Great Western Highway Upgrade Program:

Little Hartley to Lithgow (West Section)

Technical Working Paper – Stage 2 Contamination Assessment

Great Western Highway Upgrade: Little Hartley to Lithgow (West Section)

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Jacobs Arcadis Joint Venture

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Glossary of terms and acronyms

Term	Meaning
ABC	Ambient Background Concentration
ACL	Added Contaminant Limit
ACM	Asbestos containing material
AEI	Area of Environmental Interest
ANZECC	Australian and New Zealand Environment and Conservation Council
ANZG	Australian and New Zealand Guidelines for Fresh and Marine Water Quality
ARMCANZ	Agriculture and Resource Management Council of Australia and New Zealand
CLM Act	Contaminated Land Management Act 1997
CRR	Coxs River Road Intersection design stage
CSM	Conceptual Site Model
DEC	Department of Environment and Conservation
DQO	Data Quality Objective
DSI	Detailed Site Investigation
EIL	Environmental Investigation Level
EP&A Act	Environmental Planning and Assessment Act
EPL	Environment Protection Licence
ESL	Ecological Screening Level
F2L	Forty Bends to Lithgow design stage
GIL	Groundwater Investigation Level
GWH	Great Western Highway
GWHU	Great Western Highway Upgrade
HIL	Health Investigation Level
HSL	Health Screening Level
JAJV	Jacobs Arcadis Joint Venture
L2R	Little Hartley to River Lett design stage
LEP	Local Environmental Plan
LOR	Limit of Reporting
mbgl	Metres below ground level
MBTOC	Metres below top of casing
NATA	National Association of Testing Authorities
NEMP	National Environmental Management Plan

Term	Meaning
NEPM	National Environment Protection (Assessment of Site Contamination) Measure 1999 (Amended 2013)
NSW EPA	NSW Environment Protection Authority
NSW OEH	NSW Office of Environment and Heritage
PFAS	Per- and poly-fluoroalkyl substances
PSI	Preliminary Site Investigation
R2F	River Lett to Forty Bends design stage
RAP	Remedial Action Plan
REF	Review of Environmental Factors
SAC	Site Assessment Criteria
SAQP	Sampling Analysis and Quality Plan
SPT	Standard Penetration Test
Transport	Transport for New South Wales
USEPA	United State Environmental Protection Agency

Important note about your report

The sole purpose of this report is to present the findings of a Stage 2 Contamination Assessment completed by Jacobs (as part of the Jacobs Arcadis Joint Venture (the JAJV)) for Transport for New South Wales (Transport) in connection with the Review of Environmental Factors (REF) for the Greater Western Highway Upgrade (GWHU) project. The GWHU (the Site) comprises of four assessed areas located between Little Hartley and South Bowenfels, NSW.

This report was produced in accordance with and is limited to the scope of services set out in the agreement between the JAJV and Transport. That scope of services was developed with Transport.

All reports and conclusions that deal with sub-surface conditions are based on interpretation and judgement and as a result have uncertainty attached to them. You should be aware that this report contains interpretations and conclusions which are uncertain, due to the nature of the investigations. No study can investigate every risk, and even a rigorous assessment and/or sampling programme may not detect all problem areas within a site.

This report is based on assumptions that the Site conditions as revealed through sampling are indicative of conditions throughout the Site. The findings are the result of standard assessment techniques used in accordance with normal practices and standards, and (to the best of our knowledge) they represent a reasonable interpretation of the current conditions on the Site.

The passage of time, the possibility of migration, the manifestation of latent conditions or impacts of future events may require further examination of the project and subsequent data analysis, and re-evaluation of the data, findings, observations and conclusions expressed in this report.

In preparing this report, Jacobs (as part of the JAJV) has relied upon, and presumed accurate, any information (or confirmation of the absence thereof) provided by Transport and from other sources. Except as otherwise stated in the report, Jacobs (as part of the JAJV) has not attempted to verify the accuracy or completeness of any such information. If the information is subsequently determined to be false, inaccurate or incomplete then it is possible that our observations and conclusions as expressed in this report may change.

Jacobs (as part of the JAJV) has prepared this report in accordance with the usual care and thoroughness of the consulting profession, for the sole purpose described above and by reference to applicable standards, guidelines procedures and practices at the date of issue of this report. For the reasons outlined above, however, no other warranty or guarantee, whether expressed or implied, is made as to the data, observations and findings expressed in this report, to the extent permitted by law. Opinions and judgements expressed in the report are based on Jacobs’ understanding and interpretation of current regulatory standards and should not be construed as legal opinions.

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Executive summary

Project overview

Transport for NSW (Transport) proposes to upgrade the Great Western Highway between Katoomba and Lithgow. The Great Western Highway Upgrade program will deliver around 34 kilometres of four lane divided highway between Katoomba and Lithgow. The program is needed to provide a safer and more efficient link between the Central West NSW and the Sydney Motorway Network for freight, tourists and general traffic.

The proposal has been designed in four sections to allow flexibility in construction staging and delivery and includes: Little Hartley to River Lett Hill (L2R), Coxs River Road (CRR), River Lett Hill to Forty Bends (R2F) and Forty Bends to Lithgow (F2L).

Approach to Stage 2 contamination assessment

This assessment forms the second stage of one of several technical papers that form part of the REF. The purpose of this report is to identify whether land within or adjacent to the construction footprint is potentially or known to be contaminated, whether potential/known contamination could impact upon human health or the environment in the context of the proposed construction and operation of the project, and where mitigation or management measures are required to manage identified potential/known contamination.

The assessment has been conducted for the construction footprint and surrounds for each of the four design stages (the study areas). The assessment included:

- The completion of fieldwork as outlined in the *Great Western Highway Upgrade – Sampling Analysis and Quality Plan – Stage 2 Contamination Assessment* (JAJV, 2021a), to further inform/quantify the potential contamination impact assessment and the need for mitigation or management measures
- The revision of the conceptual site model (CSM) that formed part of the *Great Western Highway Upgrade - Technical Working Paper – Stage 1 Contamination Assessment* (JAJV, 2021b)
- Recommendations of remediation/mitigation measures required for the project based on the outcome of the updated CSM, if any.

Overview of potential impacts

Soil

- Soil contamination impact across the four study areas is expected to pose a generally low risk to human health and ecological receptors associated with the proposed construction and operation of the project. Only five areas of agricultural land use across all study areas exhibited elevated total coliforms when compared to the biosolids guidelines *Environmental Guidelines: Use and disposal of biosolids products* (NSW EPA, 2000). The elevated total coliform numbers are likely due to the presence of livestock and other fauna in these areas
- No other soil sample collected and analysed as part of this investigation reported concentrations of contamination exceeding the adopted site assessment criteria (SAC)
- Asbestos Containing Materials (ACM) were not detected in any soil samples submitted for laboratory identification. No potential ACM was observed in the material excavated from or in the near vicinity of the investigation locations
- Aesthetics were monitored at all investigation locations. Only minor visual signs of potential contamination (e.g. bitumen and minor organic/hydrocarbon odours) were observed and primarily related to surface samples adjacent to the road corridor and agriculture, not contamination at depth. Samples analysed in material where visual signs of potential contamination were observed did not report contamination levels above the adopted SAC with the exception of sample SS22, which reported elevated levels of total coliforms and a slight organic odour.

