

Preliminary Site Investigation

212-216 QUEEN STREET, MUSWELLBROOK, NEW SOUTH WALES

Prepared for:

Tindale Property Pty Ltd c/- Focus Town Planning

Level 20, 168 Pitt Street, Sydney, NSW 2000

Date: 26 April 2023

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1 Executive Summary

Envirotech Services Australia Pty Ltd (Envirotech) was engaged to prepare a Preliminary Site Investigation (PSI) for a property located at 212-216 Queen Street, Muswellbrook, NSW (the site). The site is proposed for redevelopment into stages 6 and 7 of the Northview Estate residential subdivision (Proposed Development) and that the PSI was required to assess whether contamination is likely to exist on the site through current and/or historical activities and whether additional investigation is required.

Scope of work comprised of site inspection, site history review, sample collection and laboratory analysis. The site history review identified the site to historically be used for rural purposes with the only infrastructure at the site comprising of a residential dwelling (now removed) and a cattle yard. Historical aerial imagery and site inspection identified two large stockpiles of imported fill located in the north western portion of the site. It is possible that the source site of the imported fill is from previous stages of the residential development to the south.

Field investigations comprised the collection of 10 soil samples from seven test pits advanced in targeted locations in the identified areas of concern (AOC). Subsurface conditions generally comprised of CLAY fill overlying natural sandy CLAYs. Minor amounts of anthropogenic material, comprising of concrete and house bricks, were encountered in TP06 and TP07 respectively. Results of analytical testing reported concentrations below the adopted environmental assessment criteria in all samples tested.

Based on the findings of the assessment, no human health and/or ecological source-pathway-receptor linkages exist for the identified potentially contaminating activities. Therefore, it is considered that the site is suitable for the Proposed Development.

2 Introduction

Envirotech Services Australia Pty Ltd (Envirotech) was engaged by Tindal Property Pty Ltd (Tindale) c/- Focus Town Planning (Focus) to prepare a Preliminary Site Investigation (PSI) for a property located at 212-216 Queen Street, Muswellbrook, NSW (the site) (**Figure 1 – Appendix A**).

It is understood that the site is proposed for redevelopment into stages 6 and 7 of the Northview Estate residential subdivision (Proposed Development) and that the PSI is required for the development application (DA) process.

2.1 Objective

The objective of this PSI is to assess whether contamination is likely to exist on the site through current and/or historical activities and whether additional investigation is required.

2.2 Scope of Work

The scope of work undertaken to achieve the objective is as follows:

- Undertake a site history review.
- Undertake a site inspection to observe onsite and offsite conditions.
- Prepare a preliminary conceptual site model (CSM).
- Undertake fieldwork investigations, including the collection of soil samples, in targeted locations based on the findings of the CSM.
- Submission of selected soil samples for laboratory analysis for the identified chemicals of potential concern (CoPC).
- Assessment of laboratory analytical results against adopted land use criteria outlined in The National Environment Protection (Assessment of Site Contamination) Measure 1999 (the ASC NEPM) schedule B1.
- Revision of CSM (if required) to determine if any source-pathway-receptor linkages exist.
- Preparation of a PSI report in accordance with NSW EPA Consultants reporting on contaminated land (2020).

3 Site History

A review of available site history information was undertaken and is provided in the following sections.

3.1 Historical Title Deed Information

Historical title deed information for the site was reviewed with the following identified:

- Commencement of the title occurred in 1913 and was held by Mr. John White, a station manager.
- Mitchells Cement Products Pty Limited purchased the property in 1979.
- The title was transferred three more times until the current proprietor, Northview Reit Pty Ltd in 2021.

A copy of the historical title deed search is provided in **Appendix B**.

3.2 Historical Aerial Photographs

A summary of the review of historical aerial photographs from 1953 to 2022 is presented in **Table 1**.

Table 1 – Historical Aerial Photographs

Year	Summary
1953	➤ The site is largely vacant with the exception of a dwelling in the north west corner of the property. ➤ Surrounding land use comprises of farmland.
1958	➤ No significant change has occurred at the site. ➤ Several building/dwellings have been constructed to the west of the site.
1967	➤ Two small structures have been constructed to the south of the dwelling in the north west corner of the property. No other significant changes have occurred. ➤ Further developed to the west has occurred, including on adjacent land to the west (industrial). ➤ Development to the south east has occurred with a large water tank installed and possible earthworks undertaken.
1974	➤ No significant change has occurred at the site. ➤ Further development to the industrial property on adjacent land to the west has occurred.
1980	➤ No significant change has occurred at the site or surrounding area.
1989	➤ No significant change has occurred at the site or surrounding area.
1998	➤ A cattle yard has been constructed in the north western portion of the site. ➤ No significant change has occurred to the surrounding area.
2008	➤ Dwelling in the top north west corner of the site has been removed. ➤ A large stockpile is now located in the north west portion of the site. The possible source site of the material is from the residential development to the south. ➤ Industrial property on adjacent land to the west has ceased operation with majority of infrastructure removed.

Year	Summary
	➤ Residential development has been constructed to the south.
2013	➤ A second stockpile is now located to the north of the first stockpile in the north western portion of the site. ➤ Further development to the residential subdivision has occurred to the south.
2017	➤ No significant change has occurred at the site or surrounding area.
2022	➤ No significant change has occurred at the site or surrounding area.

It is considered that the construction/demolition of the residential dwelling and the importation of fill is the primary contaminating activity undertaken at the site. A copy of the historical aerial photographs is provided in **Appendix C**.

3.3 Historical Business Directories

A search of the historical business directories identified the following dry cleaners, motor garages and service stations historically located within 1km of the site.

Table 2 – Former Dry Cleaners, Motor Garages and Services Stations

Business Activity	Premise	Year	Distance and Direction from site
Motor garages and engineers	Farrell's Service Station, Aberdeen Rd., Muswellbrook	1961	57 m west
Motor garages and engineers	Solo Service Station, New England Highway, Muswellbrook 2333	1991	199m north west
Motor garages and/or engineers and/or services station	Golden Fleece Service Station & Restaurant, New England Highway, Muswellbrook 2333	1961 1970 1982	

3.4 Former Gas Works

There are no NSW EPA records of former gas work sites on site or within 1 km of the site.

3.5 Delicensed Activities Still Regulated by the NSW EPA

There are no records of delicensed activities still regulated by the NSW EPA onsite or within 1km of the site.

3.6 Former Licensed NSW EPA Activities under the POEO Act

Former Licensed activities under the Protection of the Environment Operations Act 1997, now revoked or surrendered are listed in **Table 3**.

Table 3 – Former Licensed Activities under the POEO Act

EPL No	Organisation	Activity	Distance and Direction from site
4653	Luhrmann Environment Management Pty Ltd	Application of Herbicides	onsite
4838	Robert Orchard		
6630	Sydney Weed and Pest		

EPL No	Organisation	Activity	Distance and Direction from site
	Management Pty Ltd		
11677	Upper Hunter County Council	Miscellaneous licensed discharge to waters (at any time)	
12828	Hermes Resources Pty Ltd	Land-based extractive activity	694m north east

4 Site Condition and Surrounding Environment

4.1 Site Identification

Site identification details are provided in **Table 4**.

Table 4 – Site Details

Lot / DP	Part lot 58/1276946
Address	212-216 Queen Street, Muswellbrook, NSW
Approximate Area (m ²)	26 hectares
Local Government Authority	Newcastle City Council
Land Zoning	R1 – General Residential R5 – Large Lot Residential
Local Environmental Plan	Muswellbrook LEP 2009
Latitude, Longitude	-32.245640, 150.906600
Current Owner	Northview Reit Pty Ltd

4.2 Site Condition

A Senior Environmental Scientist from Envirotech attended the site on the 10th March 2023 to undertake a site inspection to observe onsite and offsite conditions. The site comprises of a large irregular shaped parcel of land located to the north of the previous stages of the Northview Estate residential subdivision. The site is currently vacant and appeared to be utilized for potential grazing purposes with the site separated into a number of paddocks. The only infrastructure observed was an old cattle yard is located in the northern portion of the site. A large stockpile was located in the north western corner of the site and some piles of felled trees were located in the southern portion of the site. A large watercourse dissects the northern portion of the site running east to west. Photographs taken during the site inspection are provide in **Appendix D**.

4.3 Surrounding Land Use

As of 10th March 2023, surrounding land use comprised of the following:

- North: Sandy Creek Road adjacent with rural/agricultural land beyond.
- South: Previous stages of Northview Estate residential subdivision with the township of Muswellbrook beyond.
- East: Rural/agricultural land with open cut mine beyond.
- West: Main Northern Railway and Aberdeen Street adjacent with rural/agricultural land and the Hunter River beyond.

4.4 Topography

Topographically the site comprises of gentle sloping terrain to the north west with elevations of approximately 180 meters Australian Height Datum (m AHD) observed in the southern portion of the site and elevations of approximately 150 m AHD observed in the north western portion of the site.

Surface runoff is considered to migrate across the site as overland flow towards the watercourse located in the northern portion of the site which discharges into Sandy Creek and then the Hunter River located to the west of the site.

4.5 Geology

The majority of the site is underlain by Palaeozoic Branxton Formation conglomerate, sandstone and siltstone of the Maitland subgroup. A small section of the north western corner of the site is underlain by Cainozoic alluvial valley deposits comprising of silt, clay, lithic to quartz lithic sand, gravel¹.

4.6 Soil Landscapes

With reference to the Soil Landscapes of Central and Eastern NSW² soil landscapes identified to be onsite included Roxburgh soil landscape located in the south eastern portion of the site and the Hunter soil landscape located in the north western portion of the site. Roxburgh soil landscapes cover undulating low hills and undulating hills and comprise of yellow and brown podzolic soils, red solodic and yellow soloths soils. Hunter soil landscapes cover floodplains of the Hunter River and its tributaries with the main soils are all formed in alluvium.

4.7 Hydrogeology

A search of the Australian Groundwater Explorer³ data base identified 34 registered groundwater boreholes within 2 km of the site of which 18 were identified to be functioning. The depth of the groundwater boreholes was reported being between 7.5 m to 19 m below ground level (m bgl). Limited standing water level (swl) information was available. However, swl was reported between 3.9 and 5.8 m bgl within groundwater bores >1.8 km south west the site. Porous, extensive highly productive aquifers exist onsite.

4.8 Acid Sulfate Soil Conditions

The Muswellbrook LEP 2009 identifies the site to be not located within a class of acid sulfate soils. Additionally, the Atlas of Australian Acid Sulfate Soils identifies the site to be within a Class B – low probability of occurrence, 6-70% chance of occurrence.

4.9 Naturally Occurring Asbestos Potential

There are no records of naturally occurring asbestos potential onsite or within 1 km of the site.

4.10 Dryland Salinity

With reference to the NSW Department of Planning and Environment⁴ a small section along the southern boundary is identified to be within a high hazard or risk of dryland salinity.

4.11 Local Meteorology

A summary of data collected by the Bureau of Meteorology between 1991 and 2023 at the Scone airport (weather station ID 061363) located 26km to the north is provided below in **Table 5**.

¹ Singleton 1:250,000 Geological Map (nsw.gov.au)

² Soil Landscapes of Central and Eastern NSW | Dataset | SEED

³ Australian Groundwater Explorer: Groundwater information: Water Information: Bureau of Meteorology (bom.gov.au)

⁴ Salinity locations and mapping | NSW Environment and Heritage

Table 5 – Summary of Local Meteorology

Mean maximum/minimum temperature	31.8°C January / 3.4°C July
Maximum/ minimum monthly rainfall	32.4 mm April / 77.7 mm November
Average annual rainfall	620.7 mm

4.12 NSW EPA Contaminated Site List

As of 11 April 2023, the site was not listed as a contaminated site notified to the NSW EPA. Additionally, there is no records of contaminated sites notified to the NSW EPA within 1 km of the site.

4.13 NSW EPA Contaminated Land Records of Notice

No records of notice were reported at the site of within 1km of the site.

4.14 National Waste Management and Liquid Fuel Facilities

There are no sites on the national waste management sites or liquid fuel facilities within 1 km of the site.

4.15 PFAS Investigation and Management Programs

There are no sites, within 1km of the site that are:

- part of the NSW EPA PFAS investigation program;
- being investigated and/or managed by the Department of Defence for PFAS contamination; or
- being investigated or managed by Airservices Australia for PFAS contamination.

4.16 Defence Sites

There are no sites which have been assessed as part of the Defence 3 Year Regional Contamination Investigation Program within 1km of the site.

4.17 Current Licensed Activities under the POEO Act

Current licensed activities under the Protection of the Environment Operations Act 1997 (POEO Act) are listed in **Table 6**.

Table 6 – Current Licensed Activities under the POEO Act

EPL No	Organisation	Activity	Current Environment Risk	Distance and Direction from site
656	Muswellbrook Coal Company LTD	Coal works Mining for coal	Level 1	onsite
3142	Australian Rail Track Corporation Limited	Railway system activities	Level 2	37 m north west

5 Preliminary Conceptual Site Model

A preliminary conceptual site model (CSM) has been developed based on information presented in sections 3 and 4.

5.1 Potential Contaminating Activities/Sources and Contaminants of Concern

Based on the findings of the site history review and site inspection, the potential contaminating activities/sources and their respective CoPC are provided in **Table 7**.

Table 7 – Potential Contaminating Activities/Sources and CoPC

Activity/Source	CoPC
Construction and demolition of residential dwelling	TRH, BTEXN, PAH, Heavy Metals, OC, OP and ACM ⁵ .
Importation of fill material in north west portion of the site	TRH, BTEXN, PAH, Heavy Metals, OC, OP and ACM.

5.2 Potential Affected Media

The potential affected media at the site is considered to be soil.

5.3 Potential Receptors

5.3.1 Potential Human Receptors

Potential human receptors identified at or surrounding the site are considered to be:

- Current and future site users (agricultural/residential).
- Future construction workers during site development (commercial/industrial).
- Users on adjacent properties (agricultural/residential).

5.3.2 Potential Ecological Receptors

Potential ecological receptors identified at or surrounding the site are considered to be:

- Fauna and flora at the site.

5.4 Potential Exposure Pathways

Potential exposures pathways are considered to be:

- Dermal contact and incidental ingestion.
- Uptake by fauna and flora.
- Inhalation of respirable fibers/dust.

⁵ Total recoverable hydrocarbons; benzene, toluene, ethylbenzene, xylene, naphthalene; polycyclic aromatic hydrocarbons; heavy metals (Arsenic (As), Cadmium (Cd), Chromium (Cr), Copper (Cu), Lead (Pb), Mercury (Hg), Nickel (Ni) and Zinc (Zn)); organochlorine pesticides (OC); organophosphorus pesticides (OP); asbestos contaminating materials.

5.5 Potential Source-Pathway-Receptor Linkages

Potential source-pathway-receptor linkages are presented in **Table 8**.

Table 8 – Potential Source-Pathway-Receptor Linkages

Source	Exposure Pathway	Receptor	Linkage
Construction and demolition of residential dwelling	➤ Dermal contact and incidental ingestion.	➤ Current and future site users	Potentially complete.
	➤ Inhalation of respirable fibers/dust.	➤ Future construction workers during site development	Potentially complete.
Importation of fill material	➤ Uptake by fauna and flora.	➤ Users on adjacent properties	Potentially complete
	➤ Dermal contact and incidental ingestion.	➤ Terrestrial fauna and flora at the site.	Potentially complete
	➤ Inhalation of respirable fibers/dust.	➤ Current and future site users	Potentially complete
	➤ Uptake by fauna and flora.	➤ Future construction workers during site development	Potentially complete
		➤ Users on adjacent properties	Potentially complete
		➤ Terrestrial fauna and flora at the site.	Potentially complete

Based on the information provided in **Table 8**, potential source-pathway-receptor linkage exists. To determine whether an actual source-pathway-receptor linkage exists, intrusive investigations and analytical testing in the areas of concern is required.

6 Data Quality

6.1 Data Quality Objectives

The Data Quality Objectives (DQOs) adopted for the PSI are summarized in **Table 9**.

Table 9 – Data Quality Objectives

DQO Step	Discussion																						
1: State the problem	The site is proposed for redevelopment into a residential subdivision and based on the preliminary CSM, potential source-pathway-receptor linkages exist.																						
2: Identify the decision/goal of the study	To undertake intrusive investigations and analytical testing to determine if: ➤ actual source-pathway-receptor linkages exist and further investigation is required; or ➤ linkages don't exist and the site is suitable for the Proposed Development.																						
3: Identify the information inputs	The information inputs to the decision/goal are: ➤ Site history information. ➤ Field data collected during intrusive sampling. ➤ Laboratory analytical data of selected soil samples for the relevant CoPC. ➤ Adopted Tier 1 assessment criteria provided in Section 7. ➤ Assessment of the reliability/quality of the analytical data, through the assessment of Quality Assurance/Quality Control (QA/QC) as per the Data Quality Indicators (DQI).																						
4: Define the boundaries of the study	Lateral extents of the PSI are limited to the lot boundaries of the site described as part Lot 58/1276946 and as shown in Figure 1 . Vertical extent of the PSI is to a maximum depth of 3.2 m bgl. A preliminary round of sampling in targeted areas will be undertaken at this stage of the investigation.																						
5: Develop the analytical approach	Acceptable limits for laboratory QA/QC are as follows: <table> <tr> <td>Field</td><td>Limit</td></tr> <tr> <td>Rinsate blanks:</td><td>All analytes < LOR⁶.</td></tr> <tr> <td>Intra laboratory duplicates</td><td>RPD⁷ <50%</td></tr> <tr> <td>Inter laboratory duplicates</td><td>RPD <50%</td></tr> <tr> <td>Trip blank</td><td><LOR</td></tr> <tr> <td>Trip Spike Recovery</td><td>> 70%</td></tr> <tr> <td>Laboratory</td><td>Limit</td></tr> <tr> <td>Matrix spike</td><td>70-130% (metals) 60-140% (organics)</td></tr> <tr> <td>Surrogate spike</td><td>70-130%</td></tr> <tr> <td>Method blank</td><td><LOR</td></tr> <tr> <td>Duplicate samples</td><td>RPD <50%</td></tr> </table>	Field	Limit	Rinsate blanks:	All analytes < LOR ⁶ .	Intra laboratory duplicates	RPD ⁷ <50%	Inter laboratory duplicates	RPD <50%	Trip blank	<LOR	Trip Spike Recovery	> 70%	Laboratory	Limit	Matrix spike	70-130% (metals) 60-140% (organics)	Surrogate spike	70-130%	Method blank	<LOR	Duplicate samples	RPD <50%
Field	Limit																						
Rinsate blanks:	All analytes < LOR ⁶ .																						
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Matrix spike	70-130% (metals) 60-140% (organics)																						
Surrogate spike	70-130%																						
Method blank	<LOR																						
Duplicate samples	RPD <50%																						

⁶ Limits of reporting

⁷ Relative percentage difference

DQO Step	Discussion
	The sampling analytical schedule is detailed in Section 8 .
6: Specify performance or acceptance criteria	ASC NEPM (2013) Schedule B2 states that the 95% Upper Confidence Limit (UCL) of the arithmetic mean provides a 95% confidence level that the true population mean will be less than or equal to this value. Therefore, a limit on decision error will be 5% that a conclusive statement may be incorrect based on a probability that 95% of the data collected will satisfy the site acceptance criteria. Additionally, a comprehensive assessment of QA/QC evaluating the reliability and useability of field and laboratory data will be undertaken based on the adopted five data quality indicators (DQI) outlined in Section 6.2.
7: Develop the plan for obtaining data	The sampling and analysis plan is detailed in Section 8 .

6.2 Data Quality Indicators

With reference to ASC NEPM (2013) Schedule B2 the following five DQIs, relating to both field and laboratory procedures, have been adopted.

Table 10 – Data Quality Indicators

DQI	Frequency/Requirement
Completeness – A measure of the amount of usable data from a data collection activity	
All critical locations sampled	Samples collected from areas of concern (AoC) identified in CSM and in accordance with the sampling and analysis plan (SAP).
Standard operating practices appropriate and complied with	Sampling undertaken in accordance with industry standards and guidelines.
Experienced sampler	Competent and consistent sampler.
Field documentation correct and completed	Fieldwork to be documented in accordance with Envirotech's standard operating practices (SOP). Soil logs to be logged in accordance with AS 1726:2017 ⁸ .
All critical samples and analytes analysed	Samples analysed from AoC identified in CSM. Analytical schedule undertaken in accordance with SAP.
Appropriate laboratory testing methods	Samples to be analysed at a NATA ⁹ accredited laboratory and by NATA approved methods.
Laboratory documentation complete	Laboratory chain of custody (CoC) appropriately completed.
Sample holding times complied with	Samples analysed to be extracted within laboratory specified time.
Comparability – The confidence (expressed qualitatively) that data may be considered to be equivalent for each sampling and analytical event	
Consistent sampling methods (i.e., equipment, sampler, sample	Sampling to be undertaken in accordance with Envirotech's SOP.

⁸ Australian Standard (AS 1726:2017) – Geotechnical Site Investigations

⁹ National Association of Testing Authority

DQI	Frequency/Requirement
preservation, containers etc.)	
Climatic conditions	Weather conditions noted on field sheets. Sampling to be undertaken during similar weather conditions (if possible). Quantify influence of climatic or physical conditions.
Consistent analytical methods, laboratories and units.	Samples to be analysed at a NATA accredited laboratory and by NATA approved methods.
Representativeness – The confidence that data is representative of each medium present on the site	
Appropriate media sampled to reflect its characteristics	Sampling to be undertaken in accordance with Envirotech's SOP.
Sample holding times complied with	Samples analysed to be extracted within laboratory specified time.
Appropriate sample collection, handling, storage and preservation.	Sampling to be undertaken in accordance with Envirotech's SOP.
Equipment calibration	Field equipment calibrated prior to each sampling event.
Precision – A quantitative measure of the variability (or reproducibility) of data	
SOPs appropriate and complied with.	Comply with industry standards and guidelines.
Intra laboratory duplicate	1 in 20 samples
Inter laboratory duplicate	1 in 20 samples
Laboratory duplicate	Minimum 1 per sample batch
Accuracy – A quantitative measure of the closeness of reported data to the true value	
Matrix spike	1 per sample batch (volatile/semi volatile)
Surrogate spike	1 per sample batch (volatile/semi volatile)
Laboratory method blank	1 per sample batch
Laboratory duplicate samples	1 per sample batch

7 Assessment Criteria

Based on the Proposed Development, the Tier 1 investigation and screening criteria for residential¹⁰ land use has been adopted and are provided in **Table 11**.

Table 11 – Tier 1 Assessment Criteria

Guideline	Assessment Criteria	Analyte Group
ASC NEPM (2013)	Health investigation level (HIL) A	Heavy metals and pesticides
	Health screening level (HSL)	Asbestos
	Soil vapour HSL A CLAY (0m<1m, 1m<2m, 2m<4m) SILT (0m<1m)	TRH and BTEXN
	Ecological investigation level (EIL) < 2m	Heavy metals, pesticides and PAH
	Ecological screening level (EIL) < 2m	TRH and BTEXN
	Management limits for fine soils	TRH
	Aesthetics	-
CRC Care (2011)	Direct contact HSLs	TRH and BTEXN

¹⁰ Residential A with garden/accessible soil also includes children's day care centres, preschools and primary schools.

8 Sampling and Analysis Methodology

8.1 Sampling Methodology

Field investigation was undertaken by a Senior Environmental Scientist on 30 March 2023 and comprised of the following:

- Soil samples were collected from seven test pits targeted to AOC identified in the preliminary CSM. Locations of test pits are provided in attached **Figure 1**.
- Test pits were advanced via 1.7t excavator with a 450mm toothed bucket to a maximum depth of 3.2 m bgl.
- Samples were collected from nominated depths, targeting all types of strata, and logged in accordance with AS1726:2017. A unique sample ID was used for each sample collected. Test pit logs are provided as **Appendix E**.
- Sampling equipment was decontaminated using Decon 90 and a dedicated pair of nitrile gloves used for each sample collection.
- Samples were collected in laboratory prepared containers and placed in an esky filled with ice for transport to a NATA accredited laboratory for analysis.

8.2 Analytical Methodology

The analytical methodology adopted for the PSI to achieve the stated objectives is summarized as follows.

8.2.1 Soil Samples

- Heavy metals (As, Cd, Cr, Cu, Pb, Hg, Ni and Zn) – 10
- OCP and OPP – 9
- TRH, BTEXN and PAH – 10
- Asbestos w/w% – 2
- pH, conductivity, particle size, soil particle density, exchangeable cations, Iron %, organic matter – 1

8.2.2 QA/QC Samples

- Field duplicate: TRH, BTEXN, PAH, heavy metals (As, Cd, Cr, Cu, Pb, Hg, Ni and Zn), OCP and OPP – 1
- Trip blank: TRH (F1) and BTEXN – 1
- Rinsate: TRH, BTEXN, PAH, heavy metals (As, Cd, Cr, Cu, Pb, Hg, Ni and Zn), OCP and OPP – 1

9 Quality Assurance/Quality Control Data Evaluation

9.1 Field QA/QC

Field QA/QC samples collected as part of the sampling program are provided in **Table 12**.

Table 12 – Field QA/QC Samples

Sample Type	Primary Sample ID	Duplicate Sample ID	Frequency
Field Duplicate	TP02_0.3	QC01	1 in 20
Trip blank	TB	-	1 per sampling event
Rinsate	RW01	-	1 per day

Analytical results of the field QA/QC samples are provided in the analytical summary tables within **Appendix F**.

9.1.1 Field Duplicate

Sample duplicates were collected of primary samples at a frequency of 1 in 20 samples. The duplicate sample collected (QC01) for the sampling program was of primary sample TP02_0.3. Calculated RPD % of the field duplicate was undertaken for all analytes and were below the adopted limit of 50% meeting the acceptance criteria. All RPD % results are provided in the analytical summary tables within **Appendix F**.

9.1.2 Trip Blank

One laboratory prepared trip blank sample (TB) was utilised during the sampling program and analysed for TRH (F1) and BTEXN with all recoveries reported below the laboratory LOR meeting the acceptance criteria. Results of the trip blank analysis is provided in the analytical summary tables within **Appendix F**.

9.1.3 Rinsate

One rinsate water sample was recovered as part of the sampling program. The sample was collected from sampling tools and with laboratory prepared rinsate water. All recoveries were reported below laboratory LOR meeting the acceptance criteria. Results of the rinsate analysis is provided in the analytical summary tables within **Appendix F**.

9.2 Laboratory QA/QC

Samples were submitted to ALS Global, a NATA accredited laboratory, for the requested analysis. Samples were collected in laboratory prepared containers and transported using insulated esky containing ice accompanied by COC documentation.

9.2.1 Summary of Outliers

A summary of laboratory QC outliers is as follows:

- No method blank value outliers occur.
- No duplicate outliers occur.
- No laboratory control outliers occur.

- No matrix spike outliers occur.
- No surrogate recovery outliers occur.
- No analysis holding time outliers exist.
- Quality control sample frequency outliers exist for TRH (semi volatile) and PAH for the rinsate water sample due to insufficient sample size. However, this is considered acceptable due to all rinsate results reporting concentrations below laboratory LOR.

9.3 Data Usability

The data validation procedure employed in the assessment of the field and laboratory QA/QC data has indicated that the reported analytical results are representative of the conditions at the sample locations and that the analytical data can be relied upon. Therefore, it is considered that the quality of the analytical data is reliable for the purposes of characterising the site for the proposed land use.

10 Field and Analytical Results

10.1 Soil Lithology

Sub surface conditions encountered during sampling comprised of the following:

Table 13 – Subsurface Conditions

Test Pit	Depth (m bgl)	Description
TP01	0-3	FILL (sandy silty CLAY) / FILL (gravelly silty sandy CLAY) / FILL (clayey SILT).
	3-3.2	sandy CLAY (natural).
TP02	0-3	FILL (sandy CLAY) / FILL (gravelly SAND) / FILL (sandy CLAY)
TP03	0-2.5	FILL (sandy CLAY)
TP04	0-2	FILL (sandy CLAY)
TP05	0-2	FILL (sandy CLAY)
TP06	0-1 ¹¹	FILL (sandy CLAY)
TP07	0-0.2	TOPSOIL (sandy SILT)
	0.2-0.6	Silty sandy CLAY (natural).

10.2 Field Observations

No staining, odours or asbestos contaminating material (ACM) was observed during sampling. Groundwater was not encountered in any test pit advanced during sampling. Minor amounts of anthropogenic material were observed within TP06 (concrete) and TP07 (house bricks).

10.3 Analytical Results

All results of analytical testing were reported below the adopted assessment criteria and or laboratory LOR. Analytical summary tables are provided in **Appendix F**. Laboratory certificates of analysis are provided in **Appendix G**.

¹¹ Refusal on concrete.

11 Discussion

Based on the results of analytical testing no exceedances of the adopted assessment criteria for residential land use were reported in any of the samples collected.

11.1 Revised CSM

To determine whether actual source-pathway-receptor linkages exist after the intrusive sampling analytical testing, a revised CSM is provided below.

Table 14 – Revised CSM

Source	Exposure Pathway	Receptor	Linkage
Construction and demolition of residential dwelling	➤ Dermal contact and incidental ingestion.	➤ Current and future site users	Incomplete. All results of analytical testing reported below adopted assessment criteria.
	➤ Inhalation of respirable fibers/dust.	➤ Future construction workers during site development	
		➤ Users on adjacent properties	
	➤ Uptake by fauna and flora.	➤ Terrestrial fauna and flora at the site.	
Importation of fill material	➤ Dermal contact and incidental ingestion.	➤ Current and future site users	Incomplete. All results of analytical testing reported below adopted assessment criteria.
	➤ Inhalation of respirable fibers/dust.	➤ Future construction workers during site development	
		➤ Users on adjacent properties	
	➤ Uptake by fauna and flora.	➤ Terrestrial fauna and flora at the site.	

Based on the information provided in **Table 14**, no actual source-pathway-receptor linkage exist due to all results of analytical testing being reported below adopted assessment criteria.

