GEOTECHNIQUE® PTY LTD

ABN 64 002 841 063

Job No: 14305/17
Our Ref: 14305/17-AA
5 August 2022

Mirvac Homes (NSW) Pty Ltd
C/- Calibre Group
PO Box 8300
BAULKHAM HILLS NSW 2153
Email: Geraldine.macaspac@calibregroup.com

Attention: Ms G Macaspac

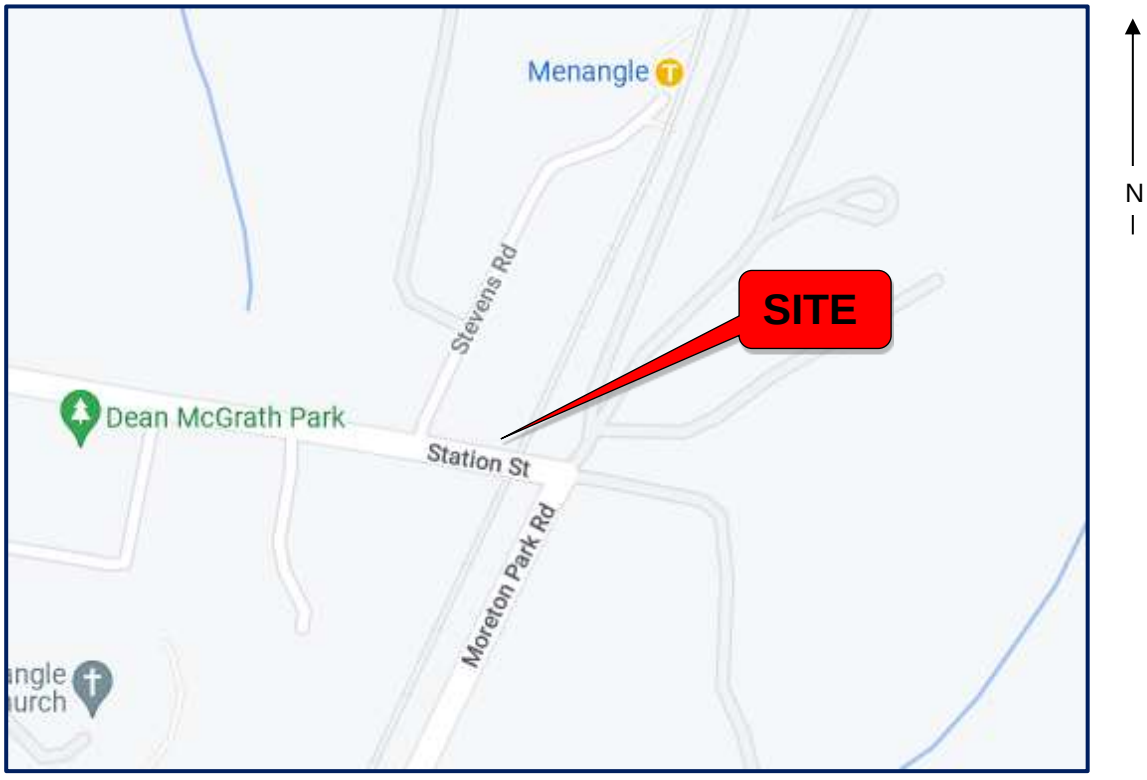
Dear Madam

re **Proposed Pedestrian Bridge**
Station Street, Menangle
Preliminary Site Investigation Addendum

Further to the preliminary site investigation (PSI) report (Our Ref: 14305/10-AA dated 31 May 2021), prepared by Geotechnique Pty Ltd (Geotechnique) and due to change of location of the proposed pedestrian bridge about 2m towards the northern direction to make it as free standing (instead of bolting with the existing Station Street road bridge), this addendum provides updated information regarding contamination assessment of soil at three additional locations along the proposed retaining wall for the proposed eastern approach ramp. No further sampling towards to northern side of the Station Street was carried out due to the presence of steel guard rail. Due to the site access issue, no sampling was carried out for the proposed western approach ramp, which is now located within fenced land owned by the railway.

The proposed free standing pedestrian bridge site is indicated on Figure 1 below.

FIGURE 1



Map Data ©2022 Google

The purpose of a contamination assessment was to determine any contamination in the along the proposed retaining wall for the proposed eastern approach ramp of the proposed pedestrian bridge.

This report was prepared generally in accordance with the NSW Environment Protection Authority (EPA), "Consultants Reporting on Contaminated Land" – 2020, and in consideration of State Environmental Planning Policy (Resilience and Hazards, 2021-Chapter 4 Remediation of Land) under the Environmental Planning and Assessment Act 1979.

In order to achieve the aim of a contamination assessment, the following scope of work was conducted in accordance with the fee proposal dated 15 July 2022 (Quote Ref: Q9986):

- An inspection of the site by an Environmental Scientist from Geotechnique Pty Ltd (Geotechnique) to determine current site conditions and identify any environmental concerns based on visual and olfactory indicators of potential contamination.
- Judgemental soil sampling by the Environmental Engineer using a hand tool, aimed at ascertaining the presence or otherwise of soil contaminants along the proposed retaining wall for the proposed eastern approach ramp.
- Chemical analysis by National Association of Testing Authorities (NATA) accredited testing laboratories, in accordance with chains of custody (COC) prepared by Geotechnique.
- Preparation and analysis of standard quality assurance (QA) and quality control (QC) samples.
- Assessment of the laboratory analytical results against current applicable guidelines.
- Assessment of the contamination status of soil.

SITE INFORMATION

The proposed pedestrian bridge (hereafter referred as the site) starts from the north east corner of Station Street and Stevens Road intersects over the railway line (by bridge) and extends to the opposing batter on the other side of the railway line on Station Street, Menangle. Instead of bolting with the existing Station Street road bridge, the new free standing pedestrian bridge will now have about 2m gap with the road bridge. Proposed free standing pedestrian bridge layout is shown on Drawing No 14305/17-AA1.

Site inspection was carried out on 29 July 2022 by an Environmental Scientist from Geotechnique as a part of this contamination assessment. No significant changes were noted since the initial investigation was carried out in March 2021. It should be noted however the revised site boundary has moved the eastern approach ramp of the proposed bridge from the previously described vacant shoulder of land to the east of the tracks to a small portion of land within part of current earthworks construction site. The revised bridge layout has also shifted the western approach ramp of the proposed bridge further to the east within a fenced land owned by the railway.

There were no obvious ash materials on the ground surface, odour, or discolouration that would indicate the potential for contamination. There were no obvious features associated with underground storage tanks (bowser, breather pipe, inlet valve and piping). There were no air emissions emanating from the site.

The site is bound to the north by Railway Corridor, to the east by rural residential, to the south by rural residential land and construction site, and to the west by Stevens Road and residential subdivision beyond the road.

TOPOGRAPHY, GEOLOGY, HYDROGEOLOGY & ACID SULPHATE SOILS MAP

In general, ground slopes towards the east and west of the site, and the central alignment consists of the rail corridor which has been cut out.

The Geological Map of Wollongong - Port Hacking (Geological Series Sheet 9029-9129, Scale 1:100,000, Edition 1, 1985), published by the Department of Mineral Resources indicates the residual soils within the site to be underlain by Triassic Age Shale of the Wianamatta Group, comprising laminite and dark grey siltstone. It was also noted on the eastern portion of the map indicates the residual soils to be underlain by Hawkesbury Sandstone comprising medium to coarse grained quartz sandstone, very minor shale and laminite lenses.

The Soil Landscape Map of Wollongong - Port Hacking (Soil Landscape Series Sheet 9029-9129, Scale 1:100,000, 1990) prepared by the Soil Conservation Service of NSW, indicates the site is located within the Theresa Park soil landscape area that typically consists of Tertiary and Quaternary alluvial soils associated with floodplains. However, landscapes in the section to the east of the railway with highly plastic soils belong to the Blacktown Group.

The site is outside the available Acid Sulphate Risk Maps, indicating that the site is in an area of No Known Occurrence. Areas classified as No Known Occurrence are those for which the environment of deposition has not been suitable for the formation of Acid Sulphate Soil. Therefore, acid sulphate soil is not an issue for the site.

Sub-surface profiles encountered in the boreholes drilled within eastern approach ramp of the proposed pedestrian bridge, are detailed in Table 1 – Borehole Logs in Attachment B and summarised below.

Fill	The following 2 types of fill were encountered: Type 1: Gravelly Sand, fine grained, grey to dark grey was encountered in BH101 to a depth of 300mm below existing ground surface (EGL), underlain by natural clayey soil. Type 2: Gravelly Clay, medium plasticity, grey was encountered at BH102, to a depth of 50mm below the below the EGL, underlain by natural clayey soil.
Natural	Silty CLAY, medium to high plasticity, orange was encountered beneath fill materials and on the surface layer of BH103.

There were no obvious ash materials, fibre-cement pieces and odour in the boreholes.

The closest waterbody to the site is the Nepean River which is about 700m to the east of the site. Based on observation and site topography, surface run-off would part of the surface run-off may eventuate in the creeks. Obvious local depressions that might capture or divert stormwater run-off were not observed within the site.

A search was carried out on 5 May 2021 through the website of Department of Primary Industries Office of Water for any registered groundwater bore data within a radius of 500m of the site as a part of the PSI. The search revealed that no information available on that date.

Groundwater or perched water was not encountered during sampling to a maximum depth of about 500mm below EGL, during the short period the borehole locations remained open. However, it should be noted that groundwater levels might vary due to rainfall and other factors not evident during field work.

Based on the previous experience in the region, groundwater in the site is anticipated to be in excess of 3.0m below existing ground surface.

FIELD SAMPLING AND LABORATORY ANALYSIS

The field work for this assessment was carried out on 29 July 2022 by the Environmental Scientist from Geotechnique, who was responsible for visually assessing the site, positioning the borehole locations as close as possible to nominated locations, drilling the borehole with hand auger, recovery of soil samples, preparation of samples for delivery to NATA accredited laboratories, and logging the sub-surface profile encountered at each borehole location.

Three judgmental test pit locations (BH101 to BH103) were positioned along the proposed retaining wall for the proposed eastern approach ramp of the proposed pedestrian bridge. The borehole locations are shown on Drawing No 14305/17-AA1 in Attachment A. No further sampling towards to northern side of the Station Street was carried out due to the presence of steel guard rail.

Although no sampling was carried out within the proposed western approach ramp of the proposed bridge due to the site access issue (fenced land owned by the railway), sampling and testing of soil was carried out during the PSI in 2021 in one location (BH3) near the proposed western approach ramp.

The soil sampling and decontamination procedures adopted were as follows:

- The boreholes were drilled using a stainless steel hand auger, over the depth interval nominated by the Environmental Scientist. Thereafter, the soil was recovered directly from the auger using disposable gloves. A trowel was used to divide the soil sample into two portions to prepare duplicate/split samples. Decontamination of the auger and trowel involved the;
  - Removal of soils adhering to the auger and trowel by scrubbing with a brush;
  - Washing the auger and trowel thoroughly in a solution of phosphate free detergent (Decon 90) using brushes and disposable gloves;
  - Rinsing the auger and trowel thoroughly with distilled water;
  - Repeating the washing / rinsing steps and rinsing with water;
  - Drying the auger and trowel with a clean cloth.
- To minimise the potential loss of volatiles, the soil sample was immediately transferred to a labelled, laboratory supplied, 250ml glass jar and sealed with an airtight, Teflon screw top lid. The fully filled jar was then placed in a chilled container.
- The recovered soil sample for asbestos analysis, transferred into small plastic zip-lock bag, which was placed in a container.

In order to measure the reproducibility of test results, duplicate and split (interlaboratory duplicates) samples were prepared for analyses. Samples were kept in a labelled, laboratory supplied, glass jar (acid-washed and solvent-rinsed) and sealed with an airtight, Teflon screw top lid. The fully filled jar was placed in a chilled container.

A rinsate water sample was collected and placed in a glass bottle and a vial supplied by the laboratory at completion of sampling. The fully filled bottle and vial were labelled and placed in a chilled container.

At completion of field sampling, the chilled containers and container were transported to our Penrith office. The chilled containers were then transferred to a refrigerator where the temperature was maintained below 4°C.

The primary samples and QA / QC samples including the trip spike sample in the chilled container were forwarded under COC conditions to the primary testing laboratory of SGS Environmental Services (SGS). Inter-laboratory duplicate (split) sample was forwarded to the secondary testing laboratory of Envirolab Services Pty Ltd (Envirolab). For asbestos testing, fill samples in the container were sent to Australian Safer Environment & Technology Pty Ltd (ASET). SGS, Envirolab and ASET are National Association of Testing Authorities (NATA) accredited.

On receipt of the samples and COC, the laboratories returned the Sample Receipt Advice (SRA) verifying the integrity of all samples received.

The soil sampling did not reveal any visual (staining or dying) or olfactory indicators of potential contaminants. In order to determine the current contamination status of the soil, all recovered fill samples and surface natural soil sample were analysed for Metals (arsenic, cadmium, chromium, copper, lead, mercury, nickel and zinc), Total Recoverable Hydrocarbons (TRH), BTEX (Benzene, Toluene, Ethyl Benzene and Xylene), Polycyclic Aromatic Hydrocarbon (PAH), Organochlorine Pesticides (OCP), Polychlorinated Biphenyls (PCB) and Phenols. The fill samples were also analysed for asbestos for screening purposes. Deeper natural clayey soil samples, immediately below the fill materials, were analysed for Metals (arsenic, cadmium, chromium, copper, lead, mercury, nickel and zinc), TRH, BTEX and PAH for screening purposes.

Reference may be made to “Laboratory Test Results, Assessment & Discussion” in this report for a summary of the laboratory test results.

FIELD QUALITY ASSURANCE & QUALITY CONTROL (QA & QC)

The following QA/QC procedures were implemented for the sampling and analytical program. The laboratory test results certificates for the QA and QC samples are included in Attachment C.

Rinsate

One rinsate water sample (RS1) was recovered on completion of field work in order to identify possible cross contamination between the sampling locations.

The rinsate was analysed for Metals (arsenic, cadmium, chromium, copper, lead, mercury, nickel and zinc), TRH, BTEX and PAH. The test results for the rinsate water sample are summarised in Table A in Attachment D.

As indicated in Table A, all concentrations in the rinsate blank sample were less than laboratory limits of reporting (LOR), which indicates that adequate decontamination was carried out in the field.

Trip Spike

Trip spike samples are obtained from the laboratory on a regular basis, prior to conducting field sampling where volatile substances are suspected. The samples are held in the Penrith office of Geotechnique, at less than 4°C, for a period of no more than seven days. During field work, the trip spike sample is kept in the chilled container with soil samples recovered from the site. The trip spike sample is then forwarded to the primary laboratory together with the soil samples recovered from the site.

The laboratory prepares the trip spike by adding a known amount of pure petrol standard to a clean sand sample. The sample is mixed thoroughly to ensure a relatively homogenous distribution of the spike throughout the sample. When the sample is submitted for analysis, the same procedure is adopted for testing as for the soil samples being analysed from the site.

The purpose of the trip spike is to detect any loss or potential loss of volatiles from the soil samples during field work, transportation, sample extraction or testing.

One trip spike sample (TS1) was forwarded to the primary analytical laboratory with the samples collected, and was tested for BTEX. The test results for the trip spike samples, reported as a percentage recovery of the applied and known spike concentrations, are shown in Table B in Attachment D.

As indicated in Table B, the results show a good recovery of the spike concentrations, ranging between 102% and 112%, which were within the acceptable ranges (70% to 130%). Furthermore, all BTEX results were less than laboratory detection limits, and there were no visible or olfactory indication of hydrocarbon contamination.

Based on the above, it is considered that any loss of volatiles that might have occurred from the recovered samples would not affect the outcome / conclusion of this report.

Duplicate Sample

A field duplicate sample was prepared in the field through the following processes:

- A larger than normal quantity of soil was recovered from the sample location selected for duplication.
- The sample was placed in a decontaminated stainless bowl and divided into two portions, using the decontaminated trowel.
- One portion of the sub-sample was immediately transferred using the decontaminated trowel into a labelled, laboratory supplied, 250ml glass jar and sealed with an airtight, Teflon screw top lid. The fully filled jar was labelled as the duplicate sample, and immediately placed in a chilled container.
- The remaining portion was stored in the same way and labelled as the original sample.

Duplicate samples were prepared on the basis of sample numbers recovered during the field work. The duplicate sample frequency was computed using the total number of samples analysed as part of this assessment. The duplicate sample frequencies computed are as follows:

Metals	5 samples analysed;	1 duplicate;	20% frequency
TRH, BTEX and PAH	5 samples analysed;	1 duplicate;	20% frequency
OCP, PCB & Phenols	3 samples analysed;	1 duplicate;	33% frequency

The duplicate frequency adopted complies with the Schedule B3 Guideline on Laboratory Analysis of Potentially Contaminated Soils of the National Environment Protection (Assessment of Site Contamination) Measure (NEPM) 1999 (April 2013), which recommends a duplicate frequency of at least 5%.

The laboratory test results are summarised in Table C in Attachment D.

A comparison was made of the laboratory test results for the duplicate samples with the original samples and the Relative Percentage Differences (RPD) was computed to assess the accuracy of the laboratory test procedures. RPD within 30% are generally considered acceptable. However, this variation can be higher for organic analysis than for inorganics and for low concentrations of analytes or non-homogeneous samples.

As shown in Table C, the comparisons between the duplicate and corresponding original sample indicated generally acceptable RPD, with the exception of RPD values for one metal. This is considered to be due to the non-homogeneous nature of the soil samples analysed.

Both concentrations with RPD in excess of 30% in the duplicate pairs were either less than the relevant assessment criteria.

Based on the above, the variation is not considered critical. Based on the overall duplicate sample numbers and comparisons, it is concluded that the laboratory test data provided by SGS are of adequate accuracy and reliability for this assessment.

Inter-laboratory Duplicate (Split) Sample

The inter-laboratory duplicate (split) sample provides a check on the analytical performance of the primary laboratory. The split sample was prepared on the basis of sample numbers recovered during field work, and the analyses undertaken by the primary laboratory.

The split sample was prepared in the same manner as the duplicate sample. Reference should be made to the above sub-section.

The split sample was forwarded to the secondary laboratory of Envirolab.

The split sample frequency was computed using the total number of samples analysed as part of this assessment. The split sample frequencies computed are as follows:

Metals	5 samples analysed;	1 split;	20% frequency
TRH, BTEX and PAH	5 samples analysed;	1 split;	20% frequency
OCP, PCB & Phenols	3 samples analysed;	1 split;	33% frequency

The split sample frequency adopted complies with the Schedule B3 of the NEPM 1999 (April 2013), which recommends a frequency of 5%.

The laboratory test results are summarised in Table D in Attachment D.

Based on Schedule B3 of the NEPM 1999 (April 2013), the difference in the results between the split samples should generally be within 30% of the mean concentration determined by both laboratories, i.e., RPD should be within 30%. However, this variation can be higher for organic analysis than for inorganics and for low concentrations of analytes or non-homogeneous samples.

As shown in Table D, the comparisons between the split and corresponding original sample indicated generally acceptable RPD, with the exception of RPD for one metal. This is considered to be due to the non-homogeneous nature of the soil samples analysed.

Both concentrations with RPD in excess of 30% in the split pairs were less than the relevant assessment criteria.

Based on the above, the variation is not considered critical. Based on the overall split sample numbers and comparisons, it is concluded that the test results provided by the primary laboratory are deemed reliable for this assessment.

LABORATORY QUALITY ASSURANCE & QUALITY CONTROL (QA & QC)

Geotechnique uses only laboratories accredited by the NATA for chemical analyses. The laboratory must also incorporate quality laboratory management systems to ensure trained analysts using validated methods and suitably calibrated equipment to produce reliable results.

In addition to the QC samples, the laboratory must also ensure that all analysts receive certification as to their competence in carrying out the analysis and participate in national and international proficiency studies.

SGS and Envirolab are both accredited by NATA and operate a Quality System designed to comply with ISO/IEC 17025.

The recovered discrete soil samples were analysed within the allowable holding times detailed in Schedule B3 of the NEPM 1999 (April 2013). It should be noted that there is no specific holding time for asbestos analysis. The rinsate sample was analysed within the allowable holding times for water detailed in Standard Methods for the Examination of Water and Wastewater (APHA).

The test methods adopted by the laboratory are indicated with the laboratory test results certificates in Attachment C. As part of the analytical run for the project, the laboratory included laboratory blanks, duplicate samples, laboratory control samples, matrix spikes and/or surrogate spikes.

We have checked the QA/QC procedures and results adopted by the laboratories against the appropriate guidelines. The QC sample numbers adopted by SGS and Envirolab are considered adequate for the analyses undertaken.

The methods used by SGS, Envirolab and ASET have been validated as recommended in the NEPM and ANZECC guidelines and endorsed by NATA.

The samples analysed for TPH (C_6–C_9) and/or BTEX were extracted by the purge and trap method recommended by the NSW EPA.

All reported laboratory LOR / Practical Quantitation Limits (PQL) were less than the assessment criteria adopted for each analyte or analyte group.

Overall, the QC elements adopted by SGS and Envirolab indicate that the analytical data falls within acceptable levels of accuracy and precision for analysis of soil. The analytical data provided is therefore considered to be reliable and useable for this assessment.

ASSESSMENT CRITERIA

Investigation levels and screening levels developed in the NEPM 1999 (April 2013) were used in this assessment, as follows:

- Risk-based Health Investigation Levels (HIL) for a broad range of metals and organic substances. The HIL are applicable for assessing human health risk via all relevant pathways of exposure. The HIL as listed in Table 1A (1) of Schedule B1 "*Guideline on Investigation Levels for Soil and Groundwater*" are provided for different land uses.

  The site is proposed for pedestrian bridge construction. As such, with regard to human health, analytical results will be assessed against risk-based HIL for *commercial / industrial* (HIL D).

- Health Screening Levels (HSL) for TRH fractions and Naphthalene are applicable for assessing human health risk via inhalation pathway. The HSL depend on specific soil physicochemical properties, land use scenarios and the characteristics of building structures. The HSL listed in Table 1A(3) of Schedule B1 "*Guideline on Investigation Levels for Soil and Groundwater*" apply to different soil types and depths below surface to >4m.

  For this assessment, the analytical results were assessed against the available HSL for *commercial / industrial* (HSL D) for clay to depth of 0m to <1m and sand to depth of 0m to <1m.

- Ecological Screening Levels (ESL) for selected petroleum hydrocarbon compounds, TRH fractions and Benzo(a)Pyrene are applicable for assessing the risk to terrestrial ecosystems. ESL listed in Table 1B(6) of Schedule B1 "*Guideline on Investigation Levels for Soil and Groundwater*" broadly apply to coarse and fine-grained soils and various land uses and are generally applicable to the top 2m of soil.

  The analytical result was assessed against the available ESL for *commercial / industrial* for fine-grained soil (clay) and coarse-grained soil (sand).

- Ecological Investigation Levels (EIL), a specific type of Soil Quality Guidelines (SQG) for selected metals, is applicable for assessing the risk to terrestrial ecosystems. EIL listed in Table 1B(1-5) of Schedule B1 "*Guideline on Investigation Levels for Soil and Groundwater*" depend on specific soil physicochemical properties and land use scenarios and generally apply to the top 2m of soil. For arsenic and lead, generic EIL are adopted, for *commercial / industrial* land use for aged contamination. For other metals, where available, EIL are calculated using the EIL calculator developed by CSIRO for NEPC.

  For this assessment, the analytical results were assessed against the available SQG / EIL for *commercial / industrial* land use for aged contamination in soil for high traffic volume.

  For DDT and Naphthalene, generic EIL are adopted, for *commercial / industrial* land use for fresh contaminants.

For discrete soil samples, the individual concentrations of analytes were assessed against the HIL D / HSL D / ESL / EIL.

For asbestos, the assessed soil must not contain asbestos containing material (ACM) in excess of 0.05%w/w, surface soil within the site is free of visible ACM, and asbestos fines (AF) and fibrous asbestos (FA) in the soil is <0.001% w/w.

The site will be deemed contaminated or containing contamination "hot spots" if the above criteria are unfulfilled. Further investigation, remediation and/or management will be recommended if the area of concern is found to be contaminated or containing contamination "hot spots".

The adopted assessment criteria for the soil samples are detailed in Tables E to I in Attachment D.

LABORATORY TEST RESULTS, ASSESSMENT & DISCUSSION

The laboratory test results certificates for the recovered samples are included in Attachment C. The test results are also presented in Tables E to I in Attachment D, together with the assessment criteria adopted. A discussion of the test data is presented in the following sub-sections.

Metals (As, Cd, Cr, Cu, Pb, Hg, Ni & Zn)

Test results of CEC and pH were adopted to calculate ecological investigation levels (EIL) in Table E.

The Metals test results for all fill samples and surface natural soil sample and deeper natural soil samples, immediately below the fill materials, are presented in Table E, and as indicated, all concentrations of Metals were below the available relevant EIL and Health Investigation Levels (HIL) for commercial/industrial development (HIL D).

TRH and BTEX

The TRH and BTEX test results for all fill samples and surface natural soil sample and deeper natural soil samples, immediately below the fill materials are presented in Table F. As shown in Table F, the concentrations of F1 TRH, F2 TRH, F3 TRH, F4 TRH and BTEX were below the relevant HSL D and / or ESL adopted. Moreover, all test results were below the laboratory limits of reporting (LOR).

Polycyclic Aromatic Hydrocarbons (PAH)

The PAH test results for all fill samples and surface natural soil sample and deeper natural soil samples, immediately below the fill materials are presented in Table G and as shown, concentrations of Benzo(a)pyrene, Benzo(a)pyrene TEQ, Naphthalene and Total PAH were below the relevant HIL D or ESL or HSL D or EIL adopted. Moreover, all test results were below the laboratory LOR.

Organochlorine Pesticides (OCP)

The OCP test results for all fill samples and surface natural soil sample are presented in Table H and as indicated, all concentrations of OCP were well below the relevant HIL D. Concentrations of DDT were also below the EIL. Moreover, all test results were below the laboratory LOR.

Polychlorinated Biphenyls (PCB)

The PCB test results for all fill samples and surface natural soil sample are presented in Table H and as indicated, the concentrations of PCB were below the relevant HIL D adopted as well as below the laboratory LOR.

Phenols
The Phenols test results for all fill samples and surface natural soil sample are presented in Table H and as indicated, the concentrations of PCB were below the relevant HIL D adopted as well as below the laboratory LOR

Asbestos
The asbestos test results for the discrete fill samples are presented in Table I and as indicated, no ACM in excess of 0.01%w/w were found and also no AF and FA in excess of 0.001%w/w were found in the analysed soil samples.

CONCLUSION & RECOMMENDATIONS
Based on the PSI (Report Ref: 14305/10-AA dated 31 May 2021) and this contamination, all the laboratory test results satisfied the criteria for stating that the analytes selected are either not present i.e., concentrations less than laboratory LOR, or present in the sampled soil within the accessible part of proposed pedestrian bridge at concentrations that do not pose a risk of hazard to human health or the environment under a “commercial / industrial” form of development.

Based on this assessment, in our opinion, the site is environmentally suitable for the proposed pedestrian bridge construction.

For any materials to be excavated and removed from the site for reuse in other development sites as fill, it is recommended that an assessment of the materials is undertaken, in accordance with the NSW EPA resource recovery exemptions and orders under the Protection of the Environment (POEO) (Waste) Regulation 2014; or NSW EPA *Certification: Virgin excavated natural material* prior to export to other development sites.

If any suspect materials (identified by unusual staining, odour, discolouration or inclusions such as building rubble, asbestos sheets/pieces/pipes, ash material, etc.) are encountered between the sampling locations during and/or in the proposed western approach ramp of the proposed bridge any stage of future earthworks/site preparation, the Unexpected Finds Management Protocol (Attachment E) should be implemented. In the event of contamination, detailed assessment, remediation and validation will be necessary.