Groundwater

- Concentrations of cadmium, copper, nickel, zinc, total nitrogen, formaldehyde and total coliforms at selected groundwater well locations were reported above the adopted SAC (protection of aquatic ecosystems and drinking water). With the exception of well GW01 in L2R/CRR, groundwater in other areas (where investigated) is unlikely to be intersected as part of construction and operations so the impact potential from the elevated contaminant concentrations in groundwater is considered to be low. Construction in the vicinity of well GW01 may intersect groundwater seepage containing elevated concentrations of cadmium and zinc which could impact upon aquatic ecosystems in receiving waterways if not managed. However, this impact is unlikely as calculated groundwater inflow rates are very low and discharged groundwater would be diluted by surface water. (JAJV, 2021c). Groundwater impacts are expected to pose a low risk to human health across the site
- Contamination related to septic tanks is possible across the site (namely F2L), however due to a lack of information from this investigation due to project constraints they have been assessed as having a moderate potential impact. These impacts should continue to be assessed and managed as septic tanks are discovered during construction under a Construction Environmental Management Plan (CEMP)
- Overall, based on the results of the investigation undertaken at the site, the contamination impacts to human health and ecological receptors during construction and operation of the site are likely to be low with only specific areas of moderate impact requiring the application of mitigation measures as outlined in **Section 9** and **Figure 8.1** to **Figure 8.4,** which are:
  - Groundwater at the former station at Little Hartley (GW01)
  - Soil in select agricultural areas across all study areas (BH06, BH07, SS13, SS22 and BH15). All agricultural areas to be disturbed within the construction footprint should be managed under the same mitigation measures.
- Given there are limited exposure risks to known contaminants during the operation of the proposal and the nature of the site (multilane highway), impacts to operation of the proposal from contaminated soil and/or groundwater (where present) are expected to be low.

Coal Tar

- Coal tar is present in asphalt at select locations and depths (see Appendix H) within the existing road corridor in the L2R/CRR and R2F study areas.

Recommendations

Based on the results of the Stage 2 contamination assessment, JAJV recommends that the site is suitable for construction and commercial/industrial land use as per the requirements outlined in the *National Environment Protection (Assessment of Site Contamination) Measure 1999 (as revised 2013)* (NEPC, 2013). An overview of the recommended mitigation measures for this project is outlined in **Section 9.** The following recommendations are made based on the findings of this assessment:

- In consideration of the construction activities to be undertaken across the site the adoption of an ‘unexpected finds’ protocol within a Construction Environmental Management Plan (CEMP) should be implemented to plan for and accommodate potential contamination impacts
- Where groundwater is encountered during excavations and dewatering is undertaken, water should be tested and appropriately managed. These measures can be managed under a CEMP
- Where coal tar is present (as outlined in Appendix H), material should be managed / disposed off-site under a CEMP prepared in accordance with the NSW Government (2015) Technical Direction 21: coal tar asphalt handling and disposal procedure.
- Implementation of location specific mitigation measures as part of a Contaminated Land Management Plan (CLMP) as outlined in **Table 9.1**
- Where locations of known or potential contamination are intersected, in particular those that have been identified as moderate impact, proper care should be taken to ensure minimal exposure to construction

workers (exposure and ingestion) as well as preventing flow into surrounding waterways. Contingency measures should be considered as part of a CEMP to manage potentially contaminated material including:

  - Stop work procedures: a suitably qualified and experienced consultant should then assess whether material is or is not contaminated
  - Treat suspected contaminated material as actually contaminated material and employ adequate environmental and safety controls.

- Areas of the study area (see **Section 4.7**) that were unable to be investigated due to property access constraints should be managed using one of the following approaches:
  - Adopt management measures for the similar AEIs investigated in other areas (e.g. adopt mitigation measures for agricultural AEIs for all agricultural areas that are to be disturbed within the construction footprint), as recommended in the Mitigation measures in **Section 9**

  Or

  - Undertake the proposed investigations when properties are accessible.

1. Introduction

1.1 Great Western Highway upgrade

Transport for NSW (Transport) is planning and investigating an upgrade of the Great Western Highway (HW5) between Katoomba and Lithgow. The Great Western Highway Upgrade program will deliver around 34 kilometres of four lane divided highway between Katoomba and Lithgow. The program is needed to provide a safer and more efficient link between the Central West NSW and the Sydney Motorway Network for freight, tourists and general traffic.

In May 2010, a preferred route for the Great Western Highway Upgrade between Mount Victoria and Lithgow was announced and the preferred corridor was subsequently reserved via SP2 Infrastructure zoning in the *Blue Mountains Local Environmental Plan 2015 (LEP, 2015)* and the *Lithgow Local Environmental Plan 2014 (LEP, 2014)*.

Jacobs Arcadis joint venture (JAJV) has been engaged to progress the concept design and prepare a Review of Environmental Factors (REF), including specialist environmental investigations, for the Little Hartley to Lithgow section of the Great Western Highway (ie the West Section). This package of the Great Western Highway Upgrade Program is the subject of this report and referred to as the proposal.

The proposal includes:

- Upgrade of about 14 kilometres of the Great Western Highway between Little Hartley and Lithgow to a four lane divided highway
- Minor embankment work and median adjustment in the Forty Bends section (upgraded in 2017) to provide a fourth lane
- Provision of service roads, where feasible and reasonable, to minimise direct access to the Great Western Highway from adjacent properties
- Upgrade and/or adjustment of existing intersections at local roads
- Provision of two heavy vehicle rest areas, one eastbound and one westbound, near Mid Hartley Road and Carroll Drive
- Temporary and permanent water quality treatment basins
- Provision of five new bridges, including twin bridges over River Lett and Jenolan Caves Road
- Upgrade of the existing bridge over River Lett as part of a local service road network
- Extension of existing drainage culverts at Rosedale Creek and Boxes Creek
- Provision of three combined drainage and fauna crossing culverts
- Establishment and use of temporary ancillary facilities during construction
- Property works including acquisition, demolition and adjustments to accesses
- Adjustment of existing utility infrastructure, including overhead powerlines, poles and underground communications cables
- Rehabilitation of disturbed areas and landscaping, where required.

The proposal has been designed in four sections to allow flexibility in construction staging and delivery and includes:

- Little Hartley to River Lett Hill (L2R)
- Coxs River Road (CRR)
- River Lett Hill to Forty Bends (R2F)

- Forty Bends to Lithgow (F2L).

The design stages and construction footprint are shown in **Figure 1.1** below. A description and key features of each stage is provided below.

