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Detailed Site Investigation

Proposed Upgrades to Kingswood Public School

Lot 172 in DP839785

46-54 Second Avenue, Kingswood

REPORT NO 20429/12-AA 24 JANUARY 2025

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Job No: 20429/12
Our Ref: 20429/12-AA
24 January 2025

NSW Department of Education
GPO Box 33
SYDNEY NSW 2001

re: **Proposed Upgrades to Kingswood Public School**
Lot 172 in DP839785
46-54 Second Avenue, Kingswood
Detailed Site Investigation

Please find herewith our *Detailed Site Investigation* report for the above site.

A brief of the outcome of the assessment is summarised in the Executive Summary.

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

Yours faithfully
GEOTECHNIQUE PTY LTD

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Acronyms and Abbreviations

Acronym / Abbreviation	Description
ABC	Ambient Background Concentration
ACL	Added Contaminant Limit
ACM	Asbestos containing material
AEC	Area of Environmental Concern
AF	Asbestos Fines
BTEX	Benzene Toluene, Ethyl Benzene and Xylenes
COC	Chains of Custody
CoPC	Contaminants of Potential Concern
COLA	Covered Outdoor Learning Area
CSM	Conceptual Site Model
DoE	Department of Education
DP	Deposited Plan
DSI	Detailed Site Investigation
ENM	Excavated natural material
EP&A Act	Environmental Planning and Assessment Act
EPA	Environment Protection Authority
ESL	Ecological Screening Level
FA	Fibrous Asbestos
Geotechnique	Geotechnique Pty Ltd
GIPA	Government Information Public Access
GLS	General Learning Spaces
HHIV	Human Health Screening Values
HIL	Health Investigation Level
HS	High School
HSL	Health Screening Level
LEP	Local Environmental Plan
LGA	Local Government Area
LOEC	lowest observed effect concentrations
LPG	Liquefied Petroleum Gas
LOR	Limit of Reporting
NATA	National Association of Testing Authorities
NEPM	National Environment Protection Measure
NSW	New South Wales
OCP	Organochlorine Pesticides
PAEC	Potential Area of Environmental Concern
PAH	Polycyclic Aromatic Hydrocarbons
PCB	Polychlorinated Biphenyls
PFAS	Per and Poly Fluoroalkyl Substances
PID	Photo-Ionisation Detector
POEO	Protection of Environment Operations

Acronym / Abbreviation	Description
PSI	Preliminary Desktop Site Investigation
QA	Quality Assurance
QC	Quality Control
TRH	Total Recoverable Hydrocarbons
RAP	Remedial Action Plan
REF	Review of Environmental Factors
RPD	Relative Percentage Differences
SAQP	Sampling, Analysis and Quality Plan
SEPP	State Environmental Planning Policy
SEPP TI	State Environmental Planning Policy (Transport and Infrastructure)
SINSW	School Infrastructure NSW
SQG	Soil Quality Guidelines
VENM	Virgin excavated natural material
VOC	Volatile organic compounds

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EXECUTIVE SUMMARY

This Detailed Site Investigation (DSI) report has been prepared by Geotechnique Pty Ltd (Geotechnique) to accompany a Review of Environmental Factors (REF) for the Department of Education (DoE) for upgrades to Kingswood Public School (the activity) under Part 5 of the *Environmental Planning and Assessment Act 1979* (EP&A Act) and *State Environmental Planning Policy (Transport and Infrastructure) 2021* (SEPP TI).

The objectives of the DSI were to determine the contamination status of the investigation area, to assess the suitability of the area for the proposed land use, and to make recommendations with regard to any future remedial works if required. The scope of work included review of the Preliminary Desktop Site Investigation (PSI) report prepared by Geotechnique, site inspection, as well as soil sampling and laboratory testing.

The findings of the assessment are summarised as follows:

- The investigation area (refer to the plan in **Appendix A**) was vacant at the time of sampling and site inspection.
- Based on the historical data collected, as well as the site inspection and the field work, the updated area of environmental concern (PAEC) / Potential AEC (PAEC) and associated contaminants of potential concern (CoPC) were identified as summarised in the table presented in Section 4.3.1 of this report. The AEC / PAEC and the associated CoPC had been addressed via laboratory testing of the recovered soil samples.
- All the laboratory test results satisfied the criteria for stating that the analytes selected are either not present i.e. concentrations less than laboratory limits of reporting or present in the sampled soil at concentrations that do not pose a risk of hazard to human health or the environment for the proposed school upgrades under the condition for primary school land use.
- Potential off-site impacts of contaminants on groundwater and waterbodies are considered to be low.
- No further site investigation, remedial action plan and remediation are deemed necessary.

Based on the assessment, it is our opinion that the site is considered suitable for the proposed school upgrades to Kingswood Public School under the condition for the primary school land use.

It should be noted that Geotechnique has conducted salinity sampling and testing in conjunction with intrusive geotechnical investigation. The results were presented in the Intrusive Geotechnical Investigation report (Our Ref: 20429/7-AA dated 24 October 2023) prepared by Geotechnique.

Based on the assessment, earthworks (disturbance or excavation of soils) for proposed activities works should be carried out in accordance with a Saline Soil Management Plan to manage impact from saline soils to proposed upgrade works and vice versa. Reference should be made to Report 20429/7-AA prepared by Geotechnique for details of the suggested Saline Soil Management Plan.

If suspect materials (identified by unusual staining, odour, discolouration or inclusions such as building rubble, asbestos sheets / pieces / pipes, ash material, imported fill materials [which are different to those encountered during this assessment], etc.) are encountered during any stage of future earthworks / site preparation / construction works, we recommend that this office is contacted for assessment and an unexpected finds management protocol in **Appendix E** of this report should be implemented.

Reference should be made to Section 8.0 for details of the recommendations regarding any materials to be excavated and removed from the site, and any fill to be imported to the site.

Reference should be made to Section 9.0 for the limitations of this report.

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1.0 INTRODUCTION

This Detailed Site Investigation (DSI) report has been prepared by Geotechnique Pty Ltd (Geotechnique) to accompany a Review of Environmental Factors (REF) for the Department of Education (DoE) for upgrades to Kingswood Public School (the activity) under Part 5 of the Environmental Planning and Assessment Act 1979 (EP&A Act) and State Environmental Planning Policy (Transport and Infrastructure) 2021 (SEPP TI).

This document has been prepared in accordance with the Guidelines for Division 5.1 assessments (the Guidelines) by the Department of Planning, Housing and Infrastructure.

This report examines and takes into account the relevant environmental factors in the Guidelines and Environmental Planning and Assessment Regulations 2021 under Section 170, Section 171 and Section 171A of the EP&A Regulation.

Figure 1 below shows the location of the site.

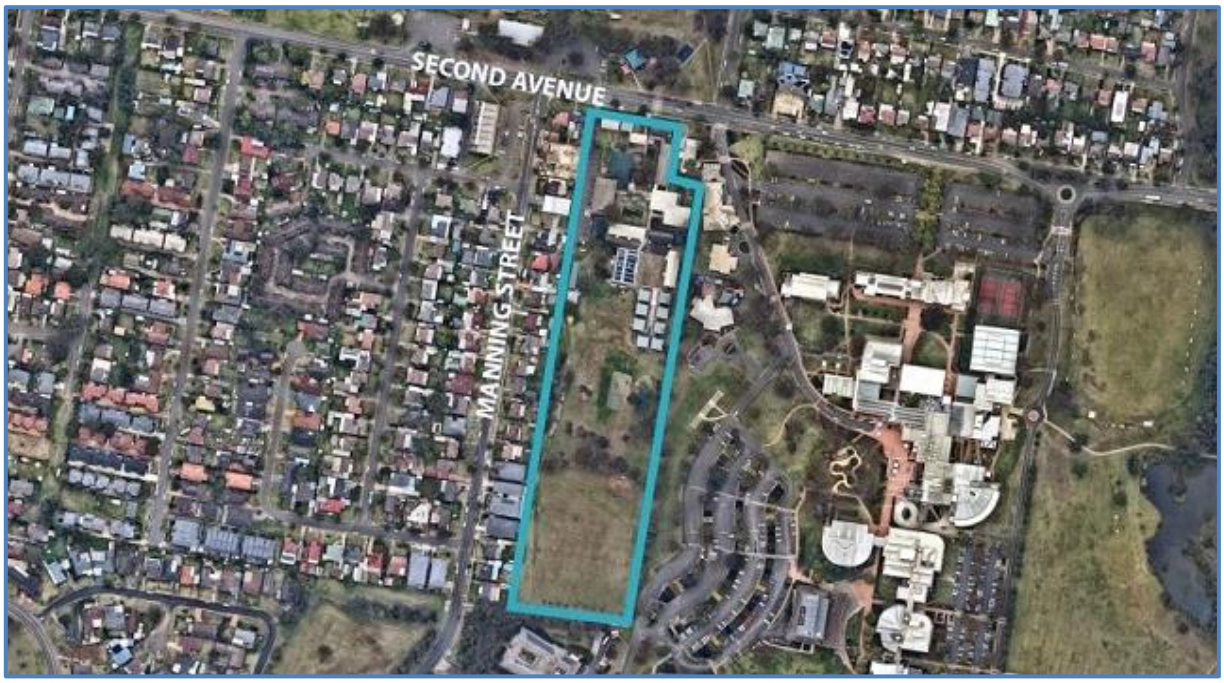


Figure 1 - Location of Kingswood Public School

This report has been prepared to determine the contamination status of the investigation area, to assess the suitability of the area for the proposed land use, and to make recommendations with regard to any future remedial works if required. Reference may be made to the plan in **Appendix A** of this report for details of the investigation area for the DSI for the school upgrades nominated by School Infrastructure NSW (SINSW).

2.0 PROPOSED ACTIVITY DESCRIPTION

The proposed activity for upgrades to Kingswood Public School (PS) includes:

- One (1) new single storey classroom building comprising eight (8) general learning spaces (GLS), two (2) learning commons areas, 2 multi-purpose spaces and a veranda along the eastern side of the building;
- The construction of a covered walkway that will provide a connection between the proposed classroom building and an existing covered outdoor learning area (COLA) to the north east of the proposed building; and
- Removal of existing portable classroom buildings containing ten (10) classrooms.

3.0 SITE DESCRIPTION

The project site is located at 46-54 Second Avenue, Kingswood and is legally described as Lot 172 in Deposited Plan (DP) 839785. Kingswood PS is located on the southern side of Second Avenue.

4.0 CONSULTANT REPORT CONTENT

Geotechnique carried out Preliminary Desktop Site Investigation (PSI) and DSI for the site between July and October 2023 as detailed in the following:

- PSI report: Preliminary Desktop Site Investigation report Site Contamination DD PSI- Kingswood PS-2312-Geotechnique-DDWO05135/23 (Ref. 20429/4-AA dated 23 October 2023); and
- DSI report: Detailed Site Investigation report Site Contamination DD DSI- Kingswood PS-2312-Geotechnique-DDWO05135/23 (Ref. 20429/8-AA dated 24 October 2023).

This section presents a summary of historical / background information and the results of the investigation / assessment.

4.1 Historical / Background Information

4.1.1 Aerial Photographs

Aerial photographs taken in 1955, 1960, 1969, 1977, 1985, 1993, 2004, July 2013 and June 2023 were examined.

Review of the aerial photographs indicated that:

- The site had been used for schooling purposes since 1950s, and gradually expanded with additional buildings since 1960s.
- Second Avenue had been formed and located immediately to the north of the site in or prior to 1950s. Trees in the property to the north of the site across the road had been cleared in late 1960s. The properties to the north east of the site across the road, as well as the adjoining western and southern properties had been vacant and progressively developed into urban residential between 1960s and 2010s. The adjacent eastern properties had been rural residential and developed into Western Sydney University campus in 1970s.

4.1.2 NSW Land Registry Services Records

The site comprises 1 lot (refer to the Drawing No 20429/4-AA1) as listed in Section 3.0.

Based on the records of NSW Land Registry Services and review of the historical photographs, the site has been used as Kingswood PS since at least 1950s. A search of school information from the SINSW website did not reveal when the Kingswood PS was established.

4.1.3 Section 10.7 Planning Certificate and Council Records

Planning Certificate (No 23/03464) under Section 10.7 (2 & 5) of the Environmental Planning and Assessment Act 1979 for the site issued on 2 August 2023 by Penrith City Council, indicated the following:

- The land is located at 46 – 54 Second Avenue, Kingswood.
- The land is zoned R3 Medium Density Residential under Penrith Local Environmental Plan 2010.
- The land is not in an area of outstanding biodiversity value under the Biodiversity Conservation Act 2016.
- The land is not in a conservation area, however described.
- An item / items of environmental heritage (identified in Penrith Local Environmental Plan 2010) is / are situated on the land.
- The land is affected by the Asbestos Policy adopted by Council.
- The land is not affected by any other policy adopted by the Council and by a policy adopted by any other public authority and notified to the council that restricts development on the land because of the likelihood of acid sulphate soils, contamination and salinity.
- There is no residential premises listed on the register of residential premises that contain or have contained loose-fill asbestos insulation (as required by Division 1A of Part 8 of the Home Building Act 1989).
- The land is biodiversity certified land (within the meaning of Part 8 of the Biodiversity Conservation Act 2016).
- The following matters are prescribed by section 59(2) of the Contaminated Land Management Act 1997 as additional matters to be specified in a planning certificate:
    - The land is not significantly contaminated land within the meaning of the Contaminated Land Management Act 1997.
    - The land is not subject to a management order within the meaning of the Contaminated Land Management Act 1997.
    - The land is not subject to an approved voluntary management proposal within the meaning of the Contaminated Land Management Act 1997.
    - The land is not subject to an ongoing maintenance order within the meaning of the Contaminated Land Management Act 1997.
    - The land is not subject to a site audit statement within the meaning of the Contaminated Land Management Act 1997.

An enquiry was made to Council under Government Information Public Access (GIPA) Act on publicly available records on Development Applications, Building Applications and application approvals. This information can sometimes include complaints or comments from neighbouring persons or companies, which might be relevant to the contamination status of the site.

A summary of the available records of Penrith City Council associated with the Kingswood PS is listed below:

- 30 March 2007, Council's conditions of approval for DA (No. DA07/0261) for Education Facility for installation of a shade structure.
- 31 January 2014, Council's conditions of approval for DA (No. DA13/1317) for Asset Management Unit for installation of security fencing & associated tree removal.

4.1.4 NSW EPA Record of Notices and POEO Public Register

A search of NSW EPA Record of Notices for Contaminated Lands and Protection of Environment Operations (POEO) Public Register on 8 August 2023 found no records for the site and the land within a radius of 500m of the site.

4.1.5 SafeWork NSW Records

A review and assessment of the records held by SafeWork NSW revealed that there was an above ground Liquefied Petroleum Gas (LPG) tank within the school with maximum storage capacity of 4,500 liters (L) under License 35/032216. Based on the SafeWork records and confirmed by the site inspection by Geotechnique on 13 September 2023, the tank was in northwestern portion of the site as shown on Drawing No 20429/4-AA1.

4.1.6 Controlled Chemicals

Based on the site inspection by our Environmental Engineer and discussion with staff from Kingswood PS, there was a storage room with concrete flooring inside S building block where chemicals (insecticides, lubricants, paints and fuel) were kept. The Engineer was told that controlled chemicals were not stored within the site.

4.1.7 Per and Poly Fluoroalkyl Substances (PFAS)

A search of the NSW Government PFAS investigation program (accessed via the EPA website on 6 September 2023) revealed that the listed 50 investigation sites were not related to the site and the land within a radius of 500m of the site.

4.1.8 School Asbestos Register

The Department of Education's schools asbestos register contains information about the existence and location of any known or presumed asbestos-containing materials on school sites, based on advice from experts.

The site inspection undertaken by EDP in June 2021 indicated that ten buildings within Kingswood PS contain asbestos containing material (ACM) within eaves lining, gable verge linings, underfloor voids, wall linings internal-infill, underfloor voids – packing to floor joists, wall linings internal, floor coverings res / textile, ceiling structures / lining, ceiling structures / lining – access hatch and partition walls (cubicles). Asbestos is also assumed to be present in several difficult to access areas.

Based on the available information regarding the historical fibro In grounds investigations / events, no previous investigations have been recorded against the school. However, ACM maybe present in grounds from time to time, and caution must be exercised prior to any ground disturbances.

Bonded asbestos fragments generally do not present a significant health risk unless tooled, cut, sanded, abraded or machined, which may release asbestos dust or fibres. Asbestos dust contains tiny almost indestructible fibres, which can cause damage to the lungs when breathed in.

4.1.9 Acid Sulfate Soils

The site is outside the available acid sulfate soil risk maps. Reference to eSPADE V2.2 indicates there are no known occurrences of acid sulphate soil materials at the site and within about 500m of the site. Therefore, it is our assessment that acid sulphate soil risk at the site is ”Low” and earthworks (disturbance or excavation of soils) for proposed works can be carried out without an approved Acid Sulphate Soil Management Plan.

4.1.10 Salinity

Reference to Map showing Salinity Potential in Western Sydney prepared by Department of Infrastructures, Planning and Natural Resources (2002) indicates moderately salinity potential across the site.

It was recommended that saline soil testing be completed to confirm the salinity status and to ascertain if earthworks are to be carried out in accordance with a Saline Soil Management Plan.

It should be noted that Geotechnique has conducted salinity sampling and testing in conjunction with intrusive geotechnical investigation. The results were presented in the Intrusive Geotechnical Investigation report (Ref. 20429/7-AA dated 24 October 2023).

Based on the assessment, earthworks (disturbance or excavation of soils) for proposed development works should be carried out in accordance with a Saline Soil Management Plan to manage impact from saline soils to proposed upgrade works and vice versa. Reference should be made to Report 20429/7-AA for details of the suggested Saline Soil Management Plan.

4.1.11 Topography

The site inspection by our Environmental Engineer revealed that in general, the site gently slopes in the southern portion of the site and in the central portion of the site as indicated on Drawing No 20429/4-AA1.

4.1.12 Regional Geology & Soil Landscape

The Geological Map of Penrith (Geological Series Sheet 9030, Scale 1:100,000, Edition 1, 1991), published by the Department of Minerals and Energy indicates the residual soils within the site to be underlain by Bringelly Shale of the Wianamatta Group, comprising shale, carbonaceous claystone, laminite, lithic Sandstone, rare coal.

The Soil Landscape Map of Penrith (soil Landscape Series Sheet 9030, Scale 1:100,000, 1989), prepared by the Soil Conservation Service of NSW, indicates that the site is located within the Luddenham soil landscape area and typically consists of poorly drained / relatively impermeable residual natural soils.

Reference should be made to Table 1 - borehole logs in **Appendix B** for descriptions of the soils encountered during sampling on 27 September 2023 for this assessment. Based on information from all borehole locations the sub-surface profile is generalised as follows:

Fill	Silty Clay, low to medium plasticity, brown, trace of gravel was encountered in BH1, BH2 and BH4 to depths ranging from approximately 0.8 to 1.0m below the existing ground level (EGL); underlain by natural soil. Gravelly Clay, low plasticity, brown, was encountered in BH5 to depth about 0.3m below the EGL. Inclusion of ceramic, brick and fibro-cement fragments in the fill was noted.
Topsoil	Silty Clay, low plasticity, brown, trace of root fibres was encountered in BH3 to depth approximately 0.2m below the EGL, underlain by natural soil
Natural Soil	Silty CLAY, medium to high plasticity, brown, grey or orange

All the recovered fill samples were screened for the presence of volatile organic compounds (VOC) using a calibrated Photo-Ionisation Detector (PID). The PID readings on recovered soil samples, as presented in Table 1 – borehole logs in **Appendix B**, were equal to zero, suggesting that the presence of volatiles in the fill is unlikely.

There were no obvious fibro-cement fragments and foreign materials, no detectable odour and no obvious staining / discolouration of the soil and vegetation in the borehole locations and recovered soil samples.

Based on the contents of the fill material, the profiles of natural soils within the site, as well as regional geological information, it appears that the fill might have resulted from cutting of the natural soil and levelling the ground during the building construction within the site.

No groundwater or perched water was encountered during sampling in conjunction with geotechnical investigation to a maximum depth of approximately 4.0m below the EGL and during the short time the boreholes remained open. It should be noted that fluctuations in the level of groundwater might occur due to variations in rainfall and / or other factors not evident during investigation.

4.1.13 Hydrology & Hydrogeology

There is no water body such as a creek, river, or wetland close to and transecting the site. Warrington County Creek is located approximately 550m to the east of the site.

A site-specific groundwater analysis is outside the scope of this assessment. However, a search was carried out on 8 August 2023 through the website of WaterNSW for any registered groundwater bore data within a radius of 500m of the site. The search revealed that no information available on that date.

4.2 Summary of Preliminary Desktop Site Investigation

The objectives of the PSI were to identify any areas of potential contamination and to assess if the site is likely to present a risk of harm to human health and the environment for primary school land use.

The scope of work included a desktop review / assessment of a range of site historical data sources and a site inspection.

Based on the desktop review and assessment of a range of available site historical data sources, several areas of environmental concern (AEC) / potential AEC (PAEC) including ACM, metal & GI features and possible pest control around the buildings and the areas of possible filling, as well as associated

contaminants of potential concern (CoPC) had been identified within the site; and preliminary conceptual site model (CSM) had been developed.

Based on the assessment, it was our opinion that the risk of harm to human health and environment was low at present site condition without any disturbance to the ground surface / soil within the site; therefore, the site was considered environmentally suitable for the proposed school upgrades to Kingswood PS.

However, it is likely that there would be disturbance of the ground surface / soil within the site; subsequently and based on the findings of the PSI, intrusive investigations including sampling and testing for a DSI would be required to address the identified AEC / PAEC and the associated CoPC, to assess and characterise the site respect to contamination, to update the CSM, to assess the suitability of the site for the proposed land use, and to make recommendations regarding any future remedial works if required.

4.3 Summary of Detailed Site Investigation

The objectives of the DSI were to determine the contamination status of the investigation area, to assess the suitability of the area for the proposed land use, and to make recommendations with regard to any future remedial works if required.

In order to achieve the objectives of the assessment, the scope of work included review of the PSI report prepared by Geotechnique, site inspection, as well as soil sampling and laboratory testing.

4.3.1 Updated Conceptual Site Model

Based on the historical data collected, as well as the site inspection and the field work, the updated AEC / PAEC and associated CoPC in the investigation area have been identified and are presented in the following Table 4.1.