12 Conclusion

This report presents the findings of a PSI, undertaken at 212-216 Queen Street Muswellbrook, prepared for the purpose of determining whether contamination is likely to exist on the site through current and/or historical activities and whether additional investigation is required. Based on the findings of the site history review, intrusive field investigations, laboratory analytical testing, it was assessed that no human health and/or ecological source-pathway-receptor linkages exist for the identified potentially contaminating activities. Therefore, it is considered that the site is suitable for the Proposed Development.

13 Limitations

This report was prepared in good faith and in accordance regulatory and industry standards for the use by the Client. The report was commissioned by Tindale Property Pty Ltd c/- Focus Town Planning and is based in part on information obtained from the Client and other parties. Readers are referred to any referenced investigation reports for further data and where necessary seek expert advice in respect to, their situation.

Information obtained in this report is considered to represent a reasonable interpretation of the general condition of the site at the time of the assessment. However, it is not possible to present findings of the entire site at all points and therefore if conditions encountered during excavation differ significantly from those outlined in this report, the author of this document should be contacted for advice.

This report and/or information contained within it should not be reproduced and/or presented/reviewed except in full. No liability will be accepted for use or interpretation of this report by any third party (unless written agreement/approval with the Client).



Appendix A



Preliminary Site Investigation: 212-216 Queen Street, Muswellbrook, NSW

Figure 1: Site Location and Features

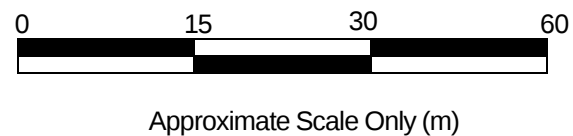
Date: 18 April 2023 Project No.: ENV 1015 Version: 1 Reference: Figure 1 Client: Tindale Property		Legend: The site Watercourse	1. Imported fill 2. Cattle yard 3. Former dwelling 4. Stockpiled trees	Envirotech Services Australia Pty Ltd ABN 25 657 766 982
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Preliminary Site Investigation: 212-216 Queen Street, Muswellbrook, NSW

Figure 2: Sampling Locations and Areas of Concern

Date: 18 April 2023
Project No.: ENV 1015
Version: 1
Reference: Figure 2
Client: Tindale Property



Legend:

 The site

 Imported fill stockpiles



Test Pit location



Location of former dwelling



Envirotech Services Australia Pty Ltd
ABN 25 657 766 982

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Appendix B



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

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

Summary of Owners Report

Address: - 212-216 Queen Street, Muswellbrook, NSW 2333

Description: - Lot 58 D.P. 1276946

<u>Date of Acquisition and term held</u>	<u>Registered Proprietor(s) & Occupations where available</u>	<u>Reference to Title at Acquisition and sale</u>
10.19.1913 (1913 to 1947)	John White (Station Manager)	Book 1008 No. 108
18.11.1947 (1957 to 1975)	Verlie Olive Weidmann (Spinster) (And her deceased estate)	Book 2035 No. 513
09.07.1974 (1975 to 1979)	Vivian Norman Bruce Simpson (Farmer) (Beneficiary of the Will of Verlie Olive Weidmann)	Book 3196 No. 226
06.04.1979 (1979 to 1982)	Mitchell's Cement Products (Morisset) Pty. Limited	Book 3359 No. 839
22.07.1982 (1982 to 1992)	Pintra Pty Limited	Book 3529 No. 6 Now 1-2/798186
02.07.1992 (1992 to 2013)	Enef Pty Limited	1-2/798186 Then 50/1112082 Now 98/1181251
12.08.2013 (2013 to 2021)	Northview Holding Company Pty Ltd	98/1181251
18.05.2021 (2023 to Date)	# Northview Reit Pty Ltd	98/1181251 Now 58/1276946

Denotes current registered proprietor

Leases: - NIL

Easements:

- 14.01.2021 (DP1181251) Easement for electricity and other purposes 2 & 15 metre(s) wide affecting the part(s) shown so burdened in the title diagram.
- 14.01.2021 (DP1181251) Right of carriageway 4 metre(s) wide affecting the part(s) shown so burdened in the title diagram.
- 21.09.2021 (DP1276946) Easement to drain sewage 3 metre(s) wide and variable width affecting the part(s) shown so burdened in the title diagram.
- 21.09.2021 (DP1276946) Easement to drain water 3 metre(s) wide affecting the part(s) shown so burdened in the title diagram.

Yours Sincerely,
Lisa Jordan
(Checked by Taylor Wilson)
15th March 2023

Email: SpecialisedServices@infotrack.com.au



Appendix C

Aerial Imagery 2022

212-216 Queen Street, Muswellbrook, NSW 2333



Aerial Imagery 2017

212-216 Queen Street, Muswellbrook, NSW 2333



Aerial Imagery 2013

212-216 Queen Street, Muswellbrook, NSW 2333



Aerial Imagery 2008

212-216 Queen Street, Muswellbrook, NSW 2333



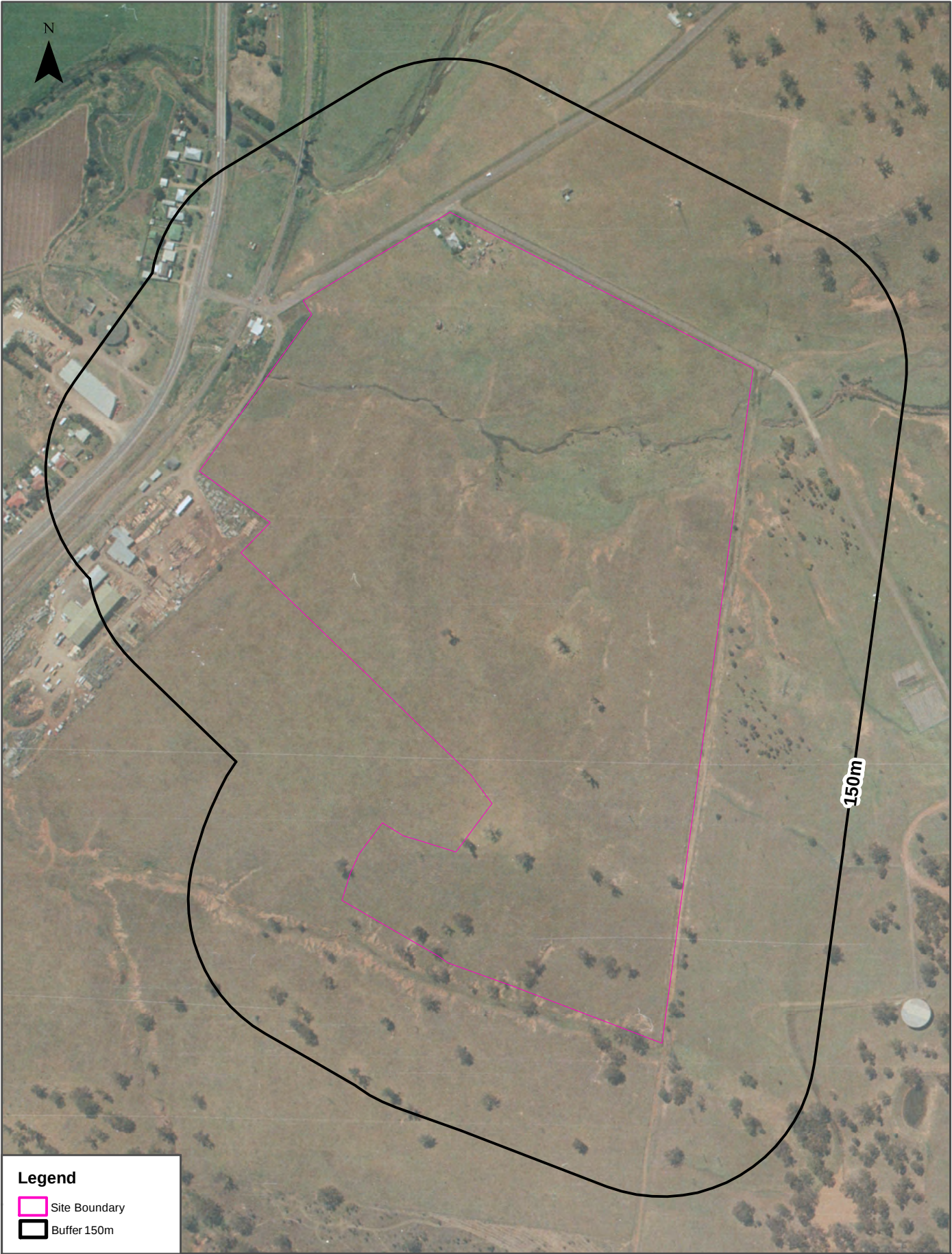
Aerial Imagery 1998

212-216 Queen Street, Muswellbrook, NSW 2333



Aerial Imagery 1989

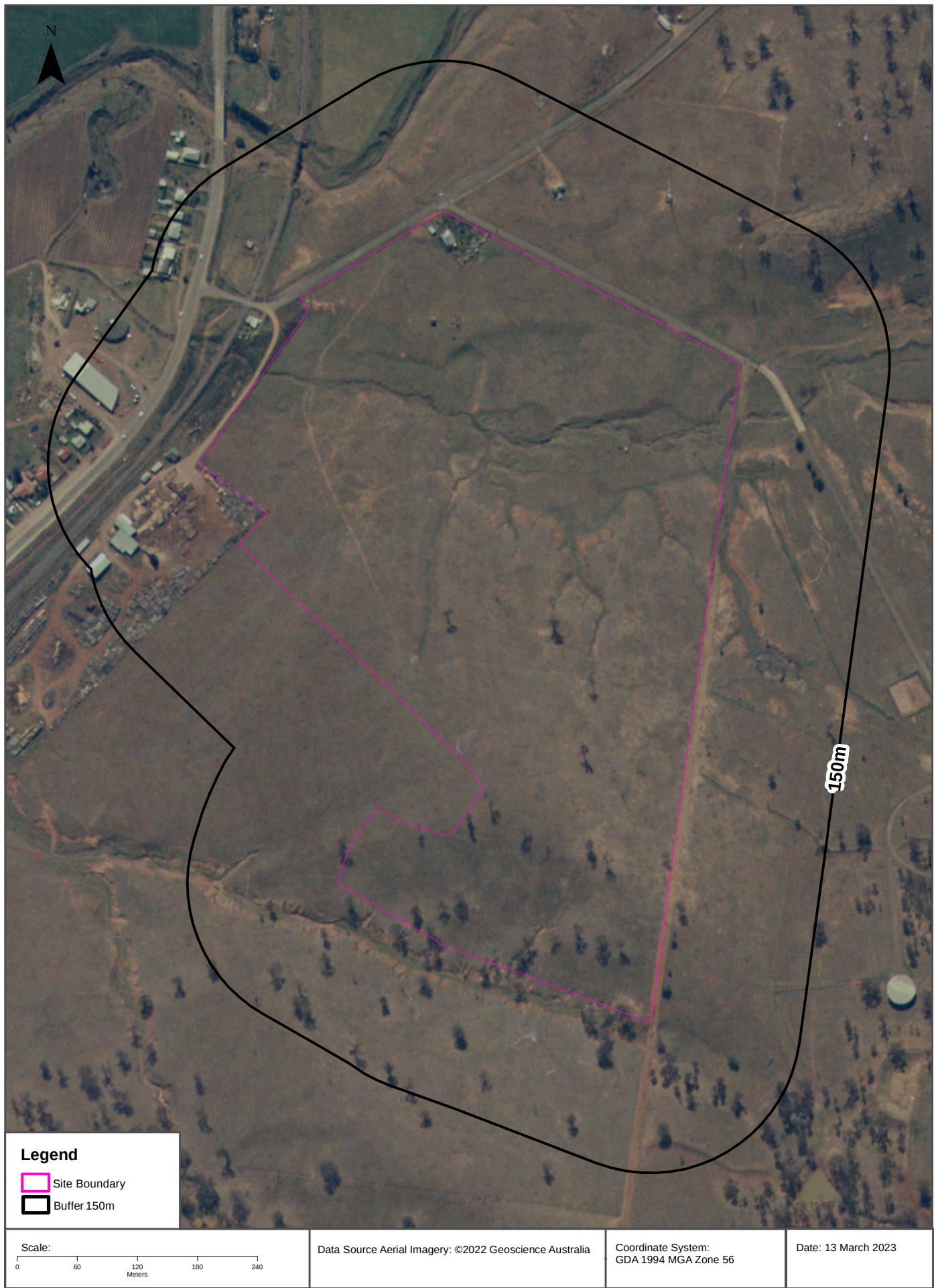
212-216 Queen Street, Muswellbrook, NSW 2333



Scale: 0 60 120 180 240 Meters	Data Source Aerial Imagery: © NSW Department of Customer Service	Coordinate System: GDA 1994 MGA Zone 56	Date: 13 March 2023
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Aerial Imagery 1980

212-216 Queen Street, Muswellbrook, NSW 2333



Aerial Imagery 1974

212-216 Queen Street, Muswellbrook, NSW 2333

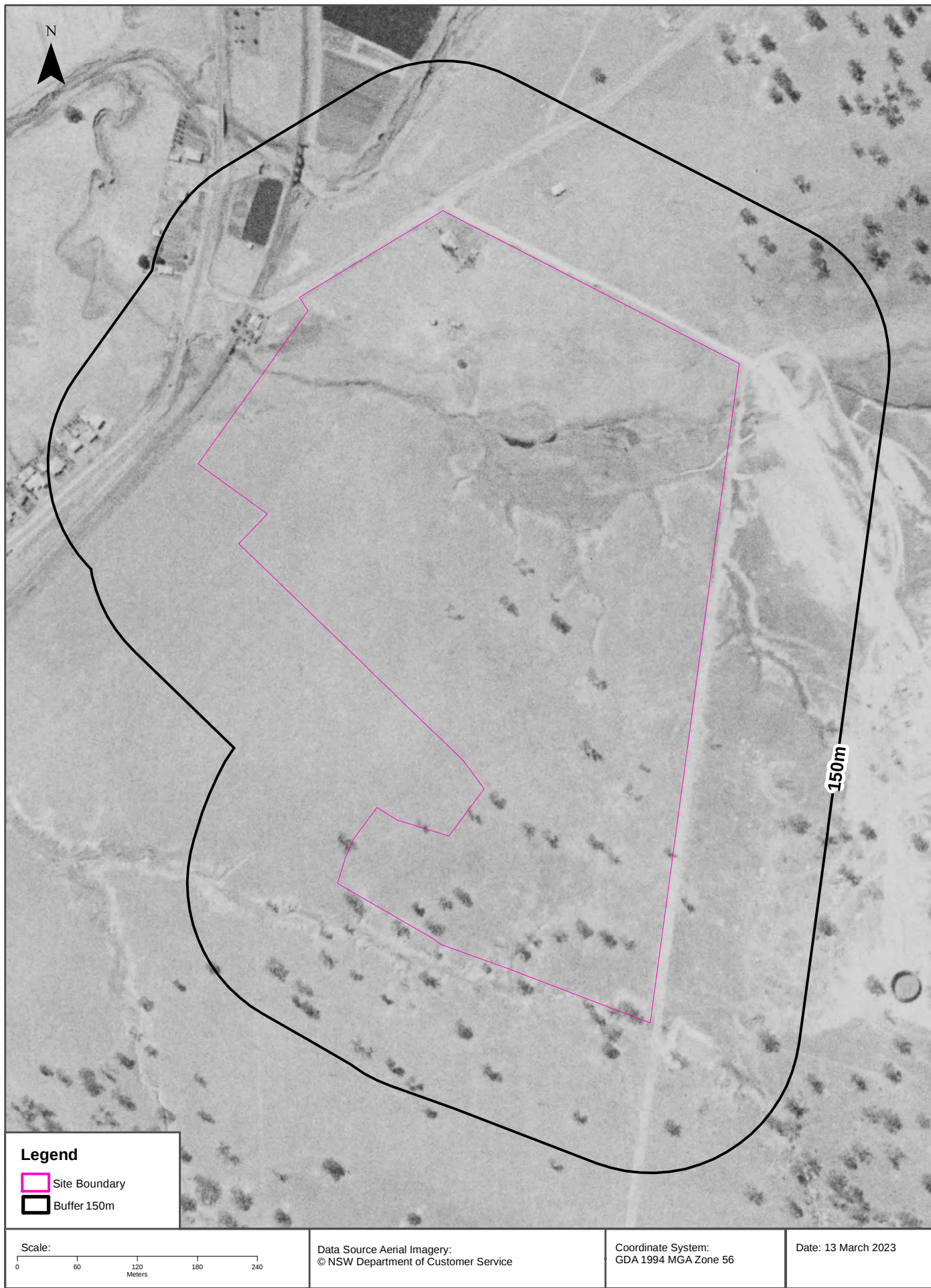


Scale: 0 60 120 180 240 Meters	Data Source Aerial Imagery: © NSW Department of Customer Service	Coordinate System: GDA 1994 MGA Zone 56	Date: 13 March 2023
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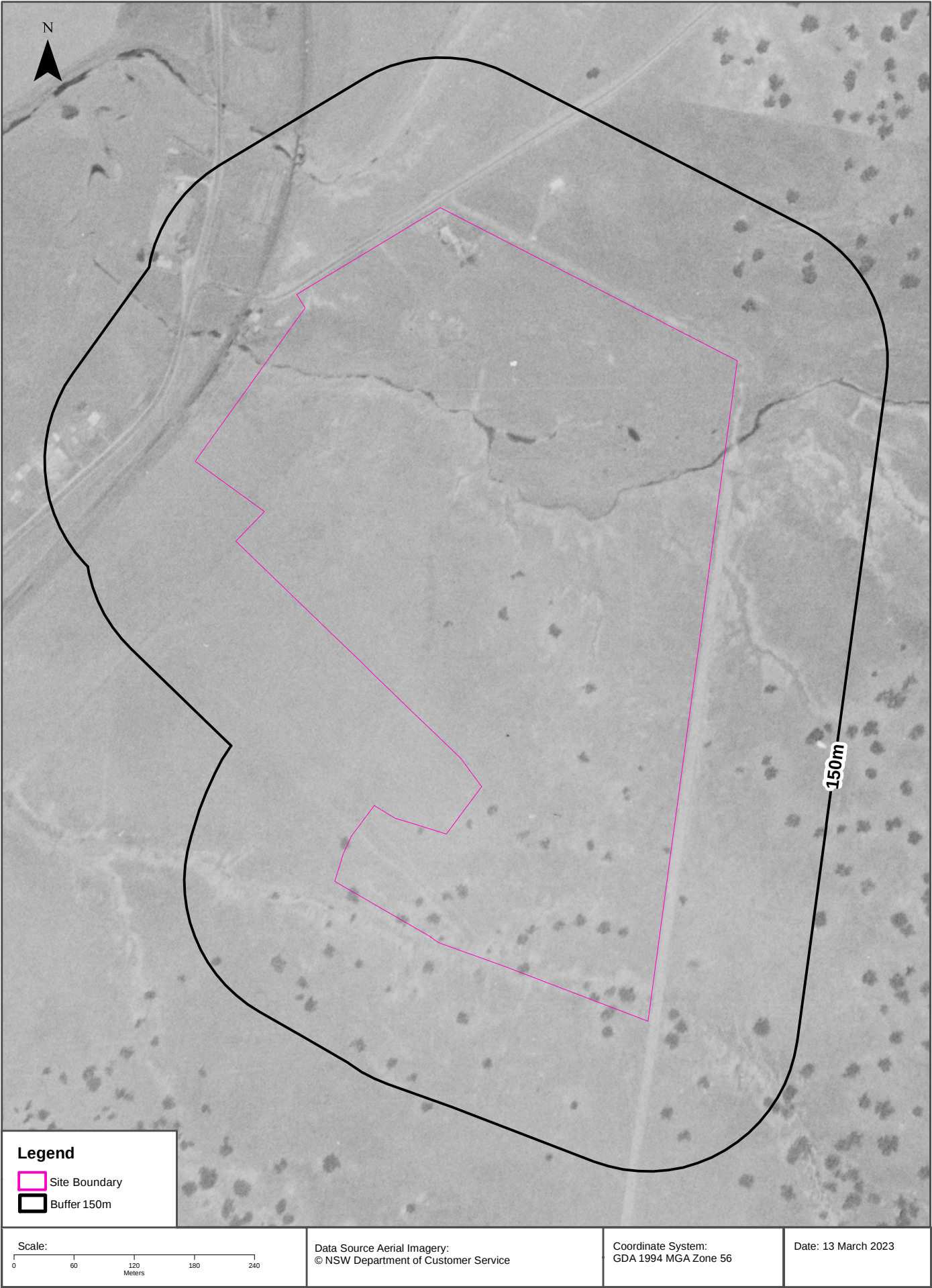
Aerial Imagery 1958

212-216 Queen Street, Muswellbrook, NSW 2333



Aerial Imagery 1953

212-216 Queen Street, Muswellbrook, NSW 2333





Appendix D



Photograph 1 – Entry to the site in the south western portion of the site.



Photograph 2 – Southern portion of the site



Photograph 3 – Eastern portion of the site.



Photograph 4 – North eastern portion of the site



Photograph 5 – Watercourse running through the site looking east



Photograph 6 – Western portion of the site looking south



Photograph 7 – Former industrial factory on adjacent land to the south west



Photograph 8 – Old cattle yard in the north western portion of the site



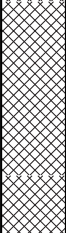
Photograph 9 – The site looking south west

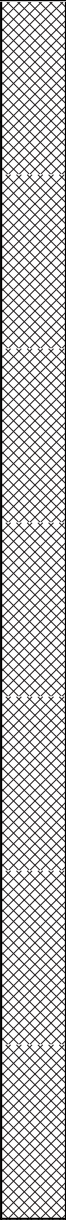


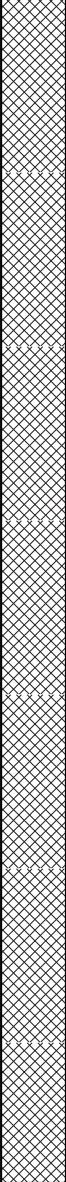
Photograph 10 – Stockpile in north western portion of the site

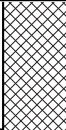
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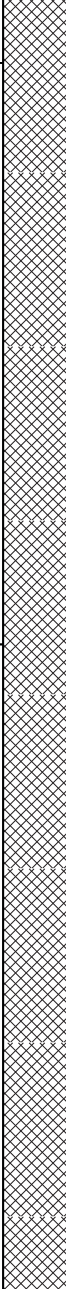
Appendix E

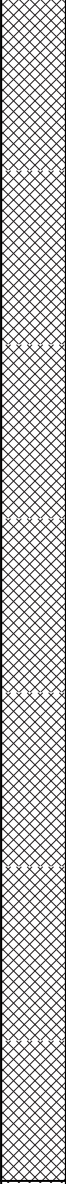
PROJECT NUMBER		ENV1015		DRILLING DATE		30/03/2023		TOTAL DEPTH		3.2	
PROJECT NAME		Muswellbrook PSI				DRILLING COMPANY		Envirotech			
CLIENT		Tindale Property Pty Ltd				DRILLER		SL			
ADDRESS		212-216 Queen Street, Muswellbrook				DRILLING METHOD		Excavator			
COMMENTS											
Depth (m)	PID	Samples	Graphic Log	Material Description (soil type: plasticity/grainsize, colour and other components)				Moisture	Additional Observations		
0.5		TP01 0.5		FILL: sandy silty CLAY, medium plasticity, fine to medium grained, brown, cobbles, small to large sub angular gravels.				D-M			
1		TP01 1.0		FILL: gravelly silty sandy CLAY, low to medium plasticity, fine to medium grained, brown, small to large sub angular gravels.							
1.5											
2											
2.5				FILL: clayey SILT (crushed siltstone?), low plasticity, fine grained, pale brown.				D			
3				sandy CLAY: medium plasticity, fine to medium grained, dark brown, trace small to medium sub angular gravel.				D-M	Natural		
				Termination Depth at:3.2 m							

PROJECT NUMBER		ENV1015		DRILLING DATE		30/03/2023		TOTAL DEPTH		3	
PROJECT NAME		Muswellbrook PSI		DRILLING COMPANY		Envirotech		LOGGED BY		SL	
CLIENT		Tindale Property Pty Ltd		DRILLER		SL					
ADDRESS		212-216 Queen Street, Muswellbrook		DRILLING METHOD		Excavator					
COMMENTS											
Depth (m)	PID	Samples	Graphic Log	Material Description (soil type: plasticity/grainsize, colour and other components)				Moisture	Additional Observations		
0.5		TP02 0.3		FILL: sandy CLAY, medium plasticity, fine to medium grained, dark brown.				D-M			
				FILL: gravelly SAND, non plastic, medium grained, grey.							
				FILL: sandy CLAY, low to medium plasticity, fine to medium grained, brown, cobbles, small to large sub angular gravel.							
2		TP02 2.0									
2.5											
3				Termination Depth at:3 m							

PROJECT NUMBER ENV1015		DRILLING DATE 30/03/2023		TOTAL DEPTH 2.5		
PROJECT NAME Muswellbrook PSI		DRILLING COMPANY Envirotech		LOGGED BY SL		
CLIENT Tindale Property Pty Ltd		DRILLER SL				
ADDRESS 212-216 Queen Street, Muswellbrook		DRILLING METHOD Excavator				
COMMENTS						
Depth (m)	PID	Samples	Graphic Log	Material Description (soil type: plasticity/grainsize, colour and other components)	Moisture	Additional Observations
0.5		TP03 0.5		FILL: sandy CLAY, low to medium plasticity, fine to medium grained, brown, cobbles, small to large sub angular gravel.	D-M	
1						
1.5						
2		TP03 2.0				
2.5				Termination Depth at:2.5 m		

PROJECT NUMBER		ENV1015		DRILLING DATE		30/03/2023		TOTAL DEPTH		2	
PROJECT NAME		Muswellbrook PSI		DRILLING COMPANY		Envirotech		LOGGED BY		SL	
CLIENT		Tindale Property Pty Ltd		DRILLER		SL					
ADDRESS		212-216 Queen Street, Muswellbrook		DRILLING METHOD		Excavator					
COMMENTS											
Depth (m)	PID	Samples	Graphic Log	Material Description (soil type: plasticity/grainsize, colour and other components)				Moisture	Additional Observations		
0.5		TP04 0.2		sandy CLAY: medium plasticity, fine to medium grained, brown, trace small to medium sub angular gravel.				D-M			
		FILL: sandy CLAY, low to medium plasticity, fine to medium grained, pale orange brown, cobbles, small to large sub angular gravel.									
1											
1.5		TP04 1.5									
2											
				Termination Depth at:2 m							

PROJECT NUMBER ENV1015		DRILLING DATE 30/03/2023		TOTAL DEPTH 2		
PROJECT NAME Muswellbrook PSI		DRILLING COMPANY Envirotech		LOGGED BY SL		
CLIENT Tindale Property Pty Ltd		DRILLER SL				
ADDRESS 212-216 Queen Street, Muswellbrook		DRILLING METHOD Excavator				
COMMENTS						
Depth (m)	PID	Samples	Graphic Log	Material Description (soil type: plasticity/grainsize, colour and other components)	Moisture	Additional Observations
0.5		TP05 0.1		sandy CLAY: medium plasticity, fine to medium grained, brown, trace small to medium sub angular gravel.	D-M	
				FILL: sandy CLAY, low to medium plasticity, fine to medium grained, pale orange brown, cobbles, small to large sub angular gravel.		
1		TP05 1				
1.5						
2				Termination Depth at:2 m		

PROJECT NUMBER ENV1015		DRILLING DATE 30/03/2023		TOTAL DEPTH 1		
PROJECT NAME Muswellbrook PSI		DRILLING COMPANY Envirotech		LOGGED BY SL		
CLIENT Tindale Property Pty Ltd		DRILLER SL				
ADDRESS 212-216 Queen Street, Muswellbrook		DRILLING METHOD Excavator				
COMMENTS						
Depth (m)	PID	Samples	Graphic Log	Material Description (soil type: plasticity/grainsize, colour and other components)	Moisture	Additional Observations
0.5		TP06_0.05		sandy CLAY: medium plasticity, fine to medium grained, brown, trace small to medium sub angular gravel.	D-M	
		TP06_0.5 ACM01		FILL: sandy silty CLAY, low to medium plasticity, fine to medium grained, pale orange brown, cobbles, small to large sub angular gravel.		Tree logs and concrete
1				Termination Depth at: 1 m Refusal		

PROJECT NUMBER ENV1015	DRILLING DATE 30/03/2023	TOTAL DEPTH 0.6
PROJECT NAME Muswellbrook PSI	DRILLING COMPANY Envirotech	LOGGED BY SL
CLIENT Tindale Property Pty Ltd	DRILLER SL	
ADDRESS 212-216 Queen Street, Muswellbrook	DRILLING METHOD Excavator	

COMMENTS

Depth (m)	PID	Samples	Graphic Log	Material Description (soil type: plasticity/grainsize, colour and other components)	Moisture	Additional Observations
		TP07_0.1 ACM02		TOSPOIL: sandy silt, non plastic, fine grained, brown.	D	Bricks
0.5				silty sandy CLAY: medium plasticity, fine to medium grained, light brown, trace small to medium sub angular gravel.	D-M	
				Termination Depth at:0.6 m		



Appendix F

	Sample ID:	TP06_0.5
	Sample Date:	30/03/2023
	Soil Type:	CLAY
	Depth (m):	0.5
Analyte grouping/Analyte	Unit	
pH in soil		
pH (CaCl ₂)	pH Unit	7.5
pH 1:5 (Soils)		
pH Value	pH Unit	9.2
Conductivity (1:5)		
Electrical Conductivity @ 25°C	µS/cm	129
Soil Classification based on Particle Size		
Clay (<2 µm)	%	11
Soil Particle Density		
Soil Particle Density (Clay/Silt/Sand)	g/cm ³	2.57
Exchangeable Cations on Alkaline Soils		
Exchangeable Calcium	meq/100g	11.5
Exchangeable Magnesium	meq/100g	10.9
Exchangeable Potassium	meq/100g	<0.2
Exchangeable Sodium	meq/100g	0.4
Cation Exchange Capacity	meq/100g	22.8
Total Metals		
Iron	%	3.17
Organic Matter		
Organic Matter	%	1.2
Total Organic Carbon	%	0.7