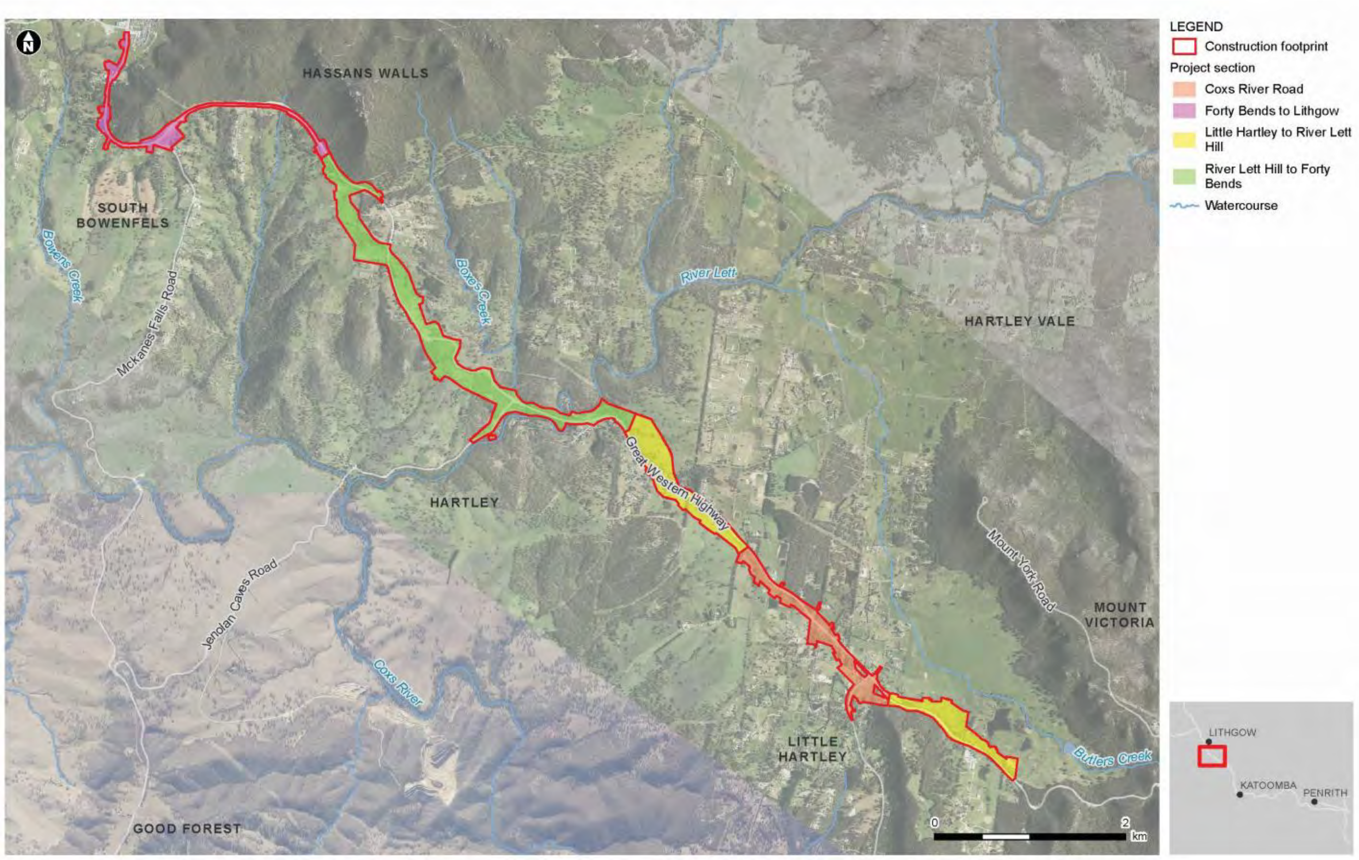

Figure 1.1: Project footprint and design stages

1.1.1 Little Hartley to River Lett Hill (L2R)

The Little Hartley to River Lett Hill section involves the realignment of about three kilometres of the Great Western Highway with two lanes in each direction from the base of Mount Victoria Pass, where it would tie into the Great Western Highway Upgrade – Central Package, to east of the River Lett, excluding Coxs River Road Intersection (see **Section 1.1.2**). Key features include:

- Two span 'Super T' bridges over the new Great Western Highway east of Coxs River Road and west of Mid Hartley Road to maintain the local access road connection
- Realignment of the highway to improve alignment and provide two lanes in each direction. The existing highway would become a local service road
- Upgrade at the intersection of the Great Western Highway and Carroll Drive
- Eleven temporary construction sediment basins and three permanent operational water quality control basins (noting three of the temporary basins would be converted to permanent basins at completion for construction)
- Construction of two heavy vehicle rest areas near Mid Hartley Road and Carroll Drive, connected by a service road.

1.1.2 Coxs River Road (CRR)

The Coxs River Road Intersection section involves the realignment of about 2.4 kilometres of the Great Western Highway with two lanes in each direction from east of the Coxs River Road intersection to near the Hartley Cemetery. Key features include:

- A grade separated interchange at Coxs River Road, supplemented by new sections of connecting roadway to create a local service road network
- Realignment of the existing highway near Browns Gap Road to create a local service road
- Upgrades to intersections at Browns Gap Road and Baaners Lane, including a vehicle turning facility on Baaners Lane
- Six temporary construction sediment basins and four permanent operational water quality control basins (noting two of the temporary basins would be converted to permanent basins at completion for construction)
- Retaining wall on the Great Western Highway eastbound adjacent to the Lolly Bug.

1.1.3 River Lett Hill to Forty Bends (R2F)

The River Lett Hill to Forty Bends section involves the realignment and/or widening of about four kilometres of the Great Western Highway to at least two lanes in each direction between the River Lett and Forty Bends Road. Key features include:

- Twin bridges over Jenolan Caves Road (about 370 metres long) to form a grade separated intersection, including on and off ramps
- Twin bridges over River Lett (about 80 metres long)
- Refurbishment of the existing bridge over River Lett on the existing Great Western Highway as part of a local road connection from the new highway
- Realignment of the existing highway from Jenolan Caves Road to about 250 metres south of Forty Bends Road (eastern junction) to improve the gradient of the road on River Lett Hill and provide for an additional climbing lane westbound. The existing highway in this section would be converted to a local service road or utilised as the on and off ramps where feasible
- Upgrades to the intersections at Blackmans Creek Road and Kelly Street, including a realignment of Kelly Street
- Five temporary construction sediment basins and seven permanent operational water quality control basins (noting four of the temporary basins would be converted to permanent basins at completion of construction)
- Construction of retaining walls at Off Ramp 1 and between River Lett twin bridges and Jenolan Caves Road intersection
- Extension of the existing box culverts at Boxes Creek
- Extensive cuts and fills at River Lett Hill, the abutments for the bridge over Jenolan Caves Road and between Service Road 8 and Forty Bends Road (eastern junction)
- Three 3.3 metre square combined drainage culverts and fauna crossings.

1.1.4 Forty Bends to Lithgow (F2L)

The Forty Bends to Lithgow section involves an upgrade of about 4.5 kilometres of the Great Western Highway to two lanes in each direction from Forty Bends Road to Magpie Hollow Road. Key features include:

- Tie-ins with the existing Forty Bends section of the highway (upgraded in 2017)
- Upgrades to intersections at McKanes Falls Road, Old Bathurst Road and Mudgee Street
- Modifications to the intersection at Forty Bends Road (western junction)

- Five permanent operational water quality control basins (noting two of these would be used as temporary basins during construction and converted to permanent basins at completion of construction)
- Four retaining structures on the eastbound alignment and one westbound
- Six drainage culverts traversing under the proposed highway, as well as additional minor culverts under local service roads and/or property access.

1.2 Location

The proposal is located between Little Hartley and Lithgow, NSW, about 96 kilometres west of the Sydney central business district, within the Lithgow local government area (LGA).

1.3 Purpose and scope of this report

JAJV was commissioned by Transport to prepare the following Stage 2 contamination assessment for the purposes of supporting the REF for the Great Western Highway Upgrade: Little Hartley to Lithgow (West Section). The objective of the Stage 2 Assessment was to gather analytical data at previously identified potential areas of environmental interest (AEI) as detailed in the Stage 1 Contamination Assessment (JAJV, 2021b) and Sampling, Analysis and Quality Plan (SAQP) (JAJV, 2021a).

The purpose of gathering this data at specific areas across the footprint was to allow for decisions to be made relating to potential impacts to workers, site users and surrounding environmental receptors to contamination (under a commercial/industrial setting – considered appropriate based on likely short term exposure during construction and limited exposure during operation) in soil, groundwater and vapour (if present) during construction and operation of the project.

This report documents the results of the scope of works presented in the SAQP (JAJV, 2021a) provided in **Appendix F** including a review of potential contamination impacts to the project associated with the soil, groundwater and vapour contamination (where present) at locations within the alignment and potential mitigation measures.