Table 4.1 Updated AEC / PAEC and Associated CoPC

AEC / PAEC	CoPC
Fill materials encountered during field sampling	➢ Metals ➢ Total Recoverable Hydrocarbons (TRH) ➢ Benzene, Toluene, Ethyl Benzene and Xylenes (BTEX) ➢ Polycyclic Aromatic Hydrocarbons (PAH) ➢ Organochlorine Pesticides (OCP) ➢ Polychlorinated Biphenyls (PCB) ➢ Asbestos
At & in the vicinity of D building block & demountable building	➢ Asbestos ➢ Metals ➢ OCP

Metals suite includes Arsenic (As), cadmium (Cd), chromium (Cr), copper (Cu), lead (Pb), mercury (Hg), nickel (Ni) and zinc (Zn)

The following Table 4.2 outlines the updated CSM presenting the potential Source, Receptor and Exposure Pathway linkages:

Table 4.2 Updated CSM

Potential Source	Potential Receptors	Potential Exposure Pathway
Potential mechanisms for contamination include: ➢ Hazardous building materials including ACM – 'top-down' (e.g. inadequate demolition practices resulting in) impacts on surficial soil; and ➢ Fill materials and / or fly tipped earth mound – importation / illegal dumping of impacted material, 'top-down' impacts (e.g. placement of fill, leaching of contaminants from fill / earth mound material, etc.) or sub-surface release (e.g. impacts from buried material).	Human receptors include workers involved in construction activities, existing and future users of the site, such as, teachers, students, parents, visitors and intrusive maintenance workers, as well as residents (including adults and children) in the immediate vicinity of the site. Ecological receptors include flora and fauna, water bodies close to the site and groundwater.	Potential exposure pathways relevant to human receptors include ingestion, dermal absorption and inhalation of dust (all contaminants) and vapours (volatile TRH, BTEX and naphthalene). The potential for exposure would typically be associated with the construction and excavation works, as well as existing and future users of the site. Exposure for the existing and future site users could occur via direct contact with soil in unpaved areas such as gardens, inhalation of airborne asbestos fibres during soil disturbance, or inhalation of vapours within enclosed space such as buildings. Potential exposure pathways for flora and fauna include primary contact and ingestion. The following have been identified as potential exposure mechanisms for site contamination: ➢ Vapour intrusion into the existing and future buildings (either from soil contamination or volatilisation of contaminants from groundwater); ➢ Contact (dermal, ingestion or inhalation) with exposed soil in landscaped areas and / or unpaved areas; ➢ Migration of groundwater off-site and into nearby water bodies including aquatic systems and those being used for recreation; and ➢ Migration of groundwater off-site into areas where groundwater is being utilised as a resource (i.e. for irrigation).

The site historical review, site inspection and field sampling identified previous and current site activities, as well as the sources of AEC / PAEC, which might have impacted the historical soils within the site.

Potentially contaminated media present at the site are considered to be surface soils and fill materials.

Based on the potential mobility of contaminants and associated potential leachability through the soil profile, vertical migration of contaminants from the surface soils into the underlying natural soils might have occurred. As a result, the natural soils and underlying shale bedrock are also considered to be potentially contaminated media.

Contaminants generally migrate from site via a combination of windblown dust, rainwater infiltration, groundwater migration and surface water run-off. The potential for contaminants to migrate is a combination of:

- The nature of the contaminants (solid / liquid and mobility characteristics).
- The extent of the contaminants (isolated or widespread).
- The locations of the contaminants (surface soils or at depth).
- The site topography, geology, hydrology and hydrogeology.

Off-site impacts of contaminants in soil are generally governed by the transport media available and likely receptors. The most common transport medium is water, whilst receptors include initially uncontaminated soils, groundwater, surface waterbodies, humans, flora and fauna.

The ground surface within the site was in general covered with buildings, hard stands and grass. The potential for migration of contaminants via wind-blown dust is considered low as a result of the exposed soils within the site. The potential for migration of contamination via surface run-off is also expected to be minor. Some migration of contaminants via surface water might still occur in the event of heavy rain.

Migration of soil contaminants to the deeper soils or groundwater regime would generally be via leaching of contaminants from the surface soil or fill, facilitated by infiltration of surface water.

There is no water body such as a creek, river or wetland close to and transecting the site. There is no permanent waterbody transecting the site. The potential for off-site impact of the contaminants on the waterbodies due to surface water run-off from the site is considered low.

Groundwater level was not encountered to the maximum depth of 4.0m below the EGL. Given that the naturally occurring soils beneath the site are relatively impermeable based on the regional geology information and borehole drilling for this assessment, the potential for recent and ongoing migration of contaminants from the site to the groundwater table below is considered low. Furthermore, the relatively impermeable clay layer and underlying shale bedrock would have minimised the potential for contaminants in the past to migrate to deeper soils or the groundwater regime. It is considered unlikely that the groundwater regime beneath the site has been impacted by contaminants in the soils. However, if high levels and widespread contaminants are detected through this assessment, a groundwater assessment will be recommended.

Sensitive receptors at the site and in the immediate vicinity, under current site conditions and based on the future land use of the site, are considered to include visitors and those studying and / or working at the site who might come into contact with potentially contaminated media. The sensitive environmental receptors that could be adversely impacted by possible contamination are considered to be groundwater.

4.3.2 Sampling, Analysis, Quality Plan and Sampling Methodology

Sampling and analyses for the assessment were carried out to obtain a reasonable assessment of the following:

1. Nature, location and likely distribution of soil contaminants beneath the investigation area.
2. The risks that the contaminants (if present) pose to human health or the environment under the conditions of the proposed land use.

The risk of harm to human health and the environment was determined through comparison of test results with EPA produced or endorsed criteria available at the time, as discussed in Section 4.3.3 of this report.

On 27 September 2023, our Environmental Scientist carried out sampling as follow:

- Five boreholes BH1 to BH5 were drilled nominated for geotechnical investigation at and in the vicinity of the investigation area determined by SINSW.

Reference may be made to Drawing No 20429/8-AA1 for details of the above-mentioned borehole locations.

The sampling procedures adopted for the assessment were generally as follows:

- The boreholes were drilled using a stainless steel auger mounted on an excavator, over the depth interval nominated by the Environmental Scientist. The representative soil sample was recovered directly from the central of auger using a stainless steel trowel.
- The stainless steel trowel was decontaminated prior to use between each sampling location, in order to prevent cross contamination.
- To minimise the potential loss of organic compounds the recovered soil sample for laboratory analysis 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.
- All the recovered fill samples were screened, using a calibrated PID, to screen for the presence or otherwise of VOC. A soil sample for PID screening was placed in an airtight polyethylene bag, ensuring enough air space ('headspace') above the sample is present to be screened in the field. The soil sample remained in the bag for approximately 15 minutes before being shaken (to thoroughly mix soil with the air in the headspace) and a PID reading recorded. The PID readings are summarised in Table 1 – borehole logs in **Appendix B** and a copy of PID calibration sheet is presented in **Appendix C**.
- The recovered soil sample for asbestos analysis was transferred into a small plastic zip-lock bag, which was placed inside a container.

In order to ensure the analytical performance of the primary laboratory, duplicate and split samples were prepared for analysis. Soil samples were kept in a labelled laboratory supplied container and sealed with an airtight screw top lid. The fully filled jar was placed in a chilled container.

The following table summarising the primary sample and the corresponding duplicate / split samples recovered and analysed. As shown in the table prepared, the split sample was prepared from primary sample which was not the same as that prepared for duplicate sample.

Primary Sample	Corresponding Duplicate	Primary Sample	Corresponding Split
BH1 (0.0-0.15m)	DDS1	BH2 (0.0-0.15m)	DSS1

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

The primary samples in the chilled container with trip spike sample were forwarded under COC conditions to the primary NATA accredited laboratory, SGS Environmental Services (SGS). The split samples in the chilled container were forwarded under COC conditions to the secondary NATA accredited laboratory, Envirolab Services Pty Ltd (Envirolab). On receipt of the samples, the laboratories returned the Sample Receipt Advice verifying the integrity of all the samples received.

Samples for asbestos analysis in plastic bags within the container were delivered to a NATA accredited testing laboratory, Australian Safer Environment & Technology Pty Ltd (ASET). All samples were sent to the laboratory with completed form. On receipt of the samples, the laboratory returned a signed COC, acknowledging the receipt of samples and verifying the integrity of all the samples received.

Based on the site observation, the soil profiles encountered and the updated conceptual site model presented in Section 4.3.1, the following laboratory analysis plan was implemented:

- Four (4) fill samples, one (1) topsoil sample, 4 natural soil samples (covering each type of natural soil), as well as the corresponding duplicate sample DDS1, and split sample DSS1 were analysed for metals.

  4 fill samples, 1 topsoil sample, as well as the corresponding duplicate sample DDS1, and split sample DSS1 were analysed for OCP.

  4 fill samples, as well as the corresponding duplicate sample DDS1, and split sample DSS1 were analysed for TRH, BTEX, PAH and PCB for screening purposes.
- Three (3) fill samples, 1 topsoil sample and 3 natural soil samples (covering each type of natural soil) were selected for analysis of Cation Exchange Capacity (CEC) and pH.
- 4 fill samples and 1 topsoil sample were analysed for asbestos for screening purposes.
- One rinsate sample RS1 was analysed for metals, TRH, BTEX and PAH.
- One trip spike sample TS1 was analysed for BTEX.

4.3.3 Assessment Criteria

Investigation levels and screening levels developed in the National Environment Protection (Assessment of Site Contamination) Measure (NEPM) 1999 (April 2013) were used for the 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 investigation area is proposed for primary school upgrade and as such the analytical results for the assessment will be assessed against the available HIL for *residential with garden / accessible soil including primary schools* (HIL A).

- Health Screening Levels (HSL) for selected petroleum compounds, fractions and Naphthalene are applicable for assessing human health risk via inhalation pathways. 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 >4 m.

  For this assessment, the analytical results will be assessed against the available HSL for clay to depth of 0m to <1m for *low density residential* (HSL A).

- Ecological Screening Levels (ESL) for selected petroleum hydrocarbon compounds, TPH fractions and Benzo(a)Pyrene (BaP) 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.

  For this assessment, the analytical results will be assessed against the available ESL for fine-grained soil (clay) for *urban residential* land use.

- Ecological Investigation Levels (EIL), a specific type of Soil Quality Guidelines (SQG) for selected metals, Naphthalene and DDT are 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. The EIL are calculated using 30% effect concentration (EC30) or lowest observed effect concentrations (LOEC) toxicity data.

For this assessment, the analytical results will be assessed against the available EIL for aged contamination in soil for *urban residential* land use.

For arsenic, Naphthalene and DDT, generic EIL for urban residential are adopted for aged contaminants. For other metals, EIL are the sum of the added contaminant limit (ACL) and the ambient background concentration (ABC). Where available, EIL are calculated using the EIL calculator developed by CSIRO for NEPC.

For asbestos assessment, the adopted assessment criteria are:

- 0.01% w/w for bonded ACM for *residential with garden / accessible soil including primary schools* land use;
- 0.001% for friable asbestos in soil; and
- No visible asbestos for surface soil.

The soil / area will be deemed contaminated if the above criteria are unfulfilled. Further investigation, remediation and / or management will be recommended if the soil / area is found to be contaminated.

4.3.4 Summary of Site and Field Observation

An Environmental Scientist from Geotechnique made the following observations during site inspection for this DSI in the investigation area on 27 September 2023:

- The area is located to the east of D building block and demountable building in the western side of the central portion of the site.
- The majority was open area and covered by grass.

Soil logs was completed during the field investigation. The soil logs recording soil lithology and depth were as presented in table below. Logging of soil profiles was carried out in accordance with AS1726-2017 Australian Standard Geotechnical Site Investigations.

Borehole	Depth Interval (m)	Soil profile	Fill, Topsoil or Natural	PID Reading (ppm)	Inclusion	Fill or Topsoil thickness (m)
BH1	0.0-1.0	Silty Clay, low to medium plasticity, brown, trace of gravel	Fill	0.0		1.0
	1.0-1.5	(CI-CH) Silty CLAY, medium to high plasticity, brown	Natural clay			
	1.5-2.0	(CI-CH) Silty CLAY, medium to high plasticity, grey	Natural clay			
BH2	0.0-0.8	Silty Clay, low to medium plasticity, brown, trace of gravel	Fill	0.0		0.8
	0.8-1.3	(CI-CH) Silty CLAY, medium to high plasticity, brown	Natural clay			
	1.3-1.8	(CI-CH) Silty CLAY, medium to high plasticity, grey	Natural clay			

Borehole	Depth Interval (m)	Soil profile	Fill, Topsoil or Natural	PID Reading (ppm)	Inclusion	Fill or Topsoil thickness (m)
BH3	0.0-0.2	Silty Clay, low plasticity, brown, trace of root fibres	Topsoil			0.2
	0.2-1.0	(CI-CH) Silty CLAY, medium to high plasticity, orange	Natural clay			
	1.0-1.5	(CI-CH) Silty CLAY, medium to high plasticity, grey	Natural clay			
BH4	0.0-0.8	Silty Clay, low to medium plasticity, brown, trace of gravel	Fill	0.0		0.8
	0.8-2.0	(CI-CH) Silty CLAY, medium to high plasticity, grey	Natural clay			
BH5	0.0-0.3	Gravelly Clay, low plasticity, brown	Fill	0.0		0.3
	0.3-2.5	(CI-CH) Silty CLAY, medium to high plasticity, grey	Natural clay			

There were no obvious fibro-cement fragments and foreign materials, no detectable odour and no obvious staining / discolouration of the soil and vegetation in the borehole locations and recovered soil samples that would indicate potential for contamination.

All the recovered fill samples were screened for the presence of VOC using a calibrated PID. The PID readings on recovered soil samples, as presented in borehole logs in **Appendix B**, were equal to zero, suggesting that the presence of volatiles in the fill is unlikely.

4.3.5 Laboratory Test Results, Assessment & Discussion

The test results for field quality assurance (QA) and quality control (QC) samples including rinsate, trip spike, duplicate and split samples are presented in Tables A to D. The laboratory test results for the analysed soil samples are presented in Tables E to I together with the assessment criteria adopted. A copy of the laboratory analytical reports and certificate of analysis is included in **Appendix D**. A discussion of the test results is presented below.

The laboratory test results for the field QA and QC samples indicated that:

- The concentrations of analytes in the rinsate blank sample (Table A) were generally less than the laboratory limits of reporting (LOR).

  Concentrations of copper (0.063mg/L) and zinc (0.02mg/L) were detected in the rinsate sample RS1, which were above or marginally above the laboratory LOR of 0.005mg/L and 0.01mg/L for copper and zinc respectively.

  The laboratory test results for the rinsate sample will only be accepted and considered useable for this assessment under the following condition:

  - Analyte concentrations in the rinsate water sample should be less than laboratory LOR or should not be detected significantly.

It is our opinion that the detected copper and zinc concentrations were not significant; therefore, it is considered that the effect on data quality is minimal.

Based on the above, the cleaning and decontamination processes adopted in the field were considered adequate.

- The spike concentrations, ranging between 96% and 98% (Table B), were within the acceptable ranges (60% - 130%) showing a good recovery. Furthermore, zero PID readings for the recovered samples were recorded in the field, all the BTEX results for the soil samples analysed were less than laboratory detection limits and there was no visible or olfactory indication of hydrocarbon contamination.

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

- The comparisons between the duplicate and corresponding original sample generally indicated acceptable Relative Percentage Differences (RPD), with the exception of RPD for chromium and nickel (Table C).

  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.

  RPD for chromium (40%) and nickel (56%) are in excess of 30%, mainly due to the non-homogeneous nature of the soil samples.

  All the concentrations with RPD in excess of 30% in the duplicate pair were both less than the relevant assessment criteria.

  Based on the overall duplicate sample number and comparisons, the variations are not considered critical, therefore it is concluded that the test results provided by the primary laboratory SGS are of adequate accuracy and reliability for this assessment.

- The comparisons between the split and corresponding original samples indicated acceptable RPD (Table 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, higher variations can be expected for organic analyses compared to inorganic analyses and for samples with low analyte concentrations or non-homogeneous samples.

  Based on the overall split sample number and comparisons, it is concluded that the test results provided by the primary laboratory can be relied upon for this assessment.

As discussed above, some duplicate sample comparisons reported RPD exceeding the generally accepted limit for some metals (chromium and nickel). This has been attributed to the heterogeneity of the samples. The results are still considered acceptable, as virtually all remaining QA and QC sample data falls within acceptance limits.

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

Overall, the quality control elements adopted by SGS and Envirolab indicate that the analytical data falls within acceptable levels of accuracy and precision for analysis of soil.

It was noted that SGS laboratory matrix spike recoveries failed acceptance criteria for TRH (C29-C36 and >C16-C34) due to the presence of significant concentration of analyte. The results are still considered acceptable as virtually all remaining QA and QC sample data of both laboratories fall within the acceptance criteria adopted. As such, these variations are not considered to have affected the laboratory data provided.

Based on the above, it is considered that the quality assurance and quality control data quality indicators have been complied with, both in the field and in the laboratories. As such, it is concluded that the laboratory test data obtained as part of this assessment is reliable and useable.

The laboratory test results for the analysed soil samples indicated that:

- The concentrations of metals were below the relevant available HIL A and / or EIL (Table E).
- The concentrations of F1 (TRH C6-C10 less BTEX), F2 (TRH >C10-C16 less Naphthalene and TRH>C10-C16), F3 (TRH >C16-C34), F4 (TRH >C34-C40) and BTEX were below the relevant available HSL A and / or ESL adopted (Table F). Moreover, the test results of F1, F2, F3, F4 and BTEX were less than the laboratory LOR.

  There was no HSL A (not limiting) for clay for Ethyl Benzene.
- All the concentrations of Benzo(a)pyrene (BaP) (TEQ), Total PAH and Naphthalene were well below the relevant HIL A, HSL A, EIL and / or ESL and less than the laboratory LOR (Table G).
- The concentrations of OCP were well below the relevant HIL A and less than the laboratory LOR (Table H). Concentrations of DDT were also below the EIL.
- The concentrations of PCB were below the HIL A and less than laboratory LOR (Table H).
- No ACM (>7mm) was detected at the LOR of 0.01% w/w, which was below the soil assessment criterion of 0.01% w/w (Table I). No asbestos fines (AF) and fibrous asbestos (FA) was detected at the LOR of 0.001% w/w, which was below the soil assessment criterion (0.001% w/w).

4.4 Site Characterisation

The investigation area was vacant at the time of sampling and site inspection.

Fill material was encountered at depths ranging from approximately 0.3m to 1.0m below the EGL in majority of the investigation area.

There were no obvious fibro-cement fragments and foreign materials, no detectable odour and no obvious staining / discolouration of the soil and vegetation in the borehole locations and recovered soil samples that would indicate potential for contamination.

Based on the contents of the fill material, the profiles of natural soils within the site, as well as regional geological information, it appears that the fill might have resulted from cutting of the natural soil and levelling the ground during the building construction within the site.

All the recovered fill samples were screened for the presence of VOC using a calibrated PID. The PID readings on recovered soil samples were equal to zero, suggesting that the presence of volatiles in the fill is unlikely.

Based on the site historical data collected, as well as the site inspection and the field work, the updated AEC / PAEC and associated CoPC were identified as summarised in the table presented in Section 4.3.1 of this report and had been addressed via laboratory testing of the recovered soil samples.

A number of the recovered soil samples were selected for analysis of CoPC including metals, TRH, BTEX, PAH, OCP, PCB and / or Asbestos associated with fill and the site features of concern.

There were no elevated concentrations of analytes detected in the samples analysed for the DSI. 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 soils at concentrations that do not pose a risk of hazard to human health or the environment for the proposed school upgrades under the condition for primary school land use.

Based on the foregoing, it is our opinion that this assessment is sufficient to determine that the investigation area is not of concern and no further investigation is deemed necessary.

There were no high levels of contaminants detected through this DSI. As such, it is our opinion that the potential off-site impacts of contaminants on groundwater and waterbodies are considered to be low.

Based on the forgoing, it is our opinion that no further site investigation, remedial action plan (RAP) and remediation are deemed necessary. Therefore, the site is environmentally suitable for the proposed upgrades to Kingswood PS.

5.0 POTENTIAL CONTAMINATION CONSTRAINTS OR RISKS

Based on anticipated site conditions, no contamination is identified within the site, subsequently, no remediation is required.

The potential constraints or risks on proposed school upgrades are:

- Unexpected findings of suspect material during any stage of future earthworks / site preparation / construction works, which can be appropriately managed in accordance with the recommended unexpected finds management protocol in **Appendix E** of this report.

6.0 MITIGATION MEASURES FOR CONTAMINATION RISKS

The following table presents recommended mitigation measure for the unexpected finds.

Mitigation Name	When is Mitigation Measure to be complied with	Mitigation Measures	Reason for Mitigation Measures
Unexpected Finds	During any stage of future earthworks / site preparation / construction works	In the event of unexpected finds, refer to the recommended unexpected finds management protocol in **Appendix E**, carry out contamination assessment and prepare a RAP if contamination is identified	To determine the presence or otherwise of an unacceptable risk to human health and environment and to manage the site suitable for the proposed school upgrades for primary school land use

7.0 SIGNIFICANCE OF ENVIRONMENTAL IMPACTS

Based on nature of potential contamination risks or issues at the site, it is our assessment that the potential impacts of the activities work or activity can be appropriately managed in accordance with the recommended unexpected finds management protocol. Therefore, from contamination consideration, it is determined that the extent and nature of potential impacts from the proposed work or activity are "Low" and will not have significant impact on the locality, community and / or the environment.

8.0 CONCLUSION AND RECOMMENDATIONS

The findings of the assessment are summarised as follows:

- The investigation area (refer to the plan in **Appendix A**) was vacant at the time of sampling and site inspection.
- Based on the historical data collected, as well as the site inspection and the field work, the updated AEC / PAEC and associated CoPC were identified as summarised in the table presented in Section 4.3.1 of this report. The AEC / PAEC and the associated CoPC had been addressed via laboratory testing of the recovered soil samples.
- All the laboratory test results satisfied the criteria for stating that the analytes selected are either not present i.e. concentrations less than laboratory limits of reporting or present in the sampled soil at concentrations that do not pose a risk of hazard to human health or the environment for the proposed school upgrades under the condition for primary school land use.
- Potential off-site impacts of contaminants on groundwater and waterbodies are considered to be low.
- No further site investigation, RAP and remediation are deemed necessary.

Based on the assessment, it is our opinion that the site is considered suitable for the proposed school upgrades to Kingswood PS under the condition for the primary school land use.

It should be noted that Geotechnique had conducted salinity sampling and testing in conjunction with intrusive geotechnical investigation. The results were presented in the Intrusive Geotechnical Investigation report (Our Ref: 20429/7-AA dated 24 October 2023).

Based on the assessment, earthworks (disturbance or excavation of soils) for proposed works should be carried out in accordance with a Saline Soil Management Plan to manage impact from saline soils to proposed upgrade works and vice versa. Reference should be made to Report 20429/7-AA prepared by Geotechnique for details of the suggested Saline Soil Management Plan.

If suspect materials (identified by unusual staining, odour, discolouration or inclusions such as building rubble, asbestos sheets / pieces / pipes, ash material, imported fill materials [which are different to those encountered during this assessment], etc.) are encountered during any stage of future earthworks / site preparation / construction works, we recommend that this office is contacted for assessment and an unexpected finds management protocol in **Appendix E** of this report should be implemented.

For any materials to be excavated and removed from the site, it is recommended that waste classification of the materials, in accordance with the "Waste Classification Guidelines Part 1: Classifying Waste" NSW EPA 2014; NSW EPA resource recovery exemptions and orders under the Protection of the Environment Operations (Waste) Regulation 2014; or NSW EPA *Certification: Virgin excavated natural material* is undertaken prior to disposal at a facility that can lawfully accept the materials.

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 discoloured and not acid sulphate soil or potential acid sulphate soil. The imported fill should either be virgin excavated natural material (VENM) or excavated natural material (ENM).

9.0 LIMITATIONS

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.

This report has been prepared for the purposes stated within. This report can also be relied upon by SINSW, DoE and relevant authorities for activities and building application assessment processes. 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.

This report shall only be presented in full and may not be used to support any other objective than those set out in the report, except where written approval is provided by Geotechnique.

The information in this report is considered accurate at the date of issue, in accordance with current site conditions during site inspection and field sampling for the DSI (27 September 2023). Any variations to the site form or use beyond that date could nullify the conclusion stated.

No contamination assessment can eliminate all risk; even a rigorous professional assessment might not detect all contamination within a site. Whilst the assessment conducted at the site was carried out in accordance with current NSW guidelines, the potential always exists for contaminants and contaminated soils to be present between sampled locations and in the grass covered areas.

Presented in **Appendix F** is a document entitled "Environmental Notes", which should be read in conjunction with this report.