Any imported soil (fill) must be assessed by a qualified environmental consultant prior to importation, to ensure suitability for the proposed use. In addition, the imported fill must not contain asbestos and ash, be free of unusual odour, not be discoloured, and not be acid sulphate soil or potential acid sulphate soil. The imported fill should either be virgin excavated natural material (VENM) or excavated natural material (ENM).

LIMITATIONS

Within the scope of work outlined in our fee proposal (Quote Ref: Q9986) dated 15 July 2022, the services performed by Geotechnique in preparing this report were conducted in a manner consistent with the level of quality and skill generally exercised by members of the profession and consulting practice.

To the best of our knowledge, all information obtained and contained in this report is true and accurate. No further investigation has been carried out to authenticate the information provided. Supporting documentation was obtained where possible, some of which is contained in this report.

This report has been prepared for Mirvac Homes (NSW) Pty Limited through Calibre Group for the purpose stated within. Wollondilly Council may rely upon the report for development and/or construction application determinations. Any reliance on this report by other parties shall be at such parties' sole risk as the report might not contain sufficient information for other purposes.

The information in this report is considered accurate at completion of field sampling (29 July 2022), in accordance with the current conditions of the site. Any variations to the site form or use beyond this date could nullify the conclusions stated.

No contamination assessment can eliminate all risk; even a rigorous professional assessment might not detect all contamination within a site.

Reference should be made to the "Environmental Notes" in Attachment F for details on the limitations of this assessment.

If you have any questions, please do not hesitate to contact the undersigned.

Yours faithfully
GEOTECHNIQUE PTY LTD

ANWAR BARBHUYIA
Senior Associate
B.E (Civil), MEngSc (Enviro), MIEAust

Attachment A Drawing No 14305/17-AA1 (Proposed Layout of Pedestrian Bridge and Borehole Locations)
Attachment B Table 1 – Borehole Logs
Attachment C Laboratory Test Results Reports/Certificates
Attachment D Laboratory Analytical Results Summary Tables (Tables A to I)
Attachment E Unexpected Finds Management Protocol
Attachment F Environmental Notes

LIST OF REFERENCES

Contaminated Land Management Act 1997

Contaminated Land Management Regulation 1998

Contaminated Sites: Consultants Reporting on Contaminated Land – NSW Environment Protection Authority 2020

Contaminated Sites: Guidelines for the NSW Site Auditor Scheme (3rd Edition) –NSW EPA 2017

Contaminated Sites: Sampling Design Guidelines - NSW Environment Protection Authority 1995

Geological of Wollongong - Port Hacking 1:100,000 Sheet (9029-9129) – Geological Survey of New South Wales, Department of Minerals and Energy 1985

National Environment Protection (Assessment of Site Contamination) Measure – National Environmental Protection Council 2013

Protection of the Environment Operations (Waste) Regulation 2005 – General Exemption Under Part 6, Clause 51 and 51A – The Excavated Natural Material Exemption & Order 2014

Soil Landscape of Wollongong - Port Hacking 1:100,000 Sheets (9029-9129) – Soil Conservation Service Survey of NSW 1990

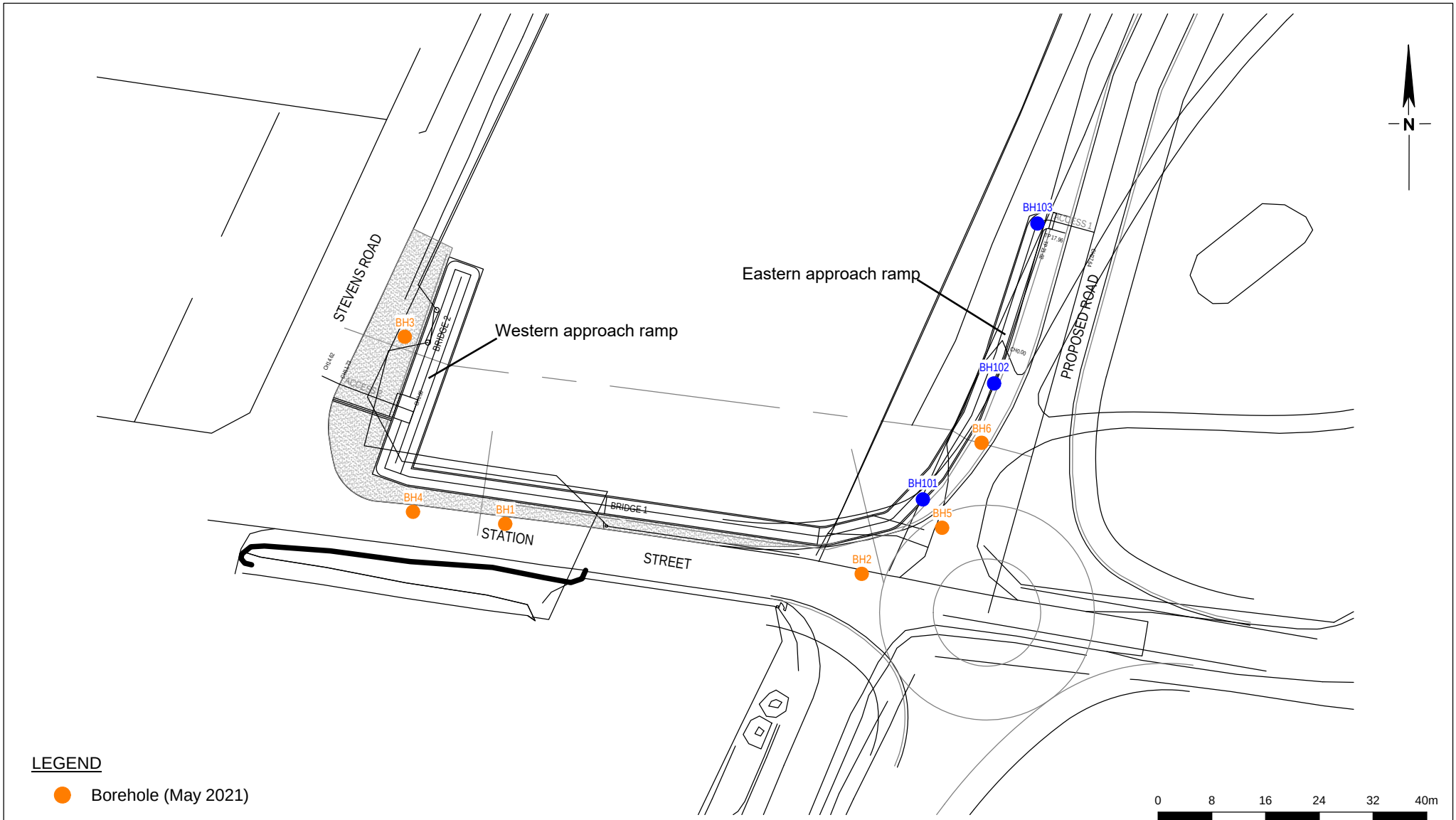
Standard Methods for the Examination of Water and Wastewater – American Public Health Association (APHA) 2017

State Environmental Planning Policy (Resilience and Hazards, 2021) under the Environmental Planning and Assessment Act 1979

Waste Classification Guidelines Part 1: Classifying Waste - NSW DECC (November 2014)

ATTACHMENT A

DRAWING NO 14305/17-AA1
(PROPOSED LAYOUT OF PEDESTRIAN BRIDGE AND BOREHOLE LOCATIONS)



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NOTES

1. Site features are indicative and are not to scale.
2. This drawing has been produced using a base plan provided by others to which additional information e.g test pits, borehole locations or notes have been added. Some or all of the plan may not be relevant at the time of producing this drawing

Calibre Professional Services Pty Ltd
Stages 3 & 4
Station Street
Menangle

Proposed Layout of Pedestrian Bridge and Borehole Locations

Drawing No: 14305/17-AA1
Job No: 14305/17
Drawn By: MH
Date: 5 August 2022
Checked By: JH/AB

File No: 14305-17
Layers: 0, AA1

ATTACHMENT B

TABLE 1
BOREHOLE LOGS

GEOTECHNIQUE PTY LTD

Project:	Proposed Pedestrian Footbridge	**Job No:**	14305/17
Location:	Station Street, Menangle	**Drawing No:**	14305/17-AA1
		Logged & Sampled by:	JH

Table 1

Borehole	Depth (m)	Sample Depth (m)	Date	Material Description	Remarks*
BH101	0.0-0.3	0.0-0.15	29/07/2022	FILL: Gravelly Sand, fine grained, grey to dark grey	
	0.3-0.5	0.35-0.45		(CI-CH) Silty CLAY, medium to high plasticity, orange	
BH102	0.0-0.05	0.0-0.05	29/07/2022	FILL: Gravelly Clay, medium plasticity, grey	
	0.05-0.3	0.1-0.2		(CI-CH) Silty CLAY, medium to high plasticity, orange	
BH103	0.0-0.3	0.0-0.15	29/07/2022	(CI-CH) Silty CLAY, medium to high plasticity, orange	

NS = No Sample

*Odour (O), Discolouration (D), Petroleum Hydrocarbon Staining (PHS), Asbestos Containing Material (ACM), Ash Material (ASHM), Demolition Waste (DW), Groundwater (GW), Perched Water (PW) PID reading etc.

ATTACHMENT C

LABORATORY TEST RESULTS REPORT/CERTIFICATE

ANALYTICAL REPORT

Accreditation No. 2562

CLIENT DETAILS

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Project	**14305/17 Menangle**
Order Number	(Not specified)
Samples	8

LABORATORY DETAILS

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SGS Reference	**SE234947 R0**
Date Received	1/8/2022
Date Reported	3/8/2022

COMMENTS

Accredited for compliance with ISO/IEC 17025 - Testing. NATA accredited laboratory 2562(4354).

SIGNATORIES

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VOC's in Soil [AN433] Tested: 2/8/2022

PARAMETER	UOM	LOR	BH101 SAND 0.0-0.15 29/7/2022 SE234947.001	BH101 CLAY 0.35-0.45 29/7/2022 SE234947.002	BH102 CLAY 0.0-0.05 29/7/2022 SE234947.003	BH102 CLAY 0.1-0.2 29/7/2022 SE234947.004	BH103 CLAY 0.0-0.15 29/7/2022 SE234947.005
Benzene	mg/kg	0.1	<0.1	<0.1	<0.1	<0.1	<0.1
Toluene	mg/kg	0.1	<0.1	<0.1	<0.1	<0.1	<0.1
Ethylbenzene	mg/kg	0.1	<0.1	<0.1	<0.1	<0.1	<0.1
m/p-xylene	mg/kg	0.2	<0.2	<0.2	<0.2	<0.2	<0.2
o-xylene	mg/kg	0.1	<0.1	<0.1	<0.1	<0.1	<0.1
Total Xylenes	mg/kg	0.3	<0.3	<0.3	<0.3	<0.3	<0.3
Total BTEX	mg/kg	0.6	<0.6	<0.6	<0.6	<0.6	<0.6
Naphthalene (VOC)	mg/kg	0.1	<0.1	<0.1	<0.1	<0.1	<0.1

PARAMETER	UOM	LOR	DDS1 SAND - 29/7/2022 SE234947.006	TS1 SOIL - 29/7/2022 SE234947.008
Benzene	mg/kg	0.1	<0.1	[112%]
Toluene	mg/kg	0.1	<0.1	[105%]
Ethylbenzene	mg/kg	0.1	<0.1	[102%]
m/p-xylene	mg/kg	0.2	<0.2	[102%]
o-xylene	mg/kg	0.1	<0.1	[103%]
Total Xylenes	mg/kg	0.3	<0.3	-
Total BTEX	mg/kg	0.6	<0.6	-
Naphthalene (VOC)	mg/kg	0.1	<0.1	-

Volatile Petroleum Hydrocarbons in Soil [AN433] Tested: 2/8/2022

PARAMETER	UOM	LOR	BH101 SAND 0.0-0.15 29/7/2022 SE234947.001	BH101 CLAY 0.35-0.45 29/7/2022 SE234947.002	BH102 CLAY 0.0-0.05 29/7/2022 SE234947.003	BH102 CLAY 0.1-0.2 29/7/2022 SE234947.004	BH103 CLAY 0.0-0.15 29/7/2022 SE234947.005
TRH C6-C9	mg/kg	20	<20	<20	<20	<20	<20
Benzene (F0)	mg/kg	0.1	<0.1	<0.1	<0.1	<0.1	<0.1
TRH C6-C10	mg/kg	25	<25	<25	<25	<25	<25
TRH C6-C10 minus BTEX (F1)	mg/kg	25	<25	<25	<25	<25	<25

PARAMETER	UOM	LOR	DDS1 SAND - 29/7/2022 SE234947.006
TRH C6-C9	mg/kg	20	<20
Benzene (F0)	mg/kg	0.1	<0.1
TRH C6-C10	mg/kg	25	<25
TRH C6-C10 minus BTEX (F1)	mg/kg	25	<25

TRH (Total Recoverable Hydrocarbons) in Soil [AN403] Tested: 2/8/2022

PARAMETER	UOM	LOR	BH101 SAND 0.0-0.15 29/7/2022 SE234947.001	BH101 CLAY 0.35-0.45 29/7/2022 SE234947.002	BH102 CLAY 0.0-0.05 29/7/2022 SE234947.003	BH102 CLAY 0.1-0.2 29/7/2022 SE234947.004	BH103 CLAY 0.0-0.15 29/7/2022 SE234947.005
TRH C10-C14	mg/kg	20	<20	<20	<20	<20	<20
TRH C15-C28	mg/kg	45	<45	<45	<45	<45	<45
TRH C29-C36	mg/kg	45	<45	<45	<45	<45	<45
TRH C37-C40	mg/kg	100	<100	<100	<100	<100	<100
TRH >C10-C16	mg/kg	25	<25	<25	<25	<25	<25
TRH >C10-C16 - Naphthalene (F2)	mg/kg	25	<25	<25	<25	<25	<25
TRH >C16-C34 (F3)	mg/kg	90	<90	<90	<90	<90	<90
TRH >C34-C40 (F4)	mg/kg	120	<120	<120	<120	<120	<120
TRH C10-C36 Total	mg/kg	110	<110	<110	<110	<110	<110
TRH >C10-C40 Total (F bands)	mg/kg	210	<210	<210	<210	<210	<210

PARAMETER	UOM	LOR	DDS1 SAND - 29/7/2022 SE234947.006
TRH C10-C14	mg/kg	20	<20
TRH C15-C28	mg/kg	45	<45
TRH C29-C36	mg/kg	45	<45
TRH C37-C40	mg/kg	100	<100
TRH >C10-C16	mg/kg	25	<25
TRH >C10-C16 - Naphthalene (F2)	mg/kg	25	<25
TRH >C16-C34 (F3)	mg/kg	90	<90
TRH >C34-C40 (F4)	mg/kg	120	<120
TRH C10-C36 Total	mg/kg	110	<110
TRH >C10-C40 Total (F bands)	mg/kg	210	<210

PAH (Polynuclear Aromatic Hydrocarbons) in Soil [AN420] Tested: 2/8/2022

PARAMETER	UOM	LOR	BH101 SAND 0.0-0.15 29/7/2022 SE234947.001	BH101 CLAY 0.35-0.45 29/7/2022 SE234947.002	BH102 CLAY 0.0-0.05 29/7/2022 SE234947.003	BH102 CLAY 0.1-0.2 29/7/2022 SE234947.004	BH103 CLAY 0.0-0.15 29/7/2022 SE234947.005
Naphthalene	mg/kg	0.1	<0.1	<0.1	<0.1	<0.1	<0.1
2-methylnaphthalene	mg/kg	0.1	<0.1	<0.1	<0.1	<0.1	<0.1
1-methylnaphthalene	mg/kg	0.1	<0.1	<0.1	<0.1	<0.1	<0.1
Acenaphthylene	mg/kg	0.1	<0.1	<0.1	<0.1	<0.1	<0.1
Acenaphthene	mg/kg	0.1	<0.1	<0.1	<0.1	<0.1	<0.1
Fluorene	mg/kg	0.1	<0.1	<0.1	<0.1	<0.1	<0.1
Phenanthrene	mg/kg	0.1	<0.1	<0.1	<0.1	<0.1	<0.1
Anthracene	mg/kg	0.1	<0.1	<0.1	<0.1	<0.1	<0.1
Fluoranthene	mg/kg	0.1	<0.1	<0.1	<0.1	<0.1	<0.1
Pyrene	mg/kg	0.1	<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	<0.1
Chrysene	mg/kg	0.1	<0.1	<0.1	<0.1	<0.1	<0.1
Benzo(b&j)fluoranthene	mg/kg	0.1	<0.1	<0.1	<0.1	<0.1	<0.1
Benzo(k)fluoranthene	mg/kg	0.1	<0.1	<0.1	<0.1	<0.1	<0.1
Benzo(a)pyrene	mg/kg	0.1	<0.1	<0.1	<0.1	<0.1	<0.1
Indeno(1,2,3-cd)pyrene	mg/kg	0.1	<0.1	<0.1	<0.1	<0.1	<0.1
Dibenzo(ah)anthracene	mg/kg	0.1	<0.1	<0.1	<0.1	<0.1	<0.1
Benzo(ghi)perylene	mg/kg	0.1	<0.1	<0.1	<0.1	<0.1	<0.1
Carcinogenic PAHs, BaP TEQ <LOR=0	TEQ (mg/kg)	0.2	<0.2	<0.2	<0.2	<0.2	<0.2
Carcinogenic PAHs, BaP TEQ <LOR=LOR	TEQ (mg/kg)	0.3	<0.3	<0.3	<0.3	<0.3	<0.3
Carcinogenic PAHs, BaP TEQ <LOR=LOR/2	TEQ (mg/kg)	0.2	<0.2	<0.2	<0.2	<0.2	<0.2
Total PAH (18)	mg/kg	0.8	<0.8	<0.8	<0.8	<0.8	<0.8
Total PAH (NEPM/WHO 16)	mg/kg	0.8	<0.8	<0.8	<0.8	<0.8	<0.8

PARAMETER	UOM	LOR	DDS1 SAND - 29/7/2022 SE234947.006
Naphthalene	mg/kg	0.1	<0.1
2-methylnaphthalene	mg/kg	0.1	<0.1
1-methylnaphthalene	mg/kg	0.1	<0.1
Acenaphthylene	mg/kg	0.1	<0.1
Acenaphthene	mg/kg	0.1	<0.1
Fluorene	mg/kg	0.1	<0.1
Phenanthrene	mg/kg	0.1	<0.1
Anthracene	mg/kg	0.1	<0.1
Fluoranthene	mg/kg	0.1	<0.1
Pyrene	mg/kg	0.1	<0.1
Benzo(a)anthracene	mg/kg	0.1	<0.1
Chrysene	mg/kg	0.1	<0.1
Benzo(b&j)fluoranthene	mg/kg	0.1	<0.1
Benzo(k)fluoranthene	mg/kg	0.1	<0.1
Benzo(a)pyrene	mg/kg	0.1	<0.1
Indeno(1,2,3-cd)pyrene	mg/kg	0.1	<0.1
Dibenzo(ah)anthracene	mg/kg	0.1	<0.1
Benzo(ghi)perylene	mg/kg	0.1	<0.1
Carcinogenic PAHs, BaP TEQ <LOR=0	TEQ (mg/kg)	0.2	<0.2
Carcinogenic PAHs, BaP TEQ <LOR=LOR	TEQ (mg/kg)	0.3	<0.3
Carcinogenic PAHs, BaP TEQ <LOR=LOR/2	TEQ (mg/kg)	0.2	<0.2
Total PAH (18)	mg/kg	0.8	<0.8
Total PAH (NEPM/WHO 16)	mg/kg	0.8	<0.8

OC Pesticides in Soil [AN420] Tested: 2/8/2022

PARAMETER	UOM	LOR	BH101 SAND 0.0-0.15 29/7/2022 SE234947.001	BH102 CLAY 0.0-0.05 29/7/2022 SE234947.003	BH103 CLAY 0.0-0.15 29/7/2022 SE234947.005
Hexachlorobenzene (HCB)	mg/kg	0.1	<0.1	<0.1	<0.1
Alpha BHC	mg/kg	0.1	<0.1	<0.1	<0.1
Lindane	mg/kg	0.1	<0.1	<0.1	<0.1
Heptachlor	mg/kg	0.1	<0.1	<0.1	<0.1
Aldrin	mg/kg	0.1	<0.1	<0.1	<0.1
Beta BHC	mg/kg	0.1	<0.1	<0.1	<0.1
Delta BHC	mg/kg	0.1	<0.1	<0.1	<0.1
Heptachlor epoxide	mg/kg	0.1	<0.1	<0.1	<0.1
o,p'-DDE	mg/kg	0.1	<0.1	<0.1	<0.1
Alpha Endosulfan	mg/kg	0.2	<0.2	<0.2	<0.2
Gamma Chlordane	mg/kg	0.1	<0.1	<0.1	<0.1
Alpha Chlordane	mg/kg	0.1	<0.1	<0.1	<0.1
trans-Nonachlor	mg/kg	0.1	<0.1	<0.1	<0.1
p,p'-DDE	mg/kg	0.1	<0.1	<0.1	<0.1
Dieldrin	mg/kg	0.05	<0.05	<0.05	<0.05
Endrin	mg/kg	0.2	<0.2	<0.2	<0.2
o,p'-DDD	mg/kg	0.1	<0.1	<0.1	<0.1
o,p'-DDT	mg/kg	0.1	<0.1	<0.1	<0.1
Beta Endosulfan	mg/kg	0.2	<0.2	<0.2	<0.2
p,p'-DDD	mg/kg	0.1	<0.1	<0.1	<0.1
p,p'-DDT	mg/kg	0.1	<0.1	<0.1	<0.1
Endosulfan sulphate	mg/kg	0.1	<0.1	<0.1	<0.1
Endrin Aldehyde	mg/kg	0.1	<0.1	<0.1	<0.1
Methoxychlor	mg/kg	0.1	<0.1	<0.1	<0.1
Endrin Ketone	mg/kg	0.1	<0.1	<0.1	<0.1
Isodrin	mg/kg	0.1	<0.1	<0.1	<0.1
Mirex	mg/kg	0.1	<0.1	<0.1	<0.1
Total OC VIC EPA	mg/kg	1	<1	<1	<1
Total CLP OC Pesticides	mg/kg	1	<1	<1	<1

PCBs in Soil [AN420] Tested: 2/8/2022

PARAMETER	UOM	LOR	BH101 SAND 0.0-0.15 29/7/2022 SE234947.001	BH102 CLAY 0.0-0.05 29/7/2022 SE234947.003	BH103 CLAY 0.0-0.15 29/7/2022 SE234947.005
Arochlor 1016	mg/kg	0.2	<0.2	<0.2	<0.2
Arochlor 1221	mg/kg	0.2	<0.2	<0.2	<0.2
Arochlor 1232	mg/kg	0.2	<0.2	<0.2	<0.2
Arochlor 1242	mg/kg	0.2	<0.2	<0.2	<0.2
Arochlor 1248	mg/kg	0.2	<0.2	<0.2	<0.2
Arochlor 1254	mg/kg	0.2	<0.2	<0.2	<0.2
Arochlor 1260	mg/kg	0.2	<0.2	<0.2	<0.2
Arochlor 1262	mg/kg	0.2	<0.2	<0.2	<0.2
Arochlor 1268	mg/kg	0.2	<0.2	<0.2	<0.2
Total PCBs (Arochlors)	mg/kg	1	<1	<1	<1

Total Phenolics in Soil [AN295] Tested: 3/8/2022

PARAMETER	UOM	LOR	BH101 SAND 0.0-0.15 29/7/2022 SE234947.001	BH101 CLAY 0.35-0.45 29/7/2022 SE234947.002	BH102 CLAY 0.0-0.05 29/7/2022 SE234947.003	BH102 CLAY 0.1-0.2 29/7/2022 SE234947.004	BH103 CLAY 0.0-0.15 29/7/2022 SE234947.005
Total Phenols	mg/kg	5	<5.0	<5.0	<5.0	<5.0	<5.0

PARAMETER	UOM	LOR	DDS1 SAND - 29/7/2022 SE234947.006
Total Phenols	mg/kg	5	<5.0

pH in soil (1:5) [AN101] Tested: 3/8/2022

PARAMETER	UOM	LOR	BH101 SAND 0.0-0.15 29/7/2022 SE234947.001	BH101 CLAY 0.35-0.45 29/7/2022 SE234947.002	BH102 CLAY 0.0-0.05 29/7/2022 SE234947.003	BH102 CLAY 0.1-0.2 29/7/2022 SE234947.004	BH103 CLAY 0.0-0.15 29/7/2022 SE234947.005
pH	pH Units	0.1	**6.1**	**5.0**	**7.8**	**4.8**	**5.7**

Exchangeable Cations and Cation Exchange Capacity (CEC/ESP/SAR) [AN122] Tested: 3/8/2022

PARAMETER	UOM	LOR	BH101 SAND 0.0-0.15 29/7/2022 SE234947.001	BH101 CLAY 0.35-0.45 29/7/2022 SE234947.002	BH102 CLAY 0.0-0.05 29/7/2022 SE234947.003	BH102 CLAY 0.1-0.2 29/7/2022 SE234947.004	BH103 CLAY 0.0-0.15 29/7/2022 SE234947.005
Exchangeable Calcium, Ca	mg/kg	2	740	460	880	580	1000
Exchangeable Calcium, Ca	meq/100g	0.01	3.7	2.3	4.4	2.9	5.2
Exchangeable Calcium Percentage*	%	0.1	42.5	40.8	54.4	42.5	53.5
Exchangeable Potassium, K	mg/kg	2	440	460	270	440	360
Exchangeable Potassium, K	meq/100g	0.01	1.1	1.2	0.70	1.1	0.92
Exchangeable Potassium Percentage*	%	0.1	13.1	20.5	8.7	16.6	9.5
Exchangeable Magnesium, Mg	mg/kg	2	450	250	330	280	410
Exchangeable Magnesium, Mg	meq/100g	0.02	3.7	2.0	2.7	2.3	3.4
Exchangeable Magnesium Percentage*	%	0.1	42.9	36.0	33.0	34.1	34.7
Exchangeable Sodium, Na	mg/kg	2	31	37	73	110	52
Exchangeable Sodium, Na	meq/100g	0.01	0.13	0.16	0.32	0.46	0.23
Exchangeable Sodium Percentage*	%	0.1	1.6	2.8	3.9	6.8	2.3
Cation Exchange Capacity	meq/100g	0.02	8.7	5.7	8.1	6.8	9.7

Total Recoverable Elements in Soil/Waste Solids/Materials by ICPOES [AN040/AN320] Tested: 2/8/2022

PARAMETER	UOM	LOR	BH101 SAND 0.0-0.15 29/7/2022 SE234947.001	BH101 CLAY 0.35-0.45 29/7/2022 SE234947.002	BH102 CLAY 0.0-0.05 29/7/2022 SE234947.003	BH102 CLAY 0.1-0.2 29/7/2022 SE234947.004	BH103 CLAY 0.0-0.15 29/7/2022 SE234947.005
Arsenic, As	mg/kg	1	4	6	8	10	9
Cadmium, Cd	mg/kg	0.3	<0.3	<0.3	<0.3	<0.3	<0.3
Chromium, Cr	mg/kg	0.5	4.8	15	8.2	16	14
Copper, Cu	mg/kg	0.5	22	22	25	25	21
Lead, Pb	mg/kg	1	20	30	27	31	31
Nickel, Ni	mg/kg	0.5	11	21	11	14	9.4
Zinc, Zn	mg/kg	2	61	65	57	53	35

PARAMETER	UOM	LOR	DDS1 SAND - 29/7/2022 SE234947.006
Arsenic, As	mg/kg	1	5
Cadmium, Cd	mg/kg	0.3	<0.3
Chromium, Cr	mg/kg	0.5	5.9
Copper, Cu	mg/kg	0.5	24
Lead, Pb	mg/kg	1	29
Nickel, Ni	mg/kg	0.5	11
Zinc, Zn	mg/kg	2	60

