Mackellar Excavations Pty Ltd

Detailed Contaminated Site **Investigation**

Lot 1 DP 1226992

16 Torrens Road,
Gunnedah, NSW

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Stephanie Cameron demonstrates the relevant qualifications, competencies, and experience appropriate to undertake this site investigation under Schedule B9 of the National Environment Protection (Assessment of Site Contamination) Measure 1999. Stephanie holds current membership of the Australian Contaminated Land Consultants Association, the Royal Australian Chemical Institute, the Australasian Land and Groundwater Association, and Soil Science Australia.

East West is a long established Tamworth-based laboratory undertaking environmental, construction, and agricultural testing. East West is accredited with the National Association of Testing Authorities and the Australasian Soil and Plant Analysis Council. East West have been successfully involved in many environmental sampling and monitoring projects over the past seven years.

This report does not provide a complete assessment of the environmental integrity of the site and is limited to the scope defined herein. Should any reader require that other matters be considered apart from those considered within this report, they should then make their own investigations and form their own conclusions.

This report has been prepared by:

Stephanie Cameron
B. App.Sci

Issue	Rev.	Date	Author	Approved	Issued To
Final	01	9 November 2021	S Cameron	S Cameron	Mackellar Excavations Pty Ltd

EXECUTIVE SUMMARY

East West conducted a preliminary site investigation into past use of Lots 1 and 2 DP 1226992 (16 Torrens Road) in the Parish of Gunnedah, County of Pottinger, and Local Government Area of Gunnedah Shire Regional Council in May 2020. Council requested additional testing be carried out across Lot 1 DP 1226992 to ensure the area was not contaminated and would not migrate onto Lot 2. This detailed site investigation should be read in conjunction with East West (2020) Preliminary Site Investigation of Lots 1 and 2 DP 1226992 (16 Torrens Road). Lots 1 and 2 are currently owned by Mackellar Equipment Hire Pty Ltd, with plans to build sheds and holding bays on Lot 2 for a resource recovery facility.

The objective of this detailed site investigation is to identify any risks and sources of contamination from current use and to determine whether Lot 1 is deemed free of contaminants of concern identified during the site investigation and whether it is fit for its proposed purpose or whether future investigation and sampling is required in accordance with NEPM guidelines (2013). The scope of works included a site field investigation, targeted topsoil sampling within Lot 1 to determine with greater certainty any contamination of concern, and analysis of the results.

Site history shows the site has been held primarily by agricultural proprietors, particularly graziers. The current owner, who has owned the property since 2011, has developed the site for use as a site compound for Mackellar Excavations Pty Ltd. A second site inspection was conducted on 22nd October 2021, where the site was assessed for possible contamination risks and obvious signs of surface contamination. As a result of use as a mechanical service and repair garage and fuel refuelling and storage, the potential for contaminants of concern identified as a moderate risk include total recoverable hydrocarbons (TRH), polyaromatic hydrocarbons (PAHs), benzene, toluene, ethylbenzene, xylene (BTEX), phenols, and heavy metals.

Soil sampling of Lot 1 was conducted on October 22nd 2021, where thirty two samples at depths of 0-150mm of natural topsoil were collected using targeted sampling. The thirty two sampling locations were also screened visually by using an auger to drill soil cores to ascertain any obvious signs of fill or contamination to a depth of 1.5m.

There were no significant readings to indicate contaminants of potential concern have contaminated the topsoil of Lot 1. Contaminants of concern were either below detection limits or well below the NEPM guidelines for the proposed commercial/industrial land use in all topsoil samples.

Considering the assessment contained within this report, there exists very low potential for contamination of Lot 2 from current use in Lot 1 as evidenced by the results of the testing across the targeted topsoil samples in Lot 1. Therefore, on the basis of the investigations undertaken, the site at 16 Torrens Road, Lots 1 and 2 DP 1226992, Gunnedah NSW meets the adopted criteria for commercial/industrial D and is therefore suitable for the proposed use.

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INTRODUCTION

East West has been engaged by Brendon McKellar, of McKellar Excavations Pty Ltd, to carry out a detailed contaminated site investigation on the site held as Lot 1 DP 1226992 (16 Torrens Road) in the Parish of Gunnedah, County of Pottinger, and Local Government Area of Gunnedah Shire Council.

It is understood that Lot 2 of the site is to be developed for a resource recovery facility to house sheds and holding bays. As a part of the preliminary investigations it was identified that Lot 1 required soil testing and analysis which is included in this detailed site investigation. This report should be read in conjunction with East West (2020) Preliminary Contaminated Site Report for Lots 1 and 2 DP1226992.

The site is situated within the locality of Gunnedah, approximately three and a half kilometres northwest of Gunnedah's main centre.

The site is currently owned by Mackellar Equipment Hire Pty Ltd, who have owned the site since 2011.

The site is currently used as a site compound for Mackellar Excavations Pty Ltd, with a mechanic garage, small refuelling station, and office onsite. Storage of chemicals associated with mechanical servicing and repair are stored on Lot 1.

The site has been subjected to a detailed site assessment with targeted sampling on Lot 1 to determine any possible sources of potential contamination that warrant further investigation. The site assessment was carried out by East West on behalf of McKellar Excavations Pty Ltd.

The assessment was conducted as required by the EPA guideline *Contaminated Sites: Guidelines for Consultants Reporting on Contaminated Sites* (2000) and consists of:

- Identify all past and present potentially contaminating activities;
- Identify potential contamination types;
- Discuss the site condition;
- Provide an assessment of site contamination; and
- Assess the need for further investigation.

The scope of work undertaken in this report comprises:

- Detailed inspection of the site;
- Described potential for contamination risks;
- Targeted soil sampling of Lot 1;
- Details of sampling and analysis;
- Analysis of results of the investigation and conclusions about the condition of the site.

1. SCOPE OF WORKS

The scope of work undertaken relates solely to the site known as Lot 1 DP 1226992 (16 Torrens Road).

The scope of work undertaken in this detailed contaminated site investigation comprises:

- Detailed targeted sampling of the site with respect to Lot borders and drainage areas on Lot 1;
- Details of sampling and analysis; and
- Analysis of the results of the investigation and conclude with any recommendations about the site.

2. SITE DESCRIPTION

The site is located within the locality of Gunnedah and is approximately three and a half kilometres northwest of Gunnedah's main centre and is located within Gunnedah's industrial estate (Figure 1). The total site area is approximately 27,900 m^2.

The site has been held by Mackellar Equipment Hire since 2011, who operate and own MacKellar Excavations Pty Ltd. It is understood the site is proposed to have sheds and holding bays built on Lot 2 for a resource recovery facility. The site is zoned as IN1 – *General Industrial* in the Gunnedah Local Environment Plan 2012. The site has a six metre wide easement to drain water on its northern boundary of Lot 2.

The site has frontage along Torrens Road and has been developed into the site compound for Mackellar Excavations. Immediately surrounding the site to the west are agricultural use lots used for residences and small grazing operations. Further west of the site is Witehaven Coal Mine, approximately 1.5km to the northwest, and the decommissioned Gunnedah slaughterhouse approximately 500m to the southwest. The northern and eastern boundaries of the site are surrounded by other developed general industrial type businesses, primarily warehouses. The Mungindi railway line is just 60m to the south, across from Torrens Road.

Figure 1. Site locality plan of Lots 1 and 2 DP 1226992 displaying surrounding land use in reference to the site (16 Torrens Road, Gunnedah NSW) outlined in red. *Image Source: Google Maps*

2.1. Land Use

The current owner has developed the site for use as a depot for the excavation company, Mackellar Excavations. The site therefore contains relevant infrastructure and uses such as a small office space, a working mechanical repair/servicing auto garage with associated chemicals used and stored on site, a refuelling station, and storage sheds for spare parts, all primarily on Lot 1 (Figure 2). Lot 2 is largely used for the storage of aggregate stockpiles related to use in earthworks (Figure 2). A residential structure exists on the southern boundary of the site and appears to be occupied (Figure 2). A portion of the site has been covered in a bitumen-sealed gravel hardstand as a driveway leading up to the office and mechanical garage through the southern entrance (Figure 3). The majority of the site appears to be covered in gravel-containing fill. An area on the eastern boundary appears to be chiefly used as a car park for staff vehicles (Figure 2). The mechanical garage sits on a concrete pad and contains a drop pit where truck wash-off, oil, grease, and vehicle fluids are collected and pumped to waste barrels. Waste chemicals are reportedly picked up by a Tamworth based waste disposal company, NLQ Pty Ltd. A large canopied open shed area is used to store chemicals related to mechanical servicing on the western boundary (Figure 2). The site contains an above-ground fuel tank that supplies diesel via a single pump. The tank is filled by fuel supply companies such as BP or Inland. Multiple small shipping containers are on site to store mechanical equipment and construction related materials such as road signs and tools (Figure 2).

2.1.1. Neighbouring Land Use

The site is surrounded to the south and west by rural lots, primarily grazing paddocks (Figure 1). To the east and immediately north of the site are other general industrial-type businesses and warehouses (Figure 2). A “GB Auto” workshop neighbours directly to the east, which is an auto electrics and air-conditioning service. Other businesses in the immediate area are Pirtek, a hydraulic equipment and supplier, and an irrigation and pumping supplier business (Figure 2). As previously mentioned, further west of the site is Whitehaven Coal Mine and the now decommissioned Gunnedah slaughterhouse (Figure 1).

Figure 2. Land use of Lots 1 and 2 DP 1226992 (outlined in red). Visible is the mechanics garage, office, residence, shed, car park, storage containers and gravel storage area. *Image Source: Google Maps*

Figure 3. Viewing the site to the north from the southern entrance. Pictured is the mechanical garage and attached office. Also in view is the diesel fuel tank and some of the storage containers in the background.

2.2 Geology and Hydrogeology

According to the Australia Manilla-Narrabri 1:250,000 Geological Series Sheet, the bedrock geology forms part of the Gunnedah basin, specifically the Boggabri Volcanics, and consists of rhylolitic to dactic lavas and ashflow tuffs with interbedded shale and rare trachyte and andesite. These bedrock components are from the Palaeozoic era.

3. Site Investigation

3.1. Local Site History

The site is currently owned by Mackellar Equipment Hire Pty Ltd. The site has been owned by the current owner since 2011. Other previous owners were shown by the site history search to have been primarily former agricultural proprietors, with ownership of this type extending back to the 1920s. Some owners had occupations of Coach Painter and Motor Garage Proprietor, but given the historical aerial photographs in the preliminary report (2020), it is unlikely that the site has been used for any related purposes. Aerial photographs have been able to illustrate that the site has historical use consistent with agricultural purposes, presumably grazing, given that no structures or their remnants are visible. The site appears to have likely undergone development in 2012, after purchase by the current owner, and when the original lot was subdivided into the new industrial deposited plans. Changes to the site once purchased by the current owners are visible as they essentially exist today from 2015.

There is an existing easement on the site that has existed since 2017. It is understood that this easement is for water drainage purposes.

The site is currently zoned as IN1 – *general industrial* and is currently used as a site compound for Mackellar Excavations Pty Ltd.

There are plans to further develop Lot 2, where the current owner intends to build sheds and holding bays for a resource recovery facility, which is in line with the site's current zoning.

3.2. Site Inspection

A previous site inspection was conducted on 13th May 2020 of Lot 1 and 2 and a subsequent inspection of only Lot 1 on 22nd October 2021. The site, Lot 1, was inspected, anecdotal evidence collected, and photos taken (see Appendix A). The above ground site inspection and observations for potential contamination sources revealed:

- A bitumen-sealed hardstand as a driveway leading to the mechanical garage and office (Figure 3), fill of various depths appeared to cover most of yard area of Lot 1;
- A mechanical garage and office set up on a concrete pad in the south-eastern portion of the property, with the majority of the south-western portion of the site used for vehicle parking (Figures 2 and 3);
- The mechanical garage is used to repair, service, and wash heavy vehicles. The bay area had a drop pit installed, where waste is collected and subsequently pumped into a storage area located behind the mechanical garage;
- A small refuelling station with above ground fuel tank to hold diesel just north of the office building. Evidence of spills surrounding the refuelling area have been remediated;
- A large open shed that stored many large tanks of chemicals associated with auto repair and servicing, such as transmission fluid, motor oil, lubricants, coolant, and AdBlue;
- Shipping containers for storage of mechanical equipment, road signs, and tools between Lot 1 and Lot 2;
- Behind the office building, were various large tanks of waste chemicals, likely stockpiled waste from the mechanical garage;
- No sediment fences were observed;
- No physical evidence of asbestos was indicated on the site;
- No visible signs of small spills around the stockpiled tanks of waste chemicals;
- No obvious odours;
- No visible signs of responses to toxic contaminants from existing flora that surrounded the site; and
- No visible on-site losses of dangerous goods or discarding of explosive materials.

3.3. Possible Contaminant Sources

There is risk of surface soil contamination from the use of the site to store, fill, and refuel vehicles with diesel, as well as use of the site as an auto-repair and service garage, with improperly bunded storage of associated chemicals and small localised spills.

The most likely types of contamination would be:

- Total petroleum hydrocarbons, monocyclic aromatic hydrocarbons (e.g. benzene, toluene, ethylbenzene & xylene (BTEX)), phenols, heavy metals, polyaromatic hydrocarbons (PAHs), oil and grease, alkalis and acids (e.g. sulphuric, phosphoric) from sources and activities that include vehicle refuelling, maintenance, and repair.