		Sample ID:	ACM01	ACM02
		Sample Date:	30/03/2023	30/03/2023
		TP ID:	TP06	TP07
		Depth (m):	0.5	0.1
		ASC NEPM 2013		
HSL A				
Analyte grouping/Analyte	Unit			
AS 4964 - 2004 Identification of Asbestos in Soils				
Asbestos Detected	g/kg	presence	No	No
Asbestos (Trace)	Fibres		No	No
Asbestos Type	-		-	-
Synthetic Mineral Fibre	-		No	No
Organic Fibre	-		No	No
Sample weight (dry)	g		1210	699
Asbestos Quantification (non-NATA)				
Asbestos Containing Material (as 15% Asbestos in ACM >7mm)	% (w/w)	0.01	<0.01	<0.01
Asbestos (Fines and Fibrous <7mm)	g		<0.0004	<0.0004
Asbestos (Fines and Fibrous FA+AF)	% (w/w)	0.001	<0.001	<0.001
Weight Used for % Calculation	kg		1.21	0.699
Fibrous Asbestos >7mm	g		<0.0004	<0.0004
Asbestos Containing Material	g		<0.1	<0.1



		Sample ID:		TP01_0.5	TP01_1.0	TP02_0.3	TP02_2.0	TP03_0.5	TP03_2.0	TP04_1.5	TP05_1.0	TP06_0.5	TP07_0.1
		Sample Date:		30/03/2023	30/03/2023	30/03/2023	30/03/2023	30/03/2023	30/03/2023	30/03/2023	30/03/2023	30/03/2023	30/03/2023
		Soil Type:		CLAY	CLAY	CLAY	CLAY	CLAY	CLAY	CLAY	CLAY	CLAY	SILT
		Depth (m):		0.5	1	0.3	2	0.5	2	1.5	1	0.5	0.1
		ASC NEPM 2013		All results in mg/kg									
		HIL A	EILs										
Analyte grouping/Analyte													
Total Metals													
Arsenic	100	100*	<5	5	7	5	<5	<5	<5	<5	<5	<5	<5
Cadmium	20		<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1
Chromium	100		26	36	60	50	33	44	74	58	50	22	22
Copper	6000	230^	12	12	21	20	17	21	23	26	22	35	35
Lead	300	1100*	7	9	6	8	<5	<5	<5	<5	6	132	132
Nickel	400	300^	36	22	43	42	23	27	49	58	49	11	11
Zinc	7400	850^	28	25	27	37	26	36	43	45	43	304	304
Total Recoverable Mercury													
Mercury	40		<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1
Organochlorine Pesticides (OC)													
alpha-BHC			-	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05
Hexachlorobenzene (HCB)	10		-	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05
beta-BHC			-	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05
gamma-BHC			-	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05
delta-BHC			-	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05
Heptachlor	6		-	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05
Aldrin			-	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05
Heptachlor epoxide			-	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05
Total Chlordane (sum)			-	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05
trans-Chlordane			-	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05
alpha-Endosulfan			-	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05
cis-Chlordane	50		-	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05
Dieldrin			-	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05
4,4'-DDE			-	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05
Endrin	10		-	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05
Endosulfan (sum)	270		-	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05
beta-Endosulfan			-	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05
4,4'-DDD			-	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05
Endrin aldehyde			-	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05
Endosulfan sulfate			-	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05
4,4'-DDT		180*	-	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2
Endrin ketone			-	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05
Methoxychlor	300		-	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2
Sum of DDD + DDE + DDT	240		-	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05
Sum of Aldrin + Dieldrin	6		-	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05
Organophosphorus Pesticides (OP)													
Dichlorvos			-	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05
Demeton-S-methyl			-	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05
Monocrotophos			-	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2
Dimethoate			-	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05
Diazinon			-	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05
Chlorpyrifos-methyl			-	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05
Parathion-methyl			-	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2
Malathion			-	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05
Fenthion			-	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05
Chlorpyrifos	160		-	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05
Parathion			-	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2
Pirimphos-ethyl			-	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05
Chlorfenvinphos			-	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05
Bromophos-ethyl			-	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05
Fenamiphos			-	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05
Prothiofos			-	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05
Ethion			-	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05
Carbophenothion			-	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05
Azinphos Methyl			-	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05

* Generic EILs for aged As, fresh DDT and fresh naphthalene in soils irrespective of their physicochemical properties
^ Soil-specific concentrations for aged metals in soil

All results in mg/kg

[illegible]

	Sample ID:	RW01
	Sample Date:	30/03/2023
Analyte grouping/Analyte	Unit	
Total Metals		
Arsenic	mg/L	<0.001
Cadmium	mg/L	<0.0001
Chromium	mg/L	<0.001
Copper	mg/L	<0.001
Lead	mg/L	<0.001
Nickel	mg/L	<0.001
Zinc	mg/L	<0.005
Total Recoverable Mercury		
Mercury	mg/L	<0.0001
Polynuclear Aromatic Hydrocarbons		
Naphthalene	µg/L	<1.0
Acenaphthylene	µg/L	<1.0
Acenaphthene	µg/L	<1.0
Fluorene	µg/L	<1.0
Phenanthrene	µg/L	<1.0
Anthracene	µg/L	<1.0
Fluoranthene	µg/L	<1.0
Pyrene	µg/L	<1.0
Benz(a)anthracene	µg/L	<1.0
Chrysene	µg/L	<1.0
Benzo(b+j)fluoranthene	µg/L	<1.0
Benzo(k)fluoranthene	µg/L	<1.0
Benzo(a)pyrene	µg/L	<0.5
Indeno(1.2.3.cd)pyrene	µg/L	<1.0
Dibenz(a,h)anthracene	µg/L	<1.0
Benzo(g,h,i)perylene	µg/L	<1.0
Sum of polycyclic aromatic hydrocarbons	µg/L	<0.5
Benzo(a)pyrene TEQ (zero)	µg/L	<0.5
Total Petroleum Hydrocarbons		
C6 - C9 Fraction	µg/L	<20
C10 - C14 Fraction	µg/L	<50
C15 - C28 Fraction	µg/L	<100
C29 - C36 Fraction	µg/L	<50
C10 - C36 Fraction (sum)	µg/L	<50
Total Recoverable Hydrocarbons - NEPM 2013 Fractions		
C6 - C10 Fraction	µg/L	<20
C6 - C10 Fraction minus BTEX (F1)	µg/L	<20
>C10 - C16 Fraction	µg/L	<100
>C16 - C34 Fraction	µg/L	<100
>C34 - C40 Fraction	µg/L	<100
>C10 - C40 Fraction (sum)	µg/L	<100
>C10 - C16 Fraction minus Naphthalene (F2)	µg/L	<100
BTEXN		
Benzene	µg/L	<1
Toluene	µg/L	<2
Ethylbenzene	µg/L	<2
meta- & para-Xylene	µg/L	<2
ortho-Xylene	µg/L	<2
Total Xylenes	µg/L	<2
Sum of BTEX	µg/L	<1
Naphthalene	µg/L	<5



Analytical Summary
QA/QC

ENV1015
Muswellbrook PSI
15/4/2023

Sample ID:	TB
Sample Date:	24/03/2023
Analyte grouping/Analyte	All results in mg/kg
Total Petroleum Hydrocarbons	
C6 - C9 Fraction	<10
Total Recoverable Hydrocarbons - NEPM 2013 Fractions	
C6 - C10 Fraction	<10
C6 - C10 Fraction minus BTEX (F1)	<10
BTEXN	
Benzene	<0.2
Toluene	<0.5
Ethylbenzene	<0.5
meta- & para-Xylene	<0.5
ortho-Xylene	<0.5
Total Xylenes	<0.5
Sum of BTEX	<0.2
Naphthalene	<1

Sample ID:	TP02_0.3	QC01	RPD %
Sample Date:	30/03/2023	30/03/2023	
Analyte grouping/Analyte	All results in mg/kg		
Total Metals			
Arsenic	7	<5	-
Cadmium	<1	<1	0%
Chromium	60	50	18%
Copper	21	22	5%
Lead	6	<5	-
Nickel	43	29	39%
Zinc	27	32	17%
Total Recoverable Mercury			
Mercury	<0.1	<0.1	0%
Organochlorine Pesticides (OC)			
alpha-BHC	<0.05	<0.05	0%
Hexachlorobenzene (HCB)	<0.05	<0.05	0%
beta-BHC	<0.05	<0.05	0%
gamma-BHC	<0.05	<0.05	0%
delta-BHC	<0.05	<0.05	0%
Heptachlor	<0.05	<0.05	0%
Aldrin	<0.05	<0.05	0%
Heptachlor epoxide	<0.05	<0.05	0%
Total Chlordane (sum)	<0.05	<0.05	0%
trans-Chlordane	<0.05	<0.05	0%
alpha-Endosulfan	<0.05	<0.05	0%
cis-Chlordane	<0.05	<0.05	0%
Dieldrin	<0.05	<0.05	0%
4,4`-DDE	<0.05	<0.05	0%
Endrin	<0.05	<0.05	0%
Endosulfan (sum)	<0.05	<0.05	0%
beta-Endosulfan	<0.05	<0.05	0%
4,4`-DDD	<0.05	<0.05	0%
Endrin aldehyde	<0.05	<0.05	0%
Endosulfan sulfate	<0.05	<0.05	0%
4,4`-DDT	<0.2	<0.2	0%
Endrin ketone	<0.05	<0.05	0%
Methoxychlor	<0.2	<0.2	0%
Sum of DDD + DDE + DDT	<0.05	<0.05	0%
Sum of Aldrin + Dieldrin	<0.05	<0.05	0%
Organophosphorus Pesticides (OP)			
Dichlorvos	<0.05	<0.05	0%
Demeton-S-methyl	<0.05	<0.05	0%
Monocrotophos	<0.2	<0.2	0%
Dimethoate	<0.05	<0.05	0%
Diazinon	<0.05	<0.05	0%
Chlorpyrifos-methyl	<0.05	<0.05	0%
Parathion-methyl	<0.2	<0.2	0%
Malathion	<0.05	<0.05	0%
Fenthion	<0.05	<0.05	0%
Chlorpyrifos	<0.05	<0.05	0%
Parathion	<0.2	<0.2	0%
Pirimphos-ethyl	<0.05	<0.05	0%
Chlorfenvinphos	<0.05	<0.05	0%
Bromophos-ethyl	<0.05	<0.05	0%
Fenamiphos	<0.05	<0.05	0%
Prothiofos	<0.05	<0.05	0%
Ethion	<0.05	<0.05	0%
Carbophenothion	<0.05	<0.05	0%
Azinphos Methyl	<0.05	<0.05	0%

Sample ID:	TP03_0.5	QC01	RPD %
Sample Date:	30/03/2023	30/03/2023	
Analyte grouping/Analyte	All results in mg/kg		
Polynuclear Aromatic Hydrocarbons			
Naphthalene	<0.5	<0.5	0%
Acenaphthylene	<0.5	<0.5	0%
Acenaphthene	<0.5	<0.5	0%
Fluorene	<0.5	<0.5	0%
Phenanthrene	<0.5	<0.5	0%
Anthracene	<0.5	<0.5	0%
Fluoranthene	<0.5	<0.5	0%
Pyrene	<0.5	<0.5	0%
Benz(a)anthracene	<0.5	<0.5	0%
Chrysene	<0.5	<0.5	0%
Benzo(b+j)fluoranthene	<0.5	<0.5	0%
Benzo(k)fluoranthene	<0.5	<0.5	0%
Benzo(a)pyrene	<0.5	<0.5	0%
Indeno(1.2.3.cd)pyrene	<0.5	<0.5	0%
Dibenz(a.h)anthracene	<0.5	<0.5	0%
Benzo(g.h.i)perylene	<0.5	<0.5	0%
Sum of polycyclic aromatic hydrocarbons	<0.5	<0.5	0%
Benzo(a)pyrene TEQ (zero)	<0.5	<0.5	0%
Benzo(a)pyrene TEQ (half LOR)	0.6	0.6	0%
Benzo(a)pyrene TEQ (LOR)	1.2	1.2	0%
Total Petroleum Hydrocarbons			
C6 - C9 Fraction	<10	<10	0%
C10 - C14 Fraction	<50	<50	0%
C15 - C28 Fraction	<100	<100	0%
C29 - C36 Fraction	<100	<100	0%
C10 - C36 Fraction (sum)	<50	<50	0%
Total Recoverable Hydrocarbons - NEPM 2013 Fractions			
C6 - C10 Fraction	<10	<10	0%
C6 - C10 Fraction minus BTEX (F1)	<10	<10	0%
>C10 - C16 Fraction	<50	<50	0%
>C16 - C34 Fraction	<100	<100	0%
>C34 - C40 Fraction	<100	<100	0%
>C10 - C40 Fraction (sum)	<50	<50	0%
>C10 - C16 Fraction minus Naphthalene (F2)	<50	<50	0%
BTEXN			
Benzene	<0.2	<0.2	0%
Toluene	<0.5	<0.5	0%
Ethylbenzene	<0.5	<0.5	0%
meta- & para-Xylene	<0.5	<0.5	0%
ortho-Xylene	<0.5	<0.5	0%
Total Xylenes	<0.5	<0.5	0%
Sum of BTEX	<0.2	<0.2	0%
Naphthalene	<1	<1	0%

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Appendix G



CERTIFICATE OF ANALYSIS

Work Order	: ES2310695	Page	: 1 of 21
Client	: Envirotech Services Australia	Laboratory	: Environmental Division Sydney
Contact	: Stuart Lord	Contact	: Customer Services ES
Address	: 271 Brunker Road Adamstown 2289	Address	: 277-289 Woodpark Road Smithfield NSW Australia 2164
Telephone	: ----	Telephone	: +61-2-8784 8555
Project	: Mussellbrook PSI	Date Samples Received	: 31-Mar-2023 19:45
Order number	: ENV1015	Date Analysis Commenced	: 04-Apr-2023
C-O-C number	: ----	Issue Date	: 13-Apr-2023 10:56
Sampler	: ----		
Site	: ----		
Quote number	: SY/222/22		
No. of samples received	: 25		
No. of samples analysed	: 17		



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

This Certificate of Analysis contains the following information:

- General Comments
- Analytical Results
- Descriptive Results
- Surrogate Control Limits

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

Signatories

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

Signatories	Position	Accreditation Category
Aleksandar Vujkovic	Laboratory Technician	Newcastle - Inorganics, Mayfield West, NSW
Ankit Joshi	Senior Chemist - Inorganics	Sydney Inorganics, Smithfield, NSW
Brendan Schrader	Laboratory Technician	Newcastle - Asbestos, Mayfield West, NSW
Dian Dao	Senior Chemist - Inorganics	Sydney Inorganics, Smithfield, NSW
Edwandy Fadjar	Organic Coordinator	Sydney Inorganics, Smithfield, NSW
Edwandy Fadjar	Organic Coordinator	Sydney Organics, Smithfield, NSW
Wisam Marassa	Inorganics Coordinator	Sydney Inorganics, Smithfield, NSW



General Comments

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

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

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

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

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

Where a result is required to meet compliance limits the associated uncertainty must be considered. Refer to the ALS Contract for details.

Key : CAS Number = CAS registry number from database maintained by Chemical Abstracts Services. The Chemical Abstracts Service is a division of the American Chemical Society.

LOR = Limit of reporting

^ = This result is computed from individual analyte detections at or above the level of reporting

ø = ALS is not NATA accredited for these tests.

~ = Indicates an estimated value.

- ALS is not NATA accredited for the analysis of Exchangeable Cations on Alkaline Soils when performed under ALS Method ED006.
- EP075 (SIM): Where reported, Benzo(a)pyrene Toxicity Equivalent Quotient (TEQ) per the NEPM (2013) is the sum total of the concentration of the eight carcinogenic PAHs multiplied by their Toxicity Equivalence Factor (TEF) relative to Benzo(a)pyrene. TEF values are provided in brackets as follows: Benz(a)anthracene (0.1), Chrysene (0.01), Benzo(b+j) & Benzo(k)fluoranthene (0.1), Benzo(a)pyrene (1.0), Indeno(1.2.3.cd)pyrene (0.1), Dibenz(a,h)anthracene (1.0), Benzo(g,h,i)perylene (0.01). Less than LOR results for 'TEQ Zero' are treated as zero.
- Benzo(a)pyrene Toxicity Equivalent Quotient (TEQ) per the NEPM (2013) is the sum total of the concentration of the eight carcinogenic PAHs multiplied by their Toxicity Equivalence Factor (TEF) relative to Benzo(a)pyrene. TEF values are provided in brackets as follows: Benz(a)anthracene (0.1), Chrysene (0.01), Benzo(b+j) & Benzo(k)fluoranthene (0.1), Benzo(a)pyrene (1.0), Indeno(1.2.3.cd)pyrene (0.1), Dibenz(a,h)anthracene (1.0), Benzo(g,h,i)perylene (0.01). Less than LOR results for 'TEQ Zero' are treated as zero, for 'TEQ 1/2LOR' are treated as half the reported LOR, and for 'TEQ LOR' are treated as being equal to the reported LOR. Note: TEQ 1/2LOR and TEQ LOR will calculate as 0.6mg/Kg and 1.2mg/Kg respectively for samples with non-detects for all of the eight TEQ PAHs.
- EP080: Where reported, Total Xylenes is the sum of the reported concentrations of m&p-Xylene and o-Xylene at or above the LOR.
- EP068: Where reported, Total Chlordane (sum) is the sum of the reported concentrations of cis-Chlordane and trans-Chlordane at or above the LOR.
- EP068: Where reported, Total OCP is the sum of the reported concentrations of all Organochlorine Pesticides at or above LOR.
- EP075(SIM): Where reported, Total Cresol is the sum of the reported concentrations of 2-Methylphenol and 3- & 4-Methylphenol at or above the LOR.
- EP080: The trip spike and its control have been analysed for volatile TPH and BTEXN only. The trip spike and control were prepared in the lab using reagent grade sand spiked with petrol. The spike was dispatched from the lab and the control retained.
- EA200N: Asbestos weights and percentages are not covered under the Scope of NATA Accreditation.
Weights of Asbestos are based on extracted bulk asbestos, fibre bundles, and/or ACM and do not include respirable fibres (if present)
The Asbestos (Fines and Fibrous) weight is calculated from the extracted Fibrous Asbestos and Asbestos Fines as an equivalent weight of 100% Asbestos
Percentages for Asbestos content in ACM are based on the 2013 NEPM default values.
All calculations of percentage Asbestos under this method are approximate and should be used as a guide only.
- EA200 'Am' Amosite (brown asbestos)
- EA200 'Cr' Crocidolite (blue asbestos)
- EA200 'Trace' - Asbestos fibres ("Free Fibres") detected by trace analysis per AS4964. The result can be interpreted that the sample contains detectable 'respirable' asbestos fibres
- EA200: Asbestos Identification Samples were analysed by Polarised Light Microscopy including dispersion staining.
- EA200 Legend
- EA200 'Ch' Chrysotile (white asbestos)
- EA200: 'UMF' Unknown Mineral Fibres. "-" indicates fibres detected may or may not be asbestos fibres. Confirmation by alternative techniques is recommended.



- EA200N: ALS laboratory procedures and methods used for the identification and quantitation of asbestos are consistent with AS4964-2004 and the requirements of the 2013 NEPM for Assessment of Site Contamination
- EA200: For samples larger than 30g, the <2mm fraction may be sub-sampled prior to trace analysis as outlined in ISO23909:2008(E) Sect 6.3.2-2
- ED007 and ED008: When Exchangeable Al is reported from these methods, it should be noted that Rayment & Lyons (2011) suggests Exchange Acidity by 1M KCl - Method 15G1 (ED005) is a more suitable method for the determination of exchange acidity (H⁺ + Al³⁺).
- EA200: 'Yes' - Asbestos detected by polarised light microscopy including dispersion staining.
- EA200: 'No*' - No asbestos found, at the reporting limit of 0.1g/kg, by polarised light microscopy including dispersion staining. Asbestos material was detected and positively identified at concentrations estimated to be below 0.1g/kg.
- EA200: 'No' - No asbestos found at the reporting limit 0.1g/kg, by polarised light microscopy including dispersion staining.



Analytical Results

Sub-Matrix: SOIL
 (Matrix: SOIL)

Sample ID

				TP01_0.5	TP01_1.0	TP02_0.3	TP02_2.0	TP03_0.5
Sampling date / time				30-Mar-2023 00:00	30-Mar-2023 00:00	30-Mar-2023 00:00	30-Mar-2023 00:00	30-Mar-2023 00:00
Compound	CAS Number	LOR	Unit	ES2310695-002	ES2310695-003	ES2310695-006	ES2310695-008	ES2310695-009
				Result	Result	Result	Result	Result
EA055: Moisture Content (Dried @ 105-110°C)								
Moisture Content	----	1.0	%	10.2	8.2	19.1	11.8	8.9
EG005(ED093)T: Total Metals by ICP-AES								
Arsenic	7440-38-2	5	mg/kg	<5	5	7	5	<5
Cadmium	7440-43-9	1	mg/kg	<1	<1	<1	<1	<1
Chromium	7440-47-3	2	mg/kg	26	36	60	50	33
Copper	7440-50-8	5	mg/kg	12	12	21	20	17
Lead	7439-92-1	5	mg/kg	7	9	6	8	<5
Nickel	7440-02-0	2	mg/kg	36	22	43	42	23
Zinc	7440-66-6	5	mg/kg	28	25	27	37	26
EG035T: Total Recoverable Mercury by FIMS								
Mercury	7439-97-6	0.1	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
EP068A: Organochlorine Pesticides (OC)								
alpha-BHC	319-84-6	0.05	mg/kg	----	<0.05	<0.05	<0.05	<0.05
Hexachlorobenzene (HCB)	118-74-1	0.05	mg/kg	----	<0.05	<0.05	<0.05	<0.05
beta-BHC	319-85-7	0.05	mg/kg	----	<0.05	<0.05	<0.05	<0.05
gamma-BHC	58-89-9	0.05	mg/kg	----	<0.05	<0.05	<0.05	<0.05
delta-BHC	319-86-8	0.05	mg/kg	----	<0.05	<0.05	<0.05	<0.05
Heptachlor	76-44-8	0.05	mg/kg	----	<0.05	<0.05	<0.05	<0.05
Aldrin	309-00-2	0.05	mg/kg	----	<0.05	<0.05	<0.05	<0.05
Heptachlor epoxide	1024-57-3	0.05	mg/kg	----	<0.05	<0.05	<0.05	<0.05
^ Total Chlordane (sum)	----	0.05	mg/kg	----	<0.05	<0.05	<0.05	<0.05
trans-Chlordane	5103-74-2	0.05	mg/kg	----	<0.05	<0.05	<0.05	<0.05
alpha-Endosulfan	959-98-8	0.05	mg/kg	----	<0.05	<0.05	<0.05	<0.05
cis-Chlordane	5103-71-9	0.05	mg/kg	----	<0.05	<0.05	<0.05	<0.05
Dieldrin	60-57-1	0.05	mg/kg	----	<0.05	<0.05	<0.05	<0.05
4,4'-DDE	72-55-9	0.05	mg/kg	----	<0.05	<0.05	<0.05	<0.05
Endrin	72-20-8	0.05	mg/kg	----	<0.05	<0.05	<0.05	<0.05
beta-Endosulfan	33213-65-9	0.05	mg/kg	----	<0.05	<0.05	<0.05	<0.05
^ Endosulfan (sum)	115-29-7	0.05	mg/kg	----	<0.05	<0.05	<0.05	<0.05
4,4'-DDD	72-54-8	0.05	mg/kg	----	<0.05	<0.05	<0.05	<0.05
Endrin aldehyde	7421-93-4	0.05	mg/kg	----	<0.05	<0.05	<0.05	<0.05
Endosulfan sulfate	1031-07-8	0.05	mg/kg	----	<0.05	<0.05	<0.05	<0.05
4,4'-DDT	50-29-3	0.2	mg/kg	----	<0.2	<0.2	<0.2	<0.2
Endrin ketone	53494-70-5	0.05	mg/kg	----	<0.05	<0.05	<0.05	<0.05



Analytical Results

Sub-Matrix: SOIL
 (Matrix: SOIL)

Sample ID

				TP01_0.5	TP01_1.0	TP02_0.3	TP02_2.0	TP03_0.5
Sampling date / time				30-Mar-2023 00:00	30-Mar-2023 00:00	30-Mar-2023 00:00	30-Mar-2023 00:00	30-Mar-2023 00:00
Compound	CAS Number	LOR	Unit	ES2310695-002	ES2310695-003	ES2310695-006	ES2310695-008	ES2310695-009
				Result	Result	Result	Result	Result
EP068A: Organochlorine Pesticides (OC) - Continued								
Methoxychlor	72-43-5	0.2	mg/kg	----	<0.2	<0.2	<0.2	<0.2
^ Sum of Aldrin + Dieldrin	309-00-2/60-57-1	0.05	mg/kg	----	<0.05	<0.05	<0.05	<0.05
^ Sum of DDD + DDE + DDT	72-54-8/72-55-9/5 0-2	0.05	mg/kg	----	<0.05	<0.05	<0.05	<0.05
EP068B: Organophosphorus Pesticides (OP)								
Dichlorvos	62-73-7	0.05	mg/kg	----	<0.05	<0.05	<0.05	<0.05
Demeton-S-methyl	919-86-8	0.05	mg/kg	----	<0.05	<0.05	<0.05	<0.05
Monocrotophos	6923-22-4	0.2	mg/kg	----	<0.2	<0.2	<0.2	<0.2
Dimethoate	60-51-5	0.05	mg/kg	----	<0.05	<0.05	<0.05	<0.05
Diazinon	333-41-5	0.05	mg/kg	----	<0.05	<0.05	<0.05	<0.05
Chlorpyrifos-methyl	5598-13-0	0.05	mg/kg	----	<0.05	<0.05	<0.05	<0.05
Parathion-methyl	298-00-0	0.2	mg/kg	----	<0.2	<0.2	<0.2	<0.2
Malathion	121-75-5	0.05	mg/kg	----	<0.05	<0.05	<0.05	<0.05
Fenthion	55-38-9	0.05	mg/kg	----	<0.05	<0.05	<0.05	<0.05
Chlorpyrifos	2921-88-2	0.05	mg/kg	----	<0.05	<0.05	<0.05	<0.05
Parathion	56-38-2	0.2	mg/kg	----	<0.2	<0.2	<0.2	<0.2
Pirimphos-ethyl	23505-41-1	0.05	mg/kg	----	<0.05	<0.05	<0.05	<0.05
Chlorfenvinphos	470-90-6	0.05	mg/kg	----	<0.05	<0.05	<0.05	<0.05
Bromophos-ethyl	4824-78-6	0.05	mg/kg	----	<0.05	<0.05	<0.05	<0.05
Fenamiphos	22224-92-6	0.05	mg/kg	----	<0.05	<0.05	<0.05	<0.05
Prothiofos	34643-46-4	0.05	mg/kg	----	<0.05	<0.05	<0.05	<0.05
Ethion	563-12-2	0.05	mg/kg	----	<0.05	<0.05	<0.05	<0.05
Carbophenothion	786-19-6	0.05	mg/kg	----	<0.05	<0.05	<0.05	<0.05
Azinphos Methyl	86-50-0	0.05	mg/kg	----	<0.05	<0.05	<0.05	<0.05
EP075(SIM)B: Polynuclear Aromatic Hydrocarbons								
Naphthalene	91-20-3	0.5	mg/kg	<0.5	<0.5	<0.5	<0.5	<0.5
Acenaphthylene	208-96-8	0.5	mg/kg	<0.5	<0.5	<0.5	<0.5	<0.5
Acenaphthene	83-32-9	0.5	mg/kg	<0.5	<0.5	<0.5	<0.5	<0.5
Fluorene	86-73-7	0.5	mg/kg	<0.5	<0.5	<0.5	<0.5	<0.5
Phenanthrene	85-01-8	0.5	mg/kg	<0.5	<0.5	<0.5	<0.5	<0.5
Anthracene	120-12-7	0.5	mg/kg	<0.5	<0.5	<0.5	<0.5	<0.5
Fluoranthene	206-44-0	0.5	mg/kg	<0.5	<0.5	<0.5	<0.5	<0.5
Pyrene	129-00-0	0.5	mg/kg	<0.5	<0.5	<0.5	<0.5	<0.5
Benz(a)anthracene	56-55-3	0.5	mg/kg	<0.5	<0.5	<0.5	<0.5	<0.5



Analytical Results

Sub-Matrix: SOIL
 (Matrix: SOIL)