Mercury in Soil [AN312] Tested: 2/8/2022

PARAMETER	UOM	LOR	BH101 SAND 0.0-0.15 29/7/2022 SE234947.001	BH101 CLAY 0.35-0.45 29/7/2022 SE234947.002	BH102 CLAY 0.0-0.05 29/7/2022 SE234947.003	BH102 CLAY 0.1-0.2 29/7/2022 SE234947.004	BH103 CLAY 0.0-0.15 29/7/2022 SE234947.005
Mercury	mg/kg	0.05	<0.05	<0.05	**0.06**	**0.17**	<0.05

PARAMETER	UOM	LOR	DDS1 SAND - 29/7/2022 SE234947.006
Mercury	mg/kg	0.05	<0.05

Moisture Content [AN002] Tested: 2/8/2022

PARAMETER	UOM	LOR	BH101 SAND 0.0-0.15 29/7/2022 SE234947.001	BH101 CLAY 0.35-0.45 29/7/2022 SE234947.002	BH102 CLAY 0.0-0.05 29/7/2022 SE234947.003	BH102 CLAY 0.1-0.2 29/7/2022 SE234947.004	BH103 CLAY 0.0-0.15 29/7/2022 SE234947.005
% Moisture	%w/w	1	**14.5**	**24.3**	**9.1**	**18.0**	**15.5**

PARAMETER	UOM	LOR	DDS1 SAND - 29/7/2022 SE234947.006
% Moisture	%w/w	1	**17.0**

VOCs in Water [AN433] Tested: 2/8/2022

PARAMETER	UOM	LOR	RS1 WATER - 29/7/2022 SE234947.007
Benzene	µg/L	0.5	<0.5
Toluene	µg/L	0.5	<0.5
Ethylbenzene	µg/L	0.5	<0.5
m/p-xylene	µg/L	1	<1
o-xylene	µg/L	0.5	<0.5
Total Xylenes	µg/L	1.5	<1.5
Total BTEX	µg/L	3	<3
Naphthalene (VOC)	µg/L	0.5	<0.5

Volatile Petroleum Hydrocarbons in Water [AN433] Tested: 2/8/2022

PARAMETER	UOM	LOR	RS1 WATER - 29/7/2022 SE234947.007
TRH C6-C9	µg/L	40	<40
Benzene (F0)	µg/L	0.5	<0.5
TRH C6-C10	µg/L	50	<50
TRH C6-C10 minus BTEX (F1)	µg/L	50	<50

TRH (Total Recoverable Hydrocarbons) in Water [AN403] Tested: 3/8/2022

PARAMETER	UOM	LOR	RS1 WATER - 29/7/2022 SE234947.007
TRH C10-C14	µg/L	50	<50
TRH C15-C28	µg/L	200	<200
TRH C29-C36	µg/L	200	<200
TRH C37-C40	µg/L	200	<200
TRH >C10-C16	µg/L	60	<60
TRH >C10-C16 - Naphthalene (F2)	µg/L	60	<60
TRH >C16-C34 (F3)	µg/L	500	<500
TRH >C34-C40 (F4)	µg/L	500	<500
TRH C10-C40	µg/L	320	<320

PAH (Polynuclear Aromatic Hydrocarbons) in Water [AN420] Tested: 3/8/2022

PARAMETER	UOM	LOR	RS1 WATER - 29/7/2022 SE234947.007
Naphthalene	µg/L	0.1	<0.1
2-methylnaphthalene	µg/L	0.1	<0.1
1-methylnaphthalene	µg/L	0.1	<0.1
Acenaphthylene	µg/L	0.1	<0.1
Acenaphthene	µg/L	0.1	<0.1
Fluorene	µg/L	0.1	<0.1
Phenanthrene	µg/L	0.1	<0.1
Anthracene	µg/L	0.1	<0.1
Fluoranthene	µg/L	0.1	<0.1
Pyrene	µg/L	0.1	<0.1
Benzo(a)anthracene	µg/L	0.1	<0.1
Chrysene	µg/L	0.1	<0.1
Benzo(b&j)fluoranthene	µg/L	0.1	<0.1
Benzo(k)fluoranthene	µg/L	0.1	<0.1
Benzo(a)pyrene	µg/L	0.1	<0.1
Indeno(1,2,3-cd)pyrene	µg/L	0.1	<0.1
Dibenzo(ah)anthracene	µg/L	0.1	<0.1
Benzo(ghi)perylene	µg/L	0.1	<0.1
Total PAH (18)	µg/L	1	<1

Metals in Water (Dissolved) by ICPOES [AN320] Tested: 2/8/2022

PARAMETER	UOM	LOR	RS1 WATER - 29/7/2022 SE234947.007
Arsenic, As	mg/L	0.02	<0.02
Cadmium, Cd	mg/L	0.001	<0.001
Chromium, Cr	mg/L	0.005	<0.005
Copper, Cu	mg/L	0.005	<0.005
Lead, Pb	mg/L	0.02	<0.02
Nickel, Ni	mg/L	0.005	<0.005
Zinc, Zn	mg/L	0.01	<0.01

Mercury (dissolved) in Water [AN311(Perth)/AN312] Tested: 3/8/2022

PARAMETER	UOM	LOR	RS1 WATER - 29/7/2022 SE234947.007
Mercury	mg/L	0.0001	<0.0001

METHOD	METHODOLOGY SUMMARY
AN002	The test is carried out by drying (at either 40°C or 105°C) a known mass of sample in a weighed evaporating basin. After fully dry the sample is re-weighed. Samples such as sludge and sediment having high percentages of moisture will take some time in a drying oven for complete removal of water.
AN020	Unpreserved water sample is filtered through a 0.45µm membrane filter and acidified with nitric acid similar to APHA3030B.
AN040/AN320	A portion of sample is digested with nitric acid to decompose organic matter and hydrochloric acid to complete the digestion of metals. The digest is then analysed by ICP OES with metals results reported on the dried sample basis. Based on USEPA method 200.8 and 6010C.
AN040	A portion of sample is digested with Nitric acid to decompose organic matter and Hydrochloric acid to complete the digestion of metals and then filtered for analysis by ASS or ICP as per USEPA Method 200.8.
AN101	pH in Soil Sludge Sediment and Water: pH is measured electrometrically using a combination electrode and is calibrated against 3 buffers purchased commercially. For soils, sediments and sludges, an extract with water (or 0.01M CaCl2) is made at a ratio of 1:5 and the pH determined and reported on the extract. Reference APHA 4500-H+.
AN122	Exchangeable Cations, CEC and ESP: Soil sample is extracted in 1M Ammonium Acetate at pH=7 (or 1M Ammonium Chloride at pH=7) with cations (Na, K, Ca & Mg) then determined by ICP OES/ICP MS and reported as Exchangeable Cations. For saline soils, these results can be corrected for water soluble cations and reported as Exchangeable cations in meq/100g or soil can be pre-treated (aqueous ethanol/aqueous glycerol) prior to extraction. Cation Exchange Capacity (CEC) is the sum of the exchangeable cations in meq/100g.
AN122	The Exchangeable Sodium Percentage (ESP) is calculated as the exchangeable sodium divided by the CEC (all in meq/100g) times 100. ESP can be used to categorise the sodicity of the soil as below: ESP < 6% non-sodic ESP 6-15% sodic ESP >15% strongly sodic Method is referenced to Rayment and Lyons, 2011, sections 15D3 and 15N1.-
AN295	For Soil, a 1:10 NaOH extraction is made and analysed after 16 hours. The soil extract or water sample is distilled in a phosphoric acid stream. Phenolic compounds in the distillate react with a reagent stream of potassium hexacyanoferrate(III) and 4-Amino-2,3-dimethyl-3-pryazolin-5-one in an alkaline medium to form a coloured complex which is analysed spectrophotometrically onboard a continuous flow analyser.
AN311(Perth)/AN312	Mercury by Cold Vapour AAS in Waters: Mercury ions are reduced by stannous chloride reagent in acidic solution to elemental mercury. This mercury vapour is purged by nitrogen into a cold cell in an atomic absorption spectrometer or mercury analyser. Quantification is made by comparing absorbances to those of the calibration standards. Reference APHA 3112/3500.
AN312	Mercury by Cold Vapour AAS in Soils: After digestion with nitric acid, hydrogen peroxide and hydrochloric acid, mercury ions are reduced by stannous chloride reagent in acidic solution to elemental mercury. This mercury vapour is purged by nitrogen into a cold cell in an atomic absorption spectrometer or mercury analyser. Quantification is made by comparing absorbances to those of the calibration standards. Reference APHA 3112/3500
AN320	Metals by ICP-OES: Samples are preserved with 10% nitric acid for a wide range of metals and some non-metals. This solution is measured by Inductively Coupled Plasma. Solutions are aspirated into an argon plasma at 8000-10000K and emit characteristic energy or light as a result of electron transitions through unique energy levels. The emitted light is focused onto a diffraction grating where it is separated into components.
AN320	Photomultipliers or CCDs are used to measure the light intensity at specific wavelengths. This intensity is directly proportional to concentration. Corrections are required to compensate for spectral overlap between elements. Reference APHA 3120 B.
AN403	Total Recoverable Hydrocarbons: Determination of Hydrocarbons by gas chromatography after a solvent extraction. Detection is by flame ionisation detector (FID) that produces an electronic signal in proportion to the combustible matter passing through it. Total Recoverable Hydrocarbons (TRH) are routinely reported as four alkane groupings based on the carbon chain length of the compounds: C6-C9, C10-C14, C15-C28 and C29-C36 and in recognition of the NEPM 1999 (2013), >C10-C16 (F2), >C16-C34 (F3) and >C34-C40 (F4). F2 is reported directly and also corrected by subtracting Naphthalene (from VOC method AN433) where available.
AN403	Additionally, the volatile C6-C9 fraction may be determined by a purge and trap technique and GC/MS because of the potential for volatiles loss. Total Recoverable Hydrocarbons - Silica (TRH-Si) follows the same method of analysis after silica gel cleanup of the solvent extract. Aliphatic/Aromatic Speciation follows the same method of analysis after fractionation of the solvent extract over silica with differential polarity of the eluent solvents.

AN403	The GC/FID method is not well suited to the analysis of refined high boiling point materials (ie lubricating oils or greases) but is particularly suited for measuring diesel, kerosene and petrol if care to control volatility is taken. This method will detect naturally occurring hydrocarbons, lipids, animal fats, phenols and PAHs if they are present at sufficient levels, dependent on the use of specific cleanup/fractionation techniques. Reference USEPA 3510B, 8015B.
AN420	(SVOCs) including OC, OP, PCB, Herbicides, PAH, Phthalates and Speciated Phenols (etc) in soils, sediments and waters are determined by GCMS/ECD technique following appropriate solvent extraction process (Based on USEPA 3500C and 8270D). Total PAH calculated from individual analyte detections at or above the limit of reporting .
AN420	SVOC Compounds: Semi-Volatile Organic Compounds (SVOCs) including OC, OP, PCB, Herbicides, PAH, Phthalates and Speciated Phenols in soils, sediments and waters are determined by GCMS/ECD technique following appropriate solvent extraction process (Based on USEPA 3500C and 8270D).
AN433	VOCs and C6-C9 Hydrocarbons by GC-MS P&T: VOC`s are volatile organic compounds. The sample is presented to a gas chromatograph via a purge and trap (P&T) concentrator and autosampler and is detected with a Mass Spectrometer (MSD). Solid samples are initially extracted with methanol whilst liquid samples are processed directly. References: USEPA 5030B, 8020A, 8260.

FOOTNOTES

*	NATA accreditation does not cover the performance of this service.	-	Not analysed.	UOM	Unit of Measure.
		NVL	Not validated.	LOR	Limit of Reporting.
**	Indicative data, theoretical holding time exceeded.	IS	Insufficient sample for analysis.	↑↓	Raised/lowered Limit of Reporting.
		LNR	Sample listed, but not received.		
***	Indicates that both * and ** apply.				

Unless it is reported that sampling has been performed by SGS, the samples have been analysed as received.
Solid samples expressed on a dry weight basis.

Where "Total" analyte groups are reported (for example, Total PAHs, Total OC Pesticides) the total will be calculated as the sum of the individual analytes, with those analytes that are reported as <LOR being assumed to be zero. The summed (Total) limit of reporting is calculated by summing the individual analyte LORs and dividing by two. For example, where 16 individual analytes are being summed and each has an LOR of 0.1 mg/kg, the "Totals" LOR will be 1.6 / 2 (0.8 mg/kg). Where only 2 analytes are being summed, the " Total" LOR will be the sum of those two LORs.

Some totals may not appear to add up because the total is rounded after adding up the raw values.

If reported, measurement uncertainty follow the ± sign after the analytical result and is expressed as the expanded uncertainty calculated using a coverage factor of 2, providing a level of confidence of approximately 95%, unless stated otherwise in the comments section of this report.

Results reported for samples tested under test methods with codes starting with ARS-SOP, radionuclide or gross radioactivity concentrations are expressed in becquerel (Bq) per unit of mass or volume or per wipe as stated on the report. Becquerel is the SI unit for activity and equals one nuclear transformation per second.
Note that in terms of units of radioactivity:

a. 1 Bq is equivalent to 27 pCi
b. 37 MBq is equivalent to 1 mCi

For results reported for samples tested under test methods with codes starting with ARS-SOP, less than (<) values indicate the detection limit for each radionuclide or parameter for the measurement system used. The respective detection limits have been calculated in accordance with ISO 11929.

The QC and MU criteria are subject to internal review according to the SGS QAQC plan and may be provided on request or alternatively can be found here: www.sgs.com.au/en-gb/environment-health-and-safety.

STATEMENT OF QA/QC PERFORMANCE

SE234947 R0

CLIENT DETAILS

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Client	Geotechnique
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Facsimile	02 4722 6161
Email	anwar@geotech.com.au
Project	**14305/17 Menangle**
Order Number	(Not specified)
Samples	8

LABORATORY DETAILS

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SGS Reference	**SE234947 R0**
Date Received	01 Aug 2022
Date Reported	03 Aug 2022

COMMENTS

All the laboratory data for each environmental matrix was compared to SGS' stated Data Quality Objectives (DQO). Comments arising from the comparison were made and are reported below.

The data relating to sampling was taken from the Chain of Custody document.
This QA/QC Statement must be read in conjunction with the referenced Analytical Report.
The Statement and the Analytical Report must not be reproduced except in full.

All Data Quality Objectives were met with the exception of the following:

Duplicate	PAH (Polynuclear Aromatic Hydrocarbons) in Soil	13 items
	Total Recoverable Elements in Soil/Waste Solids/Materials by ICPOES	5 items
	TRH (Total Recoverable Hydrocarbons) in Soil	1 item

SAMPLE SUMMARY

Samples clearly labelled	Yes	Complete documentation received	Yes
Sample container provider	SGS	Sample cooling method	Ice Bricks
Samples received in correct containers	Yes	Sample counts by matrix	7 Clay/Sand/Soil, 1
Date documentation received	1/8/2022	Type of documentation received	COC
Samples received in good order	Yes	Samples received without headspace	Yes
Sample temperature upon receipt	5.8C	Sufficient sample for analysis	Yes
Turnaround time requested	Two Days		

HOLDING TIME SUMMARY

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SGS holding time criteria are drawn from current regulations and are highly dependent on sample container preservation as specified in the SGS "Field Sampling Guide for Containers and Holding Time" (ref: GU-(AU)-ENV.001). Soil samples guidelines are derived from NEPM "Schedule B(3) Guideline on Laboratory Analysis of Potentially Contaminated Soils". Water sample guidelines are derived from "AS/NZS 5667.1 : 1998 Water Quality - sampling part 1" and APHA "Standard Methods for the Examination of Water and Wastewater" 21st edition 2005.

Extraction and analysis holding time due dates listed are calculated from the date sampled, although holding times may be extended after laboratory extraction for some analytes. The due dates are the suggested dates that samples may be held before extraction or analysis and still be considered valid.

Extraction and analysis dates are shown in **Green** when within suggested criteria or **Red** with an appended dagger symbol (†) when outside suggested criteria. If the

Exchangeable Cations and Cation Exchange Capacity (CEC/ESP/SAR)

Method: ME-(AU)-[ENV]AN122

Sample Name	Sample No.	QC Ref	Sampled	Received	Extraction Due	Extracted	Analysis Due	Analysed
BH101	SE234947.001	LB254860	29 Jul 2022	01 Aug 2022	26 Aug 2022	03 Aug 2022	26 Aug 2022	03 Aug 2022
BH101	SE234947.002	LB254860	29 Jul 2022	01 Aug 2022	26 Aug 2022	03 Aug 2022	26 Aug 2022	03 Aug 2022
BH102	SE234947.003	LB254860	29 Jul 2022	01 Aug 2022	26 Aug 2022	03 Aug 2022	26 Aug 2022	03 Aug 2022
BH102	SE234947.004	LB254860	29 Jul 2022	01 Aug 2022	26 Aug 2022	03 Aug 2022	26 Aug 2022	03 Aug 2022
BH103	SE234947.005	LB254860	29 Jul 2022	01 Aug 2022	26 Aug 2022	03 Aug 2022	26 Aug 2022	03 Aug 2022

Mercury (dissolved) in Water

Method: ME-(AU)-[ENV]AN311(Perth)/AN312

Sample Name	Sample No.	QC Ref	Sampled	Received	Extraction Due	Extracted	Analysis Due	Analysed
RS1	SE234947.007	LB254843	29 Jul 2022	01 Aug 2022	26 Aug 2022	03 Aug 2022	26 Aug 2022	03 Aug 2022

Mercury in Soil

Method: ME-(AU)-[ENV]AN312

Sample Name	Sample No.	QC Ref	Sampled	Received	Extraction Due	Extracted	Analysis Due	Analysed
BH101	SE234947.001	LB254809	29 Jul 2022	01 Aug 2022	26 Aug 2022	02 Aug 2022	26 Aug 2022	03 Aug 2022
BH101	SE234947.002	LB254809	29 Jul 2022	01 Aug 2022	26 Aug 2022	02 Aug 2022	26 Aug 2022	03 Aug 2022
BH102	SE234947.003	LB254809	29 Jul 2022	01 Aug 2022	26 Aug 2022	02 Aug 2022	26 Aug 2022	03 Aug 2022
BH102	SE234947.004	LB254809	29 Jul 2022	01 Aug 2022	26 Aug 2022	02 Aug 2022	26 Aug 2022	03 Aug 2022
BH103	SE234947.005	LB254809	29 Jul 2022	01 Aug 2022	26 Aug 2022	02 Aug 2022	26 Aug 2022	03 Aug 2022
DDS1	SE234947.006	LB254809	29 Jul 2022	01 Aug 2022	26 Aug 2022	02 Aug 2022	26 Aug 2022	03 Aug 2022

Metals in Water (Dissolved) by ICPOES

Method: ME-(AU)-[ENV]AN320

Sample Name	Sample No.	QC Ref	Sampled	Received	Extraction Due	Extracted	Analysis Due	Analysed
RS1	SE234947.007	LB254776	29 Jul 2022	01 Aug 2022	25 Jan 2023	02 Aug 2022	25 Jan 2023	02 Aug 2022

Moisture Content

Method: ME-(AU)-[ENV]AN002

Sample Name	Sample No.	QC Ref	Sampled	Received	Extraction Due	Extracted	Analysis Due	Analysed
BH101	SE234947.001	LB254795	29 Jul 2022	01 Aug 2022	12 Aug 2022	02 Aug 2022	07 Aug 2022	03 Aug 2022
BH101	SE234947.002	LB254795	29 Jul 2022	01 Aug 2022	12 Aug 2022	02 Aug 2022	07 Aug 2022	03 Aug 2022
BH102	SE234947.003	LB254795	29 Jul 2022	01 Aug 2022	12 Aug 2022	02 Aug 2022	07 Aug 2022	03 Aug 2022
BH102	SE234947.004	LB254795	29 Jul 2022	01 Aug 2022	12 Aug 2022	02 Aug 2022	07 Aug 2022	03 Aug 2022
BH103	SE234947.005	LB254795	29 Jul 2022	01 Aug 2022	12 Aug 2022	02 Aug 2022	07 Aug 2022	03 Aug 2022
DDS1	SE234947.006	LB254795	29 Jul 2022	01 Aug 2022	12 Aug 2022	02 Aug 2022	07 Aug 2022	03 Aug 2022

OC Pesticides in Soil

Method: ME-(AU)-[ENV]AN420

Sample Name	Sample No.	QC Ref	Sampled	Received	Extraction Due	Extracted	Analysis Due	Analysed
BH101	SE234947.001	LB254786	29 Jul 2022	01 Aug 2022	12 Aug 2022	02 Aug 2022	11 Sep 2022	03 Aug 2022
BH101	SE234947.002	LB254786	29 Jul 2022	01 Aug 2022	12 Aug 2022	02 Aug 2022	11 Sep 2022	03 Aug 2022
BH102	SE234947.003	LB254786	29 Jul 2022	01 Aug 2022	12 Aug 2022	02 Aug 2022	11 Sep 2022	03 Aug 2022
BH102	SE234947.004	LB254786	29 Jul 2022	01 Aug 2022	12 Aug 2022	02 Aug 2022	11 Sep 2022	03 Aug 2022
BH103	SE234947.005	LB254786	29 Jul 2022	01 Aug 2022	12 Aug 2022	02 Aug 2022	11 Sep 2022	03 Aug 2022
DDS1	SE234947.006	LB254786	29 Jul 2022	01 Aug 2022	12 Aug 2022	02 Aug 2022	11 Sep 2022	03 Aug 2022

PAH (Polynuclear Aromatic Hydrocarbons) in Soil

Method: ME-(AU)-[ENV]AN420

Sample Name	Sample No.	QC Ref	Sampled	Received	Extraction Due	Extracted	Analysis Due	Analysed
BH101	SE234947.001	LB254786	29 Jul 2022	01 Aug 2022	12 Aug 2022	02 Aug 2022	11 Sep 2022	03 Aug 2022
BH101	SE234947.002	LB254786	29 Jul 2022	01 Aug 2022	12 Aug 2022	02 Aug 2022	11 Sep 2022	03 Aug 2022
BH102	SE234947.003	LB254786	29 Jul 2022	01 Aug 2022	12 Aug 2022	02 Aug 2022	11 Sep 2022	03 Aug 2022
BH102	SE234947.004	LB254786	29 Jul 2022	01 Aug 2022	12 Aug 2022	02 Aug 2022	11 Sep 2022	03 Aug 2022
BH103	SE234947.005	LB254786	29 Jul 2022	01 Aug 2022	12 Aug 2022	02 Aug 2022	11 Sep 2022	03 Aug 2022
DDS1	SE234947.006	LB254786	29 Jul 2022	01 Aug 2022	12 Aug 2022	02 Aug 2022	11 Sep 2022	03 Aug 2022

PAH (Polynuclear Aromatic Hydrocarbons) in Water

Method: ME-(AU)-[ENV]AN420

Sample Name	Sample No.	QC Ref	Sampled	Received	Extraction Due	Extracted	Analysis Due	Analysed
RS1	SE234947.007	LB254842	29 Jul 2022	01 Aug 2022	05 Aug 2022	03 Aug 2022	12 Sep 2022	03 Aug 2022

PCBs in Soil

Method: ME-(AU)-[ENV]AN420

Sample Name	Sample No.	QC Ref	Sampled	Received	Extraction Due	Extracted	Analysis Due	Analysed
BH101	SE234947.001	LB254786	29 Jul 2022	01 Aug 2022	12 Aug 2022	02 Aug 2022	11 Sep 2022	03 Aug 2022
BH101	SE234947.002	LB254786	29 Jul 2022	01 Aug 2022	12 Aug 2022	02 Aug 2022	11 Sep 2022	03 Aug 2022
BH102	SE234947.003	LB254786	29 Jul 2022	01 Aug 2022	12 Aug 2022	02 Aug 2022	11 Sep 2022	03 Aug 2022
BH102	SE234947.004	LB254786	29 Jul 2022	01 Aug 2022	12 Aug 2022	02 Aug 2022	11 Sep 2022	03 Aug 2022
BH103	SE234947.005	LB254786	29 Jul 2022	01 Aug 2022	12 Aug 2022	02 Aug 2022	11 Sep 2022	03 Aug 2022

HOLDING TIME SUMMARY

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SGS holding time criteria are drawn from current regulations and are highly dependent on sample container preservation as specified in the SGS "Field Sampling Guide for Containers and Holding Time" (ref: GU-(AU)-ENV.001). Soil samples guidelines are derived from NEPM "Schedule B(3) Guideline on Laboratory Analysis of Potentially Contaminated Soils". Water sample guidelines are derived from "AS/NZS 5667.1 : 1998 Water Quality - sampling part 1" and APHA "Standard Methods for the Examination of Water and Wastewater" 21st edition 2005.

Extraction and analysis holding time due dates listed are calculated from the date sampled, although holding times may be extended after laboratory extraction for some analytes. The due dates are the suggested dates that samples may be held before extraction or analysis and still be considered valid.