During the site inspection East West noted the following sensitive receptors surrounding the site:

- Neighbouring surface waters to the south and west of the site
- The drainage area of the site is primarily towards the northeast

3.4.Potential Receptors

The potential receptors include:

- Future or transient users of the site;
- Any construction workers involved in the proposed site development;
- Local residents, including rural neighbours immediately to the west;
- Flora and fauna surrounding the site; and
- Waterways connected through the site's drainage easement

3.5. Exposure Pathways

Possible exposure pathways include:

- Ingestion, dermal contact, or inhalation of surface soil contamination;
- Inhalation through air transport of soil particulates (dust); and
- Ingestion or dermal contact with contaminated water

4. Sampling and Analysis Plan

Thirty one sampling locations were selected by East West on 22nd October 2021 from targeted areas within Lot 1. The targeted areas included areas which were identified in the preliminary contaminated site assessment (2020) where spills were noted to occur. A grid pattern was also placed over Lot 1 to gain 95% confidence of hitting hotspot contamination according to the sampling design guidelines. Thirty one (31) topsoil samples (BH1 through to BH31) were collected at a depth of 150mm using a ute-mounted auger in these targeted locations. According to *NSW EPA Contaminated Sites – Sampling Design Guidelines 2012*, these surface soils are most likely to be contaminated and come into contact with future users of the area or construction workers. In addition, these topsoils would reflect any migration of identified surface contaminants from Lot 1. Soil samples taken discounted any imported fill on the lot and collected on natural soil only. Fill across Lot 1 was typically 0-0.7m of road base. Soil cores were also observed at 31 sample locations across the site to a depth of up to 1.5m to visually check for any imported fill or visual sources of contamination.

Sampling rationale was to collect one topsoil sample per 30m across the Lot 1 grid area to ensure a spatial probability of detecting potential contaminants within the site. Six samples were collected in identified hotspot areas of Lot 1 in order to ascertain with greater certainty any surface contamination of Lot 1.

All samples were collected carefully to ensure no cross-contamination occurred between sampling. Samples were collected from the outer edge of the soil on the auger to ensure cross contamination did not occur from the soils in contact with the auger itself. Nitrile gloves were used to collect each sample, and the auger was fully brushed off between sample points.

To effectively preserve the samples, each sample for contamination analysis was placed in a new glass jar with plastic screw-top lid. Each jar was labelled with the job number, date, sample location, sampler, and a unique sample number.

The soil jars were transported in an esky and a sample log was filled in with the date, job number, site address, GPS coordinates, samplers, sample locations, and sample names. The sample logs can be found in Appendix C.

A filled and signed chain of custody (COC) was filled out and accompanied the samples to their destination at Envirolab. The sample containers were wrapped in bubble wrap to ensure they did not break during transit and transported via overnight express in a cooled esky to Envirolab.

All samples were collected in accordance with the NSW EPA Sampling Design Guidelines and National Environmental Protection (Assessment of Site Contamination) Measure 1999.

Sampling was performed on 22/10/2021 by Stephanie Cameron (Scientific Officer). Soil cores were performed by William King (Sole Trader) and observed by Stephanie Cameron.

Table 1 contains a sample log of those samples collected. Figure 4 indicates where the samples were collected from and Appendix A show photos of each soil core at each sample location.

Analysis of the results for systematic grid based sampling must meet the following:

- The 95% Upper Confidence Limit (UCL) of the concentration of potential contamination (COPC) results do not exceed the soil assessment criteria;
- No single sample exceeds 250% of the COPC assessment criteria; and
- The standard deviation of the concentration COPC analytical results are less than 50% of the soil assessment criteria

Figure 4. Mud map of site – sample collection locations in Lot 1 for the site at 16 Torrens Road, Gunnedah NSW. Mud map is for illustrative purposes only and is not to scale. Lot boundaries are indicative only.

Table 1: Sample Log of Samples Collected on 22/11/2021

SAMPLE ID	DEPTH	GPS COORDINATES	DESCRIPTION
EW211459-1	0-0.15m	30°57.6213" S 150°13.1344" E	**SP1** 0-1.5m sandy clay
EW211459-2	0-0.15m	30°57.6286" S 150°13.1433" E	**SP2** 0-1.5m silty clay trace of gravel
EW211459-3	0-0.15m	30°57.6258" S 150°13.1554" E	**SP3** 0-0.2m silt, 0.2-1.5m silty clay
EW211459-4	0-0.15m	30°57.6237" S 150°13.1683" E	**SP4** 0-0.2m silt, 0.2-1.5m silty sandy clay
EW211459-5	0-0.15m	30°57.6171" S 150°13.1723" E	**SP5** 0-1.5m silt trace clay
EW211459-6	0-0.15m	30°57.6112" S 150°13.1602" E	**SP6** 0-0.2m clay, 0.2-1.5m silty clay
EW211459-7	0.15-0.3m	30°57.5972" S 150°13.1362" E	**SP7** 0-0.15 fill, 0.15-1.5m silty sand
EW211459-8	0.15-0.3m	30°57.5943" S 150°13.1243" E	**SP8** 0-0.1 fill, 0.1-1.5m sandy silt
EW211459-9	0.1-0.25m	30°57.5819" S 150°13.1242" E	**SP9** 0-0.1 fill, 0.1-1.5m sandy silt trace of clay
EW211459-10	0.1-0.25m	30°57.5953" S 150°13.1394" E	**SP10** 0-0.15 fill, 0.15-1.5m light clay
EW211459-11	0.3-0.45m	30°57.5989" S 150°13.1505" E	**SP11** 0-0.3 fill, 0.3-1.5m silty sand trace of clay
EW211459-12	0.1-0.25m	30°57.6016" S 150°13.1697" E	**SP12** 0-0.1 fill, 0.1-1.5m silty sand trace of clay
EW211459-13	0-0.15m	30°57.5992" S 150°13.1860" E	**SP13** 0-0.4m sandy silt, 0.4-1.5m sandy clay
EW211459-14	0-0.15m	30°57.5753" S 150°13.2007" E	**SP14** 0-0.4m sandy silt, 0.4-1.5m sandy clay
EW211459-15	0-0.15m	30°57.5806" S 150°13.1848" E	**SP15** 0-1.5m sandy silt
EW211459-16	0-0.15m	30°57.5812" S 150°13.1754" E	**SP16** 0-0.3m clayey silty sand, 0.3-1.5m silty sand
EW211459-17	0.4-0.55m	30°57.5826" S 150°13.1557" E	**SP17** 0-0.4m fill, 0.4-1.3m silty sand, 1.3-1.5m silty sandy clay
EW211459-18	0.3-0.45m	30°57.5857" S 150°13.1440" E	**SP18** 0-0.3m fill, 0.4-1.3m silty clay, 1.3-1.5m sandy clay
EW211459-19	0.4-0.55m	30°57.5763" S 150°13.1457" E	**SP19** 0-0.4m fill, 0.4-0.6m sandy silt, 0.6-1.5m silty clay
EW211459-20	0.4-0.55m	30°57.5733" S 150°13.1507" E	**SP20** 0-0.4m fill, 0.4-0.8m sandy silt, 0.8-1.5m silty clay
EW211459-21	1.3-1.4m	30°57.5733" S 150°13.1507" E	**SP20** 0-0.4m fill, 0.4-0.8m sandy silt, 0.8-1.5m silty clay
EW211459-22	0.4-0.55m	30°57.5682" S 150°13.1544" E	**SP21** 0-0.4m fill, 0.4-0.8m sandy silt, 0.8-1.5m silty clay
EW211459-23	0.2-0.35m	30°57.5618" S 150°13.1667" E	**SP22** 0-0.2m fill, 0.2-1.5m silty sandy clay
EW211459-24	0-0.15m	30°57.5624" S 150°13.1884" E	**SP23** 0-1.5m silty sand
EW211459-25	0-0.15m	30°57.5700" S 150°13.1973" E	**SP24** 0-1.5m silty clay
EW211459-26	0.15-0.3m	30°57.5579" S 150°13.1872" E	**SP25** 0-0.15m fill, 0.15-0.3m silty clay, 0.3-1.5m sandy silt trace of clay
EW211459-27	0.3-0.45m	30°57.5514" S 150°13.1533" E	**SP26** 0-0.3m fill, 0.2-1.5m silt
EW211459-28	0-0.15m	30°57.5415" S 150°13.1380" E	**SP27** 0-1.5m silt
EW211459-29	0.5-0.65m	30°57.5554" S 150°13.1425" E	**SP28** 0-0.5m fill, 0.8-1.5m sandy silt
EW211459-30	0.2-0.35m	30°57.5593" S 150°13.1365" E	**SP29** 0-0.2m fill, 0.8-1.5m silty clay
EW211459-31	0.7-0.85m	30°57.5619" S 150°13.1454" E	**SP30** 0-0.7m fill, 0.7-0.9m sandy silt, 0.9-1.5m silty clay
EW211459-32	0.7-0.85m	30°57.5552" S 150°13.1507" E	**SP31** 0-0.7m fill, 0.7-0.9m sandy silt, 0.9-1.5m silty clay

5. RESULTS

5.1. Soil Assessment Criteria

Health Investigation Levels (HILs) are Tier 1 risk based generic assessment criteria used for the assessment of potential risks to human health from chronic exposure to contaminants in soil. They are intentionally conservative and based on a reasonable worst-case scenario for generic land use settings. The HILs selected for the soil assessment criteria are the HIL D guidelines which are commercial/industrial areas and include premises such as shops, offices, factories and industrial sites.

Ecological investigation levels (EILs) is broadly equivalent to the HIL A, HIL B and HIL C land use scenarios. The protection levels for the generic land use settings are 60% for commercial and industrial land uses. EILs apply principally to contaminants in the top 2m of soil at the finished surface/ground level which corresponds to the root zone and habitation zone of many species.

Ambient background concentrations (ABC) for the locality assumes that by adding contaminants over and above the ecosystem background concentration has an adverse effect on the environment. In some situations the ABC may be comparatively low and have a minor effect on the magnitude of the site EIL. The added contaminants limits (ACL) used for EIL determination is the added concentration (above the ABC) of a contaminant above which further appropriate investigation and evaluation of the impact on ecological values is required. The EIL is derived by summing the ACL and the ABC.

ACLs are based on the soil characteristics of pH, CEC and clay content. Empirical relationships that can model the effect of these soil properties on toxicity are used to develop soil-specific values. These soil-specific values take into account the biological availability of the element in various soils. In this approach different soils will have different contaminant EILs rather than a single generic EIL for each contaminant. The sandy, silty, clays found in Gunnedah typically have pHs of above 6 and CECs greater than 20cmol/kg and a clay content of between 30-40%. Limits for soil specific EILs were determined by using the NEPM toolbox (2013) Interactive Calculation Spreadsheet for aged contamination in the soil for commercial/industrial areas with a standard protection level of 60%.

Ecological screening levels (ESLs) for the adopted carbon fraction ranges are based on TRH analysis with F1 being obtained after subtraction of BTEX. The ESLs selected for the soil assessment criteria are for commercial/industrial.

Health screening levels (HSLs) are Tier 1 risk based generic soil assessment criteria used for the assessment of potential risks to human health from chronic inhalation exposure of petroleum vapour emanating off petroleum contaminated soils (vapour risk). They are intentionally conservative and based on a reasonable worst-case scenario for generic soil types, contamination depth and land use settings including commercial/industrial (HSLs D). HSL D soil assessment criteria for clay soil from 0 to <1 m were adopted on the basis that the proposed land use is a resource recovery holding bay and onsite topsoil comprising of silty clay.

NEPM Management Limits for petroleum have been developed for prevention of explosive vapour accumulation, prevention of the formation of observable Light Non-Aqueous Phase Liquids (LNAPL) and protection against effects on buried infrastructure. Commercial/industrial space management limits (fine) have been adopted based on the proposed land use and onsite topsoil comprising of silty clay.

NEPM Soil Ecological Assessment Levels
Soil ecological assessment was not considered warranted based on the following:

- The proposed land use is for use as a resource holding bay containing sheds; and
- There are no onsite or nearby offsite sensitive ecological receptors.

The guidelines have been located through the NSW Environment and Protection Authority (EPA) and they indicate suitable threshold values for contaminants in soil from the appropriate guidelines outlined in the *National Environment Protection (Assessment of Site Contamination) Measure (NEPM) 1999* (April 2013), NEPC 2013, Canberra.

5.2. Discussion of Results

Twenty five topsoil samples were tested for the heavy metal contaminant lead, total recoverable hydrocarbons (TRH), benzene, toluene, ethylbenzene and xylene (BTEX). Six topsoil samples and one sub soil (exhibited slight odour) located near potential hotspots such as fuel and chemical storage were tested for heavy metal contaminant (arsenic, cadmium, chromium, copper, lead, mercury, nickel and zinc), total recoverable hydrocarbons (TRH), benzene, toluene, ethylbenzene and xylene (BTEX), and polycyclic aromatic hydrocarbons (PAHs) at Envirolab (NATA accreditation 2901).

A summary of analysis for the soil samples (project reference EW211459) are located in Table 2 and Table 3. The first column contains the analytes (element and compounds tested for), the second column is the units of the results (i.e. mg/kg is milligram per kilogram or ppm of soil), and the middle columns contain the validation results for the soil samples collected. The last column displays the maximum permissible concentration of a contaminant for specific Health-Based Investigation Levels (HILs). Values over the maximum permissible concentration of a contaminant will be highlighted and further appropriate health investigation and evaluation is required.

All sample results at SP1 through to SP31 indicate levels for tested analytes below detectable limits of instrument analysis or below the soil assessment criteria – HIL commercial/industrial D threshold values (Table 2 and Table 3). Appendix A shows the 95% Upper Confidence Limit (UCL) of the concentration of potential contamination (COPC) and that all contaminants are within the thresholds for ESLs, EILs and/or HSLs.