Sample ID

				TP01_0.5	TP01_1.0	TP02_0.3	TP02_2.0	TP03_0.5
Sampling date / time				30-Mar-2023 00:00	30-Mar-2023 00:00	30-Mar-2023 00:00	30-Mar-2023 00:00	30-Mar-2023 00:00
Compound	CAS Number	LOR	Unit	ES2310695-002	ES2310695-003	ES2310695-006	ES2310695-008	ES2310695-009
				Result	Result	Result	Result	Result
EP075(SIM)B: Polynuclear Aromatic Hydrocarbons - Continued								
Chrysene	218-01-9	0.5	mg/kg	<0.5	<0.5	<0.5	<0.5	<0.5
Benzo(b+j)fluoranthene	205-99-2 205-82-3	0.5	mg/kg	<0.5	<0.5	<0.5	<0.5	<0.5
Benzo(k)fluoranthene	207-08-9	0.5	mg/kg	<0.5	<0.5	<0.5	<0.5	<0.5
Benzo(a)pyrene	50-32-8	0.5	mg/kg	<0.5	<0.5	<0.5	<0.5	<0.5
Indeno(1.2.3.cd)pyrene	193-39-5	0.5	mg/kg	<0.5	<0.5	<0.5	<0.5	<0.5
Dibenz(a.h)anthracene	53-70-3	0.5	mg/kg	<0.5	<0.5	<0.5	<0.5	<0.5
Benzo(g,h,i)perylene	191-24-2	0.5	mg/kg	<0.5	<0.5	<0.5	<0.5	<0.5
^ Sum of polycyclic aromatic hydrocarbons	----	0.5	mg/kg	<0.5	<0.5	<0.5	<0.5	<0.5
^ Benzo(a)pyrene TEQ (zero)	----	0.5	mg/kg	<0.5	<0.5	<0.5	<0.5	<0.5
^ Benzo(a)pyrene TEQ (half LOR)	----	0.5	mg/kg	0.6	0.6	0.6	0.6	0.6
^ Benzo(a)pyrene TEQ (LOR)	----	0.5	mg/kg	1.2	1.2	1.2	1.2	1.2
EP080/071: Total Petroleum Hydrocarbons								
C6 - C9 Fraction	----	10	mg/kg	<10	<10	<10	<10	<10
C10 - C14 Fraction	----	50	mg/kg	<50	<50	<50	<50	<50
C15 - C28 Fraction	----	100	mg/kg	<100	<100	<100	<100	<100
C29 - C36 Fraction	----	100	mg/kg	<100	<100	<100	<100	<100
^ C10 - C36 Fraction (sum)	----	50	mg/kg	<50	<50	<50	<50	<50
EP080/071: Total Recoverable Hydrocarbons - NEPM 2013 Fractions								
C6 - C10 Fraction	C6_C10	10	mg/kg	<10	<10	<10	<10	<10
^ C6 - C10 Fraction minus BTEX (F1)	C6_C10-BTEX	10	mg/kg	<10	<10	<10	<10	<10
>C10 - C16 Fraction	----	50	mg/kg	<50	<50	<50	<50	<50
>C16 - C34 Fraction	----	100	mg/kg	<100	<100	<100	<100	<100
>C34 - C40 Fraction	----	100	mg/kg	<100	<100	<100	<100	<100
^ >C10 - C40 Fraction (sum)	----	50	mg/kg	<50	<50	<50	<50	<50
^ >C10 - C16 Fraction minus Naphthalene (F2)	----	50	mg/kg	<50	<50	<50	<50	<50
EP080: BTEXN								
Benzene	71-43-2	0.2	mg/kg	<0.2	<0.2	<0.2	<0.2	<0.2
Toluene	108-88-3	0.5	mg/kg	<0.5	<0.5	<0.5	<0.5	<0.5
Ethylbenzene	100-41-4	0.5	mg/kg	<0.5	<0.5	<0.5	<0.5	<0.5
meta- & para-Xylene	108-38-3 106-42-3	0.5	mg/kg	<0.5	<0.5	<0.5	<0.5	<0.5
ortho-Xylene	95-47-6	0.5	mg/kg	<0.5	<0.5	<0.5	<0.5	<0.5
^ Sum of BTEX	----	0.2	mg/kg	<0.2	<0.2	<0.2	<0.2	<0.2



Analytical Results

Sub-Matrix: SOIL
 (Matrix: SOIL)

Sample ID

				TP01_0.5	TP01_1.0	TP02_0.3	TP02_2.0	TP03_0.5
Sampling date / time				30-Mar-2023 00:00	30-Mar-2023 00:00	30-Mar-2023 00:00	30-Mar-2023 00:00	30-Mar-2023 00:00
Compound	CAS Number	LOR	Unit	ES2310695-002	ES2310695-003	ES2310695-006	ES2310695-008	ES2310695-009
				Result	Result	Result	Result	Result
EP080: BTEXN - Continued								
^ Total Xylenes	----	0.5	mg/kg	<0.5	<0.5	<0.5	<0.5	<0.5
Naphthalene	91-20-3	1	mg/kg	<1	<1	<1	<1	<1
EP068S: Organochlorine Pesticide Surrogate								
Dibromo-DDE	21655-73-2	0.05	%	----	82.9	83.4	91.3	84.5
EP068T: Organophosphorus Pesticide Surrogate								
DEF	78-48-8	0.05	%	----	110	112	106	104
EP075(SIM)S: Phenolic Compound Surrogates								
Phenol-d6	13127-88-3	0.5	%	100	89.8	87.6	85.4	92.0
2-Chlorophenol-D4	93951-73-6	0.5	%	93.5	88.6	84.4	85.3	87.5
2,4,6-Tribromophenol	118-79-6	0.5	%	74.0	78.0	75.6	80.3	91.7
EP075(SIM)T: PAH Surrogates								
2-Fluorobiphenyl	321-60-8	0.5	%	97.5	91.7	89.4	94.8	91.5
Anthracene-d10	1719-06-8	0.5	%	104	97.2	103	103	101
4-Terphenyl-d14	1718-51-0	0.5	%	94.7	89.3	99.7	93.2	84.3
EP080S: TPH(V)/BTEX Surrogates								
1,2-Dichloroethane-D4	17060-07-0	0.2	%	112	114	112	123	118
Toluene-D8	2037-26-5	0.2	%	89.9	89.1	90.8	96.4	91.8
4-Bromofluorobenzene	460-00-4	0.2	%	105	99.8	101	106	102



Analytical Results

Sub-Matrix: SOIL (Matrix: SOIL)				Sample ID	TP03_2.0	TP04_1.5	TP05_1.0	TP06_0.5	TP07_0.1
Sampling date / time					30-Mar-2023 00:00	30-Mar-2023 00:00	30-Mar-2023 00:00	30-Mar-2023 00:00	30-Mar-2023 00:00
Compound	CAS Number	LOR	Unit		ES2310695-010	ES2310695-012	ES2310695-014	ES2310695-016	ES2310695-017
					Result	Result	Result	Result	Result
EA001: pH in soil using 0.01M CaCl extract									
pH (CaCl2)	----	0.1	pH Unit		----	----	----	7.5	----
EA002: pH 1:5 (Soils)									
pH Value	----	0.1	pH Unit		----	----	----	9.2	----
EA010: Conductivity (1:5)									
Electrical Conductivity @ 25°C	----	1	µS/cm		----	----	----	129	----
EA055: Moisture Content (Dried @ 105-110°C)									
Moisture Content	----	1.0	%		8.3	12.5	12.9	13.2	15.9
EA150: Soil Classification based on Particle Size									
Clay (<2 µm)	----	1	%		----	----	----	11	----
EA152: Soil Particle Density									
Soil Particle Density (Clay/Silt/Sand)	----	0.01	g/cm3		----	----	----	2.57	----
ED006: Exchangeable Cations on Alkaline Soils									
Exchangeable Calcium	----	0.2	meq/100g		----	----	----	11.5	----
Exchangeable Magnesium	----	0.2	meq/100g		----	----	----	10.9	----
Exchangeable Potassium	----	0.2	meq/100g		----	----	----	<0.2	----
Exchangeable Sodium	----	0.2	meq/100g		----	----	----	0.4	----
Cation Exchange Capacity	----	0.2	meq/100g		----	----	----	22.8	----
EG005(ED093)T: Total Metals by ICP-AES									
Iron	7439-89-6	0.005	%		----	----	----	3.17	----
Arsenic	7440-38-2	5	mg/kg		<5	<5	<5	<5	<5
Cadmium	7440-43-9	1	mg/kg		<1	<1	<1	<1	<1
Chromium	7440-47-3	2	mg/kg		44	74	58	50	22
Copper	7440-50-8	5	mg/kg		21	23	26	22	35
Lead	7439-92-1	5	mg/kg		<5	<5	<5	6	132
Nickel	7440-02-0	2	mg/kg		27	49	58	49	11
Zinc	7440-66-6	5	mg/kg		36	43	45	43	304
EG035T: Total Recoverable Mercury by FIMS									
Mercury	7439-97-6	0.1	mg/kg		<0.1	<0.1	<0.1	<0.1	<0.1
EP004: Organic Matter									
Organic Matter	----	0.5	%		----	----	----	1.2	----
Total Organic Carbon	----	0.5	%		----	----	----	0.7	----
EP068A: Organochlorine Pesticides (OC)									
alpha-BHC	319-84-6	0.05	mg/kg		<0.05	<0.05	<0.05	<0.05	<0.05



Analytical Results

Sub-Matrix: SOIL
 (Matrix: SOIL)

Sample ID

				TP03_2.0	TP04_1.5	TP05_1.0	TP06_0.5	TP07_0.1
Sampling date / time				30-Mar-2023 00:00	30-Mar-2023 00:00	30-Mar-2023 00:00	30-Mar-2023 00:00	30-Mar-2023 00:00
Compound	CAS Number	LOR	Unit	ES2310695-010	ES2310695-012	ES2310695-014	ES2310695-016	ES2310695-017
				Result	Result	Result	Result	Result
EP068A: Organochlorine Pesticides (OC) - Continued								
Hexachlorobenzene (HCB)	118-74-1	0.05	mg/kg	<0.05	<0.05	<0.05	<0.05	<0.05
beta-BHC	319-85-7	0.05	mg/kg	<0.05	<0.05	<0.05	<0.05	<0.05
gamma-BHC	58-89-9	0.05	mg/kg	<0.05	<0.05	<0.05	<0.05	<0.05
delta-BHC	319-86-8	0.05	mg/kg	<0.05	<0.05	<0.05	<0.05	<0.05
Heptachlor	76-44-8	0.05	mg/kg	<0.05	<0.05	<0.05	<0.05	<0.05
Aldrin	309-00-2	0.05	mg/kg	<0.05	<0.05	<0.05	<0.05	<0.05
Heptachlor epoxide	1024-57-3	0.05	mg/kg	<0.05	<0.05	<0.05	<0.05	<0.05
^ Total Chlordane (sum)	----	0.05	mg/kg	<0.05	<0.05	<0.05	<0.05	<0.05
trans-Chlordane	5103-74-2	0.05	mg/kg	<0.05	<0.05	<0.05	<0.05	<0.05
alpha-Endosulfan	959-98-8	0.05	mg/kg	<0.05	<0.05	<0.05	<0.05	<0.05
cis-Chlordane	5103-71-9	0.05	mg/kg	<0.05	<0.05	<0.05	<0.05	<0.05
Dieldrin	60-57-1	0.05	mg/kg	<0.05	<0.05	<0.05	<0.05	<0.05
4,4'-DDE	72-55-9	0.05	mg/kg	<0.05	<0.05	<0.05	<0.05	<0.05
Endrin	72-20-8	0.05	mg/kg	<0.05	<0.05	<0.05	<0.05	<0.05
beta-Endosulfan	33213-65-9	0.05	mg/kg	<0.05	<0.05	<0.05	<0.05	<0.05
^ Endosulfan (sum)	115-29-7	0.05	mg/kg	<0.05	<0.05	<0.05	<0.05	<0.05
4,4'-DDD	72-54-8	0.05	mg/kg	<0.05	<0.05	<0.05	<0.05	<0.05
Endrin aldehyde	7421-93-4	0.05	mg/kg	<0.05	<0.05	<0.05	<0.05	<0.05
Endosulfan sulfate	1031-07-8	0.05	mg/kg	<0.05	<0.05	<0.05	<0.05	<0.05
4,4'-DDT	50-29-3	0.2	mg/kg	<0.2	<0.2	<0.2	<0.2	<0.2
Endrin ketone	53494-70-5	0.05	mg/kg	<0.05	<0.05	<0.05	<0.05	<0.05
Methoxychlor	72-43-5	0.2	mg/kg	<0.2	<0.2	<0.2	<0.2	<0.2
^ Sum of Aldrin + Dieldrin	309-00-2/60-57-1	0.05	mg/kg	<0.05	<0.05	<0.05	<0.05	<0.05
^ Sum of DDD + DDE + DDT	72-54-8/72-55-9/50-2	0.05	mg/kg	<0.05	<0.05	<0.05	<0.05	<0.05
EP068B: Organophosphorus Pesticides (OP)								
Dichlorvos	62-73-7	0.05	mg/kg	<0.05	<0.05	<0.05	<0.05	<0.05
Demeton-S-methyl	919-86-8	0.05	mg/kg	<0.05	<0.05	<0.05	<0.05	<0.05
Monocrotophos	6923-22-4	0.2	mg/kg	<0.2	<0.2	<0.2	<0.2	<0.2
Dimethoate	60-51-5	0.05	mg/kg	<0.05	<0.05	<0.05	<0.05	<0.05
Diazinon	333-41-5	0.05	mg/kg	<0.05	<0.05	<0.05	<0.05	<0.05
Chlorpyrifos-methyl	5598-13-0	0.05	mg/kg	<0.05	<0.05	<0.05	<0.05	<0.05
Parathion-methyl	298-00-0	0.2	mg/kg	<0.2	<0.2	<0.2	<0.2	<0.2
Malathion	121-75-5	0.05	mg/kg	<0.05	<0.05	<0.05	<0.05	<0.05
Fenthion	55-38-9	0.05	mg/kg	<0.05	<0.05	<0.05	<0.05	<0.05



Analytical Results

Sub-Matrix: SOIL
 (Matrix: SOIL)

Sample ID

				TP03_2.0	TP04_1.5	TP05_1.0	TP06_0.5	TP07_0.1
Sampling date / time				30-Mar-2023 00:00	30-Mar-2023 00:00	30-Mar-2023 00:00	30-Mar-2023 00:00	30-Mar-2023 00:00
Compound	CAS Number	LOR	Unit	ES2310695-010	ES2310695-012	ES2310695-014	ES2310695-016	ES2310695-017
				Result	Result	Result	Result	Result
EP068B: Organophosphorus Pesticides (OP) - Continued								
Chlorpyrifos	2921-88-2	0.05	mg/kg	<0.05	<0.05	<0.05	<0.05	<0.05
Parathion	56-38-2	0.2	mg/kg	<0.2	<0.2	<0.2	<0.2	<0.2
Pirimphos-ethyl	23505-41-1	0.05	mg/kg	<0.05	<0.05	<0.05	<0.05	<0.05
Chlorfenvinphos	470-90-6	0.05	mg/kg	<0.05	<0.05	<0.05	<0.05	<0.05
Bromophos-ethyl	4824-78-6	0.05	mg/kg	<0.05	<0.05	<0.05	<0.05	<0.05
Fenamiphos	22224-92-6	0.05	mg/kg	<0.05	<0.05	<0.05	<0.05	<0.05
Prothiofos	34643-46-4	0.05	mg/kg	<0.05	<0.05	<0.05	<0.05	<0.05
Ethion	563-12-2	0.05	mg/kg	<0.05	<0.05	<0.05	<0.05	<0.05
Carbophenothion	786-19-6	0.05	mg/kg	<0.05	<0.05	<0.05	<0.05	<0.05
Azinphos Methyl	86-50-0	0.05	mg/kg	<0.05	<0.05	<0.05	<0.05	<0.05
EP075(SIM)B: Polynuclear Aromatic Hydrocarbons								
Naphthalene	91-20-3	0.5	mg/kg	<0.5	<0.5	<0.5	<0.5	<0.5
Acenaphthylene	208-96-8	0.5	mg/kg	<0.5	<0.5	<0.5	<0.5	<0.5
Acenaphthene	83-32-9	0.5	mg/kg	<0.5	<0.5	<0.5	<0.5	<0.5
Fluorene	86-73-7	0.5	mg/kg	<0.5	<0.5	<0.5	<0.5	<0.5
Phenanthrene	85-01-8	0.5	mg/kg	<0.5	<0.5	<0.5	<0.5	<0.5
Anthracene	120-12-7	0.5	mg/kg	<0.5	<0.5	<0.5	<0.5	<0.5
Fluoranthene	206-44-0	0.5	mg/kg	<0.5	<0.5	<0.5	<0.5	<0.5
Pyrene	129-00-0	0.5	mg/kg	<0.5	<0.5	<0.5	<0.5	<0.5
Benz(a)anthracene	56-55-3	0.5	mg/kg	<0.5	<0.5	<0.5	<0.5	<0.5
Chrysene	218-01-9	0.5	mg/kg	<0.5	<0.5	<0.5	<0.5	<0.5
Benzo(b+j)fluoranthene	205-99-2 205-82-3	0.5	mg/kg	<0.5	<0.5	<0.5	<0.5	<0.5
Benzo(k)fluoranthene	207-08-9	0.5	mg/kg	<0.5	<0.5	<0.5	<0.5	<0.5
Benzo(a)pyrene	50-32-8	0.5	mg/kg	<0.5	<0.5	<0.5	<0.5	<0.5
Indeno(1.2.3.cd)pyrene	193-39-5	0.5	mg/kg	<0.5	<0.5	<0.5	<0.5	<0.5
Dibenz(a.h)anthracene	53-70-3	0.5	mg/kg	<0.5	<0.5	<0.5	<0.5	<0.5
Benzo(g.h.i)perylene	191-24-2	0.5	mg/kg	<0.5	<0.5	<0.5	<0.5	<0.5
^ Sum of polycyclic aromatic hydrocarbons	----	0.5	mg/kg	<0.5	<0.5	<0.5	<0.5	<0.5
^ Benzo(a)pyrene TEQ (zero)	----	0.5	mg/kg	<0.5	<0.5	<0.5	<0.5	<0.5
^ Benzo(a)pyrene TEQ (half LOR)	----	0.5	mg/kg	0.6	0.6	0.6	0.6	0.6
^ Benzo(a)pyrene TEQ (LOR)	----	0.5	mg/kg	1.2	1.2	1.2	1.2	1.2
EP080/071: Total Petroleum Hydrocarbons								
C6 - C9 Fraction	----	10	mg/kg	<10	<10	<10	<10	<10
C10 - C14 Fraction	----	50	mg/kg	<50	<50	<50	<50	<50



Analytical Results

Sub-Matrix: SOIL (Matrix: SOIL)				Sample ID	TP03_2.0	TP04_1.5	TP05_1.0	TP06_0.5	TP07_0.1
Sampling date / time					30-Mar-2023 00:00	30-Mar-2023 00:00	30-Mar-2023 00:00	30-Mar-2023 00:00	30-Mar-2023 00:00
Compound	CAS Number	LOR	Unit		ES2310695-010	ES2310695-012	ES2310695-014	ES2310695-016	ES2310695-017
					Result	Result	Result	Result	Result
EP080/071: Total Petroleum Hydrocarbons - Continued									
C15 - C28 Fraction	----	100	mg/kg		<100	<100	<100	<100	<100
C29 - C36 Fraction	----	100	mg/kg		<100	<100	<100	<100	<100
^ C10 - C36 Fraction (sum)	----	50	mg/kg		<50	<50	<50	<50	<50
EP080/071: Total Recoverable Hydrocarbons - NEPM 2013 Fractions									
C6 - C10 Fraction	C6_C10	10	mg/kg		<10	<10	<10	<10	<10
^ C6 - C10 Fraction minus BTEX (F1)	C6_C10-BTEX	10	mg/kg		<10	<10	<10	<10	<10
>C10 - C16 Fraction	----	50	mg/kg		<50	<50	<50	<50	<50
>C16 - C34 Fraction	----	100	mg/kg		<100	<100	<100	<100	<100
>C34 - C40 Fraction	----	100	mg/kg		<100	<100	<100	<100	<100
^ >C10 - C40 Fraction (sum)	----	50	mg/kg		<50	<50	<50	<50	<50
^ >C10 - C16 Fraction minus Naphthalene (F2)	----	50	mg/kg		<50	<50	<50	<50	<50
EP080: BTEXN									
Benzene	71-43-2	0.2	mg/kg		<0.2	<0.2	<0.2	<0.2	<0.2
Toluene	108-88-3	0.5	mg/kg		<0.5	<0.5	<0.5	<0.5	<0.5
Ethylbenzene	100-41-4	0.5	mg/kg		<0.5	<0.5	<0.5	<0.5	<0.5
meta- & para-Xylene	108-38-3 106-42-3	0.5	mg/kg		<0.5	<0.5	<0.5	<0.5	<0.5
ortho-Xylene	95-47-6	0.5	mg/kg		<0.5	<0.5	<0.5	<0.5	<0.5
^ Sum of BTEX	----	0.2	mg/kg		<0.2	<0.2	<0.2	<0.2	<0.2
^ Total Xylenes	----	0.5	mg/kg		<0.5	<0.5	<0.5	<0.5	<0.5
Naphthalene	91-20-3	1	mg/kg		<1	<1	<1	<1	<1
EP068S: Organochlorine Pesticide Surrogate									
Dibromo-DDE	21655-73-2	0.05	%		73.1	71.4	94.3	70.9	115
EP068T: Organophosphorus Pesticide Surrogate									
DEF	78-48-8	0.05	%		82.2	75.9	109	78.1	119
EP075(SIM)S: Phenolic Compound Surrogates									
Phenol-d6	13127-88-3	0.5	%		89.0	79.8	82.6	93.3	96.0
2-Chlorophenol-D4	93951-73-6	0.5	%		83.2	95.5	89.2	92.2	89.5
2,4,6-Tribromophenol	118-79-6	0.5	%		73.7	72.6	70.7	67.0	90.3
EP075(SIM)T: PAH Surrogates									
2-Fluorobiphenyl	321-60-8	0.5	%		92.8	97.2	93.0	82.0	91.4
Anthracene-d10	1719-06-8	0.5	%		100	96.9	87.2	94.3	98.2
4-Terphenyl-d14	1718-51-0	0.5	%		90.8	89.9	93.1	96.4	97.4



Analytical Results

Sub-Matrix: SOIL (Matrix: SOIL)				Sample ID	TP03_2.0	TP04_1.5	TP05_1.0	TP06_0.5	TP07_0.1
Sampling date / time					30-Mar-2023 00:00	30-Mar-2023 00:00	30-Mar-2023 00:00	30-Mar-2023 00:00	30-Mar-2023 00:00
Compound	CAS Number	LOR	Unit		ES2310695-010	ES2310695-012	ES2310695-014	ES2310695-016	ES2310695-017
					Result	Result	Result	Result	Result
EP080S: TPH(V)/BTEX Surrogates									
1,2-Dichloroethane-D4	17060-07-0	0.2	%		119	119	114	121	125
Toluene-D8	2037-26-5	0.2	%		97.2	91.9	84.8	90.9	93.2
4-Bromofluorobenzene	460-00-4	0.2	%		106	100	95.3	103	101



Analytical Results

Sub-Matrix: SOIL
 (Matrix: SOIL)

Sample ID

				ACM01	ACM02	QC01	TB	TS
Sampling date / time				30-Mar-2023 00:00	30-Mar-2023 00:00	30-Mar-2023 00:00	24-Mar-2023 00:00	27-Mar-2023 00:00
Compound	CAS Number	LOR	Unit	ES2310695-019	ES2310695-020	ES2310695-021	ES2310695-023	ES2310695-024
				Result	Result	Result	Result	Result
EA055: Moisture Content (Dried @ 105-110°C)								
Moisture Content	-----	1.0	%	----	----	10.4	----	----
EA200: AS 4964 - 2004 Identification of Asbestos in Soils								
Asbestos Detected	1332-21-4	0.1	g/kg	No	No	----	----	----
Asbestos Type	1332-21-4	-	--	-	-	----	----	----
Asbestos (Trace)	1332-21-4	5	Fibres	No	No	----	----	----
Sample weight (dry)	-----	0.01	g	1210	699	----	----	----
Synthetic Mineral Fibre	-----	-	--	No	No	----	----	----
Organic Fibre	-----	-	--	No	No	----	----	----
APPROVED IDENTIFIER:	-----	-	--	B.SCHRADER	B.SCHRADER	----	----	----
EA200N: Asbestos Quantification (non-NATA)								
∅ Asbestos (Fines and Fibrous <7mm)	1332-21-4	0.0004	g	<0.0004	<0.0004	----	----	----
∅ Asbestos (Fines and Fibrous FA+AF)	-----	0.001	% (w/w)	<0.001	<0.001	----	----	----
∅ Asbestos Containing Material	1332-21-4	0.1	g	<0.1	<0.1	----	----	----
∅ Asbestos Containing Material (as 15% Asbestos in ACM >7mm)	1332-21-4	0.01	% (w/w)	<0.01	<0.01	----	----	----
∅ Weight Used for % Calculation	-----	0.0001	kg	1.21	0.699	----	----	----
∅ Fibrous Asbestos >7mm	-----	0.0004	g	<0.0004	<0.0004	----	----	----
EG005(ED093)T: Total Metals by ICP-AES								
Arsenic	7440-38-2	5	mg/kg	----	----	<5	----	----
Cadmium	7440-43-9	1	mg/kg	----	----	<1	----	----
Chromium	7440-47-3	2	mg/kg	----	----	50	----	----
Copper	7440-50-8	5	mg/kg	----	----	22	----	----
Lead	7439-92-1	5	mg/kg	----	----	<5	----	----
Nickel	7440-02-0	2	mg/kg	----	----	29	----	----
Zinc	7440-66-6	5	mg/kg	----	----	32	----	----
EG035T: Total Recoverable Mercury by FIMS								
Mercury	7439-97-6	0.1	mg/kg	----	----	<0.1	----	----
EP068A: Organochlorine Pesticides (OC)								
alpha-BHC	319-84-6	0.05	mg/kg	----	----	<0.05	----	----
Hexachlorobenzene (HCB)	118-74-1	0.05	mg/kg	----	----	<0.05	----	----
beta-BHC	319-85-7	0.05	mg/kg	----	----	<0.05	----	----
gamma-BHC	58-89-9	0.05	mg/kg	----	----	<0.05	----	----
delta-BHC	319-86-8	0.05	mg/kg	----	----	<0.05	----	----



Analytical Results

Sub-Matrix: SOIL
 (Matrix: SOIL)

Sample ID

				ACM01	ACM02	QC01	TB	TS
Sampling date / time				30-Mar-2023 00:00	30-Mar-2023 00:00	30-Mar-2023 00:00	24-Mar-2023 00:00	27-Mar-2023 00:00
Compound	CAS Number	LOR	Unit	ES2310695-019	ES2310695-020	ES2310695-021	ES2310695-023	ES2310695-024
				Result	Result	Result	Result	Result
EP068A: Organochlorine Pesticides (OC) - Continued								
Heptachlor	76-44-8	0.05	mg/kg	----	----	<0.05	----	----
Aldrin	309-00-2	0.05	mg/kg	----	----	<0.05	----	----
Heptachlor epoxide	1024-57-3	0.05	mg/kg	----	----	<0.05	----	----
^ Total Chlordane (sum)	----	0.05	mg/kg	----	----	<0.05	----	----
trans-Chlordane	5103-74-2	0.05	mg/kg	----	----	<0.05	----	----
alpha-Endosulfan	959-98-8	0.05	mg/kg	----	----	<0.05	----	----
cis-Chlordane	5103-71-9	0.05	mg/kg	----	----	<0.05	----	----
Dieldrin	60-57-1	0.05	mg/kg	----	----	<0.05	----	----
4,4'-DDE	72-55-9	0.05	mg/kg	----	----	<0.05	----	----
Endrin	72-20-8	0.05	mg/kg	----	----	<0.05	----	----
beta-Endosulfan	33213-65-9	0.05	mg/kg	----	----	<0.05	----	----
^ Endosulfan (sum)	115-29-7	0.05	mg/kg	----	----	<0.05	----	----
4,4'-DDD	72-54-8	0.05	mg/kg	----	----	<0.05	----	----
Endrin aldehyde	7421-93-4	0.05	mg/kg	----	----	<0.05	----	----
Endosulfan sulfate	1031-07-8	0.05	mg/kg	----	----	<0.05	----	----
4,4'-DDT	50-29-3	0.2	mg/kg	----	----	<0.2	----	----
Endrin ketone	53494-70-5	0.05	mg/kg	----	----	<0.05	----	----
Methoxychlor	72-43-5	0.2	mg/kg	----	----	<0.2	----	----
^ Sum of Aldrin + Dieldrin	309-00-2/60-57-1	0.05	mg/kg	----	----	<0.05	----	----
^ Sum of DDD + DDE + DDT	72-54-8/72-55-9/50-2	0.05	mg/kg	----	----	<0.05	----	----
EP068B: Organophosphorus Pesticides (OP)								
Dichlorvos	62-73-7	0.05	mg/kg	----	----	<0.05	----	----
Demeton-S-methyl	919-86-8	0.05	mg/kg	----	----	<0.05	----	----
Monocrotophos	6923-22-4	0.2	mg/kg	----	----	<0.2	----	----
Dimethoate	60-51-5	0.05	mg/kg	----	----	<0.05	----	----
Diazinon	333-41-5	0.05	mg/kg	----	----	<0.05	----	----
Chlorpyrifos-methyl	5598-13-0	0.05	mg/kg	----	----	<0.05	----	----
Parathion-methyl	298-00-0	0.2	mg/kg	----	----	<0.2	----	----
Malathion	121-75-5	0.05	mg/kg	----	----	<0.05	----	----
Fenthion	55-38-9	0.05	mg/kg	----	----	<0.05	----	----
Chlorpyrifos	2921-88-2	0.05	mg/kg	----	----	<0.05	----	----
Parathion	56-38-2	0.2	mg/kg	----	----	<0.2	----	----
Pirimphos-ethyl	23505-41-1	0.05	mg/kg	----	----	<0.05	----	----
Chlorfenvinphos	470-90-6	0.05	mg/kg	----	----	<0.05	----	----