Extraction and analysis dates are shown in **Green** when within suggested criteria or **Red** with an appended dagger symbol (†) when outside suggested criteria. If the

PCBs in Soil (continued)

Method: ME-(AU)-[ENV]AN420

Sample Name	Sample No.	QC Ref	Sampled	Received	Extraction Due	Extracted	Analysis Due	Analysed
DDS1	SE234947.006	LB254786	29 Jul 2022	01 Aug 2022	12 Aug 2022	02 Aug 2022	11 Sep 2022	03 Aug 2022

pH in soil (1:5)

Method: ME-(AU)-[ENV]AN101

Sample Name	Sample No.	QC Ref	Sampled	Received	Extraction Due	Extracted	Analysis Due	Analysed
BH101	SE234947.001	LB254846	29 Jul 2022	01 Aug 2022	05 Aug 2022	03 Aug 2022	04 Aug 2022	03 Aug 2022
BH101	SE234947.002	LB254846	29 Jul 2022	01 Aug 2022	05 Aug 2022	03 Aug 2022	04 Aug 2022	03 Aug 2022
BH102	SE234947.003	LB254846	29 Jul 2022	01 Aug 2022	05 Aug 2022	03 Aug 2022	04 Aug 2022	03 Aug 2022
BH102	SE234947.004	LB254846	29 Jul 2022	01 Aug 2022	05 Aug 2022	03 Aug 2022	04 Aug 2022	03 Aug 2022
BH103	SE234947.005	LB254846	29 Jul 2022	01 Aug 2022	05 Aug 2022	03 Aug 2022	04 Aug 2022	03 Aug 2022

Total Phenolics in Soil

Method: ME-(AU)-[ENV]AN295

Sample Name	Sample No.	QC Ref	Sampled	Received	Extraction Due	Extracted	Analysis Due	Analysed
BH101	SE234947.001	LB254852	29 Jul 2022	01 Aug 2022	12 Aug 2022	03 Aug 2022	12 Aug 2022	03 Aug 2022
BH101	SE234947.002	LB254852	29 Jul 2022	01 Aug 2022	12 Aug 2022	03 Aug 2022	12 Aug 2022	03 Aug 2022
BH102	SE234947.003	LB254852	29 Jul 2022	01 Aug 2022	12 Aug 2022	03 Aug 2022	12 Aug 2022	03 Aug 2022
BH102	SE234947.004	LB254852	29 Jul 2022	01 Aug 2022	12 Aug 2022	03 Aug 2022	12 Aug 2022	03 Aug 2022
BH103	SE234947.005	LB254852	29 Jul 2022	01 Aug 2022	12 Aug 2022	03 Aug 2022	12 Aug 2022	03 Aug 2022
DDS1	SE234947.006	LB254852	29 Jul 2022	01 Aug 2022	12 Aug 2022	03 Aug 2022	12 Aug 2022	03 Aug 2022

Total Recoverable Elements in Soil/Waste Solids/Materials by ICPOES

Method: ME-(AU)-[ENV]AN040/AN320

Sample Name	Sample No.	QC Ref	Sampled	Received	Extraction Due	Extracted	Analysis Due	Analysed
BH101	SE234947.001	LB254805	29 Jul 2022	01 Aug 2022	25 Jan 2023	02 Aug 2022	25 Jan 2023	03 Aug 2022
BH101	SE234947.002	LB254805	29 Jul 2022	01 Aug 2022	25 Jan 2023	02 Aug 2022	25 Jan 2023	03 Aug 2022
BH102	SE234947.003	LB254805	29 Jul 2022	01 Aug 2022	25 Jan 2023	02 Aug 2022	25 Jan 2023	03 Aug 2022
BH102	SE234947.004	LB254805	29 Jul 2022	01 Aug 2022	25 Jan 2023	02 Aug 2022	25 Jan 2023	03 Aug 2022
BH103	SE234947.005	LB254805	29 Jul 2022	01 Aug 2022	25 Jan 2023	02 Aug 2022	25 Jan 2023	03 Aug 2022
DDS1	SE234947.006	LB254805	29 Jul 2022	01 Aug 2022	25 Jan 2023	02 Aug 2022	25 Jan 2023	03 Aug 2022

TRH (Total Recoverable Hydrocarbons) in Soil

Method: ME-(AU)-[ENV]AN403

Sample Name	Sample No.	QC Ref	Sampled	Received	Extraction Due	Extracted	Analysis Due	Analysed
BH101	SE234947.001	LB254786	29 Jul 2022	01 Aug 2022	12 Aug 2022	02 Aug 2022	11 Sep 2022	03 Aug 2022
BH101	SE234947.002	LB254786	29 Jul 2022	01 Aug 2022	12 Aug 2022	02 Aug 2022	11 Sep 2022	03 Aug 2022
BH102	SE234947.003	LB254786	29 Jul 2022	01 Aug 2022	12 Aug 2022	02 Aug 2022	11 Sep 2022	03 Aug 2022
BH102	SE234947.004	LB254786	29 Jul 2022	01 Aug 2022	12 Aug 2022	02 Aug 2022	11 Sep 2022	03 Aug 2022
BH103	SE234947.005	LB254786	29 Jul 2022	01 Aug 2022	12 Aug 2022	02 Aug 2022	11 Sep 2022	03 Aug 2022
DDS1	SE234947.006	LB254786	29 Jul 2022	01 Aug 2022	12 Aug 2022	02 Aug 2022	11 Sep 2022	03 Aug 2022

TRH (Total Recoverable Hydrocarbons) in Water

Method: ME-(AU)-[ENV]AN403

Sample Name	Sample No.	QC Ref	Sampled	Received	Extraction Due	Extracted	Analysis Due	Analysed
RS1	SE234947.007	LB254842	29 Jul 2022	01 Aug 2022	05 Aug 2022	03 Aug 2022	12 Sep 2022	03 Aug 2022

VOC's in Soil

Method: ME-(AU)-[ENV]AN433

Sample Name	Sample No.	QC Ref	Sampled	Received	Extraction Due	Extracted	Analysis Due	Analysed
BH101	SE234947.001	LB254789	29 Jul 2022	01 Aug 2022	12 Aug 2022	02 Aug 2022	12 Aug 2022	03 Aug 2022
BH101	SE234947.002	LB254789	29 Jul 2022	01 Aug 2022	12 Aug 2022	02 Aug 2022	12 Aug 2022	03 Aug 2022
BH102	SE234947.003	LB254789	29 Jul 2022	01 Aug 2022	12 Aug 2022	02 Aug 2022	12 Aug 2022	03 Aug 2022
BH102	SE234947.004	LB254789	29 Jul 2022	01 Aug 2022	12 Aug 2022	02 Aug 2022	12 Aug 2022	03 Aug 2022
BH103	SE234947.005	LB254789	29 Jul 2022	01 Aug 2022	12 Aug 2022	02 Aug 2022	12 Aug 2022	03 Aug 2022
DDS1	SE234947.006	LB254789	29 Jul 2022	01 Aug 2022	12 Aug 2022	02 Aug 2022	12 Aug 2022	03 Aug 2022
TS1	SE234947.008	LB254789	29 Jul 2022	01 Aug 2022	12 Aug 2022	02 Aug 2022	12 Aug 2022	03 Aug 2022

VOCs in Water

Method: ME-(AU)-[ENV]AN433

Sample Name	Sample No.	QC Ref	Sampled	Received	Extraction Due	Extracted	Analysis Due	Analysed
RS1	SE234947.007	LB254772	29 Jul 2022	01 Aug 2022	12 Aug 2022	02 Aug 2022	12 Aug 2022	03 Aug 2022

Volatile Petroleum Hydrocarbons in Soil

Method: ME-(AU)-[ENV]AN433

Sample Name	Sample No.	QC Ref	Sampled	Received	Extraction Due	Extracted	Analysis Due	Analysed
BH101	SE234947.001	LB254789	29 Jul 2022	01 Aug 2022	12 Aug 2022	02 Aug 2022	12 Aug 2022	03 Aug 2022
BH101	SE234947.002	LB254789	29 Jul 2022	01 Aug 2022	12 Aug 2022	02 Aug 2022	12 Aug 2022	03 Aug 2022
BH102	SE234947.003	LB254789	29 Jul 2022	01 Aug 2022	12 Aug 2022	02 Aug 2022	12 Aug 2022	03 Aug 2022
BH102	SE234947.004	LB254789	29 Jul 2022	01 Aug 2022	12 Aug 2022	02 Aug 2022	12 Aug 2022	03 Aug 2022
BH103	SE234947.005	LB254789	29 Jul 2022	01 Aug 2022	12 Aug 2022	02 Aug 2022	12 Aug 2022	03 Aug 2022

HOLDING TIME SUMMARY

SE234947 R0

SGS holding time criteria are drawn from current regulations and are highly dependent on sample container preservation as specified in the SGS "Field Sampling Guide for Containers and Holding Time" (ref: GU-(AU)-ENV.001). Soil samples guidelines are derived from NEPM "Schedule B(3) Guideline on Laboratory Analysis of Potentially Contaminated Soils". Water sample guidelines are derived from "AS/NZS 5667.1 : 1998 Water Quality - sampling part 1" and APHA "Standard Methods for the Examination of Water and Wastewater" 21st edition 2005.

Extraction and analysis holding time due dates listed are calculated from the date sampled, although holding times may be extended after laboratory extraction for some analytes. The due dates are the suggested dates that samples may be held before extraction or analysis and still be considered valid.

Extraction and analysis dates are shown in **Green** when within suggested criteria or **Red** with an appended dagger symbol (†) when outside suggested criteria. If the

Volatile Petroleum Hydrocarbons in Soil (continued) — **Method: ME-(AU)-[ENV]AN433**

Sample Name	Sample No.	QC Ref	Sampled	Received	Extraction Due	Extracted	Analysis Due	Analysed
DDS1	SE234947.006	LB254789	29 Jul 2022	01 Aug 2022	12 Aug 2022	02 Aug 2022	12 Aug 2022	03 Aug 2022
TS1	SE234947.008	LB254789	29 Jul 2022	01 Aug 2022	12 Aug 2022	02 Aug 2022	12 Aug 2022	03 Aug 2022

Volatile Petroleum Hydrocarbons in Water — **Method: ME-(AU)-[ENV]AN433**

Sample Name	Sample No.	QC Ref	Sampled	Received	Extraction Due	Extracted	Analysis Due	Analysed
RS1	SE234947.007	LB254772	29 Jul 2022	01 Aug 2022	12 Aug 2022	02 Aug 2022	12 Aug 2022	03 Aug 2022

Surrogate results are evaluated against upper and lower limit criteria established in the SGS QA/QC plan (Ref: MP-(AU)-[ENV]QU-022). At least two of three routine level soil sample surrogate spike recoveries for BTEX/VOC are to be within 70-130% where control charts have not been developed and within the established control limits for charted surrogates. Matrix effects may void this as an acceptance criterion. Water sample surrogate spike recoveries are to be within 40-130%. The presence of emulsions, surfactants and particulates may void this as an acceptance criterion.

Result is shown in **Green** when within suggested criteria or **Red** with an appended reason identifer when outside suggested criteria. Refer to the footnotes section at the end of this report for failure reasons.

OC Pesticides in Soil

Method: ME-(AU)-[ENV]AN420

Parameter	Sample Name	Sample Number	Units	Criteria	Recovery %
Tetrachloro-m-xylene (TCMX) (Surrogate)	BH101	SE234947.001	%	60 - 130%	115
	BH102	SE234947.003	%	60 - 130%	111
	BH103	SE234947.005	%	60 - 130%	111

PAH (Polynuclear Aromatic Hydrocarbons) in Soil

Method: ME-(AU)-[ENV]AN420

Parameter	Sample Name	Sample Number	Units	Criteria	Recovery %
2-fluorobiphenyl (Surrogate)	BH101	SE234947.001	%	70 - 130%	98
	BH101	SE234947.002	%	70 - 130%	96
	BH102	SE234947.003	%	70 - 130%	96
	BH102	SE234947.004	%	70 - 130%	96
	BH103	SE234947.005	%	70 - 130%	91
	DDS1	SE234947.006	%	70 - 130%	96
d14-p-terphenyl (Surrogate)	BH101	SE234947.001	%	70 - 130%	99
	BH101	SE234947.002	%	70 - 130%	97
	BH102	SE234947.003	%	70 - 130%	98
	BH102	SE234947.004	%	70 - 130%	98
	BH103	SE234947.005	%	70 - 130%	93
	DDS1	SE234947.006	%	70 - 130%	99
d5-nitrobenzene (Surrogate)	BH101	SE234947.001	%	70 - 130%	98
	BH101	SE234947.002	%	70 - 130%	96
	BH102	SE234947.003	%	70 - 130%	96
	BH102	SE234947.004	%	70 - 130%	96
	BH103	SE234947.005	%	70 - 130%	92
	DDS1	SE234947.006	%	70 - 130%	97

PAH (Polynuclear Aromatic Hydrocarbons) in Water

Method: ME-(AU)-[ENV]AN420

Parameter	Sample Name	Sample Number	Units	Criteria	Recovery %
2-fluorobiphenyl (Surrogate)	RS1	SE234947.007	%	40 - 130%	56
d14-p-terphenyl (Surrogate)	RS1	SE234947.007	%	40 - 130%	78
d5-nitrobenzene (Surrogate)	RS1	SE234947.007	%	40 - 130%	48

PCBs in Soil

Method: ME-(AU)-[ENV]AN420

Parameter	Sample Name	Sample Number	Units	Criteria	Recovery %
Tetrachloro-m-xylene (TCMX) (Surrogate)	BH101	SE234947.001	%	60 - 130%	115
	BH102	SE234947.003	%	60 - 130%	111
	BH103	SE234947.005	%	60 - 130%	111

VOC's in Soil

Method: ME-(AU)-[ENV]AN433

Parameter	Sample Name	Sample Number	Units	Criteria	Recovery %
Bromofluorobenzene (Surrogate)	BH101	SE234947.001	%	60 - 130%	73
	BH101	SE234947.002	%	60 - 130%	77
	BH102	SE234947.003	%	60 - 130%	82
	BH102	SE234947.004	%	60 - 130%	76
	BH103	SE234947.005	%	60 - 130%	82
	DDS1	SE234947.006	%	60 - 130%	75
	TS1	SE234947.008	%	60 - 130%	84
d4-1,2-dichloroethane (Surrogate)	BH101	SE234947.001	%	60 - 130%	74
	BH101	SE234947.002	%	60 - 130%	77
	BH102	SE234947.003	%	60 - 130%	83
	BH102	SE234947.004	%	60 - 130%	82
	BH103	SE234947.005	%	60 - 130%	87
	DDS1	SE234947.006	%	60 - 130%	81
	TS1	SE234947.008	%	60 - 130%	86
d8-toluene (Surrogate)	BH101	SE234947.001	%	60 - 130%	85
	BH101	SE234947.002	%	60 - 130%	87
	BH102	SE234947.003	%	60 - 130%	94
	BH102	SE234947.004	%	60 - 130%	91
	BH103	SE234947.005	%	60 - 130%	98
	DDS1	SE234947.006	%	60 - 130%	86
	TS1	SE234947.008	%	60 - 130%	93

VOCs in Water

Method: ME-(AU)-[ENV]AN433

Parameter	Sample Name	Sample Number	Units

Surrogate results are evaluated against upper and lower limit criteria established in the SGS QA/QC plan (Ref: MP-(AU)-[ENV]QU-022). At least two of three routine level soil sample surrogate spike recoveries for BTEX/VOC are to be within 70-130% where control charts have not been developed and within the established control limits for charted surrogates. Matrix effects may void this as an acceptance criterion. Water sample surrogate spike recoveries are to be within 40-130%. The presence of emulsions, surfactants and particulates may void this as an acceptance criterion.

Result is shown in **Green** when within suggested criteria or **Red** with an appended reason identifer when outside suggested criteria. Refer to the footnotes section at the end of this report for failure reasons.

VOCs in Water (continued) — Method: ME-(AU)-[ENV]AN433

Parameter	Sample Name	Sample Number	Units	Criteria	Recovery %
Bromofluorobenzene (Surrogate)	RS1	SE234947.007	%	40 - 130%	106
d4-1,2-dichloroethane (Surrogate)	RS1	SE234947.007	%	40 - 130%	89
d8-toluene (Surrogate)	RS1	SE234947.007	%	40 - 130%	97

Volatile Petroleum Hydrocarbons in Soil — Method: ME-(AU)-[ENV]AN433

Parameter	Sample Name	Sample Number	Units	Criteria	Recovery %
Bromofluorobenzene (Surrogate)	BH101	SE234947.001	%	60 - 130%	73
	BH101	SE234947.002	%	60 - 130%	77
	BH102	SE234947.003	%	60 - 130%	82
	BH102	SE234947.004	%	60 - 130%	76
	BH103	SE234947.005	%	60 - 130%	82
	DDS1	SE234947.006	%	60 - 130%	75
d4-1,2-dichloroethane (Surrogate)	BH101	SE234947.001	%	60 - 130%	74
	BH101	SE234947.002	%	60 - 130%	77
	BH102	SE234947.003	%	60 - 130%	83
	BH102	SE234947.004	%	60 - 130%	82
	BH103	SE234947.005	%	60 - 130%	87
	DDS1	SE234947.006	%	60 - 130%	81
d8-toluene (Surrogate)	BH101	SE234947.001	%	60 - 130%	85
	BH101	SE234947.002	%	60 - 130%	87
	BH102	SE234947.003	%	60 - 130%	94
	BH102	SE234947.004	%	60 - 130%	91
	BH103	SE234947.005	%	60 - 130%	98
	DDS1	SE234947.006	%	60 - 130%	86

Volatile Petroleum Hydrocarbons in Water — Method: ME-(AU)-[ENV]AN433

Parameter	Sample Name	Sample Number	Units	Criteria	Recovery %
Bromofluorobenzene (Surrogate)	RS1	SE234947.007	%	40 - 130%	106
d4-1,2-dichloroethane (Surrogate)	RS1	SE234947.007	%	60 - 130%	89
d8-toluene (Surrogate)	RS1	SE234947.007	%	40 - 130%	97

Blank results are evaluated against the limit of reporting (LOR), for the chosen method and its associated instrumentation, typically 2.5 times the statistically determined method detection limit (MDL).

Result is shown in **Green** when within suggested criteria or **Red** with an appended dagger symbol (†) when outside suggested criteria.

Exchangeable Cations and Cation Exchange Capacity (CEC/ESP/SAR)

Method: ME-(AU)-[ENV]AN122

Sample Number	Parameter	Units	LOR	Result
LB254860.001	Exchangeable Sodium, Na	mg/kg	2	0.2717
	Exchangeable Potassium, K	mg/kg	2	0.1264
	Exchangeable Calcium, Ca	mg/kg	2	-0.1826
	Exchangeable Magnesium, Mg	mg/kg	2	-0.0182

Mercury (dissolved) in Water

Method: ME-(AU)-[ENV]AN311(Perth)/AN312

Sample Number	Parameter	Units	LOR	Result
LB254843.001	Mercury	mg/L	0.0001	<0.0001

Mercury in Soil

Method: ME-(AU)-[ENV]AN312

Sample Number	Parameter	Units	LOR	Result
LB254809.001	Mercury	mg/kg	0.05	<0.05

Metals in Water (Dissolved) by ICPOES

Method: ME-(AU)-[ENV]AN320

Sample Number	Parameter	Units	LOR	Result
LB254776.001	Arsenic, As	mg/L	0.02	<0.02
	Cadmium, Cd	mg/L	0.001	<0.001
	Chromium, Cr	mg/L	0.005	<0.005
	Copper, Cu	mg/L	0.005	<0.005
	Lead, Pb	mg/L	0.02	<0.02
	Nickel, Ni	mg/L	0.005	<0.005
	Zinc, Zn	mg/L	0.01	<0.01

OC Pesticides in Soil

Method: ME-(AU)-[ENV]AN420

Sample Number	Parameter	Units	LOR	Result
LB254786.001	Hexachlorobenzene (HCB)	mg/kg	0.1	<0.1
	Alpha BHC	mg/kg	0.1	<0.1
	Lindane	mg/kg	0.1	<0.1
	Heptachlor	mg/kg	0.1	<0.1
	Aldrin	mg/kg	0.1	<0.1
	Beta BHC	mg/kg	0.1	<0.1
	Delta BHC	mg/kg	0.1	<0.1
	Heptachlor epoxide	mg/kg	0.1	<0.1
	Alpha Endosulfan	mg/kg	0.2	<0.2
	Gamma Chlordane	mg/kg	0.1	<0.1
	Alpha Chlordane	mg/kg	0.1	<0.1
	p,p'-DDE	mg/kg	0.1	<0.1
	Dieldrin	mg/kg	0.05	<0.05
	Endrin	mg/kg	0.2	<0.2
	Beta Endosulfan	mg/kg	0.2	<0.2
	p,p'-DDD	mg/kg	0.1	<0.1
	p,p'-DDT	mg/kg	0.1	<0.1
	Endosulfan sulphate	mg/kg	0.1	<0.1
	Endrin Aldehyde	mg/kg	0.1	<0.1
	Methoxychlor	mg/kg	0.1	<0.1
	Endrin Ketone	mg/kg	0.1	<0.1
	Isodrin	mg/kg	0.1	<0.1
	Mirex	mg/kg	0.1	<0.1
Surrogates	Tetrachloro-m-xylene (TCMX) (Surrogate)	%	-	92

PAH (Polynuclear Aromatic Hydrocarbons) in Soil

Method: ME-(AU)-[ENV]AN420

Sample Number	Parameter	Units	LOR	Result
LB254786.001	Naphthalene	mg/kg	0.1	<0.1
	2-methylnaphthalene	mg/kg	0.1	<0.1
	1-methylnaphthalene	mg/kg	0.1	<0.1
	Acenaphthylene	mg/kg	0.1	<0.1
	Acenaphthene	mg/kg	0.1	<0.1
	Fluorene	mg/kg	0.1	<0.1
	Phenanthrene	mg/kg	0.1	<0.1

Blank results are evaluated against the limit of reporting (LOR), for the chosen method and its associated instrumentation, typically 2.5 times the statistically determined method detection limit (MDL).

Result is shown in **Green** when within suggested criteria or **Red** with an appended dagger symbol (†) when outside suggested criteria.

PAH (Polynuclear Aromatic Hydrocarbons) in Soil (continued)

Method: ME-(AU)-[ENV]AN420

Sample Number		Parameter	Units	LOR	Result
LB254786.001		Anthracene	mg/kg	0.1	<0.1
		Fluoranthene	mg/kg	0.1	<0.1
		Pyrene	mg/kg	0.1	<0.1
		Benzo(a)anthracene	mg/kg	0.1	<0.1
		Chrysene	mg/kg	0.1	<0.1
		Benzo(a)pyrene	mg/kg	0.1	<0.1
		Indeno(1,2,3-cd)pyrene	mg/kg	0.1	<0.1
		Dibenzo(ah)anthracene	mg/kg	0.1	<0.1
		Benzo(ghi)perylene	mg/kg	0.1	<0.1
		Total PAH (18)	mg/kg	0.8	<0.8
	Surrogates	d5-nitrobenzene (Surrogate)	%	-	92
		2-fluorobiphenyl (Surrogate)	%	-	92
		d14-p-terphenyl (Surrogate)	%	-	95

PAH (Polynuclear Aromatic Hydrocarbons) in Water

Method: ME-(AU)-[ENV]AN420

Sample Number		Parameter	Units	LOR	Result
LB254842.001		Naphthalene	µg/L	0.1	<0.1
		2-methylnaphthalene	µg/L	0.1	<0.1
		1-methylnaphthalene	µg/L	0.1	<0.1
		Acenaphthylene	µg/L	0.1	<0.1
		Acenaphthene	µg/L	0.1	<0.1
		Fluorene	µg/L	0.1	<0.1
		Phenanthrene	µg/L	0.1	<0.1
		Anthracene	µg/L	0.1	<0.1
		Fluoranthene	µg/L	0.1	<0.1
		Pyrene	µg/L	0.1	<0.1
		Benzo(a)anthracene	µg/L	0.1	<0.1
		Chrysene	µg/L	0.1	<0.1
		Benzo(a)pyrene	µg/L	0.1	<0.1
		Indeno(1,2,3-cd)pyrene	µg/L	0.1	<0.1
		Dibenzo(ah)anthracene	µg/L	0.1	<0.1
		Benzo(ghi)perylene	µg/L	0.1	<0.1
	Surrogates	d5-nitrobenzene (Surrogate)	%	-	56
		2-fluorobiphenyl (Surrogate)	%	-	62
		d14-p-terphenyl (Surrogate)	%	-	76

PCBs in Soil

Method: ME-(AU)-[ENV]AN420

Sample Number		Parameter	Units	LOR	Result
LB254786.001		Arochlor 1016	mg/kg	0.2	<0.2
		Arochlor 1221	mg/kg	0.2	<0.2
		Arochlor 1232	mg/kg	0.2	<0.2
		Arochlor 1242	mg/kg	0.2	<0.2
		Arochlor 1248	mg/kg	0.2	<0.2
		Arochlor 1254	mg/kg	0.2	<0.2
		Arochlor 1260	mg/kg	0.2	<0.2
		Arochlor 1262	mg/kg	0.2	<0.2
		Arochlor 1268	mg/kg	0.2	<0.2
		Total PCBs (Arochlors)	mg/kg	1	<1
	Surrogates	Tetrachloro-m-xylene (TCMX) (Surrogate)	%	-	92

Total Phenolics in Soil

Method: ME-(AU)-[ENV]AN295

Sample Number	Parameter	Units	LOR	Result
LB254852.001	Total Phenols	mg/kg	5	<5.0

Total Recoverable Elements in Soil/Waste Solids/Materials by ICPOES

Method: ME-(AU)-[ENV]AN040/AN320

Sample Number	Parameter	Units	LOR	Result
LB254805.001	Arsenic, As	mg/kg	1	<1
	Cadmium, Cd	mg/kg	0.3	<0.3
	Chromium, Cr	mg/kg	0.5	<0.5
	Copper, Cu	mg/kg	0.5	<0.5
	Nickel, Ni	mg/kg	0.5	<0.5

Blank results are evaluated against the limit of reporting (LOR), for the chosen method and its associated instrumentation, typically 2.5 times the statistically determined method detection limit (MDL).

Result is shown in **Green** when within suggested criteria or **Red** with an appended dagger symbol (†) when outside suggested criteria.

Total Recoverable Elements in Soil/Waste Solids/Materials by ICPOES (continued)

Method: ME-(AU)-[ENV]AN040/AN320

Sample Number	Parameter	Units	LOR	Result
LB254805.001	Lead, Pb	mg/kg	1	<1
	Zinc, Zn	mg/kg	2	<2

TRH (Total Recoverable Hydrocarbons) in Soil

Method: ME-(AU)-[ENV]AN403

Sample Number	Parameter	Units	LOR	Result
LB254786.001	TRH C10-C14	mg/kg	20	<20
	TRH C15-C28	mg/kg	45	<45
	TRH C29-C36	mg/kg	45	<45
	TRH C37-C40	mg/kg	100	<100
	TRH C10-C36 Total	mg/kg	110	<110

TRH (Total Recoverable Hydrocarbons) in Water

Method: ME-(AU)-[ENV]AN403

Sample Number	Parameter	Units	LOR	Result
LB254842.001	TRH C10-C14	µg/L	50	<50
	TRH C15-C28	µg/L	200	<200
	TRH C29-C36	µg/L	200	<200
	TRH C37-C40	µg/L	200	<200

VOC's in Soil

Method: ME-(AU)-[ENV]AN433

Sample Number		Parameter	Units	LOR	Result
LB254789.001	Monocyclic Aromatic Hydrocarbons	Benzene	mg/kg	0.1	<0.1
		Toluene	mg/kg	0.1	<0.1
		Ethylbenzene	mg/kg	0.1	<0.1
		m/p-xylene	mg/kg	0.2	<0.2
		o-xylene	mg/kg	0.1	<0.1
	Polycyclic VOCs	Naphthalene (VOC)	mg/kg	0.1	<0.1
	Surrogates	d4-1,2-dichloroethane (Surrogate)	%	-	86
		d8-toluene (Surrogate)	%	-	103
		Bromofluorobenzene (Surrogate)	%	-	90
	Totals	Total BTEX	mg/kg	0.6	<0.6

VOCs in Water

Method: ME-(AU)-[ENV]AN433

Sample Number		Parameter	Units	LOR	Result
LB254772.001	Monocyclic Aromatic Hydrocarbons	Benzene	µg/L	0.5	<0.5
		Toluene	µg/L	0.5	<0.5
		Ethylbenzene	µg/L	0.5	<0.5
		m/p-xylene	µg/L	1	<1
		o-xylene	µg/L	0.5	<0.5
	Polycyclic VOCs	Naphthalene (VOC)	µg/L	0.5	<0.5
	Surrogates	d4-1,2-dichloroethane (Surrogate)	%	-	90
		d8-toluene (Surrogate)	%	-	94
		Bromofluorobenzene (Surrogate)	%	-	103

Volatile Petroleum Hydrocarbons in Soil

Method: ME-(AU)-[ENV]AN433

Sample Number		Parameter	Units	LOR	Result
LB254789.001		TRH C6-C9	mg/kg	20	<20
	Surrogates	d4-1,2-dichloroethane (Surrogate)	%	-	86

Volatile Petroleum Hydrocarbons in Water

Method: ME-(AU)-[ENV]AN433

Sample Number		Parameter	Units	LOR	Result
LB254772.001		TRH C6-C9	µg/L	40	<40
	Surrogates	d4-1,2-dichloroethane (Surrogate)	%	-	90
		d8-toluene (Surrogate)	%	-	94
		Bromofluorobenzene (Surrogate)	%	-	103

Duplicates are calculated as Relative Percentage Difference (RPD) using the formula: RPD = | OriginalResult - ReplicateResult | x 100 / Mean

The RPD is evaluated against the Maximum Allowable Difference (MAD) criteria and can be graphically represented by a curve calculated from the Statistical Detection Limit (SDL) and Limiting Repeatability (LR) using the formula: MAD = 100 x SDL / Mean + LR

Where the Maximum Allowable Difference evaluates to a number larger than 200 it is displayed as 200.

RPD is shown in **Green** when within suggested criteria or **Red** with an appended reason identifer when outside suggested criteria. Refer to the footnotes section at the end of this report for failure reasons.