The basis on which information was selected for the results summaries was to identify those contaminants that were common contaminants, contaminants of concern, or recorded a measurement above the lowest obtainable reading (LOR or limit of detection). Levels that measure below the instrument's level of detection are typically below guideline limits for contaminants but were still included to show the overall condition of the soil at the site. The quality control data was reviewed and not incorporated into the contained information in the summary as there were no anomalies that needed to be highlighted. The full laboratory documents are attached in Appendix C.

The results of the boreholes to a depth of 1.5m at the sampling locations indicated no signs of visible contamination, and were consistent with natural soil profiles as to be expected in the area. The site generally consisted of red-brown silty clays with varying proportions of gravel. Photos of soil cores are located in Appendix A.

The results of the sampling from the initial and further investigation reveal that:

- No contaminants of concern have been detected with the 95% Upper Confidence Limit (UCL) of the concentration of potential contamination (COPC) with no contaminant exceeding the specified soil assessment criteria for HILs and EILs;
- No single sample exceeds 250% of the COPC assessment criteria; and
- The standard deviation of the concentration COPC analytical results are less than 50% of the soil assessment criteria.

Statistical analysis and details of the results against NEPM guidelines are found in Appendix B.

Table 2: Summary of Topsoil Analysis Results

ANALYTE	Units	SP 1	SP 2	SP 3	SP 4	SP 5	SP 6	SP 7	SP 8	SP 9	SP 10	SP 11	SP 12	SP 13	*NEPC Guidelines NEPM Health-Based Investigation Levels (Commercial-Industrial D)*
		211459-1	**211459-2**	**211459-3**	**211459-4**	**211459-5**	**211459-6**	**211459-7**	**211459-8**	**211459-9**	**211459-10**	**211459-11**	**211459-12**	**211459-13**	
		0-0.15m	**0-0.15m**	**0-0.15m**	**0-0.15m**	**0-0.15m**	**0-0.15m**	**0.15-0.3m**	**0.15-0.3m**	**0.1-0.25m**	**0.1-0.25m**	**0.3-0.45m**	**0.1-0.25m**	**0-0.15m**	
Trace Metals															
Lead	mg/kg	14	13	15	11	13	15	11	8	14	10	11	14	16	***1500***
Total Recoverable Hydrocarbons															
vTPH C6-C10 less BTEX (F1)	mg/kg	<25	<25	<25	<25	<25	<25	<25	<25	<25	<25	<25	<25	<25	***250 (0 to <1m in silty clay)***
TRH >C10-C16 less naphthalene (F2)	mg/kg	<50	<50	<50	<50	<50	<50	<50	<50	<50	<50	<50	<50	<50	***NL***

ANALYTE	Units	SP 14	SP 15	SP 16	SP 17	SP 18	SP 21	SP 22	SP 23	SP 24	SP 25	SP 26	SP 27	*NEPC Guidelines NEPM Health-Based Investigation Levels (Commercial-Industrial D)*
		211459-14	**211459-15**	**211459-16**	**211459-17**	**211459-18**	**211459-22**	**211459-23**	**211459-24**	**211459-25**	**211459-26**	**211459-27**	**211459-28**	
		0-0.15m	0-0.15m	0-0.15m	0.4-0.55m	0.3-0.45m	0.4-0.55m	0.2-0.35m	0-0.15m	0-0.15m	0.15-0.3m	0.3-0.45m	0-0.15m	
Trace Metals														
Lead	mg/kg	14	14	12	11	12	12	11	11	15	11	12	12	***1500***
Total Recoverable Hydrocarbons														
vTPH C6-C10 less BTEX (F1)	mg/kg	<25	<25	<25	<25	<25	<25	<25	<25	<25	<25	<25	<25	***250 (0 to <1m in silty clay)***
TRH >C10-C16 less naphthalene (F2)	mg/kg	<50	<50	<50	<50	<50	<50	<50	<50	<50	<50	<50	<50	***NL***

Table 3: Summary of Hotspot Analysis Results

ANALYTE	Units	SP 19 **211459 -19** 0.4-0.55m	SP 20 **211459 -20** 0.4-0.55m	SP 20 **211459 -21** 1.3-1.4m	SP 28 **211459 -29** 0.5-0.65m	SP 29 **211459 -30** 0.2-0.35m	SP 30 **211459 -31** 0.7-0.85m	SP 31 **211459 -32** 0.7-0.85m	*NEPC Guidelines NEPM Health-Based Investigation Levels (Commercial-Industrial D)*
Trace Metals									
Arsenic	mg/kg	<4	<4	<4	<4	<4	<4	<4	***3000***
Cadmium	mg/kg	<0.4	<0.4	<0.4	<0.4	<0.4	<0.4	<0.4	***800***
Chromium	mg/kg	25	25	21	24	17	26	17	***3000***
Copper	mg/kg	10	7	17	9	8	6	7	***250000***
Mercury	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	***4000 (inorganic Hg)***
Nickel	mg/kg	18	13	23	17	12	10	8	***4000***
Lead	mg/kg	11	10	14	11	9	8	8	***1500***
Zinc	mg/kg	21	18	29	18	14	14	14	***400000***
Total Recoverable Hydrocarbons									
vTPH C6-C10 less BTEX (F1)	mg/kg	<25	<25	<25	<25	<25	<25	<25	***250 (0 to <1m in silty clay)***
TRH >C10-C16 less naphthalene (F2)	mg/kg	<50	<50	<50	<50	<50	<50	<50	***NL***
Polyaromatic Hydrocarbons									
Total +ve PAHs	mg/kg	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	***4000***
Benzo(a)pyrene TEQ	mg/kg	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	***40***

6. QUALITY ASSURANCE/QUALITY CONTROL

6.1.QA/QC Documentation

All samples were transported to the laboratories for analysis with relevant COC documentation containing the following:

- Site identification;
- Sampler(s);
- Nature of the sample – soil;
- Collection date; and
- Analysis to be performed

Original COC and sample receipts advisory (SRA) documentation can be found in Appendix C.

6.2. Laboratories

Samples were submitted to NATA accredited laboratory, Envirolab (NATA accreditation 2901).

As part of their National Association of Testing Authorities NATA accreditation, the laboratories are required to carry out routine in-house quality control (QC) procedures, which are presented in Appendix C.

7. CONCLUSIONS

East West was commissioned to undertake a further detailed site investigation of Lot 1 DP 1226992 with sampling to estimate the potential site contamination risks from use as a site compound for Mackellar Excavations Pty Ltd, and whether use as a site compound could affect future development of the site's Lot 2.

Preliminary investigations of the site history were consistent with primary production, particularly use as grazing fields. The site has been developed for use as a site compound for aggregate stockpiling, mechanical servicing, and office space. A site inspection was conducted on 13th May 2020 and 22nd October 2021 to ascertain the site condition and identify any sources of contamination or contaminating activities. The predominant areas of concern noted during the site inspection were the diesel tank refuelling area and areas where chemicals are used and stored. There exists potential for small localised areas of shallow contamination associated with these areas. Identified surface contamination from use in Lot 1 could have the potential to migrate to Lot 2 considering the site's drainage to the north-northeast.

In order to determine the likelihood for migration of potential surface contamination from those areas identified on Lot 1 into Lot 2, sampling of the site in Lot 1 was conducted on October 22nd 2021. Results of the sampling across Lot 1 revealed that contaminants of potential concern (COPC) were not identified in soil at concentrations in excess of assessment criteria in all soil samples analysed.

Considering the assessment contained within this report, there exists very low potential for contamination of Lot 2 from current use in Lot 1 as evidenced by the results of the testing across the targeted topsoil and hotspot samples. The results of the investigation reveal that the site at 16 Torrens Road, Lots 1 and 2 DP 1226992, Gunnedah NSW are considered fit for Lot 2's proposed development as a resource recovery bay and holding facility under industrial guidelines.

7. REPORT LIMITATIONS

This report has been prepared for use by the client who has commissioned the works in accordance with the project brief only.

This report does not provide a complete assessment of the environmental integrity of the site and is limited by the scope as defined above.

8. REFERENCES

NSW EPA [2000], *Contaminated Sites: Guidelines for Consultants Reporting on Contaminated Sites.* Sydney South, ISBN 0 7310 3892 4

NEPC [2013], *Schedule B1 – Guideline on Investigation Levels for Soil and Groundwater Measure 1999* (May 2013). Canberra.

APPENDIX A – EVIDENCE OF SOIL CORES PHOTOGRAPHS (OCTOBER 22 2021)

Figure 5. SP1 borehole displaying dry, natural soil

Figure 6. SP2 borehole displaying dry, natural soil

Figure 7. SP3 borehole displaying dry, natural soil

Figure 8. SP4 borehole displaying dry, natural soil

Figure 9. SP5 borehole displaying dry, natural soil

Figure 10. SP6 borehole displaying dry, natural soil

Figure 11. SP7 borehole displaying dry, natural soil beneath 150mm of road base/fill

Figure 12. SP8 borehole displaying dry, natural soil beneath 100mm of road base/fill

Figure 13. SP9 borehole displaying dry, natural soil beneath 100mm of road base/fill

Figure 14. SP10 borehole displaying dry, natural soil beneath 150mm of road base/fill

Figure 15. SP11 borehole displaying dry, natural soil beneath 300mm of road base/fill

Figure 16. SP12 borehole displaying dry, natural soil beneath 100mm of road base/fill

Figure 17. SP13 borehole displaying dry, natural soil beneath 400mm of road base/fill

Figure 18. SP14 borehole displaying dry, natural

Figure 19. SP15 borehole displaying dry, natural soil

Figure 20. SP16 borehole displaying dry, natural

Figure 21. SP17 borehole displaying dry, natural soil beneath 400mm of road base/fill

Figure 22. SP18 borehole displaying dry, natural soil beneath 300mm of road base/fill

Figure 23. SP19 borehole displaying dry, natural soil beneath 400mm of road base/fill

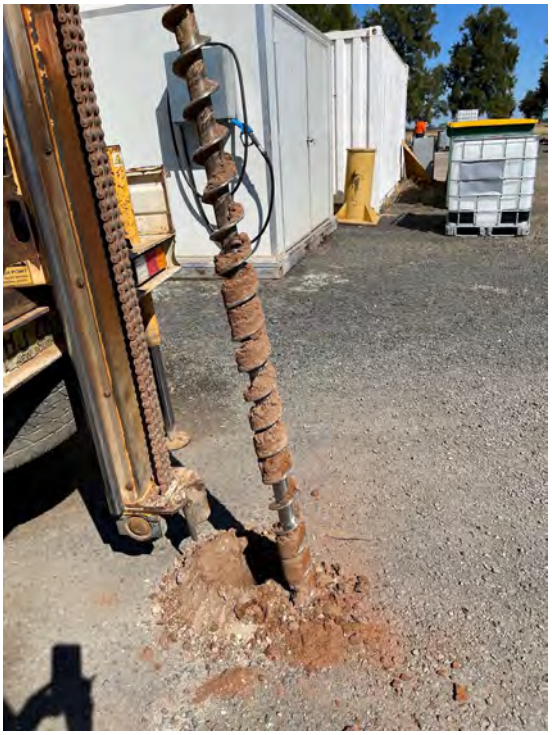

Figure 24. SP20 borehole displaying dry, natural soil beneath 400mm of road base/fill

Figure 25. SP21 borehole displaying dry, natural soil beneath 400mm of road base/fill

Figure 26. SP22 borehole displaying dry, natural soil beneath 200mm of road base/fill

Figure 27. SP23 borehole displaying dry, natural soil

Figure 28. SP24 borehole displaying dry, natural

Figure 29. SP25 borehole displaying dry, natural soil

Figure 30. SP26 borehole displaying dry, natural soil beneath 300mm of road base/fill

Figure 31. SP27 borehole displaying dry, natural soil

Figure 32. SP28 borehole displaying dry, natural soil beneath 100mm of road base/fill

Figure 33. SP29 borehole displaying dry, natural soil beneath 200mm of road base/fill

Figure 34. SP30 borehole displaying dry, natural soil beneath 700mm of road base/fill

Figure 35. SP31 borehole displaying dry, natural soil beneath 700mm of road base/fill

APPENDIX B – FULL RESULTS TABLES

		Lead
		mg/kg
EQL		5
NSW 2014 General Solid Waste CT1 (No Leaching)		100
NSW 2014 General Solid Waste CT2 (No Leaching)		400
NEPM 2013 Table 1A(3) Commercial/Industrial D Soil HSL for Vapour Intrusion (Sand) 0-1m		
NEPM 2013 Table 1A(3) Commercial/Industrial D for Vapour Intrusion (Silt) 0-1m		
NEPM 2013 Table 1B(4) Generic EIL – Commercial and Industrial		1800
NEPM 2013 Table 1B(5) ESLs for Commercial and Industrial (Coarse Soil) 0-2m		
NEPM 2013 Table 1B(5) ESLs for Commercial and Industrial (Fine Soil) 0-2m		
NEPM 2013 Table 1A(1) HILs Commercial/Industrial D		1500
Field ID	Date	
211459-1	22/10/21	14
211459-2	22/10/21	13
211459-3	22/10/21	15
211459-4	22/10/21	11
211459-5	22/10/21	13
211459-6	22/10/21	15
211459-7	22/10/21	11
211459-8	22/10/21	8
211459-9	22/10/21	14
211459-10	22/10/21	10
211459-11	22/10/21	11
211459-12	22/10/21	14
211459-13	22/10/21	16
211459-14	22/10/21	14
211459-15	22/10/21	14
211459-16	22/10/21	12
211459-17	22/10/21	11
211459-18	22/10/21	12
211459-21	22/10/21	12
211459-22	22/10/21	11
211459-23	22/10/21	11
211459-24	22/10/21	15
211459-25	22/10/21	11
211459-26	22/10/21	12
211459-27	22/10/21	12
	Mean (mg/L)	**12**
	Std Dev	**1.896**
	CV	**6.583**
	α at 95% (n-1)	**1.714**
	95% UCL	**14.8**
	Guidelines Pass/Fail	**PASS**