Sub-Matrix: SOIL (Matrix: SOIL)				Sample ID	ACM01	ACM02	QC01	TB	TS
Sampling date / time				30-Mar-2023 00:00	30-Mar-2023 00:00	30-Mar-2023 00:00	24-Mar-2023 00:00	27-Mar-2023 00:00	
Compound	CAS Number	LOR	Unit	ES2310695-019	ES2310695-020	ES2310695-021	ES2310695-023	ES2310695-024	
				Result	Result	Result	Result	Result	
EP068B: Organophosphorus Pesticides (OP) - Continued									
Bromophos-ethyl	4824-78-6	0.05	mg/kg	----	----	<0.05	----	----	
Fenamiphos	22224-92-6	0.05	mg/kg	----	----	<0.05	----	----	
Prothiofos	34643-46-4	0.05	mg/kg	----	----	<0.05	----	----	
Ethion	563-12-2	0.05	mg/kg	----	----	<0.05	----	----	
Carbophenothion	786-19-6	0.05	mg/kg	----	----	<0.05	----	----	
Azinphos Methyl	86-50-0	0.05	mg/kg	----	----	<0.05	----	----	
EP075(SIM)B: Polynuclear Aromatic Hydrocarbons									
Naphthalene	91-20-3	0.5	mg/kg	----	----	<0.5	----	----	
Acenaphthylene	208-96-8	0.5	mg/kg	----	----	<0.5	----	----	
Acenaphthene	83-32-9	0.5	mg/kg	----	----	<0.5	----	----	
Fluorene	86-73-7	0.5	mg/kg	----	----	<0.5	----	----	
Phenanthrene	85-01-8	0.5	mg/kg	----	----	<0.5	----	----	
Anthracene	120-12-7	0.5	mg/kg	----	----	<0.5	----	----	
Fluoranthene	206-44-0	0.5	mg/kg	----	----	<0.5	----	----	
Pyrene	129-00-0	0.5	mg/kg	----	----	<0.5	----	----	
Benzo(a)anthracene	56-55-3	0.5	mg/kg	----	----	<0.5	----	----	
Chrysene	218-01-9	0.5	mg/kg	----	----	<0.5	----	----	
Benzo(b+j)fluoranthene	205-99-2 205-82-3	0.5	mg/kg	----	----	<0.5	----	----	
Benzo(k)fluoranthene	207-08-9	0.5	mg/kg	----	----	<0.5	----	----	
Benzo(a)pyrene	50-32-8	0.5	mg/kg	----	----	<0.5	----	----	
Indeno(1.2.3.cd)pyrene	193-39-5	0.5	mg/kg	----	----	<0.5	----	----	
Dibenz(a.h)anthracene	53-70-3	0.5	mg/kg	----	----	<0.5	----	----	
Benzo(g.h.i)perylene	191-24-2	0.5	mg/kg	----	----	<0.5	----	----	
^ Sum of polycyclic aromatic hydrocarbons		----	0.5	mg/kg	----	<0.5	----	----	
^ Benzo(a)pyrene TEQ (zero)		----	0.5	mg/kg	----	<0.5	----	----	
^ Benzo(a)pyrene TEQ (half LOR)		----	0.5	mg/kg	----	0.6	----	----	
^ Benzo(a)pyrene TEQ (LOR)		----	0.5	mg/kg	----	1.2	----	----	
EP080/071: Total Petroleum Hydrocarbons									
C6 - C9 Fraction	----	10	mg/kg	----	----	<10	<10	----	
C10 - C14 Fraction	----	50	mg/kg	----	----	<50	----	----	
C15 - C28 Fraction	----	100	mg/kg	----	----	<100	----	----	
C29 - C36 Fraction	----	100	mg/kg	----	----	<100	----	----	
^ C10 - C36 Fraction (sum)		----	50	mg/kg	----	<50	----	----	
EP080/071: Total Recoverable Hydrocarbons - NEPM 2013 Fractions									



Analytical Results

Sub-Matrix: SOIL
 (Matrix: SOIL)

Sample ID

				ACM01	ACM02	QC01	TB	TS
Sampling date / time				30-Mar-2023 00:00	30-Mar-2023 00:00	30-Mar-2023 00:00	24-Mar-2023 00:00	27-Mar-2023 00:00
Compound	CAS Number	LOR	Unit	ES2310695-019	ES2310695-020	ES2310695-021	ES2310695-023	ES2310695-024
				Result	Result	Result	Result	Result
EP080/071: Total Recoverable Hydrocarbons - NEPM 2013 Fractions - Continued								
C6 - C10 Fraction	C6_C10	10	mg/kg	----	----	<10	<10	----
^ C6 - C10 Fraction minus BTEX (F1)	C6_C10-BTEX	10	mg/kg	----	----	<10	<10	----
>C10 - C16 Fraction	----	50	mg/kg	----	----	<50	----	----
>C16 - C34 Fraction	----	100	mg/kg	----	----	<100	----	----
>C34 - C40 Fraction	----	100	mg/kg	----	----	<100	----	----
^ >C10 - C40 Fraction (sum)	----	50	mg/kg	----	----	<50	----	----
^ >C10 - C16 Fraction minus Naphthalene (F2)	----	50	mg/kg	----	----	<50	----	----
EP080: BTEXN								
Benzene	71-43-2	0.2	mg/kg	----	----	<0.2	<0.2	----
Toluene	108-88-3	0.5	mg/kg	----	----	<0.5	<0.5	----
Ethylbenzene	100-41-4	0.5	mg/kg	----	----	<0.5	<0.5	----
meta- & para-Xylene	108-38-3 106-42-3	0.5	mg/kg	----	----	<0.5	<0.5	----
ortho-Xylene	95-47-6	0.5	mg/kg	----	----	<0.5	<0.5	----
^ Sum of BTEX	----	0.2	mg/kg	----	----	<0.2	<0.2	----
^ Total Xylenes	----	0.5	mg/kg	----	----	<0.5	<0.5	----
Naphthalene	91-20-3	1	mg/kg	----	----	<1	<1	----
EP068S: Organochlorine Pesticide Surrogate								
Dibromo-DDE	21655-73-2	0.05	%	----	----	86.2	----	----
EP068T: Organophosphorus Pesticide Surrogate								
DEF	78-48-8	0.05	%	----	----	118	----	----
EP075(SIM)S: Phenolic Compound Surrogates								
Phenol-d6	13127-88-3	0.5	%	----	----	85.1	----	----
2-Chlorophenol-D4	93951-73-6	0.5	%	----	----	87.8	----	----
2,4,6-Tribromophenol	118-79-6	0.5	%	----	----	76.2	----	----
EP075(SIM)T: PAH Surrogates								
2-Fluorobiphenyl	321-60-8	0.5	%	----	----	88.3	----	----
Anthracene-d10	1719-06-8	0.5	%	----	----	109	----	----
4-Terphenyl-d14	1718-51-0	0.5	%	----	----	93.6	----	----
EP080S: TPH(V)/BTEX Surrogates								
1,2-Dichloroethane-D4	17060-07-0	0.2	%	----	----	110	89.8	92.5
Toluene-D8	2037-26-5	0.2	%	----	----	84.0	87.7	91.5
4-Bromofluorobenzene	460-00-4	0.2	%	----	----	96.0	91.6	91.7



Analytical Results

Sub-Matrix: SOIL (Matrix: SOIL)				Sample ID	TSC	----	----	----	----
				Sampling date / time	27-Mar-2023 00:00	----	----	----	----
Compound	CAS Number	LOR	Unit	ES2310695-025	-----	-----	-----	-----	
				Result	----	----	----	----	
EP080S: TPH(V)/BTEX Surrogates									
1.2-Dichloroethane-D4	17060-07-0	0.2	%	100	----	----	----	----	
Toluene-D8	2037-26-5	0.2	%	102	----	----	----	----	
4-Bromofluorobenzene	460-00-4	0.2	%	98.8	----	----	----	----	



Analytical Results

Sub-Matrix: WATER
 (Matrix: WATER)

Sample ID

				RW01	----	----	----	----
Sampling date / time				30-Mar-2023 00:00	----	----	----	----
Compound	CAS Number	LOR	Unit	ES2310695-022	-----	-----	-----	-----
				Result	----	----	----	----
EG020T: Total Metals by ICP-MS								
Arsenic	7440-38-2	0.001	mg/L	<0.001	----	----	----	----
Cadmium	7440-43-9	0.0001	mg/L	<0.0001	----	----	----	----
Chromium	7440-47-3	0.001	mg/L	<0.001	----	----	----	----
Copper	7440-50-8	0.001	mg/L	<0.001	----	----	----	----
Lead	7439-92-1	0.001	mg/L	<0.001	----	----	----	----
Nickel	7440-02-0	0.001	mg/L	<0.001	----	----	----	----
Zinc	7440-66-6	0.005	mg/L	<0.005	----	----	----	----
EG035T: Total Recoverable Mercury by FIMS								
Mercury	7439-97-6	0.0001	mg/L	<0.0001	----	----	----	----
EP075(SIM)B: Polynuclear Aromatic Hydrocarbons								
Naphthalene	91-20-3	1.0	µg/L	<1.0	----	----	----	----
Acenaphthylene	208-96-8	1.0	µg/L	<1.0	----	----	----	----
Acenaphthene	83-32-9	1.0	µg/L	<1.0	----	----	----	----
Fluorene	86-73-7	1.0	µg/L	<1.0	----	----	----	----
Phenanthrene	85-01-8	1.0	µg/L	<1.0	----	----	----	----
Anthracene	120-12-7	1.0	µg/L	<1.0	----	----	----	----
Fluoranthene	206-44-0	1.0	µg/L	<1.0	----	----	----	----
Pyrene	129-00-0	1.0	µg/L	<1.0	----	----	----	----
Benz(a)anthracene	56-55-3	1.0	µg/L	<1.0	----	----	----	----
Chrysene	218-01-9	1.0	µg/L	<1.0	----	----	----	----
Benzo(b+j)fluoranthene	205-99-2 205-82-3	1.0	µg/L	<1.0	----	----	----	----
Benzo(k)fluoranthene	207-08-9	1.0	µg/L	<1.0	----	----	----	----
Benzo(a)pyrene	50-32-8	0.5	µg/L	<0.5	----	----	----	----
Indeno(1.2.3.cd)pyrene	193-39-5	1.0	µg/L	<1.0	----	----	----	----
Dibenz(a.h)anthracene	53-70-3	1.0	µg/L	<1.0	----	----	----	----
Benzo(g.h.i)perylene	191-24-2	1.0	µg/L	<1.0	----	----	----	----
^ Sum of polycyclic aromatic hydrocarbons	-----	0.5	µg/L	<0.5	----	----	----	----
^ Benzo(a)pyrene TEQ (zero)	-----	0.5	µg/L	<0.5	----	----	----	----
EP080/071: Total Petroleum Hydrocarbons								
C6 - C9 Fraction	-----	20	µg/L	<20	----	----	----	----
C10 - C14 Fraction	-----	50	µg/L	<50	----	----	----	----
C15 - C28 Fraction	-----	100	µg/L	<100	----	----	----	----
C29 - C36 Fraction	-----	50	µg/L	<50	----	----	----	----
^ C10 - C36 Fraction (sum)	-----	50	µg/L	<50	----	----	----	----



Analytical Results

Sub-Matrix: WATER (Matrix: WATER)				Sample ID	RW01	----	----	----	----
Sampling date / time					30-Mar-2023 00:00	----	----	----	----
Compound	CAS Number	LOR	Unit		ES2310695-022	-----	-----	-----	-----
					Result	----	----	----	----
EP080/071: Total Recoverable Hydrocarbons - NEPM 2013 Fractions									
C6 - C10 Fraction	C6_C10	20	µg/L		<20	----	----	----	----
^ C6 - C10 Fraction minus BTEX (F1)	C6_C10-BTEX	20	µg/L		<20	----	----	----	----
>C10 - C16 Fraction	----	100	µg/L		<100	----	----	----	----
>C16 - C34 Fraction	----	100	µg/L		<100	----	----	----	----
>C34 - C40 Fraction	----	100	µg/L		<100	----	----	----	----
^ >C10 - C40 Fraction (sum)	----	100	µg/L		<100	----	----	----	----
^ >C10 - C16 Fraction minus Naphthalene (F2)	----	100	µg/L		<100	----	----	----	----
EP080: BTEXN									
Benzene	71-43-2	1	µg/L		<1	----	----	----	----
Toluene	108-88-3	2	µg/L		<2	----	----	----	----
Ethylbenzene	100-41-4	2	µg/L		<2	----	----	----	----
meta- & para-Xylene	108-38-3 106-42-3	2	µg/L		<2	----	----	----	----
ortho-Xylene	95-47-6	2	µg/L		<2	----	----	----	----
^ Total Xylenes	----	2	µg/L		<2	----	----	----	----
^ Sum of BTEX	----	1	µg/L		<1	----	----	----	----
Naphthalene	91-20-3	5	µg/L		<5	----	----	----	----
EP075(SIM)S: Phenolic Compound Surrogates									
Phenol-d6	13127-88-3	1.0	%		19.8	----	----	----	----
2-Chlorophenol-D4	93951-73-6	1.0	%		40.5	----	----	----	----
2,4,6-Tribromophenol	118-79-6	1.0	%		45.9	----	----	----	----
EP075(SIM)T: PAH Surrogates									
2-Fluorobiphenyl	321-60-8	1.0	%		58.5	----	----	----	----
Anthracene-d10	1719-06-8	1.0	%		63.1	----	----	----	----
4-Terphenyl-d14	1718-51-0	1.0	%		57.7	----	----	----	----
EP080S: TPH(V)/BTEX Surrogates									
1,2-Dichloroethane-D4	17060-07-0	2	%		127	----	----	----	----
Toluene-D8	2037-26-5	2	%		107	----	----	----	----
4-Bromofluorobenzene	460-00-4	2	%		109	----	----	----	----



Analytical Results

Descriptive Results

Sub-Matrix: **SOIL**

Method: Compound	Sample ID - Sampling date / time	Analytical Results
EA200: AS 4964 - 2004 Identification of Asbestos in Soils		
EA200: Description	ACM01 - 30-Mar-2023 00:00	A soil sample.
EA200: Description	ACM02 - 30-Mar-2023 00:00	A soil sample.



Surrogate Control Limits

Sub-Matrix: SOIL		Recovery Limits (%)	
Compound	CAS Number	Low	High
EP068S: Organochlorine Pesticide Surrogate			
Dibromo-DDE	21655-73-2	49	147
EP068T: Organophosphorus Pesticide Surrogate			
DEF	78-48-8	35	143
EP075(SIM)S: Phenolic Compound Surrogates			
Phenol-d6	13127-88-3	63	123
2-Chlorophenol-D4	93951-73-6	66	122
2,4,6-Tribromophenol	118-79-6	40	138
EP075(SIM)T: PAH Surrogates			
2-Fluorobiphenyl	321-60-8	70	122
Anthracene-d10	1719-06-8	66	128
4-Terphenyl-d14	1718-51-0	65	129
EP080S: TPH(V)/BTEX Surrogates			
1,2-Dichloroethane-D4	17060-07-0	63	125
Toluene-D8	2037-26-5	67	124
4-Bromofluorobenzene	460-00-4	66	131

Sub-Matrix: WATER		Recovery Limits (%)	
Compound	CAS Number	Low	High
EP075(SIM)S: Phenolic Compound Surrogates			
Phenol-d6	13127-88-3	10	44
2-Chlorophenol-D4	93951-73-6	14	94
2,4,6-Tribromophenol	118-79-6	17	125
EP075(SIM)T: PAH Surrogates			
2-Fluorobiphenyl	321-60-8	20	104
Anthracene-d10	1719-06-8	27	113
4-Terphenyl-d14	1718-51-0	32	112
EP080S: TPH(V)/BTEX Surrogates			
1,2-Dichloroethane-D4	17060-07-0	72	143
Toluene-D8	2037-26-5	75	131
4-Bromofluorobenzene	460-00-4	73	137

Inter-Laboratory Testing

Analysis conducted by ALS Newcastle, NATA accreditation no. 825, site no. 1656 (Chemistry) 9854 (Biology).

(SOIL) EA150: Soil Classification based on Particle Size

(SOIL) EA152: Soil Particle Density

(SOIL) EA200N: Asbestos Quantification (non-NATA)

(SOIL) EA200: AS 4964 - 2004 Identification of Asbestos in Soils



QUALITY CONTROL REPORT

Work Order : **ES2310695**

Page : 1 of 17

Client : **Envirotech Services Australia**

Contact : Stuart Lord

Address : 271 Brunker Road
Adamstown 2289

Telephone : ----

Project : Mussellbrook PSI

Order number : ENV1015

C-O-C number : ----

Sampler : ----

Site : ----

Quote number : SY/222/22

No. of samples received : 25

No. of samples analysed : 17

Laboratory : Environmental Division Sydney

Contact : Customer Services ES

Address : 277-289 Woodpark Road Smithfield NSW Australia 2164

Telephone : +61-2-8784 8555

Date Samples Received : 31-Mar-2023

Date Analysis Commenced : 04-Apr-2023

Issue Date : 13-Apr-2023



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

This Quality Control Report contains the following information:

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

Signatories

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

Signatories	Position	Accreditation Category
Aleksandar Vujkovic	Laboratory Technician	Newcastle - Inorganics, Mayfield West, NSW
Ankit Joshi	Senior Chemist - Inorganics	Sydney Inorganics, Smithfield, NSW
Brendan Schrader	Laboratory Technician	Newcastle - Asbestos, Mayfield West, NSW
Dian Dao	Senior Chemist - Inorganics	Sydney Inorganics, Smithfield, NSW
Edwandy Fadjjar	Organic Coordinator	Sydney Inorganics, Smithfield, NSW
Edwandy Fadjjar	Organic Coordinator	Sydney Organics, Smithfield, NSW
Wisam Marassa	Inorganics Coordinator	Sydney Inorganics, Smithfield, NSW



General Comments

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

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

Where a reported less than (<) result is higher than the LOR, this may be due to primary sample extract/digestate dilution and/or insufficient sample for analysis. Where the LOR of a reported result differs from standard LOR, this may be due to high moisture content, insufficient sample (reduced weight employed) or matrix interference.

Key :
 Anonymous = Refers to samples which are not specifically part of this work order but formed part of the QC process lot
 CAS Number = CAS registry number from database maintained by Chemical Abstracts Services. The Chemical Abstracts Service is a division of the American Chemical Society.
 LOR = Limit of reporting
 RPD = Relative Percentage Difference
 # = Indicates failed QC

Laboratory Duplicate (DUP) Report

The quality control term Laboratory Duplicate refers to a randomly selected intralaboratory split. Laboratory duplicates provide information regarding method precision and sample heterogeneity. The permitted ranges for the Relative Percent Deviation (RPD) of Laboratory Duplicates are specified in ALS Method QWI-EN/38 and are dependent on the magnitude of results in comparison to the level of reporting: Result < 10 times LOR: No Limit; Result between 10 and 20 times LOR: 0% - 50%; Result > 20 times LOR: 0% - 20%.

Sub-Matrix: **SOIL**

Sub-Matrix: SOIL				Laboratory Duplicate (DUP) Report					
Laboratory sample ID	Sample ID	Method: Compound	CAS Number	LOR	Unit	Original Result	Duplicate Result	RPD (%)	Acceptable RPD (%)
EG005(ED093)T: Total Metals by ICP-AES (QC Lot: 4972789)									
ES2310695-016	TP06_0.5	EG005T: Cadmium	7440-43-9	1	mg/kg	<1	<1	0.0	No Limit
		EG005T: Chromium	7440-47-3	2	mg/kg	50	53	6.3	0% - 20%
		EG005T: Nickel	7440-02-0	2	mg/kg	49	43	13.6	0% - 20%
		EG005T: Arsenic	7440-38-2	5	mg/kg	<5	<5	0.0	No Limit
		EG005T: Copper	7440-50-8	5	mg/kg	22	21	0.0	No Limit
		EG005T: Lead	7439-92-1	5	mg/kg	6	5	0.0	No Limit
		EG005T: Zinc	7440-66-6	5	mg/kg	43	43	0.0	No Limit
		EG005T: Iron	7439-89-6	50	mg/kg	3.17 %	31400	1.2	0% - 20%
EG005(ED093)T: Total Metals by ICP-AES (QC Lot: 4981223)									
ES2310695-002	TP01_0.5	EG005T: Cadmium	7440-43-9	1	mg/kg	<1	<1	0.0	No Limit
		EG005T: Chromium	7440-47-3	2	mg/kg	26	30	12.4	0% - 50%
		EG005T: Nickel	7440-02-0	2	mg/kg	36	29	22.0	0% - 50%
		EG005T: Arsenic	7440-38-2	5	mg/kg	<5	<5	0.0	No Limit
		EG005T: Copper	7440-50-8	5	mg/kg	12	11	11.5	No Limit
		EG005T: Lead	7439-92-1	5	mg/kg	7	5	24.6	No Limit
		EG005T: Zinc	7440-66-6	5	mg/kg	28	22	25.7	No Limit
		EG005T: Iron	7439-89-6	50	mg/kg	27100	24400	10.4	0% - 20%
ES2310896-087	Anonymous	EG005T: Cadmium	7440-43-9	1	mg/kg	<1	<1	0.0	No Limit
		EG005T: Chromium	7440-47-3	2	mg/kg	16	16	0.0	No Limit
		EG005T: Nickel	7440-02-0	2	mg/kg	23	26	14.7	0% - 50%
		EG005T: Arsenic	7440-38-2	5	mg/kg	<5	<5	0.0	No Limit
		EG005T: Copper	7440-50-8	5	mg/kg	24	27	10.1	No Limit
		EG005T: Lead	7439-92-1	5	mg/kg	16	16	0.0	No Limit
		EG005T: Zinc	7440-66-6	5	mg/kg	58	60	3.0	0% - 50%

Page : 3 of 17
 Work Order : ES2310695
 Client : Envirotech Services Australia
 Project : Mussellbrook PSI



Sub-Matrix: SOIL				Laboratory Duplicate (DUP) Report					
Laboratory sample ID	Sample ID	Method: Compound	CAS Number	LOR	Unit	Original Result	Duplicate Result	RPD (%)	Acceptable RPD (%)
EG005(ED093)T: Total Metals by ICP-AES (QC Lot: 4981223) - continued									
ES2310896-087	Anonymous	EG005T: Iron	7439-89-6	50	mg/kg	31800	34400	7.7	0% - 20%
EA001: pH in soil using 0.01M CaCl extract (QC Lot: 4977760)									
ES2310695-016	TP06_0.5	EA001: pH (CaCl2)	----	0.1	pH Unit	7.5	8.4	10.7	0% - 20%
EA002: pH 1:5 (Soils) (QC Lot: 4972780)									
ES2310986-004	Anonymous	EA002: pH Value	----	0.1	pH Unit	5.9	6.2	5.3	0% - 20%
ES2310809-001	Anonymous	EA002: pH Value	----	0.1	pH Unit	8.4	8.5	0.0	0% - 20%
EA010: Conductivity (1:5) (QC Lot: 4972781)									
ES2310986-004	Anonymous	EA010: Electrical Conductivity @ 25°C	----	1	µS/cm	224	183	19.9	0% - 20%
ES2310809-001	Anonymous	EA010: Electrical Conductivity @ 25°C	----	1	µS/cm	81	72	10.7	0% - 20%
EA055: Moisture Content (Dried @ 105-110°C) (QC Lot: 4972792)									
ES2310809-002	Anonymous	EA055: Moisture Content	----	0.1	%	22.0	21.9	0.0	0% - 20%
ES2310986-007	Anonymous	EA055: Moisture Content	----	0.1	%	10.6	10.8	2.2	0% - 20%
EA055: Moisture Content (Dried @ 105-110°C) (QC Lot: 4981229)									
ES2310695-006	TP02_0.3	EA055: Moisture Content	----	0.1	%	19.1	17.2	10.2	0% - 50%
ES2311035-006	Anonymous	EA055: Moisture Content	----	0.1	%	17.6	12.1	37.1	0% - 50%
ED006: Exchangeable Cations on Alkaline Soils (QC Lot: 4985714)									
ES2310695-016	TP06_0.5	ED006: Exchangeable Calcium	----	0.2	meq/100g	11.5	11.9	3.4	0% - 20%
		ED006: Exchangeable Magnesium	----	0.2	meq/100g	10.9	11.3	3.2	0% - 20%
		ED006: Exchangeable Potassium	----	0.2	meq/100g	<0.2	<0.2	0.0	No Limit
		ED006: Exchangeable Sodium	----	0.2	meq/100g	0.4	0.4	0.0	No Limit
		ED006: Cation Exchange Capacity	----	0.2	meq/100g	22.8	23.7	3.8	0% - 20%
EG035T: Total Recoverable Mercury by FIMS (QC Lot: 4972788)									
ES2310695-016	TP06_0.5	EG035T: Mercury	7439-97-6	0.1	mg/kg	<0.1	<0.1	0.0	No Limit
EG035T: Total Recoverable Mercury by FIMS (QC Lot: 4981222)									
ES2310695-002	TP01_0.5	EG035T: Mercury	7439-97-6	0.1	mg/kg	<0.1	<0.1	0.0	No Limit
ES2310896-087	Anonymous	EG035T: Mercury	7439-97-6	0.1	mg/kg	<0.1	<0.1	0.0	No Limit
EP004: Organic Matter (QC Lot: 4974873)									
ES2310695-016	TP06_0.5	EP004: Organic Matter	----	0.5	%	1.2	1.6	32.4	No Limit
		EP004: Total Organic Carbon	----	0.5	%	0.7	0.9	33.0	No Limit
EP068A: Organochlorine Pesticides (OC) (QC Lot: 4976741)									
ES2310695-003	TP01_1.0	EP068: alpha-BHC	319-84-6	0.05	mg/kg	<0.05	<0.05	0.0	No Limit
		EP068: Hexachlorobenzene (HCB)	118-74-1	0.05	mg/kg	<0.05	<0.05	0.0	No Limit
		EP068: beta-BHC	319-85-7	0.05	mg/kg	<0.05	<0.05	0.0	No Limit
		EP068: gamma-BHC	58-89-9	0.05	mg/kg	<0.05	<0.05	0.0	No Limit
		EP068: delta-BHC	319-86-8	0.05	mg/kg	<0.05	<0.05	0.0	No Limit
		EP068: Heptachlor	76-44-8	0.05	mg/kg	<0.05	<0.05	0.0	No Limit
		EP068: Aldrin	309-00-2	0.05	mg/kg	<0.05	<0.05	0.0	No Limit
		EP068: Heptachlor epoxide	1024-57-3	0.05	mg/kg	<0.05	<0.05	0.0	No Limit



Sub-Matrix: SOIL				Laboratory Duplicate (DUP) Report					
Laboratory sample ID	Sample ID	Method: Compound	CAS Number	LOR	Unit	Original Result	Duplicate Result	RPD (%)	Acceptable RPD (%)
EP068A: Organochlorine Pesticides (OC) (QC Lot: 4976741) - continued									
ES2310695-003	TP01_1.0	EP068: trans-Chlordane	5103-74-2	0.05	mg/kg	<0.05	<0.05	0.0	No Limit
		EP068: alpha-Endosulfan	959-98-8	0.05	mg/kg	<0.05	<0.05	0.0	No Limit
		EP068: cis-Chlordane	5103-71-9	0.05	mg/kg	<0.05	<0.05	0.0	No Limit
		EP068: Dieldrin	60-57-1	0.05	mg/kg	<0.05	<0.05	0.0	No Limit
		EP068: 4,4'-DDE	72-55-9	0.05	mg/kg	<0.05	<0.05	0.0	No Limit
		EP068: Endrin	72-20-8	0.05	mg/kg	<0.05	<0.05	0.0	No Limit
		EP068: beta-Endosulfan	33213-65-9	0.05	mg/kg	<0.05	<0.05	0.0	No Limit
		EP068: 4,4'-DDD	72-54-8	0.05	mg/kg	<0.05	<0.05	0.0	No Limit
		EP068: Endrin aldehyde	7421-93-4	0.05	mg/kg	<0.05	<0.05	0.0	No Limit
		EP068: Endosulfan sulfate	1031-07-8	0.05	mg/kg	<0.05	<0.05	0.0	No Limit
		EP068: Endrin ketone	53494-70-5	0.05	mg/kg	<0.05	<0.05	0.0	No Limit
		EP068: 4,4'-DDT	50-29-3	0.2	mg/kg	<0.2	<0.2	0.0	No Limit
		EP068: Methoxychlor	72-43-5	0.2	mg/kg	<0.2	<0.2	0.0	No Limit
EP068B: Organophosphorus Pesticides (OP) (QC Lot: 4976741)									
ES2310695-003	TP01_1.0	EP068: Dichlorvos	62-73-7	0.05	mg/kg	<0.05	<0.05	0.0	No Limit
		EP068: Demeton-S-methyl	919-86-8	0.05	mg/kg	<0.05	<0.05	0.0	No Limit
		EP068: Dimethoate	60-51-5	0.05	mg/kg	<0.05	<0.05	0.0	No Limit
		EP068: Diazinon	333-41-5	0.05	mg/kg	<0.05	<0.05	0.0	No Limit
		EP068: Chlorpyrifos-methyl	5598-13-0	0.05	mg/kg	<0.05	<0.05	0.0	No Limit
		EP068: Malathion	121-75-5	0.05	mg/kg	<0.05	<0.05	0.0	No Limit
		EP068: Fenthion	55-38-9	0.05	mg/kg	<0.05	<0.05	0.0	No Limit
		EP068: Chlorpyrifos	2921-88-2	0.05	mg/kg	<0.05	<0.05	0.0	No Limit
		EP068: Pirimphos-ethyl	23505-41-1	0.05	mg/kg	<0.05	<0.05	0.0	No Limit
		EP068: Chlorfenvinphos	470-90-6	0.05	mg/kg	<0.05	<0.05	0.0	No Limit
		EP068: Bromophos-ethyl	4824-78-6	0.05	mg/kg	<0.05	<0.05	0.0	No Limit
		EP068: Fenamiphos	22224-92-6	0.05	mg/kg	<0.05	<0.05	0.0	No Limit
		EP068: Prothiofos	34643-46-4	0.05	mg/kg	<0.05	<0.05	0.0	No Limit
		EP068: Ethion	563-12-2	0.05	mg/kg	<0.05	<0.05	0.0	No Limit
		EP068: Carbophenothion	786-19-6	0.05	mg/kg	<0.05	<0.05	0.0	No Limit
		EP068: Azinphos Methyl	86-50-0	0.05	mg/kg	<0.05	<0.05	0.0	No Limit
		EP068: Monocrotophos	6923-22-4	0.2	mg/kg	<0.2	<0.2	0.0	No Limit
		EP068: Parathion-methyl	298-00-0	0.2	mg/kg	<0.2	<0.2	0.0	No Limit
		EP068: Parathion	56-38-2	0.2	mg/kg	<0.2	<0.2	0.0	No Limit
		EP075(SIM)B: Polynuclear Aromatic Hydrocarbons (QC Lot: 4976740)							
ES2310695-021	QC01	EP075(SIM): Naphthalene	91-20-3	0.5	mg/kg	<0.5	<0.5	0.0	No Limit
		EP075(SIM): Acenaphthylene	208-96-8	0.5	mg/kg	<0.5	<0.5	0.0	No Limit
		EP075(SIM): Acenaphthene	83-32-9	0.5	mg/kg	<0.5	<0.5	0.0	No Limit
		EP075(SIM): Fluorene	86-73-7	0.5	mg/kg	<0.5	<0.5	0.0	No Limit
		EP075(SIM): Phenanthrene	85-01-8	0.5	mg/kg	<0.5	<0.5	0.0	No Limit
		EP075(SIM): Anthracene	120-12-7	0.5	mg/kg	<0.5	<0.5	0.0	No Limit