NOTE: The RPD reported is calculated from the unrounded data for the original and replicate result. Manual calculation of the RPD from the rounded data reported may

Mercury (dissolved) in Water

Method: ME-(AU)-[ENV]AN311(Perth)/AN312

Original	Duplicate	Parameter	Units	LOR	Original	Duplicate	Criteria %	RPD %
SE234970.003	LB254843.014	Mercury	µg/L	0.0001	<0.0001	<0.0001	200	17
SE234992.002	LB254843.027	Mercury	µg/L	0.0001	<0.0001	<0.0001	200	67

Mercury in Soil

Method: ME-(AU)-[ENV]AN312

Original	Duplicate	Parameter	Units	LOR	Original	Duplicate	Criteria %	RPD %
SE234913.001	LB254809.014	Mercury	mg/kg	0.05	<0.05	<0.05	200	-3
SE234947.006	LB254809.023	Mercury	mg/kg	0.05	<0.05	0.06	126	24

Metals in Water (Dissolved) by ICPOES

Method: ME-(AU)-[ENV]AN320

Original	Duplicate	Parameter	Units	LOR	Original	Duplicate	Criteria %	RPD %
SE234947.007	LB254776.004	Arsenic, As	mg/L	0.02	<0.02	<0.02	200	40
		Cadmium, Cd	mg/L	0.001	<0.001	<0.001	200	150
		Chromium, Cr	mg/L	0.005	<0.005	<0.005	200	-233
		Copper, Cu	mg/L	0.005	<0.005	<0.005	200	126
		Lead, Pb	mg/L	0.02	<0.02	<0.02	200	8
		Nickel, Ni	mg/L	0.005	<0.005	<0.005	200	64
		Zinc, Zn	mg/L	0.01	<0.01	<0.01	200	44

Moisture Content

Method: ME-(AU)-[ENV]AN002

Original	Duplicate	Parameter	Units	LOR	Original	Duplicate	Criteria %	RPD %
SE234947.006	LB254795.011	% Moisture	%w/w	1	17.0	17.5	36	3
SE234973.001	LB254795.013	% Moisture	%w/w	1	11.3	11.1	39	2

OC Pesticides in Soil

Method: ME-(AU)-[ENV]AN420

Original	Duplicate		Parameter	Units	LOR	Original	Duplicate	Criteria %	RPD %
SE234947.005	LB254786.019		Hexachlorobenzene (HCB)	mg/kg	0.1	<0.1	<0.1	200	NA
			Alpha BHC	mg/kg	0.1	<0.1	<0.1	200	64
			Lindane	mg/kg	0.1	<0.1	<0.1	200	200
			Heptachlor	mg/kg	0.1	<0.1	<0.1	200	33
			Aldrin	mg/kg	0.1	<0.1	<0.1	200	NA
			Beta BHC	mg/kg	0.1	<0.1	<0.1	200	200
			Delta BHC	mg/kg	0.1	<0.1	<0.1	200	NA
			Heptachlor epoxide	mg/kg	0.1	<0.1	<0.1	200	111
			o,p'-DDE	mg/kg	0.1	<0.1	<0.1	200	NA
			Alpha Endosulfan	mg/kg	0.2	<0.2	<0.2	200	NA
			Gamma Chlordane	mg/kg	0.1	<0.1	<0.1	200	200
			Alpha Chlordane	mg/kg	0.1	<0.1	<0.1	200	NA
			trans-Nonachlor	mg/kg	0.1	<0.1	<0.1	200	NA
			p,p'-DDE	mg/kg	0.1	<0.1	<0.1	200	NA
			Dieldrin	mg/kg	0.05	<0.05	<0.05	200	45
			Endrin	mg/kg	0.2	<0.2	<0.2	200	13
			o,p'-DDD	mg/kg	0.1	<0.1	<0.1	200	NA
			o,p'-DDT	mg/kg	0.1	<0.1	<0.1	200	NA
			Beta Endosulfan	mg/kg	0.2	<0.2	<0.2	200	78
			p,p'-DDD	mg/kg	0.1	<0.1	<0.1	200	NA
			p,p'-DDT	mg/kg	0.1	<0.1	<0.1	200	18
			Endosulfan sulphate	mg/kg	0.1	<0.1	<0.1	200	55
			Endrin Aldehyde	mg/kg	0.1	<0.1	<0.1	200	NA
			Methoxychlor	mg/kg	0.1	<0.1	<0.1	200	NA
			Endrin Ketone	mg/kg	0.1	<0.1	<0.1	200	NA
			Isodrin	mg/kg	0.1	<0.1	<0.1	200	196
			Mirex	mg/kg	0.1	<0.1	<0.1	200	NA
			Total CLP OC Pesticides	mg/kg	1	<1	<1	200	NA
			Total OC VIC EPA	mg/kg	1	<1	<1	200	NA
		Surrogates	Tetrachloro-m-xylene (TCMX) (Surrogate)	mg/kg	-	0.17	0.16	30	4
SE234973.001	LB254786.016		Hexachlorobenzene (HCB)	mg/kg	0.1	<0.1	<0.1	200	NA
			Alpha BHC	mg/kg	0.1	<0.1	<0.1	200	200
			Lindane	mg/kg	0.1	<0.1	<0.1	200	94
			Heptachlor	mg/kg	0.1	<0.1	<0.1	200	28

Duplicates are calculated as Relative Percentage Difference (RPD) using the formula: RPD = | OriginalResult - ReplicateResult | x 100 / Mean

The RPD is evaluated against the Maximum Allowable Difference (MAD) criteria and can be graphically represented by a curve calculated from the Statistical Detection Limit (SDL) and Limiting Repeatability (LR) using the formula: MAD = 100 x SDL / Mean + LR

Where the Maximum Allowable Difference evaluates to a number larger than 200 it is displayed as 200.

RPD is shown in **Green** when within suggested criteria or **Red** with an appended reason identifer when outside suggested criteria. Refer to the footnotes section at the end of this report for failure reasons.

NOTE: The RPD reported is calculated from the unrounded data for the original and replicate result. Manual calculation of the RPD from the rounded data reported may

OC Pesticides in Soil (continued)

Method: ME-(AU)-[ENV]AN420

Original	Duplicate		Parameter	Units	LOR	Original	Duplicate	Criteria %	RPD %
SE234973.001	LB254786.016		Aldrin	mg/kg	0.1	<0.1	<0.1	200	123
			Beta BHC	mg/kg	0.1	<0.1	<0.1	200	200
			Delta BHC	mg/kg	0.1	<0.1	<0.1	200	23
			Heptachlor epoxide	mg/kg	0.1	<0.1	<0.1	200	77
			o,p'-DDE	mg/kg	0.1	<0.1	<0.1	200	NA
			Alpha Endosulfan	mg/kg	0.2	<0.2	<0.2	200	NA
			Gamma Chlordane	mg/kg	0.1	<0.1	<0.1	200	200
			Alpha Chlordane	mg/kg	0.1	<0.1	<0.1	200	200
			trans-Nonachlor	mg/kg	0.1	<0.1	<0.1	200	200
			p,p'-DDE	mg/kg	0.1	<0.1	<0.1	200	NA
			Dieldrin	mg/kg	0.05	<0.05	<0.05	200	31
			Endrin	mg/kg	0.2	<0.2	<0.2	200	113
			o,p'-DDD	mg/kg	0.1	<0.1	<0.1	200	NA
			o,p'-DDT	mg/kg	0.1	<0.1	<0.1	200	NA
			Beta Endosulfan	mg/kg	0.2	<0.2	<0.2	200	33
			p,p'-DDD	mg/kg	0.1	<0.1	<0.1	200	NA
			p,p'-DDT	mg/kg	0.1	<0.1	<0.1	200	121
			Endosulfan sulphate	mg/kg	0.1	<0.1	<0.1	200	200
			Endrin Aldehyde	mg/kg	0.1	<0.1	<0.1	200	149
			Methoxychlor	mg/kg	0.1	<0.1	<0.1	200	NA
			Endrin Ketone	mg/kg	0.1	<0.1	<0.1	200	200
			Isodrin	mg/kg	0.1	<0.1	<0.1	200	200
			Mirex	mg/kg	0.1	<0.1	<0.1	200	200
			Total CLP OC Pesticides	mg/kg	1	<1	<1	200	NA
			Total OC VIC EPA	mg/kg	1	<1	<1	200	NA
		Surrogates	Tetrachloro-m-xylene (TCMX) (Surrogate)	mg/kg	-	0.17	0.17	30	3

PAH (Polynuclear Aromatic Hydrocarbons) in Soil

Method: ME-(AU)-[ENV]AN420

Original	Duplicate		Parameter	Units	LOR	Original	Duplicate	Criteria %	RPD %
SE234947.006	LB254786.014		Naphthalene	mg/kg	0.1	<0.1	<0.1	200	72
			2-methylnaphthalene	mg/kg	0.1	<0.1	<0.1	200	57
			1-methylnaphthalene	mg/kg	0.1	<0.1	<0.1	200	40
			Acenaphthylene	mg/kg	0.1	<0.1	<0.1	200	100
			Acenaphthene	mg/kg	0.1	<0.1	<0.1	200	87
			Fluorene	mg/kg	0.1	<0.1	<0.1	200	101
			Phenanthrene	mg/kg	0.1	<0.1	<0.1	200	82
			Anthracene	mg/kg	0.1	<0.1	<0.1	200	88
			Fluoranthene	mg/kg	0.1	<0.1	<0.1	200	101
			Pyrene	mg/kg	0.1	<0.1	<0.1	200	102
			Benzo(a)anthracene	mg/kg	0.1	<0.1	<0.1	200	2
			Chrysene	mg/kg	0.1	<0.1	<0.1	200	10
			Benzo(b&j)fluoranthene	mg/kg	0.1	<0.1	<0.1	200	86
			Benzo(k)fluoranthene	mg/kg	0.1	<0.1	<0.1	200	200
			Benzo(a)pyrene	mg/kg	0.1	<0.1	<0.1	200	101
			Indeno(1,2,3-cd)pyrene	mg/kg	0.1	<0.1	<0.1	200	104
			Dibenzo(ah)anthracene	mg/kg	0.1	<0.1	<0.1	200	113
			Benzo(ghi)perylene	mg/kg	0.1	<0.1	<0.1	200	102
			Carcinogenic PAHs, BaP TEQ <LOR=0	mg/kg	0.2	<0.2	<0.2	200	NA
			Carcinogenic PAHs, BaP TEQ <LOR=LOR	mg/kg	0.3	<0.3	<0.3	134	0
			Carcinogenic PAHs, BaP TEQ <LOR=LOR/2	mg/kg	0.2	<0.2	<0.2	175	0
			Total PAH (18)	mg/kg	0.8	<0.8	<0.8	200	NA
		Surrogates	d5-nitrobenzene (Surrogate)	mg/kg	-	0.5	0.5	30	1
			2-fluorobiphenyl (Surrogate)	mg/kg	-	0.5	0.5	30	1
			d14-p-terphenyl (Surrogate)	mg/kg	-	0.5	0.5	30	0
SE234973.001	LB254786.016		Naphthalene	mg/kg	0.1	<0.1	<0.1	200	9
			2-methylnaphthalene	mg/kg	0.1	<0.1	<0.1	200	30
			1-methylnaphthalene	mg/kg	0.1	<0.1	<0.1	200	37
			Acenaphthylene	mg/kg	0.1	<0.1	0.31140222	91	180 ②
			Acenaphthene	mg/kg	0.1	<0.1	<0.1	200	63
			Fluorene	mg/kg	0.1	<0.1	<0.1	200	114
			Phenanthrene	mg/kg	0.1	<0.1	<0.1	172	31

Duplicates are calculated as Relative Percentage Difference (RPD) using the formula: RPD = | OriginalResult - ReplicateResult | x 100 / Mean

The RPD is evaluated against the Maximum Allowable Difference (MAD) criteria and can be graphically represented by a curve calculated from the Statistical Detection Limit (SDL) and Limiting Repeatability (LR) using the formula: MAD = 100 x SDL / Mean + LR

Where the Maximum Allowable Difference evaluates to a number larger than 200 it is displayed as 200.

RPD is shown in **Green** when within suggested criteria or **Red** with an appended reason identifer when outside suggested criteria. Refer to the footnotes section at the end of this report for failure reasons.

NOTE: The RPD reported is calculated from the unrounded data for the original and replicate result. Manual calculation of the RPD from the rounded data reported may

PAH (Polynuclear Aromatic Hydrocarbons) in Soil (continued)

Method: ME-(AU)-[ENV]AN420

Original	Duplicate		Parameter	Units	LOR	Original	Duplicate	Criteria %	RPD %
SE234973.001	LB254786.016		Anthracene	mg/kg	0.1	<0.1	<0.1	200	125
			Fluoranthene	mg/kg	0.1	0.2	0.45432945	61	84 ②
			Pyrene	mg/kg	0.1	0.2	0.63666131	53	89 ②
			Benzo(a)anthracene	mg/kg	0.1	0.2	0.46598476	61	92 ②
			Chrysene	mg/kg	0.1	0.2	0.48527531	60	94 ②
			Benzo(b&j)fluoranthene	mg/kg	0.1	0.2	0.77286532	50	107 ②
			Benzo(k)fluoranthene	mg/kg	0.1	<0.1	0.27347240	85	98 ②
			Benzo(a)pyrene	mg/kg	0.1	0.2	0.56980202	55	89 ②
			Indeno(1,2,3-cd)pyrene	mg/kg	0.1	0.2	0.35181362	69	77 ②
			Dibenzo(ah)anthracene	mg/kg	0.1	<0.1	<0.1	197	80
			Benzo(ghi)perylene	mg/kg	0.1	0.2	0.4	64	42
			Carcinogenic PAHs, BaP TEQ <LOR=0	mg/kg	0.2	0.3	0.76396148	48	91 ②
			Carcinogenic PAHs, BaP TEQ <LOR=LOR	mg/kg	0.3	0.4	0.86396148	58	76 ②
			Carcinogenic PAHs, BaP TEQ <LOR=LOR/2	mg/kg	0.2	0.3	0.81396148	45	83 ②
			Total PAH (18)	mg/kg	0.8	1.7	4.66795630	33	93 ②
		Surrogates	d5-nitrobenzene (Surrogate)	mg/kg	-	0.5	0.5	30	3
			2-fluorobiphenyl (Surrogate)	mg/kg	-	0.5	0.5	30	2
			d14-p-terphenyl (Surrogate)	mg/kg	-	0.5	0.5	30	7

PCBs in Soil

Method: ME-(AU)-[ENV]AN420

Original	Duplicate		Parameter	Units	LOR	Original	Duplicate	Criteria %	RPD %
SE234947.005	LB254786.019		Arochlor 1016	mg/kg	0.2	<0.2	<0.2	200	NA
			Arochlor 1221	mg/kg	0.2	<0.2	<0.2	200	NA
			Arochlor 1232	mg/kg	0.2	<0.2	<0.2	200	NA
			Arochlor 1242	mg/kg	0.2	<0.2	<0.2	200	NA
			Arochlor 1248	mg/kg	0.2	<0.2	<0.2	200	NA
			Arochlor 1254	mg/kg	0.2	<0.2	<0.2	200	NA
			Arochlor 1260	mg/kg	0.2	<0.2	<0.2	200	NA
			Arochlor 1262	mg/kg	0.2	<0.2	<0.2	200	NA
			Arochlor 1268	mg/kg	0.2	<0.2	<0.2	200	NA
			Total PCBs (Arochlors)	mg/kg	1	<1	<1	200	NA
		Surrogates	Tetrachloro-m-xylene (TCMX) (Surrogate)	mg/kg	-	0	0	30	4
SE234973.001	LB254786.016		Arochlor 1016	mg/kg	0.2	<0.2	<0.2	200	NA
			Arochlor 1221	mg/kg	0.2	<0.2	<0.2	200	NA
			Arochlor 1232	mg/kg	0.2	<0.2	<0.2	200	NA
			Arochlor 1242	mg/kg	0.2	<0.2	<0.2	200	NA
			Arochlor 1248	mg/kg	0.2	<0.2	<0.2	200	NA
			Arochlor 1254	mg/kg	0.2	<0.2	<0.2	200	NA
			Arochlor 1260	mg/kg	0.2	<0.2	<0.2	200	NA
			Arochlor 1262	mg/kg	0.2	<0.2	<0.2	200	NA
			Arochlor 1268	mg/kg	0.2	<0.2	<0.2	200	NA
			Total PCBs (Arochlors)	mg/kg	1	<1	<1	200	NA
		Surrogates	Tetrachloro-m-xylene (TCMX) (Surrogate)	mg/kg	-	0	0	30	3

pH in soil (1:5)

Method: ME-(AU)-[ENV]AN101

Original	Duplicate	Parameter	Units	LOR	Original	Duplicate	Criteria %	RPD %
SE234856.007	LB254846.018	pH	pH Units	0.1	5.3	5.4	32	1

Total Phenolics in Soil

Method: ME-(AU)-[ENV]AN295

Original	Duplicate	Parameter	Units	LOR	Original	Duplicate	Criteria %	RPD %
SE234947.006	LB254852.010	Total Phenols	mg/kg	5	<5	<5	199	22

Total Recoverable Elements in Soil/Waste Solids/Materials by ICPOES

Method: ME-(AU)-[ENV]AN040/AN320

Original	Duplicate	Parameter	Units	LOR	Original	Duplicate	Criteria %	RPD %
SE234913.001	LB254805.014	Arsenic, As	mg/kg	1	6	5	49	10
		Cadmium, Cd	mg/kg	0.3	<0.3	<0.3	200	217
		Chromium, Cr	mg/kg	0.5	9.3	9.5	35	3
		Copper, Cu	mg/kg	0.5	2.5	2.4	50	4

Duplicates are calculated as Relative Percentage Difference (RPD) using the formula: RPD = | OriginalResult - ReplicateResult | x 100 / Mean

The RPD is evaluated against the Maximum Allowable Difference (MAD) criteria and can be graphically represented by a curve calculated from the Statistical Detection Limit (SDL) and Limiting Repeatability (LR) using the formula: MAD = 100 x SDL / Mean + LR

Where the Maximum Allowable Difference evaluates to a number larger than 200 it is displayed as 200.

RPD is shown in **Green** when within suggested criteria or **Red** with an appended reason identifer when outside suggested criteria. Refer to the footnotes section at the end of this report for failure reasons.

NOTE: The RPD reported is calculated from the unrounded data for the original and replicate result. Manual calculation of the RPD from the rounded data reported may

Total Recoverable Elements in Soil/Waste Solids/Materials by ICPOES (continued)

Method: ME-(AU)-[ENV]AN040/AN320

Original	Duplicate	Parameter	Units	LOR	Original	Duplicate	Criteria %	RPD %
SE234913.001	LB254805.014	Nickel, Ni	mg/kg	0.5	1.5	1.5	64	2
		Lead, Pb	mg/kg	1	5	5	51	1
		Zinc, Zn	mg/kg	2	26	28	37	9
SE234947.006	LB254805.023	Arsenic, As	mg/kg	1	5	2.82231867	55	61 ②
		Cadmium, Cd	mg/kg	0.3	<0.3	<0.3	200	7
		Chromium, Cr	mg/kg	0.5	5.9	4.0	40	39
		Copper, Cu	mg/kg	0.5	24	16.7935180	32	36 ②
		Nickel, Ni	mg/kg	0.5	11	6.52583404	36	54 ②
		Lead, Pb	mg/kg	1	29	12.7922876	35	76 ②
		Zinc, Zn	mg/kg	2	60	39.2107636	34	43 ②

TRH (Total Recoverable Hydrocarbons) in Soil

Method: ME-(AU)-[ENV]AN403

Original	Duplicate		Parameter	Units	LOR	Original	Duplicate	Criteria %	RPD %
SE234947.006	LB254786.014		TRH C10-C14	mg/kg	20	<20	<20	200	NA
			TRH C15-C28	mg/kg	45	<45	<45	200	NA
			TRH C29-C36	mg/kg	45	<45	<45	200	NA
			TRH C37-C40	mg/kg	100	<100	<100	200	NA
			TRH C10-C36 Total	mg/kg	110	<110	<110	200	NA
			TRH >C10-C40 Total (F bands)	mg/kg	210	<210	<210	200	NA
		TRH F Bands	TRH >C10-C16	mg/kg	25	<25	<25	200	NA
			TRH >C10-C16 - Naphthalene (F2)	mg/kg	25	<25	<25	200	NA
			TRH >C16-C34 (F3)	mg/kg	90	<90	<90	200	NA
			TRH >C34-C40 (F4)	mg/kg	120	<120	<120	200	NA
SE234973.001	LB254786.016		TRH C10-C14	mg/kg	20	<20	<20	200	NA
			TRH C15-C28	mg/kg	45	540	320	41	51 ②
			TRH C29-C36	mg/kg	45	170	220	53	29
			TRH C37-C40	mg/kg	100	<100	<100	200	NA
			TRH C10-C36 Total	mg/kg	110	710	540	48	26
			TRH >C10-C40 Total (F bands)	mg/kg	210	790	620	60	23
		TRH F Bands	TRH >C10-C16	mg/kg	25	<25	<25	200	NA
			TRH >C10-C16 - Naphthalene (F2)	mg/kg	25	<25	<25	200	NA
			TRH >C16-C34 (F3)	mg/kg	90	640	470	46	31
			TRH >C34-C40 (F4)	mg/kg	120	150	160	109	4

VOC's in Soil

Method: ME-(AU)-[ENV]AN433

Original	Duplicate		Parameter	Units	LOR	Original	Duplicate	Criteria %	RPD %
SE234947.006	LB254789.014	Monocyclic	Benzene	mg/kg	0.1	<0.1	<0.1	200	NA
		Aromatic	Toluene	mg/kg	0.1	<0.1	<0.1	200	2
		Hydrocarbons	Ethylbenzene	mg/kg	0.1	<0.1	<0.1	200	5
			m/p-xylene	mg/kg	0.2	<0.2	<0.2	200	9
			o-xylene	mg/kg	0.1	<0.1	<0.1	200	5
		Polycyclic	Naphthalene (VOC)	mg/kg	0.1	<0.1	<0.1	200	5
		Surrogates	d4-1,2-dichloroethane (Surrogate)	mg/kg	-	8.1	8.5	50	5
			d8-toluene (Surrogate)	mg/kg	-	8.6	9.4	50	8
			Bromofluorobenzene (Surrogate)	mg/kg	-	7.5	7.9	50	5
		Totals	Total Xylenes	mg/kg	0.3	<0.3	<0.3	200	8
			Total BTEX	mg/kg	0.6	<0.6	<0.6	200	NA
SE234973.001	LB254789.017	Monocyclic	Benzene	mg/kg	0.1	<0.1	<0.1	200	NA
		Aromatic	Toluene	mg/kg	0.1	<0.1	<0.1	200	78
		Hydrocarbons	Ethylbenzene	mg/kg	0.1	<0.1	<0.1	200	112
			m/p-xylene	mg/kg	0.2	<0.2	<0.2	200	104
			o-xylene	mg/kg	0.1	<0.1	<0.1	200	108
		Polycyclic	Naphthalene (VOC)	mg/kg	0.1	<0.1	<0.1	200	7
		Surrogates	d4-1,2-dichloroethane (Surrogate)	mg/kg	-	9.0	8.6	50	5
			d8-toluene (Surrogate)	mg/kg	-	9.9	9.3	50	7
			Bromofluorobenzene (Surrogate)	mg/kg	-	8.3	8.1	50	3
		Totals	Total Xylenes	mg/kg	0.3	<0.3	<0.3	200	106
			Total BTEX	mg/kg	0.6	<0.6	<0.6	200	NA

VOCs in Water

Method: ME-(AU)-[ENV]AN433

Original	Duplicate	Parameter	Units	LOR

Duplicates are calculated as Relative Percentage Difference (RPD) using the formula: RPD = | OriginalResult - ReplicateResult | x 100 / Mean

The RPD is evaluated against the Maximum Allowable Difference (MAD) criteria and can be graphically represented by a curve calculated from the Statistical Detection Limit (SDL) and Limiting Repeatability (LR) using the formula: MAD = 100 x SDL / Mean + LR

Where the Maximum Allowable Difference evaluates to a number larger than 200 it is displayed as 200.

RPD is shown in **Green** when within suggested criteria or **Red** with an appended reason identifer when outside suggested criteria. Refer to the footnotes section at the end of this report for failure reasons.

NOTE: The RPD reported is calculated from the unrounded data for the original and replicate result. Manual calculation of the RPD from the rounded data reported may

VOCs in Water (continued)

Method: ME-(AU)-[ENV]AN433

Original	Duplicate		Parameter	Units	LOR	Original	Duplicate	Criteria %	RPD %
SE234874.001	LB254772.018	Monocyclic	Benzene	µg/L	0.5	<0.5	<0.5	200	NA
		Aromatic	Toluene	µg/L	0.5	<0.5	<0.5	200	87
		Hydrocarbons	Ethylbenzene	µg/L	0.5	<0.5	<0.5	200	22
			m/p-xylene	µg/L	1	<1	<1	200	5
			o-xylene	µg/L	0.5	<0.5	<0.5	200	15
		Polycyclic	Naphthalene (VOC)	µg/L	0.5	<0.5	<0.5	200	68
		Surrogates	d4-1,2-dichloroethane (Surrogate)	µg/L	-	9.2	8.7	30	5
			d8-toluene (Surrogate)	µg/L	-	9.8	9.4	30	4
			Bromofluorobenzene (Surrogate)	µg/L	-	10.6	10.1	30	5

Volatile Petroleum Hydrocarbons in Soil

Method: ME-(AU)-[ENV]AN433

Original	Duplicate		Parameter	Units	LOR	Original	Duplicate	Criteria %	RPD %
SE234947.006	LB254789.014		TRH C6-C10	mg/kg	25	<25	<25	200	200
			TRH C6-C9	mg/kg	20	<20	<20	200	200
		Surrogates	d4-1,2-dichloroethane (Surrogate)	mg/kg	-	8.1	8.5	30	5
			d8-toluene (Surrogate)	mg/kg	-	8.6	9.4	30	8
			Bromofluorobenzene (Surrogate)	mg/kg	-	7.5	7.9	30	5
		VPH F Bands	Benzene (F0)	mg/kg	0.1	<0.1	<0.1	200	NA
			TRH C6-C10 minus BTEX (F1)	mg/kg	25	<25	<25	200	200
SE234973.001	LB254789.017		TRH C6-C10	mg/kg	25	<25	<25	200	28
			TRH C6-C9	mg/kg	20	<20	<20	200	29
		Surrogates	d4-1,2-dichloroethane (Surrogate)	mg/kg	-	9.0	8.6	30	5
			d8-toluene (Surrogate)	mg/kg	-	9.9	9.3	30	7
			Bromofluorobenzene (Surrogate)	mg/kg	-	8.3	8.1	30	3
		VPH F Bands	Benzene (F0)	mg/kg	0.1	<0.1	<0.1	200	NA
			TRH C6-C10 minus BTEX (F1)	mg/kg	25	<25	<25	200	28

Volatile Petroleum Hydrocarbons in Water

Method: ME-(AU)-[ENV]AN433

Original	Duplicate		Parameter	Units	LOR	Original	Duplicate	Criteria %	RPD %
SE234874.001	LB254772.018		TRH C6-C10	µg/L	50	<50	<50	200	200
			TRH C6-C9	µg/L	40	<40	<40	200	200
		Surrogates	d4-1,2-dichloroethane (Surrogate)	µg/L	-	9.2	8.7	30	5
			d8-toluene (Surrogate)	µg/L	-	9.8	9.4	30	4
			Bromofluorobenzene (Surrogate)	µg/L	-	10.6	10.1	30	5
		VPH F Bands	Benzene (F0)	µg/L	0.5	<0.5	<0.5	200	NA
			TRH C6-C10 minus BTEX (F1)	µg/L	50	<50	<50	200	200

Laboratory Control Standard (LCS) results are evaluated against an expected result, typically the concentration of analyte spiked into the control during the sample preparation stage, producing a percentage recovery. The criteria applied to the percentage recovery is established in the SGS QA /QC plan (Ref: MP-(AU)-[ENV]QU-022). For more information refer to the footnotes in the concluding page of this report.