LIST OF REFERENCES

Acid Sulphate Soil Manual - New South Wales, Acid sulphate Soil Management Advisory Committee 1988

Australian Standard AS1726-2017, Geotechnical Site Investigation 2017

Contaminated Land Management Act 1997

Contaminated Land Management Regulation 1998

Geology of the Penrith 1:100,000 Sheet (9030) – Geological Survey of New South Wales, Department of Minerals and Energy 1991

Guidelines for the Assessment, Remediation and Management of Asbestos Contaminated Sites in Western Australia

National Environment Protection (Assessment of Site Contamination) Measures, 1999 (April 2013) - National Environmental Protection Council

Protection of the Environment Operations Act – 1997

Resource Recovery Order / Exemption Under Part 9, Clause 93 of the Protection of the Environment Operations (Waste) Regulation 2014 – The Excavated Natural Material Order / Exemption 2014 NSW Environment Protection Authority

SINSW website: https://www.schoolinfrastructure.nsw.gov.au/

Soil Landscape of the Penrith 1:100,000 Sheet (9030) – Soil Conservation Service of NSW 1989

Salinity Potential in Western Sydney (scale approximately 1:140,000), Department of Infrastructure, Planning and Natural Resources 2002

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

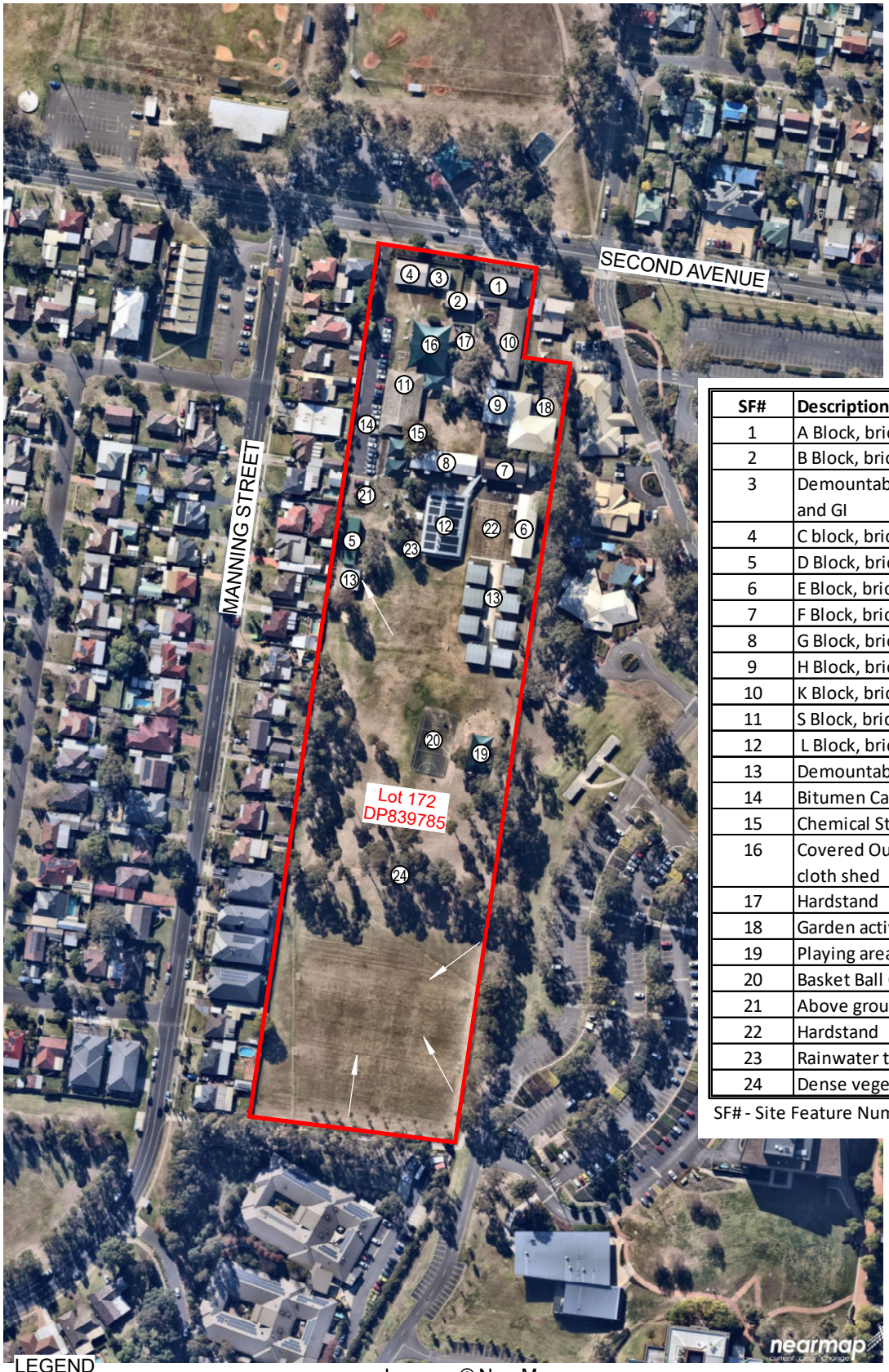
The NSW Government PFAS Investigation Program: https://www.epa.nsw.gov.au/your-environment/contaminated-land/pfas-investigation-program

Trace Element Concentrations in Soils from Rural and Urban Areas of Australia, Henry Olszowy et al., 1995

Waste Classification Guidelines Part 1: Classifying Waste – NSW EPA 2014

DRAWINGS

Drawing No	
20429/4-AA1	*Site Layout*
20429/8-AA1	*Borehole Locations*



SF#	Description
1	A Block, brick building, Tiled roof
2	B Block, brick building, GI roof
3	Demountable , modern fibro clad and GI
4	C block, brick building, GI roof
5	D Block, brick building, GI roof
6	E Block, brick building, GI roof
7	F Block, brick building, Tiled roof
8	G Block, brick building, GI roof
9	H Block, brick building, GI roof
10	K Block, brick building, Tiled roof
11	S Block, brick building, Tiled roof
12	L Block, brick building, GI roof
13	Demountables
14	Bitumen Carpark and road
15	Chemical Storage Room
16	Covered Outdoor learning Area/ cloth shed
17	Hardstand
18	Garden activities
19	Playing area with cloth awning
20	Basket Ball Court
21	Above ground LPG Tank
22	Hardstand
23	Rainwater tank
24	Dense vegetation

SF# - Site Feature Number

LEGEND

- Site Boundary
- (#) Site Feature Number
- Slope

0 30 60 90 120 150m

Scale 1:3000

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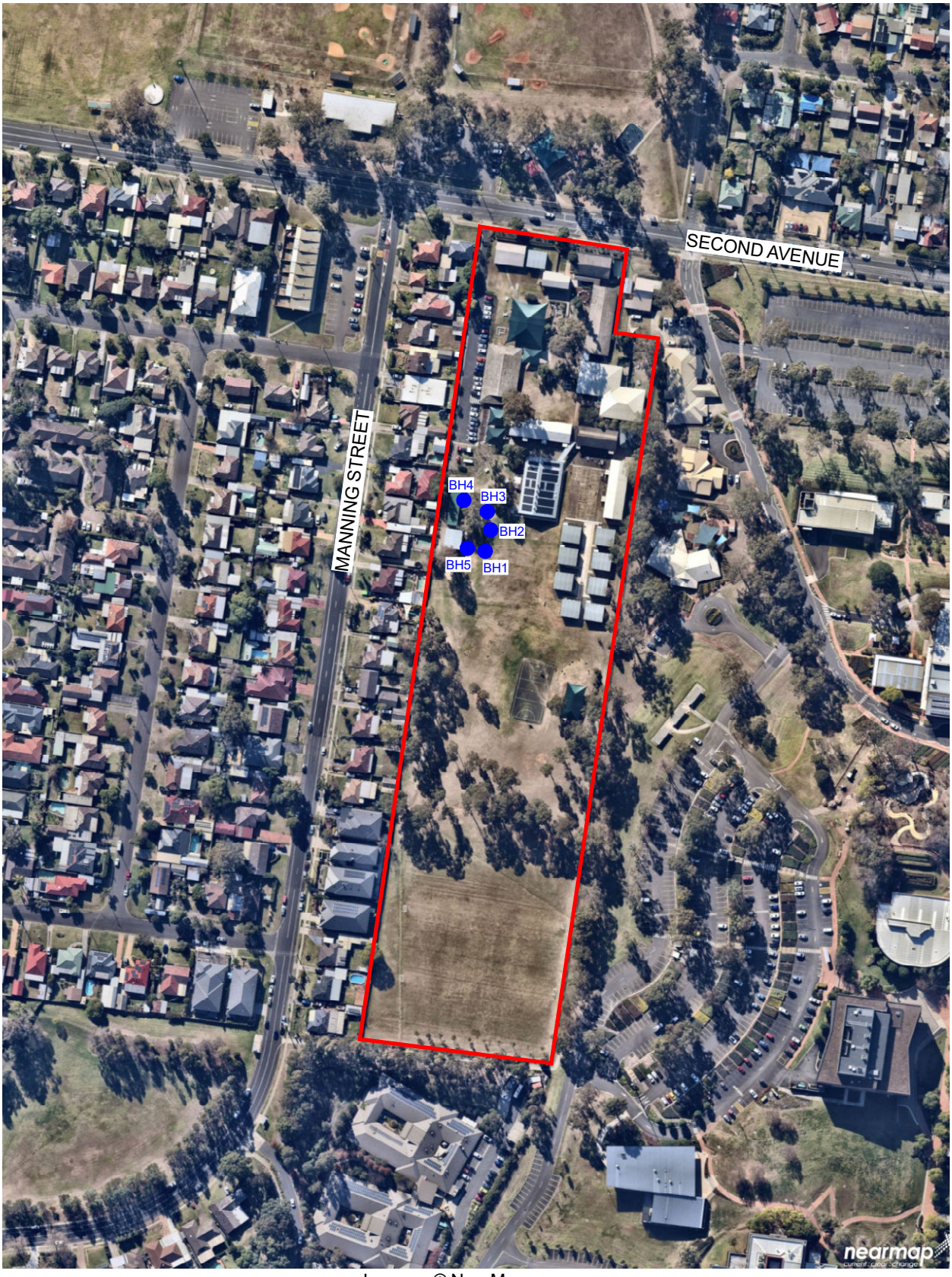
Contract No DDWO 0513/23
Kingswood Public School (2312)
Lot 172 DP839785
Second Avenue, Kingswood

Site Layout and Features

Drawing No: 20429/4-AA1
Job No: 20429/4
Drawn By: MH
Date: 19 October 2023
Checked By: MA/JX

File No: 20429-4
Layers: 0, AA1



Imagery © NearMap.com

LEGEND

Site Boundary

Borehole

0 30 60 90 120 150m

Scale 1:3000

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Contract No DDWO 0513/23
Kingswood Public School (2312)
Lot 172 DP839785
Second Avenue, Kingswood

Borehole Locations

Drawing No: 20429/8-AA1
Job No: 20429/8
Drawn By: MH
Date: 3 October 2023
Checked By: JH/JX/IJ

File No: 20429-8
Layers: 0, AA1

LABORATORY TEST RESULT SUMMARY TABLES

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TABLE A
RINSATE
(Ref No: 20429/8)

SAMPLE DATE	RS1 27/09/2023
METAL	**(mg/L)**
Arsenic	<0.02
Cadmium	<0.001
Chromium	<0.005
Copper	0.063
Lead	<0.02
Mercury	<0.0001
Nickel	<0.005
Zinc	0.02
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

GEOTECHNIQUE
PTY LTD

TABLE B
TRIP SPIKE
(Ref No: 20429/8)

Sample	Sampling Date	BTEX			
		Benzene	Toluene	Ethylbenzene	Xylenes
TS1	27/09/2023	97%	97%	98%	98%

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

GEOTECHNIQUE
PTY LTD

TABLE C
DUPLICATE SAMPLE
(Ref No: 20429/8)

ANALYTE	BH1 0.0-0.15 (m) mg/kg	DDS1 mg/kg	RELATIVE PERCENTAGE DIFFERENCES (RPD) %
Arsenic	7	6	15
Cadmium	<0.3	<0.3	-
Chromium	21	14	40
Copper	16	14	13
Lead	15	12	22
Mercury	<0.05	<0.05	-
Nickel	6.6	3.7	56
Zinc	25	19	27
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	<0.1	<0.1	-
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	<0.1	<0.1	-
Methoxychlor	<0.1	<0.1	-
Mirex	<0.1	<0.1	-
Endosulfan (alpha, beta & sulphate)	<0.3	<0.3	-
DDD+DDE+DDT	<0.6	<0.6	-
Chlordane (alpha & gamma)	<0.2	<0.2	-
POLYCHLORINATED BIPHENYLS (PCB)			
Total PCB	<1	<1	-

GEOTECHNIQUE
PTY LTD

TABLE D
SPLIT SAMPLE
(Ref No: 20429/8)

ANALYTE	BH2 0.0-0.15 (m) mg/kg (SGS)	DSS1 mg/kg (ENVIROLAB)	RELATIVE PERCENTAGE DIFFERENCES (RPD) %
Arsenic	8	10	22
Cadmium	<0.3	<0.4	-
Chromium	22	22	0
Copper	16	17	6
Lead	15	18	18
Mercury	<0.05	<0.1	-
Nickel	4.7	6	24
Zinc	22	24	9
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	<0.1	<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	<0.1	<0.1	-
Methoxychlor	<0.1	<0.1	-
Endosulfan (alpha (I), beta (II) & sulphate)	<0.3	<0.3	-
DDD+DDE+DDT	<0.6	<0.1	-
Chlordane (alpha & gamma)	<0.2	<0.2	-
POLYCHLORINATED BIPHENYLS (PCB)			
Total PCB	<1	<0.1	-

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TABLE E
METAL, CATION EXCHANGE CAPACITY (CEC) & pH TEST RESULTS
DISCRETE SAMPLES
(Ref No: 20429/8)

Sample Location	Depth (m)	METAL (mg/kg) ARSENIC	CADMIUM	CHROMIUM (Total)	COPPER	LEAD	MERCURY	NICKEL	ZINC	CEC ($cmol_c/kg$)	pH
BH1	0.0-0.15	7	<0.3	21	16	15	<0.05	6.6	25	16	6.5
BH1	1.05-1.15	6	<0.3	13	14	10	<0.05	3.5	17	13	5.3
BH2	0.0-0.15	8	<0.3	22	16	15	<0.05	4.7	22	-	-
BH3	0.0-0.15	6	<0.3	14	17	15	<0.05	5.0	40	11	6.3
BH3	0.25-0.35	6	<0.3	18	16	10	<0.05	2.9	15	13	5.2
BH4	0.0-0.15	7	<0.3	15	13	15	<0.05	6.9	30	14	6.6
BH4	0.85-0.95	2	<0.3	3.5	7.4	6	<0.05	1.2	6	20	4.8
BH5	0.0-0.15	5	<0.3	10	10	14	<0.05	3.9	26	28	8.3
BH5	1.35-0.45	<1	<0.3	2.5	6.8	5	<0.05	1.1	6	-	-
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] A - Residential		100	20	100 [c]	6000	300	10 [d]	400	7400		
Ecological Investigation Levels (EIL) [b]- Urban residential		100 [e]	-	190[f]	90	1200 [g]	-	180	230		

Notes:
a: Residential with garden / accessible soil (home grown produce <10% fruit and vegetable intake (no poultry)), also includes childcare centres,
b: EIL of aged chromium (III), copper, nickel & zinc were derived from calculation spreadsheet developed by CSIRO for NEPC; Old Suburb with Low Traffic; the lowest CEC=11 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 + ambient background concentration; Old Suburb with Low Traffic.

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TABLE F
TOTAL RECOVERABLE HYDROCARBONS (TRH) AND BTEX TEST RESULTS
DISCRETE SAMPLES
(Ref No: 20429/8)

												NATIONAL ENVIRONMENT PROTECTION AMENDMENT MEASURE (2013)															
												Health Screening Levels (HSL) A Low density residential									Ecological Screening Levels for fine-grained soil Urban residential								
			TRH (mg/kg)					BTEX (mg/kg)																				
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		
BH1	0.0-0.15	Clay	<25	<25	<25	<90	<120	<0.1	<0.1	<0.1	<0.3	50	280	0.7	480	NL	110	180	120	1300	5600	65	105	125	45		
BH2	0.0-0.15	Clay	<25	<25	<25	<90	<120	<0.1	<0.1	<0.1	<0.3	50	280	0.7	480	NL	110	180	120	1300	5600	65	105	125	45		
BH4	0.0-0.15	Clay	<25	<25	<25	<90	<120	<0.1	<0.1	<0.1	<0.3	50	280	0.7	480	NL	110	180	120	1300	5600	65	105	125	45		
BH5	0.0-0.15	Clay	<25	<25	<25	<90	<120	<0.1	<0.1	<0.1	<0.3	50	280	0.7	480	NL	110	180	120	1300	5600	65	105	125	45		
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: 20429/8)

							NATIONAL ENVIRONMENT PROTECTION AMENDMENT MEASURE (2013)				
			PAH (mg/kg)				Health-based Investigation Levels (HIL) A - Residential[a] A		Health Screening Level (HSL) A - Low density residential	Generic Ecological Investigation Level (EIL) - Urban residential	Ecological Screening Level (ESL) - Urban residential
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)
BH1	0.0-0.15	Clay	<0.3	<0.1	<0.1	<0.1	3	300	5	170	0.7
BH2	0.0-0.15	Clay	<0.3	<0.1	<0.1	<0.1	3	300	5	170	0.7
BH4	0.0-0.15	Clay	<0.3	<0.1	<0.1	<0.1	3	300	5	170	0.7
BH5	0.0-0.15	Clay	<0.3	<0.1	<0.1	<0.1	3	300	5	170	0.7
Limit of Reporting (LOR)			0.3	0.1	0.1	0.1					

Notes: a: Residential with garden / accessible soil (home grown produce <10% fruit and vegetable intake (no poultry)), also includes childcare centres, preschools and primary schools.

NL: Not Limiting

GEOTECHNIQUE PTY LTD

TABLE H
ORGANOCHLORINE PESTICIDES (OCP) & POLYCHLORINATED BIPHENYLS (PCB) TEST RESULTS
DISCRETE SAMPLES
(Ref No: 20429/8)

Sample Location	Depth (m)	OCP (mg/kg) HEXACHLOROBENZENE (HCB)	HEPTACHLOR	ALDRIN+DIELDRIN	ENDRIN	METHOXYCHLOR	MIREX	ENDOSULFAN (alpha, beta & sulphate)	DDD+DDE+DDT	DDT	CHLORDANE (alpha & gamma)	(mg/kg) PCB
BH1	0.0-0.15	<0.1	<0.1	<0.15	<0.1	<0.1	<0.1	<0.3	<0.6	<0.2	<0.2	<1
BH2	0.0-0.15	<0.1	<0.1	<0.15	<0.1	<0.1	<0.1	<0.3	<0.6	<0.2	<0.2	<1
BH3	0.0-0.15	<0.1	<0.1	<0.15	<0.1	<0.1	<0.1	<0.3	<0.6	<0.2	<0.2	-
BH4	0.0-0.15	<0.1	<0.1	<0.15	<0.1	<0.1	<0.1	<0.3	<0.6	<0.2	<0.2	<1
BH5	0.0-0.15	<0.1	<0.1	<0.15	<0.1	<0.1	<0.1	<0.3	<0.6	<0.2	<0.2	<1
Limit of Reporting (LOR)		0.1	0.1	0.15	0.1	0.1	0.1	0.3	0.6	0.2	0.2	1
NATIONAL ENVIRONMENT PROTECTION AMENDMENT MEASURE (2013)												
Health-based Investigation Levels (HIL) A [a] - Residential A		10	6	6	10	300	10	270	240		50	1
Ecological Investigation Levels (EIL) - Urban residential										180 [b]		

Notes:
a: Residential with garden / accessible soil (home grown produce <10% fruit and vegetable intake (no poultry)), also includes childcare centres, preschools and primary schools.

b: Generic EIL for DDT

GEOTECHNIQUE
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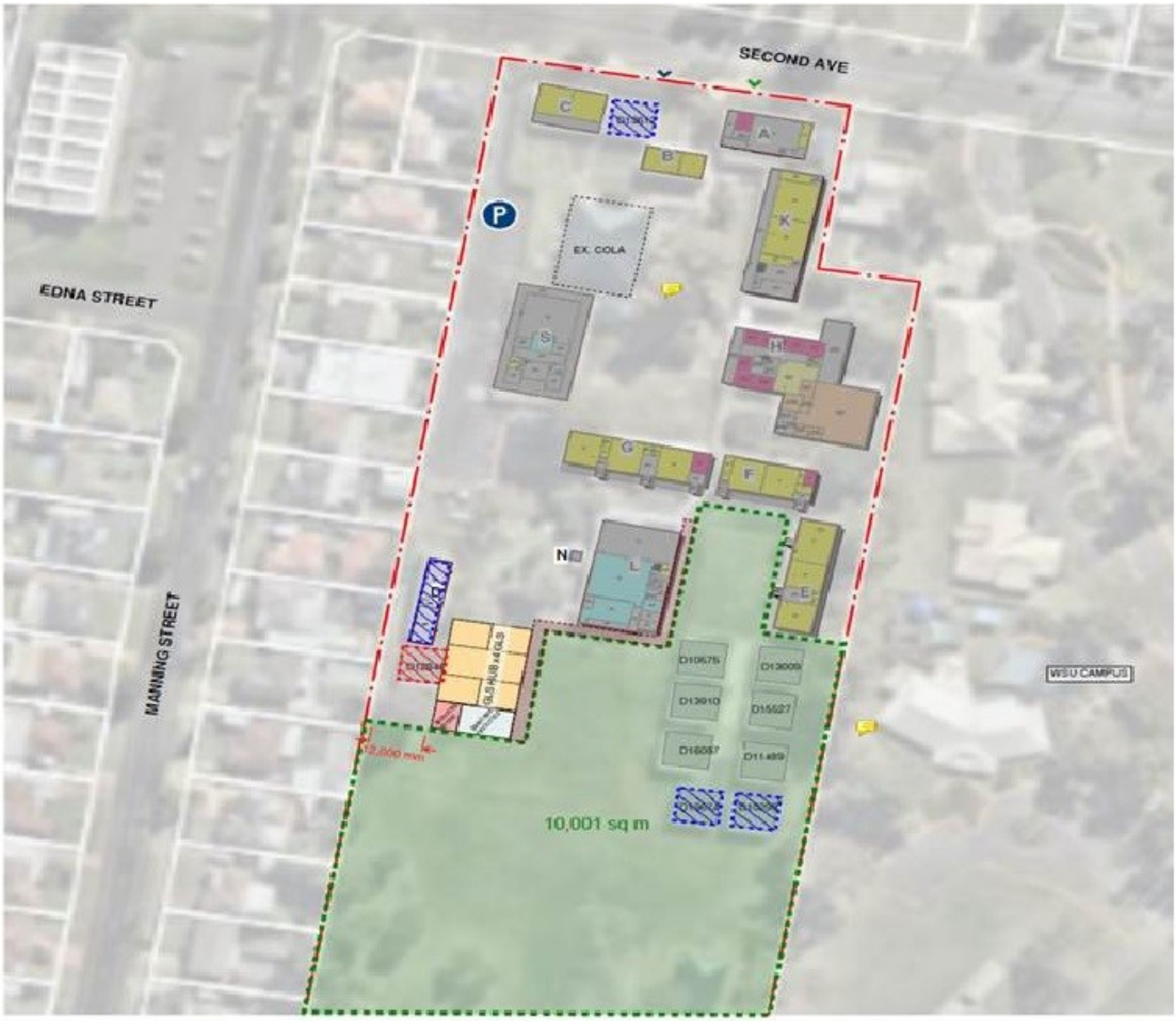
TABLE I
ASBESTOS TEST RESULTS
DISCRETE SAMPLES
(Ref No: 20429/8)

Sample Location	Depth (m)	ASBESTOS (% w/w)		
Soil Sample		Bonded ACM (>7mm)	AF	FA
BH1	0.0-0.15	<0.01	<0.001	<0.001
BH2	0.0-0.15	<0.01	<0.001	<0.001
BH3	0.0-0.15	<0.01	<0.001	<0.001
BH4	0.0-0.15	<0.01	<0.001	<0.001
BH5	0.0-0.15	<0.01	<0.001	<0.001
Limits of Reporting (LOR)		0.01	0.001	0.001
NATIONAL ENVIRONMENT PROTECTION AMENDMENT MEASURE (2013)				
Health Screening Levels [a] - Residential A		0.01	0.001	0.001

Notes:
ACM: Asbestos Containing Material
AF: Asbestos Fines
FA: Fibrous Asbestos
a: Residential with garden / accessible soil (home grown produce <10% fruit and vegetable intake (no poultry)), also includes childcare centres, preschools and primary schools.