Sub-Matrix: SOIL				Laboratory Duplicate (DUP) Report						
Laboratory sample ID	Sample ID	Method: Compound	CAS Number	LOR	Unit	Original Result	Duplicate Result	RPD (%)	Acceptable RPD (%)	
EP075(SIM)B: Polynuclear Aromatic Hydrocarbons (QC Lot: 4976740) - continued										
ES2310695-021	QC01	EP075(SIM): Fluoranthene	206-44-0	0.5	mg/kg	<0.5	<0.5	0.0	No Limit	
		EP075(SIM): Pyrene	129-00-0	0.5	mg/kg	<0.5	<0.5	0.0	No Limit	
		EP075(SIM): Benz(a)anthracene	56-55-3	0.5	mg/kg	<0.5	<0.5	0.0	No Limit	
		EP075(SIM): Chrysene	218-01-9	0.5	mg/kg	<0.5	<0.5	0.0	No Limit	
		EP075(SIM): Benzo(b+j)fluoranthene	205-99-2	0.5	mg/kg	<0.5	<0.5	0.0	No Limit	
			205-82-3							
		EP075(SIM): Benzo(k)fluoranthene	207-08-9	0.5	mg/kg	<0.5	<0.5	0.0	No Limit	
		EP075(SIM): Benzo(a)pyrene	50-32-8	0.5	mg/kg	<0.5	<0.5	0.0	No Limit	
		EP075(SIM): Indeno(1.2.3.cd)pyrene	193-39-5	0.5	mg/kg	<0.5	<0.5	0.0	No Limit	
		EP075(SIM): Dibenz(a,h)anthracene	53-70-3	0.5	mg/kg	<0.5	<0.5	0.0	No Limit	
		EP075(SIM): Benzo(g,h,i)perylene	191-24-2	0.5	mg/kg	<0.5	<0.5	0.0	No Limit	
		EP075(SIM): Sum of polycyclic aromatic hydrocarbons	----	0.5	mg/kg	<0.5	<0.5	0.0	No Limit	
			EP075(SIM): Benzo(a)pyrene TEQ (zero)	----	0.5	mg/kg	<0.5	<0.5	0.0	No Limit
ES2310695-003	TP01_1.0	EP075(SIM): Naphthalene	91-20-3	0.5	mg/kg	<0.5	<0.5	0.0	No Limit	
		EP075(SIM): Acenaphthylene	208-96-8	0.5	mg/kg	<0.5	<0.5	0.0	No Limit	
		EP075(SIM): Acenaphthene	83-32-9	0.5	mg/kg	<0.5	<0.5	0.0	No Limit	
		EP075(SIM): Fluorene	86-73-7	0.5	mg/kg	<0.5	<0.5	0.0	No Limit	
		EP075(SIM): Phenanthrene	85-01-8	0.5	mg/kg	<0.5	<0.5	0.0	No Limit	
		EP075(SIM): Anthracene	120-12-7	0.5	mg/kg	<0.5	<0.5	0.0	No Limit	
		EP075(SIM): Fluoranthene	206-44-0	0.5	mg/kg	<0.5	<0.5	0.0	No Limit	
		EP075(SIM): Pyrene	129-00-0	0.5	mg/kg	<0.5	<0.5	0.0	No Limit	
		EP075(SIM): Benz(a)anthracene	56-55-3	0.5	mg/kg	<0.5	<0.5	0.0	No Limit	
		EP075(SIM): Chrysene	218-01-9	0.5	mg/kg	<0.5	<0.5	0.0	No Limit	
		EP075(SIM): Benzo(b+j)fluoranthene	205-99-2	0.5	mg/kg	<0.5	<0.5	0.0	No Limit	
			205-82-3							
		EP075(SIM): Benzo(k)fluoranthene	207-08-9	0.5	mg/kg	<0.5	<0.5	0.0	No Limit	
		EP075(SIM): Benzo(a)pyrene	50-32-8	0.5	mg/kg	<0.5	<0.5	0.0	No Limit	
		EP075(SIM): Indeno(1.2.3.cd)pyrene	193-39-5	0.5	mg/kg	<0.5	<0.5	0.0	No Limit	
		EP075(SIM): Dibenz(a,h)anthracene	53-70-3	0.5	mg/kg	<0.5	<0.5	0.0	No Limit	
		EP075(SIM): Benzo(g,h,i)perylene	191-24-2	0.5	mg/kg	<0.5	<0.5	0.0	No Limit	
		EP075(SIM): Sum of polycyclic aromatic hydrocarbons	----	0.5	mg/kg	<0.5	<0.5	0.0	No Limit	
			EP075(SIM): Benzo(a)pyrene TEQ (zero)	----	0.5	mg/kg	<0.5	<0.5	0.0	No Limit
		EP080/071: Total Petroleum Hydrocarbons (QC Lot: 4976490)								
ES2311487-001	Anonymous	EP080: C6 - C9 Fraction	----	10	mg/kg	<10	<10	0.0	No Limit	
ES2311487-008	Anonymous	EP080: C6 - C9 Fraction	----	10	mg/kg	<10	<10	0.0	No Limit	
EP080/071: Total Petroleum Hydrocarbons (QC Lot: 4976491)										
ES2310695-002	TP01_0.5	EP080: C6 - C9 Fraction	----	10	mg/kg	<10	<10	0.0	No Limit	
ES2310695-021	QC01	EP080: C6 - C9 Fraction	----	10	mg/kg	<10	<10	0.0	No Limit	



Sub-Matrix: SOIL				Laboratory Duplicate (DUP) Report					
Laboratory sample ID	Sample ID	Method: Compound	CAS Number	LOR	Unit	Original Result	Duplicate Result	RPD (%)	Acceptable RPD (%)
EP080/071: Total Petroleum Hydrocarbons (QC Lot: 4976739)									
ES2310695-021	QC01	EP071: C15 - C28 Fraction	----	100	mg/kg	<100	<100	0.0	No Limit
		EP071: C29 - C36 Fraction	----	100	mg/kg	<100	<100	0.0	No Limit
		EP071: C10 - C14 Fraction	----	50	mg/kg	<50	<50	0.0	No Limit
ES2310695-003	TP01_1.0	EP071: C15 - C28 Fraction	----	100	mg/kg	<100	<100	0.0	No Limit
		EP071: C29 - C36 Fraction	----	100	mg/kg	<100	<100	0.0	No Limit
		EP071: C10 - C14 Fraction	----	50	mg/kg	<50	<50	0.0	No Limit
EP080/071: Total Recoverable Hydrocarbons - NEPM 2013 Fractions (QC Lot: 4976490)									
ES2311487-001	Anonymous	EP080: C6 - C10 Fraction	C6_C10	10	mg/kg	<10	<10	0.0	No Limit
ES2311487-008	Anonymous	EP080: C6 - C10 Fraction	C6_C10	10	mg/kg	<10	<10	0.0	No Limit
EP080/071: Total Recoverable Hydrocarbons - NEPM 2013 Fractions (QC Lot: 4976491)									
ES2310695-002	TP01_0.5	EP080: C6 - C10 Fraction	C6_C10	10	mg/kg	<10	<10	0.0	No Limit
ES2310695-021	QC01	EP080: C6 - C10 Fraction	C6_C10	10	mg/kg	<10	<10	0.0	No Limit
EP080/071: Total Recoverable Hydrocarbons - NEPM 2013 Fractions (QC Lot: 4976739)									
ES2310695-021	QC01	EP071: >C16 - C34 Fraction	----	100	mg/kg	<100	<100	0.0	No Limit
		EP071: >C34 - C40 Fraction	----	100	mg/kg	<100	<100	0.0	No Limit
		EP071: >C10 - C16 Fraction	----	50	mg/kg	<50	<50	0.0	No Limit
ES2310695-003	TP01_1.0	EP071: >C16 - C34 Fraction	----	100	mg/kg	<100	<100	0.0	No Limit
		EP071: >C34 - C40 Fraction	----	100	mg/kg	<100	<100	0.0	No Limit
		EP071: >C10 - C16 Fraction	----	50	mg/kg	<50	<50	0.0	No Limit
EP080: BTEXN (QC Lot: 4976490)									
ES2311487-001	Anonymous	EP080: Benzene	71-43-2	0.2	mg/kg	<0.2	<0.2	0.0	No Limit
		EP080: Toluene	108-88-3	0.5	mg/kg	<0.5	<0.5	0.0	No Limit
		EP080: Ethylbenzene	100-41-4	0.5	mg/kg	<0.5	<0.5	0.0	No Limit
		EP080: meta- & para-Xylene	108-38-3	0.5	mg/kg	<0.5	<0.5	0.0	No Limit
			106-42-3						
		EP080: ortho-Xylene	95-47-6	0.5	mg/kg	<0.5	<0.5	0.0	No Limit
ES2311487-008	Anonymous	EP080: Naphthalene	91-20-3	1	mg/kg	<1	<1	0.0	No Limit
		EP080: Benzene	71-43-2	0.2	mg/kg	<0.2	<0.2	0.0	No Limit
		EP080: Toluene	108-88-3	0.5	mg/kg	<0.5	<0.5	0.0	No Limit
		EP080: Ethylbenzene	100-41-4	0.5	mg/kg	<0.5	<0.5	0.0	No Limit
		EP080: meta- & para-Xylene	108-38-3	0.5	mg/kg	<0.5	<0.5	0.0	No Limit
			106-42-3						
ES2311487-008	Anonymous	EP080: ortho-Xylene	95-47-6	0.5	mg/kg	<0.5	<0.5	0.0	No Limit
		EP080: Naphthalene	91-20-3	1	mg/kg	<1	<1	0.0	No Limit
EP080: BTEXN (QC Lot: 4976491)									
ES2310695-002	TP01_0.5	EP080: Benzene	71-43-2	0.2	mg/kg	<0.2	<0.2	0.0	No Limit
		EP080: Toluene	108-88-3	0.5	mg/kg	<0.5	<0.5	0.0	No Limit
		EP080: Ethylbenzene	100-41-4	0.5	mg/kg	<0.5	<0.5	0.0	No Limit



Sub-Matrix: SOIL				Laboratory Duplicate (DUP) Report					
Laboratory sample ID	Sample ID	Method: Compound	CAS Number	LOR	Unit	Original Result	Duplicate Result	RPD (%)	Acceptable RPD (%)
EP080: BTEXN (QC Lot: 4976491) - continued									
ES2310695-002	TP01_0.5	EP080: meta- & para-Xylene	108-38-3 106-42-3	0.5	mg/kg	<0.5	<0.5	0.0	No Limit
		EP080: ortho-Xylene	95-47-6	0.5	mg/kg	<0.5	<0.5	0.0	No Limit
		EP080: Naphthalene	91-20-3	1	mg/kg	<1	<1	0.0	No Limit
ES2310695-021	QC01	EP080: Benzene	71-43-2	0.2	mg/kg	<0.2	<0.2	0.0	No Limit
		EP080: Toluene	108-88-3	0.5	mg/kg	<0.5	<0.5	0.0	No Limit
		EP080: Ethylbenzene	100-41-4	0.5	mg/kg	<0.5	<0.5	0.0	No Limit
		EP080: meta- & para-Xylene	108-38-3 106-42-3	0.5	mg/kg	<0.5	<0.5	0.0	No Limit
		EP080: ortho-Xylene	95-47-6	0.5	mg/kg	<0.5	<0.5	0.0	No Limit
		EP080: Naphthalene	91-20-3	1	mg/kg	<1	<1	0.0	No Limit
Sub-Matrix: WATER				Laboratory Duplicate (DUP) Report					
Laboratory sample ID	Sample ID	Method: Compound	CAS Number	LOR	Unit	Original Result	Duplicate Result	RPD (%)	Acceptable RPD (%)
EG020T: Total Metals by ICP-MS (QC Lot: 4972950)									
ES2310695-022	RW01	EG020A-T: Cadmium	7440-43-9	0.0001	mg/L	<0.0001	<0.0001	0.0	No Limit
		EG020A-T: Arsenic	7440-38-2	0.001	mg/L	<0.001	<0.001	0.0	No Limit
		EG020A-T: Chromium	7440-47-3	0.001	mg/L	<0.001	<0.001	0.0	No Limit
		EG020A-T: Copper	7440-50-8	0.001	mg/L	<0.001	<0.001	0.0	No Limit
		EG020A-T: Lead	7439-92-1	0.001	mg/L	<0.001	<0.001	0.0	No Limit
		EG020A-T: Nickel	7440-02-0	0.001	mg/L	<0.001	<0.001	0.0	No Limit
		EG020A-T: Zinc	7440-66-6	0.005	mg/L	<0.005	<0.005	0.0	No Limit
ES2311061-001	Anonymous	EG020A-T: Cadmium	7440-43-9	0.0001	mg/L	<0.0001	<0.0001	0.0	No Limit
		EG020A-T: Arsenic	7440-38-2	0.001	mg/L	<0.001	<0.001	0.0	No Limit
		EG020A-T: Chromium	7440-47-3	0.001	mg/L	<0.001	<0.001	0.0	No Limit
		EG020A-T: Copper	7440-50-8	0.001	mg/L	0.006	0.007	0.0	No Limit
		EG020A-T: Lead	7439-92-1	0.001	mg/L	<0.001	<0.001	0.0	No Limit
		EG020A-T: Nickel	7440-02-0	0.001	mg/L	<0.001	<0.001	0.0	No Limit
		EG020A-T: Zinc	7440-66-6	0.005	mg/L	<0.005	<0.005	0.0	No Limit
EG035T: Total Recoverable Mercury by FIMS (QC Lot: 4972935)									
ES2310025-001	Anonymous	EG035T: Mercury	7439-97-6	0.0001	mg/L	<0.0001	<0.0001	0.0	No Limit
ES2310967-001	Anonymous	EG035T: Mercury	7439-97-6	0.0001	mg/L	<0.0001	<0.0001	0.0	No Limit
EP080/071: Total Petroleum Hydrocarbons (QC Lot: 4976002)									
CA2301964-030	Anonymous	EP080: C6 - C9 Fraction	----	20	µg/L	150	130	11.1	No Limit
ES2310924-015	Anonymous	EP080: C6 - C9 Fraction	----	20	µg/L	<20	<20	0.0	No Limit
EP080/071: Total Recoverable Hydrocarbons - NEPM 2013 Fractions (QC Lot: 4976002)									
CA2301964-030	Anonymous	EP080: C6 - C10 Fraction	C6_C10	20	µg/L	140	130	11.5	No Limit
ES2310924-015	Anonymous	EP080: C6 - C10 Fraction	C6_C10	20	µg/L	<20	<20	0.0	No Limit
EP080: BTEXN (QC Lot: 4976002)									
CA2301964-030	Anonymous	EP080: Benzene	71-43-2	1	µg/L	3	3	0.0	No Limit

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 Work Order : ES2310695
 Client : Envirotech Services Australia
 Project : Mussellbrook PSI



Sub-Matrix: WATER				Laboratory Duplicate (DUP) Report					
Laboratory sample ID	Sample ID	Method: Compound	CAS Number	LOR	Unit	Original Result	Duplicate Result	RPD (%)	Acceptable RPD (%)
EP080: BTEXN (QC Lot: 4976002) - continued									
CA2301964-030	Anonymous	EP080: Toluene	108-88-3	2	µg/L	4	4	0.0	No Limit
		EP080: Ethylbenzene	100-41-4	2	µg/L	13	12	0.0	No Limit
		EP080: meta- & para-Xylene	108-38-3	2	µg/L	23	23	0.0	0% - 50%
			106-42-3						
		EP080: ortho-Xylene	95-47-6	2	µg/L	13	13	0.0	No Limit
		EP080: Naphthalene	91-20-3	5	µg/L	<5	<5	0.0	No Limit
ES2310924-015	Anonymous	EP080: Benzene	71-43-2	1	µg/L	<1	<1	0.0	No Limit
		EP080: Toluene	108-88-3	2	µg/L	<2	<2	0.0	No Limit
		EP080: Ethylbenzene	100-41-4	2	µg/L	<2	<2	0.0	No Limit
		EP080: meta- & para-Xylene	108-38-3	2	µg/L	<2	<2	0.0	No Limit
			106-42-3						
		EP080: ortho-Xylene	95-47-6	2	µg/L	<2	<2	0.0	No Limit
		EP080: Naphthalene	91-20-3	5	µg/L	<5	<5	0.0	No Limit



Method Blank (MB) and Laboratory Control Sample (LCS) Report

The quality control term Method / Laboratory Blank refers to an analyte free matrix to which all reagents are added in the same volumes or proportions as used in standard sample preparation. The purpose of this QC parameter is to monitor potential laboratory contamination. The quality control term Laboratory Control Sample (LCS) refers to a certified reference material, or a known interference free matrix spiked with target analytes. The purpose of this QC parameter is to monitor method precision and accuracy independent of sample matrix. Dynamic Recovery Limits are based on statistical evaluation of processed LCS.

Sub-Matrix: **SOIL**

Sub-Matrix: SOIL				Method Blank (MB) Report	Laboratory Control Spike (LCS) Report			
					Spike Concentration	Spike Recovery (%) LCS	Acceptable Limits (%) Low High	
Method: Compound	CAS Number	LOR	Unit	Result				
EG005(ED093)T: Total Metals by ICP-AES (QCLot: 4972789)								
EG005T: Arsenic	7440-38-2	5	mg/kg	<5	121.1 mg/kg	112	88.0	113
EG005T: Cadmium	7440-43-9	1	mg/kg	<1	0.74 mg/kg	126	70.0	130
EG005T: Chromium	7440-47-3	2	mg/kg	<2	19.6 mg/kg	131	68.0	132
EG005T: Copper	7440-50-8	5	mg/kg	<5	52.9 mg/kg	96.5	89.0	111
EG005T: Iron	7439-89-6	50	mg/kg	<50	31660 mg/kg	109	89.0	112
EG005T: Lead	7439-92-1	5	mg/kg	<5	60.8 mg/kg	119	82.0	119
EG005T: Nickel	7440-02-0	2	mg/kg	<2	15.3 mg/kg	119	80.0	120
EG005T: Zinc	7440-66-6	5	mg/kg	<5	139.3 mg/kg	108	66.0	133
EG005(ED093)T: Total Metals by ICP-AES (QCLot: 4981223)								
EG005T: Arsenic	7440-38-2	5	mg/kg	<5	121.1 mg/kg	95.1	88.0	113
EG005T: Cadmium	7440-43-9	1	mg/kg	<1	0.74 mg/kg	80.4	70.0	130
EG005T: Chromium	7440-47-3	2	mg/kg	<2	19.6 mg/kg	101	68.0	132
EG005T: Copper	7440-50-8	5	mg/kg	<5	52.9 mg/kg	100	89.0	111
EG005T: Iron	7439-89-6	50	mg/kg	<50	31660 mg/kg	109	89.0	112
EG005T: Lead	7439-92-1	5	mg/kg	<5	60.8 mg/kg	97.9	82.0	119
EG005T: Nickel	7440-02-0	2	mg/kg	<2	15.3 mg/kg	92.6	80.0	120
EG005T: Zinc	7440-66-6	5	mg/kg	<5	139.3 mg/kg	87.9	66.0	133
EA002: pH 1:5 (Soils) (QCLot: 4972780)								
EA002: pH Value	----	----	pH Unit	----	4 pH Unit	101	98.8	101
				----	7 pH Unit	99.7	98.8	101
EA010: Conductivity (1:5) (QCLot: 4972781)								
EA010: Electrical Conductivity @ 25°C	----	1	µS/cm	<1	1412 µS/cm	100	92.0	108
ED006: Exchangeable Cations on Alkaline Soils (QCLot: 4985714)								
ED006: Exchangeable Calcium	----	0.2	meq/100g	<0.2	2.5 meq/100g	106	80.0	110
ED006: Exchangeable Magnesium	----	0.2	meq/100g	<0.2	4.17 meq/100g	102	80.0	110
ED006: Exchangeable Potassium	----	0.2	meq/100g	<0.2	1.28 meq/100g	102	80.0	110
ED006: Exchangeable Sodium	----	0.2	meq/100g	<0.2	2.17 meq/100g	102	80.0	110
ED006: Cation Exchange Capacity	----	0.2	meq/100g	<0.2	----	----	----	----
EG035T: Total Recoverable Mercury by FIMS (QCLot: 4972788)								
EG035T: Mercury	7439-97-6	0.1	mg/kg	<0.1	0.087 mg/kg	108	70.0	125



Sub-Matrix: SOIL				Method Blank (MB) Report	Laboratory Control Spike (LCS) Report			
					Spike Concentration	Spike Recovery (%) LCS	Acceptable Limits (%) Low High	
Method: Compound	CAS Number	LOR	Unit	Result				
EG035T: Total Recoverable Mercury by FIMS (QCLot: 4981222)								
EG035T: Mercury	7439-97-6	0.1	mg/kg	<0.1	0.087 mg/kg	83.1	70.0	125
EP004: Organic Matter (QCLot: 4974873)								
EP004: Organic Matter	----	0.5	%	<0.5	2.53 %	82.2	82.0	98.0
EP004: Total Organic Carbon	----	0.5	%	<0.5	1.46 %	82.9	81.0	99.0
EP068A: Organochlorine Pesticides (OC) (QCLot: 4976741)								
EP068: alpha-BHC	319-84-6	0.05	mg/kg	<0.05	0.5 mg/kg	86.1	69.0	113
EP068: Hexachlorobenzene (HCB)	118-74-1	0.05	mg/kg	<0.05	0.5 mg/kg	88.3	65.0	117
EP068: beta-BHC	319-85-7	0.05	mg/kg	<0.05	0.5 mg/kg	86.5	67.0	119
EP068: gamma-BHC	58-89-9	0.05	mg/kg	<0.05	0.5 mg/kg	86.2	68.0	116
EP068: delta-BHC	319-86-8	0.05	mg/kg	<0.05	0.5 mg/kg	84.9	65.0	117
EP068: Heptachlor	76-44-8	0.05	mg/kg	<0.05	0.5 mg/kg	87.1	67.0	115
EP068: Aldrin	309-00-2	0.05	mg/kg	<0.05	0.5 mg/kg	88.3	69.0	115
EP068: Heptachlor epoxide	1024-57-3	0.05	mg/kg	<0.05	0.5 mg/kg	89.2	62.0	118
EP068: trans-Chlordane	5103-74-2	0.05	mg/kg	<0.05	0.5 mg/kg	88.5	63.0	117
EP068: alpha-Endosulfan	959-98-8	0.05	mg/kg	<0.05	0.5 mg/kg	85.3	66.0	116
EP068: cis-Chlordane	5103-71-9	0.05	mg/kg	<0.05	0.5 mg/kg	88.4	64.0	116
EP068: Dieldrin	60-57-1	0.05	mg/kg	<0.05	0.5 mg/kg	87.8	66.0	116
EP068: 4,4`-DDE	72-55-9	0.05	mg/kg	<0.05	0.5 mg/kg	88.1	67.0	115
EP068: Endrin	72-20-8	0.05	mg/kg	<0.05	0.5 mg/kg	91.3	67.0	123
EP068: beta-Endosulfan	33213-65-9	0.05	mg/kg	<0.05	0.5 mg/kg	95.1	69.0	115
EP068: 4,4`-DDD	72-54-8	0.05	mg/kg	<0.05	0.5 mg/kg	86.8	69.0	121
EP068: Endrin aldehyde	7421-93-4	0.05	mg/kg	<0.05	0.5 mg/kg	80.8	56.0	120
EP068: Endosulfan sulfate	1031-07-8	0.05	mg/kg	<0.05	0.5 mg/kg	87.9	62.0	124
EP068: 4,4`-DDT	50-29-3	0.2	mg/kg	<0.2	0.5 mg/kg	84.1	66.0	120
EP068: Endrin ketone	53494-70-5	0.05	mg/kg	<0.05	0.5 mg/kg	102	64.0	122
EP068: Methoxychlor	72-43-5	0.2	mg/kg	<0.2	0.5 mg/kg	88.7	54.0	130
EP068B: Organophosphorus Pesticides (OP) (QCLot: 4976741)								
EP068: Dichlorvos	62-73-7	0.05	mg/kg	<0.05	0.5 mg/kg	80.4	59.0	119
EP068: Demeton-S-methyl	919-86-8	0.05	mg/kg	<0.05	0.5 mg/kg	91.5	62.0	128
EP068: Monocrotophos	6923-22-4	0.2	mg/kg	<0.2	0.5 mg/kg	86.2	54.0	126
EP068: Dimethoate	60-51-5	0.05	mg/kg	<0.05	0.5 mg/kg	88.2	67.0	119
EP068: Diazinon	333-41-5	0.05	mg/kg	<0.05	0.5 mg/kg	86.8	70.0	120
EP068: Chlorpyrifos-methyl	5598-13-0	0.05	mg/kg	<0.05	0.5 mg/kg	84.9	72.0	120
EP068: Parathion-methyl	298-00-0	0.2	mg/kg	<0.2	0.5 mg/kg	82.7	68.0	120



Sub-Matrix: SOIL				Method Blank (MB) Report	Laboratory Control Spike (LCS) Report			
					Spike Concentration	Spike Recovery (%) LCS	Acceptable Limits (%) Low High	
Method: <i>Compound</i>	CAS Number	LOR	Unit	Result				
EP068B: Organophosphorus Pesticides (OP) (QCLot: 4976741) - continued								
EP068: Malathion	121-75-5	0.05	mg/kg	<0.05	0.5 mg/kg	86.7	68.0	122
EP068: Fenthion	55-38-9	0.05	mg/kg	<0.05	0.5 mg/kg	86.2	69.0	117
EP068: Chlorpyrifos	2921-88-2	0.05	mg/kg	<0.05	0.5 mg/kg	87.1	76.0	118
EP068: Parathion	56-38-2	0.2	mg/kg	<0.2	0.5 mg/kg	82.6	64.0	122
EP068: Pirimphos-ethyl	23505-41-1	0.05	mg/kg	<0.05	0.5 mg/kg	89.1	70.0	116
EP068: Chlorfenvinphos	470-90-6	0.05	mg/kg	<0.05	0.5 mg/kg	92.1	69.0	121
EP068: Bromophos-ethyl	4824-78-6	0.05	mg/kg	<0.05	0.5 mg/kg	83.8	66.0	118
EP068: Fenamiphos	22224-92-6	0.05	mg/kg	<0.05	0.5 mg/kg	98.8	68.0	124
EP068: Prothiofos	34643-46-4	0.05	mg/kg	<0.05	0.5 mg/kg	86.7	62.0	112
EP068: Ethion	563-12-2	0.05	mg/kg	<0.05	0.5 mg/kg	88.4	68.0	120
EP068: Carbophenothion	786-19-6	0.05	mg/kg	<0.05	0.5 mg/kg	92.6	65.0	127
EP068: Azinphos Methyl	86-50-0	0.05	mg/kg	<0.05	0.5 mg/kg	87.9	41.0	123
EP075(SIM)B: Polynuclear Aromatic Hydrocarbons (QCLot: 4976740)								
EP075(SIM): Naphthalene	91-20-3	0.5	mg/kg	<0.5	6 mg/kg	96.5	77.0	125
EP075(SIM): Acenaphthylene	208-96-8	0.5	mg/kg	<0.5	6 mg/kg	94.3	72.0	124
EP075(SIM): Acenaphthene	83-32-9	0.5	mg/kg	<0.5	6 mg/kg	91.6	73.0	127
EP075(SIM): Fluorene	86-73-7	0.5	mg/kg	<0.5	6 mg/kg	91.0	72.0	126
EP075(SIM): Phenanthrene	85-01-8	0.5	mg/kg	<0.5	6 mg/kg	91.0	75.0	127
EP075(SIM): Anthracene	120-12-7	0.5	mg/kg	<0.5	6 mg/kg	91.4	77.0	127
EP075(SIM): Fluoranthene	206-44-0	0.5	mg/kg	<0.5	6 mg/kg	94.5	73.0	127
EP075(SIM): Pyrene	129-00-0	0.5	mg/kg	<0.5	6 mg/kg	93.4	74.0	128
EP075(SIM): Benz(a)anthracene	56-55-3	0.5	mg/kg	<0.5	6 mg/kg	97.1	69.0	123
EP075(SIM): Chrysene	218-01-9	0.5	mg/kg	<0.5	6 mg/kg	97.4	75.0	127
EP075(SIM): Benzo(b+j)fluoranthene	205-99-2 205-82-3	0.5	mg/kg	<0.5	6 mg/kg	90.2	68.0	116
EP075(SIM): Benzo(k)fluoranthene	207-08-9	0.5	mg/kg	<0.5	6 mg/kg	102	74.0	126
EP075(SIM): Benzo(a)pyrene	50-32-8	0.5	mg/kg	<0.5	6 mg/kg	89.9	70.0	126
EP075(SIM): Indeno(1.2.3.cd)pyrene	193-39-5	0.5	mg/kg	<0.5	6 mg/kg	81.9	61.0	121
EP075(SIM): Dibenz(a,h)anthracene	53-70-3	0.5	mg/kg	<0.5	6 mg/kg	76.7	62.0	118
EP075(SIM): Benzo(g,h,i)perylene	191-24-2	0.5	mg/kg	<0.5	6 mg/kg	81.8	63.0	121
EP080/071: Total Petroleum Hydrocarbons (QCLot: 4976490)								
EP080: C6 - C9 Fraction	----	10	mg/kg	<10	26 mg/kg	108	72.2	131
EP080/071: Total Petroleum Hydrocarbons (QCLot: 4976491)								
EP080: C6 - C9 Fraction	----	10	mg/kg	<10	26 mg/kg	96.3	72.2	131