Recovery is shown in **Green** when within suggested criteria or **Red** with an appended dagger symbol (†) when outside suggested criteria.

Exchangeable Cations and Cation Exchange Capacity (CEC/ESP/SAR)

Method: ME-(AU)-[ENV]AN122

Sample Number	Parameter	Units	LOR	Result	Expected	Criteria %	Recovery %
LB254860.002	Exchangeable Sodium, Na	meq/100g	0.01	0.20	0.194	80 - 120	104
	Exchangeable Potassium, K	meq/100g	0.01	0.61	0.63	80 - 120	97
	Exchangeable Calcium, Ca	meq/100g	0.01	5.7	6.3	80 - 120	91
	Exchangeable Magnesium, Mg	meq/100g	0.02	1.0	1.11	80 - 120	93

Mercury in Soil

Method: ME-(AU)-[ENV]AN312

Sample Number	Parameter	Units	LOR	Result	Expected	Criteria %	Recovery %
LB254809.002	Mercury	mg/kg	0.05	0.24	0.2	70 - 130	120

Metals in Water (Dissolved) by ICPOES

Method: ME-(AU)-[ENV]AN320

Sample Number	Parameter	Units	LOR	Result	Expected	Criteria %	Recovery %
LB254776.002	Arsenic, As	mg/L	0.02	0.50	0.5	80 - 120	100
	Cadmium, Cd	mg/L	0.001	0.47	0.5	80 - 120	95
	Chromium, Cr	mg/L	0.005	0.50	0.5	80 - 120	99
	Copper, Cu	mg/L	0.005	0.52	0.5	80 - 120	105
	Lead, Pb	mg/L	0.02	0.48	0.5	80 - 120	97
	Nickel, Ni	mg/L	0.005	0.50	0.5	80 - 120	99
	Zinc, Zn	mg/L	0.01	0.50	0.5	80 - 120	101

OC Pesticides in Soil

Method: ME-(AU)-[ENV]AN420

Sample Number		Parameter	Units	LOR	Result	Expected	Criteria %	Recovery %
LB254786.002		Heptachlor	mg/kg	0.1	0.2	0.2	60 - 140	91
		Aldrin	mg/kg	0.1	0.2	0.2	60 - 140	87
		Delta BHC	mg/kg	0.1	0.2	0.2	60 - 140	89
		Dieldrin	mg/kg	0.05	0.17	0.2	60 - 140	87
		Endrin	mg/kg	0.2	<0.2	0.2	60 - 140	94
		p,p'-DDT	mg/kg	0.1	0.2	0.2	60 - 140	90
	Surrogates	Tetrachloro-m-xylene (TCMX) (Surrogate)	mg/kg	-	0.16	0.15	40 - 130	107

PAH (Polynuclear Aromatic Hydrocarbons) in Soil

Method: ME-(AU)-[ENV]AN420

Sample Number		Parameter	Units	LOR	Result	Expected	Criteria %	Recovery %
LB254786.002		Naphthalene	mg/kg	0.1	4.4	4	60 - 140	111
		Acenaphthylene	mg/kg	0.1	4.2	4	60 - 140	104
		Acenaphthene	mg/kg	0.1	4.2	4	60 - 140	106
		Phenanthrene	mg/kg	0.1	4.3	4	60 - 140	107
		Anthracene	mg/kg	0.1	4.2	4	60 - 140	104
		Fluoranthene	mg/kg	0.1	4.1	4	60 - 140	102
		Pyrene	mg/kg	0.1	4.2	4	60 - 140	105
		Benzo(a)pyrene	mg/kg	0.1	3.9	4	60 - 140	98
	Surrogates	d5-nitrobenzene (Surrogate)	mg/kg	-	0.4	0.5	40 - 130	89
		2-fluorobiphenyl (Surrogate)	mg/kg	-	0.5	0.5	40 - 130	94
		d14-p-terphenyl (Surrogate)	mg/kg	-	0.4	0.5	40 - 130	88

PAH (Polynuclear Aromatic Hydrocarbons) in Water

Method: ME-(AU)-[ENV]AN420

Sample Number		Parameter	Units	LOR	Result	Expected	Criteria %	Recovery %
LB254842.002		Naphthalene	µg/L	0.1	27	40	60 - 140	67
		Acenaphthylene	µg/L	0.1	33	40	60 - 140	82
		Acenaphthene	µg/L	0.1	32	40	60 - 140	79
		Phenanthrene	µg/L	0.1	35	40	60 - 140	88
		Anthracene	µg/L	0.1	33	40	60 - 140	82
		Fluoranthene	µg/L	0.1	36	40	60 - 140	91
		Pyrene	µg/L	0.1	33	40	60 - 140	82
		Benzo(a)pyrene	µg/L	0.1	37	40	60 - 140	92
	Surrogates	d5-nitrobenzene (Surrogate)	µg/L	-	0.2	0.5	40 - 130	46
		2-fluorobiphenyl (Surrogate)	µg/L	-	0.3	0.5	40 - 130	56
		d14-p-terphenyl (Surrogate)	µg/L	-	0.3	0.5	40 - 130	62

PCBs in Soil

Method: ME-(AU)-[ENV]AN420

Sample Number	Parameter	Units	LOR	Result	Expected	Criteria %	Recovery %
LB254786.002	Arochlor 1260	mg/kg	0.2	0.4	0.4	60 - 140	111

Laboratory Control Standard (LCS) results are evaluated against an expected result, typically the concentration of analyte spiked into the control during the sample preparation stage, producing a percentage recovery. The criteria applied to the percentage recovery is established in the SGS QA /QC plan (Ref: MP-(AU)-[ENV]QU-022). For more information refer to the footnotes in the concluding page of this report.

Recovery is shown in **Green** when within suggested criteria or **Red** with an appended dagger symbol (†) when outside suggested criteria.

pH in soil (1:5)

Method: ME-(AU)-[ENV]AN101

Sample Number	Parameter	Units	LOR	Result	Expected	Criteria %	Recovery %
LB254846.003	pH	pH Units	0.1	7.4	7.415	98 - 102	100

Total Phenolics in Soil

Method: ME-(AU)-[ENV]AN295

Sample Number	Parameter	Units	LOR	Result	Expected	Criteria %	Recovery %
LB254852.002	Total Phenols	mg/kg	5	19	20	80 - 120	96

Total Recoverable Elements in Soil/Waste Solids/Materials by ICPOES

Method: ME-(AU)-[ENV]AN040/AN320

Sample Number	Parameter	Units	LOR	Result	Expected	Criteria %	Recovery %
LB254805.002	Arsenic, As	mg/kg	1	350	318.22	80 - 120	109
	Cadmium, Cd	mg/kg	0.3	4.6	4.81	70 - 130	96
	Chromium, Cr	mg/kg	0.5	39	38.31	80 - 120	101
	Copper, Cu	mg/kg	0.5	330	290	80 - 120	113
	Nickel, Ni	mg/kg	0.5	190	187	80 - 120	104
	Lead, Pb	mg/kg	1	94	89.9	80 - 120	105
	Zinc, Zn	mg/kg	2	290	273	80 - 120	106

TRH (Total Recoverable Hydrocarbons) in Soil

Method: ME-(AU)-[ENV]AN403

Sample Number		Parameter	Units	LOR	Result	Expected	Criteria %	Recovery %
LB254786.002		TRH C10-C14	mg/kg	20	50	40	60 - 140	125
		TRH C15-C28	mg/kg	45	49	40	60 - 140	123
		TRH C29-C36	mg/kg	45	<45	40	60 - 140	98
	TRH F Bands	TRH >C10-C16	mg/kg	25	50	40	60 - 140	125
		TRH >C16-C34 (F3)	mg/kg	90	<90	40	60 - 140	110
		TRH >C34-C40 (F4)	mg/kg	120	<120	20	60 - 140	95

TRH (Total Recoverable Hydrocarbons) in Water

Method: ME-(AU)-[ENV]AN403

Sample Number		Parameter	Units	LOR	Result	Expected	Criteria %	Recovery %
LB254842.002		TRH C10-C14	µg/L	50	1200	1200	60 - 140	98
		TRH C15-C28	µg/L	200	1300	1200	60 - 140	104
		TRH C29-C36	µg/L	200	1300	1200	60 - 140	109
	TRH F Bands	TRH >C10-C16	µg/L	60	1100	1200	60 - 140	88
		TRH >C16-C34 (F3)	µg/L	500	1300	1200	60 - 140	108
		TRH >C34-C40 (F4)	µg/L	500	650	600	60 - 140	108

VOC's in Soil

Method: ME-(AU)-[ENV]AN433

Sample Number		Parameter	Units	LOR	Result	Expected	Criteria %	Recovery %
LB254789.002	Monocyclic	Benzene	mg/kg	0.1	4.9	5	60 - 140	97
	Aromatic	Toluene	mg/kg	0.1	4.6	5	60 - 140	93
	Hydrocarbons	Ethylbenzene	mg/kg	0.1	4.7	5	60 - 140	94
		m/p-xylene	mg/kg	0.2	8.9	10	60 - 140	89
		o-xylene	mg/kg	0.1	4.8	5	60 - 140	96
	Surrogates	d4-1,2-dichloroethane (Surrogate)	mg/kg	-	8.4	10	70 - 130	84
		d8-toluene (Surrogate)	mg/kg	-	10.3	10	70 - 130	103
		Bromofluorobenzene (Surrogate)	mg/kg	-	9.2	10	70 - 130	92

VOCs in Water

Method: ME-(AU)-[ENV]AN433

Sample Number		Parameter	Units	LOR	Result	Expected	Criteria %	Recovery %
LB254772.002	Monocyclic	Benzene	µg/L	0.5	54	45.45	60 - 140	119
	Aromatic	Toluene	µg/L	0.5	55	45.45	60 - 140	122
	Hydrocarbons	Ethylbenzene	µg/L	0.5	53	45.45	60 - 140	117
		m/p-xylene	µg/L	1	110	90.9	60 - 140	116
		o-xylene	µg/L	0.5	53	45.45	60 - 140	116
	Surrogates	d4-1,2-dichloroethane (Surrogate)	µg/L	-	9.8	10	60 - 140	98
		d8-toluene (Surrogate)	µg/L	-	10.1	10	70 - 130	101
		Bromofluorobenzene (Surrogate)	µg/L	-	10.2	10	70 - 130	102

Volatile Petroleum Hydrocarbons in Soil

Method: ME-(AU)-[ENV]AN433

Sample Number	Parameter	Units	LOR

Laboratory Control Standard (LCS) results are evaluated against an expected result, typically the concentration of analyte spiked into the control during the sample preparation stage, producing a percentage recovery. The criteria applied to the percentage recovery is established in the SGS QA /QC plan (Ref: MP-(AU)-[ENV]QU-022). For more information refer to the footnotes in the concluding page of this report.

Recovery is shown in **Green** when within suggested criteria or **Red** with an appended dagger symbol (†) when outside suggested criteria.

Volatile Petroleum Hydrocarbons in Soil (continued) — Method: ME-(AU)-[ENV]AN433

Sample Number		Parameter	Units	LOR	Result	Expected	Criteria %	Recovery %
LB254789.002		TRH C6-C10	mg/kg	25	80	92.5	60 - 140	87
		TRH C6-C9	mg/kg	20	71	80	60 - 140	89
	Surrogates	d4-1,2-dichloroethane (Surrogate)	mg/kg	-	8.4	10	70 - 130	84
		Bromofluorobenzene (Surrogate)	mg/kg	-	9.2	10	70 - 130	92
	VPH F Bands	TRH C6-C10 minus BTEX (F1)	mg/kg	25	52	62.5	60 - 140	84

Volatile Petroleum Hydrocarbons in Water — Method: ME-(AU)-[ENV]AN433

Sample Number		Parameter	Units	LOR	Result	Expected	Criteria %	Recovery %
LB254772.002		TRH C6-C10	µg/L	50	860	946.63	60 - 140	91
		TRH C6-C9	µg/L	40	750	818.71	60 - 140	92
	Surrogates	d4-1,2-dichloroethane (Surrogate)	µg/L	-	9.8	10	60 - 140	98
		d8-toluene (Surrogate)	µg/L	-	10.1	10	70 - 130	101
		Bromofluorobenzene (Surrogate)	µg/L	-	10.2	10	70 - 130	102
	VPH F Bands	TRH C6-C10 minus BTEX (F1)	µg/L	50	540	639.67	60 - 140	85

Matrix Spike (MS) results are evaluated as the percentage recovery of an expected result, typically the concentration of analyte spiked into a field sub -sample during the sample preparation stage. The original sample's result is subtracted from the sub-sample result before determining the percentage recovery. The criteria applied to the percentage recovery is established in the SGS QA/QC plan (ref: MP-(AU)-[ENV]QU-022). For more information refer to the footnotes in the concluding page of this report.

Recovery is shown in **Green** when within suggested criteria or **Red** with an appended reason identifer when outside suggested criteria. Refer to the footnotes section at the end of this report for failure reasons.

Mercury in Soil

Method: ME-(AU)-[ENV]AN312

QC Sample	Sample Number	Parameter	Units	LOR	Result	Original	Spike	Recovery%
SE234912.001	LB254809.004	Mercury	mg/kg	0.05	0.20	<0.05	0.2	94

OC Pesticides in Soil

Method: ME-(AU)-[ENV]AN420

QC Sample	Sample Number	Parameter	Units	LOR	Original	Spike	Recovery%
SE234947.001	LB254786.018	Hexachlorobenzene (HCB)	mg/kg	0.1	<0.1	-	-
		Alpha BHC	mg/kg	0.1	<0.1	-	-
		Lindane	mg/kg	0.1	<0.1	-	-
		Heptachlor	mg/kg	0.1	<0.1	0.2	97
		Aldrin	mg/kg	0.1	<0.1	0.2	92
		Beta BHC	mg/kg	0.1	<0.1	-	-
		Delta BHC	mg/kg	0.1	<0.1	0.2	94
		Heptachlor epoxide	mg/kg	0.1	<0.1	-	-
		o,p'-DDE	mg/kg	0.1	<0.1	-	-
		Alpha Endosulfan	mg/kg	0.2	<0.2	-	-
		Gamma Chlordane	mg/kg	0.1	<0.1	-	-
		Alpha Chlordane	mg/kg	0.1	<0.1	-	-
		trans-Nonachlor	mg/kg	0.1	<0.1	-	-
		p,p'-DDE	mg/kg	0.1	<0.1	-	-
		Dieldrin	mg/kg	0.05	<0.05	0.2	93
		Endrin	mg/kg	0.2	<0.2	0.2	98
		o,p'-DDD	mg/kg	0.1	<0.1	-	-
		o,p'-DDT	mg/kg	0.1	<0.1	-	-
		Beta Endosulfan	mg/kg	0.2	<0.2	-	-
		p,p'-DDD	mg/kg	0.1	<0.1	-	-
		p,p'-DDT	mg/kg	0.1	<0.1	0.2	91
		Endosulfan sulphate	mg/kg	0.1	<0.1	-	-
		Endrin Aldehyde	mg/kg	0.1	<0.1	-	-
		Methoxychlor	mg/kg	0.1	<0.1	-	-
		Endrin Ketone	mg/kg	0.1	<0.1	-	-
		Isodrin	mg/kg	0.1	<0.1	-	-
		Mirex	mg/kg	0.1	<0.1	-	-
		Total CLP OC Pesticides	mg/kg	1	<1	-	-
		Total OC VIC EPA	mg/kg	1	<1	-	-
	Surrogates	Tetrachloro-m-xylene (TCMX) (Surrogate)	mg/kg	-	0.17	-	106

PAH (Polynuclear Aromatic Hydrocarbons) in Soil

Method: ME-(AU)-[ENV]AN420

QC Sample	Sample Number	Parameter	Units	LOR	Original	Spike	Recovery%
SE234947.001	LB254786.018	Naphthalene	mg/kg	0.1	<0.1	4	108
		2-methylnaphthalene	mg/kg	0.1	<0.1	-	-
		1-methylnaphthalene	mg/kg	0.1	<0.1	-	-
		Acenaphthylene	mg/kg	0.1	<0.1	4	101
		Acenaphthene	mg/kg	0.1	<0.1	4	103
		Fluorene	mg/kg	0.1	<0.1	-	-
		Phenanthrene	mg/kg	0.1	<0.1	4	104
		Anthracene	mg/kg	0.1	<0.1	4	101
		Fluoranthene	mg/kg	0.1	<0.1	4	100
		Pyrene	mg/kg	0.1	<0.1	4	101
		Benzo(a)anthracene	mg/kg	0.1	<0.1	-	-
		Chrysene	mg/kg	0.1	<0.1	-	-
		Benzo(b&j)fluoranthene	mg/kg	0.1	<0.1	-	-
		Benzo(k)fluoranthene	mg/kg	0.1	<0.1	-	-
		Benzo(a)pyrene	mg/kg	0.1	<0.1	4	94
		Indeno(1,2,3-cd)pyrene	mg/kg	0.1	<0.1	-	-
		Dibenzo(ah)anthracene	mg/kg	0.1	<0.1	-	-
		Benzo(ghi)perylene	mg/kg	0.1	<0.1	-	-
		Carcinogenic PAHs, BaP TEQ <LOR=0	TEQ (mg/kg)	0.2	<0.2	-	-
		Carcinogenic PAHs, BaP TEQ <LOR=LOR	TEQ (mg/kg)	0.3	<0.3	-	-
		Carcinogenic PAHs, BaP TEQ <LOR=LOR/2	TEQ (mg/kg)	0.2	<0.2	-	-
		Total PAH (18)	mg/kg	0.8	<0.8	-	-

Matrix Spike (MS) results are evaluated as the percentage recovery of an expected result, typically the concentration of analyte spiked into a field sub -sample during the sample preparation stage. The original sample's result is subtracted from the sub-sample result before determining the percentage recovery. The criteria applied to the percentage recovery is established in the SGS QA/QC plan (ref: MP-(AU)-[ENV]QU-022). For more information refer to the footnotes in the concluding page of this report.

Recovery is shown in **Green** when within suggested criteria or **Red** with an appended reason identifer when outside suggested criteria. Refer to the footnotes section at the end of this report for failure reasons.

PAH (Polynuclear Aromatic Hydrocarbons) in Soil (continued)

Method: ME-(AU)-[ENV]AN420

QC Sample	Sample Number		Parameter	Units	LOR	Original	Spike	Recovery%
SE234947.001	LB254786.018	Surrogates	d5-nitrobenzene (Surrogate)	mg/kg	-	0.5	-	101
			2-fluorobiphenyl (Surrogate)	mg/kg	-	0.5	-	103
			d14-p-terphenyl (Surrogate)	mg/kg	-	0.5	-	96

PCBs in Soil

Method: ME-(AU)-[ENV]AN420

QC Sample	Sample Number		Parameter	Units	LOR	Original	Spike	Recovery%
SE234947.001	LB254786.018		Arochlor 1016	mg/kg	0.2	<0.2	-	-
			Arochlor 1221	mg/kg	0.2	<0.2	-	-
			Arochlor 1232	mg/kg	0.2	<0.2	-	-
			Arochlor 1242	mg/kg	0.2	<0.2	-	-
			Arochlor 1248	mg/kg	0.2	<0.2	-	-
			Arochlor 1254	mg/kg	0.2	<0.2	-	-
			Arochlor 1260	mg/kg	0.2	<0.2	0.4	107
			Arochlor 1262	mg/kg	0.2	<0.2	-	-
			Arochlor 1268	mg/kg	0.2	<0.2	-	-
			Total PCBs (Arochlors)	mg/kg	1	<1	-	-
		Surrogates	Tetrachloro-m-xylene (TCMX) (Surrogate)	mg/kg	-	0	-	106

Total Phenolics in Soil

Method: ME-(AU)-[ENV]AN295

QC Sample	Sample Number	Parameter	Units	LOR	Result	Original	Spike	Recovery%
SE234947.001	LB254852.004	Total Phenols	mg/kg	5	19	<5.0	20	96

Total Recoverable Elements in Soil/Waste Solids/Materials by ICPOES

Method: ME-(AU)-[ENV]AN040/AN320

QC Sample	Sample Number	Parameter	Units	LOR	Result	Original	Spike	Recovery%
SE234912.001	LB254805.004	Arsenic, As	mg/kg	1	48	3	50	90
		Cadmium, Cd	mg/kg	0.3	42	<0.3	50	83
		Chromium, Cr	mg/kg	0.5	56	13	50	85
		Copper, Cu	mg/kg	0.5	54	8.4	50	92
		Nickel, Ni	mg/kg	0.5	54	6.5	50	95
		Lead, Pb	mg/kg	1	83	44	50	76
		Zinc, Zn	mg/kg	2	97	61	50	72

TRH (Total Recoverable Hydrocarbons) in Soil

Method: ME-(AU)-[ENV]AN403

QC Sample	Sample Number		Parameter	Units	LOR	Original	Spike	Recovery%
SE234947.001	LB254786.018		TRH C10-C14	mg/kg	20	<20	40	125
			TRH C15-C28	mg/kg	45	<45	40	118
			TRH C29-C36	mg/kg	45	<45	40	105
			TRH C37-C40	mg/kg	100	<100	-	-
			TRH C10-C36 Total	mg/kg	110	<110	-	-
			TRH >C10-C40 Total (F bands)	mg/kg	210	<210	-	-
		TRH F	TRH >C10-C16	mg/kg	25	<25	40	123
		Bands	TRH >C10-C16 - Naphthalene (F2)	mg/kg	25	<25	-	-
			TRH >C16-C34 (F3)	mg/kg	90	<90	40	110
			TRH >C34-C40 (F4)	mg/kg	120	<120	-	-

VOC's in Soil

Method: ME-(AU)-[ENV]AN433

QC Sample	Sample Number		Parameter	Units	LOR	Original	Spike	Recovery%
SE234947.001	LB254789.019	Monocyclic	Benzene	mg/kg	0.1	<0.1	5	83
		Aromatic	Toluene	mg/kg	0.1	<0.1	5	80
		Hydrocarbons	Ethylbenzene	mg/kg	0.1	<0.1	5	83
			m/p-xylene	mg/kg	0.2	<0.2	10	79
			o-xylene	mg/kg	0.1	<0.1	5	86
		Polycyclic	Naphthalene (VOC)	mg/kg	0.1	<0.1	-	-
		Surrogates	d4-1,2-dichloroethane (Surrogate)	mg/kg	-	7.4	10	82
			d8-toluene (Surrogate)	mg/kg	-	8.5	10	93
			Bromofluorobenzene (Surrogate)	mg/kg	-	7.3	10	86
		Totals	Total Xylenes	mg/kg	0.3	<0.3	-	-
			Total BTEX	mg/kg	0.6	<0.6	-	-

Volatile Petroleum Hydrocarbons in Soil

Method: ME-(AU)-[ENV]AN433

QC Sample	Sample Number	Parameter	Units	LOR

Matrix Spike (MS) results are evaluated as the percentage recovery of an expected result, typically the concentration of analyte spiked into a field sub -sample during the sample preparation stage. The original sample's result is subtracted from the sub-sample result before determining the percentage recovery. The criteria applied to the percentage recovery is established in the SGS QA/QC plan (ref: MP-(AU)-[ENV]QU-022). For more information refer to the footnotes in the concluding page of this report.

Recovery is shown in **Green** when within suggested criteria or **Red** with an appended reason identifer when outside suggested criteria. Refer to the footnotes section at the end of this report for failure reasons.

Volatile Petroleum Hydrocarbons in Soil (continued) **Method: ME-(AU)-[ENV]AN433**

QC Sample	Sample Number		Parameter	Units	LOR	Original	Spike	Recovery%
SE234947.001	LB254789.019		TRH C6-C10	mg/kg	25	<25	92.5	80
			TRH C6-C9	mg/kg	20	<20	80	82
		Surrogates	d4-1,2-dichloroethane (Surrogate)	mg/kg	-	7.4	10	82
			d8-toluene (Surrogate)	mg/kg	-	8.5	10	93
			Bromofluorobenzene (Surrogate)	mg/kg	-	7.3	-	86
		VPH F	Benzene (F0)	mg/kg	0.1	<0.1	-	-
		Bands	TRH C6-C10 minus BTEX (F1)	mg/kg	25	<25	62.5	79

MATRIX SPIKE DUPLICATES

SE234947 R0

Matrix spike duplicates are calculated as Relative Percent Difference (RPD) using the formula: RPD = | OriginalResult - ReplicateResult | x 100 / Mean

The original result is the analyte concentration of the matrix spike. The Duplicate result is the analyte concentration of the matrix spike duplicate.

The RPD is evaluated against the Maximum Allowable Difference (MAD) criteria and can be graphically represented by a curve calculated from the Statistical Detection Limit (SDL) and Limiting Repeatability (LR) using the formula: MAD = 100 x SDL / Mean + LR

Where the Maximum Allowable Difference evaluates to a number larger than 200 it is displayed as 200.

RPD is shown in **Green** when within suggested criteria or **Red** with an appended reason identifer when outside suggested criteria. Refer to the footnotes section at the

No matrix spike duplicates were required for this job.

Samples analysed as received.

Solid samples expressed on a dry weight basis.

QC criteria are subject to internal review according to the SGS QA/QC plan and may be provided on request or alternatively can be found here: https://www.sgs.com.au/~/media/Local/Australia/Documents/Technical Documents/MP-AU-ENV-QU-022 QA QC Plan.pdf

*	NATA accreditation does not cover the performance of this service.
**	Indicative data, theoretical holding time exceeded.
***	Indicates that both * and ** apply.
-	Sample not analysed for this analyte.
IS	Insufficient sample for analysis.
LNR	Sample listed, but not received.
LOR	Limit of reporting.
QFH	QC result is above the upper tolerance.
QFL	QC result is below the lower tolerance.
①	At least 2 of 3 surrogates are within acceptance criteria.
②	RPD failed acceptance criteria due to sample heterogeneity.
③	Results less than 5 times LOR preclude acceptance criteria for RPD.
④	Recovery failed acceptance criteria due to matrix interference.
⑤	Recovery failed acceptance criteria due to the presence of significant concentration of analyte (i.e. the concentration of analyte exceeds the spike level).
⑥	LOR was raised due to sample matrix interference.
⑦	LOR was raised due to dilution of significantly high concentration of analyte in sample.
⑧	Reanalysis of sample in duplicate confirmed sample heterogeneity and inconsistency of results.
⑨	Recovery failed acceptance criteria due to sample heterogeneity.
⑩	LOR was raised due to high conductivity of the sample (required dilution).
†	Refer to relevant report comments for further information.

