Approved By
Loren Bardwell, Development Chemist

Authorised By
Nancy Zhang, Laboratory Manager

Metals from Leaching Fluid pH 2.9 or 5		
Our Reference		337513-A-2
Your Reference	UNITS	218
Depth		0.1-0.2
Date Sampled		08/11/2023
Type of sample		Soil
Date extracted	-	21/11/2023
Date analysed	-	21/11/2023
pH of soil for fluid# determ.	pH units	7.2
pH of soil TCLP (after HCl)	pH units	2.4
Extraction fluid used		1
pH of final Leachate	pH units	5.6
Lead	mg/L	<0.03

Method ID	Methodology Summary
Inorg-004	Toxicity Characteristic Leaching Procedure (TCLP) using AS 4439. Please note that the mass used may be scaled down from default based on sample mass available. Samples are stored at 2-6oC before and after leachate preparation.
Metals-020	Determination of various metals by ICP-AES following buffer determination as per USEPA 1311 and hence AS 4439.3. Extraction Fluid 1 refers to the pH 5.0 buffer and Extraction Fluid 2 is the pH 2.9 buffer.

QUALITY CONTROL: Metals from Leaching Fluid pH 2.9 or 5					Duplicate				Spike Recovery %	
Test Description	Units	PQL	Method	Blank	#	Base	Dup.	RPD	LCS-W1	[NT]
Date extracted	-			21/11/2023	[NT]	[NT]	[NT]	[NT]	21/11/2023	[NT]
Date analysed	-			21/11/2023	[NT]	[NT]	[NT]	[NT]	21/11/2023	[NT]
Lead	mg/L	0.03	Metals-020	<0.03	[NT]	[NT]	[NT]	[NT]	103	[NT]

Result Definitions

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

Quality Control Definitions

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

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

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

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

Laboratory Acceptance Criteria

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

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

Spikes for Physical and Aggregate Tests are not applicable.

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

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

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

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

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

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

Where matrix spike recoveries fall below the lower limit of the acceptance criteria (e.g. for non-labile or standard Organics <60%), positive result(s) in the parent sample will subsequently have a higher than typical estimated uncertainty (MU estimates supplied on request) and in these circumstances the sample result is likely biased significantly low.

Measurement Uncertainty estimates are available for most tests upon request.

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

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

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SAMPLE RECEIPT ADVICE

Client Details

Client	Douglas Partners Canberra
Attention	Emily Bodel

Sample Login Details

Your reference	224779.00, Googong
Envirolab Reference	337513-A
Date Sample Received	10/11/2023
Date Instructions Received	20/11/2023
Date Results Expected to be Reported	21/11/2023

Sample Condition

Samples received in appropriate condition for analysis	Yes
No. of Samples Provided	Additional TCLP analysis
Turnaround Time Requested	1 day
Temperature on Receipt (°C)	12
Cooling Method	Ice Pack
Sampling Date Provided	YES

Comments

Nil

Please direct any queries to:

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

Analysis Underway, details on the following page:

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Sample ID	pH of soil for fluid#determ.	pH of soil TCLP (after HCl)	Extraction fluid used	pH of final Leachate	Lead	On Hold
217-0.1-0.2						✓
218-0.1-0.2	✓	✓	✓	✓	✓	
219-0.1-0.2						✓
220-0.1-0.2						✓
221-0.1-0.2						✓
222-0.05-0.1						✓
223-0.1-0.2						✓
224-0.05-0.1						✓
225-0.2-0.3						✓
226-0.1-0.15						✓
218 - [TRIPLICATE]-0.1-0.2						✓

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

Additional Info

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

Appendix K

Data Quality Assurance and Quality Control Site Audit Statement

1. Field and Laboratory Data Quality Assurance and Quality Control

The field and laboratory data quality assurance and quality control (QA/QC) procedures and results are summarised in the following Table 1. Reference should be made to the field work methodology and the laboratory results / certificates of analysis for further details. The relative percentage difference (RPD) results, along with the other field QC samples are included at the end of this appendix.

Table 1: Field and laboratory quality control

Item	Evaluation / acceptance criteria	Compliance
Analytical laboratories used	National Authority for Testing Association (NATA) accreditation	C
Holding times	Various based on type of analysis	PC
Intra-laboratory replicates	5% of primary samples;	C
	<30% RPD	C
Inter-laboratory replicates	5% of primary samples;	NC
	<30% RPD	C
Trip Spikes	1 per sampling event; 60-140% recovery	NC
Trip Blanks	1 per sampling event; <PQL	NC
Laboratory / Reagent Blanks	1 per batch; <PQL	C
Laboratory Duplicate	1 per lab batch; As laboratory certificate	PC
Matrix Spikes	1 per lab batch; 70-130% recovery (inorganics); 60-140% recovery (organics)	PC
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 standard operating procedure (SOP) for all aspects of the sampling field work	C

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

It is noted that results for replicate sample R3 were not recorded due to an administrative error. As a result, inter-laboratory testing was conducted at a frequency of less than 5%. The low frequency of inter-laboratory replicate testing (3%) is not considered to affect the overall assessment.