Sub-Matrix: SOIL				Method Blank (MB) Report	Laboratory Control Spike (LCS) Report			
					Spike Concentration	Spike Recovery (%) LCS	Acceptable Limits (%) Low High	
Method: <i>Compound</i>	CAS Number	LOR	Unit	Result				
EP080/071: Total Petroleum Hydrocarbons (QCLot: 4976739)								
EP071: C10 - C14 Fraction	----	50	mg/kg	<50	300 mg/kg	88.3	75.0	129
EP071: C15 - C28 Fraction	----	100	mg/kg	<100	450 mg/kg	94.2	77.0	131
EP071: C29 - C36 Fraction	----	100	mg/kg	<100	300 mg/kg	97.0	71.0	129
EP080/071: Total Recoverable Hydrocarbons - NEPM 2013 Fractions (QCLot: 4976490)								
EP080: C6 - C10 Fraction	C6_C10	10	mg/kg	<10	31 mg/kg	107	72.4	133
EP080/071: Total Recoverable Hydrocarbons - NEPM 2013 Fractions (QCLot: 4976491)								
EP080: C6 - C10 Fraction	C6_C10	10	mg/kg	<10	31 mg/kg	96.4	72.4	133
EP080/071: Total Recoverable Hydrocarbons - NEPM 2013 Fractions (QCLot: 4976739)								
EP071: >C10 - C16 Fraction	----	50	mg/kg	<50	375 mg/kg	92.8	77.0	125
EP071: >C16 - C34 Fraction	----	100	mg/kg	<100	525 mg/kg	94.2	74.0	138
EP071: >C34 - C40 Fraction	----	100	mg/kg	<100	225 mg/kg	94.8	63.0	131
EP080: BTEXN (QCLot: 4976490)								
EP080: Benzene	71-43-2	0.2	mg/kg	<0.2	1 mg/kg	98.3	76.0	124
EP080: Toluene	108-88-3	0.5	mg/kg	<0.5	1 mg/kg	107	78.5	121
EP080: Ethylbenzene	100-41-4	0.5	mg/kg	<0.5	1 mg/kg	102	77.4	121
EP080: meta- & para-Xylene	108-38-3 106-42-3	0.5	mg/kg	<0.5	2 mg/kg	102	78.2	121
EP080: ortho-Xylene	95-47-6	0.5	mg/kg	<0.5	1 mg/kg	105	81.3	121
EP080: Naphthalene	91-20-3	1	mg/kg	<1	1 mg/kg	110	78.8	122
EP080: BTEXN (QCLot: 4976491)								
EP080: Benzene	71-43-2	0.2	mg/kg	<0.2	1 mg/kg	85.4	76.0	124
EP080: Toluene	108-88-3	0.5	mg/kg	<0.5	1 mg/kg	97.4	78.5	121
EP080: Ethylbenzene	100-41-4	0.5	mg/kg	<0.5	1 mg/kg	95.3	77.4	121
EP080: meta- & para-Xylene	108-38-3 106-42-3	0.5	mg/kg	<0.5	2 mg/kg	100	78.2	121
EP080: ortho-Xylene	95-47-6	0.5	mg/kg	<0.5	1 mg/kg	98.6	81.3	121
EP080: Naphthalene	91-20-3	1	mg/kg	<1	1 mg/kg	94.6	78.8	122

Sub-Matrix: WATER				Method Blank (MB) Report	Laboratory Control Spike (LCS) Report			
					Spike Concentration	Spike Recovery (%)	Acceptable Limits (%)	
Method: Compound	CAS Number	LOR	Unit	Result			LCS	Low
EG020T: Total Metals by ICP-MS (QCLot: 4972950)								
EG020A-T: Arsenic	7440-38-2	0.001	mg/L	<0.001	0.1 mg/L	97.6	82.0	114
EG020A-T: Cadmium	7440-43-9	0.0001	mg/L	<0.0001	0.1 mg/L	96.8	84.0	112
EG020A-T: Chromium	7440-47-3	0.001	mg/L	<0.001	0.1 mg/L	99.0	86.0	116
EG020A-T: Copper	7440-50-8	0.001	mg/L	<0.001	0.1 mg/L	96.5	83.0	118



Sub-Matrix: **WATER**

				Method Blank (MB) Report	Laboratory Control Spike (LCS) Report			
					Spike Concentration	Spike Recovery (%) LCS	Acceptable Limits (%)	
Method: Compound	CAS Number	LOR	Unit	Result			Low	High
EG020T: Total Metals by ICP-MS (QCLot: 4972950) - continued								
EG020A-T: Lead	7439-92-1	0.001	mg/L	<0.001	0.1 mg/L	101	85.0	115
EG020A-T: Nickel	7440-02-0	0.001	mg/L	<0.001	0.1 mg/L	96.0	84.0	116
EG020A-T: Zinc	7440-66-6	0.005	mg/L	<0.005	0.1 mg/L	96.6	79.0	117
EG035T: Total Recoverable Mercury by FIMS (QCLot: 4972935)								
EG035T: Mercury	7439-97-6	0.0001	mg/L	<0.0001	0.01 mg/L	98.2	77.0	111
EP075(SIM)B: Polynuclear Aromatic Hydrocarbons (QCLot: 4976825)								
EP075(SIM): Naphthalene	91-20-3	1	µg/L	<1.0	5 µg/L	69.9	50.0	94.0
EP075(SIM): Acenaphthylene	208-96-8	1	µg/L	<1.0	5 µg/L	84.6	63.6	114
EP075(SIM): Acenaphthene	83-32-9	1	µg/L	<1.0	5 µg/L	88.6	62.2	113
EP075(SIM): Fluorene	86-73-7	1	µg/L	<1.0	5 µg/L	97.0	63.9	115
EP075(SIM): Phenanthrene	85-01-8	1	µg/L	<1.0	5 µg/L	72.1	62.6	116
EP075(SIM): Anthracene	120-12-7	1	µg/L	<1.0	5 µg/L	76.3	64.3	116
EP075(SIM): Fluoranthene	206-44-0	1	µg/L	<1.0	5 µg/L	66.2	63.6	118
EP075(SIM): Pyrene	129-00-0	1	µg/L	<1.0	5 µg/L	69.8	63.1	118
EP075(SIM): Benz(a)anthracene	56-55-3	1	µg/L	<1.0	5 µg/L	70.7	64.1	117
EP075(SIM): Chrysene	218-01-9	1	µg/L	<1.0	5 µg/L	66.9	62.5	116
EP075(SIM): Benzo(b+j)fluoranthene	205-99-2 205-82-3	1	µg/L	<1.0	5 µg/L	76.8	61.7	119
EP075(SIM): Benzo(k)fluoranthene	207-08-9	1	µg/L	<1.0	5 µg/L	67.0	63.0	115
EP075(SIM): Benzo(a)pyrene	50-32-8	0.5	µg/L	<0.5	5 µg/L	68.1	63.3	117
EP075(SIM): Indeno(1.2.3.cd)pyrene	193-39-5	1	µg/L	<1.0	5 µg/L	67.3	59.9	118
EP075(SIM): Dibenz(a,h)anthracene	53-70-3	1	µg/L	<1.0	5 µg/L	68.6	61.2	117
EP075(SIM): Benzo(g,h,i)perylene	191-24-2	1	µg/L	<1.0	5 µg/L	67.0	59.1	118
EP080/071: Total Petroleum Hydrocarbons (QCLot: 4976002)								
EP080: C6 - C9 Fraction	----	20	µg/L	<20	260 µg/L	89.4	75.0	127
EP080/071: Total Petroleum Hydrocarbons (QCLot: 4976824)								
EP071: C10 - C14 Fraction	----	50	µg/L	<50	400 µg/L	79.3	53.7	97.0
EP071: C15 - C28 Fraction	----	100	µg/L	<100	600 µg/L	77.9	63.3	107
EP071: C29 - C36 Fraction	----	50	µg/L	<50	400 µg/L	91.2	58.3	120
EP080/071: Total Recoverable Hydrocarbons - NEPM 2013 Fractions (QCLot: 4976002)								
EP080: C6 - C10 Fraction	C6_C10	20	µg/L	<20	310 µg/L	91.2	75.0	127
EP080/071: Total Recoverable Hydrocarbons - NEPM 2013 Fractions (QCLot: 4976824)								
EP071: >C10 - C16 Fraction	----	100	µg/L	<100	500 µg/L	76.2	53.9	95.5
EP071: >C16 - C34 Fraction	----	100	µg/L	<100	700 µg/L	85.2	57.8	110

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 Work Order : ES2310695
 Client : Envirotech Services Australia
 Project : Mussellbrook PSI



Sub-Matrix: **WATER**

Sub-Matrix: WATER				Method Blank (MB) Report	Laboratory Control Spike (LCS) Report			
					Spike Concentration	Spike Recovery (%) LCS	Acceptable Limits (%) Low High	
Method: Compound	CAS Number	LOR	Unit	Result				
EP080/071: Total Recoverable Hydrocarbons - NEPM 2013 Fractions (QCLot: 4976824) - continued								
EP071: >C34 - C40 Fraction	----	100	µg/L	<100	300 µg/L	84.9	50.5	115
EP080: BTEXN (QCLot: 4976002)								
EP080: Benzene	71-43-2	1	µg/L	<1	10 µg/L	81.6	68.3	119
EP080: Toluene	108-88-3	2	µg/L	<2	10 µg/L	91.7	73.5	120
EP080: Ethylbenzene	100-41-4	2	µg/L	<2	10 µg/L	95.6	73.8	122
EP080: meta- & para-Xylene	108-38-3	2	µg/L	<2	10 µg/L	97.2	73.0	122
	106-42-3							
EP080: ortho-Xylene	95-47-6	2	µg/L	<2	10 µg/L	98.8	76.4	123
EP080: Naphthalene	91-20-3	5	µg/L	<5	10 µg/L	91.8	75.5	124

Matrix Spike (MS) Report

The quality control term Matrix Spike (MS) refers to an intralaboratory split sample spiked with a representative set of target analytes. The purpose of this QC parameter is to monitor potential matrix effects on analyte recoveries. Static Recovery Limits as per laboratory Data Quality Objectives (DQOs). Ideal recovery ranges stated may be waived in the event of sample matrix interference.

Sub-Matrix: **SOIL**

Sub-Matrix: SOIL				Matrix Spike (MS) Report			
				Spike	SpikeRecovery(%)	Acceptable Limits (%)	
Laboratory sample ID	Sample ID	Method: Compound	CAS Number	Concentration	MS	Low	High
EG005(ED093)T: Total Metals by ICP-AES (QCLot: 4972789)							
ES2310695-016	TP06_0.5	EG005T: Arsenic	7440-38-2	50 mg/kg	91.8	70.0	130
		EG005T: Cadmium	7440-43-9	50 mg/kg	84.1	70.0	130
		EG005T: Chromium	7440-47-3	50 mg/kg	87.6	68.0	132
		EG005T: Copper	7440-50-8	250 mg/kg	94.8	70.0	130
		EG005T: Lead	7439-92-1	250 mg/kg	98.4	70.0	130
		EG005T: Nickel	7440-02-0	50 mg/kg	84.5	70.0	130
		EG005T: Zinc	7440-66-6	250 mg/kg	94.7	66.0	133
EG005(ED093)T: Total Metals by ICP-AES (QCLot: 4981223)							
ES2310695-002	TP01_0.5	EG005T: Arsenic	7440-38-2	50 mg/kg	86.4	70.0	130
		EG005T: Cadmium	7440-43-9	50 mg/kg	88.9	70.0	130
		EG005T: Chromium	7440-47-3	50 mg/kg	108	68.0	132
		EG005T: Copper	7440-50-8	250 mg/kg	98.8	70.0	130
		EG005T: Lead	7439-92-1	250 mg/kg	88.3	70.0	130
		EG005T: Nickel	7440-02-0	50 mg/kg	122	70.0	130
		EG005T: Zinc	7440-66-6	250 mg/kg	90.8	66.0	133
EG035T: Total Recoverable Mercury by FIMS (QCLot: 4972788)							
ES2310695-016	TP06_0.5	EG035T: Mercury	7439-97-6	5 mg/kg	107	70.0	130
EG035T: Total Recoverable Mercury by FIMS (QCLot: 4981222)							
ES2310695-002	TP01_0.5	EG035T: Mercury	7439-97-6	5 mg/kg	96.9	70.0	130



Sub-Matrix: SOIL				Matrix Spike (MS) Report			
				Spike	SpikeRecovery(%)	Acceptable Limits (%)	
Laboratory sample ID	Sample ID	Method: Compound	CAS Number	Concentration	MS	Low	High
EP004: Organic Matter (QCLot: 4974873)							
ES2310695-016	TP06_0.5	EP004: Organic Matter	----	1.51 %	77.4	70.0	130
		EP004: Total Organic Carbon	----	0.88 %	76.9	70.0	130
EP068A: Organochlorine Pesticides (OC) (QCLot: 4976741)							
ES2310695-003	TP01_1.0	EP068: gamma-BHC	58-89-9	0.5 mg/kg	119	70.0	130
		EP068: Heptachlor	76-44-8	0.5 mg/kg	119	70.0	130
		EP068: Aldrin	309-00-2	0.5 mg/kg	119	70.0	130
		EP068: Dieldrin	60-57-1	0.5 mg/kg	122	70.0	130
		EP068: Endrin	72-20-8	2 mg/kg	118	70.0	130
		EP068: 4,4'-DDT	50-29-3	2 mg/kg	117	70.0	130
EP068B: Organophosphorus Pesticides (OP) (QCLot: 4976741)							
ES2310695-003	TP01_1.0	EP068: Diazinon	333-41-5	0.5 mg/kg	83.0	70.0	130
		EP068: Chlorpyrifos-methyl	5598-13-0	0.5 mg/kg	116	70.0	130
		EP068: Pirimphos-ethyl	23505-41-1	0.5 mg/kg	113	70.0	130
		EP068: Bromophos-ethyl	4824-78-6	0.5 mg/kg	114	70.0	130
		EP068: Prothiofos	34643-46-4	0.5 mg/kg	104	70.0	130
EP075(SIM)B: Polynuclear Aromatic Hydrocarbons (QCLot: 4976740)							
ES2310695-003	TP01_1.0	EP075(SIM): Acenaphthene	83-32-9	10 mg/kg	81.0	70.0	130
		EP075(SIM): Pyrene	129-00-0	10 mg/kg	86.2	70.0	130
EP080/071: Total Petroleum Hydrocarbons (QCLot: 4976490)							
ES2311487-001	Anonymous	EP080: C6 - C9 Fraction	----	32.5 mg/kg	95.3	60.4	142
EP080/071: Total Petroleum Hydrocarbons (QCLot: 4976491)							
ES2310695-002	TP01_0.5	EP080: C6 - C9 Fraction	----	32.5 mg/kg	91.7	60.4	142
EP080/071: Total Petroleum Hydrocarbons (QCLot: 4976739)							
ES2310695-003	TP01_1.0	EP071: C10 - C14 Fraction	----	480 mg/kg	103	73.0	137
		EP071: C15 - C28 Fraction	----	3100 mg/kg	111	53.0	131
		EP071: C29 - C36 Fraction	----	2060 mg/kg	123	52.0	132
EP080/071: Total Recoverable Hydrocarbons - NEPM 2013 Fractions (QCLot: 4976490)							
ES2311487-001	Anonymous	EP080: C6 - C10 Fraction	C6_C10	37.5 mg/kg	93.8	61.1	142
EP080/071: Total Recoverable Hydrocarbons - NEPM 2013 Fractions (QCLot: 4976491)							
ES2310695-002	TP01_0.5	EP080: C6 - C10 Fraction	C6_C10	37.5 mg/kg	90.4	61.1	142
EP080/071: Total Recoverable Hydrocarbons - NEPM 2013 Fractions (QCLot: 4976739)							
ES2310695-003	TP01_1.0	EP071: >C10 - C16 Fraction	----	860 mg/kg	99.9	73.0	137
		EP071: >C16 - C34 Fraction	----	4320 mg/kg	114	53.0	131
		EP071: >C34 - C40 Fraction	----	890 mg/kg	127	52.0	132
EP080: BTEXN (QCLot: 4976490)							
ES2311487-001	Anonymous						



Sub-Matrix: SOIL				Matrix Spike (MS) Report			
				Spike	SpikeRecovery(%)	Acceptable Limits (%)	
Laboratory sample ID	Sample ID	Method: Compound	CAS Number	Concentration	MS	Low	High
EP080: BTEXN (QCLot: 4976490) - continued							
ES2311487-001	Anonymous	EP080: Benzene	71-43-2	2.5 mg/kg	81.4	62.1	122
		EP080: Toluene	108-88-3	2.5 mg/kg	92.2	66.6	119
		EP080: Ethylbenzene	100-41-4	2.5 mg/kg	91.6	67.4	123
		EP080: meta- & para-Xylene	108-38-3	2.5 mg/kg	89.6	66.4	121
		106-42-3					
		EP080: ortho-Xylene	95-47-6	2.5 mg/kg	93.5	70.7	121
		EP080: Naphthalene	91-20-3	2.5 mg/kg	88.1	61.1	115
EP080: BTEXN (QCLot: 4976491)							
ES2310695-002	TP01_0.5	EP080: Benzene	71-43-2	2.5 mg/kg	78.5	62.1	122
		EP080: Toluene	108-88-3	2.5 mg/kg	85.8	66.6	119
		EP080: Ethylbenzene	100-41-4	2.5 mg/kg	93.0	67.4	123
		EP080: meta- & para-Xylene	108-38-3	2.5 mg/kg	94.5	66.4	121
		106-42-3					
		EP080: ortho-Xylene	95-47-6	2.5 mg/kg	97.4	70.7	121
		EP080: Naphthalene	91-20-3	2.5 mg/kg	87.7	61.1	115
Sub-Matrix: WATER				Matrix Spike (MS) Report			
				Spike	SpikeRecovery(%)	Acceptable Limits (%)	
Laboratory sample ID	Sample ID	Method: Compound	CAS Number	Concentration	MS	Low	High
EG020T: Total Metals by ICP-MS (QCLot: 4972950)							
ES2310799-001	Anonymous	EG020A-T: Arsenic	7440-38-2	1 mg/L	95.9	70.0	130
		EG020A-T: Cadmium	7440-43-9	0.25 mg/L	97.1	70.0	130
		EG020A-T: Chromium	7440-47-3	1 mg/L	99.9	70.0	130
		EG020A-T: Copper	7440-50-8	1 mg/L	99.7	70.0	130
		EG020A-T: Lead	7439-92-1	1 mg/L	104	70.0	130
		EG020A-T: Nickel	7440-02-0	1 mg/L	96.6	70.0	130
		EG020A-T: Zinc	7440-66-6	1 mg/L	95.2	70.0	130
EG035T: Total Recoverable Mercury by FIMS (QCLot: 4972935)							
ES2310545-006	Anonymous	EG035T: Mercury	7439-97-6	0.01 mg/L	93.4	70.0	130
EP080/071: Total Petroleum Hydrocarbons (QCLot: 4976002)							
CA2301964-030	Anonymous	EP080: C6 - C9 Fraction	----	325 µg/L	95.7	70.0	130
EP080/071: Total Recoverable Hydrocarbons - NEPM 2013 Fractions (QCLot: 4976002)							
CA2301964-030	Anonymous	EP080: C6 - C10 Fraction	C6_C10	375 µg/L	93.7	70.0	130
EP080: BTEXN (QCLot: 4976002)							
CA2301964-030	Anonymous	EP080: Benzene	71-43-2	25 µg/L	73.0	70.0	130
		EP080: Toluene	108-88-3	25 µg/L	81.6	70.0	130
		EP080: Ethylbenzene	100-41-4	25 µg/L	89.3	70.0	130



Sub-Matrix: WATER				Matrix Spike (MS) Report			
Laboratory sample ID		Sample ID		Spike	SpikeRecovery(%)	Acceptable Limits (%)	
		Method: Compound	CAS Number	Concentration	MS	Low	High
EP080: BTEXN (QCLot: 4976002) - continued							
CA2301964-030	Anonymous	EP080: meta- & para-Xylene	108-38-3	25 µg/L	88.0	70.0	130
			106-42-3				
		EP080: ortho-Xylene	95-47-6	25 µg/L	90.8	70.0	130
		EP080: Naphthalene	91-20-3	25 µg/L	79.1	70.0	130



QA/QC Compliance Assessment to assist with Quality Review

Work Order	: ES2310695	Page	: 1 of 11
Client	: Envirotech Services Australia	Laboratory	: Environmental Division Sydney
Contact	: Stuart Lord	Telephone	: +61-2-8784 8555
Project	: Mussellbrook PSI	Date Samples Received	: 31-Mar-2023
Site	: ----	Issue Date	: 13-Apr-2023
Sampler	: ----	No. of samples received	: 25
Order number	: ENV1015	No. of samples analysed	: 17

This report is automatically generated by the ALS LIMS through interpretation of the ALS Quality Control Report and several Quality Assurance parameters measured by ALS. This automated reporting highlights any non-conformances, facilitates faster and more accurate data validation and is designed to assist internal expert and external Auditor review. Many components of this report contribute to the overall DQO assessment and reporting for guideline compliance.

Brief method summaries and references are also provided to assist in traceability.

Summary of Outliers

Outliers : Quality Control Samples

This report highlights outliers flagged in the Quality Control (QC) Report.

- **NO** Method Blank value outliers occur.
- **NO** Duplicate outliers occur.
- **NO** Laboratory Control outliers occur.
- **NO** Matrix Spike outliers occur.
- For all regular sample matrices, **NO** surrogate recovery outliers occur.

Outliers : Analysis Holding Time Compliance

- **NO** Analysis Holding Time Outliers exist.

Outliers : Frequency of Quality Control Samples

- Quality Control Sample Frequency Outliers exist - please see following pages for full details.



Outliers : Frequency of Quality Control Samples

Matrix: **WATER**

Quality Control Sample Type Method	Count		Rate (%)		Quality Control Specification
	QC	Regular	Actual	Expected	
	0				
Laboratory Duplicates (DUP)					
PAH/Phenols (GC/MS - SIM)	0	14	0.00	10.00	NEPM 2013 B3 & ALS QC Standard
TRH - Semivolatile Fraction	0	10	0.00	10.00	NEPM 2013 B3 & ALS QC Standard
Matrix Spikes (MS)					
PAH/Phenols (GC/MS - SIM)	0	14	0.00	5.00	NEPM 2013 B3 & ALS QC Standard
TRH - Semivolatile Fraction	0	10	0.00	5.00	NEPM 2013 B3 & ALS QC Standard

Analysis Holding Time Compliance

If samples are identified below as having been analysed or extracted outside of recommended holding times, this should be taken into consideration when interpreting results.

This report summarizes extraction / preparation and analysis times and compares each with ALS recommended holding times (referencing USEPA SW 846, APHA, AS and NEPM) based on the sample container provided. Dates reported represent first date of extraction or analysis and preclude subsequent dilutions and reruns. A listing of breaches (if any) is provided herein.

Holding time for leachate methods (e.g. TCLP) vary according to the analytes reported. Assessment compares the leach date with the shortest analyte holding time for the equivalent soil method. These are: organics 14 days, mercury 28 days & other metals 180 days. A recorded breach does not guarantee a breach for all non-volatile parameters.

Holding times for VOC in soils vary according to analytes of interest. Vinyl Chloride and Styrene holding time is 7 days; others 14 days. A recorded breach does not guarantee a breach for all VOC analytes and should be verified in case the reported breach is a false positive or Vinyl Chloride and Styrene are not key analytes of interest/concern.

Matrix: **SOIL**

Evaluation: ✖ = Holding time breach ; ✔ = Within holding time.

Method	Sample Date	Extraction / Preparation			Analysis		
Container / Client Sample ID(s)		Date extracted	Due for extraction	Evaluation	Date analysed	Due for analysis	Evaluation
EA001: pH in soil using 0.01M CaCl extract							
Soil Glass Jar - Unpreserved (EA001) TP06_0.5	30-Mar-2023	06-Apr-2023	06-Apr-2023	✓	06-Apr-2023	06-Apr-2023	✓
EA002: pH 1:5 (Soils)							
Soil Glass Jar - Unpreserved (EA002) TP06_0.5	30-Mar-2023	06-Apr-2023	06-Apr-2023	✓	06-Apr-2023	06-Apr-2023	✓
EA010: Conductivity (1:5)							
Soil Glass Jar - Unpreserved (EA010) TP06_0.5	30-Mar-2023	06-Apr-2023	06-Apr-2023	✓	06-Apr-2023	04-May-2023	✓
EA055: Moisture Content (Dried @ 105-110°C)							
Soil Glass Jar - Unpreserved (EA055) TP06_0.5	30-Mar-2023	----	----	----	04-Apr-2023	13-Apr-2023	✓
Soil Glass Jar - Unpreserved (EA055) TP01_0.5, TP02_0.3, TP03_0.5, TP04_1.5, TP07_0.1, TP01_1.0, TP02_2.0, TP03_2.0, TP05_1.0, QC01	30-Mar-2023	----	----	----	11-Apr-2023	13-Apr-2023	✓
EA150: Soil Classification based on Particle Size							
Snap Lock Bag (EA150H) TP06_0.5	30-Mar-2023	----	----	----	06-Apr-2023	26-Sep-2023	✓



Matrix: **SOIL**

Evaluation: ✖ = Holding time breach ; ✔ = Within holding time.

Method	Sample Date	Extraction / Preparation			Analysis		
Container / Client Sample ID(s)		Date extracted	Due for extraction	Evaluation	Date analysed	Due for analysis	Evaluation
EA152: Soil Particle Density							
Snap Lock Bag (EA152) TP06_0.5	30-Mar-2023	----	----	----	06-Apr-2023	26-Sep-2023	✓
EA200: AS 4964 - 2004 Identification of Asbestos in Soils							
Snap Lock Bag (EA200) ACM01, ACM02	30-Mar-2023	----	----	----	05-Apr-2023	26-Sep-2023	✓
EA200N: Asbestos Quantification (non-NATA)							
Snap Lock Bag (EA200N) ACM01, ACM02	30-Mar-2023	----	----	----	05-Apr-2023	26-Sep-2023	✓
ED006: Exchangeable Cations on Alkaline Soils							
Soil Glass Jar - Unpreserved (ED006) TP06_0.5	30-Mar-2023	12-Apr-2023	27-Apr-2023	✓	12-Apr-2023	27-Apr-2023	✓
EG005(ED093)T: Total Metals by ICP-AES							
Soil Glass Jar - Unpreserved (EG005T) TP06_0.5	30-Mar-2023	04-Apr-2023	26-Sep-2023	✓	05-Apr-2023	26-Sep-2023	✓
Soil Glass Jar - Unpreserved (EG005T) TP01_0.5, TP02_0.3, TP03_0.5, TP04_1.5, TP07_0.1, TP01_1.0, TP02_2.0, TP03_2.0, TP05_1.0, QC01	30-Mar-2023	11-Apr-2023	26-Sep-2023	✓	11-Apr-2023	26-Sep-2023	✓
EG035T: Total Recoverable Mercury by FIMS							
Soil Glass Jar - Unpreserved (EG035T) TP06_0.5	30-Mar-2023	04-Apr-2023	27-Apr-2023	✓	06-Apr-2023	27-Apr-2023	✓
Soil Glass Jar - Unpreserved (EG035T) TP01_0.5, TP02_0.3, TP03_0.5, TP04_1.5, TP07_0.1, TP01_1.0, TP02_2.0, TP03_2.0, TP05_1.0, QC01	30-Mar-2023	11-Apr-2023	27-Apr-2023	✓	12-Apr-2023	27-Apr-2023	✓
EP004: Organic Matter							
Soil Glass Jar - Unpreserved (EP004) TP06_0.5	30-Mar-2023	12-Apr-2023	27-Apr-2023	✓	12-Apr-2023	27-Apr-2023	✓
EP068A: Organochlorine Pesticides (OC)							
Soil Glass Jar - Unpreserved (EP068) TP01_1.0, TP02_2.0, TP03_2.0, TP05_1.0, TP07_0.1, TP02_0.3, TP03_0.5, TP04_1.5, TP06_0.5, QC01	30-Mar-2023	06-Apr-2023	13-Apr-2023	✓	08-Apr-2023	16-May-2023	✓

Evaluation: ✖ = Holding time breach ; ✔ = Within holding time.

Method	Sample Date	Extraction / Preparation			Analysis		
Container / Client Sample ID(s)		Date extracted	Due for extraction	Evaluation	Date analysed	Due for analysis	Evaluation
EP068B: Organophosphorus Pesticides (OP)							
Soil Glass Jar - Unpreserved (EP068) TP01_1.0, TP02_2.0, TP03_2.0, TP05_1.0, TP07_0.1, TP02_0.3, TP03_0.5, TP04_1.5, TP06_0.5, QC01	30-Mar-2023	06-Apr-2023	13-Apr-2023	✓	08-Apr-2023	16-May-2023	✓
EP075(SIM)B: Polynuclear Aromatic Hydrocarbons							
Soil Glass Jar - Unpreserved (EP075(SIM)) TP01_0.5, TP02_0.3, TP03_0.5, TP04_1.5, TP06_0.5, QC01 TP01_1.0, TP02_2.0, TP03_2.0, TP05_1.0, TP07_0.1	30-Mar-2023	06-Apr-2023	13-Apr-2023	✓	11-Apr-2023	16-May-2023	✓
EP080/071: Total Petroleum Hydrocarbons							
Soil Glass Jar - Unpreserved (EP080) TB	24-Mar-2023	06-Apr-2023	07-Apr-2023	✓	06-Apr-2023	07-Apr-2023	✓
Soil Glass Jar - Unpreserved (EP071) TP01_0.5, TP02_0.3, TP03_0.5, TP04_1.5, TP06_0.5, QC01 TP01_1.0, TP02_2.0, TP03_2.0, TP05_1.0, TP07_0.1	30-Mar-2023	06-Apr-2023	13-Apr-2023	✓	09-Apr-2023	16-May-2023	✓
Soil Glass Jar - Unpreserved (EP080) TP01_0.5, TP02_0.3, TP03_0.5, TP04_1.5, TP06_0.5, QC01 TP01_1.0, TP02_2.0, TP03_2.0, TP05_1.0, TP07_0.1	30-Mar-2023	06-Apr-2023	13-Apr-2023	✓	11-Apr-2023	13-Apr-2023	✓



Matrix: **SOIL**

Evaluation: ✖ = Holding time breach ; ✔ = Within holding time.