APPENDIX A

PLAN SHOWING INVESTIGATION AREA FOR PROPOSED SCHOOL UPGRADES PROVIDED BY SINSW


SECOND AVE
EDNA STREET
MANNING STREET
EX. COLA
C
A
B
K
S
H
G
F
N
L
E
D10675
D13000
D13910
D15527
D16557
D11489
GLS HUB x4GLS
10,001 sq m
WSU CAMPUS

APPENDIX B

TABLE 1 – BOREHOLE LOGS

GEOTECHNIQUE PTY LTD

Project:	Proposed School Upgrade	**Job No:**	20429/8
Location:	Kingswood Public School - Second Avenue Kingswood	**Drawing No:**	20429/8-AA1
		Logged & Sampled by:	JH

Table 1

Test Pit	Depth (m)	Sample Depth (m)	Date	Material Description	PID	Remarks*
BH1	0.0-1.0	0.0-0.15	27/09/2023	FILL: Silty Clay, low to medium plasticity, brown, trace of gravel	0.0 ppm	
		0.5-0.8			0.0 ppm	
	1.0-1.5	1.05-1.15		(CI-CH) Silty CLAY, medium to high plasticity, brown		
	1.5-2.0	1.55-1.65		(CI-CH) Silty CLAY, medium to high plasticity, grey		
BH2	0.0-0.8	0.0-0.15	27/09/2023	FILL: Silty Clay, low to medium plasticity, brown, trace of gravel	0.0 ppm	
		0.5-0.8			0.0 ppm	
	0.8-1.3	0.85-0.95		(CI-CH) Silty CLAY, medium to high plasticity, brown		
	1.3-1.8	1.35-1.45		(CI-CH) Silty CLAY, medium to high plasticity, grey		
BH3	0.0-0.2	0.0-0.15	27/09/2023	TOPSOIL: Silty Clay, low plasticity, brown, trace of root fibres		
	0.2-1.0	0.25-0.35		(CI-CH) Silty CLAY, medium to high plasticity, orange		
	1.0-1.5	1.05-1.15		(CI-CH) Silty CLAY, medium to high plasticity, grey		
BH4	0.0-0.8	0.0-0.15	27/09/2023	FILL: Silty Clay, low to medium plasticity, brown, trace of gravel	0.0 ppm	
		0.5-0.8			0.0 ppm	
	0.8-2.0	0.85-0.95		(CI-CH) Silty CLAY, medium to high plasticity, grey		
		1.85-1.95				
BH5	0.0-0.3	0.0-0.15	27/09/2023	FILL: Gravelly Clay, low plasticity, brown	0.0 ppm	
	0.3-2.0	0.35-0.45		(CI-CH) Silty CLAY, medium to high plasticity, grey		
		1.35-0.45				

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.

APPENDIX C

PID CALIBRATION SHEET

GEOTECHNIQUE
PTY LTD

PID CALIBRATION

CLIENT	SINSW	JOB NO	20429/8
PROJECT	SCHOOL UPGRADE	DATE	27/9/23
ADDRESS	KINGSWOOD PS	CHECKED BY	JA
PID MODEL	**PID MODEL: PGM – 7600 MINIRAE 2000**	CALIBRATED BY	JH
SERIAL NO	**SERIAL NO: 110 – 005380**		

This performance of this PID has been checked and calibrated as follows:

☒ **Charged***

☒ **Calibrate** **0.0ppm** **Reading:** 0.0 **ppm**

100ppm **Isobutylene** **Reading:** 100.0 **ppm**

Gas Bottle Number 173 **Lot No** 51809

Signed & Approved [redacted] Date: 27/9/23

Note: * Should be between 5.V and 6.2V

APPENDIX D

LABORATORY ANALYTICAL REPORTS / CERTIFICATE OF ANALYSIS

ANALYTICAL REPORT

Accreditation No. 2562

CLIENT DETAILS

Contact	John Xu
Client	Geotechnique
Address	P.O. Box 880 NSW 2751
Telephone	02 4722 2700
Facsimile	02 4722 6161
Email	john.xu@geotech.com.au
Project	**20429/8 Kingswood**
Order Number	**20429/8**
Samples	12

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
SGS Reference	**SE254502 R0**
Date Received	28/9/2023
Date Reported	9/10/2023

COMMENTS

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

SIGNATORIES

Akheeqar BENIAMEEN
Chemist

Bennet LO
Senior Chemist

Dong LIANG
Metals/Inorganics Team Leader

Huong CRAWFORD
Production Manager

Ly Kim HA
Organic Section Head

Shane MCDERMOTT
Inorganic/Metals Chemist

Teresa NGUYEN
Organic Chemist

VOC's in Soil [AN433] Tested: 29/9/2023

PARAMETER	UOM	LOR	BH1 CLAY 0.0-0.15 27/9/2023 SE254502.001	BH2 CLAY 0.0-0.15 27/9/2023 SE254502.003	BH4 CLAY 0.0-0.15 27/9/2023 SE254502.006	BH5 CLAY 0.0-0.15 27/9/2023 SE254502.008	DDS1 CLAY - 27/9/2023 SE254502.010
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
Naphthalene (VOC)*	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	0.3	<0.3	<0.3	<0.3	<0.3	<0.3

PARAMETER	UOM	LOR	TS1 SAND - 27/9/2023 SE254502.012
Benzene	mg/kg	0.1	[97%]
Toluene	mg/kg	0.1	[97%]
Ethylbenzene	mg/kg	0.1	[98%]
m/p-xylene	mg/kg	0.2	[98%]
o-xylene	mg/kg	0.1	[98%]
Naphthalene (VOC)*	mg/kg	0.1	-
Total Xylenes*	mg/kg	0.3	-
Total BTEX*	mg/kg	0.3	-

Volatile Petroleum Hydrocarbons in Soil [AN433] Tested: 29/9/2023

PARAMETER	UOM	LOR	BH1 CLAY 0.0-0.15 27/9/2023 SE254502.001	BH2 CLAY 0.0-0.15 27/9/2023 SE254502.003	BH4 CLAY 0.0-0.15 27/9/2023 SE254502.006	BH5 CLAY 0.0-0.15 27/9/2023 SE254502.008	DDS1 CLAY - 27/9/2023 SE254502.010
Benzene (F0)	mg/kg	0.1	<0.1	<0.1	<0.1	<0.1	<0.1
TRH C6-C9	mg/kg	20	<20	<20	<20	<20	<20
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

TRH (Total Recoverable Hydrocarbons) in Soil [AN403] Tested: 29/9/2023

PARAMETER	UOM	LOR	BH1 CLAY 0.0-0.15 27/9/2023 SE254502.001	BH2 CLAY 0.0-0.15 27/9/2023 SE254502.003	BH4 CLAY 0.0-0.15 27/9/2023 SE254502.006	BH5 CLAY 0.0-0.15 27/9/2023 SE254502.008	DDS1 CLAY - 27/9/2023 SE254502.010
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

PAH (Polynuclear Aromatic Hydrocarbons) in Soil [AN420] Tested: 29/9/2023

PARAMETER	UOM	LOR	BH1 CLAY 0.0-0.15 27/9/2023 SE254502.001	BH2 CLAY 0.0-0.15 27/9/2023 SE254502.003	BH4 CLAY 0.0-0.15 27/9/2023 SE254502.006	BH5 CLAY 0.0-0.15 27/9/2023 SE254502.008	DDS1 CLAY - 27/9/2023 SE254502.010
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(b&j&k)fluoranthene	mg/kg	0.2	<0.2	<0.2	<0.2	<0.2	<0.2
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*	mg/kg	0.2	<0.2	<0.2	<0.2	<0.2	<0.2
Carcinogenic PAHs, BaP TEQ <LOR=LOR*	mg/kg	0.3	<0.3	<0.3	<0.3	<0.3	<0.3
Carcinogenic PAHs, BaP TEQ <LOR=LOR/2*	mg/kg	0.2	<0.2	<0.2	<0.2	<0.2	<0.2
Total PAH (18)	mg/kg	0.1	<0.1	<0.1	<0.1	<0.1	<0.1
Total PAH (NEPM/WHO 16)	mg/kg	0.1	<0.1	<0.1	<0.1	<0.1	<0.1

OC Pesticides in Soil [AN420] Tested: 29/9/2023

PARAMETER	UOM	LOR	BH1 CLAY 0.0-0.15 27/9/2023 SE254502.001	BH2 CLAY 0.0-0.15 27/9/2023 SE254502.003	BH3 CLAY 0.0-0.15 27/9/2023 SE254502.004	BH4 CLAY 0.0-0.15 27/9/2023 SE254502.006	BH5 CLAY 0.0-0.15 27/9/2023 SE254502.008
Alpha BHC	mg/kg	0.1	<0.1	<0.1	<0.1	<0.1	<0.1
Hexachlorobenzene (HCB)	mg/kg	0.1	<0.1	<0.1	<0.1	<0.1	<0.1
Beta BHC	mg/kg	0.1	<0.1	<0.1	<0.1	<0.1	<0.1
Lindane (gamma BHC)	mg/kg	0.1	<0.1	<0.1	<0.1	<0.1	<0.1
Delta BHC	mg/kg	0.1	<0.1	<0.1	<0.1	<0.1	<0.1
Heptachlor	mg/kg	0.1	<0.1	<0.1	<0.1	<0.1	<0.1
Aldrin	mg/kg	0.1	<0.1	<0.1	<0.1	<0.1	<0.1
Isodrin	mg/kg	0.1	<0.1	<0.1	<0.1	<0.1	<0.1
Heptachlor epoxide	mg/kg	0.1	<0.1	<0.1	<0.1	<0.1	<0.1
Gamma Chlordane	mg/kg	0.1	<0.1	<0.1	<0.1	<0.1	<0.1
Alpha Chlordane	mg/kg	0.1	<0.1	<0.1	<0.1	<0.1	<0.1
Alpha Endosulfan	mg/kg	0.1	<0.1	<0.1	<0.1	<0.1	<0.1
p,p'-DDE	mg/kg	0.1	<0.1	<0.1	<0.1	<0.1	<0.1
o,p'-DDE*	mg/kg	0.1	<0.1	<0.1	<0.1	<0.1	<0.1
o,p'-DDD*	mg/kg	0.1	<0.1	<0.1	<0.1	<0.1	<0.1
o,p'-DDT*	mg/kg	0.1	<0.1	<0.1	<0.1	<0.1	<0.1
p,p'-DDD	mg/kg	0.1	<0.1	<0.1	<0.1	<0.1	<0.1
p,p'-DDT	mg/kg	0.1	<0.1	<0.1	<0.1	<0.1	<0.1
Dieldrin	mg/kg	0.05	<0.05	<0.05	<0.05	<0.05	<0.05
Endrin	mg/kg	0.1	<0.1	<0.1	<0.1	<0.1	<0.1
Beta Endosulfan	mg/kg	0.1	<0.1	<0.1	<0.1	<0.1	<0.1
Endrin aldehyde	mg/kg	0.1	<0.1	<0.1	<0.1	<0.1	<0.1
Endosulfan sulphate	mg/kg	0.1	<0.1	<0.1	<0.1	<0.1	<0.1
Endrin ketone	mg/kg	0.1	<0.1	<0.1	<0.1	<0.1	<0.1
Methoxychlor	mg/kg	0.1	<0.1	<0.1	<0.1	<0.1	<0.1
Mirex	mg/kg	0.1	<0.1	<0.1	<0.1	<0.1	<0.1
Total CLP OC Pesticides	mg/kg	1	<1	<1	<1	<1	<1
Total Other OC VIC EPA	mg/kg	1	<1	<1	<1	<1	<1
Total OC VIC EPA	mg/kg	1	<1	<1	<1	<1	<1

OC Pesticides in Soil [AN420] Tested: 29/9/2023 (continued)

PARAMETER	UOM	LOR	DDS1 CLAY - 27/9/2023 SE254502.010
Alpha BHC	mg/kg	0.1	<0.1
Hexachlorobenzene (HCB)	mg/kg	0.1	<0.1
Beta BHC	mg/kg	0.1	<0.1
Lindane (gamma BHC)	mg/kg	0.1	<0.1
Delta BHC	mg/kg	0.1	<0.1
Heptachlor	mg/kg	0.1	<0.1
Aldrin	mg/kg	0.1	<0.1
Isodrin	mg/kg	0.1	<0.1
Heptachlor epoxide	mg/kg	0.1	<0.1
Gamma Chlordane	mg/kg	0.1	<0.1
Alpha Chlordane	mg/kg	0.1	<0.1
Alpha Endosulfan	mg/kg	0.1	<0.1
p,p'-DDE	mg/kg	0.1	<0.1
o,p'-DDE*	mg/kg	0.1	<0.1
o,p'-DDD*	mg/kg	0.1	<0.1
o,p'-DDT*	mg/kg	0.1	<0.1
p,p'-DDD	mg/kg	0.1	<0.1
p,p'-DDT	mg/kg	0.1	<0.1
Dieldrin	mg/kg	0.05	<0.05
Endrin	mg/kg	0.1	<0.1
Beta Endosulfan	mg/kg	0.1	<0.1
Endrin aldehyde	mg/kg	0.1	<0.1
Endosulfan sulphate	mg/kg	0.1	<0.1
Endrin ketone	mg/kg	0.1	<0.1
Methoxychlor	mg/kg	0.1	<0.1
Mirex	mg/kg	0.1	<0.1
Total CLP OC Pesticides	mg/kg	1	<1
Total Other OC VIC EPA	mg/kg	1	<1
Total OC VIC EPA	mg/kg	1	<1

PCBs in Soil [AN420] Tested: 29/9/2023

PARAMETER	UOM	LOR	BH1 CLAY 0.0-0.15 27/9/2023 SE254502.001	BH2 CLAY 0.0-0.15 27/9/2023 SE254502.003	BH4 CLAY 0.0-0.15 27/9/2023 SE254502.006	BH5 CLAY 0.0-0.15 27/9/2023 SE254502.008	DDS1 CLAY - 27/9/2023 SE254502.010
Arochlor 1016	mg/kg	0.2	<0.2	<0.2	<0.2	<0.2	<0.2
Arochlor 1221	mg/kg	0.2	<0.2	<0.2	<0.2	<0.2	<0.2
Arochlor 1232	mg/kg	0.2	<0.2	<0.2	<0.2	<0.2	<0.2
Arochlor 1242	mg/kg	0.2	<0.2	<0.2	<0.2	<0.2	<0.2
Arochlor 1248	mg/kg	0.2	<0.2	<0.2	<0.2	<0.2	<0.2
Arochlor 1254	mg/kg	0.2	<0.2	<0.2	<0.2	<0.2	<0.2
Arochlor 1260	mg/kg	0.2	<0.2	<0.2	<0.2	<0.2	<0.2
Arochlor 1262	mg/kg	0.2	<0.2	<0.2	<0.2	<0.2	<0.2
Arochlor 1268	mg/kg	0.2	<0.2	<0.2	<0.2	<0.2	<0.2
Total PCBs (Arochlors)	mg/kg	1	<1.0	<1.0	<1.0	<1.0	<1.0

pH in soil (1:5) [AN101] Tested: 5/10/2023

PARAMETER	UOM	LOR	BH1 CLAY 0.0-0.15 27/9/2023 SE254502.001	BH1 CLAY 1.05-1.15 27/9/2023 SE254502.002	BH3 CLAY 0.0-0.15 27/9/2023 SE254502.004	BH3 CLAY 0.25-0.35 27/9/2023 SE254502.005	BH4 CLAY 0.0-0.15 27/9/2023 SE254502.006
pH	pH Units	0.1	**6.5**	**5.3**	**6.3**	**5.2**	**6.6**

PARAMETER	UOM	LOR	BH4 CLAY 0.85-0.95 27/9/2023 SE254502.007	BH5 CLAY 0.0-0.15 27/9/2023 SE254502.008
pH	pH Units	0.1	**4.8**	**8.3**

Exchangeable Cations and Cation Exchange Capacity (CEC/ESP/SAR) [AN122] Tested: 8/10/2023

PARAMETER	UOM	LOR	BH1 CLAY 0.0-0.15 27/9/2023 SE254502.001	BH1 CLAY 1.05-1.15 27/9/2023 SE254502.002	BH3 CLAY 0.0-0.15 27/9/2023 SE254502.004	BH3 CLAY 0.25-0.35 27/9/2023 SE254502.005	BH4 CLAY 0.0-0.15 27/9/2023 SE254502.006
Exchangeable Calcium, Ca	cmol (+)/kg	0.01	6.1	1.1	3.5	2.3	6.2
Exchangeable Calcium Percentage*	%	0.1	39.5	8.2	32.7	18.2	43.5
Exchangeable Potassium, K	cmol (+)/kg	0.01	0.64	0.37	0.50	0.48	0.42
Exchangeable Potassium Percentage*	%	0.1	4.1	2.9	4.7	3.7	2.9
Exchangeable Magnesium, Mg	cmol (+)/kg	0.02	7.5	8.8	5.7	8.0	5.8
Exchangeable Magnesium Percentage*	%	0.1	48.3	68.6	53.5	63.3	40.3
Exchangeable Sodium, Na	cmol (+)/kg	0.01	1.3	2.6	0.97	1.9	1.9
Exchangeable Sodium Percentage*	%	0.1	8.1	20.3	9.1	14.8	13.3
Cation Exchange Capacity	cmol (+)/kg	0.02	16	13	11	13	14

PARAMETER	UOM	LOR	BH4 CLAY 0.85-0.95 27/9/2023 SE254502.007	BH5 CLAY 0.0-0.15 27/9/2023 SE254502.008
Exchangeable Calcium, Ca	cmol (+)/kg	0.01	0.79	25
Exchangeable Calcium Percentage*	%	0.1	4.0	89.7
Exchangeable Potassium, K	cmol (+)/kg	0.01	0.58	0.62
Exchangeable Potassium Percentage*	%	0.1	2.9	2.2
Exchangeable Magnesium, Mg	cmol (+)/kg	0.02	11	1.5
Exchangeable Magnesium Percentage*	%	0.1	56.1	5.5
Exchangeable Sodium, Na	cmol (+)/kg	0.01	7.3	0.74
Exchangeable Sodium Percentage*	%	0.1	37.0	2.6
Cation Exchange Capacity	cmol (+)/kg	0.02	20	28

Total Recoverable Elements in Soil/Waste Solids/Materials by ICPOES [AN040/AN320] Tested: 29/9/2023

PARAMETER	UOM	LOR	BH1 CLAY 0.0-0.15 27/9/2023 SE254502.001	BH1 CLAY 1.05-1.15 27/9/2023 SE254502.002	BH2 CLAY 0.0-0.15 27/9/2023 SE254502.003	BH3 CLAY 0.0-0.15 27/9/2023 SE254502.004	BH3 CLAY 0.25-0.35 27/9/2023 SE254502.005
Arsenic, As	mg/kg	1	7	6	8	6	6
Cadmium, Cd	mg/kg	0.3	<0.3	<0.3	<0.3	<0.3	<0.3
Chromium, Cr	mg/kg	0.5	21	13	22	14	18
Copper, Cu	mg/kg	0.5	16	14	16	17	16
Lead, Pb	mg/kg	1	15	10	15	15	10
Nickel, Ni	mg/kg	0.5	6.6	3.5	4.7	5.0	2.9
Zinc, Zn	mg/kg	2	25	17	22	40	15

PARAMETER	UOM	LOR	BH4 CLAY 0.0-0.15 27/9/2023 SE254502.006	BH4 CLAY 0.85-0.95 27/9/2023 SE254502.007	BH5 CLAY 0.0-0.15 27/9/2023 SE254502.008	BH5 CLAY 1.35-0.45 27/9/2023 SE254502.009	DDS1 CLAY - 27/9/2023 SE254502.010
Arsenic, As	mg/kg	1	7	2	5	<1	6
Cadmium, Cd	mg/kg	0.3	<0.3	<0.3	<0.3	<0.3	<0.3
Chromium, Cr	mg/kg	0.5	15	3.5	10	2.5	14
Copper, Cu	mg/kg	0.5	13	7.4	10	6.8	14
Lead, Pb	mg/kg	1	15	6	14	5	12
Nickel, Ni	mg/kg	0.5	6.9	1.2	3.9	1.1	3.7
Zinc, Zn	mg/kg	2	30	6	26	6	19

Mercury in Soil [AN312] Tested: 29/9/2023

PARAMETER	UOM	LOR	BH1 CLAY 0.0-0.15 27/9/2023 SE254502.001	BH1 CLAY 1.05-1.15 27/9/2023 SE254502.002	BH2 CLAY 0.0-0.15 27/9/2023 SE254502.003	BH3 CLAY 0.0-0.15 27/9/2023 SE254502.004	BH3 CLAY 0.25-0.35 27/9/2023 SE254502.005
Mercury	mg/kg	0.05	<0.05	<0.05	<0.05	<0.05	<0.05

PARAMETER	UOM	LOR	BH4 CLAY 0.0-0.15 27/9/2023 SE254502.006	BH4 CLAY 0.85-0.95 27/9/2023 SE254502.007	BH5 CLAY 0.0-0.15 27/9/2023 SE254502.008	BH5 CLAY 1.35-0.45 27/9/2023 SE254502.009	DDS1 CLAY - 27/9/2023 SE254502.010
Mercury	mg/kg	0.05	<0.05	<0.05	<0.05	<0.05	<0.05

Moisture Content [AN002] Tested: 3/10/2023

PARAMETER	UOM	LOR	BH1 CLAY 0.0-0.15 27/9/2023 SE254502.001	BH1 CLAY 1.05-1.15 27/9/2023 SE254502.002	BH2 CLAY 0.0-0.15 27/9/2023 SE254502.003	BH3 CLAY 0.0-0.15 27/9/2023 SE254502.004	BH3 CLAY 0.25-0.35 27/9/2023 SE254502.005
% Moisture	%w/w	1	**11.7**	**14.3**	**12.2**	**10.5**	**13.5**

PARAMETER	UOM	LOR	BH4 CLAY 0.0-0.15 27/9/2023 SE254502.006	BH4 CLAY 0.85-0.95 27/9/2023 SE254502.007	BH5 CLAY 0.0-0.15 27/9/2023 SE254502.008	BH5 CLAY 1.35-0.45 27/9/2023 SE254502.009	DDS1 CLAY - 27/9/2023 SE254502.010
% Moisture	%w/w	1	**9.9**	**16.2**	**3.8**	**18.3**	**10.4**

VOCs in Water [AN433] Tested: 4/10/2023

PARAMETER	UOM	LOR	RS1 WATER - 27/9/2023 SE254502.011
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: 4/10/2023

PARAMETER	UOM	LOR	RS1 WATER - 27/9/2023 SE254502.011
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: 29/9/2023

PARAMETER	UOM	LOR	RS1 WATER - 27/9/2023 SE254502.011
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: 29/9/2023

PARAMETER	UOM	LOR	RS1 WATER - 27/9/2023 SE254502.011
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: 3/10/2023

PARAMETER	UOM	LOR	RS1 WATER - 27/9/2023 SE254502.011
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	**0.063**
Lead, Pb	mg/L	0.02	<0.02
Nickel, Ni	mg/L	0.005	<0.005
Zinc, Zn	mg/L	0.01	**0.02**

Mercury (dissolved) in Water [AN311(Perth)/AN312] Tested: 3/10/2023

PARAMETER	UOM	LOR	RS1 WATER - 27/9/2023 SE254502.011
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 AAS 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.-
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.
**	Indicative data, theoretical holding time exceeded.	NVL	Not validated.	LOR	Limit of Reporting.
***	Indicates that both * and ** apply.	IS	Insufficient sample for analysis.	↑↓	Raised/lowered Limit of Reporting.
		LNR	Sample listed, but not received.		