The absence of trip spikes and trip blanks are not considered to affect the overall assessment, particularly as the potential for volatile contaminants being present in soil at the site is low.

A review of the laboratory certificates was conducted, and the following comments were made by the laboratory:

- The laboratory acceptance criteria has been exceeded for 335052-1 for Arsenic (As), Copper (Cu), Lead (Pb) and Manganese (Mn). Therefore a triplicate result has been issued as laboratory sample number 335052-52;
- Percent spike recovery for manganese in samples 335052-47 and 335052-6 is not applicable due to the high concentration of the element in the sample. However, an acceptable recovery was obtained for the laboratory control sample (LCS);
- The laboratory acceptance criteria has been exceeded for 337513-2 for Arsenic (As), Copper (Cu) and Lead (Pb). Therefore, a triplicate result has been issued as laboratory sample number 337513-11; and
- The laboratory acceptance criteria has been exceeded for 338375-1 for Lead (Pb). Therefore a triplicate result has been issued as laboratory sample number 338375-3.

Analysis for TRH, BTEX, PAH, OCP and OPP was undertaken slightly outside recommended holding times for some samples. This and the above-listed non-compliances at the laboratory are not considered to affect the overall assessment of analytical results.

In summary, the QC data is determined to be of sufficient quality to be considered acceptable for the assessment.

2. Data Quality Indicators

The reliability of field procedures and analytical results was assessed against the following data quality indicators (DQI) as outlined in NEPC *National Environment Protection (Assessment of Site Contamination) Measure 1999 (as amended 2013) [NEPM]* (NEPC, 2013):

- Completeness: a measure of the amount of usable data from a data collection activity;
- Comparability: the confidence (qualitative) that data may be considered to be equivalent for each sampling and analytical event;
- Representativeness: the confidence (qualitative) of data representativeness of media present on-site;
- Precision: a measure of variability or reproducibility of data; and
- Accuracy: a measure of closeness of the data to the 'true' value.

Table 2: Data quality indicators

Data quality indicator	Method(s) of achievement
Completeness	Systematic and selected target locations sampled.
	Preparation of borehole logs, test pit logs, sample location plan and chain of custody (CoC) 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 CoC documentation.
	NATA accredited laboratory results certificates provided by the laboratory.
	Satisfactory frequency and results for field and laboratory quality control (QC) samples as discussed in Section 1.
Comparability	Using appropriate techniques for sample recovery, storage and transportation, which were the same for the duration of the project.
	Experienced sampler 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 DQO.
	Samples were extracted and analysed for all analytes 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 DQI have been generally complied with.

3. Conclusion

Based on the results of the field QA and field and laboratory QC, and evaluation against the DQI it is concluded that the field and laboratory test data obtained are reliable and useable for this assessment.

4. 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.

Table QA1: Relative Percentage Difference Results for Replicate Samples

			Metals									TRH						BTEX				PAH
			Arsenic	Cadmium	Total Chromium	Copper	Lead	Mercury (inorganic)	Nickel	Zinc	Manganese	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]
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
R1	0.2 m	26/09/23	8	<0.4	46	4	9	<0.1	17	33	350	<25	<50	<25	<50	<100	<100	<0.2	<0.5	<1	<1	<0.1
215	0.2 m	26/09/23	9	<0.4	41	4	10	<0.1	16	31	410	<25	<50	<25	<50	<100	<100	<0.2	<0.5	<1	<1	<0.1
		Difference	1	0	5	0	1	0	1	2	60	0	0	0	0	0	0	0	0	0	0	0
		RPD	12%	0%	11%	0%	11%	0%	6%	6%	16%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%
R2	0.2 m	26/09/23	15	<0.4	39	38	6	<0.1	18	35	200	<25	<50	<25	<50	<100	<100	<0.2	<0.5	<1	<1	<0.1
212	0.2 m	26/09/23	16	<0.4	45	48	7	<0.1	21	41	230	<25	<50	<25	<50	<100	<100	<0.2	<0.5	<1	<1	<0.1
		Difference	1	0	6	10	1	0	3	6	30	0	0	0	0	0	0	0	0	0	0	0
		RPD	6%	0%	14%	23%	15%	0%	15%	16%	14%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%
R1-081123		8/11/2023	15	<1	18	8	22	<0.1	8	47	-	<10	<50	<10	<50	<100	<100	<0.2	<0.5	<0.5	<0.5	<1
219		8/11/2023	15	<0.4	19	10	26	<0.1	10	47	240	<25	<50	<25	<50	<100	<100	<0.2	<0.5	<1	<1	<0.1
		Difference	0	0	1	2	1	0	2	0	-	0	0	0	0	0	0	0	0	0	0	0
		RPD	0%	0%	5%	22%	17%	0%	22%	0%	-	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%