SGS EHS Sydney

SE234947

GEOTECHNIQUE PTY LTD

1 LEMKO PLACE PENRITH NSW 2750

CHAIN OF CUSTODY

Results Required By: 2 days — **Date: Wednesday, 3 August 2022**

Except pH Results Required By - — **Date:**

Your Reference No.: [redacted]

TO: SGS
UNIT 16, 33 MADDOX STREET
ALEXANDRIA NSW 2015

Sampled By: JH — Ref No: 14305/17 — Project Manager: ANWAR BARBHUYIA

Location: Menangle

	Location	Depth (m)	Date	Soil	Water	Material	Metals As Cd Cr Cu Pb Hg Ni Zn	pH	CEC	CL8 TRH BTEX PAH	CL10 Metals* TRH BTEX PAH	CL16 Metals* TRH BTEX PAH OC PCB	Be B Co Mn Se	Mn	BTEX	TRH & BTEX	PAH	OCP	PCB	OCP & PCB	OPP&PCB	OCP,OPP & PCB	Cyanide	VOC	Phenol	PFAS	TCLP PAH	TCLP	Metals (Retest)
1	BH101	0.0-0.15	29/07/2022	G		Sand		✓	✓			✓													✓				
2	BH101	0.35-0.45	29/07/2022	G		Clay		✓	✓		✓														✓				
3	BH102	0.0-0.05	29/07/2022	G		Clay		✓	✓			✓													✓				
4	BH102	0.1-0.2	29/07/2022	G		Clay		✓	✓		✓														✓				
5	BH103	0.0-0.15	29/07/2022	G		Clay		✓	✓			✓													✓				
6	DDS1		29/07/2022	G		Sand						✓													✓				
7	RS1		29/07/2022		Vial+WG						✓																		
8	TS1		29/07/2022	WG											✓														

Relinquished by			Received by		
Name	Signature	Date	Name	Signature	Date
ANWAR BARBHUYIA	AB	1/08/2022	Suba	[signature]	01/08/22 @ 3:25

WG: Water sample (glass bottle)
WP: Water sample (plastic bottle)
G Soil sample (glass jar)
P Soil sample (plastic bag)
FCP Fibro Cement Piece (plastic bag)
✓ Test required

SAMPLE RECEIPT ADVICE

SE234947

CLIENT DETAILS

Contact	Anwar Barbhuyia
Client	Geotechnique
Address	P.O. Box 880 PENRITH NSW 2751
Telephone	02 4722 2700
Facsimile	02 4722 6161
Email	anwar@geotech.com.au
Project	**14305/17 Menangle**
Order Number	**14305/17**
Samples	8

LABORATORY DETAILS

Manager	Huong Crawford
Laboratory	SGS Alexandria Environmental
Address	Unit 16, 33 Maddox St Alexandria NSW 2015
Telephone	+61 2 8594 0400
Facsimile	+61 2 8594 0499
Email	au.environmental.sydney@sgs.com
Samples Received	Mon 1/8/2022
Report Due	Wed 3/8/2022
SGS Reference	**SE234947**

SUBMISSION DETAILS

This is to confirm that 8 samples were received on Monday 1/8/2022. Results are expected to be ready by COB Wednesday 3/8/2022. Please quote SGS reference SE234947 when making enquiries. Refer below for details relating to sample integrity upon receipt.

Samples clearly labelled	Yes	Complete documentation received	Yes
Sample container provider	SGS	Sample cooling method	Ice Bricks
Samples received in correct containers	Yes	Sample counts by matrix	7 Clay/Sand/Soil, 1 Water
Date documentation received	1/8/2022	Type of documentation received	COC
Samples received in good order	Yes	Samples received without headspace	Yes
Sample temperature upon receipt	5.8C	Sufficient sample for analysis	Yes
Turnaround time requested	Two Days		

Unless otherwise instructed, water and bulk samples will be held for one month from date of report, and soil samples will be held for two months.

COMMENTS

SAMPLE RECEIPT ADVICE

SE234947

CLIENT DETAILS

Client Geotechnique

Project 14305/17 Menangle

SUMMARY OF ANALYSIS

No.	Sample ID	OC Pesticides in Soil	PAH (Polynuclear Aromatic Hydrocarbons) in Soil	PCBs in Soil	pH in soil (1:5)	Total Phenolics in Soil	TRH (Total Recoverable Hydrocarbons) in Soil	VOC's in Soil	Volatile Petroleum Hydrocarbons in Soil
001	BH101 0.0-0.15	30	26	11	1	1	10	11	7
002	BH101 0.35-0.45	-	26	-	1	1	10	11	7
003	BH102 0.0-0.05	30	26	11	1	1	10	11	7
004	BH102 0.1-0.2	-	26	-	1	1	10	11	7
005	BH103 0.0-0.15	30	26	11	1	1	10	11	7
006	DDS1	-	26	-	-	1	10	11	7
008	TS1	-	-	-	-	-	-	11	-

CONTINUED OVERLEAF

The above table represents SGS' interpretation of the client-supplied Chain Of Custody document.
The numbers shown in the table indicate the number of results requested in each package.
Please indicate as soon as possible should your request differ from these details .
Testing as per this table shall commence immediately unless the client intervenes with a correction .

SAMPLE RECEIPT ADVICE

SE234947

CLIENT DETAILS

Client Geotechnique

Project 14305/17 Menangle

SUMMARY OF ANALYSIS

No.	Sample ID	Exchangeable Cations and Cation Exchange Capacity	Mercury in Soil	Moisture Content	Total Recoverable Elements in Soil/Waste	VOCs in Water
001	BH101 0.0-0.15	13	1	1	7	-
002	BH101 0.35-0.45	13	1	1	7	-
003	BH102 0.0-0.05	13	1	1	7	-
004	BH102 0.1-0.2	13	1	1	7	-
005	BH103 0.0-0.15	13	1	1	7	-
006	DDS1	-	1	1	7	-
007	RS1	-	-	-	-	11

CONTINUED OVERLEAF

The above table represents SGS' interpretation of the client-supplied Chain Of Custody document.
The numbers shown in the table indicate the number of results requested in each package.
Please indicate as soon as possible should your request differ from these details .
Testing as per this table shall commence immediately unless the client intervenes with a correction .

SAMPLE RECEIPT ADVICE

SE234947

CLIENT DETAILS

Client Geotechnique

Project 14305/17 Menangle

SUMMARY OF ANALYSIS

No.	Sample ID	Mercury (dissolved) in Water	Metals in Water (Dissolved) by ICPOES	PAH (Polynuclear Aromatic Hydrocarbons) in Water	TRH (Total Recoverable Hydrocarbons) in Water	Volatile Petroleum Hydrocarbons in Water
007	RS1	1	7	22	9	7

The above table represents SGS' interpretation of the client-supplied Chain Of Custody document.
The numbers shown in the table indicate the number of results requested in each package.
Please indicate as soon as possible should your request differ from these details .
Testing as per this table shall commence immediately unless the client intervenes with a correction .

AUSTRALIAN SAFER ENVIRONMENT & TECHNOLOGY PTY LTD

ABN 36 088 095 112

Our ref : ASET103331 / 106511 / 1 - 2
Your ref : 14305/17 - Station Street Menangle
NATA Accreditation No: 14484

2 August 2022

Geotechnique Pty Ltd
PO Box 880
Penrith NSW 2751

Attn: Mr Anwar Barbhuyia

Dear Anwar

Asbestos Identification
This report presents the results of two samples, forwarded by Geotechnique Pty Ltd on 1 August 2022, for analysis for asbestos.

1.Introduction: Two samples forwarded were examined and analysed for the presence of asbestos on 1 August 2022.

2. Methods : The samples were examined under a Stereo Microscope and selected fibres were analysed by Polarized Light Microscopy in conjunction with Dispersion Staining method **(Australian Standard AS4964 - 2004 and Safer Environment Method 1 as the supplementary work instruction) (Qualitative Analysis only).**

The report also provides approximate weights and percentages, categories of asbestos forms appearing in the sample, such as **AF**(Asbestos Fines), **FA**(Friable Asbestos and **ACM** (Asbestos Containing Material), also satisfying the requirements of the NEPM Guidelines).

3. Results : **Sample No. 1. ASET103331 / 106511 / 1. BH101 - 0.0-0.15.**
Approx dimensions 10.0 cm x 10.0 cm x 9.1 cm
Approximate total dry weight of soil = 909.0g.
The sample consisted of a mixture of clayish sandy soil, organic fibres, stones and plant matter.
No asbestos detected.

Sample No. 2. ASET103331 / 106511 / 2. BH102 - 0.0-0.05.
Approx dimensions 10.0 cm x 10.0 cm x 1.2 cm
Approximate total dry weight of soil = 1153.0g.
The sample consisted of a mixture of clayish sandy soil, organic fibres, stones and plant matter.
No asbestos detected.

Reported by,

Mahen De Silva. BSc, MSc, Grad Dip (Occ Hyg)
Occupational Hygienist / Approved Identifier.
Approved Signatory

NATA
WORLD RECOGNISED ACCREDITATION

Accredited for compliance with ISO/IEC 17025 -Testing.

This report is consistent with the analytical procedures and reporting recommendations in the Western Australia Guidelines for the Assessment Remediation and Management of Asbestos contaminated sites in

Western Australia and it also satisfies the requirements of the current NEPM Guidelines. NATA Accreditation does not cover the performance of this service.

Disclaimers;

The approx; weights given above can be used only as a guide. They do not represent absolute weights of each kind of asbestos, as it is impossible to extract all loose fibres from soil and other asbestos containing building material samples using this method. However above figures may be used as closest approximations to the exact values in each case. Estimation and/ or reporting of asbestos fibre weights in asbestos containing materials and soil is out of the Scope of the NATA Accreditation. NATA Accreditation only covers the qualitative part of the results reported. This weight disclaimer also covers weight / weight percentages if given.

ACM - Asbestos Containing Material - Products or materials that contain asbestos in an inert bound matrix such as cement or resin. Here taken to be sound material, even as fragments and not fitting through a 7mm X 7 mm sieve.

AF -Includes asbestos free fibres, small fibre bundles and also ACM fragments that pass through a 7mm X 7 mm sieve.

FA -Friable asbestos material such as severely weathered ACM, and asbestos in the form of loose fibrous material such as insulation products.

^ denotes loose fibres of relevant asbestos types detected in soil/dust.
*** denotes asbestos detected in ACM in bonded form.**
 # denotes friable asbestos as soft fibro plaster, fragments of ACM smaller than 7mm which are considered as friable and / or highly weathered ACM that will easily crumble.
λ denotes samples that have been analysed only in accordance to AS 4964 – 2004.
Ω Sample volume criteria of 500mL have not been satisfied.

The results contained in this report relate only to the sample/s submitted for testing. Australian Safer Environment & Technology accepts no responsibility for whether or not the submitted sample/s is/are representative. Results indicating "No asbestos detected" indicates a reporting limit specified in AS4964 -2004 which is 0.1g/ Kg (0.01%). Any amounts detected at assumed lower level than that would be reported, however those assumed lower levels may be treated as "No asbestos detected" as specified and recommended by A4964-2004. Trace / respirable level asbestos will be reported only when detected and trace analysis have been performed on each sample as required by AS4964-2004. When loose asbestos fibres/ fibre bundles are detected and reported that means they are larger handpicked fibres/ fibre bundles, and they do not represent respirable fibres. Dust/soil samples are always subjected to trace analysis except where the amounts involved are extremely minute and trace analysis is not possible to be carried out. When trace analysis is not performed on dust samples it will be indicated in the report that trace analysis has not been carried out due to the volume of the sample being extremely minute.

Estimation of asbestos weights involves the use of following assumptions;
Volume of each kind of Asbestos present in broken edges have been visually estimated and its been assumed that volumes remain similar throughout the binding matrix and those volumes are only approximate and not exact. Material densities have been assumed to be similar to commonly found similar materials and may not be exact.

All samples indicating "No asbestos detected" are assumed to be less than 0.001% for friable AF and FA portions detected and 0.01 % for ACM detected unless the approximate weight is given.

AUSTRALIAN SAFER ENVIRONMENT & TECHNOLOGY PTY LTD
SUITE 710 / 90 GEORGE STREET, HORNSBY NSW 2077 – P.O. BOX 1644 HORNSBY WESTFIELD NSW 1635
PHONE: (02) 99872183 FAX: (02)99872151 EMAIL: info@ausset.com.au

URGENT

CHAIN OF CUSTODY RECORD

						Asbestos in Material	Asbestos in Soil (+/-)	Asbestos WA/ NEPM 500mL	Asbestos Fibre Count	Asbestos in Water	Asbestos in Dust	Lead Analysis
ASET JOB NO: ASET03331/106511/1-2				Contact Name:	ANWAR BARBHUYIA							
Name/ Company Name: Geotechnique				Job No:	14305/17							
Address: 1 Lemko Place Penrith				Project Address:	Station Street, Menangle							
				Purchase Order:								
Contact Ph: 0247222700				Email Results to:								
	Sample ID	Date	Type	Container	Sample Depth (m)							
1	BH101	29/07/2022	Soil	P	0.0-0.15			√				
2	BH102	29/07/2022	Soil	P	0.0-0.05			√				
Relinquished By: ANWAR BARBHUYIA				Received By:		Turn around time					Shipment Method	
Date & Time: 1/08/2022				Date & Time:	1/8/22 2-30pm	Same Day	24 hrs	48 hrs	3 Days	5 days		
Signature: AB				Signature:				√				

01 AUG 2022

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 301952

Client Details

Client	Geotechnique Pty Ltd
Attention	Anwar Barbhuyia
Address	PO Box 880, Penrith, NSW, 2751

Sample Details

Your Reference	**14305/17, Menangle**
Number of Samples	1 Soil
Date samples received	01/08/2022
Date completed instructions received	01/08/2022

Analysis Details

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

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

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

Report Details

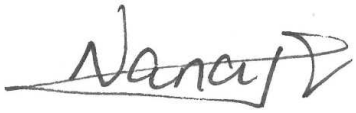
Date results requested by	03/08/2022
Date of Issue	03/08/2022

NATA Accreditation Number 2901. This document shall not be reproduced except in full.

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

Results Approved By
Diego Bigolin, Inorganics Supervisor
Giovanni Agosti, Group Technical Manager
Greta Petzold, Assistant Operation Manager
Josh Williams, Organics and LC Supervisor
Kyle Gavrily, Senior Chemist

Authorised By



Nancy Zhang, Laboratory Manager

vTRH(C6-C10)/BTEXN in Soil		
Our Reference		301952-1
Your Reference	UNITS	DSS1
Date Sampled		29/07/2022
Type of sample		Soil
Date extracted	-	02/08/2022
Date analysed	-	03/08/2022
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	%	114

svTRH (C10-C40) in Soil		
Our Reference		301952-1
Your Reference	UNITS	DSS1
Date Sampled		29/07/2022
Type of sample		Soil
Date extracted	-	02/08/2022
Date analysed	-	03/08/2022
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	%	81

PAHs in Soil		
Our Reference		301952-1
Your Reference	UNITS	DSS1
Date Sampled		29/07/2022
Type of sample		Soil
Date extracted	-	02/08/2022
Date analysed	-	02/08/2022
Naphthalene	mg/kg	<0.1
Acenaphthylene	mg/kg	<0.1
Acenaphthene	mg/kg	<0.1
Fluorene	mg/kg	<0.1
Phenanthrene	mg/kg	<0.1
Anthracene	mg/kg	<0.1
Fluoranthene	mg/kg	<0.1
Pyrene	mg/kg	<0.1
Benzo(a)anthracene	mg/kg	<0.1
Chrysene	mg/kg	<0.1
Benzo(b,j+k)fluoranthene	mg/kg	<0.2
Benzo(a)pyrene	mg/kg	<0.05
Indeno(1,2,3-c,d)pyrene	mg/kg	<0.1
Dibenzo(a,h)anthracene	mg/kg	<0.1
Benzo(g,h,i)perylene	mg/kg	<0.1
Total +ve PAH's	mg/kg	<0.05
Benzo(a)pyrene TEQ calc (zero)	mg/kg	<0.5
Benzo(a)pyrene TEQ calc(half)	mg/kg	<0.5
Benzo(a)pyrene TEQ calc(PQL)	mg/kg	<0.5
Surrogate p-Terphenyl-d14	%	89

Organochlorine Pesticides in soil		
Our Reference		301952-1
Your Reference	UNITS	DSS1
Date Sampled		29/07/2022
Type of sample		Soil
Date extracted	-	02/08/2022
Date analysed	-	02/08/2022
alpha-BHC	mg/kg	<0.1
HCB	mg/kg	<0.1
beta-BHC	mg/kg	<0.1
gamma-BHC	mg/kg	<0.1
Heptachlor	mg/kg	<0.1
delta-BHC	mg/kg	<0.1
Aldrin	mg/kg	<0.1
Heptachlor Epoxide	mg/kg	<0.1
gamma-Chlordane	mg/kg	<0.1
alpha-chlordane	mg/kg	<0.1
Endosulfan I	mg/kg	<0.1
pp-DDE	mg/kg	<0.1
Dieldrin	mg/kg	<0.1
Endrin	mg/kg	<0.1
Endosulfan II	mg/kg	<0.1
pp-DDD	mg/kg	<0.1
Endrin Aldehyde	mg/kg	<0.1
pp-DDT	mg/kg	<0.1
Endosulfan Sulphate	mg/kg	<0.1
Methoxychlor	mg/kg	<0.1
Total +ve DDT+DDD+DDE	mg/kg	<0.1
Surrogate TCMX	%	88

PCBs in Soil		
Our Reference		301952-1
Your Reference	UNITS	DSS1
Date Sampled		29/07/2022
Type of sample		Soil
Date extracted	-	02/08/2022
Date analysed	-	02/08/2022
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	%	88

Misc Soil - Inorg		
Our Reference		301952-1
Your Reference	UNITS	DSS1
Date Sampled		29/07/2022
Type of sample		Soil
Date prepared	-	03/08/2022
Date analysed	-	03/08/2022
Total Phenolics (as Phenol)	mg/kg	<5

Acid Extractable metals in soil		
Our Reference		301952-1
Your Reference	UNITS	DSS1
Date Sampled		29/07/2022
Type of sample		Soil
Date prepared	-	03/08/2022
Date analysed	-	03/08/2022
Arsenic	mg/kg	<4
Cadmium	mg/kg	<0.4
Chromium	mg/kg	6
Copper	mg/kg	25
Lead	mg/kg	23
Mercury	mg/kg	<0.1
Nickel	mg/kg	10
Zinc	mg/kg	49

Moisture		
Our Reference		301952-1
Your Reference	UNITS	DSS1
Date Sampled		29/07/2022
Type of sample		Soil
Date prepared	-	02/08/2022
Date analysed	-	03/08/2022
Moisture	%	5.2

Method ID	Methodology Summary
Inorg-008	Moisture content determined by heating at 105+/-5 °C for a minimum of 12 hours.
Inorg-031	Total Phenolics by segmented flow analyser (in line distillation with colourimetric finish). Solids are extracted in a caustic media prior to analysis.
Metals-020	Determination of various metals by ICP-AES.
Metals-021	Determination of Mercury by Cold Vapour AAS.
Org-020	Soil samples are extracted with Dichloromethane/Acetone and waters with Dichloromethane and analysed by GC-FID. F2 = (>C10-C16)-Naphthalene as per NEPM B1 Guideline on Investigation Levels for Soil and Groundwater (HSLs Tables 1A (3, 4)). Note Naphthalene is determined from the VOC analysis.
Org-020	Soil samples are extracted with Dichloromethane/Acetone and waters with Dichloromethane and analysed by GC-FID. F2 = (>C10-C16)-Naphthalene as per NEPM B1 Guideline on Investigation Levels for Soil and Groundwater (HSLs Tables 1A (3, 4)). Note Naphthalene is determined from the VOC analysis. Note, the Total +ve TRH PQL is reflective of the lowest individual PQL and is therefore "Total +ve TRH" is simply a sum of the positive individual TRH fractions (>C10-C40).
Org-021	Soil samples are extracted with dichloromethane/acetone and waters with dichloromethane and analysed by GC-ECD.
Org-021	Soil samples are extracted with dichloromethane/acetone and waters with dichloromethane and analysed by GC-ECD. Note, the Total +ve PCBs PQL is reflective of the lowest individual PQL and is therefore" Total +ve PCBs" is simply a sum of the positive individual PCBs.
Org-022/025	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-25	[NT]
Date extracted	-			02/08/2022	[NT]	[NT]	[NT]	[NT]	02/08/2022	[NT]
Date analysed	-			03/08/2022	[NT]	[NT]	[NT]	[NT]	03/08/2022	[NT]
TRH C_6 - C_9	mg/kg	25	Org-023	<25	[NT]	[NT]	[NT]	[NT]	103	[NT]
TRH C_6 - C_{10}	mg/kg	25	Org-023	<25	[NT]	[NT]	[NT]	[NT]	103	[NT]
Benzene	mg/kg	0.2	Org-023	<0.2	[NT]	[NT]	[NT]	[NT]	115	[NT]
Toluene	mg/kg	0.5	Org-023	<0.5	[NT]	[NT]	[NT]	[NT]	106	[NT]
Ethylbenzene	mg/kg	1	Org-023	<1	[NT]	[NT]	[NT]	[NT]	96	[NT]
m+p-xylene	mg/kg	2	Org-023	<2	[NT]	[NT]	[NT]	[NT]	100	[NT]
o-Xylene	mg/kg	1	Org-023	<1	[NT]	[NT]	[NT]	[NT]	102	[NT]
Naphthalene	mg/kg	1	Org-023	<1	[NT]	[NT]	[NT]	[NT]	[NT]	[NT]
Surrogate aaa-Trifluorotoluene	%		Org-023	115	[NT]	[NT]	[NT]	[NT]	114	[NT]

QUALITY CONTROL: svTRH (C10-C40) in Soil						Duplicate			Spike Recovery %	
Test Description	Units	PQL	Method	Blank	#	Base	Dup.	RPD	LCS-25	[NT]
Date extracted	-			02/08/2022	[NT]	[NT]	[NT]	[NT]	02/08/2022	[NT]
Date analysed	-			02/08/2022	[NT]	[NT]	[NT]	[NT]	02/08/2022	[NT]
TRH C_{10} - C_{14}	mg/kg	50	Org-020	<50	[NT]	[NT]	[NT]	[NT]	102	[NT]
TRH C_{15} - C_{28}	mg/kg	100	Org-020	<100	[NT]	[NT]	[NT]	[NT]	95	[NT]
TRH C_{29} - C_{36}	mg/kg	100	Org-020	<100	[NT]	[NT]	[NT]	[NT]	86	[NT]
TRH >C_{10} -C_{16}	mg/kg	50	Org-020	<50	[NT]	[NT]	[NT]	[NT]	102	[NT]
TRH >C_{16} -C_{34}	mg/kg	100	Org-020	<100	[NT]	[NT]	[NT]	[NT]	95	[NT]
TRH >C_{34} -C_{40}	mg/kg	100	Org-020	<100	[NT]	[NT]	[NT]	[NT]	86	[NT]
Surrogate o-Terphenyl	%		Org-020	76	[NT]	[NT]	[NT]	[NT]	119	[NT]

QUALITY CONTROL: PAHs in Soil						Duplicate			Spike Recovery %	
Test Description	Units	PQL	Method	Blank	#	Base	Dup.	RPD	LCS-25	[NT]
Date extracted	-			02/08/2022	[NT]	[NT]	[NT]	[NT]	02/08/2022	[NT]
Date analysed	-			02/08/2022	[NT]	[NT]	[NT]	[NT]	02/08/2022	[NT]
Naphthalene	mg/kg	0.1	Org-022/025	<0.1	[NT]	[NT]	[NT]	[NT]	82	[NT]
Acenaphthylene	mg/kg	0.1	Org-022/025	<0.1	[NT]	[NT]	[NT]	[NT]	[NT]	[NT]
Acenaphthene	mg/kg	0.1	Org-022/025	<0.1	[NT]	[NT]	[NT]	[NT]	79	[NT]
Fluorene	mg/kg	0.1	Org-022/025	<0.1	[NT]	[NT]	[NT]	[NT]	82	[NT]
Phenanthrene	mg/kg	0.1	Org-022/025	<0.1	[NT]	[NT]	[NT]	[NT]	88	[NT]
Anthracene	mg/kg	0.1	Org-022/025	<0.1	[NT]	[NT]	[NT]	[NT]	[NT]	[NT]
Fluoranthene	mg/kg	0.1	Org-022/025	<0.1	[NT]	[NT]	[NT]	[NT]	92	[NT]
Pyrene	mg/kg	0.1	Org-022/025	<0.1	[NT]	[NT]	[NT]	[NT]	95	[NT]
Benzo(a)anthracene	mg/kg	0.1	Org-022/025	<0.1	[NT]	[NT]	[NT]	[NT]	[NT]	[NT]
Chrysene	mg/kg	0.1	Org-022/025	<0.1	[NT]	[NT]	[NT]	[NT]	87	[NT]
Benzo(b,j+k)fluoranthene	mg/kg	0.2	Org-022/025	<0.2	[NT]	[NT]	[NT]	[NT]	[NT]	[NT]
Benzo(a)pyrene	mg/kg	0.05	Org-022/025	<0.05	[NT]	[NT]	[NT]	[NT]	84	[NT]
Indeno(1,2,3-c,d)pyrene	mg/kg	0.1	Org-022/025	<0.1	[NT]	[NT]	[NT]	[NT]	[NT]	[NT]
Dibenzo(a,h)anthracene	mg/kg	0.1	Org-022/025	<0.1	[NT]	[NT]	[NT]	[NT]	[NT]	[NT]
Benzo(g,h,i)perylene	mg/kg	0.1	Org-022/025	<0.1	[NT]	[NT]	[NT]	[NT]	[NT]	[NT]
Surrogate p-Terphenyl-d14	%		Org-022/025	88	[NT]	[NT]	[NT]	[NT]	88	[NT]

QUALITY CONTROL: Organochlorine Pesticides in soil					Duplicate				Spike Recovery %	
Test Description	Units	PQL	Method	Blank	#	Base	Dup.	RPD	LCS-25	[NT]
Date extracted	-			02/08/2022	[NT]	[NT]	[NT]	[NT]	02/08/2022	[NT]
Date analysed	-			02/08/2022	[NT]	[NT]	[NT]	[NT]	02/08/2022	[NT]
alpha-BHC	mg/kg	0.1	Org-022/025	<0.1	[NT]	[NT]	[NT]	[NT]	80	[NT]
HCB	mg/kg	0.1	Org-022/025	<0.1	[NT]	[NT]	[NT]	[NT]	[NT]	[NT]
beta-BHC	mg/kg	0.1	Org-022/025	<0.1	[NT]	[NT]	[NT]	[NT]	82	[NT]
gamma-BHC	mg/kg	0.1	Org-022/025	<0.1	[NT]	[NT]	[NT]	[NT]	[NT]	[NT]
Heptachlor	mg/kg	0.1	Org-022/025	<0.1	[NT]	[NT]	[NT]	[NT]	79	[NT]
delta-BHC	mg/kg	0.1	Org-022/025	<0.1	[NT]	[NT]	[NT]	[NT]	[NT]	[NT]
Aldrin	mg/kg	0.1	Org-022/025	<0.1	[NT]	[NT]	[NT]	[NT]	89	[NT]
Heptachlor Epoxide	mg/kg	0.1	Org-022/025	<0.1	[NT]	[NT]	[NT]	[NT]	90	[NT]
gamma-Chlordane	mg/kg	0.1	Org-022/025	<0.1	[NT]	[NT]	[NT]	[NT]	[NT]	[NT]
alpha-chlordane	mg/kg	0.1	Org-022/025	<0.1	[NT]	[NT]	[NT]	[NT]	[NT]	[NT]
Endosulfan I	mg/kg	0.1	Org-022/025	<0.1	[NT]	[NT]	[NT]	[NT]	[NT]	[NT]
pp-DDE	mg/kg	0.1	Org-022/025	<0.1	[NT]	[NT]	[NT]	[NT]	82	[NT]
Dieldrin	mg/kg	0.1	Org-022/025	<0.1	[NT]	[NT]	[NT]	[NT]	88	[NT]
Endrin	mg/kg	0.1	Org-022/025	<0.1	[NT]	[NT]	[NT]	[NT]	72	[NT]
Endosulfan II	mg/kg	0.1	Org-022/025	<0.1	[NT]	[NT]	[NT]	[NT]	[NT]	[NT]
pp-DDD	mg/kg	0.1	Org-022/025	<0.1	[NT]	[NT]	[NT]	[NT]	80	[NT]
Endrin Aldehyde	mg/kg	0.1	Org-022/025	<0.1	[NT]	[NT]	[NT]	[NT]	[NT]	[NT]
pp-DDT	mg/kg	0.1	Org-022/025	<0.1	[NT]	[NT]	[NT]	[NT]	[NT]	[NT]
Endosulfan Sulphate	mg/kg	0.1	Org-022/025	<0.1	[NT]	[NT]	[NT]	[NT]	72	[NT]
Methoxychlor	mg/kg	0.1	Org-022/025	<0.1	[NT]	[NT]	[NT]	[NT]	[NT]	[NT]
Surrogate TCMX	%		Org-022/025	88	[NT]	[NT]	[NT]	[NT]	87	[NT]

QUALITY CONTROL: PCBs in Soil						Duplicate			Spike Recovery %	
Test Description	Units	PQL	Method	Blank	#	Base	Dup.	RPD	LCS-25	[NT]
Date extracted	-			02/08/2022	[NT]	[NT]	[NT]	[NT]	02/08/2022	[NT]
Date analysed	-			02/08/2022	[NT]	[NT]	[NT]	[NT]	02/08/2022	[NT]
Aroclor 1016	mg/kg	0.1	Org-021	<0.1	[NT]	[NT]	[NT]	[NT]	[NT]	[NT]
Aroclor 1221	mg/kg	0.1	Org-021	<0.1	[NT]	[NT]	[NT]	[NT]	[NT]	[NT]
Aroclor 1232	mg/kg	0.1	Org-021	<0.1	[NT]	[NT]	[NT]	[NT]	[NT]	[NT]
Aroclor 1242	mg/kg	0.1	Org-021	<0.1	[NT]	[NT]	[NT]	[NT]	[NT]	[NT]
Aroclor 1248	mg/kg	0.1	Org-021	<0.1	[NT]	[NT]	[NT]	[NT]	[NT]	[NT]
Aroclor 1254	mg/kg	0.1	Org-021	<0.1	[NT]	[NT]	[NT]	[NT]	124	[NT]
Aroclor 1260	mg/kg	0.1	Org-021	<0.1	[NT]	[NT]	[NT]	[NT]	[NT]	[NT]
Surrogate TCMX	%		Org-021	88	[NT]	[NT]	[NT]	[NT]	87	[NT]

QUALITY CONTROL: Misc Soil - Inorg					Duplicate				Spike Recovery %	
Test Description	Units	PQL	Method	Blank	#	Base	Dup.	RPD	LCS-25	[NT]
Date prepared	-			03/08/2022	[NT]	[NT]	[NT]	[NT]	03/08/2022	[NT]
Date analysed	-			03/08/2022	[NT]	[NT]	[NT]	[NT]	03/08/2022	[NT]
Total Phenolics (as Phenol)	mg/kg	5	Inorg-031	<5	[NT]	[NT]	[NT]	[NT]	103	[NT]

QUALITY CONTROL: Acid Extractable metals in soil						Duplicate			Spike Recovery %	
Test Description	Units	PQL	Method	Blank	#	Base	Dup.	RPD	LCS-25	[NT]
Date prepared	-			03/08/2022	[NT]	[NT]	[NT]	[NT]	03/08/2022	[NT]
Date analysed	-			03/08/2022	[NT]	[NT]	[NT]	[NT]	03/08/2022	[NT]
Arsenic	mg/kg	4	Metals-020	<4	[NT]	[NT]	[NT]	[NT]	105	[NT]
Cadmium	mg/kg	0.4	Metals-020	<0.4	[NT]	[NT]	[NT]	[NT]	105	[NT]
Chromium	mg/kg	1	Metals-020	<1	[NT]	[NT]	[NT]	[NT]	108	[NT]
Copper	mg/kg	1	Metals-020	<1	[NT]	[NT]	[NT]	[NT]	103	[NT]
Lead	mg/kg	1	Metals-020	<1	[NT]	[NT]	[NT]	[NT]	106	[NT]
Mercury	mg/kg	0.1	Metals-021	<0.1	[NT]	[NT]	[NT]	[NT]	103	[NT]
Nickel	mg/kg	1	Metals-020	<1	[NT]	[NT]	[NT]	[NT]	105	[NT]
Zinc	mg/kg	1	Metals-020	<1	[NT]	[NT]	[NT]	[NT]	108	[NT]

Result Definitions

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

Quality Control Definitions

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

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

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

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

Laboratory Acceptance Criteria

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

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

Spikes for Physical and Aggregate Tests are not applicable.