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

SE254502 R0

CLIENT DETAILS

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Project	**20429/8 Kingswood**
Order Number	**20429/8**
Samples	12

LABORATORY DETAILS

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Email	au.environmental.sydney@sgs.com
SGS Reference	**SE254502 R0**
Date Received	28 Sep 2023
Date Reported	09 Oct 2023

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:

Extraction Date	pH in soil (1:5)	7 items
Analysis Date	Moisture Content	10 items
Matrix Spike	TRH (Total Recoverable Hydrocarbons) in Soil	2 items

SAMPLE SUMMARY

Sample counts by matrix	11 Clay/Sand, 1 Wa	Type of documentation received	COC
Date documentation received	28/9/2023	Samples received in good order	Yes
Samples received without headspace	Yes	Sample temperature upon receipt	10.6°C
Sample container provider	SGS	Turnaround time requested	3 Days/Standard
Samples received in correct containers	Yes	Sufficient sample for analysis	Yes
Sample cooling method	Ice Bricks	Samples clearly labelled	Yes
Complete documentation received	Yes		

HOLDING TIME SUMMARY

SE254502 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

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
BH1	SE254502.001	LB292790	27 Sep 2023	28 Sep 2023	25 Oct 2023	08 Oct 2023	25 Oct 2023	09 Oct 2023
BH1	SE254502.002	LB292790	27 Sep 2023	28 Sep 2023	25 Oct 2023	08 Oct 2023	25 Oct 2023	09 Oct 2023
BH3	SE254502.004	LB292790	27 Sep 2023	28 Sep 2023	25 Oct 2023	08 Oct 2023	25 Oct 2023	09 Oct 2023
BH3	SE254502.005	LB292790	27 Sep 2023	28 Sep 2023	25 Oct 2023	08 Oct 2023	25 Oct 2023	09 Oct 2023
BH4	SE254502.006	LB292790	27 Sep 2023	28 Sep 2023	25 Oct 2023	08 Oct 2023	25 Oct 2023	09 Oct 2023
BH4	SE254502.007	LB292790	27 Sep 2023	28 Sep 2023	25 Oct 2023	08 Oct 2023	25 Oct 2023	09 Oct 2023
BH5	SE254502.008	LB292790	27 Sep 2023	28 Sep 2023	25 Oct 2023	08 Oct 2023	25 Oct 2023	09 Oct 2023

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	SE254502.011	LB292297	27 Sep 2023	28 Sep 2023	25 Oct 2023	03 Oct 2023	25 Oct 2023	03 Oct 2023

Mercury in Soil

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

Sample Name	Sample No.	QC Ref	Sampled	Received	Extraction Due	Extracted	Analysis Due	Analysed
BH1	SE254502.001	LB292279	27 Sep 2023	28 Sep 2023	25 Oct 2023	29 Sep 2023	25 Oct 2023	09 Oct 2023
BH1	SE254502.002	LB292279	27 Sep 2023	28 Sep 2023	25 Oct 2023	29 Sep 2023	25 Oct 2023	09 Oct 2023
BH2	SE254502.003	LB292279	27 Sep 2023	28 Sep 2023	25 Oct 2023	29 Sep 2023	25 Oct 2023	09 Oct 2023
BH3	SE254502.004	LB292279	27 Sep 2023	28 Sep 2023	25 Oct 2023	29 Sep 2023	25 Oct 2023	09 Oct 2023
BH3	SE254502.005	LB292279	27 Sep 2023	28 Sep 2023	25 Oct 2023	29 Sep 2023	25 Oct 2023	09 Oct 2023
BH4	SE254502.006	LB292279	27 Sep 2023	28 Sep 2023	25 Oct 2023	29 Sep 2023	25 Oct 2023	09 Oct 2023
BH4	SE254502.007	LB292279	27 Sep 2023	28 Sep 2023	25 Oct 2023	29 Sep 2023	25 Oct 2023	09 Oct 2023
BH5	SE254502.008	LB292279	27 Sep 2023	28 Sep 2023	25 Oct 2023	29 Sep 2023	25 Oct 2023	09 Oct 2023
BH5	SE254502.009	LB292279	27 Sep 2023	28 Sep 2023	25 Oct 2023	29 Sep 2023	25 Oct 2023	09 Oct 2023
DDS1	SE254502.010	LB292279	27 Sep 2023	28 Sep 2023	25 Oct 2023	29 Sep 2023	25 Oct 2023	09 Oct 2023

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	SE254502.011	LB292295	27 Sep 2023	28 Sep 2023	25 Mar 2024	03 Oct 2023	25 Mar 2024	03 Oct 2023

Moisture Content

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

Sample Name	Sample No.	QC Ref	Sampled	Received	Extraction Due	Extracted	Analysis Due	Analysed
BH1	SE254502.001	LB292357	27 Sep 2023	28 Sep 2023	11 Oct 2023	03 Oct 2023	08 Oct 2023	09 Oct 2023†
BH1	SE254502.002	LB292357	27 Sep 2023	28 Sep 2023	11 Oct 2023	03 Oct 2023	08 Oct 2023	09 Oct 2023†
BH2	SE254502.003	LB292357	27 Sep 2023	28 Sep 2023	11 Oct 2023	03 Oct 2023	08 Oct 2023	09 Oct 2023†
BH3	SE254502.004	LB292357	27 Sep 2023	28 Sep 2023	11 Oct 2023	03 Oct 2023	08 Oct 2023	09 Oct 2023†
BH3	SE254502.005	LB292357	27 Sep 2023	28 Sep 2023	11 Oct 2023	03 Oct 2023	08 Oct 2023	09 Oct 2023†
BH4	SE254502.006	LB292357	27 Sep 2023	28 Sep 2023	11 Oct 2023	03 Oct 2023	08 Oct 2023	09 Oct 2023†
BH4	SE254502.007	LB292357	27 Sep 2023	28 Sep 2023	11 Oct 2023	03 Oct 2023	08 Oct 2023	09 Oct 2023†
BH5	SE254502.008	LB292357	27 Sep 2023	28 Sep 2023	11 Oct 2023	03 Oct 2023	08 Oct 2023	09 Oct 2023†
BH5	SE254502.009	LB292357	27 Sep 2023	28 Sep 2023	11 Oct 2023	03 Oct 2023	08 Oct 2023	09 Oct 2023†
DDS1	SE254502.010	LB292357	27 Sep 2023	28 Sep 2023	11 Oct 2023	03 Oct 2023	08 Oct 2023	09 Oct 2023†

OC Pesticides in Soil

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

Sample Name	Sample No.	QC Ref	Sampled	Received	Extraction Due	Extracted	Analysis Due	Analysed
BH1	SE254502.001	LB292223	27 Sep 2023	28 Sep 2023	11 Oct 2023	29 Sep 2023	08 Nov 2023	09 Oct 2023
BH2	SE254502.003	LB292223	27 Sep 2023	28 Sep 2023	11 Oct 2023	29 Sep 2023	08 Nov 2023	09 Oct 2023
BH3	SE254502.004	LB292223	27 Sep 2023	28 Sep 2023	11 Oct 2023	29 Sep 2023	08 Nov 2023	09 Oct 2023
BH4	SE254502.006	LB292223	27 Sep 2023	28 Sep 2023	11 Oct 2023	29 Sep 2023	08 Nov 2023	09 Oct 2023
BH5	SE254502.008	LB292223	27 Sep 2023	28 Sep 2023	11 Oct 2023	29 Sep 2023	08 Nov 2023	09 Oct 2023
DDS1	SE254502.010	LB292223	27 Sep 2023	28 Sep 2023	11 Oct 2023	29 Sep 2023	08 Nov 2023	09 Oct 2023

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
BH1	SE254502.001	LB292223	27 Sep 2023	28 Sep 2023	11 Oct 2023	29 Sep 2023	08 Nov 2023	09 Oct 2023
BH2	SE254502.003	LB292223	27 Sep 2023	28 Sep 2023	11 Oct 2023	29 Sep 2023	08 Nov 2023	09 Oct 2023
BH3	SE254502.004	LB292223	27 Sep 2023	28 Sep 2023	11 Oct 2023	29 Sep 2023	08 Nov 2023	09 Oct 2023
BH4	SE254502.006	LB292223	27 Sep 2023	28 Sep 2023	11 Oct 2023	29 Sep 2023	08 Nov 2023	09 Oct 2023
BH5	SE254502.008	LB292223	27 Sep 2023	28 Sep 2023	11 Oct 2023	29 Sep 2023	08 Nov 2023	09 Oct 2023
DDS1	SE254502.010	LB292223	27 Sep 2023	28 Sep 2023	11 Oct 2023	29 Sep 2023	08 Nov 2023	09 Oct 2023

HOLDING TIME SUMMARY

SE254502 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

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	SE254502.011	LB292157	27 Sep 2023	28 Sep 2023	04 Oct 2023	29 Sep 2023	08 Nov 2023	05 Oct 2023

PCBs in Soil

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

Sample Name	Sample No.	QC Ref	Sampled	Received	Extraction Due	Extracted	Analysis Due	Analysed
BH1	SE254502.001	LB292223	27 Sep 2023	28 Sep 2023	11 Oct 2023	29 Sep 2023	08 Nov 2023	09 Oct 2023
BH2	SE254502.003	LB292223	27 Sep 2023	28 Sep 2023	11 Oct 2023	29 Sep 2023	08 Nov 2023	09 Oct 2023
BH3	SE254502.004	LB292223	27 Sep 2023	28 Sep 2023	11 Oct 2023	29 Sep 2023	08 Nov 2023	09 Oct 2023
BH4	SE254502.006	LB292223	27 Sep 2023	28 Sep 2023	11 Oct 2023	29 Sep 2023	08 Nov 2023	09 Oct 2023
BH5	SE254502.008	LB292223	27 Sep 2023	28 Sep 2023	11 Oct 2023	29 Sep 2023	08 Nov 2023	09 Oct 2023
DDS1	SE254502.010	LB292223	27 Sep 2023	28 Sep 2023	11 Oct 2023	29 Sep 2023	08 Nov 2023	09 Oct 2023

pH in soil (1:5)

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

Sample Name	Sample No.	QC Ref	Sampled	Received	Extraction Due	Extracted	Analysis Due	Analysed
BH1	SE254502.001	LB292565	27 Sep 2023	28 Sep 2023	04 Oct 2023	05 Oct 2023†	06 Oct 2023	06 Oct 2023
BH1	SE254502.002	LB292565	27 Sep 2023	28 Sep 2023	04 Oct 2023	05 Oct 2023†	06 Oct 2023	06 Oct 2023
BH3	SE254502.004	LB292565	27 Sep 2023	28 Sep 2023	04 Oct 2023	05 Oct 2023†	06 Oct 2023	06 Oct 2023
BH3	SE254502.005	LB292565	27 Sep 2023	28 Sep 2023	04 Oct 2023	05 Oct 2023†	06 Oct 2023	06 Oct 2023
BH4	SE254502.006	LB292565	27 Sep 2023	28 Sep 2023	04 Oct 2023	05 Oct 2023†	06 Oct 2023	06 Oct 2023
BH4	SE254502.007	LB292565	27 Sep 2023	28 Sep 2023	04 Oct 2023	05 Oct 2023†	06 Oct 2023	06 Oct 2023
BH5	SE254502.008	LB292565	27 Sep 2023	28 Sep 2023	04 Oct 2023	05 Oct 2023†	06 Oct 2023	06 Oct 2023

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
BH1	SE254502.001	LB292271	27 Sep 2023	28 Sep 2023	25 Mar 2024	29 Sep 2023	25 Mar 2024	09 Oct 2023
BH1	SE254502.002	LB292271	27 Sep 2023	28 Sep 2023	25 Mar 2024	29 Sep 2023	25 Mar 2024	09 Oct 2023
BH2	SE254502.003	LB292271	27 Sep 2023	28 Sep 2023	25 Mar 2024	29 Sep 2023	25 Mar 2024	09 Oct 2023
BH3	SE254502.004	LB292271	27 Sep 2023	28 Sep 2023	25 Mar 2024	29 Sep 2023	25 Mar 2024	09 Oct 2023
BH3	SE254502.005	LB292271	27 Sep 2023	28 Sep 2023	25 Mar 2024	29 Sep 2023	25 Mar 2024	09 Oct 2023
BH4	SE254502.006	LB292271	27 Sep 2023	28 Sep 2023	25 Mar 2024	29 Sep 2023	25 Mar 2024	09 Oct 2023
BH4	SE254502.007	LB292271	27 Sep 2023	28 Sep 2023	25 Mar 2024	29 Sep 2023	25 Mar 2024	09 Oct 2023
BH5	SE254502.008	LB292271	27 Sep 2023	28 Sep 2023	25 Mar 2024	29 Sep 2023	25 Mar 2024	09 Oct 2023
BH5	SE254502.009	LB292271	27 Sep 2023	28 Sep 2023	25 Mar 2024	29 Sep 2023	25 Mar 2024	09 Oct 2023
DDS1	SE254502.010	LB292271	27 Sep 2023	28 Sep 2023	25 Mar 2024	29 Sep 2023	25 Mar 2024	09 Oct 2023

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
BH1	SE254502.001	LB292223	27 Sep 2023	28 Sep 2023	11 Oct 2023	29 Sep 2023	08 Nov 2023	09 Oct 2023
BH2	SE254502.003	LB292223	27 Sep 2023	28 Sep 2023	11 Oct 2023	29 Sep 2023	08 Nov 2023	09 Oct 2023
BH3	SE254502.004	LB292223	27 Sep 2023	28 Sep 2023	11 Oct 2023	29 Sep 2023	08 Nov 2023	09 Oct 2023
BH4	SE254502.006	LB292223	27 Sep 2023	28 Sep 2023	11 Oct 2023	29 Sep 2023	08 Nov 2023	09 Oct 2023
BH5	SE254502.008	LB292223	27 Sep 2023	28 Sep 2023	11 Oct 2023	29 Sep 2023	08 Nov 2023	09 Oct 2023
DDS1	SE254502.010	LB292223	27 Sep 2023	28 Sep 2023	11 Oct 2023	29 Sep 2023	08 Nov 2023	09 Oct 2023

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	SE254502.011	LB292157	27 Sep 2023	28 Sep 2023	04 Oct 2023	29 Sep 2023	08 Nov 2023	05 Oct 2023

VOC's in Soil

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

Sample Name	Sample No.	QC Ref	Sampled	Received	Extraction Due	Extracted	Analysis Due	Analysed
BH1	SE254502.001	LB292224	27 Sep 2023	28 Sep 2023	11 Oct 2023	29 Sep 2023	11 Oct 2023	09 Oct 2023
BH2	SE254502.003	LB292224	27 Sep 2023	28 Sep 2023	11 Oct 2023	29 Sep 2023	11 Oct 2023	09 Oct 2023
BH4	SE254502.006	LB292224	27 Sep 2023	28 Sep 2023	11 Oct 2023	29 Sep 2023	11 Oct 2023	09 Oct 2023
BH5	SE254502.008	LB292224	27 Sep 2023	28 Sep 2023	11 Oct 2023	29 Sep 2023	11 Oct 2023	09 Oct 2023
DDS1	SE254502.010	LB292224	27 Sep 2023	28 Sep 2023	11 Oct 2023	29 Sep 2023	11 Oct 2023	09 Oct 2023
TS1	SE254502.012	LB292224	27 Sep 2023	28 Sep 2023	11 Oct 2023	29 Sep 2023	11 Oct 2023	09 Oct 2023

VOCs in Water

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

Sample Name	Sample No.	QC Ref	Sampled	Received	Extraction Due	Extracted	Analysis Due	Analysed
RS1	SE254502.011	LB292470	27 Sep 2023	28 Sep 2023	11 Oct 2023	04 Oct 2023	11 Oct 2023	05 Oct 2023

HOLDING TIME SUMMARY

SE254502 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 — **Method: ME-(AU)-[ENV]AN433**

Sample Name	Sample No.	QC Ref	Sampled	Received	Extraction Due	Extracted	Analysis Due	Analysed
BH1	SE254502.001	LB292224	27 Sep 2023	28 Sep 2023	11 Oct 2023	29 Sep 2023	11 Oct 2023	09 Oct 2023
BH2	SE254502.003	LB292224	27 Sep 2023	28 Sep 2023	11 Oct 2023	29 Sep 2023	11 Oct 2023	09 Oct 2023
BH4	SE254502.006	LB292224	27 Sep 2023	28 Sep 2023	11 Oct 2023	29 Sep 2023	11 Oct 2023	09 Oct 2023
BH5	SE254502.008	LB292224	27 Sep 2023	28 Sep 2023	11 Oct 2023	29 Sep 2023	11 Oct 2023	09 Oct 2023
DDS1	SE254502.010	LB292224	27 Sep 2023	28 Sep 2023	11 Oct 2023	29 Sep 2023	11 Oct 2023	09 Oct 2023
TS1	SE254502.012	LB292224	27 Sep 2023	28 Sep 2023	11 Oct 2023	29 Sep 2023	11 Oct 2023	09 Oct 2023

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	SE254502.011	LB292470	27 Sep 2023	28 Sep 2023	11 Oct 2023	04 Oct 2023	11 Oct 2023	05 Oct 2023

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)	BH1	SE254502.001	%	60 - 130%	101
	BH2	SE254502.003	%	60 - 130%	105
	BH3	SE254502.004	%	60 - 130%	98
	BH4	SE254502.006	%	60 - 130%	101
	BH5	SE254502.008	%	60 - 130%	97
	DDS1	SE254502.010	%	60 - 130%	106

PAH (Polynuclear Aromatic Hydrocarbons) in Soil

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

Parameter	Sample Name	Sample Number	Units	Criteria	Recovery %
2-fluorobiphenyl (Surrogate)	BH1	SE254502.001	%	70 - 130%	99
	BH2	SE254502.003	%	70 - 130%	100
	BH4	SE254502.006	%	70 - 130%	102
	BH5	SE254502.008	%	70 - 130%	106
	DDS1	SE254502.010	%	70 - 130%	99
d14-p-terphenyl (Surrogate)	BH1	SE254502.001	%	70 - 130%	106
	BH2	SE254502.003	%	70 - 130%	108
	BH4	SE254502.006	%	70 - 130%	110
	BH5	SE254502.008	%	70 - 130%	112
	DDS1	SE254502.010	%	70 - 130%	105
d5-nitrobenzene (Surrogate)	BH1	SE254502.001	%	70 - 130%	92
	BH2	SE254502.003	%	70 - 130%	94
	BH4	SE254502.006	%	70 - 130%	96
	BH5	SE254502.008	%	70 - 130%	97
	DDS1	SE254502.010	%	70 - 130%	92

PAH (Polynuclear Aromatic Hydrocarbons) in Water

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

Parameter	Sample Name	Sample Number	Units	Criteria	Recovery %
2-fluorobiphenyl (Surrogate)	RS1	SE254502.011	%	40 - 130%	78
d14-p-terphenyl (Surrogate)	RS1	SE254502.011	%	40 - 130%	84
d5-nitrobenzene (Surrogate)	RS1	SE254502.011	%	40 - 130%	66

PCBs in Soil

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

Parameter	Sample Name	Sample Number	Units	Criteria	Recovery %
TCMX (Surrogate)	BH1	SE254502.001	%	60 - 130%	98
	BH2	SE254502.003	%	60 - 130%	102
	BH4	SE254502.006	%	60 - 130%	97
	BH5	SE254502.008	%	60 - 130%	94
	DDS1	SE254502.010	%	60 - 130%	102

VOC's in Soil

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

Parameter	Sample Name	Sample Number	Units	Criteria	Recovery %
Bromofluorobenzene (Surrogate)	BH1	SE254502.001	%	60 - 130%	95
	BH2	SE254502.003	%	60 - 130%	86
	BH4	SE254502.006	%	60 - 130%	91
	BH5	SE254502.008	%	60 - 130%	98
	DDS1	SE254502.010	%	60 - 130%	84
	TS1	SE254502.012	%	60 - 130%	80
d4-1,2-dichloroethane (Surrogate)	BH1	SE254502.001	%	60 - 130%	95
	BH2	SE254502.003	%	60 - 130%	79
	BH4	SE254502.006	%	60 - 130%	91
	BH5	SE254502.008	%	60 - 130%	102
	DDS1	SE254502.010	%	60 - 130%	85
	TS1	SE254502.012	%	60 - 130%	84
d8-toluene (Surrogate)	BH1	SE254502.001	%	60 - 130%	92
	BH2	SE254502.003	%	60 - 130%	83
	BH4	SE254502.006	%	60 - 130%	88
	BH5	SE254502.008	%	60 - 130%	97
	DDS1	SE254502.010	%	60 - 130%	82
	TS1	SE254502.012	%	60 - 130%	85

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	SE254502.011	%	40 - 130%	104
d4-1,2-dichloroethane (Surrogate)	RS1	SE254502.011	%	40 - 130%	79
d8-toluene (Surrogate)	RS1	SE254502.011	%	40 - 130%	90

Volatile Petroleum Hydrocarbons in Soil

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

Parameter	Sample Name	Sample Number	Units	Criteria	Recovery %
Bromofluorobenzene (Surrogate)	BH1	SE254502.001	%	60 - 130%	95
	BH2	SE254502.003	%	60 - 130%	86
	BH4	SE254502.006	%	60 - 130%	91
	BH5	SE254502.008	%	60 - 130%	98
	DDS1	SE254502.010	%	60 - 130%	84
d4-1,2-dichloroethane (Surrogate)	BH1	SE254502.001	%	60 - 130%	95
	BH2	SE254502.003	%	60 - 130%	79
	BH4	SE254502.006	%	60 - 130%	91
	BH5	SE254502.008	%	60 - 130%	102
	DDS1	SE254502.010	%	60 - 130%	85
d8-toluene (Surrogate)	BH1	SE254502.001	%	60 - 130%	92
	BH2	SE254502.003	%	60 - 130%	83
	BH4	SE254502.006	%	60 - 130%	88
	BH5	SE254502.008	%	60 - 130%	97
	DDS1	SE254502.010	%	60 - 130%	82

Volatile Petroleum Hydrocarbons in Water

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

Parameter	Sample Name	Sample Number	Units	Criteria	Recovery %
Bromofluorobenzene (Surrogate)	RS1	SE254502.011	%	40 - 130%	104
d4-1,2-dichloroethane (Surrogate)	RS1	SE254502.011	%	60 - 130%	79
d8-toluene (Surrogate)	RS1	SE254502.011	%	40 - 130%	90

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.