		Arsenic	Cadmium	Chromium	Copper	Mercury	Nickel	Lead	Zinc
		mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg
EQL		4	0.4	5	5	0.1	5	5	5
NSW 2014 General Solid Waste CT1 (No Leaching)		100	20	100		4	40	100	
NSW 2014 General Solid Waste CT2 (No Leaching)		400	80	400		16	160	400	
NEPM 2013 Table 1A(3) Commercial/Industrial D Soil HSL for Vapour Intrusion (Sand) 0-1m									
NEPM 2013 Table 1A(3) Commercial/Industrial D for Vapour Intrusion (Silt) 0-1m									
NEPM 2013 Table 1B(4) Generic EIL – Commercial and Industrial		170						1800	
NEPM 2013 Table 1B(5) ESLs for Commercial and Industrial (Coarse Soil) 0-2m									
NEPM 2013 Table 1B(5) ESLs for Commercial and Industrial (Fine Soil) 0-2m									
NEPM 2013 Table 1A(1) HILs Commercial/Industrial D		3000	800	3000	250000	4000	4000	1500	400000
Field ID	Date								
211459-19	22/10/21	<4	<0.4	25	10	<0.1	18	11	21
211459-20	22/10/21	<4	<0.4	25	7	<0.1	13	10	18
211459-21	22/10/21	<4	<0.4	21	17	<0.1	23	14	29
211459-29	22/10/21	<4	<0.4	24	9	<0.1	17	11	18
211459-30	22/10/21	<4	<0.4	17	8	<0.1	12	9	14
211459-31	22/10/21	<4	<0.4	26	6	<0.1	10	8	14
211459-32	22/10/21	<4	<0.4	17	7	<0.1	8	8	14
	Mean (mg/L)	**4**	**0.4**	**22**	**9**	**0.1**	**14**	**10**	**18**
	Std Dev	**0.000**	**0.000**	**3.848**	**3.716**	**0.000**	**5.192**	**2.116**	**5.438**
	CV	**0.000**	**0.000**	**5.754**	**2.460**	**0.000**	**2.779**	**4.794**	**3.363**
	α at 95% (n-1)	**1.943**	**1.943**	**1.943**	**1.943**	**1.943**	**1.943**	**1.943**	**1.943**
	95% UCL	**4**	**0.4**	**27**	**11**	**0.1**	**17**	**14**	**21**
	Guidelines Pass/Fail	**PASS**	**PASS**	**PASS**	**PASS**	**PASS**	**PASS**	**PASS**	**PASS**

		BTEX						TRH							TPH				
		Benzene	Toluene	Ethylbenzene	Xylene (m & p)	Xylene (o)	Xylene Total	C6-C10	C6-C10 (F1 minus BTEX)	C10-C16	C10-C16 (F2 minus Napthalene)	C16-C34	C134-C40	C10-C40 (Sum of total)	C6-C9	C10-C14	C15-C28	C29-C36	+C10-C36 (Sum of total)
		mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg
EQL		0.2	0.5	1	2	1	1	25	25	50	50	100	100	50	25	50	100	100	100
NSW 2014 General Solid Waste CT1 (No Leaching)		10	288	600			1000								650				10000
NSW 2014 General Solid Waste CT2 (No Leaching)		40	1152	2400			4000								2600				40000
NEPM 2013 Table 1A(3) Commercial/Industrial D Soil HSL for Vapour Intrusion (Sand)																			
0-1m		3					230		260										
1-2m		3							370										
2-4m		3							630										
>=4m		3																	
NEPM 2013 Table 1A(3) Commercial/Industrial D for Vapour Intrusion (Silt)																			
0-1m		4							250										
1-2m		4							360										
2-4m		6							590										
>=4m		10																	
NEPM 2013 Table 1B(4) Generic EIL – Commercial and Industrial																			
NEPM 2013 Table 1B(5) ESLs for Commercial and Industrial (Coarse Soil)																			
0-2m		75	135	165			180		215		170	1700	3300						
NEPM 2013 Table 1B(5) ESLs for Commercial and Industrial (Fine Soil)																			
0-2m		95	135	185			95		215		170	2500	6600						
NEPM 2013 Table 1A(1) HILs Commercial/Industrial D																			
Field ID	Date																		
211459-19	22/10/21	<0.2	<0.5	<1	>2	<1	<1	<25	<25	<50	<50	<100	<100	<50	<25	<50	<100	<100	<100
211459-20	22/10/21	<0.2	<0.5	<1	>2	<1	<1	<25	<25	<50	<50	<100	<100	<50	<25	<50	<100	<100	<100
211459-21	22/10/21	<0.2	<0.5	<1	>2	<1	<1	<25	<25	<50	<50	<100	<100	<50	<25	<50	<100	<100	<100
211459-29	22/10/21	<0.2	<0.5	<1	>2	<1	<1	<25	<25	<50	<50	<100	<100	<50	<25	<50	<100	<100	<100
211459-30	22/10/21	<0.2	<0.5	<1	>2	<1	<1	<25	<25	<50	<50	<100	<100	<50	<25	<50	<100	<100	<100
211459-31	22/10/21	<0.2	<0.5	<1	>2	<1	<1	<25	<25	<50	<50	<100	<100	<50	<25	<50	<100	<100	<100
211459-32	22/10/21	<0.2	<0.5	<1	>2	<1	<1	<25	<25	<50	<50	<100	<100	<50	<25	<50	<100	<100	<100
	Mean (mg/L)	**0.2**	**0.5**	**1**	**2**	**1**	**1**	**25**	**25**	**50**	**50**	**100**	**100**	**50**	**25**	**50**	**100**	**100**	**100**
	Std Dev	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**
	CV	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**
	α at 95% (n-1)	**1.943**	**1.943**	**1.943**	**1.943**	**1.943**	**1.943**	**1.943**	**1.943**	**1.943**	**1.943**	**1.943**	**1.943**	**1.943**	**1.943**	**1.943**	**1.943**	**1.943**	**1.943**
	95% UCL	**0.2**	**0.5**	**1**	**2**	**1**	**1**	**25**	**25**	**50**	**50**	**100**	**100**	**50**	**25**	**50**	**100**	**100**	**100**
	Guidelines Pass/Fail	**PASS**	**PASS**	**PASS**	**PASS**	**PASS**	**PASS**	**PASS**	**PASS**	**PASS**	**PASS**	**PASS**	**PASS**	**PASS**	**PASS**	**PASS**	**PASS**	**PASS**	**PASS**

		PAHs																		
		Acenaphthene	Acenaphthylene	Anthracene	Benz(a)anthracene	Benzo(a)pyrene	Benzo(b, j + k)fluoranthene	Benzo(g,h,i)perylene	Chrysene	Dibenz(a,h)anthracene	Fluoranthene	Fluorene	Indeno(1,2,3-c,d)pyrene	Napthalene	Phenanthrene	Pyrene	Benzo(a)pyrene TEQ calc (Half)	Benzo(a)pyrene TEQ (LOR)	Benzo(a)pyrene TEQ calc (PQL)	PAHs (Sum of total)
		mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg
EQL		0.1	0.1	0.1	0.1	0.05	0.2	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.5	0.5	0.5	0.05
NSW 2014 General Solid Waste CT1 (No Leaching)						0.8														200
NSW 2014 General Solid Waste CT2 (No Leaching)						3.2														800
NEPM 2013 Table 1A(3) Commercial/Industrial D Soil HSL for Vapour Intrusion (Sand)																				
0-1m																				
NEPM 2013 Table 1A(3) Commercial/Industrial D for Vapour Intrusion (Silt)																				
0-1m																				
NEPM 2013 Table 1B(4) Generic EIL – Commercial and Industrial														370						
NEPM 2013 Table 1B(5) ESLs for Commercial and Industrial (Coarse Soil)																				
0-2m						0.7														
NEPM 2013 Table 1B(5) ESLs for Urban Res (Fine Soil)																				
0-2m						1.4														
NEPM 2013 Table 1A(1) HILs Commercial/Industrial D																	3	3	3	300
Field ID	Date																			
211459-19	22/10/21	<0.1	<0.1	<0.1	<0.1	<0.05	<0.2	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.5	<0.5	<0.5	<0.05
211459-20	22/10/21	<0.1	<0.1	<0.1	<0.1	<0.05	<0.2	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.5	<0.5	<0.5	<0.05
211459-21	22/10/21	<0.1	<0.1	<0.1	<0.1	<0.05	<0.2	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.5	<0.5	<0.5	<0.05
211459-29	22/10/21	<0.1	<0.1	<0.1	<0.1	<0.05	<0.2	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.5	<0.5	<0.5	<0.05
211459-30	22/10/21	<0.1	<0.1	<0.1	<0.1	<0.05	<0.2	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.5	<0.5	<0.5	<0.05
211459-31	22/10/21	<0.1	<0.1	<0.1	<0.1	<0.05	<0.2	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.5	<0.5	<0.5	<0.05
211459-32	22/10/21	<0.1	<0.1	<0.1	<0.1	<0.05	<0.2	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.5	<0.5	<0.5	<0.05
	Mean (mg/L)	0.1	0.1	0.1	0.1	0.05	0.2	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.	0.1	0.5	0.5	0.5	0.05
	Std Dev	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
	CV	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
	α at 95% (n-1)	1.943	1.943	1.943	1.943	1.943	1.943	1.943	1.943	1.943	1.943	1.943	1.943	1.943	1.943	1.943	1.943	1.943	1.943	1.943
	95% UCL	0.1	0.1	0.1	0.1	0.05	0.2	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.5	0.5	0.5	0.05
	Guidelines Pass/Fail	PASS	PASS	PASS	PASS	PASS	PASS	PASS	PASS	PASS	PASS	PASS	PASS	PASS	PASS	PASS	PASS	PASS	PASS	PASS

APPENDIX C – SUPPORTING DOCUMENTS

Envirolab Services Pty Ltd
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12 Ashley St Chatswood NSW 2067
ph 02 9910 6200 fax 02 9910 6201
customerservice@envirolab.com.au
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CERTIFICATE OF ANALYSIS 281268

Client Details

Client	East West Enviroag Pty Ltd
Attention	Stephanie Cameron
Address	82 Plain St, Tamworth, NSW, 2340

Sample Details

Your Reference	**EW211459**
Number of Samples	32 Soil
Date samples received	27/10/2021
Date completed instructions received	27/10/2021

Analysis Details

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

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

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

Report Details

Date results requested by	03/11/2021
Date of Issue	03/11/2021

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

Results Approved By
Diego Bigolin, Inorganics Supervisor
Hannah Nguyen, Metals Supervisor
Steven Luong, Organics Supervisor

Authorised By

Nancy Zhang, Laboratory Manager

vTRH(C6-C10)/BTEXN in Soil						
Our Reference		281268-1	281268-2	281268-3	281268-4	281268-5
Your Reference	UNITS	211459-1	211459-2	211459-3	211459-4	211459-5
Date Sampled		22/10/2021	22/10/2021	22/10/2021	22/10/2021	22/10/2021
Type of sample		Soil	Soil	Soil	Soil	Soil
Date extracted	-	28/10/2021	28/10/2021	28/10/2021	28/10/2021	28/10/2021
Date analysed	-	29/10/2021	29/10/2021	29/10/2021	29/10/2021	29/10/2021
TRH C_6 - C_9	mg/kg	<25	<25	<25	<25	<25
TRH C_6 - C_{10}	mg/kg	<25	<25	<25	<25	<25
vTPH C_6 - C_{10} less BTEX (F1)	mg/kg	<25	<25	<25	<25	<25
Benzene	mg/kg	<0.2	<0.2	<0.2	<0.2	<0.2
Toluene	mg/kg	<0.5	<0.5	<0.5	<0.5	<0.5
Ethylbenzene	mg/kg	<1	<1	<1	<1	<1
m+p-xylene	mg/kg	<2	<2	<2	<2	<2
o-Xylene	mg/kg	<1	<1	<1	<1	<1
Naphthalene	mg/kg	<1	<1	<1	<1	<1
Total +ve Xylenes	mg/kg	<3	<3	<3	<3	<3
Surrogate aaa-Trifluorotoluene	%	91	90	97	85	83

vTRH(C6-C10)/BTEXN in Soil						
Our Reference		281268-6	281268-7	281268-8	281268-9	281268-10
Your Reference	UNITS	211459-6	211459-7	211459-8	211459-9	211459-10
Date Sampled		22/10/2021	22/10/2021	22/10/2021	22/10/2021	22/10/2021
Type of sample		Soil	Soil	Soil	Soil	Soil
Date extracted	-	28/10/2021	28/10/2021	28/10/2021	28/10/2021	28/10/2021
Date analysed	-	29/10/2021	29/10/2021	29/10/2021	29/10/2021	29/10/2021
TRH C_6 - C_9	mg/kg	<25	<25	<25	<25	<25
TRH C_6 - C_{10}	mg/kg	<25	<25	<25	<25	<25
vTPH C_6 - C_{10} less BTEX (F1)	mg/kg	<25	<25	<25	<25	<25
Benzene	mg/kg	<0.2	<0.2	<0.2	<0.2	<0.2
Toluene	mg/kg	<0.5	<0.5	<0.5	<0.5	<0.5
Ethylbenzene	mg/kg	<1	<1	<1	<1	<1
m+p-xylene	mg/kg	<2	<2	<2	<2	<2
o-Xylene	mg/kg	<1	<1	<1	<1	<1
Naphthalene	mg/kg	<1	<1	<1	<1	<1
Total +ve Xylenes	mg/kg	<3	<3	<3	<3	<3
Surrogate aaa-Trifluorotoluene	%	93	87	78	85	78