This Stage 2 contamination assessment has been developed in accordance with Schedule B2 of the National Environment Protection (Assessment of Site Contamination) Measure 1999 (as amended in 2013) (NEPM) (NEPC, 2013) and the Per- and poly-fluoroalkyl substances (PFAS) National Environmental Management Plan (NEMP) (PFAS NEMP, 2020). The following standards and guidelines have also been considered:

- Contaminated Land Guidelines: Consultants Reporting on Contaminated Land (NSW EPA, 2020)
- Guidelines for the NSW Site Auditor Scheme (3rd edition) (NSW EPA, 2017)
- Guidelines for the Assessment and Management of Groundwater Contamination, Department of Environment and Conservation (DEC, 2007)
- Guidelines on the Duty to Report Contamination under the Contamination Land Management Act 1997 (NSW EPA, 2015)
- Technical Note: Investigation of Service Station Sites (NSW EPA, 2014).
- Technical Direction 21: coal tar asphalt handling and disposal procedure, NSW Government - Transport Roads and Maritime Services (NSW RMS, 2015).

2. Background Information

The following previous investigation reports for the GWHU site have been reviewed to assist in the development of the SAQP (2021a) and this Stage 2 contamination assessment:

- Jacobs Arcadis Joint Venture (JAJV) (2021b) *Stage 1 Contamination Assessment – Great Western Highway Upgrade: Little Hartley to Lithgow (West Section)*
- Transport for New South Wales (Transport) (2020*) Preliminary Environmental Investigation, Great Western Highway Upgrade, Katoomba to Lithgow*, September 2020
- Mount Victoria to Lithgow Alliance (MV2L) (2011b) *Great Western Highway Upgrade, Corridor Study, Contaminated Land*
- Sinclair Knight Merz (SKM) (2009) *Mount Victoria to Lithgow Great Western Highway upgrade, Route Options Report,* October 2009

2.1 Jacobs Arcadis Joint Venture (JAJV) (2021b) Stage 1 Contamination Assessment – Great Western Highway Upgrade: Little Hartley to Lithgow (West Section)

Jacobs Arcadis Joint Venture (JAJV) was engaged by Transport to undertake a Stage 1 Contamination Assessment as part of the Great Western Highway Upgrade: Little Hartley to Lithgow (West Section). The objective of the contamination assessment was to identify potential areas of environmental interest which would assist in identifying construction limitations/constraints and management options within the proposal area with respect to contamination.

The key findings based on the Stage 1 contamination assessment include:

- There are nine AEIs that have a moderate to high contamination impact potential in relation to soil, groundwater and vapour across the site, requiring further investigation. These include:
    - Soil and groundwater sampling within areas of proposed cutting or piling at the former service station in Little Hartley
    - Groundwater sampling within the proposed area of cutting near Hartley Cemetery
    - Sampling of soil stockpiles
    - Sampling of surface soil and sediment along the current road corridor
    - Soil sampling within the construction footprint at the Little Hartley Airfield
    - Soil sampling within agricultural properties along the construction footprint to target specific point sources (for example sheep dips or waste burial, where identified) as well as general agricultural land use
    - Groundwater sampling nearby areas of identified septic tank use, including in Hartley Village
    - Soil and groundwater sampling within the proposed area of cutting or piling for bridge construction near River Lett, where there is a history of mining operations
    - Groundwater sampling within the construction footprint in South Bowenfels to assess the potential impact from the former service station.

Based on the results of the Stage 1 contamination assessment, a Stage 2 contamination assessment was recommended to further investigate these potential contamination impacts and inform the need for mitigation and/or remedial measures.

2.2 Preliminary Environmental Investigation, Great Western Highway Upgrade, Katoomba to Lithgow, September 2020, Transport for NSW

A preliminary environmental investigation (PEI) for the proposed upgrade of the Great Western Highway between Katoomba and Lithgow was completed in 2020 to identify environmental and social considerations for the strategic and concept design phases.

With relation to contamination, potentially contaminated sites identified included the current highway corridor, former service stations in Hartley, Shell Coles Express service station in South Bowenfels, the former Little Hartley Airfield and broad agricultural land use. The potential for erosion and sedimentation was also identified as a risk during construction.

The PEI also identified that there were known occurrences of acid sulfate rock within the study area, such as existing cuttings within the Shoalhaven Group.

2.3 Corridor Study, Contaminated Land Assessment, October 2011, Mount Victoria to Lithgow Alliance

A contamination assessment was prepared during development of the concept design to identify potential constraints associated with potential contamination for the proposed upgrade between Mount Victoria and Lithgow. The assessment included a review of desktop information such as previous reports, aerial photographs and observations from a site inspection.

Previous reports referenced in the July 2011 study were not available to review as part of this assessment, however the summarised findings have been incorporated.

The following areas of environmental interest were identified within the study area:

L2R:

- Cemetery in Hartley
- Former Royal Hotel Landfill, Hartley.

L2R and CRR:

- Former Service Station, Log Cabin Farmhouse, Little Hartley (now The Lolly Bug). The report identified that below ground fuel storage tanks and refuelling infrastructure remained at the front of the site
- Stockpiled construction and general waste materials along the existing road at several locations
- Road corridor
- Regional agricultural land use including the use of chemicals, storage and use of fuels, potential for filling and waste disposal, potential for cattle/sheep dip sites, orchards, herbicides and pesticides
- Airfield in Little Hartley where aviation or vehicular fuel could have been stored or used and fill material used during construction.

R2F:

- Waste disposal at Bullock Team Camp Sites in Fernhill from the 19th and 20th Centuries
- Mining operations south of the corridor in River Lett, though no ore processing is thought to have occurred. It is unlikely that this occurred within the study area however the exact location is unknown
- Stockpiled construction and general waste materials along the existing road at several locations
- Road corridor

- Regional agricultural land use including the use of chemicals, storage and use of fuels, fill and waste disposal.

F2L:

- Shell Service Station, South Bowenfels
- Former service station, South Bowenfels. Investigations undertaken in 2002 (PPK Environment and Infrastructure) and 2003 (Parsons Brinkherhoff) identified an underground storage tank and hydrocarbon impacts in soil and groundwater along the east of the current road corridor
- Cemetery in South Bowenfels
- Stockpiled construction and general waste materials along the existing road at several locations
- Road corridor
- Regional agricultural land use including the use of chemicals, storage and use of fuels, fill and waste disposal.

Additional areas of potential concern were identified outside the current project study area, including the rail corridor and a former Sewage Treatment Plant in Mount Victoria.

The areas of potential interest were considered to represent negligible to low constraints on the design and construction of the proposed highway upgrade at the time of preparing the Corridor Study. The report recommended intrusive investigations be completed at the former service station site in Little Hartley, with potential contamination in other areas of interest to be managed as part of usual construction management practices.

2.4 Mount Victoria to Lithgow, Great Western Highway upgrade, Route Options Report, October 2009, Sinclair Knight Merz (SKM)

The Route Options Report prepared in 2009 for upgrade of the highway between Mount Victoria and Lithgow identified the following potential contamination risks within the study area:

General:

- Potential pesticide and metal contamination from historic and current agricultural activities
- Potential asbestos or asbestos containing materials (ACM)
- Potential for fill soil, ACM or other contaminants associated with the construction and use of the current road alignment

L2R and CRR:

- Fuel or oil storage and use at the former Little Hartley Airfield
- Little Hartley Motors
- Little Hartley Sale Yards

L2R:

- Corney’s Garage (former) in Hartley.

3. Preliminary Conceptual Site Model

As part of the Stage 1 contamination assessment (JAJV, 2021b), Jacobs developed a Preliminary Conceptual Site Model (PCSM) for each of the four study areas. The PCSM was designed to summarise the potential contaminant sources, pathways and receptors (SPR) identified at the site that may present a potential impact to human health and/or the environment associated with construction and operation of the project.