Mercury (dissolved) in Water

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

Sample Number	Parameter	Units	LOR	Result
LB292297.001	Mercury	mg/L	0.0001	<0.0001

Mercury in Soil

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

Sample Number	Parameter	Units	LOR	Result
LB292279.001	Mercury	mg/kg	0.05	<0.05

Metals in Water (Dissolved) by ICPOES

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

Sample Number	Parameter	Units	LOR	Result
LB292295.001	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
LB292223.001	Alpha BHC	mg/kg	0.1	<0.1
	Hexachlorobenzene (HCB)	mg/kg	0.1	<0.1
	Beta BHC	mg/kg	0.1	<0.1
	Lindane (gamma BHC)	mg/kg	0.1	<0.1
	Delta BHC	mg/kg	0.1	<0.1
	Heptachlor	mg/kg	0.1	<0.1
	Aldrin	mg/kg	0.1	<0.1
	Isodrin	mg/kg	0.1	<0.1
	Heptachlor epoxide	mg/kg	0.1	<0.1
	Gamma Chlordane	mg/kg	0.1	<0.1
	Alpha Chlordane	mg/kg	0.1	<0.1
	Alpha Endosulfan	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	0.1	<0.1
	Beta Endosulfan	mg/kg	0.1	<0.1
	p,p'-DDD	mg/kg	0.1	<0.1
	Endrin aldehyde	mg/kg	0.1	<0.1
	Endosulfan sulphate	mg/kg	0.1	<0.1
	p,p'-DDT	mg/kg	0.1	<0.1
	Endrin ketone	mg/kg	0.1	<0.1
	Methoxychlor	mg/kg	0.1	<0.1
	Mirex	mg/kg	0.1	<0.1
Surrogates	Tetrachloro-m-xylene (TCMX) (Surrogate)	%	-	89

PAH (Polynuclear Aromatic Hydrocarbons) in Soil

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

Sample Number	Parameter	Units	LOR	Result
LB292223.001	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
	Anthracene	mg/kg	0.1	<0.1
	Fluoranthene	mg/kg	0.1	<0.1
	Pyrene	mg/kg	0.1	<0.1
	Benzo(a)anthracene	mg/kg	0.1	<0.1
	Chrysene	mg/kg	0.1	<0.1
	Benzo(b&j&k)fluoranthene	mg/kg	0.2	<0.2
	Benzo(a)pyrene	mg/kg	0.1	<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
LB292223.001		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	0.1	<0.1
	Surrogates	d5-nitrobenzene (Surrogate)	%	-	92
		2-fluorobiphenyl (Surrogate)	%	-	98
		d14-p-terphenyl (Surrogate)	%	-	105

PAH (Polynuclear Aromatic Hydrocarbons) in Water

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

Sample Number		Parameter	Units	LOR	Result
LB292157.001		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)	%	-	48
		2-fluorobiphenyl (Surrogate)	%	-	50
		d14-p-terphenyl (Surrogate)	%	-	69

PCBs in Soil

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

Sample Number		Parameter	Units	LOR	Result
LB292223.001		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	<1.0
	Surrogates	TCMX (Surrogate)	%	-	85

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

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

Sample Number	Parameter	Units	LOR	Result
LB292271.001	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
	Lead, Pb	mg/kg	1	<1
	Zinc, Zn	mg/kg	2	<2

TRH (Total Recoverable Hydrocarbons) in Water

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

Sample Number	Parameter	Units	LOR	Result
LB292157.001	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

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.

VOC's in Soil (continued)

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

Sample Number		Parameter	Units	LOR	Result
LB292224.001	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)	%	-	82
		Bromofluorobenzene (Surrogate)	%	-	86
	Totals	Total BTEX*	mg/kg	0.3	<0.3

VOCs in Water

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

Sample Number		Parameter	Units	LOR	Result
LB292470.001	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)	%	-	111
		d8-toluene (Surrogate)	%	-	104
		Bromofluorobenzene (Surrogate)	%	-	99

Volatile Petroleum Hydrocarbons in Soil

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

Sample Number		Parameter	Units	LOR	Result
LB292224.001		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
LB292470.001		TRH C6-C9	µg/L	40	<40
	Surrogates	d4-1,2-dichloroethane (Surrogate)	%	-	111
		d8-toluene (Surrogate)	%	-	104
		Bromofluorobenzene (Surrogate)	%	-	99

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 %
SE254531.002	LB292297.014	Mercury	µg/L	0.0001	<0.0001	<0.0001	200	0
SE254581.024	LB292297.021	Mercury	µg/L	0.0001	<0.0001	<0.0001	200	0

Mercury in Soil

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

Original	Duplicate	Parameter	Units	LOR	Original	Duplicate	Criteria %	RPD %
SE254370.067	LB292279.014	Mercury	mg/kg	0.05	0.011760404	90.0173883215	200	0

Moisture Content

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

Original	Duplicate	Parameter	Units	LOR	Original	Duplicate	Criteria %	RPD %
SE254370.067	LB292357.011	% Moisture	%w/w	1	8.895265432	8.9262613195	41	0
SE254502.010	LB292357.022	% Moisture	%w/w	1	10.4	11.9	39	13

OC Pesticides in Soil

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

Original	Duplicate		Parameter	Units	LOR	Original	Duplicate	Criteria %	RPD %
SE254370.067	LB292223.014		Alpha BHC	mg/kg	0.1	<0.1	<0.1	200	0
			Hexachlorobenzene (HCB)	mg/kg	0.1	<0.1	<0.1	200	0
			Beta BHC	mg/kg	0.1	<0.1	<0.1	200	0
			Lindane (gamma BHC)	mg/kg	0.1	<0.1	<0.1	200	0
			Delta BHC	mg/kg	0.1	<0.1	<0.1	200	0
			Heptachlor	mg/kg	0.1	<0.1	<0.1	200	0
			Aldrin	mg/kg	0.1	<0.1	<0.1	200	0
			Isodrin	mg/kg	0.1	<0.1	<0.1	200	0
			Heptachlor epoxide	mg/kg	0.1	<0.1	<0.1	200	0
			Gamma Chlordane	mg/kg	0.1	<0.1	<0.1	200	0
			Alpha Chlordane	mg/kg	0.1	<0.1	<0.1	200	0
			Alpha Endosulfan	mg/kg	0.1	<0.2	<0.2	200	0
			o,p'-DDE*	mg/kg	0.1	<0.1	<0.1	200	0
			p,p'-DDE	mg/kg	0.1	<0.1	<0.1	200	0
			Dieldrin	mg/kg	0.05	<0.2	<0.2	200	0
			Endrin	mg/kg	0.1	<0.2	<0.2	200	0
			Beta Endosulfan	mg/kg	0.1	<0.2	<0.2	200	0
			o,p'-DDD*	mg/kg	0.1	<0.1	<0.1	200	0
			p,p'-DDD	mg/kg	0.1	<0.1	<0.1	200	0
			Endrin aldehyde	mg/kg	0.1	<0.1	<0.1	200	0
			Endosulfan sulphate	mg/kg	0.1	<0.1	<0.1	200	0
			o,p'-DDT*	mg/kg	0.1	<0.1	<0.1	200	0
			p,p'-DDT	mg/kg	0.1	<0.1	<0.1	200	0
			Endrin ketone	mg/kg	0.1	<0.1	<0.1	200	0
			Methoxychlor	mg/kg	0.1	<0.1	<0.1	161	0
			Mirex	mg/kg	0.1	<0.1	<0.1	187	0
			Total CLP OC Pesticides	mg/kg	1	<1	<1	200	0
			Total OC VIC EPA	mg/kg	1	<1	<1	200	0
			Total Other OC VIC EPA	mg/kg	1	<1	<1	200	0
		Surrogates	Tetrachloro-m-xylene (TCMX) (Surrogate)	mg/kg	-	0.15	0.15	30	3
SE254502.010	LB292223.030		Alpha BHC	mg/kg	0.1	<0.1	<0.1	200	0
			Hexachlorobenzene (HCB)	mg/kg	0.1	<0.1	<0.1	200	0
			Beta BHC	mg/kg	0.1	<0.1	<0.1	200	0
			Lindane (gamma BHC)	mg/kg	0.1	<0.1	<0.1	200	0
			Delta BHC	mg/kg	0.1	<0.1	<0.1	200	0
			Heptachlor	mg/kg	0.1	<0.1	<0.1	200	0
			Aldrin	mg/kg	0.1	<0.1	<0.1	200	0
			Isodrin	mg/kg	0.1	<0.1	<0.1	200	0
			Heptachlor epoxide	mg/kg	0.1	<0.1	<0.1	200	0
			Gamma Chlordane	mg/kg	0.1	<0.1	<0.1	200	0
			Alpha Chlordane	mg/kg	0.1	<0.1	<0.1	200	0
			Alpha Endosulfan	mg/kg	0.1	<0.1	<0.2	200	0
			o,p'-DDE*	mg/kg	0.1	<0.1	<0.1	200	0

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 %
SE254502.010	LB292223.030		p,p'-DDE	mg/kg	0.1	<0.1	<0.1	200	0
			Dieldrin	mg/kg	0.05	<0.05	<0.2	200	0
			Endrin	mg/kg	0.1	<0.1	<0.2	200	0
			Beta Endosulfan	mg/kg	0.1	<0.1	<0.2	200	0
			o,p'-DDD*	mg/kg	0.1	<0.1	<0.1	200	0
			p,p'-DDD	mg/kg	0.1	<0.1	<0.1	200	0
			Endrin aldehyde	mg/kg	0.1	<0.1	<0.1	200	0
			Endosulfan sulphate	mg/kg	0.1	<0.1	<0.1	200	0
			o,p'-DDT*	mg/kg	0.1	<0.1	<0.1	200	0
			p,p'-DDT	mg/kg	0.1	<0.1	<0.1	200	0
			Endrin ketone	mg/kg	0.1	<0.1	<0.1	200	0
			Methoxychlor	mg/kg	0.1	<0.1	<0.1	200	0
			Mirex	mg/kg	0.1	<0.1	<0.1	200	0
			Total CLP OC Pesticides	mg/kg	1	<1	<1	200	0
			Total OC VIC EPA	mg/kg	1	<1	<1	200	0
			Total Other OC VIC EPA	mg/kg	1	<1	<1	200	0
		Surrogates	Tetrachloro-m-xylene (TCMX) (Surrogate)	mg/kg	-	0.16	0.14	30	10

PAH (Polynuclear Aromatic Hydrocarbons) in Soil

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

Original	Duplicate		Parameter	Units	LOR	Original	Duplicate	Criteria %	RPD %
SE254502.010	LB292223.030		Naphthalene	mg/kg	0.1	<0.1	<0.1	200	0
			2-methylnaphthalene	mg/kg	0.1	<0.1	<0.1	200	0
			1-methylnaphthalene	mg/kg	0.1	<0.1	<0.1	200	0
			Acenaphthylene	mg/kg	0.1	<0.1	<0.1	200	0
			Acenaphthene	mg/kg	0.1	<0.1	<0.1	200	0
			Fluorene	mg/kg	0.1	<0.1	<0.1	200	0
			Phenanthrene	mg/kg	0.1	<0.1	<0.1	200	0
			Anthracene	mg/kg	0.1	<0.1	<0.1	200	0
			Fluoranthene	mg/kg	0.1	<0.1	<0.1	200	0
			Pyrene	mg/kg	0.1	<0.1	<0.1	200	0
			Benzo(a)anthracene	mg/kg	0.1	<0.1	<0.1	200	0
			Chrysene	mg/kg	0.1	<0.1	<0.1	200	0
			Benzo(b&j)fluoranthene	mg/kg	0.1	<0.1	<0.1	200	0
			Benzo(k)fluoranthene	mg/kg	0.1	<0.1	<0.1	200	0
			Benzo(b&j&k)fluoranthene	mg/kg	0.2	<0.2	<0.2	200	0
			Benzo(a)pyrene	mg/kg	0.1	<0.1	<0.1	200	0
			Indeno(1,2,3-cd)pyrene	mg/kg	0.1	<0.1	<0.1	200	0
			Dibenzo(ah)anthracene	mg/kg	0.1	<0.1	<0.1	200	0
			Benzo(ghi)perylene	mg/kg	0.1	<0.1	<0.1	200	0
			Carcinogenic PAHs, BaP TEQ <LOR=0*	mg/kg	0.2	<0.2	<0.2	200	0
			Carcinogenic PAHs, BaP TEQ <LOR=LOR/2*	mg/kg	0.2	<0.2	<0.2	175	0
			Carcinogenic PAHs, BaP TEQ <LOR=LOR*	mg/kg	0.3	<0.3	<0.3	134	0
			Total PAH (18)	mg/kg	0.1	<0.1	<0.8	200	0
		Surrogates	d5-nitrobenzene (Surrogate)	mg/kg	-	0.46	0.5	30	2
			2-fluorobiphenyl (Surrogate)	mg/kg	-	0.49	0.5	30	1
			d14-p-terphenyl (Surrogate)	mg/kg	-	0.53	0.5	30	3

PAH (Polynuclear Aromatic Hydrocarbons) in Water

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

Original	Duplicate	Parameter	Units	LOR	Original	Duplicate	Criteria %	RPD %
SE254453.001	LB292157.025	Naphthalene	µg/L	0.1	<0.1	<0.1	200	0
		2-methylnaphthalene	µg/L	0.1	<0.1	<0.1	200	0
		1-methylnaphthalene	µg/L	0.1	<0.1	<0.1	200	0
		Acenaphthylene	µg/L	0.1	<0.1	<0.1	200	0
		Acenaphthene	µg/L	0.1	<0.1	<0.1	200	0
		Fluorene	µg/L	0.1	<0.1	<0.1	200	0
		Phenanthrene	µg/L	0.1	<0.1	<0.1	200	0
		Anthracene	µg/L	0.1	<0.1	<0.1	200	0
		Fluoranthene	µg/L	0.1	<0.1	<0.1	200	0
		Pyrene	µg/L	0.1	<0.1	<0.1	200	0
		Benzo(a)anthracene	µg/L	0.1	<0.1	<0.1	200	0
		Chrysene	µg/L	0.1	<0.1	<0.1	200	0
		Benzo(b&j)fluoranthene	µg/L	0.1	<0.1	<0.1	200	0

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 Water (continued)

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

Original	Duplicate		Parameter	Units	LOR	Original	Duplicate	Criteria %	RPD %
SE254453.001	LB292157.025		Benzo(k)fluoranthene	µg/L	0.1	<0.1	<0.1	200	0
			Benzo(a)pyrene	µg/L	0.1	<0.1	<0.1	200	0
			Indeno(1,2,3-cd)pyrene	µg/L	0.1	<0.1	<0.1	200	0
			Dibenzo(ah)anthracene	µg/L	0.1	<0.1	<0.1	200	0
			Benzo(ghi)perylene	µg/L	0.1	<0.1	<0.1	200	0
		Surrogates	d5-nitrobenzene (Surrogate)	µg/L	-	0.4	0.4	30	9
			2-fluorobiphenyl (Surrogate)	µg/L	-	0.4	0.4	30	4
			d14-p-terphenyl (Surrogate)	µg/L	-	0.5	0.5	30	1

PCBs in Soil

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

Original	Duplicate		Parameter	Units	LOR	Original	Duplicate	Criteria %	RPD %
SE254370.067	LB292223.014		Arochlor 1016	mg/kg	0.2	0	0	200	0
			Arochlor 1221	mg/kg	0.2	0	0	200	0
			Arochlor 1232	mg/kg	0.2	0	0	200	0
			Arochlor 1242	mg/kg	0.2	0	0	200	0
			Arochlor 1248	mg/kg	0.2	0	0	200	0
			Arochlor 1254	mg/kg	0.2	0	0	200	0
			Arochlor 1260	mg/kg	0.2	0	0	200	0
			Arochlor 1262	mg/kg	0.2	0	0	200	0
			Arochlor 1268	mg/kg	0.2	0	0	200	0
			Total PCBs (Arochlors)	mg/kg	1	0	0	200	0
		Surrogates	TCMX (Surrogate)	mg/kg	-	0.14372433840	0.1398303473	30	3
SE254502.010	LB292223.031		Arochlor 1016	mg/kg	0.2	<0.2	0	200	0
			Arochlor 1221	mg/kg	0.2	<0.2	0	200	0
			Arochlor 1232	mg/kg	0.2	<0.2	0	200	0
			Arochlor 1242	mg/kg	0.2	<0.2	0	200	0
			Arochlor 1248	mg/kg	0.2	<0.2	0	200	0
			Arochlor 1254	mg/kg	0.2	<0.2	0	200	0
			Arochlor 1260	mg/kg	0.2	<0.2	0	200	0
			Arochlor 1262	mg/kg	0.2	<0.2	0	200	0
			Arochlor 1268	mg/kg	0.2	<0.2	0	200	0
			Total PCBs (Arochlors)	mg/kg	1	<1.0	0	200	0
		Surrogates	TCMX (Surrogate)	mg/kg	-	0.15	0.1369491844	30	11

pH in soil (1:5)

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

Original	Duplicate	Parameter	Units	LOR	Original	Duplicate	Criteria %	RPD %
SE254502.008	LB292565.011	pH	pH Units	0.1	8.3	8.3	31	0

TRH (Total Recoverable Hydrocarbons) in Soil

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

Original	Duplicate		Parameter	Units	LOR	Original	Duplicate	Criteria %	RPD %
SE254370.067	LB292223.013		TRH C10-C14	mg/kg	20	45	44	75	2
			TRH C15-C28	mg/kg	45	490	450	40	8
			TRH C29-C36	mg/kg	45	670	550	37	19
			TRH C37-C40	mg/kg	100	370	280	61	30
			TRH C10-C36 Total	mg/kg	110	1200	1000	40	14
			TRH >C10-C40 Total (F bands)	mg/kg	210	1600	1300	44	17
		TRH F Bands	TRH >C10-C16	mg/kg	25	66	64	69	3
			TRH >C10-C16 - Naphthalene (F2)	mg/kg	25	66	64	69	3
			TRH >C16-C34 (F3)	mg/kg	90	880	780	41	12
			TRH >C34-C40 (F4)	mg/kg	120	630	480	52	27
SE254502.010	LB292223.029		TRH C10-C14	mg/kg	20	<20	<20	200	0
			TRH C15-C28	mg/kg	45	<45	<45	200	0
			TRH C29-C36	mg/kg	45	<45	<45	200	0
			TRH C37-C40	mg/kg	100	<100	<100	200	0
			TRH C10-C36 Total	mg/kg	110	<110	<110	200	0
			TRH >C10-C40 Total (F bands)	mg/kg	210	<210	<210	200	0
		TRH F Bands	TRH >C10-C16	mg/kg	25	<25	<25	200	0
			TRH >C10-C16 - Naphthalene (F2)	mg/kg	25	<25	<25	200	0
			TRH >C16-C34 (F3)	mg/kg	90	<90	<90	200	0
			TRH >C34-C40 (F4)	mg/kg	120	<120	<120	200	0

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

TRH (Total Recoverable Hydrocarbons) in Water

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

Original	Duplicate		Parameter	Units	LOR	Original	Duplicate	Criteria %	RPD %
SE254431.001	LB292157.026		TRH C10-C14	µg/L	50	<0.05	<0.05	153	0
			TRH C15-C28	µg/L	200	0.5	0.4	74	5
			TRH C29-C36	µg/L	200	<0.2	<0.2	200	0
			TRH C37-C40	µg/L	200	<200	<200	200	0
			TRH C10-C40	µg/L	320	0.53	0.55	89	4
		TRH F Bands	TRH >C10-C16	µg/L	60	<0.06	0.07	135	12
			TRH >C10-C16 - Naphthalene (F2)	µg/L	60	<0.06	0.07	135	12
			TRH >C16-C34 (F3)	µg/L	500	<0.5	<0.5	137	0
			TRH >C34-C40 (F4)	µg/L	500	<0.5	<0.5	200	0
SE254453.001	LB292157.025		TRH C10-C14	µg/L	50	<0.05	<0.05	200	0
			TRH C15-C28	µg/L	200	<0.2	<0.2	200	0
			TRH C29-C36	µg/L	200	<0.2	<0.2	200	0
			TRH C37-C40	µg/L	200	<200	<200	200	0
			TRH C10-C40	µg/L	320	<0.32	<0.32	200	0
		TRH F Bands	TRH >C10-C16	µg/L	60	<0.06	<0.06	200	0
			TRH >C10-C16 - Naphthalene (F2)	µg/L	60	<0.06	<0.06	200	0
			TRH >C16-C34 (F3)	µg/L	500	<0.5	<0.5	200	0
			TRH >C34-C40 (F4)	µg/L	500	<0.5	<0.5	200	0

VOC's in Soil

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

Original	Duplicate		Parameter	Units	LOR	Original	Duplicate	Criteria %	RPD %
SE254370.067	LB292224.014	Monocyclic	Benzene	mg/kg	0.1	<0.1	<0.1	200	0
		Aromatic	Toluene	mg/kg	0.1	<0.1	<0.1	200	0
			Ethylbenzene	mg/kg	0.1	<0.1	<0.1	200	0
			m/p-xylene	mg/kg	0.2	<0.2	<0.2	200	0
			o-xylene	mg/kg	0.1	<0.1	<0.1	200	0
		Polycyclic	Naphthalene (VOC)*	mg/kg	0.1	0.1	0.1	109	6
		Surrogates	d4-1,2-dichloroethane (Surrogate)	mg/kg	-	9.4	8.9	50	5
			d8-toluene (Surrogate)	mg/kg	-	9.0	8.7	50	3
			Bromofluorobenzene (Surrogate)	mg/kg	-	9.2	8.9	50	3
		Totals	Total BTEX*	mg/kg	0.3	<0.6	<0.6	200	0
			Total Xylenes*	mg/kg	0.3	<0.3	<0.3	200	0
SE254460.017	LB292224.024	Monocyclic	Benzene	mg/kg	0.1	<0.1	<0.1	200	0
		Aromatic	Toluene	mg/kg	0.1	<0.1	<0.1	200	0
			Ethylbenzene	mg/kg	0.1	<0.1	<0.1	200	0
			m/p-xylene	mg/kg	0.2	<0.2	<0.2	200	0
			o-xylene	mg/kg	0.1	<0.1	<0.1	200	0
		Polycyclic	Naphthalene (VOC)*	mg/kg	0.1	<0.1	<0.1	200	0
		Surrogates	d4-1,2-dichloroethane (Surrogate)	mg/kg	-	8.5	9.0	50	6
			d8-toluene (Surrogate)	mg/kg	-	8.1	8.6	50	5
			Bromofluorobenzene (Surrogate)	mg/kg	-	8.2	8.7	50	6
		Totals	Total BTEX*	mg/kg	0.3	<0.6	<0.6	200	0
			Total Xylenes*	mg/kg	0.3	<0.3	<0.3	200	0

VOCs in Water

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

Original	Duplicate		Parameter	Units	LOR	Original	Duplicate	Criteria %	RPD %
SE254456.009	LB292470.024	Monocyclic	Benzene	µg/L	0.5	<0.5	<0.5	200	0
		Aromatic	Toluene	µg/L	0.5	<0.5	<0.5	200	0
			Ethylbenzene	µg/L	0.5	<0.5	<0.5	200	0
			m/p-xylene	µg/L	1	<1	<1	200	0
			o-xylene	µg/L	0.5	<0.5	<0.5	200	0
		Polycyclic	Naphthalene (VOC)*	µg/L	0.5	<0.5	<0.5	200	0
		Surrogates	d4-1,2-dichloroethane (Surrogate)	µg/L	-	10.6	10.4	30	2
			d8-toluene (Surrogate)	µg/L	-	7.8	7.8	30	0
			Bromofluorobenzene (Surrogate)	µg/L	-	11.3	11.4	30	1
		Totals	Total BTEX	µg/L	3	<3	<3	200	0
SE254493.001	LB292470.023	Monocyclic	Benzene	µg/L	0.5	<0.5	<0.5	200	0
		Aromatic	Toluene	µg/L	0.5	<0.5	<0.5	200	0
			Ethylbenzene	µg/L	0.5	<0.5	<0.5	200	0
			m/p-xylene	µg/L	1	<1	<1	200	0
			o-xylene	µg/L	0.5	<0.5	<0.5	200	0
		Polycyclic	Naphthalene (VOC)*	µg/L	0.5	<0.5	<0.5	200	0

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 %
SE254493.001	LB292470.023	Surrogates	d4-1,2-dichloroethane (Surrogate)	µg/L	-	10.3	12.8	30	22
			d8-toluene (Surrogate)	µg/L	-	11.3	11.0	30	2
			Bromofluorobenzene (Surrogate)	µg/L	-	9.7	9.2	30	5
		Totals	Total BTEX	µg/L	3	<3	<3	200	0

Volatile Petroleum Hydrocarbons in Soil

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

Original	Duplicate		Parameter	Units	LOR	Original	Duplicate	Criteria %	RPD %
SE254370.067	LB292224.014		TRH C6-C10	mg/kg	25	<25	<25	200	0
			TRH C6-C9	mg/kg	20	<20	<20	200	0
		Surrogates	d4-1,2-dichloroethane (Surrogate)	mg/kg	-	9.4	8.9	50	5
			d8-toluene (Surrogate)	mg/kg	-	9.0	8.7	50	3
			Bromofluorobenzene (Surrogate)	mg/kg	-	9.2	8.9	50	3
		VPH F Bands	Benzene (F0)	mg/kg	0.1	<0.1	<0.1	200	0
			TRH C6-C10 minus BTEX (F1)	mg/kg	25	<25	<25	200	0
SE254460.017	LB292224.024		TRH C6-C10	mg/kg	25	<25	<25	200	0
			TRH C6-C9	mg/kg	20	<20	<20	200	0
		Surrogates	d4-1,2-dichloroethane (Surrogate)	mg/kg	-	8.5	9.0	50	6
			d8-toluene (Surrogate)	mg/kg	-	8.1	8.6	50	5
			Bromofluorobenzene (Surrogate)	mg/kg	-	8.2	8.7	50	6
		VPH F Bands	Benzene (F0)	mg/kg	0.1	<0.1	<0.1	200	0
			TRH C6-C10 minus BTEX (F1)	mg/kg	25	<25	<25	200	0

Volatile Petroleum Hydrocarbons in Water

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

Original	Duplicate		Parameter	Units	LOR	Original	Duplicate	Criteria %	RPD %
SE254456.009	LB292470.024		TRH C6-C10	µg/L	50	<50	<50	200	0
			TRH C6-C9	µg/L	40	<40	<40	200	0
		Surrogates	d4-1,2-dichloroethane (Surrogate)	µg/L	-	10.6	10.4	30	2
			d8-toluene (Surrogate)	µg/L	-	7.8	7.8	30	0
			Bromofluorobenzene (Surrogate)	µg/L	-	11.3	11.4	30	1
		VPH F Bands	Benzene (F0)	µg/L	0.5	<0.5	<0.5	200	0
			TRH C6-C10 minus BTEX (F1)	µg/L	50	<50	<50	200	0

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.