vTRH(C6-C10)/BTEXN in Soil						
Our Reference		281268-11	281268-12	281268-13	281268-14	281268-15
Your Reference	UNITS	211459-11	211459-12	211459-13	211459-14	211459-15
Date Sampled		22/10/2021	22/10/2021	22/10/2021	22/10/2021	22/10/2021
Type of sample		Soil	Soil	Soil	Soil	Soil
Date extracted	-	28/10/2021	28/10/2021	28/10/2021	28/10/2021	28/10/2021
Date analysed	-	29/10/2021	29/10/2021	29/10/2021	29/10/2021	29/10/2021
TRH C_6 - C_9	mg/kg	<25	<25	<25	<25	<25
TRH C_6 - C_{10}	mg/kg	<25	<25	<25	<25	<25
vTPH C_6 - C_{10} less BTEX (F1)	mg/kg	<25	<25	<25	<25	<25
Benzene	mg/kg	<0.2	<0.2	<0.2	<0.2	<0.2
Toluene	mg/kg	<0.5	<0.5	<0.5	<0.5	<0.5
Ethylbenzene	mg/kg	<1	<1	<1	<1	<1
m+p-xylene	mg/kg	<2	<2	<2	<2	<2
o-Xylene	mg/kg	<1	<1	<1	<1	<1
Naphthalene	mg/kg	<1	<1	<1	<1	<1
Total +ve Xylenes	mg/kg	<3	<3	<3	<3	<3
Surrogate aaa-Trifluorotoluene	%	80	94	74	87	90

vTRH(C6-C10)/BTEXN in Soil						
Our Reference		281268-16	281268-17	281268-18	281268-19	281268-20
Your Reference	UNITS	211459-16	211459-17	211459-18	211459-19	211459-20
Date Sampled		22/10/2021	22/10/2021	22/10/2021	22/10/2021	22/10/2021
Type of sample		Soil	Soil	Soil	Soil	Soil
Date extracted	-	28/10/2021	28/10/2021	28/10/2021	28/10/2021	28/10/2021
Date analysed	-	29/10/2021	29/10/2021	29/10/2021	29/10/2021	30/10/2021
TRH C_6 - C_9	mg/kg	<25	<25	<25	<25	<25
TRH C_6 - C_{10}	mg/kg	<25	<25	<25	<25	<25
vTPH C_6 - C_{10} less BTEX (F1)	mg/kg	<25	<25	<25	<25	<25
Benzene	mg/kg	<0.2	<0.2	<0.2	<0.2	<0.2
Toluene	mg/kg	<0.5	<0.5	<0.5	<0.5	<0.5
Ethylbenzene	mg/kg	<1	<1	<1	<1	<1
m+p-xylene	mg/kg	<2	<2	<2	<2	<2
o-Xylene	mg/kg	<1	<1	<1	<1	<1
Naphthalene	mg/kg	<1	<1	<1	<1	<1
Total +ve Xylenes	mg/kg	<3	<3	<3	<3	<3
Surrogate aaa-Trifluorotoluene	%	88	80	86	94	96

vTRH(C6-C10)/BTEXN in Soil						
Our Reference		281268-21	281268-22	281268-23	281268-24	281268-25
Your Reference	UNITS	211459-21	211459-22	211459-23	211459-24	211459-25
Date Sampled		22/10/2021	22/10/2021	22/10/2021	22/10/2021	22/10/2021
Type of sample		Soil	Soil	Soil	Soil	Soil
Date extracted	-	28/10/2021	28/10/2021	28/10/2021	28/10/2021	28/10/2021
Date analysed	-	30/10/2021	30/10/2021	30/10/2021	30/10/2021	30/10/2021
TRH C_6 - C_9	mg/kg	<25	<25	<25	<25	<25
TRH C_6 - C_{10}	mg/kg	<25	<25	<25	<25	<25
vTPH C_6 - C_{10} less BTEX (F1)	mg/kg	<25	<25	<25	<25	<25
Benzene	mg/kg	<0.2	<0.2	<0.2	<0.2	<0.2
Toluene	mg/kg	<0.5	<0.5	<0.5	<0.5	<0.5
Ethylbenzene	mg/kg	<1	<1	<1	<1	<1
m+p-xylene	mg/kg	<2	<2	<2	<2	<2
o-Xylene	mg/kg	<1	<1	<1	<1	<1
Naphthalene	mg/kg	<1	<1	<1	<1	<1
Total +ve Xylenes	mg/kg	<3	<3	<3	<3	<3
Surrogate aaa-Trifluorotoluene	%	89	85	89	88	85

vTRH(C6-C10)/BTEXN in Soil						
Our Reference		281268-26	281268-27	281268-28	281268-29	281268-30
Your Reference	UNITS	211459-26	211459-27	211459-28	211459-29	211459-30
Date Sampled		22/10/2021	22/10/2021	22/10/2021	22/10/2021	22/10/2021
Type of sample		Soil	Soil	Soil	Soil	Soil
Date extracted	-	28/10/2021	28/10/2021	28/10/2021	28/10/2021	28/10/2021
Date analysed	-	30/10/2021	30/10/2021	30/10/2021	30/10/2021	30/10/2021
TRH C_6 - C_9	mg/kg	<25	<25	<25	<25	<25
TRH C_6 - C_{10}	mg/kg	<25	<25	<25	<25	<25
vTPH C_6 - C_{10} less BTEX (F1)	mg/kg	<25	<25	<25	<25	<25
Benzene	mg/kg	<0.2	<0.2	<0.2	<0.2	<0.2
Toluene	mg/kg	<0.5	<0.5	<0.5	<0.5	<0.5
Ethylbenzene	mg/kg	<1	<1	<1	<1	<1
m+p-xylene	mg/kg	<2	<2	<2	<2	<2
o-Xylene	mg/kg	<1	<1	<1	<1	<1
Naphthalene	mg/kg	<1	<1	<1	<1	<1
Total +ve Xylenes	mg/kg	<3	<3	<3	<3	<3
Surrogate aaa-Trifluorotoluene	%	83	81	83	83	86

vTRH(C6-C10)/BTEXN in Soil			
Our Reference		281268-31	281268-32
Your Reference	UNITS	211459-31	211459-32
Date Sampled		22/10/2021	22/10/2021
Type of sample		Soil	Soil
Date extracted	-	28/10/2021	28/10/2021
Date analysed	-	30/10/2021	30/10/2021
TRH C_6 - C_9	mg/kg	<25	<25
TRH C_6 - C_{10}	mg/kg	<25	<25
vTPH C_6 - C_{10} less BTEX (F1)	mg/kg	<25	<25
Benzene	mg/kg	<0.2	<0.2
Toluene	mg/kg	<0.5	<0.5
Ethylbenzene	mg/kg	<1	<1
m+p-xylene	mg/kg	<2	<2
o-Xylene	mg/kg	<1	<1
Naphthalene	mg/kg	<1	<1
Total +ve Xylenes	mg/kg	<3	<3
Surrogate aaa-Trifluorotoluene	%	90	84

svTRH (C10-C40) in Soil						
Our Reference		281268-1	281268-2	281268-3	281268-4	281268-5
Your Reference	UNITS	211459-1	211459-2	211459-3	211459-4	211459-5
Date Sampled		22/10/2021	22/10/2021	22/10/2021	22/10/2021	22/10/2021
Type of sample		Soil	Soil	Soil	Soil	Soil
Date extracted	-	28/10/2021	28/10/2021	28/10/2021	28/10/2021	28/10/2021
Date analysed	-	28/10/2021	28/10/2021	28/10/2021	28/10/2021	28/10/2021
TRH C_{10} - C_{14}	mg/kg	<50	<50	<50	<50	<50
TRH C_{15} - C_{28}	mg/kg	<100	<100	<100	<100	<100
TRH C_{29} - C_{36}	mg/kg	<100	<100	<100	<100	<100
Total +ve TRH (C10-C36)	mg/kg	<50	<50	<50	<50	<50
TRH >C_{10} -C_{16}	mg/kg	<50	<50	<50	<50	<50
TRH >C_{10} - C_{16} less Naphthalene (F2)	mg/kg	<50	<50	<50	<50	<50
TRH >C_{16} -C_{34}	mg/kg	<100	<100	<100	<100	<100
TRH >C_{34} -C_{40}	mg/kg	<100	<100	<100	<100	<100
Total +ve TRH (>C10-C40)	mg/kg	<50	<50	<50	<50	<50
Surrogate o-Terphenyl	%	81	81	80	81	81

svTRH (C10-C40) in Soil						
Our Reference		281268-6	281268-7	281268-8	281268-9	281268-10
Your Reference	UNITS	211459-6	211459-7	211459-8	211459-9	211459-10
Date Sampled		22/10/2021	22/10/2021	22/10/2021	22/10/2021	22/10/2021
Type of sample		Soil	Soil	Soil	Soil	Soil
Date extracted	-	28/10/2021	28/10/2021	28/10/2021	28/10/2021	28/10/2021
Date analysed	-	28/10/2021	28/10/2021	28/10/2021	28/10/2021	28/10/2021
TRH C_{10} - C_{14}	mg/kg	<50	<50	<50	<50	<50
TRH C_{15} - C_{28}	mg/kg	<100	<100	<100	<100	<100
TRH C_{29} - C_{36}	mg/kg	<100	<100	<100	<100	<100
Total +ve TRH (C10-C36)	mg/kg	<50	<50	<50	<50	<50
TRH >C_{10} -C_{16}	mg/kg	<50	<50	<50	<50	<50
TRH >C_{10} - C_{16} less Naphthalene (F2)	mg/kg	<50	<50	<50	<50	<50
TRH >C_{16} -C_{34}	mg/kg	<100	<100	<100	<100	<100
TRH >C_{34} -C_{40}	mg/kg	<100	<100	<100	<100	<100
Total +ve TRH (>C10-C40)	mg/kg	<50	<50	<50	<50	<50
Surrogate o-Terphenyl	%	80	79	80	80	79

svTRH (C10-C40) in Soil						
Our Reference		281268-11	281268-12	281268-13	281268-14	281268-15
Your Reference	UNITS	211459-11	211459-12	211459-13	211459-14	211459-15
Date Sampled		22/10/2021	22/10/2021	22/10/2021	22/10/2021	22/10/2021
Type of sample		Soil	Soil	Soil	Soil	Soil
Date extracted	-	28/10/2021	28/10/2021	28/10/2021	28/10/2021	28/10/2021
Date analysed	-	28/10/2021	29/10/2021	29/10/2021	30/10/2021	30/10/2021
TRH C_{10} - C_{14}	mg/kg	<50	<50	<50	<50	<50
TRH C_{15} - C_{28}	mg/kg	<100	<100	<100	<100	<100
TRH C_{29} - C_{36}	mg/kg	<100	<100	<100	<100	<100
Total +ve TRH (C10-C36)	mg/kg	<50	<50	<50	<50	<50
TRH >C_{10} -C_{16}	mg/kg	<50	<50	<50	<50	<50
TRH >C_{10} - C_{16} less Naphthalene (F2)	mg/kg	<50	<50	<50	<50	<50
TRH >C_{16} -C_{34}	mg/kg	<100	<100	<100	<100	<100
TRH >C_{34} -C_{40}	mg/kg	<100	<100	<100	<100	<100
Total +ve TRH (>C10-C40)	mg/kg	<50	<50	<50	<50	<50
Surrogate o-Terphenyl	%	80	78	80	89	75

svTRH (C10-C40) in Soil						
Our Reference		281268-16	281268-17	281268-18	281268-19	281268-20
Your Reference	UNITS	211459-16	211459-17	211459-18	211459-19	211459-20
Date Sampled		22/10/2021	22/10/2021	22/10/2021	22/10/2021	22/10/2021
Type of sample		Soil	Soil	Soil	Soil	Soil
Date extracted	-	28/10/2021	28/10/2021	28/10/2021	28/10/2021	28/10/2021
Date analysed	-	30/10/2021	30/10/2021	30/10/2021	30/10/2021	28/10/2021
TRH C_{10} - C_{14}	mg/kg	<50	<50	<50	<50	<50
TRH C_{15} - C_{28}	mg/kg	<100	<100	<100	<100	<100
TRH C_{29} - C_{36}	mg/kg	<100	<100	<100	<100	<100
Total +ve TRH (C10-C36)	mg/kg	<50	<50	<50	<50	<50
TRH >C_{10} -C_{16}	mg/kg	<50	<50	<50	<50	<50
TRH >C_{10} - C_{16} less Naphthalene (F2)	mg/kg	<50	<50	<50	<50	<50
TRH >C_{16} -C_{34}	mg/kg	<100	<100	<100	<100	<100
TRH >C_{34} -C_{40}	mg/kg	<100	<100	<100	<100	<100
Total +ve TRH (>C10-C40)	mg/kg	<50	<50	<50	<50	<50
Surrogate o-Terphenyl	%	75	75	77	78	80