The PCSM was developed based on current understanding of the site at the time of undertaking the Stage 1 contamination assessment (JAJV, 2021b) and prior to undertaking of field investigations associated with the Stage 2 contamination assessment. The contamination impact rankings were developed by considering both the contamination status and possible exposure pathways. The matrix shown in **Table 3.1** below was used to determine the preliminary contamination impact rankings.

Table 3.1: Contamination potential matrix

		Contamination severity and extent				
		SE1 Low potential for contamination to be present in the media of concern at concentrations above the relevant assessment criteria and limited in extent	**SE2** Contamination possibly present in the media of concern at concentrations above the relevant assessment criteria and limited in extent	**SE3** Contamination possibly present in the media of concern at concentrations above the relevant assessment criteria and potentially widespread	**SE4** Known contamination present in the media of concern at concentrations above the relevant assessment criteria and limited in extent	**SE5** Known contamination present in the media of concern at concentrations above the relevant assessment criteria and widespread
Pathways and receptors	**PR1** Media of concern is unlikely to coincide with or otherwise impact on the construction scope or operation *AND/OR* No or unlikely exposure pathway for human or ecological receptor's during construction or operation	Very low	Low	Low	Moderate	Moderate
	PR2 Media of concern may intersect the construction scope or operational areas. *AND* Exposure pathway for human or ecological receptors could be present and complete during construction or operation	Low	Moderate	Moderate	High	High

	PR3 Media of concern would intersect the construction scope or operational areas *AND* Exposure pathway for human or ecological receptors could be present and complete during construction or operation	Moderate	Moderate	High	High	Very high

The PCSM for each study area is presented in **Table 3.2** to **Table 3.4.**

Table 3.2: Preliminary conceptual site model - L2R and CRR study areas

Site of concern and potential source of contamination	Construction element and anticipated depth	Contamination severity and extent assessment				Pathways and receptors Assessment of relationship to construction footprint and scope				Potential contamination impact
		Media	**COPCs**	**Contamination status**	**Refer to Table 3-1**	**Location relative to project**	**Potential for contamination to be intersected by project**	**Exposure pathways (der – direct contact, ing – ingestion or inh – inhalation)**	**Refer to Table 3-1**	
AEI 1: Royal Hartley Hotel waste burial. Likely inert waste such as glass, metal, ceramics. Given age of waste burial unlikely to be remaining organic matter degradation.	Filling batters. Construction of twin bridges to the west at Jenolan Caves Rd. Construction of water quality basin to the south west.	Soil	General inert waste, heavy metals, hydrocarbons (TRH, BTEX, PAH), pesticides (OCP, OPP)	Contamination possibly present in the media of concern at concentrations above the relevant assessment criteria and limited in extent	SE2	Within construction footprint.	Soil contamination from source (if present) may be disturbed during construction however would be limited to shallow soil earthworks required for pavement and filling.	Soil contamination unlikely to be exposed during construction within waste burial area as activities relate to filling, therefore unlikely to impact upon human and ecological receptors during construction or operation.	PR1	Low
		Groundwater		Low potential for contamination to be present in the media of concern at concentrations above the relevant assessment criteria and limited in extent	SE1		Groundwater contamination (if present) unlikely to be exposed during construction based on depth of groundwater and proposed design in this location.	Groundwater contamination (if present) unlikely to be exposed during construction and therefore unlikely to impact upon human and ecological receptors during construction or operation.	PR1	Very low
AEI 2: Stockpiles. Potential contamination associated with bitumen, asphalt, asbestos or other miscellaneous wastes or contaminated soil.	Filling; pavement (side road/truck rest); filling	Surface soils	Heavy metals, hydrocarbons (TRH, BTEX, PAH), pesticides, herbicides, asbestos	Contamination possibly present in the media of concern at concentrations above the relevant assessment criteria and limited in extent	SE2	Within and adjacent to construction footprint	Contamination within stockpiles (if present) may be disturbed during construction while levelling sites or during subsurface works.	Construction workers could be exposed to soil contamination via contact (der, ing, inh) with contaminated soils and dust. Adjacent site users could be exposed to soil contamination via dust emissions (inh), namely asbestos. Ecological receptors may be exposed if runoff to surface waterways occurs. Potential for exposure during operation if stockpiles remain in place and are contaminated.	PR3	Moderate
AEI 3: Former service station (Little Hartley). Potential contamination associated with fuel storage and use or workshop activities. Underground fuel storage tanks potentially still present	Cutting (~2 - 3 m) and embankment filling, construction of new bridge over highway to the east, construction of water quality control basins, construction of grade	Soil	Heavy metals, hydrocarbons (TRH, BTEX, PAH)	Contamination possibly present in the media of concern at concentrations above the relevant assessment criteria and potentially widespread	SE3	Adjacent to construction footprint	Soil contamination (if present) could be exposed during excavation based on construction design.	Construction workers could be exposed to soil contamination via contact (der, ing, inh) with contaminated soils and vapour. Exposure to adjacent site users possible via vapour (inh).	PR3	High

Site of concern and potential source of contamination	Construction element and anticipated depth	Contamination severity and extent assessment				Pathways and receptors Assessment of relationship to construction footprint and scope				Potential contamination impact
		Media	COPCs	Contamination status	Refer to Table 3-1	Location relative to project	Potential for contamination to be intersected by project	Exposure pathways (der – direct contact, ing – ingestion or inh – inhalation)	Refer to Table 3-1	
adjoining current highway (MV2L, 2011)	separated interchange at CRR (potential for piling).							Sensitive environmental receptors may be exposed if sediment runoff to surface waterways occurs. Exposure unlikely to occur during operation.		
		Groundwater					Groundwater contamination (if present) could be exposed during excavation based on construction design and potential for shallow groundwater in area.	Construction workers could be exposed to contamination via contact with contaminated groundwater (der, ing). Sensitive environmental receptors may be exposed if groundwater runoff to surface waterways occurs. Exposure unlikely to occur during operation.		
		Vapour					Vapour from hydrocarbon contamination in soil and/or groundwater (if present) may be released during excavation works near the source site.	Construction workers and operational users of road could be exposed to vapour via inhalation (inh). Exposure unlikely to occur during operation.		
AEI 4: Former Little Hartley Airfield. Potential contamination associated with refuelling, maintenance or incident fire fighting however these activities appear to have been on a small scale (if occurred).	Embankment filling. Construction of water quality control basins south of the new road.	Soil	Heavy metals, hydrocarbons (TRH, BTEX, PAH), PFAS	Contamination possibly present in the media of concern at concentrations above the relevant assessment criteria and potentially widespread	SE3	Partially within construction footprint	Disturbance of soil contamination from source (if present) would be limited to shallow soil earthworks required for pavement and filling or within water quality basin location.	Construction workers could be exposed to shallow soil contamination via contact (der, ing) with contaminated soils and dust. Exposure to adjacent site users unlikely. Sensitive environmental receptors may be exposed if sediment runoff to surface waterways occurs. Exposure unlikely to occur during operation.	PR2	Moderate
		Groundwater					Groundwater contamination (if present) unlikely to be exposed during construction based on depth of groundwater and proposed design in this location.	Groundwater contamination (if present) unlikely to be exposed during construction and therefore unlikely to impact upon human and ecological receptors during construction or operation.	PR1	Low