Method		Sample Date	Extraction / Preparation			Analysis		
Container / Client Sample ID(s)			Date extracted	Due for extraction	Evaluation	Date analysed	Due for analysis	Evaluation
EP080/071: Total Recoverable Hydrocarbons - NEPM 2013 Fractions								
Soil Glass Jar - Unpreserved (EP080) TB		24-Mar-2023	06-Apr-2023	07-Apr-2023	✓	06-Apr-2023	07-Apr-2023	✓
Soil Glass Jar - Unpreserved (EP071) TP01_0.5, TP02_0.3, TP03_0.5, TP04_1.5, TP06_0.5, QC01 TP01_1.0, TP02_2.0, TP03_2.0, TP05_1.0, TP07_0.1,		30-Mar-2023	06-Apr-2023	13-Apr-2023	✓	09-Apr-2023	16-May-2023	✓
Soil Glass Jar - Unpreserved (EP080) TP01_0.5, TP02_0.3, TP03_0.5, TP04_1.5, TP06_0.5, QC01 TP01_1.0, TP02_2.0, TP03_2.0, TP05_1.0, TP07_0.1,		30-Mar-2023	06-Apr-2023	13-Apr-2023	✓	11-Apr-2023	13-Apr-2023	✓
EP080: BTEXN								
Soil Glass Jar - Unpreserved (EP080) TB		24-Mar-2023	06-Apr-2023	07-Apr-2023	✓	06-Apr-2023	07-Apr-2023	✓
Soil Glass Jar - Unpreserved (EP080) TP01_0.5, TP02_0.3, TP03_0.5, TP04_1.5, TP06_0.5, QC01 TP01_1.0, TP02_2.0, TP03_2.0, TP05_1.0, TP07_0.1,		30-Mar-2023	06-Apr-2023	13-Apr-2023	✓	11-Apr-2023	13-Apr-2023	✓

Matrix: **WATER**

Evaluation: ✖ = Holding time breach ; ✔ = Within holding time.

Method	Sample Date	Extraction / Preparation			Analysis		
Container / Client Sample ID(s)		Date extracted	Due for extraction	Evaluation	Date analysed	Due for analysis	Evaluation
EG020T: Total Metals by ICP-MS							
Clear Plastic Bottle - Nitric Acid; Unfiltered (EG020A-T) RW01	30-Mar-2023	04-Apr-2023	26-Sep-2023	✓	04-Apr-2023	26-Sep-2023	✓
EG035T: Total Recoverable Mercury by FIMS							
Clear Plastic Bottle - Nitric Acid; Unfiltered (EG035T) RW01	30-Mar-2023	----	----	----	06-Apr-2023	27-Apr-2023	✓
EP075(SIM)B: Polynuclear Aromatic Hydrocarbons							
Amber Glass Bottle - Unpreserved (EP075(SIM)) RW01	30-Mar-2023	06-Apr-2023	06-Apr-2023	✓	09-Apr-2023	16-May-2023	✓



Matrix: **WATER** Evaluation: ✖ = Holding time breach ; ✔ = Within holding time.

Method	Sample Date	Extraction / Preparation			Analysis		
Container / Client Sample ID(s)		Date extracted	Due for extraction	Evaluation	Date analysed	Due for analysis	Evaluation
EP080/071: Total Petroleum Hydrocarbons							
Amber Glass Bottle - Unpreserved (EP071) RW01	30-Mar-2023	06-Apr-2023	06-Apr-2023	✔	09-Apr-2023	16-May-2023	✔
Amber VOC Vial - Sulfuric Acid (EP080) RW01	30-Mar-2023	11-Apr-2023	13-Apr-2023	✔	11-Apr-2023	13-Apr-2023	✔
EP080/071: Total Recoverable Hydrocarbons - NEPM 2013 Fractions							
Amber Glass Bottle - Unpreserved (EP071) RW01	30-Mar-2023	06-Apr-2023	06-Apr-2023	✔	09-Apr-2023	16-May-2023	✔
Amber VOC Vial - Sulfuric Acid (EP080) RW01	30-Mar-2023	11-Apr-2023	13-Apr-2023	✔	11-Apr-2023	13-Apr-2023	✔
EP080: BTEXN							
Amber VOC Vial - Sulfuric Acid (EP080) RW01	30-Mar-2023	11-Apr-2023	13-Apr-2023	✔	11-Apr-2023	13-Apr-2023	✔



Quality Control Parameter Frequency Compliance

The following report summarises the frequency of laboratory QC samples analysed within the analytical lot(s) in which the submitted sample(s) was(were) processed. Actual rate should be greater than or equal to the expected rate. A listing of breaches is provided in the Summary of Outliers.

Matrix: **SOIL**

Evaluation: ✖ = Quality Control frequency not within specification ; ✔ = Quality Control frequency within specification.

Quality Control Sample Type		Count		Rate (%)			Quality Control Specification
Analytical Methods	Method	QC	Regular	Actual	Expected	Evaluation	
Laboratory Duplicates (DUP)							
Electrical Conductivity (1:5)	EA010	2	20	10.00	10.00	✓	NEPM 2013 B3 & ALS QC Standard
Exchangeable Cations on Alkaline Soils	ED006	1	3	33.33	10.00	✓	NEPM 2013 B3 & ALS QC Standard
Moisture Content	EA055	4	40	10.00	10.00	✓	NEPM 2013 B3 & ALS QC Standard
Organic Matter	EP004	1	7	14.29	10.00	✓	NEPM 2013 B3 & ALS QC Standard
PAH/Phenols (SIM)	EP075(SIM)	2	11	18.18	10.00	✓	NEPM 2013 B3 & ALS QC Standard
Pesticides by GCMS	EP068	1	10	10.00	10.00	✓	NEPM 2013 B3 & ALS QC Standard
pH (1:5)	EA002	2	20	10.00	10.00	✓	NEPM 2013 B3 & ALS QC Standard
pH in soil using a 0.01M CaCl2 extract	EA001	1	1	100.00	10.00	✓	NEPM 2013 B3 & ALS QC Standard
Total Mercury by FIMS	EG035T	3	21	14.29	10.00	✓	NEPM 2013 B3 & ALS QC Standard
Total Metals by ICP-AES	EG005T	3	23	13.04	10.00	✓	NEPM 2013 B3 & ALS QC Standard
TRH - Semivolatile Fraction	EP071	2	11	18.18	10.00	✓	NEPM 2013 B3 & ALS QC Standard
TRH Volatiles/BTEX	EP080	4	40	10.00	10.00	✓	NEPM 2013 B3 & ALS QC Standard
Laboratory Control Samples (LCS)							
Electrical Conductivity (1:5)	EA010	1	20	5.00	5.00	✓	NEPM 2013 B3 & ALS QC Standard
Exchangeable Cations on Alkaline Soils	ED006	1	3	33.33	5.00	✓	NEPM 2013 B3 & ALS QC Standard
Organic Matter	EP004	1	7	14.29	5.00	✓	NEPM 2013 B3 & ALS QC Standard
PAH/Phenols (SIM)	EP075(SIM)	1	11	9.09	5.00	✓	NEPM 2013 B3 & ALS QC Standard
Pesticides by GCMS	EP068	1	10	10.00	5.00	✓	NEPM 2013 B3 & ALS QC Standard
pH (1:5)	EA002	2	20	10.00	10.00	✓	NEPM 2013 B3 & ALS QC Standard
Total Mercury by FIMS	EG035T	2	21	9.52	5.00	✓	NEPM 2013 B3 & ALS QC Standard
Total Metals by ICP-AES	EG005T	2	23	8.70	5.00	✓	NEPM 2013 B3 & ALS QC Standard
TRH - Semivolatile Fraction	EP071	1	11	9.09	5.00	✓	NEPM 2013 B3 & ALS QC Standard
TRH Volatiles/BTEX	EP080	2	40	5.00	5.00	✓	NEPM 2013 B3 & ALS QC Standard
Method Blanks (MB)							
Electrical Conductivity (1:5)	EA010	1	20	5.00	5.00	✓	NEPM 2013 B3 & ALS QC Standard
Exchangeable Cations on Alkaline Soils	ED006	1	3	33.33	5.00	✓	NEPM 2013 B3 & ALS QC Standard
Organic Matter	EP004	1	7	14.29	5.00	✓	NEPM 2013 B3 & ALS QC Standard
PAH/Phenols (SIM)	EP075(SIM)	1	11	9.09	5.00	✓	NEPM 2013 B3 & ALS QC Standard
Pesticides by GCMS	EP068	1	10	10.00	5.00	✓	NEPM 2013 B3 & ALS QC Standard
Total Mercury by FIMS	EG035T	2	21	9.52	5.00	✓	NEPM 2013 B3 & ALS QC Standard
Total Metals by ICP-AES	EG005T	2	23	8.70	5.00	✓	NEPM 2013 B3 & ALS QC Standard
TRH - Semivolatile Fraction	EP071	1	11	9.09	5.00	✓	NEPM 2013 B3 & ALS QC Standard
TRH Volatiles/BTEX	EP080	2	40	5.00	5.00	✓	NEPM 2013 B3 & ALS QC Standard
Matrix Spikes (MS)							
Organic Matter	EP004	1	7	14.29	5.00	✓	NEPM 2013 B3 & ALS QC Standard
PAH/Phenols (SIM)	EP075(SIM)	1	11	9.09	5.00	✓	NEPM 2013 B3 & ALS QC Standard



Matrix: **SOIL** Evaluation: ✖ = Quality Control frequency not within specification ; ✔ = Quality Control frequency within specification.

Quality Control Sample Type		Count		Rate (%)			Quality Control Specification
Analytical Methods	Method	QC	Regular	Actual	Expected	Evaluation	
Matrix Spikes (MS) - Continued							
Pesticides by GCMS	EP068	1	10	10.00	5.00	✓	NEPM 2013 B3 & ALS QC Standard
Total Mercury by FIMS	EG035T	2	21	9.52	5.00	✓	NEPM 2013 B3 & ALS QC Standard
Total Metals by ICP-AES	EG005T	2	23	8.70	5.00	✓	NEPM 2013 B3 & ALS QC Standard
TRH - Semivolatile Fraction	EP071	1	11	9.09	5.00	✓	NEPM 2013 B3 & ALS QC Standard
TRH Volatiles/BTEX	EP080	2	40	5.00	5.00	✓	NEPM 2013 B3 & ALS QC Standard

Matrix: **WATER** Evaluation: ✖ = Quality Control frequency not within specification ; ✔ = Quality Control frequency within specification.

Quality Control Sample Type		Count		Rate (%)			Quality Control Specification
Analytical Methods	Method	QC	Regular	Actual	Expected	Evaluation	
Laboratory Duplicates (DUP)							
PAH/Phenols (GC/MS - SIM)	EP075(SIM)	0	14	0.00	10.00	✖	NEPM 2013 B3 & ALS QC Standard
Total Mercury by FIMS	EG035T	2	13	15.38	10.00	✔	NEPM 2013 B3 & ALS QC Standard
Total Metals by ICP-MS - Suite A	EG020A-T	2	19	10.53	10.00	✔	NEPM 2013 B3 & ALS QC Standard
TRH - Semivolatile Fraction	EP071	0	10	0.00	10.00	✖	NEPM 2013 B3 & ALS QC Standard
TRH Volatiles/BTEX	EP080	2	20	10.00	10.00	✔	NEPM 2013 B3 & ALS QC Standard
Laboratory Control Samples (LCS)							
PAH/Phenols (GC/MS - SIM)	EP075(SIM)	1	14	7.14	5.00	✔	NEPM 2013 B3 & ALS QC Standard
Total Mercury by FIMS	EG035T	1	13	7.69	5.00	✔	NEPM 2013 B3 & ALS QC Standard
Total Metals by ICP-MS - Suite A	EG020A-T	1	19	5.26	5.00	✔	NEPM 2013 B3 & ALS QC Standard
TRH - Semivolatile Fraction	EP071	1	10	10.00	5.00	✔	NEPM 2013 B3 & ALS QC Standard
TRH Volatiles/BTEX	EP080	1	20	5.00	5.00	✔	NEPM 2013 B3 & ALS QC Standard
Method Blanks (MB)							
PAH/Phenols (GC/MS - SIM)	EP075(SIM)	1	14	7.14	5.00	✔	NEPM 2013 B3 & ALS QC Standard
Total Mercury by FIMS	EG035T	1	13	7.69	5.00	✔	NEPM 2013 B3 & ALS QC Standard
Total Metals by ICP-MS - Suite A	EG020A-T	1	19	5.26	5.00	✔	NEPM 2013 B3 & ALS QC Standard
TRH - Semivolatile Fraction	EP071	1	10	10.00	5.00	✔	NEPM 2013 B3 & ALS QC Standard
TRH Volatiles/BTEX	EP080	1	20	5.00	5.00	✔	NEPM 2013 B3 & ALS QC Standard
Matrix Spikes (MS)							
PAH/Phenols (GC/MS - SIM)	EP075(SIM)	0	14	0.00	5.00	✖	NEPM 2013 B3 & ALS QC Standard
Total Mercury by FIMS	EG035T	1	13	7.69	5.00	✔	NEPM 2013 B3 & ALS QC Standard
Total Metals by ICP-MS - Suite A	EG020A-T	1	19	5.26	5.00	✔	NEPM 2013 B3 & ALS QC Standard
TRH - Semivolatile Fraction	EP071	0	10	0.00	5.00	✖	NEPM 2013 B3 & ALS QC Standard
TRH Volatiles/BTEX	EP080	1	20	5.00	5.00	✔	NEPM 2013 B3 & ALS QC Standard



Brief Method Summaries

The analytical procedures used by the Environmental Division have been developed from established internationally recognized procedures such as those published by the US EPA, APHA, AS and NEPM. In house developed procedures are employed in the absence of documented standards or by client request. The following report provides brief descriptions of the analytical procedures employed for results reported in the Certificate of Analysis. Sources from which ALS methods have been developed are provided within the Method Descriptions.

Analytical Methods	Method	Matrix	Method Descriptions
pH in soil using a 0.01M CaCl ₂ extract	EA001	SOIL	In house: Referenced to Rayment and Lyons 4B3 (mod.) or 4B4 (mod.) 10 g of soil is mixed with 50 mL of 0.01M CaCl ₂ and tumbled end over end for 1 hour. pH is measured from the continuous suspension. This method is compliant with NEPM Schedule B(3).
pH (1:5)	EA002	SOIL	In house: Referenced to Rayment and Lyons 4A1 and APHA 4500H+. pH is determined on soil samples after a 1:5 soil/water leach. This method is compliant with NEPM Schedule B(3).
Electrical Conductivity (1:5)	EA010	SOIL	In house: Referenced to Rayment and Lyons 3A1 and APHA 2510. Conductivity is determined on soil samples using a 1:5 soil/water leach. This method is compliant with NEPM Schedule B(3).
Moisture Content	EA055	SOIL	In house: A gravimetric procedure based on weight loss over a 12 hour drying period at 105-110 degrees C. This method is compliant with NEPM Schedule B(3).
Particle Size Analysis by Hydrometer	EA150H	SOIL	Particle Size Analysis by Hydrometer according to AS1289.3.6.3
Soil Particle Density	EA152	SOIL	Soil Particle Density by AS 1289.3.5.1: Methods of testing soils for engineering purposes - Soil classification tests - Determination of the soil particle density of a soil - Standard method
Asbestos Identification in Soils	EA200	SOIL	AS 4964 Method for the qualitative identification of asbestos in bulk samples Analysis by Polarised Light Microscopy including dispersion staining
Asbestos Classification and Quantitation per NEPM 2013	* EA200N	SOIL	Asbestos Classification and Quantitation per NEPM with Confirmation of Identification by AS 4964 - Gravimetric determination of Asbestos Containing Material, Fibrous Asbestos, Asbestos Fines and sample weight and calculation of percentage concentrations per NEPM protocols. Asbestos (Fines and Fibrous FA+AF) is reported as the equivalent weight in the sample received after accounting for sub-sampling (where applicable for the <7mm and/or <2mm fractions).
Exchangeable Cations on Alkaline Soils	ED006	SOIL	In house: Referenced to Soil Survey Test Method C5. Soluble salts are removed from the sample prior to analysis. Cations are exchanged from the sample by contact with alcoholic ammonium chloride at pH 8.5. They are then quantitated in the final solution by ICPAES and reported as meq/100g of original soil.
Total Metals by ICP-AES	EG005T	SOIL	In house: Referenced to APHA 3120; USEPA SW 846 - 6010. Metals are determined following an appropriate acid digestion of the soil. The ICPAES technique ionises samples in a plasma, emitting a characteristic spectrum based on metals present. Intensities at selected wavelengths are compared against those of matrix matched standards. This method is compliant with NEPM Schedule B(3)
Total Mercury by FIMS	EG035T	SOIL	In house: Referenced to APHA 3112 Hg - B (Flow-injection (SnCl ₂) (Cold Vapour generation) AAS) FIM-AAS is an automated flameless atomic absorption technique. Mercury in solids are determined following an appropriate acid digestion. Ionic mercury is reduced online to atomic mercury vapour by SnCl ₂ which is then purged into a heated quartz cell. Quantification is by comparing absorbance against a calibration curve. This method is compliant with NEPM Schedule B(3)
Organic Matter	EP004	SOIL	In house: Referenced to AS1289.4.1.1. Dichromate oxidation method after Walkley and Black. This method is compliant with NEPM Schedule B(3)
Pesticides by GCMS	EP068	SOIL	In house: Referenced to USEPA SW 846 - 8270 Extracts are analysed by Capillary GC/MS and quantification is by comparison against an established 5 point calibration curve. This technique is compliant with NEPM Schedule B(3).



Analytical Methods	Method	Matrix	Method Descriptions
TRH - Semivolatile Fraction	EP071	SOIL	In house: Referenced to USEPA SW 846 - 8015 Sample extracts are analysed by Capillary GC/FID and quantified against alkane standards over the range C10 - C40. Compliant with NEPM Schedule B(3).
PAH/Phenols (SIM)	EP075(SIM)	SOIL	In house: Referenced to USEPA SW 846 - 8270. Extracts are analysed by Capillary GC/MS in Selective Ion Mode (SIM) and quantification is by comparison against an established 5 point calibration curve. This method is compliant with NEPM Schedule B(3)
TRH Volatiles/BTEX	EP080	SOIL	In house: Referenced to USEPA SW 846 - 8260. Extracts are analysed by Purge and Trap, Capillary GC/MS. Quantification is by comparison against an established 5 point calibration curve. Compliant with NEPM Schedule B(3) amended.
Total Metals by ICP-MS - Suite A	EG020A-T	WATER	In house: Referenced to APHA 3125; USEPA SW846 - 6020, ALS QWI-EN/EG020. The ICPMS technique utilizes a highly efficient argon plasma to ionize selected elements. Ions are then passed into a high vacuum mass spectrometer, which separates the analytes based on their distinct mass to charge ratios prior to their measurement by a discrete dynode ion detector.
Total Mercury by FIMS	EG035T	WATER	In house: Referenced to APHA 3112 Hg - B (Flow-injection (SnCl ₂)(Cold Vapour generation) AAS) FIM-AAS is an automated flameless atomic absorption technique. A bromate/bromide reagent is used to oxidise any organic mercury compounds in the unfiltered sample. The ionic mercury is reduced online to atomic mercury vapour by SnCl ₂ which is then purged into a heated quartz cell. Quantification is by comparing absorbance against a calibration curve. This method is compliant with NEPM Schedule B(3).
TRH - Semivolatile Fraction	EP071	WATER	In house: Referenced to USEPA SW 846 - 8015 The sample extract is analysed by Capillary GC/FID and quantification is by comparison against an established 5 point calibration curve of n-Alkane standards. This method is compliant with the QC requirements of NEPM Schedule B(3)
PAH/Phenols (GC/MS - SIM)	EP075(SIM)	WATER	In house: Referenced to USEPA SW 846 - 8270 Sample extracts are analysed by Capillary GC/MS in SIM Mode and quantification is by comparison against an established 5 point calibration curve. This method is compliant with NEPM Schedule B(3)
TRH Volatiles/BTEX	EP080	WATER	In house: Referenced to USEPA SW 846 - 8260 Water samples are directly purged prior to analysis by Capillary GC/MS and quantification is by comparison against an established 5 point calibration curve. Alternatively, a sample is equilibrated in a headspace vial and a portion of the headspace determined by GCMS analysis. This method is compliant with the QC requirements of NEPM Schedule B(3)

Preparation Methods	Method	Matrix	Method Descriptions
pH in soil using a 0.01M CaCl ₂ extract	EA001-PR	SOIL	In house: Referenced to Rayment and Lyons 4B1, 10 g of soil is mixed with 50 mL of 0.01M CaCl ₂ and tumbled end over end for 1 hour. pH is measured from the continuous suspension. This method is compliant with NEPM Schedule B(3).
Exchangeable Cations Preparation Method (Alkaline Soils)	ED006PR	SOIL	In house: Referenced to Rayment and Lyons method 15C1.
Exchangeable Cations Preparation Method	ED007PR	SOIL	In house: Referenced to Rayment & Lyons method 15A1. A 1M NH ₄ Cl extraction by end over end tumbling at a ratio of 1:20. There is no pretreatment for soluble salts. Extracts can be run by ICP for cations.
1:5 solid / water leach for soluble analytes	EN34	SOIL	10 g of soil is mixed with 50 mL of reagent grade water and tumbled end over end for 1 hour. Water soluble salts are leached from the soil by the continuous suspension. Samples are settled and the water filtered off for analysis.



Preparation Methods	Method	Matrix	Method Descriptions
Hot Block Digest for metals in soils sediments and sludges	EN69	SOIL	In house: Referenced to USEPA 200.2. Hot Block Acid Digestion 1.0g of sample is heated with Nitric and Hydrochloric acids, then cooled. Peroxide is added and samples heated and cooled again before being filtered and bulked to volume for analysis. Digest is appropriate for determination of selected metals in sludge, sediments, and soils. This method is compliant with NEPM Schedule B(3).
Organic Matter	EP004-PR	SOIL	In house: Referenced to AS1289.4.1.1. Dichromate oxidation method after Walkley and Black. This method is compliant with NEPM Schedule B(3).
Methanolic Extraction of Soils for Purge and Trap	ORG16	SOIL	In house: Referenced to USEPA SW 846 - 5030A. 5g of solid is shaken with surrogate and 10mL methanol prior to analysis by Purge and Trap - GC/MS.
Tumbler Extraction of Solids	ORG17	SOIL	In house: Mechanical agitation (tumbler). 10g of sample, Na2SO4 and surrogate are extracted with 30mL 1:1 DCM/Acetone by end over end tumble. The solvent is decanted, dehydrated and concentrated (by KD) to the desired volume for analysis.
Digestion for Total Recoverable Metals	EN25	WATER	In house: Referenced to USEPA SW846-3005. Method 3005 is a Nitric/Hydrochloric acid digestion procedure used to prepare surface and ground water samples for analysis by ICPAES or ICPMS. This method is compliant with NEPM Schedule B(3)
Separatory Funnel Extraction of Liquids	ORG14	WATER	In house: Referenced to USEPA SW 846 - 3510 100 mL to 1L of sample is transferred to a separatory funnel and serially extracted three times using DCM for each extract. The resultant extracts are combined, dehydrated and concentrated for analysis. This method is compliant with NEPM Schedule B(3) . ALS default excludes sediment which may be resident in the container.
Volatiles Water Preparation	ORG16-W	WATER	A 5 mL aliquot or 5 mL of a diluted sample is added to a 40 mL VOC vial for purging.



CHAIN OF CUSTODY

ALS Laboratory
please tick →

CLIENT: **Envirotech Services**

OFFICE:

PROJECT: **Muswellbrook PSI**

ORDER NUMBER: **ENVIS15**

PROJECT MANAGER: **SL**

SAMPLER: **CONTACT PH: 0403766722**

COC emailed to ALS? (YES / NO) **YES**

Email Reports to (will default to PM if no other addresses are listed): **stuart@envirotechservices.com.au**

Email invoice to (will default to PM if no other addresses are listed):

COMMENTS/SPECIAL HANDLING/STORAGE OR DISPOSAL:

Standard TAT (List due date): ☒ Standard TAT (List due date): ☐ Non Standard or urgent TAT (List due date):

RECEIVED BY: **30/3**

RECEIVED BY: **30/3**

RECEIVED BY: **3/13/23**

FOR LABORATORY USE ONLY (Circle)

Custody Seal intact? ☒ Yes ☐ No

Freeze/thawed for birds present upon receipt? ☒ Yes ☐ No

Random Sample Temperature on Receipt ☒ Yes ☐ No

Other comment: **6.5**

RECEIVED BY: **3/13/23**

DATE/TIME: **3/13/23**

DATE/TIME: **3/13/23**

DATE/TIME: **3/13/23**

DATE/TIME: **3/13/23**

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DATE/TIME: **3/13/23**

ALS USE	SAMPLE DETAILS MATRIX: SOLID(S) WATER (W)	CONTAINER INFORMATION	ANALYSIS REQUIRED including SITES (NB: Suite Codes must be listed to attract suite price) Where Metals are required, specify Total (unfiltered bottle required) or Dissolved (field filtered bottle required).					Additional Information			
LAB ID	SAMPLE ID	DATE / TIME	MATRIX	TYPE & PRESERVATIVE (codes below)	(refer to TOTAL CONTAINERS)	S-26	S-12	EA200N	P-22		Comments on likely contaminant levels, dilutions, or samples requiring specific QC analysis etc.
1	TP01-0.1	30/3	S			X					Asbestos @ EN1.
2	TP01-0.5					X					TRAY.
3	TP01-1.0					X	X				ASB-004
4	TP01-2.0										
5	TP01-3.0								X		
6	TP02-0.3					X	X				
7	TP02-1.0								X		
8	TP02-2.0					X	X				
9	TP03-0.5					X	X				
10	TP03-2.0					X	X				
11	TP04-0.2								X		
12	TP04-1.5					X	X				
TOTAL											

LAB OF ORIGIN:
NEWCASTLE

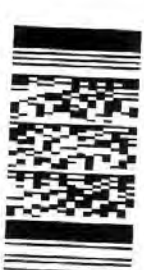


Environmental Division
Sydney
Work Order Reference
ES2310695



Telephone : + 61-2-8784 8555

LAB OF ORIGIN:
NEWCASTLE



Telephone: + 61-2-8784 8656

Environmental Division
Sydney
Work Order Reference
ES2310695

Water Container Codes: P = Unpreserved Plastic; N = Nitric Preserved Plastic; OFC = Nitric Preserved OFC; SH = Sodium Hydroxide Preserved Plastic; AG = Amber Glass Unpreserved Plastic; AP = Airfreight Unpreserved Plastic; V = VOA Vial HCl Preserved; VS = VOA Vial Sodium Bisulfate Preserved; AV = Airfreight Unpreserved Vial SG = Sulfuric Preserved Amber Glass; H = HCl Preserved Plastic; HS = HCl Preserved Specimen bottle; SP = Sulfuric Preserved Plastic; F = Formaldehyde Preserved Glass; Z = Zinc Aspartate Preserved Bottle; E = EDTA Preserved Bottle; ST = Sterile Bottle; ASS = Plastic Bag for Acid-Soluble Solids; B = Unpreserved Bag.



CHAIN OF CUSTODY

ALS Laboratory
Please tick ✓

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Fax: 206.468.1235
Email: info@alslab.com
Web: www.alslab.com

CLIENT: Envirotech Services

OFFICE:

PROJECT: Muirwellbrook PSI

ORDER NUMBER: ENVIR015

PROJECT MANAGER: CONTACT PH: 0463768722

SAMPLER: SAMPLER MOBILE: EDD FORMAT (or default):

COC emailed to ALS? (YES / NO)

Email Reports to (will default to PM if no other addresses are listed):

Email Invoice to (will default to PM if no other addresses are listed):

COMMENTS/SPECIAL HANDLING/STORAGE OR DISPOSAL:

TURNAROUND REQUIREMENTS: ☒ Standard TAT (list due date): ☐ Non Standard or urgent TAT (list due date):

(Standard TAT may be longer for some tests e.g. Ultra Trace Organics)

ALS QUOTE NO.: ENV/222/21

RECEIVED BY: 3/13

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DATE/TIME: 3/13

RECEIVED BY: 3/13

FOR LABORATORY USE ONLY (Circle)

Custody Seal intact? ☒ Yes ☐ No ☐ N/A

Freezer / frozen ice blocks present upon receipt? ☒ Yes ☐ No ☐ N/A

Random Sample Temperature on Receipt: 6.5

Other comment: 6.5

RECEIVED BY: 3/13

DATE/TIME: 3/13

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RECEIVED BY: 3/13

ANALYSIS REQUIRED including SITES (NB, Suite Codes must be listed to attract suite price)

Where Metals are required, specify Total (unfiltered bottle required) or Dissolved (filtered bottle required)

Additional Information

Comments on likely contaminant levels, dilutions, or samples requiring specific QC analysis etc.

LAB ID

SAMPLE ID

DATE / TIME

MATRIX

TYPE & PRESERVATIVE codes below

(refer to

TOTAL CONTAINERS

S-26

S-12

EA200N

P-22

Hold

S-4

W-26

24

TS

✓

TOTAL

LAB OF ORIGIN:
NEWCASTLE

Water Container Codes: P = Unpreserved Plastic; N = Nitric Preserved Plastic; ORC = Nitric Preserved ORC; SH = Sodium Hydroxide/Cd Preserved; S = Sodium Hydroxide Preserved Plastic; AG = Amber Glass Unpreserved; AP - Airtight Unpreserved Plastic; V = VOA Vial HCl Preserved; VB = VOA Vial Sodium Bisulfate Preserved; VS = VOA Vial Sulfuric Preserved; AV = Airtight Unpreserved Vial; SG = Sulfuric Preserved Amber Glass; H = HCl Preserved Plastic; HS = HCl Preserved Speciation bottle; SP = Sulfuric Preserved Plastic; F = Formic Acid Preserved Plastic; Z = Zinc Acetate Preserved Bottle; E = EDTA Preserved Bottle; ASS = Plastic Bag for Acid Substrate Solids; B = Unpreserved Bag.