Mercury in Soil

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

Sample Number	Parameter	Units	LOR	Result	Expected	Criteria %	Recovery %
LB292279.002	Mercury	mg/kg	0.05	0.19	0.2	80 - 120	97

Metals in Water (Dissolved) by ICPOES

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

Sample Number	Parameter	Units	LOR	Result	Expected	Criteria %	Recovery %
LB292295.002	Arsenic, As	mg/L	0.02	0.51	0.5	80 - 120	102
	Cadmium, Cd	mg/L	0.001	0.48	0.5	80 - 120	96
	Chromium, Cr	mg/L	0.005	0.52	0.5	80 - 120	105
	Copper, Cu	mg/L	0.005	0.51	0.5	80 - 120	102
	Lead, Pb	mg/L	0.02	0.49	0.5	80 - 120	97
	Nickel, Ni	mg/L	0.005	0.48	0.5	80 - 120	97
	Zinc, Zn	mg/L	0.01	0.50	0.5	80 - 120	100

OC Pesticides in Soil

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

Sample Number		Parameter	Units	LOR	Result	Expected	Criteria %	Recovery %
LB292223.002		Delta BHC	mg/kg	0.1	0.1	0.2	60 - 140	67
		Heptachlor	mg/kg	0.1	0.2	0.2	60 - 140	75
		Aldrin	mg/kg	0.1	0.1	0.2	60 - 140	70
		Dieldrin	mg/kg	0.05	0.15	0.2	60 - 140	75
		Endrin	mg/kg	0.1	0.2	0.2	60 - 140	78
		p,p'-DDT	mg/kg	0.1	0.2	0.2	60 - 140	82
	Surrogates	Tetrachloro-m-xylene (TCMX) (Surrogate)	mg/kg	-	0.13	0.15	40 - 130	87

PAH (Polynuclear Aromatic Hydrocarbons) in Soil

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

Sample Number		Parameter	Units	LOR	Result	Expected	Criteria %	Recovery %
LB292223.002		Naphthalene	mg/kg	0.1	4.1	4	60 - 140	101
		Acenaphthylene	mg/kg	0.1	4.1	4	60 - 140	102
		Acenaphthene	mg/kg	0.1	4.2	4	60 - 140	106
		Phenanthrene	mg/kg	0.1	4.1	4	60 - 140	101
		Anthracene	mg/kg	0.1	4.0	4	60 - 140	101
		Fluoranthene	mg/kg	0.1	4.0	4	60 - 140	99
		Pyrene	mg/kg	0.1	4.0	4	60 - 140	99
		Benzo(a)pyrene	mg/kg	0.1	4.2	4	60 - 140	104
	Surrogates	d5-nitrobenzene (Surrogate)	mg/kg	-	0.49	0.5	40 - 130	99
		2-fluorobiphenyl (Surrogate)	mg/kg	-	0.56	0.5	40 - 130	111
		d14-p-terphenyl (Surrogate)	mg/kg	-	0.53	0.5	40 - 130	106

PAH (Polynuclear Aromatic Hydrocarbons) in Water

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

Sample Number		Parameter	Units	LOR	Result	Expected	Criteria %	Recovery %
LB292157.002		Naphthalene	µg/L	0.1	27	40	60 - 140	68
		Acenaphthylene	µg/L	0.1	30	40	60 - 140	74
		Acenaphthene	µg/L	0.1	31	40	60 - 140	77
		Phenanthrene	µg/L	0.1	32	40	60 - 140	79
		Anthracene	µg/L	0.1	32	40	60 - 140	79
		Fluoranthene	µg/L	0.1	32	40	60 - 140	79
		Pyrene	µg/L	0.1	33	40	60 - 140	82
		Benzo(a)pyrene	µg/L	0.1	33	40	60 - 140	84
	Surrogates	d5-nitrobenzene (Surrogate)	µg/L	-	0.2	0.5	40 - 130	49
		2-fluorobiphenyl (Surrogate)	µg/L	-	0.3	0.5	40 - 130	55
		d14-p-terphenyl (Surrogate)	µg/L	-	0.3	0.5	40 - 130	63

PCBs in Soil

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

Sample Number	Parameter	Units	LOR	Result	Expected	Criteria %	Recovery %
LB292223.002	Arochlor 1260	mg/kg	0.2	0.4	0.4	60 - 140	108

pH in soil (1:5)

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

Sample Number	Parameter	Units	LOR	Result	Expected	Criteria %	Recovery %
LB292565.003	pH	pH Units	0.1	7.4	7.415	98 - 102	100

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.

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 %
LB292271.002		Arsenic, As	mg/kg	1	350	318.22	80 - 120	109
		Cadmium, Cd	mg/kg	0.3	4.4	4.81	70 - 130	92
		Chromium, Cr	mg/kg	0.5	44	38.31	80 - 120	114
		Copper, Cu	mg/kg	0.5	330	290	80 - 120	113
		Nickel, Ni	mg/kg	0.5	190	187	80 - 120	102
		Lead, Pb	mg/kg	1	92	89.9	80 - 120	102
		Zinc, Zn	mg/kg	2	290	273	80 - 120	105

TRH (Total Recoverable Hydrocarbons) in Soil

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

Sample Number		Parameter	Units	LOR	Result	Expected	Criteria %	Recovery %
LB292223.001		TRH C10-C14	mg/kg	20	36	40	60 - 140	89
		TRH C15-C28	mg/kg	45	<45	40	60 - 140	79
		TRH C29-C36	mg/kg	45	<45	40	60 - 140	86
	TRH F Bands	TRH >C10-C16	mg/kg	25	36	40	60 - 140	90
		TRH >C16-C34 (F3)	mg/kg	90	<90	40	60 - 140	76
		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 %
LB292157.002		TRH C10-C14	µg/L	50	900	1200	60 - 140	75
		TRH C15-C28	µg/L	200	1100	1200	60 - 140	95
		TRH C29-C36	µg/L	200	1200	1200	60 - 140	101
	TRH F Bands	TRH >C10-C16	µg/L	60	1000	1200	60 - 140	86
		TRH >C16-C34 (F3)	µg/L	500	1200	1200	60 - 140	98
		TRH >C34-C40 (F4)	µg/L	500	630	600	60 - 140	105

VOC's in Soil

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

Sample Number		Parameter	Units	LOR	Result	Expected	Criteria %	Recovery %
LB292224.002	Monocyclic Aromatic	Benzene	mg/kg	0.1	4.0	5	60 - 140	80
		Toluene	mg/kg	0.1	4.0	5	60 - 140	80
		Ethylbenzene	mg/kg	0.1	4.0	5	60 - 140	80
		m/p-xylene	mg/kg	0.2	8.1	10	60 - 140	81
		o-xylene	mg/kg	0.1	4.1	5	60 - 140	82
	Surrogates	d4-1,2-dichloroethane (Surrogate)	mg/kg	-	9.3	10	70 - 130	93
		d8-toluene (Surrogate)	mg/kg	-	8.8	10	70 - 130	88
		Bromofluorobenzene (Surrogate)	mg/kg	-	8.4	10	70 - 130	84

VOCs in Water

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

Sample Number		Parameter	Units	LOR	Result	Expected	Criteria %	Recovery %
LB292470.002	Monocyclic Aromatic	Benzene	µg/L	0.5	57	45.45	60 - 140	125
		Toluene	µg/L	0.5	50	45.45	60 - 140	111
		Ethylbenzene	µg/L	0.5	50	45.45	60 - 140	110
		m/p-xylene	µg/L	1	100	90.9	60 - 140	110
		o-xylene	µg/L	0.5	50	45.45	60 - 140	110
	Surrogates	d4-1,2-dichloroethane (Surrogate)	µg/L	-	10.2	10	60 - 140	102
		d8-toluene (Surrogate)	µg/L	-	11.4	10	70 - 130	114
		Bromofluorobenzene (Surrogate)	µg/L	-	9.3	10	70 - 130	93

Volatile Petroleum Hydrocarbons in Soil

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

Sample Number		Parameter	Units	LOR	Result	Expected	Criteria %	Recovery %
LB292224.002		TRH C6-C10	mg/kg	25	74	92.5	60 - 140	80
		TRH C6-C9	mg/kg	20	65	80	60 - 140	82
	Surrogates	d4-1,2-dichloroethane (Surrogate)	mg/kg	-	9.3	10	70 - 130	93
		Bromofluorobenzene (Surrogate)	mg/kg	-	8.4	10	70 - 130	84
	VPH F Bands	TRH C6-C10 minus BTEX (F1)	mg/kg	25	50	62.5	60 - 140	80

Volatile Petroleum Hydrocarbons in Water

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

Sample Number		Parameter	Units	LOR	Result	Expected	Criteria %	Recovery %
LB292470.002		TRH C6-C10	µg/L	50	840	946.63	60 - 140	88
		TRH C6-C9	µg/L	40	710	818.71	60 - 140	87
	Surrogates	d4-1,2-dichloroethane (Surrogate)	µg/L	-	10.2	10	60 - 140	102
		d8-toluene (Surrogate)	µg/L	-	11.4	10	70 - 130	114
		Bromofluorobenzene (Surrogate)	µg/L	-	9.3	10	70 - 130	93
	VPH F Bands	TRH C6-C10 minus BTEX (F1)	µg/L	50	530	639.67	60 - 140	83

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 (dissolved) in Water

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

QC Sample	Sample Number	Parameter	Units	LOR	Result	Original	Spike	Recovery%
SE254477.066	LB292297.004	Mercury	mg/L	0.0001	0.0019	-0.006	0.008	97

Mercury in Soil

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

QC Sample	Sample Number	Parameter	Units	LOR	Result	Original	Spike	Recovery%
SE254370.058	LB292279.004	Mercury	mg/kg	0.05	0.19	0.01098337950	0.2	91

OC Pesticides in Soil

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

QC Sample	Sample Number		Parameter	Units	LOR	Result	Original	Spike	Recovery%
SE254370.058	LB292223.004		Alpha BHC	mg/kg	0.1	<0.1	0.00014965359	-	-
			Hexachlorobenzene (HCB)	mg/kg	0.1	<0.1	0.02857946759	-	-
			Beta BHC	mg/kg	0.1	<0.1	0.00062681615	-	-
			Lindane (gamma BHC)	mg/kg	0.1	<0.1	0.03288181862	-	-
			Delta BHC	mg/kg	0.1	0.1	0	0.2	60
			Heptachlor	mg/kg	0.1	0.2	0.01191461530	0.2	84
			Aldrin	mg/kg	0.1	0.1	0.00395206690	0.2	73
			Isodrin	mg/kg	0.1	<0.1	4.89975010529	-	-
			Heptachlor epoxide	mg/kg	0.1	<0.1	0.00677866437	-	-
			Gamma Chlordane	mg/kg	0.1	<0.1	0.00143038688	-	-
			Alpha Chlordane	mg/kg	0.1	<0.1	0.00209478153	-	-
			Alpha Endosulfan	mg/kg	0.1	<0.1	0.00182633518	-	-
			o,p'-DDE*	mg/kg	0.1	<0.1	0.00182633518	-	-
			p,p'-DDE	mg/kg	0.1	<0.1	0.00018161551	-	-
			Dieldrin	mg/kg	0.05	0.19	0.03649861721	0.2	76
			Endrin	mg/kg	0.1	0.2	0.00864987401	0.2	80
			Beta Endosulfan	mg/kg	0.1	<0.1	0.00060000599	-	-
			o,p'-DDD*	mg/kg	0.1	<0.1	0.00648646928	-	-
			p,p'-DDD	mg/kg	0.1	<0.1	0.00999623072	-	-
			Endrin aldehyde	mg/kg	0.1	<0.1	0.00666783817	-	-
			Endosulfan sulphate	mg/kg	0.1	<0.1	0.00139924744	-	-
			o,p'-DDT*	mg/kg	0.1	<0.1	0.00999623072	-	-
			p,p'-DDT	mg/kg	0.1	0.2	0.00757323452	0.2	79
			Endrin ketone	mg/kg	0.1	<0.1	0.01585553921	-	-
			Methoxychlor	mg/kg	0.1	<0.1	0.04861409480	-	-
			Mirex	mg/kg	0.1	<0.1	0.05054668174	-	-
			Total CLP OC Pesticides	mg/kg	1	<1	0	-	-
			Total OC VIC EPA	mg/kg	1	<1	0	-	-
			Total Other OC VIC EPA	mg/kg	1	<1	0	-	-
		Surrogates	Tetrachloro-m-xylene (TCMX) (Surrogate)	mg/kg	-	0.14	0.15136500184	-	96

PCBs in Soil

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

QC Sample	Sample Number		Parameter	Units	LOR	Result	Original	Spike	Recovery%
SE254370.058	LB292223.004		Arochlor 1016	mg/kg	0.2	<0.2	0	-	-
			Arochlor 1221	mg/kg	0.2	<0.2	0	-	-
			Arochlor 1232	mg/kg	0.2	<0.2	0	-	-
			Arochlor 1242	mg/kg	0.2	<0.2	0	-	-
			Arochlor 1248	mg/kg	0.2	<0.2	0	-	-
			Arochlor 1254	mg/kg	0.2	<0.2	0	-	-
			Arochlor 1260	mg/kg	0.2	0.4	0	0.4	108
			Arochlor 1262	mg/kg	0.2	<0.2	0	-	-
			Arochlor 1268	mg/kg	0.2	<0.2	0	-	-
			Total PCBs (Arochlors)	mg/kg	1	<1.0	0	-	-
		Surrogates	TCMX (Surrogate)	mg/kg	-	0.14	0.14563841804	-	93

TRH (Total Recoverable Hydrocarbons) in Soil

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

QC Sample	Sample Number	Parameter	Units	LOR	Result	Original	Spike	Recovery%
SE254370.058	LB292223.003	TRH C10-C14	mg/kg	20	69	28.60421248358	40	101
		TRH C15-C28	mg/kg	45	350	99.2846960384	40	135
		TRH C29-C36	mg/kg	45	430	53.4643382382	40	185 ⑤

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.

TRH (Total Recoverable Hydrocarbons) in Soil (continued)

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

QC Sample	Sample Number		Parameter	Units	LOR	Result	Original	Spike	Recovery%
SE254370.058	LB292223.003		TRH C37-C40	mg/kg	100	280	143.5658717062	-	-
			TRH C10-C36 Total	mg/kg	110	850	881.3532467603	-	-
			TRH >C10-C40 Total (F bands)	mg/kg	210	1100	927.7086166166	-	-
		TRH F	TRH >C10-C16	mg/kg	25	80	38.50973334891	40	103
		Bands	TRH >C10-C16 - Naphthalene (F2)	mg/kg	25	80	38.30732767213	-	-
			TRH >C16-C34 (F3)	mg/kg	90	590	510.8726577302	40	200 Ⓢ
			TRH >C34-C40 (F4)	mg/kg	120	450	478.3262255375	-	-

VOC's in Soil

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

QC Sample	Sample Number		Parameter	Units	LOR	Result	Original	Spike	Recovery%
SE254370.058	LB292224.004	Monocyclic	Benzene	mg/kg	0.1	4.3	0.04976027702	5	86
		Aromatic	Toluene	mg/kg	0.1	4.3	0.02538419181	5	86
			Ethylbenzene	mg/kg	0.1	4.4	0.03071904923	5	87
			m/p-xylene	mg/kg	0.2	8.8	0.09953114153	10	87
			o-xylene	mg/kg	0.1	4.4	0.05532819225	5	88
		Polycyclic	Naphthalene (VOC)*	mg/kg	0.1	0.2	0.20240567678	-	-
		Surrogates	d4-1,2-dichloroethane (Surrogate)	mg/kg	-	9.0	9.40375847543	10	90
			d8-toluene (Surrogate)	mg/kg	-	8.7	8.88781265740	10	87
			Bromofluorobenzene (Surrogate)	mg/kg	-	8.5	9.63329924691	10	85
		Totals	Total BTEX*	mg/kg	0.3	26	0	-	-
			Total Xylenes*	mg/kg	0.3	13	0.15485933379	-	-

VOCs in Water

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

QC Sample	Sample Number		Parameter	Units	LOR	Result	Original	Spike	Recovery%
SE254456.001	LB292470.026	Monocyclic	Benzene	µg/L	0.5	55	<0.5	45.45	121
		Aromatic	Toluene	µg/L	0.5	57	<0.5	45.45	126
			Ethylbenzene	µg/L	0.5	58	<0.5	45.45	129
			m/p-xylene	µg/L	1	120	<1	90.9	127
			o-xylene	µg/L	0.5	60	<0.5	45.45	132
		Polycyclic	Naphthalene (VOC)*	µg/L	0.5	<0.5	<0.5	-	-
		Surrogates	d4-1,2-dichloroethane (Surrogate)	µg/L	-	11.7	10.6	-	117
			d8-toluene (Surrogate)	µg/L	-	9.8	7.1	-	98
			Bromofluorobenzene (Surrogate)	µg/L	-	9.6	10.8	-	96
		Totals	Total BTEX	µg/L	3	350	<3	-	-

Volatile Petroleum Hydrocarbons in Soil

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

QC Sample	Sample Number		Parameter	Units	LOR	Result	Original	Spike	Recovery%
SE254370.058	LB292224.004		TRH C6-C10	mg/kg	25	86	1.01546761006	92.5	92
			TRH C6-C9	mg/kg	20	73	0	80	92
		Surrogates	d4-1,2-dichloroethane (Surrogate)	mg/kg	-	9.0	9.40375847543	10	90
			d8-toluene (Surrogate)	mg/kg	-	8.7	8.88781265740	10	87
			Bromofluorobenzene (Surrogate)	mg/kg	-	8.5	9.63329924691	-	85
		VPH F	Benzene (F0)	mg/kg	0.1	4.3	0.04976027702	-	-
		Bands	TRH C6-C10 minus BTEX (F1)	mg/kg	25	59	1.01546761006	62.5	93

Volatile Petroleum Hydrocarbons in Water

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

QC Sample	Sample Number		Parameter	Units	LOR	Original	Spike	Recovery%
SE254456.001	LB292470.026		TRH C6-C10	µg/L	50	<50	946.63	79
			TRH C6-C9	µg/L	40	<40	818.71	70
		Surrogates	d4-1,2-dichloroethane (Surrogate)	µg/L	-	10.6	-	117
			d8-toluene (Surrogate)	µg/L	-	7.1	-	98
			Bromofluorobenzene (Surrogate)	µg/L	-	10.8	-	96
		VPH F	Benzene (F0)	µg/L	0.5	<0.5	-	-
		Bands	TRH C6-C10 minus BTEX (F1)	µg/L	50	<50	639.67	62

MATRIX SPIKE DUPLICATES

SE254502 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.

GEOTECHNIQUE PTY LTD

1 LEMKO PLACE PENRITH NSW 2750

CHAIN OF CUSTODY

Results Required By: Normal Turnaround — **Date:** Thursday, 5 October 2023

Except pH Results Required By 3 days — **Date:** Tuesday, 3 October 2023

Your Reference No.: [redacted]

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

Sampled By: JH — Ref No: 20429/8 — Project Manager: JOHN XU

Location: Kingswood

	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	BH1	0.0-0.15	27/09/2023	G		Clay		✓	✓			✓																	
	BH1	0.5-0.8	27/09/2023	G		Clay																							
2	BH1	1.05-1.15	27/09/2023	G		Clay	✓	✓	✓																				
	BH1	1.55-1.65	27/09/2023	G		Clay																							
3	BH2	0.0-0.15	27/09/2023	G		Clay						✓																	
	BH2	0.5-0.8	27/09/2023	G		Clay																							
	BH2	0.85-0.95	27/09/2023	G		Clay																							
	BH2	1.35-1.45	27/09/2023	G		Clay																							
4	BH3	0.0-0.15	27/09/2023	G		Clay	✓	✓	✓									✓											
5	BH3	0.25-0.35	27/09/2023	G		Clay	✓	✓	✓																				
	BH3	1.05-1.15	27/09/2023	G		Clay																							
6	BH4	0.0-0.15	27/09/2023	G		Clay		✓	✓			✓																	
	BH4	0.5-0.8	27/09/2023	G		Clay																							
7	BH4	0.85-0.95	27/09/2023	G		Clay	✓	✓	✓																				
	BH4	1.85-1.95	27/09/2023	G		Clay																							
8	BH5	0.0-0.15	27/09/2023	G		Clay		✓	✓			✓																	
	BH5	0.35-0.45	27/09/2023	G		Clay																							
9	BH5	1.35-0.45	27/09/2023	G		Clay	✓																						
10	DDS1		27/09/2023	G		Clay						✓																	
11	RS1		27/09/2023		Vial+WG						✓																		
12	TS1		27/09/2023	Vial											✓														

Relinquished by			Received by		
Name	Signature	Date	Name	Signature	Date
JOHN XU	JX	28/09/2023	Suba	B. Subary	28/09/23 @ 3:00

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

SGS EHS Sydney COC
SE254502

SAMPLE RECEIPT ADVICE

SE254502

CLIENT DETAILS

Contact	John Xu
Client	Geotechnique
Address	P.O. Box 880 NSW 2751
Telephone	02 4722 2700
Facsimile	02 4722 6161
Email	john.xu@geotech.com.au
Project	**20429/8 Kingswood**
Order Number	**20429/8**
Samples	12

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	Thu 28/9/2023
Report Due	Thu 5/10/2023
SGS Reference	**SE254502**

SUBMISSION DETAILS

This is to confirm that 12 samples were received on Thursday 28/9/2023. Results are expected to be ready by COB Thursday 5/10/2023.
Please quote SGS reference SE254502 when making enquiries. Refer below for details relating to sample integrity upon receipt.