Site of concern and potential source of contamination	Construction element and anticipated depth	Contamination severity and extent assessment				Pathways and receptors Assessment of relationship to construction footprint and scope				Potential contamination impact
		Media	**COPCs**	**Contamination status**	**Refer to Table 3-1**	**Location relative to project**	**Potential for contamination to be intersected by project**	**Exposure pathways (der – direct contact, ing – ingestion or inh – inhalation)**	**Refer to Table 3-1**	
AEI 5: Hartley Cemetery. Potential contamination associated with breakdown of organic sources.	Cutting (1 - 2 m) and embankment filling. Construction of water quality control basins south of the new road.	Soil	Heavy metals, nutrients, formaldehyde	Contamination possibly present in the media of concern at concentrations above the relevant assessment criteria and limited in extent	SE2	Adjacent to construction footprint	Soil contamination (if present) unlikely to be disturbed during construction as likely to be localised to cemetery site within soil (outside footprint).	Soil contamination unlikely to be exposed during construction and therefore unlikely to impact upon human and ecological receptors during construction or operation	PR1	Low
		Groundwater					Groundwater contamination (if present) may be disturbed during construction if shallow groundwater intersects cut. Flow direction away from alignment however means groundwater (if intersected) unlikely to be contaminated from source site.	Construction workers or ongoing users of road could be exposed to contaminated groundwater via contact (der, ing), if contaminated shallow groundwater encountered and seepage from cut occurs. Sensitive environmental receptors may be exposed if groundwater runoff to surface waterways occurs.	PR2	Moderate
AEI 6: Former Little Hartley Motors. Potential contamination associated with workshop activities including oil/fuel storage and use.	Embankment filling. Construction of water quality control basins south of the new road.	Soil	Heavy metals, hydrocarbons (TRH, BTEX, PAH)	Contamination possibly present in the media of concern at concentrations above the relevant assessment criteria and limited in extent	SE2	Adjacent to construction footprint	Soil contamination from source (if present) unlikely to be disturbed during construction as most likely localised to source site where no excavation occurring.	Soil, groundwater or vapour contamination unlikely to be exposed during construction and therefore unlikely to impact upon human and ecological receptors during construction or operation	PR1	Low
		Groundwater					Groundwater contamination (if present) unlikely to be exposed during construction based on depth of groundwater and proposed design in this location.			
		Vapour					Vapour from hydrocarbon contamination in soil and/or groundwater (if present) is unlikely to be released as subsurface works not proposed near source site.			
AEI 7: Former Corney's Garage. Potential contamination associated with workshop activities including oil/fuel storage and use.	Cutting (~0.5 m) on service road, construction of twin bridges to the north at Jenolan Caves Rd/GWH intersection.	Soil	Heavy metals, hydrocarbons (TRH, BTEX, PAH)	Contamination possibly present in the media of concern at concentrations above the relevant assessment	SE2	Adjacent to construction footprint on service road	Soil contamination from source (if present) unlikely to be disturbed during construction as most likely localised to source site where no excavation occurring.	Soil, groundwater or vapour contamination unlikely to be exposed during construction and therefore unlikely to impact upon human and	PR1	Low

Site of concern and potential source of contamination	**Construction element and anticipated depth**	**Contamination severity and extent assessment**				**Pathways and receptors** **Assessment of relationship to construction footprint and scope**				**Potential contamination impact**
		Media	**COPCs**	**Contamination status**	**Refer to Table 3-1**	**Location relative to project**	**Potential for contamination to be intersected by project**	**Exposure pathways (der – direct contact, ing – ingestion or inh – inhalation)**	**Refer to Table 3-1**	
		Groundwater		criteria and limited in extent			Groundwater contamination (if present) unlikely to be exposed during construction based on depth of groundwater and proposed design in this location.	ecological receptors during construction or operation		
		Vapour					Vapour from hydrocarbon contamination in soil and/or groundwater (if present) is unlikely to be released as subsurface works not proposed near source site.			
General: agricultural land use. Potential contamination associated with use of herbicides, pesticides, fuel, machinery, sheep/cattle dips, and waste disposal.	Various	Soil	Heavy metals, hydrocarbons (TRH, BTEX, PAH), pesticides, herbicides, asbestos, microbiological	Contamination possibly present in the media of concern at concentrations above the relevant assessment criteria and limited in extent	SE2	Within and adjacent to construction footprint	Soil contamination (if present) may be disturbed during construction however would likely be limited to shallow soil.	Construction workers could be exposed to shallow soil contamination via contact (der, ing, inh) with contaminated soils and dust. Adjacent site users could be exposed to contamination via dust emissions (inh), namely asbestos if encountered. Ecological receptors may be exposed if sediment runoff to surface waterways occurs. Exposure unlikely to occur during operation.	PR3	Moderate
		Groundwater					Groundwater contamination (if present) may be exposed during construction where cuts intersect groundwater and a point source is present in immediate vicinity (e.g. sheep/cattle dip, fuel storage).	Construction workers could be exposed to contaminated groundwater via contact (der, ing), if groundwater is intersected and point source nearby. Sensitive environmental receptors may be exposed if runoff to surface waterways occurs. Exposure unlikely to occur during operation.		
General: current road corridor. Potential contamination associated with vehicle emissions, fuel spills, and bitumen surface.	Various	Surface soils	Heavy metals, hydrocarbons (TRH, BTEX, PAH)	Contamination possibly present in the media of concern at concentrations above the relevant assessment	SE2	Within construction footprint.	Shallow soil or sediment contamination (if present) may be disturbed during construction within current roadway, particularly within road verges	"Construction workers and ongoing users of site could be exposed to soil/sediment contamination via contact (der, ing) with contaminated soils and dust.		Moderate

Site of concern and potential source of contamination	**Construction element and anticipated depth**	**Contamination severity and extent assessment**				**Pathways and receptors Assessment of relationship to construction footprint and scope**				**Potential contamination impact**
		Media	**COPCs**	**Contamination status**	**Refer to Table 3-1**	**Location relative to project**	**Potential for contamination to be intersected by project**	**Exposure pathways (der – direct contact, ing – ingestion or inh – inhalation)**	**Refer to Table 3-1**	
				criteria and limited in extent				Exposure to adjacent site users unlikely. Sensitive environmental receptors may be exposed if sediment runoff to surface waterways occurs."		

Table 3.3: Preliminary conceptual site model – R2F study area

Site of concern and potential source of contamination	Construction element and anticipated depth	Contamination severity and extent assessment				Pathways and receptors Assessment of relationship to construction footprint and scope				Potential contamination impact
		Media	**COPCs**	**Contamination status**	**Refer to Table 3-1**	**Location relative to project**	**Potential for contamination to be intersected by project**	**Exposure pathways (der – direct contact, ing – ingestion or inh – inhalation)**	**Refer to Table 3-1**	
General: septic tanks including in Hartley Village. Potential contamination associated with leaks or spills.	Cutting (~0.5m) and embankment filling	Soil	Heavy metals, nutrients, microbiological	Low potential for contamination to be present in the media of concern at concentrations above the relevant assessment criteria and limited in extent	SE1	Potentially within construction footprint associated with farm houses / buildings.	Low potential for soil contamination to be present associated with this AEI.	Soil contamination unlikely to be present and therefore unlikely to impact upon human and ecological receptors during construction or operation	PR2	Low
		Groundwater		Contamination possibly present in the media of concern at concentrations above the relevant assessment criteria and limited in extent	SE2		Groundwater contamination (if present) may be exposed during construction if septic tank present adjacent to or within areas of excavation/cutting.	Construction workers could be exposed to groundwater contamination via contact (der, ing) with contaminated water (if encountered). Exposure to adjacent site users unlikely. Sensitive environmental receptors may be exposed if water runoff to surface waterways occurs. Exposure unlikely to occur during operation.	PR2	Moderate
AEI 8: Waste disposal at Fernhill. Likely inert waste such as glass, metal, ceramics. Given age of waste burial (19-20th C) unlikely to be remaining organic matter degradation.	Pavement (side road)	Soil	General inert waste, heavy metals, hydrocarbons (TRH, BTEX, PAH), pesticides (OCP, OPP)	Contamination possibly present in the media of concern at concentrations above the relevant assessment criteria and limited in extent	SE2	Within construction footprint.	Soil contamination from source (if present) unlikely to be disturbed during construction based on proposed design.	Soil and groundwater contamination (if present) unlikely to be exposed during construction and therefore unlikely to impact upon human and ecological receptors during construction or operation	PR1	Low
		Groundwater		Low potential for contamination to be present in the media of concern at concentrations above the relevant assessment criteria and limited in extent	SE1		Groundwater contamination (if present) unlikely to be exposed during construction based on depth of groundwater and proposed design in this location.		PR1	Very low
AEI 12: Mining Operations, River Lett. Potential contamination associated with mining operations. No ore processing understood to have	Cutting (7 - 16 m west of the river) and embankment filling, construction of new twin bridges and	Soil	Heavy metals and cyanide	Contamination possibly present in the media of concern at concentrations above the relevant assessment criteria and potentially widespread	SE3	Likely outside construction footprint however location unknown	Soil contamination (if present) may be disturbed during construction of cutting and new bridges in this area.	Construction workers could be exposed to soil contamination via contact (der, ing) with contaminated soils and dust. Exposure to adjacent site users unlikely. Sensitive environmental receptors may be exposed if sediment runoff	PR2	Moderate