svTRH (C10-C40) in Soil						
Our Reference		281268-21	281268-22	281268-23	281268-24	281268-25
Your Reference	UNITS	211459-21	211459-22	211459-23	211459-24	211459-25
Date Sampled		22/10/2021	22/10/2021	22/10/2021	22/10/2021	22/10/2021
Type of sample		Soil	Soil	Soil	Soil	Soil
Date extracted	-	28/10/2021	28/10/2021	28/10/2021	28/10/2021	28/10/2021
Date analysed	-	28/10/2021	28/10/2021	28/10/2021	28/10/2021	28/10/2021
TRH C_{10} - C_{14}	mg/kg	<50	<50	<50	<50	<50
TRH C_{15} - C_{28}	mg/kg	<100	<100	<100	<100	<100
TRH C_{29} - C_{36}	mg/kg	<100	<100	<100	<100	<100
Total +ve TRH (C10-C36)	mg/kg	<50	<50	<50	<50	<50
TRH >C_{10} -C_{16}	mg/kg	<50	<50	<50	<50	<50
TRH >C_{10} - C_{16} less Naphthalene (F2)	mg/kg	<50	<50	<50	<50	<50
TRH >C_{16} -C_{34}	mg/kg	<100	<100	<100	<100	<100
TRH >C_{34} -C_{40}	mg/kg	<100	<100	<100	<100	<100
Total +ve TRH (>C10-C40)	mg/kg	<50	<50	<50	<50	<50
Surrogate o-Terphenyl	%	82	81	82	81	80

svTRH (C10-C40) in Soil						
Our Reference		281268-26	281268-27	281268-28	281268-29	281268-30
Your Reference	UNITS	211459-26	211459-27	211459-28	211459-29	211459-30
Date Sampled		22/10/2021	22/10/2021	22/10/2021	22/10/2021	22/10/2021
Type of sample		Soil	Soil	Soil	Soil	Soil
Date extracted	-	28/10/2021	28/10/2021	28/10/2021	28/10/2021	28/10/2021
Date analysed	-	28/10/2021	28/10/2021	28/10/2021	28/10/2021	28/10/2021
TRH C_{10} - C_{14}	mg/kg	<50	<50	<50	<50	<50
TRH C_{15} - C_{28}	mg/kg	<100	<100	<100	<100	<100
TRH C_{29} - C_{36}	mg/kg	<100	<100	<100	<100	<100
Total +ve TRH (C10-C36)	mg/kg	<50	<50	<50	<50	<50
TRH >C_{10} -C_{16}	mg/kg	<50	<50	<50	<50	<50
TRH >C_{10} - C_{16} less Naphthalene (F2)	mg/kg	<50	<50	<50	<50	<50
TRH >C_{16} -C_{34}	mg/kg	<100	<100	<100	<100	<100
TRH >C_{34} -C_{40}	mg/kg	<100	<100	<100	<100	<100
Total +ve TRH (>C10-C40)	mg/kg	<50	<50	<50	<50	<50
Surrogate o-Terphenyl	%	95	82	80	79	81

svTRH (C10-C40) in Soil			
Our Reference		281268-31	281268-32
Your Reference	UNITS	211459-31	211459-32
Date Sampled		22/10/2021	22/10/2021
Type of sample		Soil	Soil
Date extracted	-	28/10/2021	28/10/2021
Date analysed	-	29/10/2021	29/10/2021
TRH C_{10} - C_{14}	mg/kg	<50	<50
TRH C_{15} - C_{28}	mg/kg	<100	<100
TRH C_{29} - C_{36}	mg/kg	<100	<100
Total +ve TRH (C10-C36)	mg/kg	<50	<50
TRH >C_{10} -C_{16}	mg/kg	<50	<50
TRH >C_{10} - C_{16} less Naphthalene (F2)	mg/kg	<50	<50
TRH >C_{16} -C_{34}	mg/kg	<100	<100
TRH >C_{34} -C_{40}	mg/kg	<100	<100
Total +ve TRH (>C10-C40)	mg/kg	<50	<50
Surrogate o-Terphenyl	%	80	79

PAHs in Soil						
Our Reference		281268-19	281268-20	281268-21	281268-29	281268-30
Your Reference	UNITS	211459-19	211459-20	211459-21	211459-29	211459-30
Date Sampled		22/10/2021	22/10/2021	22/10/2021	22/10/2021	22/10/2021
Type of sample		Soil	Soil	Soil	Soil	Soil
Date extracted	-	28/10/2021	28/10/2021	28/10/2021	28/10/2021	28/10/2021
Date analysed	-	29/10/2021	29/10/2021	29/10/2021	29/10/2021	29/10/2021
Naphthalene	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Acenaphthylene	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Acenaphthene	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Fluorene	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Phenanthrene	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Anthracene	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Fluoranthene	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Pyrene	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Benzo(a)anthracene	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Chrysene	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Benzo(b,j+k)fluoranthene	mg/kg	<0.2	<0.2	<0.2	<0.2	<0.2
Benzo(a)pyrene	mg/kg	<0.05	<0.05	<0.05	<0.05	<0.05
Indeno(1,2,3-c,d)pyrene	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Dibenzo(a,h)anthracene	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Benzo(g,h,i)perylene	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Total +ve PAH's	mg/kg	<0.05	<0.05	<0.05	<0.05	<0.05
Benzo(a)pyrene TEQ calc (zero)	mg/kg	<0.5	<0.5	<0.5	<0.5	<0.5
Benzo(a)pyrene TEQ calc(half)	mg/kg	<0.5	<0.5	<0.5	<0.5	<0.5
Benzo(a)pyrene TEQ calc(PQL)	mg/kg	<0.5	<0.5	<0.5	<0.5	<0.5
Surrogate p-Terphenyl-d14	%	111	118	118	107	108

PAHs in Soil			
Our Reference		281268-31	281268-32
Your Reference	UNITS	211459-31	211459-32
Date Sampled		22/10/2021	22/10/2021
Type of sample		Soil	Soil
Date extracted	-	28/10/2021	28/10/2021
Date analysed	-	29/10/2021	29/10/2021
Naphthalene	mg/kg	<0.1	<0.1
Acenaphthylene	mg/kg	<0.1	<0.1
Acenaphthene	mg/kg	<0.1	<0.1
Fluorene	mg/kg	<0.1	<0.1
Phenanthrene	mg/kg	<0.1	<0.1
Anthracene	mg/kg	<0.1	<0.1
Fluoranthene	mg/kg	<0.1	<0.1
Pyrene	mg/kg	<0.1	<0.1
Benzo(a)anthracene	mg/kg	<0.1	<0.1
Chrysene	mg/kg	<0.1	<0.1
Benzo(b,j+k)fluoranthene	mg/kg	<0.2	<0.2
Benzo(a)pyrene	mg/kg	<0.05	<0.05
Indeno(1,2,3-c,d)pyrene	mg/kg	<0.1	<0.1
Dibenzo(a,h)anthracene	mg/kg	<0.1	<0.1
Benzo(g,h,i)perylene	mg/kg	<0.1	<0.1
Total +ve PAH's	mg/kg	<0.05	<0.05
Benzo(a)pyrene TEQ calc (zero)	mg/kg	<0.5	<0.5
Benzo(a)pyrene TEQ calc(half)	mg/kg	<0.5	<0.5
Benzo(a)pyrene TEQ calc(PQL)	mg/kg	<0.5	<0.5
Surrogate p-Terphenyl-d14	%	111	109

Acid Extractable metals in soil						
Our Reference		281268-1	281268-2	281268-3	281268-4	281268-5
Your Reference	UNITS	211459-1	211459-2	211459-3	211459-4	211459-5
Date Sampled		22/10/2021	22/10/2021	22/10/2021	22/10/2021	22/10/2021
Type of sample		Soil	Soil	Soil	Soil	Soil
Date prepared	-	28/10/2021	28/10/2021	28/10/2021	28/10/2021	28/10/2021
Date analysed	-	02/11/2021	02/11/2021	02/11/2021	02/11/2021	02/11/2021
Lead	mg/kg	14	13	15	11	13

Acid Extractable metals in soil						
Our Reference		281268-6	281268-7	281268-8	281268-9	281268-10
Your Reference	UNITS	211459-6	211459-7	211459-8	211459-9	211459-10
Date Sampled		22/10/2021	22/10/2021	22/10/2021	22/10/2021	22/10/2021
Type of sample		Soil	Soil	Soil	Soil	Soil
Date prepared	-	28/10/2021	28/10/2021	28/10/2021	28/10/2021	28/10/2021
Date analysed	-	02/11/2021	02/11/2021	02/11/2021	02/11/2021	02/11/2021
Lead	mg/kg	15	11	8	14	10

Acid Extractable metals in soil						
Our Reference		281268-11	281268-12	281268-13	281268-14	281268-15
Your Reference	UNITS	211459-11	211459-12	211459-13	211459-14	211459-15
Date Sampled		22/10/2021	22/10/2021	22/10/2021	22/10/2021	22/10/2021
Type of sample		Soil	Soil	Soil	Soil	Soil
Date prepared	-	28/10/2021	28/10/2021	28/10/2021	28/10/2021	28/10/2021
Date analysed	-	02/11/2021	02/11/2021	02/11/2021	02/11/2021	02/11/2021
Lead	mg/kg	11	14	16	14	14

Acid Extractable metals in soil						
Our Reference		281268-16	281268-17	281268-18	281268-19	281268-20
Your Reference	UNITS	211459-16	211459-17	211459-18	211459-19	211459-20
Date Sampled		22/10/2021	22/10/2021	22/10/2021	22/10/2021	22/10/2021
Type of sample		Soil	Soil	Soil	Soil	Soil
Date prepared	-	28/10/2021	28/10/2021	28/10/2021	28/10/2021	28/10/2021
Date analysed	-	02/11/2021	02/11/2021	02/11/2021	02/11/2021	02/11/2021
Arsenic	mg/kg	[NA]	[NA]	[NA]	<4	<4
Cadmium	mg/kg	[NA]	[NA]	[NA]	<0.4	<0.4
Chromium	mg/kg	[NA]	[NA]	[NA]	25	25
Copper	mg/kg	[NA]	[NA]	[NA]	10	7
Lead	mg/kg	12	11	12	11	10
Mercury	mg/kg	[NA]	[NA]	[NA]	<0.1	<0.1
Nickel	mg/kg	[NA]	[NA]	[NA]	18	13
Zinc	mg/kg	[NA]	[NA]	[NA]	21	18

Acid Extractable metals in soil						
Our Reference		281268-21	281268-22	281268-23	281268-24	281268-25
Your Reference	UNITS	211459-21	211459-22	211459-23	211459-24	211459-25
Date Sampled		22/10/2021	22/10/2021	22/10/2021	22/10/2021	22/10/2021
Type of sample		Soil	Soil	Soil	Soil	Soil
Date prepared	-	28/10/2021	28/10/2021	28/10/2021	28/10/2021	28/10/2021
Date analysed	-	02/11/2021	02/11/2021	02/11/2021	02/11/2021	02/11/2021
Arsenic	mg/kg	4	[NA]	[NA]	[NA]	[NA]
Cadmium	mg/kg	<0.4	[NA]	[NA]	[NA]	[NA]
Chromium	mg/kg	21	[NA]	[NA]	[NA]	[NA]
Copper	mg/kg	17	[NA]	[NA]	[NA]	[NA]
Lead	mg/kg	14	12	11	11	15
Mercury	mg/kg	<0.1	[NA]	[NA]	[NA]	[NA]
Nickel	mg/kg	23	[NA]	[NA]	[NA]	[NA]
Zinc	mg/kg	29	[NA]	[NA]	[NA]	[NA]

Acid Extractable metals in soil						
Our Reference		281268-26	281268-27	281268-28	281268-29	281268-30
Your Reference	UNITS	211459-26	211459-27	211459-28	211459-29	211459-30
Date Sampled		22/10/2021	22/10/2021	22/10/2021	22/10/2021	22/10/2021
Type of sample		Soil	Soil	Soil	Soil	Soil
Date prepared	-	28/10/2021	28/10/2021	28/10/2021	28/10/2021	28/10/2021
Date analysed	-	02/11/2021	02/11/2021	02/11/2021	02/11/2021	02/11/2021
Arsenic	mg/kg	[NA]	[NA]	[NA]	<4	<4
Cadmium	mg/kg	[NA]	[NA]	[NA]	<0.4	<0.4
Chromium	mg/kg	[NA]	[NA]	[NA]	24	17
Copper	mg/kg	[NA]	[NA]	[NA]	9	8
Lead	mg/kg	11	12	12	11	9
Mercury	mg/kg	[NA]	[NA]	[NA]	<0.1	<0.1
Nickel	mg/kg	[NA]	[NA]	[NA]	17	12
Zinc	mg/kg	[NA]	[NA]	[NA]	18	14

Acid Extractable metals in soil			
Our Reference		281268-31	281268-32
Your Reference	UNITS	211459-31	211459-32
Date Sampled		22/10/2021	22/10/2021
Type of sample		Soil	Soil
Date prepared	-	28/10/2021	28/10/2021
Date analysed	-	02/11/2021	02/11/2021
Arsenic	mg/kg	<4	<4
Cadmium	mg/kg	<0.4	<0.4
Chromium	mg/kg	26	17
Copper	mg/kg	6	7
Lead	mg/kg	8	8
Mercury	mg/kg	<0.1	<0.1
Nickel	mg/kg	10	8
Zinc	mg/kg	14	14