Sample counts by matrix	11 Clay/Sand, 1 Water	Type of documentation received	COC
Date documentation received	28/9/2023	Samples received in good order	Yes
Samples received without headspace	Yes	Sample temperature upon receipt	10.6°C
Sample container provider	SGS	Turnaround time requested	3 Days/Standard
Samples received in correct containers	Yes	Sufficient sample for analysis	Yes
Sample cooling method	Ice Bricks	Samples clearly labelled	Yes
Complete documentation received	Yes		

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

9 Clay samples have been placed on hold as no tests have been assigned for them by the client. These samples will not be processed.

SAMPLE RECEIPT ADVICE

SE254502

CLIENT DETAILS

Client Geotechnique

Project 20429/8 Kingswood

SUMMARY OF ANALYSIS

No.	Sample ID	Exchangeable Cations and Cation Exchange Capacity	OC Pesticides in Soil	PAH (Polynuclear Aromatic Hydrocarbons) in Soil	PCBs in Soil	pH in soil (1:5)	TRH (Total Recoverable Hydrocarbons) in Soil	VOC's in Soil	Volatile Petroleum Hydrocarbons in Soil
001	BH1 0.0-0.15	9	30	27	11	1	10	11	7
002	BH1 1.05-1.15	9	-	-	-	1	-	-	-
003	BH2 0.0-0.15	-	30	27	11	-	10	11	7
004	BH3 0.0-0.15	9	30	-	-	1	-	-	-
005	BH3 0.25-0.35	9	-	-	-	1	-	-	-
006	BH4 0.0-0.15	9	30	27	11	1	10	11	7
007	BH4 0.85-0.95	9	-	-	-	1	-	-	-
008	BH5 0.0-0.15	9	30	27	11	1	10	11	7
010	DDS1	-	30	27	11	-	10	11	7
012	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

SE254502

CLIENT DETAILS

Client Geotechnique

Project 20429/8 Kingswood

SUMMARY OF ANALYSIS

No.	Sample ID	Mercury in Soil	Moisture Content	Total Recoverable Elements in Soil/Waste	VOCs in Water	Volatile Petroleum Hydrocarbons in Water
001	BH1 0.0-0.15	1	1	7	-	-
002	BH1 1.05-1.15	1	1	7	-	-
003	BH2 0.0-0.15	1	1	7	-	-
004	BH3 0.0-0.15	1	1	7	-	-
005	BH3 0.25-0.35	1	1	7	-	-
006	BH4 0.0-0.15	1	1	7	-	-
007	BH4 0.85-0.95	1	1	7	-	-
008	BH5 0.0-0.15	1	1	7	-	-
009	BH5 1.35-0.45	1	1	7	-	-
010	DDS1	1	1	7	-	-
011	RS1	-	-	-	11	7

CONTINUED OVERLEAF

The above table represents SGS' interpretation of the client-supplied Chain Of Custody document.
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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

SE254502

CLIENT DETAILS

Client Geotechnique

Project 20429/8 Kingswood

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
011	RS1	1	7	22	9

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 : ASET112800 / 115980 / 1 - 5
Your ref : 20429/8 - Kingswood Public School
NATA Accreditation No: 14484

Accredited for compliance with ISO/IEC 17025 - Testing.

3 October 2023

Geotechnique Pty Ltd
PO Box 880
Penrith NSW 2751

Attn: Mr John Xu

Dear John

Asbestos Identification
This report presents the results of five samples, forwarded by Geotechnique Pty Ltd on 29 September 2023, for analysis for asbestos.

1.Introduction: Five samples forwarded were examined and analysed for the presence of asbestos on 3 October 2023.

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 AS 4964 - 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. ASET112800 / 115980 / 1. 20429/8 - BH1 - 0.0-0.15.
Approx dimensions 10.0 cm x 10.0 cm x 11.0 cm
Approximate total dry weight of soil = 1104.0g.
The sample consisted of a mixture of clayish sandy soil, organic fibres, stones, fragments of ceramic tiles and plant matter.
No asbestos detected.

Sample No. 2. ASET112800 / 115980 / 2. 20429/8 - BH2 - 0.0-0.15.
Approx dimensions 10.0 cm x 10.0 cm x 11.0 cm
Approximate total dry weight of soil = 1098.0g.
The sample consisted of a mixture of clayish sandy soil, organic fibres, stones, fragments of clay and plant matter.
No asbestos detected.

Sample No. 3. ASET112800 / 115980 / 3. 20429/8 - BH3 - 0.0-0.15.
Approx dimensions 10.0 cm x 10.0 cm x 11.1 cm
Approximate total dry weight of soil = 1106.0g.
The sample consisted of a mixture of clayish sandy soil, organic fibres, stones, fragments of wood chips and plant matter.
No asbestos detected.

Sample No. 4. ASET112800 / 115980 / 4. 20429/8 - BH4 - 0.0-0.15.
Approx dimensions 10.0 cm x 10.0 cm x 14.2 cm
Approximate total dry weight of soil = 1423.0g.
The sample consisted of a mixture of clayish sandy soil, organic fibres, stones, fragments of glass and plant matter.
No asbestos detected.

Sample No. 5. ASET112800 / 115980 / 5. 20429/8 - BH5 - 0.0-0.15.
Approx dimensions 10.0 cm x 10.0 cm x 14.8 cm
Approximate total dry weight of soil = 1482.0g.
The sample consisted of a mixture of clayish sandy soil, organic fibres, stones, fragments of brick like material, cement like material, ceramic tiles, plastic and plant matter.
No asbestos detected.

Reported by,

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

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
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CHAIN OF CUSTODY RECORD

ASET JOB NO: ASET112800/115980/1-5				Contact Name:	JOHN XU	Asbestos in Material	Asbestos in Soil (+/-)	Asbestos WA/ NEPM 500mL	Asbestos Fibre Count	Asbestos in Water	Asbestos in Dust	Lead Analysis
Name/ Company Name: Geotechnique				Job No:	20429/8							
Address: 1 Lemko Place Penrith				Project Address:	Kingswood Public School							
				Purchase Order:								
Contact Ph: 0247222700				Email Results to:								
	Sample ID	Date	Type	Container	Sample Depth (m)							
1	BH1	27/09/2023	Soil	P	0.0-0.15			√				
2	BH2	27/09/2023	Soil	P	0.0-0.15			√				
3	BH3	27/09/2023	Soil	P	0.0-0.15			√				
4	BH4	27/09/2023	Soil	P	0.0-0.15			√				
5	BH5	27/09/2023	Soil	P	0.0-0.15			√				

RECEIVED
29 SEP 2023
BY: ET

Relinquished By: JOHN XU	Received By: ET	Turn around time					Shipment Method
Date: 29/09/2023	Date & Time: 29/09/23	Same Day	24 hrs	48 hrs	3 Days	5 days	
Signature: John Xu	Signature:				✔		

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 334228

Client Details

Client	Geotechnique Pty Ltd
Attention	John Xu
Address	PO Box 880, Penrith, NSW, 2751

Sample Details

Your Reference	**20429/8, Kingswood**
Number of Samples	1 Soil
Date samples received	28/09/2023
Date completed instructions received	28/09/2023

Analysis Details

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

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

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

Report Details

Date results requested by	06/10/2023
Date of Issue	03/10/2023

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

Results Approved By
Liam Timmins, Organics Supervisor
Loren Bardwell, Development Chemist
Tim Toll, Chemist (FAS)

Authorised By
Nancy Zhang, Laboratory Manager

vTRH(C6-C10)/BTEXN in Soil		
Our Reference		334228-1
Your Reference	UNITS	DSS1
Date Sampled		27/09/2023
Type of sample		Soil
Date extracted	-	29/09/2023
Date analysed	-	03/10/2023
TRH C_6 - C_9	mg/kg	<25
TRH C_6 - C_{10}	mg/kg	<25
vTPH C_6 - C_{10} less BTEX (F1)	mg/kg	<25
Benzene	mg/kg	<0.2
Toluene	mg/kg	<0.5
Ethylbenzene	mg/kg	<1
m+p-xylene	mg/kg	<2
o-Xylene	mg/kg	<1
Naphthalene	mg/kg	<1
Total +ve Xylenes	mg/kg	<1
Surrogate aaa-Trifluorotoluene	%	104

svTRH (C10-C40) in Soil		
Our Reference		334228-1
Your Reference	UNITS	DSS1
Date Sampled		27/09/2023
Type of sample		Soil
Date extracted	-	29/09/2023
Date analysed	-	30/09/2023
TRH C_{10} - C_{14}	mg/kg	<50
TRH C_{15} - C_{28}	mg/kg	<100
TRH C_{29} - C_{36}	mg/kg	<100
Total +ve TRH (C10-C36)	mg/kg	<50
TRH >C_{10} -C_{16}	mg/kg	<50
TRH >C_{10} - C_{16} less Naphthalene (F2)	mg/kg	<50
TRH >C_{16} -C_{34}	mg/kg	<100
TRH >C_{34} -C_{40}	mg/kg	<100
Total +ve TRH (>C10-C40)	mg/kg	<50
Surrogate o-Terphenyl	%	74

PAHs in Soil		
Our Reference		334228-1
Your Reference	UNITS	DSS1
Date Sampled		27/09/2023
Type of sample		Soil
Date extracted	-	29/09/2023
Date analysed	-	29/09/2023
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	%	103

Organochlorine Pesticides in soil		
Our Reference		334228-1
Your Reference	UNITS	DSS1
Date Sampled		27/09/2023
Type of sample		Soil
Date extracted	-	29/09/2023
Date analysed	-	29/09/2023
alpha-BHC	mg/kg	<0.1
HCB	mg/kg	<0.1
beta-BHC	mg/kg	<0.1
gamma-BHC	mg/kg	<0.1
Heptachlor	mg/kg	<0.1
delta-BHC	mg/kg	<0.1
Aldrin	mg/kg	<0.1
Heptachlor Epoxide	mg/kg	<0.1
gamma-Chlordane	mg/kg	<0.1
alpha-chlordane	mg/kg	<0.1
Endosulfan I	mg/kg	<0.1
pp-DDE	mg/kg	<0.1
Dieldrin	mg/kg	<0.1
Endrin	mg/kg	<0.1
Endosulfan II	mg/kg	<0.1
pp-DDD	mg/kg	<0.1
Endrin Aldehyde	mg/kg	<0.1
pp-DDT	mg/kg	<0.1
Endosulfan Sulphate	mg/kg	<0.1
Methoxychlor	mg/kg	<0.1
Mirex	mg/kg	<0.1
Total +ve DDT+DDD+DDE	mg/kg	<0.1
Surrogate TCMX	%	103

PCBs in Soil		
Our Reference		334228-1
Your Reference	UNITS	DSS1
Date Sampled		27/09/2023
Type of sample		Soil
Date extracted	-	29/09/2023
Date analysed	-	29/09/2023
Aroclor 1016	mg/kg	<0.1
Aroclor 1221	mg/kg	<0.1
Aroclor 1232	mg/kg	<0.1
Aroclor 1242	mg/kg	<0.1
Aroclor 1248	mg/kg	<0.1
Aroclor 1254	mg/kg	<0.1
Aroclor 1260	mg/kg	<0.1
Total +ve PCBs (1016-1260)	mg/kg	<0.1
Surrogate TCMX	%	103

Acid Extractable metals in soil		
Our Reference		334228-1
Your Reference	UNITS	DSS1
Date Sampled		27/09/2023
Type of sample		Soil
Date prepared	-	03/10/2023
Date analysed	-	03/10/2023
Arsenic	mg/kg	10
Cadmium	mg/kg	<0.4
Chromium	mg/kg	22
Copper	mg/kg	17
Lead	mg/kg	18
Mercury	mg/kg	<0.1
Nickel	mg/kg	6
Zinc	mg/kg	24

Moisture		
Our Reference		334228-1
Your Reference	UNITS	DSS1
Date Sampled		27/09/2023
Type of sample		Soil
Date prepared	-	29/09/2023
Date analysed	-	03/10/2023
Moisture	%	11

Method ID	Methodology Summary
Inorg-008	Moisture content determined by heating at 105+/-5 °C for a minimum of 12 hours.
Metals-020	Determination of various metals by ICP-AES.
Metals-021	Determination of Mercury by Cold Vapour AAS.
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-1	[NT]
Date extracted	-			29/09/2023	[NT]	[NT]	[NT]	[NT]	29/09/2023	[NT]
Date analysed	-			03/10/2023	[NT]	[NT]	[NT]	[NT]	03/10/2023	[NT]
TRH C_6 - C_9	mg/kg	25	Org-023	<25	[NT]	[NT]	[NT]	[NT]	118	[NT]
TRH C_6 - C_{10}	mg/kg	25	Org-023	<25	[NT]	[NT]	[NT]	[NT]	118	[NT]
Benzene	mg/kg	0.2	Org-023	<0.2	[NT]	[NT]	[NT]	[NT]	119	[NT]
Toluene	mg/kg	0.5	Org-023	<0.5	[NT]	[NT]	[NT]	[NT]	120	[NT]
Ethylbenzene	mg/kg	1	Org-023	<1	[NT]	[NT]	[NT]	[NT]	111	[NT]
m+p-xylene	mg/kg	2	Org-023	<2	[NT]	[NT]	[NT]	[NT]	120	[NT]
o-Xylene	mg/kg	1	Org-023	<1	[NT]	[NT]	[NT]	[NT]	119	[NT]
Naphthalene	mg/kg	1	Org-023	<1	[NT]	[NT]	[NT]	[NT]	[NT]	[NT]
Surrogate aaa-Trifluorotoluene	%		Org-023	105	[NT]	[NT]	[NT]	[NT]	107	[NT]

QUALITY CONTROL: svTRH (C10-C40) in Soil						Duplicate			Spike Recovery %	
Test Description	Units	PQL	Method	Blank	#	Base	Dup.	RPD	LCS-1	[NT]
Date extracted	-			29/09/2023	[NT]	[NT]	[NT]	[NT]	29/09/2023	[NT]
Date analysed	-			30/09/2023	[NT]	[NT]	[NT]	[NT]	30/09/2023	[NT]
TRH C_{10} - C_{14}	mg/kg	50	Org-020	<50	[NT]	[NT]	[NT]	[NT]	119	[NT]
TRH C_{15} - C_{28}	mg/kg	100	Org-020	<100	[NT]	[NT]	[NT]	[NT]	107	[NT]
TRH C_{29} - C_{36}	mg/kg	100	Org-020	<100	[NT]	[NT]	[NT]	[NT]	114	[NT]
TRH >C_{10} -C_{16}	mg/kg	50	Org-020	<50	[NT]	[NT]	[NT]	[NT]	119	[NT]
TRH >C_{16} -C_{34}	mg/kg	100	Org-020	<100	[NT]	[NT]	[NT]	[NT]	107	[NT]
TRH >C_{34} -C_{40}	mg/kg	100	Org-020	<100	[NT]	[NT]	[NT]	[NT]	114	[NT]
Surrogate o-Terphenyl	%		Org-020	77	[NT]	[NT]	[NT]	[NT]	88	[NT]

QUALITY CONTROL: PAHs in Soil						Duplicate			Spike Recovery %	
Test Description	Units	PQL	Method	Blank	#	Base	Dup.	RPD	LCS-1	[NT]
Date extracted	-			29/09/2023	[NT]	[NT]	[NT]	[NT]	29/09/2023	[NT]
Date analysed	-			29/09/2023	[NT]	[NT]	[NT]	[NT]	29/09/2023	[NT]
Naphthalene	mg/kg	0.1	Org-022/025	<0.1	[NT]	[NT]	[NT]	[NT]	103	[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]	103	[NT]
Fluorene	mg/kg	0.1	Org-022/025	<0.1	[NT]	[NT]	[NT]	[NT]	92	[NT]
Phenanthrene	mg/kg	0.1	Org-022/025	<0.1	[NT]	[NT]	[NT]	[NT]	102	[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]	94	[NT]
Pyrene	mg/kg	0.1	Org-022/025	<0.1	[NT]	[NT]	[NT]	[NT]	107	[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]	81	[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]	96	[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	101	[NT]	[NT]	[NT]	[NT]	96	[NT]

QUALITY CONTROL: Organochlorine Pesticides in soil					Duplicate				Spike Recovery %	
Test Description	Units	PQL	Method	Blank	#	Base	Dup.	RPD	LCS-1	[NT]
Date extracted	-			29/09/2023	[NT]	[NT]	[NT]	[NT]	29/09/2023	[NT]
Date analysed	-			29/09/2023	[NT]	[NT]	[NT]	[NT]	29/09/2023	[NT]
alpha-BHC	mg/kg	0.1	Org-022/025	<0.1	[NT]	[NT]	[NT]	[NT]	94	[NT]
HCB	mg/kg	0.1	Org-022/025	<0.1	[NT]	[NT]	[NT]	[NT]	[NT]	[NT]
beta-BHC	mg/kg	0.1	Org-022/025	<0.1	[NT]	[NT]	[NT]	[NT]	92	[NT]
gamma-BHC	mg/kg	0.1	Org-022/025	<0.1	[NT]	[NT]	[NT]	[NT]	[NT]	[NT]
Heptachlor	mg/kg	0.1	Org-022/025	<0.1	[NT]	[NT]	[NT]	[NT]	89	[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]	77	[NT]
Heptachlor Epoxide	mg/kg	0.1	Org-022/025	<0.1	[NT]	[NT]	[NT]	[NT]	96	[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]	101	[NT]
Dieldrin	mg/kg	0.1	Org-022/025	<0.1	[NT]	[NT]	[NT]	[NT]	112	[NT]
Endrin	mg/kg	0.1	Org-022/025	<0.1	[NT]	[NT]	[NT]	[NT]	84	[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]	92	[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]	100	[NT]
Methoxychlor	mg/kg	0.1	Org-022/025	<0.1	[NT]	[NT]	[NT]	[NT]	[NT]	[NT]
Mirex	mg/kg	0.1	Org-022/025	<0.1	[NT]	[NT]	[NT]	[NT]	[NT]	[NT]
Surrogate TCMX	%		Org-022/025	95	[NT]	[NT]	[NT]	[NT]	92	[NT]

QUALITY CONTROL: PCBs in Soil						Duplicate			Spike Recovery %	
Test Description	Units	PQL	Method	Blank	#	Base	Dup.	RPD	LCS-1	[NT]
Date extracted	-			29/09/2023	[NT]	[NT]	[NT]	[NT]	29/09/2023	[NT]
Date analysed	-			29/09/2023	[NT]	[NT]	[NT]	[NT]	29/09/2023	[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]	114	[NT]
Aroclor 1260	mg/kg	0.1	Org-021	<0.1	[NT]	[NT]	[NT]	[NT]	[NT]	[NT]
Surrogate TCMX	%		Org-021	95	[NT]	[NT]	[NT]	[NT]	92	[NT]

QUALITY CONTROL: Acid Extractable metals in soil						Duplicate			Spike Recovery %	
Test Description	Units	PQL	Method	Blank	#	Base	Dup.	RPD	LCS-1	[NT]
Date prepared	-			03/10/2023	[NT]	[NT]	[NT]	[NT]	03/10/2023	[NT]
Date analysed	-			03/10/2023	[NT]	[NT]	[NT]	[NT]	03/10/2023	[NT]
Arsenic	mg/kg	4	Metals-020	<4	[NT]	[NT]	[NT]	[NT]	119	[NT]
Cadmium	mg/kg	0.4	Metals-020	<0.4	[NT]	[NT]	[NT]	[NT]	107	[NT]
Chromium	mg/kg	1	Metals-020	<1	[NT]	[NT]	[NT]	[NT]	120	[NT]
Copper	mg/kg	1	Metals-020	<1	[NT]	[NT]	[NT]	[NT]	112	[NT]
Lead	mg/kg	1	Metals-020	<1	[NT]	[NT]	[NT]	[NT]	118	[NT]
Mercury	mg/kg	0.1	Metals-021	<0.1	[NT]	[NT]	[NT]	[NT]	102	[NT]
Nickel	mg/kg	1	Metals-020	<1	[NT]	[NT]	[NT]	[NT]	109	[NT]
Zinc	mg/kg	1	Metals-020	<1	[NT]	[NT]	[NT]	[NT]	122	[NT]

Result Definitions

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

Quality Control Definitions

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

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

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

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

Laboratory Acceptance Criteria

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

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

Spikes for Physical and Aggregate Tests are not applicable.

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

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

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

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

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

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

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

Measurement Uncertainty estimates are available for most tests upon request.

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

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

coc: 28/9/23 1442

GEOTECHNIQUE PTY LTD

1 LEMKO PLACE PENRITH NSW 2750

CHAIN OF CUSTODY

Results Required By: Normal Turnaround **Date:** Thursday, 5 October 2023

Your Reference No.:

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

Sampled By: JH
Project Manager: JOHN XU
Ref No: 20429/8
Location: Kingswood

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		27/09/2023	G		✔	✔	✔	✔		✔			5			

Relinquished by			Received by		
Name	Signature	Date	Name	Signature	Date
JOHN XU	JX	28/09/2023	Christine Ho	~~[illegible]~~	28/9/23

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

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

Job No: 334228
Date Received: 28/9/23
Time Received: 1630
Received By: CH
Temp: Cool/Ambient 18°C
Cooling: Ice/Icepack
Security: Intact/Broken/None

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	John Xu

Sample Login Details

Your reference	20429/8, Kingswood
Envirolab Reference	334228
Date Sample Received	28/09/2023
Date Instructions Received	28/09/2023
Date Results Expected to be Reported	06/10/2023

Sample Condition

Samples received in appropriate condition for analysis	Yes
No. of Samples Provided	1 Soil
Turnaround Time Requested	Standard
Temperature on Receipt (°C)	18
Cooling Method	None
Sampling Date Provided	YES

Comments

Nil

Please direct any queries to:

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

Analysis Underway, details on the following page:

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

Sample ID	vTRH(C6-C10)/BTEXN in Soil	svTRH (C10-C40) in Soil	PAHs in Soil	Organochlorine Pesticides in soil	PCBs in Soil	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.

APPENDIX E

UNEXPECTED FINDS MANAGEMENT PROTOCOL

GEOTECHNIQUE® PTY LTD
ABN 64 002 841 063
An eiaustralia company

Unexpected Finds Management Protocol
Proposed School Upgrades To Kingswood Public School
46-54 Second Avenue, Kingswood

In the event that unexpected finds and / or suspect materials (identified by unusual staining, odour, discolouration or inclusions such as building rubble, asbestos sheets / pieces / pipes, ash material, imported fill materials (which are different to those encountered during this assessment), etc.) are encountered during future earthworks / site preparation / construction works, 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 action.
- 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 bonded ACM is encountered, the following measures are implemented:

- Engage a SafeWork accredited Class B 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.
- A SafeWork Licensed Asbestos Assessor 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 SafeWork accredited Class A 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
- A SafeWork Licensed Asbestos Assessor must be engaged to provide a clearance certificate.

APPENDIX 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.