Site of concern and potential source of contamination	Construction element and anticipated depth	Contamination severity and extent assessment				Pathways and receptors Assessment of relationship to construction footprint and scope				Potential contamination impact
		Media	COPCs	Contamination status	Refer to Table 3-1	Location relative to project	Potential for contamination to be intersected by project	Exposure pathways (der – direct contact, ing – ingestion or inh – inhalation)	Refer to Table 3-1	
occurred or visual evidence of tailings/stockpiles.	refurbishment of current bridge (potential for piling)							to surface waterways including River Lett occurs. Exposure unlikely to occur during operation.		
		Groundwater		Contamination possibly present in the media of concern at concentrations above the relevant assessment criteria and limited in extent	SE2		Groundwater contamination (if present) may be disturbed during construction if groundwater intersected in cutting or bridge construction.	Construction workers could be exposed to groundwater contamination via contact (der, ing) with contaminated water Exposure to adjacent site users unlikely. Sensitive environmental receptors may be exposed if water runoff to surface waterways including River Lett occurs. Exposure during operation could occur if road users exposed to groundwater contamination (der, ing), if seepage from cuts occurs.		Moderate
General: agricultural land use. Potential contamination associated with use of herbicides, pesticides, fuel, machinery, sheep/cattle dips, and waste disposal.	Various	Soil	Heavy metals, hydrocarbons (TRH, BTEX, PAH), pesticides, herbicides, asbestos, microbiological	Contamination possibly present in the media of concern at concentrations above the relevant assessment criteria and limited in extent	SE2	Within and adjacent to construction footprint	Soil contamination (if present) may be disturbed during construction however would likely be limited to shallow soil.	Construction workers could be exposed to shallow soil contamination via contact (der, ing, inh) with contaminated soils and dust. Adjacent site users could be exposed to contamination via dust emissions (inh), namely asbestos if encountered. Ecological receptors may be exposed if sediment runoff to surface waterways occurs. Exposure unlikely to occur during operation.	PR3	Moderate
		Groundwater					Groundwater contamination (if present) may be exposed during construction where cuts intersect groundwater and a point source is present in immediate vicinity (e.g. sheep/cattle dip, fuel storage).	Construction workers could be exposed to contaminated groundwater via contact (der, ing), if groundwater is intersected and point source nearby. Sensitive environmental receptors may be exposed if runoff to surface waterways occurs. Exposure unlikely to occur during operation.		

Site of concern and potential source of contamination	Construction element and anticipated depth	Contamination severity and extent assessment				Pathways and receptors Assessment of relationship to construction footprint and scope				Potential contamination impact
		Media	COPCs	Contamination status	Refer to Table 3-1	Location relative to project	Potential for contamination to be intersected by project	Exposure pathways (der – direct contact, ing – ingestion or inh – inhalation)	Refer to Table 3-1	
General: current road corridor. Potential contamination associated with vehicle emissions, fuel spills, and bitumen surface.	Various	Surface soils	Heavy metals, hydrocarbons (TRH, BTEX, PAH)	Contamination possibly present in the media of concern at concentrations above the relevant assessment criteria and limited in extent	SE2	Within construction footprint.	Shallow soil or sediment contamination (if present) may be disturbed during construction within current roadway, particularly within road verges	Construction workers and ongoing users of site could be exposed to soil/sediment contamination via contact (der, ing) with contaminated soils and dust. Exposure to adjacent site users unlikely. Sensitive environmental receptors may be exposed if sediment runoff to surface waterways occurs.	PR3	Moderate

Table 3.4: Preliminary conceptual site model – F2L study area

Site of concern and potential source of contamination	Construction element and anticipated depth	Contamination severity and extent assessment				Pathways and receptors Assessment of relationship to construction footprint and scope				Potential contamination impact
		Media	**COPCs**	**Contamination status**	**Refer to Table 3-1**	**Location relative to project**	**Potential for contamination to be intersected by project**	**Exposure pathways (der – direct contact, ing – ingestion or inh – inhalation)**	**Refer to Table 3-1**	
AEI 9: Shell Coles Express South Bowenfels. Potential contamination associated with fuel storage. EPA notified site but not regulated - contamination unlikely to be widespread but may be present	Embankment filling / pavement	Soil	Heavy metals, hydrocarbons (TRH, BTEX, PAH)	Contamination possibly present in the media of concern at concentrations above the relevant assessment criteria and limited in extent	SE2	Approx. 50 m from construction footprint.	Soil contamination (if present) unlikely to be disturbed during construction as likely to be localised to service station site within soil (outside footprint).	Soil, groundwater or vapour contamination (if present) unlikely to be exposed during construction and therefore unlikely to impact upon human and ecological receptors during construction or operation	PR1	Low
		Groundwater					Groundwater contamination (if present) unlikely to be exposed during construction based on depth of groundwater, flow direction and proposed design near this location.			
		Vapour					Vapour from hydrocarbon contamination in soil and/or groundwater (if present) is unlikely to be released as subsurface works not proposed near source site.			
AEI 10: Former service station South Bowenfels. Known groundwater contamination associated with fuel storage.	Filling batters / pavement	Soil	Heavy metals, hydrocarbons (TRH, BTEX, PAH)	Contamination possibly present in the media of concern at concentrations above the relevant assessment criteria and limited in extent	SE2	Approx. 50 m from construction footprint.	Soil contamination unlikely to be disturbed during construction as likely to be localised to service station site within soil (outside footprint), and based on construction activities nearest to source site (no subsurface work)	Soil, groundwater or vapour contamination unlikely to be exposed during construction and therefore unlikely to impact upon human and ecological receptors during construction or operation	PR1	Low
		Groundwater		Known contamination present in the media of concern at concentrations above the relevant assessment criteria and limited in extent	SE4		Groundwater contamination unlikely to be exposed during construction based on depth of groundwater, flow direction and proposed design near this location (no subsurface work).			Moderate
		Vapour		Contamination possibly present in the media of concern at concentrations above the relevant assessment criteria and potentially widespread	SE3		Vapour unlikely to be exposed during construction based on proposed design near this location.			Low
AEI 11: Cemetery South Bowenfels. Potential contamination associated with breakdown of organic sources.	Filling batters / pavement	Soil	Heavy metals, nutrients, formaldehyde	Contamination possibly present in the media of concern at concentrations above the relevant assessment criteria and limited in extent	SE2	Adjacent to construction footprint	Soil contamination (if present) unlikely to be disturbed during construction as likely to be localised to cemetery within soil (outside footprint).	Soil and groundwater contamination (if present) unlikely to be exposed during construction and therefore unlikely to impact upon human and ecological receptors during construction or operation	PR1	Low
		Groundwater					Groundwater contamination (if present) unlikely to be exposed during construction based on depth of groundwater, flow direction and proposed design near this location (no subsurface works).			