Misc Soil - Inorg						
Our Reference		281268-19	281268-20	281268-21	281268-29	281268-30
Your Reference	UNITS	211459-19	211459-20	211459-21	211459-29	211459-30
Date Sampled		22/10/2021	22/10/2021	22/10/2021	22/10/2021	22/10/2021
Type of sample		Soil	Soil	Soil	Soil	Soil
Date prepared	-	28/10/2021	28/10/2021	28/10/2021	28/10/2021	28/10/2021
Date analysed	-	28/10/2021	28/10/2021	28/10/2021	28/10/2021	28/10/2021
Total Phenolics (as Phenol)	mg/kg	<5	<5	<5	<5	<5

Misc Soil - Inorg			
Our Reference		281268-31	281268-32
Your Reference	UNITS	211459-31	211459-32
Date Sampled		22/10/2021	22/10/2021
Type of sample		Soil	Soil
Date prepared	-	28/10/2021	28/10/2021
Date analysed	-	28/10/2021	28/10/2021
Total Phenolics (as Phenol)	mg/kg	<5	<5

Moisture						
Our Reference		281268-1	281268-2	281268-3	281268-4	281268-5
Your Reference	UNITS	211459-1	211459-2	211459-3	211459-4	211459-5
Date Sampled		22/10/2021	22/10/2021	22/10/2021	22/10/2021	22/10/2021
Type of sample		Soil	Soil	Soil	Soil	Soil
Date prepared	-	28/10/2021	28/10/2021	28/10/2021	28/10/2021	28/10/2021
Date analysed	-	28/10/2021	28/10/2021	28/10/2021	28/10/2021	28/10/2021
Moisture	%	8.5	7.8	7.6	11	9.9

Moisture						
Our Reference		281268-6	281268-7	281268-8	281268-9	281268-10
Your Reference	UNITS	211459-6	211459-7	211459-8	211459-9	211459-10
Date Sampled		22/10/2021	22/10/2021	22/10/2021	22/10/2021	22/10/2021
Type of sample		Soil	Soil	Soil	Soil	Soil
Date prepared	-	28/10/2021	28/10/2021	28/10/2021	28/10/2021	28/10/2021
Date analysed	-	28/10/2021	28/10/2021	28/10/2021	28/10/2021	28/10/2021
Moisture	%	9.7	8.6	5.4	11	9.2

Moisture						
Our Reference		281268-11	281268-12	281268-13	281268-14	281268-15
Your Reference	UNITS	211459-11	211459-12	211459-13	211459-14	211459-15
Date Sampled		22/10/2021	22/10/2021	22/10/2021	22/10/2021	22/10/2021
Type of sample		Soil	Soil	Soil	Soil	Soil
Date prepared	-	28/10/2021	28/10/2021	28/10/2021	28/10/2021	28/10/2021
Date analysed	-	28/10/2021	28/10/2021	28/10/2021	28/10/2021	28/10/2021
Moisture	%	9.8	11	13	5.0	10

Moisture						
Our Reference		281268-16	281268-17	281268-18	281268-19	281268-20
Your Reference	UNITS	211459-16	211459-17	211459-18	211459-19	211459-20
Date Sampled		22/10/2021	22/10/2021	22/10/2021	22/10/2021	22/10/2021
Type of sample		Soil	Soil	Soil	Soil	Soil
Date prepared	-	28/10/2021	28/10/2021	28/10/2021	28/10/2021	28/10/2021
Date analysed	-	28/10/2021	28/10/2021	28/10/2021	28/10/2021	28/10/2021
Moisture	%	13	9.9	8.0	8.9	8.1

Moisture						
Our Reference		281268-21	281268-22	281268-23	281268-24	281268-25
Your Reference	UNITS	211459-21	211459-22	211459-23	211459-24	211459-25
Date Sampled		22/10/2021	22/10/2021	22/10/2021	22/10/2021	22/10/2021
Type of sample		Soil	Soil	Soil	Soil	Soil
Date prepared	-	28/10/2021	28/10/2021	28/10/2021	28/10/2021	28/10/2021
Date analysed	-	28/10/2021	28/10/2021	28/10/2021	28/10/2021	28/10/2021
Moisture	%	15	14	8.7	10	12

Moisture						
Our Reference		281268-26	281268-27	281268-28	281268-29	281268-30
Your Reference	UNITS	211459-26	211459-27	211459-28	211459-29	211459-30
Date Sampled		22/10/2021	22/10/2021	22/10/2021	22/10/2021	22/10/2021
Type of sample		Soil	Soil	Soil	Soil	Soil
Date prepared	-	28/10/2021	28/10/2021	28/10/2021	28/10/2021	28/10/2021
Date analysed	-	28/10/2021	28/10/2021	28/10/2021	28/10/2021	28/10/2021
Moisture	%	11	6.0	8.7	12	14

Moisture			
Our Reference		281268-31	281268-32
Your Reference	UNITS	211459-31	211459-32
Date Sampled		22/10/2021	22/10/2021
Type of sample		Soil	Soil
Date prepared	-	28/10/2021	28/10/2021
Date analysed	-	28/10/2021	28/10/2021
Moisture	%	8.2	7.9

Method ID	Methodology Summary
Inorg-008	Moisture content determined by heating at 105+/-5 °C for a minimum of 12 hours.
Inorg-031	Total Phenolics by segmented flow analyser (in line distillation with colourimetric finish). Solids are extracted in a caustic media prior to analysis.
Metals-020	Determination of various metals by ICP-AES.
Metals-021	Determination of Mercury by Cold Vapour AAS.
Org-020	Soil samples are extracted with Dichloromethane/Acetone and waters with Dichloromethane and analysed by GC-FID. F2 = (>C10-C16)-Naphthalene as per NEPM B1 Guideline on Investigation Levels for Soil and Groundwater (HSLs Tables 1A (3, 4)). Note Naphthalene is determined from the VOC analysis.
Org-020	Soil samples are extracted with Dichloromethane/Acetone and waters with Dichloromethane and analysed by GC-FID. F2 = (>C10-C16)-Naphthalene as per NEPM B1 Guideline on Investigation Levels for Soil and Groundwater (HSLs Tables 1A (3, 4)). Note Naphthalene is determined from the VOC analysis. Note, the Total +ve TRH PQL is reflective of the lowest individual PQL and is therefore "Total +ve TRH" is simply a sum of the positive individual TRH fractions (>C10-C40).
Org-022/025	Soil samples are extracted with Dichloromethane/Acetone and waters with Dichloromethane and analysed by GC-MS and/or GC-MS/MS. Benzo(a)pyrene TEQ as per NEPM B1 Guideline on Investigation Levels for Soil and Groundwater - 2013. For soil results:- 1. 'EQ PQL'values are assuming all contributing PAHs reported as <PQL are actually at the PQL. This is the most conservative approach and can give false positive TEQs given that PAHs that contribute to the TEQ calculation may not be present. 2. 'EQ zero'values are assuming all contributing PAHs reported as <PQL are zero. This is the least conservative approach and is more susceptible to false negative TEQs when PAHs that contribute to the TEQ calculation are present but below PQL. 3. 'EQ half PQL'values are assuming all contributing PAHs reported as <PQL are half the stipulated PQL. Hence a mid-point between the most and least conservative approaches above. Note, the Total +ve PAHs PQL is reflective of the lowest individual PQL and is therefore "Total +ve PAHs" is simply a sum of the positive individual PAHs.
Org-023	Soil samples are extracted with methanol and spiked into water prior to analysing by purge and trap GC-MS.
Org-023	Soil samples are extracted with methanol and spiked into water prior to analysing by purge and trap GC-MS. Water samples are analysed directly by purge and trap GC-MS. F1 = (C6-C10)-BTEX as per NEPM B1 Guideline on Investigation Levels for Soil and Groundwater.

Method ID	Methodology Summary
Org-023	Soil samples are extracted with methanol and spiked into water prior to analysing by purge and trap GC-MS. Water samples are analysed directly by purge and trap GC-MS. F1 = (C6-C10)-BTEX as per NEPM B1 Guideline on Investigation Levels for Soil and Groundwater. Note, the Total +ve Xylene PQL is reflective of the lowest individual PQL and is therefore "Total +ve Xylenes" is simply a sum of the positive individual Xylenes.

QUALITY CONTROL: vTRH(C6-C10)/BTEXN in Soil						Duplicate			Spike Recovery %	
Test Description	Units	PQL	Method	Blank	#	Base	Dup.	RPD	LCS-4	281268-2
Date extracted	-			28/10/2021	1	28/10/2021	28/10/2021		28/10/2021	28/10/2021
Date analysed	-			29/10/2021	1	29/10/2021	29/10/2021		29/10/2021	29/10/2021
TRH C_6 - C_9	mg/kg	25	Org-023	<25	1	<25	<25	0	93	92
TRH C_6 - C_{10}	mg/kg	25	Org-023	<25	1	<25	<25	0	93	92
Benzene	mg/kg	0.2	Org-023	<0.2	1	<0.2	<0.2	0	75	75
Toluene	mg/kg	0.5	Org-023	<0.5	1	<0.5	<0.5	0	84	82
Ethylbenzene	mg/kg	1	Org-023	<1	1	<1	<1	0	104	103
m+p-xylene	mg/kg	2	Org-023	<2	1	<2	<2	0	100	99
o-Xylene	mg/kg	1	Org-023	<1	1	<1	<1	0	95	94
Naphthalene	mg/kg	1	Org-023	<1	1	<1	<1	0	[NT]	[NT]
Surrogate aaa-Trifluorotoluene	%		Org-023	94	1	91	98	7	91	90

QUALITY CONTROL: vTRH(C6-C10)/BTEXN in Soil						Duplicate			Spike Recovery %	
Test Description	Units	PQL	Method	Blank	#	Base	Dup.	RPD	LCS-5	281268-21
Date extracted	-			[NT]	11	28/10/2021	28/10/2021		28/10/2021	28/10/2021
Date analysed	-			[NT]	11	29/10/2021	29/10/2021		30/10/2021	30/10/2021
TRH C_6 - C_9	mg/kg	25	Org-023	[NT]	11	<25	<25	0	101	83
TRH C_6 - C_{10}	mg/kg	25	Org-023	[NT]	11	<25	<25	0	101	83
Benzene	mg/kg	0.2	Org-023	[NT]	11	<0.2	<0.2	0	80	69
Toluene	mg/kg	0.5	Org-023	[NT]	11	<0.5	<0.5	0	89	76
Ethylbenzene	mg/kg	1	Org-023	[NT]	11	<1	<1	0	115	93
m+p-xylene	mg/kg	2	Org-023	[NT]	11	<2	<2	0	111	89
o-Xylene	mg/kg	1	Org-023	[NT]	11	<1	<1	0	105	84
Naphthalene	mg/kg	1	Org-023	[NT]	11	<1	<1	0	[NT]	[NT]
Surrogate aaa-Trifluorotoluene	%		Org-023	[NT]	11	80	84	5	90	81

QUALITY CONTROL: vTRH(C6-C10)/BTEXN in Soil						Duplicate			Spike Recovery %	
Test Description	Units	PQL	Method	Blank	#	Base	Dup.	RPD	[NT]	[NT]
Date extracted	-			[NT]	20	28/10/2021	28/10/2021		[NT]	[NT]
Date analysed	-			[NT]	20	30/10/2021	30/10/2021		[NT]	[NT]
TRH C_6 - C_9	mg/kg	25	Org-023	[NT]	20	<25	<25	0	[NT]	[NT]
TRH C_6 - C_{10}	mg/kg	25	Org-023	[NT]	20	<25	<25	0	[NT]	[NT]
Benzene	mg/kg	0.2	Org-023	[NT]	20	<0.2	<0.2	0	[NT]	[NT]
Toluene	mg/kg	0.5	Org-023	[NT]	20	<0.5	<0.5	0	[NT]	[NT]
Ethylbenzene	mg/kg	1	Org-023	[NT]	20	<1	<1	0	[NT]	[NT]
m+p-xylene	mg/kg	2	Org-023	[NT]	20	<2	<2	0	[NT]	[NT]
o-Xylene	mg/kg	1	Org-023	[NT]	20	<1	<1	0	[NT]	[NT]
Naphthalene	mg/kg	1	Org-023	[NT]	20	<1	<1	0	[NT]	[NT]
Surrogate aaa-Trifluorotoluene	%		Org-023	[NT]	20	96	82	16	[NT]	[NT]

QUALITY CONTROL: svTRH (C10-C40) in Soil						Duplicate			Spike Recovery %	
Test Description	Units	PQL	Method	Blank	#	Base	Dup.	RPD	LCS-4	281268-2
Date extracted	-			28/10/2021	1	28/10/2021	28/10/2021		28/10/2021	28/10/2021
Date analysed	-			28/10/2021	1	28/10/2021	28/10/2021		28/10/2021	28/10/2021
TRH C_{10} - C_{14}	mg/kg	50	Org-020	<50	1	<50	<50	0	107	103
TRH C_{15} - C_{28}	mg/kg	100	Org-020	<100	1	<100	<100	0	105	106
TRH C_{29} - C_{36}	mg/kg	100	Org-020	<100	1	<100	<100	0	109	100
TRH >C_{10} -C_{16}	mg/kg	50	Org-020	<50	1	<50	<50	0	107	103
TRH >C_{16} -C_{34}	mg/kg	100	Org-020	<100	1	<100	<100	0	105	106
TRH >C_{34} -C_{40}	mg/kg	100	Org-020	<100	1	<100	<100	0	109	100
Surrogate o-Terphenyl	%		Org-020	82	1	81	81	0	108	81