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

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

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

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

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

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

Measurement Uncertainty estimates are available for most tests upon request.

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

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

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

Job No: 301952.
Date Received: 01/08/22.
Time Received: 1720
Received By: CH
Temp: Cool/~~Ambient~~
Cooling: Ice/~~Icepack~~
Security: Intact/Broken/None

GEOTECHNIQUE PTY LTD

1 LEMKO PLACE PENRITH NSW 2750

CHAIN OF CUSTODY

Results Required By: 2 days **Date:** Wednesday, 3 August 2022
Except pH Results Required By [redacted] **Date:**
Your Reference No.:

TO: ENVIROLAB SERVICES PTY LTD
12 ASHLEY STREET
CHATSWOOD NSW 2067

Sampled By: JH
Project Manager: ANWAR BARBHUYIA
Ref No: 14305/17
Location: Menangle

Location	Depth (m)	Date	Soil	Material	Metals As Cd Cr Cu Pb Hg Ni Zn	TRH & BTEX	PAH	OCP	OP	PCB	PHENOL	CYANIDE	COMBO NO	PFAS (extended)	TCLP PFAS (water–routine level, short) (PFOS+PFHxS, PFOA)	COAL TAR (RTA Test Method T542)2
DSS1		29/07/2022	G		✔	✔	✔	✔		✔	✔		7			

Relinquished by			Received by			
Name	Signature	Date	Name	Signature	Date	
ANWAR BARBHUYIA	AB	1/08/2022	[illegible]	[illegible]	01/08/22 1720	

G	Soil sample (glass jar)	FCP	Fibro Cement Piece (plastic bag)	PFASC	PFAS Container	*: As,Cd,Cr,Cu,Pb,Hg,Ni & Zn (8 metals)
P	Soil sample (plastic bag)	✔	Test required			

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	Geotechnique Pty Ltd
Attention	Anwar Barbhuyia

Sample Login Details

Your reference	14305/17, Menangle
Envirolab Reference	301952
Date Sample Received	01/08/2022
Date Instructions Received	01/08/2022
Date Results Expected to be Reported	03/08/2022

Sample Condition

Samples received in appropriate condition for analysis	Yes
No. of Samples Provided	1 Soil
Turnaround Time Requested	Standard
Temperature on Receipt (°C)	7
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	PCBs in Soil	Misc Soil - Inorg	Acid Extractable metalsin soil
DSS1	✓	✓	✓	✓	✓	✓	✓

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.

ATTACHMENT D

LABORATORY ANALYTICAL RESULTS SUMMARY TABLES (TABLES A TO I)

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TABLE A
RINSATE
(Ref No: 14305/17-AA)

SAMPLE DATE	RS1 29/07/2022
METAL	**(mg/L)**
Arsenic	<0.02
Cadmium	<0.001
Chromium	<0.005
Copper	<0.005
Lead	<0.02
Mercury	<0.0001
Nickel	<0.005
Zinc	<0.01
TOTAL RECOVERABLE HYDROCARBON (TRH)	**(µg/L)**
F1 (C6-C10 less BTEX)	<50
F2 (>C10-C16)	<60
F3 (>C16-C34)	<500
F4 (>C34-C40)	<500
BTEX	**(µg/L)**
Benzene	<0.5
Toluene	<0.5
Ethyl Benzene	<0.5
Xylenes	<1.5
POLYCYCLIC AROMATIC HYDROCARBON (PAH)	**(µg/L)**
Total PAH	<1
Naphthalene	<0.1
Benzo(a)Pyrene	<0.1

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PTY LTD

TABLE B
TRIP SPIKE
(Ref No: 14305/17-AA)

Sample	Sampling Date	BTEX			
		Benzene	Toluene	Ethylbenzene	Xylenes
TS1	29/07/2022	112%	105%	102%	102%

Note : results are reported as percentage recovery of known spike concentrations

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TABLE C
DUPLICATE SAMPLE
(Ref No: 14305/17-AA)

ANALYTE	BH101 0.0-0.15 (m) mg/kg	DDS1 mg/kg	RELATIVE PERCENTAGE DIFFERENCES (RPD) %
Arsenic	4	5	22
Cadmium	<0.3	<0.3	-
Chromium	4.8	5.9	21
Copper	22	24	9
Lead	20	29	37
Mercury	<0.05	<0.05	-
Nickel	11	11	0
Zinc	61	60	2
TOTAL RECOVERABLE HYDROCARBONS (TRH)			
F1 (C6-C10 less BTEX)	<25	<25	-
F2 (>C10-C16)	<25	<25	-
F3 (>C16-C34)	<90	<90	-
F4 (>C34-C40)	<120	<120	-
BTEX			
Benzene	<0.1	<0.1	-
Toluene	<0.1	<0.1	-
Ethyl Benzene	<0.1	<0.1	-
Xylenes	<0.3	<0.3	-
POLYCYCLIC AROMATIC HYDROCARBONS			
Benzo(a)Pyrene TEQ	<0.3	<0.3	-
Total PAH	<0.8	<0.8	-
Naphthalene	<0.1	<0.1	-
Benzo(a)Pyrene	<0.1	<0.1	-
ORGANOCHLORINE PESTICIDES (OCP)			
Hexachlorobenzene (HCB)	<0.1	<0.1	-
Heptachlor	<0.1	<0.1	-
Aldrin+Dieldrin	<0.15	<0.15	-
Endrin	<0.2	<0.2	-
Methoxychlor	<0.1	<0.1	-
Mirex	<0.1	<0.1	-
Endosulfan (alpha, beta & sulphate)	<0.5	<0.5	-
DDD+DDE+DDT	<0.6	<0.6	-
Chlordane (alpha & gamma)	<0.2	<0.2	-
POLYCHLORINATED BIPHENYLS (PCB)			
Total PCB	<1	<1	-
Phenols	<5	<5	-

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TABLE D
SPLIT SAMPLE
(Ref No: 14305/17-AA)

ANALYTE	BH102 0.0-0.05 (m) mg/kg (SGS)	DSS1 mg/kg (ENVIROLAB)	RELATIVE PERCENTAGE DIFFERENCES (RPD) %
Arsenic	8	<4	-
Cadmium	<0.3	<0.4	-
Chromium	8.2	6	31
Copper	25	25	0
Lead	27	23	16
Mercury	0.06	<0.1	-
Nickel	11	10	10
Zinc	57	49	15
TOTAL RECOVERABLE HYDROCARBONS (TRH)			
F1 (C6-C10 less BTEX)	<25	<25	-
F2 (>C10-C16)	<25	<50	-
F3 (>C16-C34)	<90	<100	-
F4 (>C34-C40)	<120	<100	-
BTEX			
Benzene	<0.1	<0.2	-
Toluene	<0.1	<0.5	-
Ethyl Benzene	<0.1	<1	-
Xylenes	<0.3	<1	-
POLYCYCLIC AROMATIC HYDROCARBONS (PAH)			
Benzo(a)Pyrene TEQ	<0.3	<0.5	-
Total PAH	<0.8	<0.05	-
Naphthalene	<0.1	<0.1	-
Benzo(a)Pyrene	<0.1	<0.05	-
ORGANOCHLORINE PESTICIDES (OCP)			
Hexachlorobenzene (HCB)	<0.1	<0.1	-
Heptachlor	<0.1	<0.1	-
Aldrin+Dieldrin	<0.15	<0.2	-
Endrin	<0.2	<0.1	-
Methoxychlor	<0.1	<0.1	-
Endosulfan (alpha (I), beta (II) & sulphate)	<0.5	<0.3	-
DDD+DDE+DDT	<0.6	<0.1	-
Chlordane (alpha & gamma)	<0.2	<0.2	-
POLYCHLORINATED BIPHENYLS (PCB)			
Total PCB	<1	<0.1	-
Phenols	<5	<5	-

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TABLE E
METAL, CATION EXCHANGE CAPACITY (CEC) & pH TEST RESULTS
DISCRETE SAMPLES
(Ref No: 14305/17-AA)

Sample Location	Depth (m)	METAL (mg/kg) ARSENIC	CADMIUM	CHROMIUM (Total)	COPPER	LEAD	MERCURY	NICKEL	ZINC	CEC ($cmol_c/kg$)	pH
BH101	0.0-0.15	4	<0.3	4.8	22	20	<0.05	11	61	8.7	6.1
BH101	0.35-0.45	6	<0.3	15	22	30	<0.05	21	65	5.7	5
BH102	0.0-0.05	8	<0.3	8.2	25	27	0.06	11	57	8.1	7.8
BH102	0.1-0.2	10	<0.3	16	25	31	0.17	14	53	6.8	4.8
BH103	0.0-0.15	9	<0.3	14	21	31	<0.05	9.4	35	9.7	5.7
Limit of Reporting (LOR)		1	0.3	0.5	0.5	1	0.05	0.5	2	0.02	0.1
NATIONAL ENVIRONMENT PROTECTION AMENDMENT MEASURE (2013)											
Health-based Investigation Levels (HIL) [a] D - Commercial / Industrial D		3000	900	3600 [c]	240000	1500	180 [d]	6000	400000		
Ecological Investigation Levels (EIL) [b]- Commercial and industrial		160 [e]	-	320[f]	140	1800 [g]	-	80	320		

Notes:
a: Commercial / industrial includes premises such as shops, offices, factories and industrial sites.
b: EIL of aged chromium (III), copper, nickel & zinc were derived from calculation spreadsheet developed by CSIRO for NEPC; Old Suburb with High Traffic; the lowest CEC=5.7 cmolc/kg & pH=4.8; the assumed clay content=1 % were selected for derivation of EIL; a conservative approach.

c: Chromium (VI)
d: Methyl Mercury
e: Generic EIL for aged arsenic
f: Chromium (III)
g: Generic added contaminant limit for aged lead

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TABLE F
TOTAL RECOVERABLE HYDROCARBONS (TRH) AND BTEX TEST RESULTS
DISCRETE SAMPLES
(Ref No: 14305/17-AA)

												NATIONAL ENVIRONMENT PROTECTION AMENDMENT MEASURE (2013)																	
			TRH (mg/kg)					BTEX (mg/kg)				Health Screening Levels (HSL) D Commercial / Industrial						Ecological Screening Levels for fine-grained soil Commercial and industrial								Ecological Screening Levels for coarse-grained soil Commercial and industrial							
Sample Location	Depth (m)	Soil type	F1	F2*	F2**	F3	F4	BENZENE	TOLUENE	ETHYLBENZENE	XYLENES	F1	F2*	BENZENE	TOLUENE	ETHYLBENZENE	XYLENES	F1	F2**	F3	F4	BENZENE	TOLUENE	ETHYLBENZENE	XYLENES	F1	F2**	F3	F4	BENZENE	TOLUENE	ETHYLBENZENE	XYLENES
BH101	0.0-0.15	Sand	<25	<25	<25	<90	<120	<0.1	<0.1	<0.1	<0.3	260	NL	3	NL	NL	230	-	-	-	-	-	-	-	-	215	170	1700	3300	75	135	165	180
BH101	0.35-0.45	Clay	<25	<25	<25	<90	<120	<0.1	<0.1	<0.1	<0.3	310	NL	4	NL	NL	NL	215	170	2500	6600	95	135	185	95	-	-	-	-	-	-	-	-
BH102	0.0-0.05	Clay	<25	<25	<25	<90	<120	<0.1	<0.1	<0.1	<0.3	310	NL	4	NL	NL	NL	215	170	2500	6600	95	135	185	95	-	-	-	-	-	-	-	-
BH102	0.1-0.2	Clay	<25	<25	<25	<90	<120	<0.1	<0.1	<0.1	<0.3	310	NL	4	NL	NL	NL	215	170	2500	6600	95	135	185	95	-	-	-	-	-	-	-	-
BH103	0.0-0.15	Clay	<25	<25	<25	<90	<120	<0.1	<0.1	<0.1	<0.3	310	NL	4	NL	NL	NL	215	170	2500	6600	95	135	185	95	-	-	-	-	-	-	-	-
Limit of Reporting (LOR)			25	25	25	90	120	0.1	0.1	0.1	0.3																				

Notes:
F1: C6-C10 less BTEX
F2*: >C10-C16 less Naphthalene
F2**: >C10-C16
F3: >C16-C34
F4: >C34-C40
NL: Not Limiting

GEOTECHNIQUE PTY LTD

TABLE G
POLYCYCLIC AROMATIC HYDROCARBONS (PAH) TEST RESULTS
DISCRETE SAMPLES
(Ref No: 14305/17-AA)

							NATIONAL ENVIRONMENT PROTECTION AMENDMENT MEASURE (2013)			
			PAH (mg/kg)				Health-based Investigation Levels (HIL) D [a] Commercial / Industrial D		Health Screening Level (HSL) D - Commercial / Industrial	Generic Ecological Investigation Level (EIL) - Commercial and industrial	Ecological Screening Level (ESL) - Commercial and industrial
Sample Location	Depth (m)	Soil type	BaP TEQ	TOTAL PAHs	NAPHTHALENE	BENZO(a)PYRENE (BaP)	BaP TEQ	TOTAL PAHs	NAPHTHALENE	NAPHTHALENE	BENZO(a)PYRENE (BaP)
BH101	0.0-0.15	Sand	<0.3	<0.8	<0.1	<0.1	40	4000	NL	370	1.4
BH101	0.35-0.45	Clay	<0.3	<0.8	<0.1	<0.1	40	4000	NL	370	1.4
BH102	0.0-0.05	Clay	<0.3	<0.8	<0.1	<0.1	40	4000	NL	370	1.4
BH102	0.1-0.2	Clay	<0.3	<0.8	<0.1	<0.1	40	4000	NL	370	1.4
BH103	0.0-0.15	Clay	<0.3	<0.8	<0.1	<0.1	40	4000	NL	370	1.4
Limit of Reporting (LOR)			0.3	0.8	0.1	0.1					

Notes: a: Commercial / industrial includes premises such as shops, offices, factories and industrial sites.

NL: Not Limiting

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TABLE H
ORGANOCHLORINE PESTICIDES (OCP), POLYCHLORINATED BIPHENYLS (PCB) & PHENOLS TEST RESULTS
DISCRETE SAMPLES
(Ref No: 14305/17-AA)

Sample Location	Depth (m)	OCP (mg/kg)										PCB (mg/kg)	Phenols (mg/kg)
		HEXACHLOROBENZENE (HCB)	HEPTACHLOR	ALDRIN+DIELDRIN	ENDRIN	METHOXYCHLOR	MIREX	ENDOSULFAN (alpha, beta & sulphate)	DDD+DDE+DDT	DDT	CHLORDANE (alpha & gamma)		
BH101	0.0-0.15	<0.1	<0.1	<0.15	<0.2	<0.1	<0.1	<0.5	<0.6	<0.2	<0.2	<1	<5
BH102	0.0-0.05	<0.1	<0.1	<0.15	<0.2	<0.1	<0.1	<0.5	<0.6	<0.2	<0.2	<1	<5
BH103	0.0-0.15	<0.1	<0.1	<0.15	<0.2	<0.1	<0.1	<0.5	<0.6	<0.2	<0.2	<1	<5
Limit of Reporting (LOR)		0.1	0.1	0.15	0.2	0.1	0.1	0.5	0.6	0.2	0.2	1	5
NATIONAL ENVIRONMENT PROTECTION AMENDMENT MEASURE (2013)													
Health-based Investigation Levels (HIL) D [a] - Commercial / Industrial D		80	50	45	100	2500	100	2000	3600		530	7	240000
Ecological Investigation Levels (EIL) - Commercial and industrial										640 [b]			

Notes: a: Commercial / industrial includes premises such as shops, offices, factories and industrial sites.

b: Generic EIL for DDT

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TABLE I
ASBESTOS TEST RESULTS
DISCRETE SAMPLES
(Ref No: 14305/17-AA)

Sample Location	Depth (m)	ASBESTOS (% w/w)		
Soil Sample		Bonded ACM (>7mm)	AF	FA
BH101	0.0-0.15	<0.01	<0.001	<0.001
BH102	0.0-0.05	<0.01	<0.001	<0.001
NATIONAL ENVIRONMENT PROTECTION AMENDMENT MEASURE (2013)				
Health Screening Levels [a] - Commercial / Industrial D		0.05	0.001	0.001

Notes: ACM: Asbestos Containing Material
AF: Asbestos Fines
FA: Fibrous Asbestos
a: Commercial / industrial includes premises such as shops, offices, factories and industrial sites.

ATTACHMENT E

UNEXPECTED FINDS MANAGEMENT PROTOCOL

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UNEXPECTED FINDS MANAGEMENT PROTOCOL

STATION STREET, MENANGLE

In the event that unexpected finds and/or suspect materials (identified by unusual staining, odour, discolouration or inclusions such as building rubble, asbestos sheeting/pieces/pipes, ash material, imported fill, etc.) are encountered during any stage of future earthworks/site preparation/any demolition, the following actions are to be undertaken.

Management of unexpected finds and/or suspect materials
If unexpected finds and/or suspect materials are encountered:

- Works are to be ceased.
- An Environmental consultant is to be engaged to take appropriate sampling and testing of contaminants of potential concern at a nominated rate in accordance with current NSW EPA guidelines.
- If contamination is identified, the contaminated materials must be disposed of at an EPA licensed landfill facility with an appropriate waste classification.

Management of bonded asbestos containing material (ACM)
If ACM is encountered, the following measures are implemented:

- Engage a Class B Licence for bonded asbestos contractor.
- Removal of the asbestos waste must be carried out in accordance with the requirements of the regulators, such as SafeWork NSW and NSW EPA.
- Competent personnel or a SafeWork NSW Licensed Asbestos Assessor or a Professional Hygienist should be engaged to provide a clearance certificate.

Management of friable asbestos within the soil
It is recommended that the following measures are implemented if friable asbestos is encountered:

- Engage a Class A licensed contractor for friable asbestos
- Removal of the asbestos waste must be carried out in accordance with the requirements of the regulators, such as SafeWork NSW and NSW EPA
- A SafeWork NSW Licensed Asbestos Assessor or a Professional Hygienist must be engaged to provide a clearance certificate

ATTACHMENT F

ENVIRONMENTAL NOTES

IMPORTANT INFORMATION REGARDING YOUR ENVIRONMENTAL SITE ASSESSMENT

These notes have been prepared by Geotechnique Pty Ltd, using guidelines prepared by the ASFE (Associated Soil and Foundation Engineers). The notes are offered to assist in the interpretation of your environmental site assessment report.

REASONS FOR AN ENVIRONMENTAL ASSESSMENT

Environmental site assessments are typically, though not exclusively, performed in the following circumstances:

- As a pre-acquisition assessment on behalf of either a purchaser or a vendor, when a property is to be sold
- As a pre-development assessment, when a property or area of land is to be redeveloped, or the land use has changed e.g. from a factory to a residential subdivision
- As a pre-development assessment of greenfield sites, to establish baseline conditions and assess environmental, geological and hydrological constraints to the development of e.g. a landfill
- As an audit of the environmental effects of previous and present site usage

Each circumstance requires a specific approach to the assessment of soil and groundwater contamination. In all cases the objective is to identify and if possible quantify the risks that unrecognised contamination poses to the ongoing proposed activity. Such risks may be both financial (clean-up costs or limitations in site use) and physical (health risks to site users or the public).

ENVIRONMENTAL SITE ASSESSMENT LIMITATIONS

Although information provided by an environmental site assessment can reduce exposure to the risk of the presence of contamination, no environmental site assessment can eliminate the risk. Even a rigorous professional assessment may not detect all contamination within a site. Contaminants may be present in areas that were not surveyed or sampled, or may migrate to areas which did not show signs of contamination when sampled. Contaminant analysis cannot possibly cover every type of contaminant that may occur; only the most likely contaminants are screened.

AN ENVIRONMENTAL SITE ASSESSMENT REPORT IS BASED ON A UNIQUE SET OF PROJECT SPECIFIC FACTORS

In the following events and in order to avoid cost problems, you should ask your consultant to assess any changes in the conclusion and recommendations made in the assessment:

- When the nature of the proposed development is changed e.g. if a residential development is proposed, rather than a commercial development
- When the size or configuration of the proposed development is altered e.g. if a basement is added
- When the location or orientation of the proposed structure is modified
- When there is a change of land ownership, or
- For application to an adjacent site

ENVIRONMENTAL SITE ASSESSMENT FINDINGS ARE PROFESSIONAL ESTIMATES

Site assessment identifies actual sub-surface conditions only at those points where samples are taken, when they are taken. Data obtained from the sampling and subsequent laboratory analyses are interpreted by geologists, engineers or scientists and opinions are drawn about the overall sub-surface conditions, the nature and extent of contamination, the likely impact on any proposed development and appropriate remediation measures. Actual conditions may differ from those inferred, because no professional, no matter how qualified and no sub-surface exploration program, no matter how comprehensive, can reveal what is hidden by earth, rock and time. The actual interface between materials may be far more gradual or abrupt than an assessment indicates. Actual conditions in areas not sampled may differ from predictions. Nothing can be done to prevent the unanticipated, however, steps can be taken to help minimise the impact. For this reason site owners should retain the services of their consultants throughout the development stages of the project in order to identify variances, conduct additional tests that may be necessary and to recommend solutions to problems encountered on site.

Soil and groundwater contamination is a field in which legislation and interpretation of legislation by government departments is changing rapidly. Whilst every attempt is made by Geotechnique Pty Ltd to be familiar with current policy, our interpretation of the investigation findings should not be taken to be that of the relevant authority. When approval from a statutory authority is required for a project, approval should be directly sought.

STABILITY OF SUB-SURFACE CONDITIONS
Sub-surface conditions can change by natural processes and site activities. As an environmental site assessment is based on conditions existing at the time of the investigation, project decisions should not be based on environmental site assessment data that may have been affected by time. The consultant should be requested to advise if additional tests are required.

ENVIRONMENTAL SITE ASSESSMENTS ARE PERFORMED FOR SPECIFIC PURPOSES AND CLIENTS
Environmental site assessments are prepared in response to a specific scope of work required to meet the specific needs of specific individuals e.g. an assessment prepared for a consulting civil engineer may not be adequate to a construction contractor or another consulting civil engineer.

An assessment should not be used by other persons for any purpose or by the client for a different purpose. No individual, other than the client, should apply an assessment, even for its intended purpose, without first conferring with the consultant. No person should apply an assessment for any purpose other than that originally contemplated, without first conferring with the consultant.

MISINTERPRETATION OF ENVIRONMENTAL SITE ASSESSMENTS
Costly problems can occur when design professionals develop plans based on misinterpretation of an environmental site assessment. In order to minimise problems, the environmental consultant should be retained to work with appropriate design professionals, to explain relevant findings and to review the adequacy of plans and specifications relative to contamination issues.

LOGS SHOULD NOT BE SEPARATED FROM THE REPORT
Borehole and test pit logs are prepared by environmental scientists, engineers or geologists, based upon interpretation of field conditions and laboratory evaluation of field samples. Logs are normally provided in our reports and these would not be redrawn for inclusion in site remediation or other design drawings, as subtle but significant drafting errors or omissions may occur in the transfer process. Photographic reproduction can eliminate this problem, however, contractors can still misinterpret the logs during bid preparation if separated from the text of the assessment. Should this occur, delays and disputes, or unanticipated costs may result.

To reduce the likelihood of borehole and test pit log misinterpretation, the complete assessment should be available to persons or organisations involved in the project, such as contractors, for their use. Denial of such access and disclaiming responsibility for the accuracy of sub-surface information does not insulate an owner from the attendant liability. It is critical that the site owner provides all available site information to persons and organisations, such as contractors.

READ RESPONSIBILITY CLAUSES CLOSELY
An environmental site assessment is based extensively on judgement and opinion; therefore, it is necessarily less exact than other disciplines. This situation has resulted in wholly unwarranted claims being lodged against consultants. In order to aid in prevention of this problem, model clauses have been developed for use in written transmittals. These are definitive clauses, designed to indicate consultant responsibility. Their use helps all parties involved recognise individual responsibilities and formulate appropriate action. Some of these definitive clauses are likely to appear in the environmental site assessment and you are encouraged to read them closely. Your consultant will be happy to give full and frank answers to any questions you may have.