QUALITY CONTROL: svTRH (C10-C40) in Soil						Duplicate			Spike Recovery %	
Test Description	Units	PQL	Method	Blank	#	Base	Dup.	RPD	LCS-5	281268-21
Date extracted	-			[NT]	11	28/10/2021	28/10/2021		28/10/2021	28/10/2021
Date analysed	-			[NT]	11	28/10/2021	29/10/2021		28/10/2021	28/10/2021
TRH C_{10} - C_{14}	mg/kg	50	Org-020	[NT]	11	<50	<50	0	107	117
TRH C_{15} - C_{28}	mg/kg	100	Org-020	[NT]	11	<100	<100	0	108	118
TRH C_{29} - C_{36}	mg/kg	100	Org-020	[NT]	11	<100	<100	0	109	115
TRH >C_{10} -C_{16}	mg/kg	50	Org-020	[NT]	11	<50	<50	0	107	117
TRH >C_{16} -C_{34}	mg/kg	100	Org-020	[NT]	11	<100	<100	0	108	118
TRH >C_{34} -C_{40}	mg/kg	100	Org-020	[NT]	11	<100	<100	0	109	115
Surrogate o-Terphenyl	%		Org-020	[NT]	11	80	79	1	107	82

QUALITY CONTROL: svTRH (C10-C40) in Soil						Duplicate			Spike Recovery %	
Test Description	Units	PQL	Method	Blank	#	Base	Dup.	RPD	[NT]	[NT]
Date extracted	-			[NT]	20	28/10/2021	28/10/2021		[NT]	[NT]
Date analysed	-			[NT]	20	28/10/2021	28/10/2021		[NT]	[NT]
TRH C_{10} - C_{14}	mg/kg	50	Org-020	[NT]	20	<50	<50	0	[NT]	[NT]
TRH C_{15} - C_{28}	mg/kg	100	Org-020	[NT]	20	<100	<100	0	[NT]	[NT]
TRH C_{29} - C_{36}	mg/kg	100	Org-020	[NT]	20	<100	<100	0	[NT]	[NT]
TRH >C_{10} -C_{16}	mg/kg	50	Org-020	[NT]	20	<50	<50	0	[NT]	[NT]
TRH >C_{16} -C_{34}	mg/kg	100	Org-020	[NT]	20	<100	<100	0	[NT]	[NT]
TRH >C_{34} -C_{40}	mg/kg	100	Org-020	[NT]	20	<100	<100	0	[NT]	[NT]
Surrogate o-Terphenyl	%		Org-020	[NT]	20	80	83	4	[NT]	[NT]

QUALITY CONTROL: PAHs in Soil						Duplicate			Spike Recovery %	
Test Description	Units	PQL	Method	Blank	#	Base	Dup.	RPD	LCS-4	281268-21
Date extracted	-			28/10/2021	20	28/10/2021	28/10/2021		28/10/2021	28/10/2021
Date analysed	-			29/10/2021	20	29/10/2021	29/10/2021		29/10/2021	29/10/2021
Naphthalene	mg/kg	0.1	Org-022/025	<0.1	20	<0.1	<0.1	0	113	109
Acenaphthylene	mg/kg	0.1	Org-022/025	<0.1	20	<0.1	<0.1	0	[NT]	[NT]
Acenaphthene	mg/kg	0.1	Org-022/025	<0.1	20	<0.1	<0.1	0	111	107
Fluorene	mg/kg	0.1	Org-022/025	<0.1	20	<0.1	<0.1	0	114	109
Phenanthrene	mg/kg	0.1	Org-022/025	<0.1	20	<0.1	<0.1	0	124	118
Anthracene	mg/kg	0.1	Org-022/025	<0.1	20	<0.1	<0.1	0	[NT]	[NT]
Fluoranthene	mg/kg	0.1	Org-022/025	<0.1	20	<0.1	<0.1	0	108	106
Pyrene	mg/kg	0.1	Org-022/025	<0.1	20	<0.1	<0.1	0	109	107
Benzo(a)anthracene	mg/kg	0.1	Org-022/025	<0.1	20	<0.1	<0.1	0	[NT]	[NT]
Chrysene	mg/kg	0.1	Org-022/025	<0.1	20	<0.1	<0.1	0	113	105
Benzo(b,j+k)fluoranthene	mg/kg	0.2	Org-022/025	<0.2	20	<0.2	<0.2	0	[NT]	[NT]
Benzo(a)pyrene	mg/kg	0.05	Org-022/025	<0.05	20	<0.05	<0.05	0	124	120
Indeno(1,2,3-c,d)pyrene	mg/kg	0.1	Org-022/025	<0.1	20	<0.1	<0.1	0	[NT]	[NT]
Dibenzo(a,h)anthracene	mg/kg	0.1	Org-022/025	<0.1	20	<0.1	<0.1	0	[NT]	[NT]
Benzo(g,h,i)perylene	mg/kg	0.1	Org-022/025	<0.1	20	<0.1	<0.1	0	[NT]	[NT]
Surrogate p-Terphenyl-d14	%		Org-022/025	115	20	118	119	1	114	109

QUALITY CONTROL: Acid Extractable metals in soil						Duplicate			Spike Recovery %	
Test Description	Units	PQL	Method	Blank	#	Base	Dup.	RPD	LCS-5	281268-2
Date prepared	-			28/10/2021	1	28/10/2021	28/10/2021		28/10/2021	28/10/2021
Date analysed	-			02/11/2021	1	02/11/2021	02/11/2021		02/11/2021	02/11/2021
Arsenic	mg/kg	4	Metals-020	<4	20	<4	<4	0	106	[NT]
Cadmium	mg/kg	0.4	Metals-020	<0.4	20	<0.4	<0.4	0	104	[NT]
Chromium	mg/kg	1	Metals-020	<1	20	25	26	4	107	[NT]
Copper	mg/kg	1	Metals-020	<1	20	7	8	13	108	[NT]
Lead	mg/kg	1	Metals-020	<1	1	14	12	15	108	93
Mercury	mg/kg	0.1	Metals-021	<0.1	20	<0.1	<0.1	0	101	[NT]
Nickel	mg/kg	1	Metals-020	<1	20	13	14	7	107	[NT]
Zinc	mg/kg	1	Metals-020	<1	20	18	17	6	105	[NT]

QUALITY CONTROL: Acid Extractable metals in soil						Duplicate			Spike Recovery %	
Test Description	Units	PQL	Method	Blank	#	Base	Dup.	RPD	LCS-6	281268-21
Date prepared	-			[NT]	11	28/10/2021	28/10/2021		28/10/2021	28/10/2021
Date analysed	-			[NT]	11	02/11/2021	02/11/2021		02/11/2021	02/11/2021
Lead	mg/kg	1	Metals-020	[NT]	11	11	11	0	113	94
Arsenic	mg/kg	4	Metals-020	[NT]	[NT]	[NT]	[NT]	[NT]	105	94
Cadmium	mg/kg	0.4	Metals-020	[NT]	[NT]	[NT]	[NT]	[NT]	105	90
Chromium	mg/kg	1	Metals-020	[NT]	[NT]	[NT]	[NT]	[NT]	109	101
Copper	mg/kg	1	Metals-020	[NT]	[NT]	[NT]	[NT]	[NT]	109	109
Mercury	mg/kg	0.1	Metals-021	[NT]	[NT]	[NT]	[NT]	[NT]	107	104
Nickel	mg/kg	1	Metals-020	[NT]	[NT]	[NT]	[NT]	[NT]	110	94
Zinc	mg/kg	1	Metals-020	[NT]	[NT]	[NT]	[NT]	[NT]	107	92

QUALITY CONTROL: Acid Extractable metals in soil						Duplicate			Spike Recovery %	
Test Description	Units	PQL	Method	Blank	#	Base	Dup.	RPD	[NT]	[NT]
Date prepared	-			[NT]	20	28/10/2021	28/10/2021		[NT]	[NT]
Date analysed	-			[NT]	20	02/11/2021	02/11/2021		[NT]	[NT]
Lead	mg/kg	1	Metals-020	[NT]	20	10	10	0	[NT]	[NT]

QUALITY CONTROL: Misc Soil - Inorg						Duplicate			Spike Recovery %	
Test Description	Units	PQL	Method	Blank	#	Base	Dup.	RPD	LCS-4	281268-21
Date prepared	-			28/10/2021	20	28/10/2021	28/10/2021		28/10/2021	28/10/2021
Date analysed	-			28/10/2021	20	28/10/2021	28/10/2021		28/10/2021	28/10/2021
Total Phenolics (as Phenol)	mg/kg	5	Inorg-031	<5	20	<5	<5	0	100	103

Result Definitions

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

Quality Control Definitions

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

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

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

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

Laboratory Acceptance Criteria

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

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

Spikes for Physical and Aggregate Tests are not applicable.

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

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

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

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

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

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

Measurement Uncertainty estimates are available for most tests upon request.

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

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

CHAIN OF CUSTODY - Client

ENVIROLAB GROUP - National phone number 1300 42 43 44

Sydney Lab - Envirolab Services
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Adelaide Office - Envirolab Services
7a The Parade, Norwood, SA 5067
Ph 0406 350 706 / adelaide@envirolab.com.au

Client: East West Enviroag	Client Project Name / Number / Site etc (ie report title): EW211459
Contact Person: Steph Cameron	
Phone: 02 6762 1733	PO No.: EW211459
Sampler: N/A	Envirolab Quote No. :
Address: 82 Plain Street Tamworth 2340	Date results required: Standard *Note: Inform lab in advance if urgent turnaround is required - surcharges apply*
Phone: 02 6762 1733 Mob: 0447 116 818	Report format: esdat / equis /
Email: stephanie.c@eastwestonline.com.au, anne.m@eastwestonline.com.au, jason.l@eastwestonline.com.au, annemarie@eastwestonline.com.au, admin@eastwestonline.com.au	Lab Comments:

Sample information					Tests Required	Comments
Envirolab Sample ID	Client Sample ID or information	Depth	Date sampled	Type of sample		Provide as much information about the sample as you can
	211459-1		22/10/2021	Soil	Combo 1 All samples	
	211459-2		22/10/2021	Soil		
	211459-3		22/10/2021	Soil		
	211459-4		22/10/2021	Soil		
	211459-5		22/10/2021	Soil		
	211459-6		22/10/2021	Soil		
	211459-7		22/10/2021	Soil		
	211459-8		22/10/2021	Soil		
	211459-9		22/10/2021	Soil		
	211459-10		22/10/2021	Soil		
	211459-11		22/10/2021	Soil		
	211459-12		22/10/2021	Soil		
	211459-13		22/10/2021	Soil		
	211459-14		22/10/2021	Soil		
	211459-15		22/10/2021	Soil		
	211459-16		22/10/2021	Soil		
	211459-17		22/10/2021	Soil		
	211459-18		22/10/2021	Soil		
	211459-19		22/10/2021	Soil	Combo 4 All samples	
	211459-20		22/10/2021	Soil		
	211459-21		22/10/2021	Soil		
	211459-22		22/10/2021	Soil	Combo 1 All samples	
	211459-23		22/10/2021	Soil		
	211459-24		22/10/2021	Soil		
	211459-25		22/10/2021	Soil		
	211459-26		22/10/2021	Soil		
	211459-27		22/10/2021	Soil		
	211459-28		22/10/2021	Soil		
	211459-29		22/10/2021	Soil	Combo 4 All samples	
	211459-30		22/10/2021	Soil		
	211459-31		22/10/2021	Soil		
	211459-32		22/10/2021	Soil		

Relinquished by (Company): East West	Received by (Company):	*Lab use only:*
Print Name: Jason Lowien	Print Name:	Samples Received: Cool or Ambient (circle one)
Date & Time: 25/10/2021	Date & Time:	Temperature Received at: (if applicable)
Signature:	Signature:	Transported by: Hand delivered / courier

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

SAMPLE RECEIPT ADVICE

Client Details

Client	East West Enviroag Pty Ltd
Attention	Stephanie Cameron

Sample Login Details

Your reference	EW211459
Envirolab Reference	281268
Date Sample Received	27/10/2021
Date Instructions Received	27/10/2021
Date Results Expected to be Reported	03/11/2021

Sample Condition

Samples received in appropriate condition for analysis	Yes
No. of Samples Provided	32 Soil
Turnaround Time Requested	Standard
Temperature on Receipt (°C)	21
Cooling Method	None
Sampling Date Provided	YES

Comments

Nil

Please direct any queries to:

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

Analysis Underway, details on the following page:

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Sample ID	vTRH(C6-C10)/BTEXN in Soil	svTRH (C10-C40) in Soil	PAHs in Soil	Acid Extractable metalsin soil	Misc Soil - Inorg
211459-1	✓	✓		✓	
211459-2	✓	✓		✓	
211459-3	✓	✓		✓	
211459-4	✓	✓		✓	
211459-5	✓	✓		✓	
211459-6	✓	✓		✓	
211459-7	✓	✓		✓	
211459-8	✓	✓		✓	
211459-9	✓	✓		✓	
211459-10	✓	✓		✓	
211459-11	✓	✓		✓	
211459-12	✓	✓		✓	
211459-13	✓	✓		✓	
211459-14	✓	✓		✓	
211459-15	✓	✓		✓	
211459-16	✓	✓		✓	
211459-17	✓	✓		✓	
211459-18	✓	✓		✓	
211459-19	✓	✓	✓	✓	✓
211459-20	✓	✓	✓	✓	✓
211459-21	✓	✓	✓	✓	✓
211459-22	✓	✓		✓	
211459-23	✓	✓		✓	
211459-24	✓	✓		✓	
211459-25	✓	✓		✓	
211459-26	✓	✓		✓	
211459-27	✓	✓		✓	
211459-28	✓	✓		✓	
211459-29	✓	✓	✓	✓	✓
211459-30	✓	✓	✓	✓	✓
211459-31	✓	✓	✓	✓	✓
211459-32	✓	✓	✓	✓	✓

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

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Additional Info

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