Site of concern and potential source of contamination	Construction element and anticipated depth	Contamination severity and extent assessment				Pathways and receptors Assessment of relationship to construction footprint and scope				Potential contamination impact
		Media	**COPCs**	**Contamination status**	**Refer to Table 3-1**	**Location relative to project**	**Potential for contamination to be intersected by project**	**Exposure pathways (der – direct contact, ing – ingestion or inh – inhalation)**	**Refer to Table 3-1**	
General: agricultural land use. Potential contamination associated with use of herbicides, pesticides, fuel, machinery, sheep/cattle dips, and waste disposal.	Various	Soil	Heavy metals, hydrocarbons (TRH, BTEX, PAH), pesticides, herbicides, asbestos, microbiological	Contamination possibly present in the media of concern at concentrations above the relevant assessment criteria and limited in extent	SE2	Within and adjacent to construction footprint	Soil contamination (if present) may be disturbed during construction however would likely be limited to shallow soil.	Construction workers could be exposed to shallow soil contamination via contact (der, ing, inh) with contaminated soils and dust. Adjacent site users could be exposed to contamination via dust emissions (inh), namely asbestos if encountered. Ecological receptors may be exposed if sediment runoff to surface waterways occurs. Exposure unlikely to occur during operation.	PR3	Moderate
		Groundwater					Groundwater contamination (if present) may be exposed during construction where cuts intersect groundwater and a point source is present in immediate vicinity (e.g. sheep/cattle dip, fuel storage).	Construction workers could be exposed to contaminated groundwater via contact (der, ing), if groundwater is intersected and point source nearby. Sensitive environmental receptors may be exposed if runoff to surface waterways occurs. Exposure unlikely to occur during operation.		
General: current road corridor. Potential contamination associated with vehicle emissions, fuel spills, and bitumen surface.	Various	Surface soils	Heavy metals, hydrocarbons (TRH, BTEX, PAH)	Contamination possibly present in the media of concern at concentrations above the relevant assessment criteria and limited in extent	SE2	Within construction footprint.	Shallow soil or sediment contamination (if present) may be disturbed during construction within current roadway, particularly within road verges	Construction workers and ongoing users of site could be exposed to soil/sediment contamination via contact (der, ing) with contaminated soils and dust. Exposure to adjacent site users unlikely. Sensitive environmental receptors may be exposed if sediment runoff to surface waterways occurs.	PR3	Moderate

4. Scope of Works

The scope of works was undertaken in general accordance with the SAQP (JAJV, 2021a) (see Appendix F). Departures from this plan are described in **Section 4.7**. Investigation locations were selected to target the previously identified moderate to high AEIs as detailed in the Stage 1 Contamination Assessment (JAJV, 2021b).

JAJV personnel attended site between 23 August 2021 to 21 September 2021 to undertake the sampling and analysis program for the Stage 2 contamination assessment. The site investigation and sampling were undertaken by experienced JAJV environmental scientists in general accordance with the SAQP (JAJV, 2021a) and documented Jacobs procedures.

The following works were completed as part of this fieldwork:

- Service location
- Soil sampling
- Well installation/development
- Groundwater sampling
- Sampling of existing/select pavements for coal tar.

4.1 Sample locations

An overview of the sample locations, rationale and analytical schedules are presented in **Table 4.1** to **Table 4.3** below. A summary of these sample locations and their relevant AEIs are shown in **Figure 4.1** to **Figure 4.4** below.

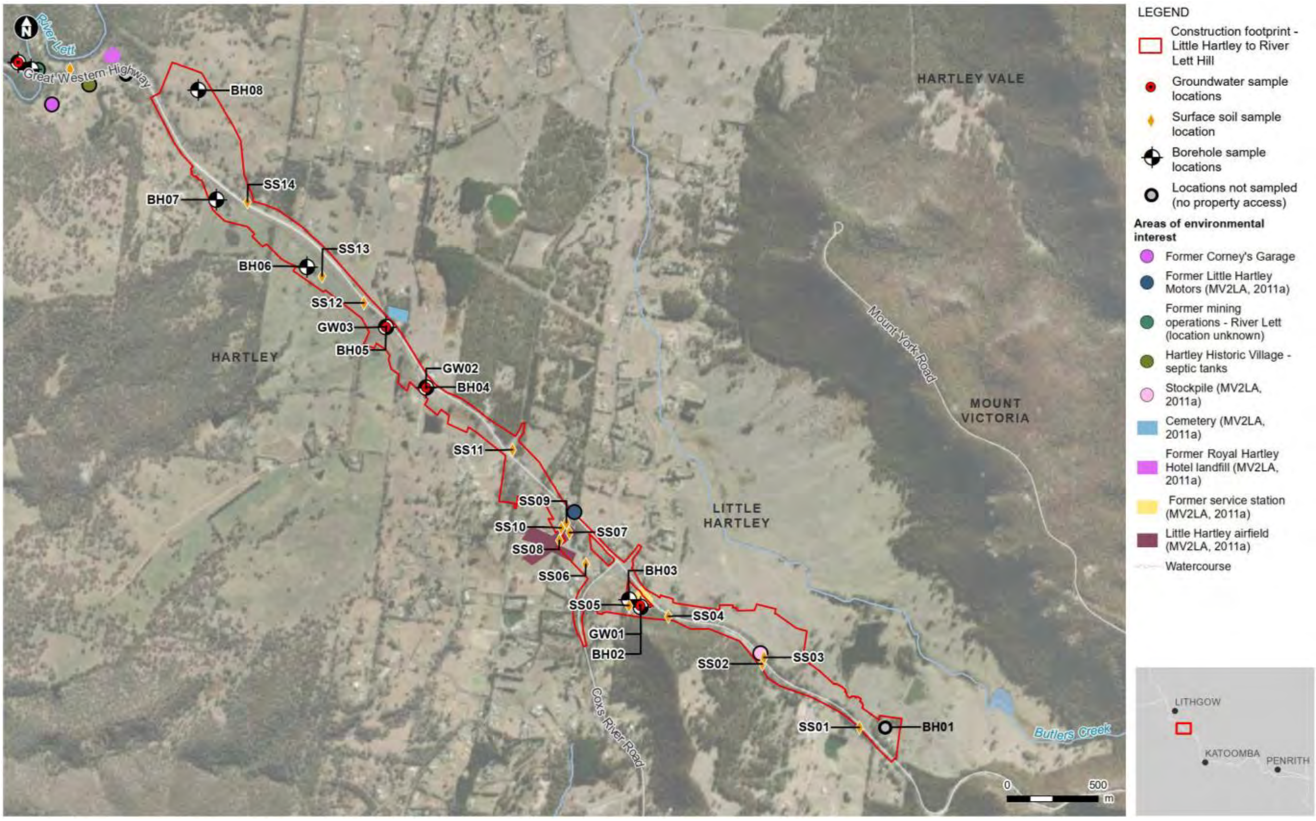

Figure 4.1: Sampling locations for L2R study area

Figure 4.2: Sampling locations for CRR study area

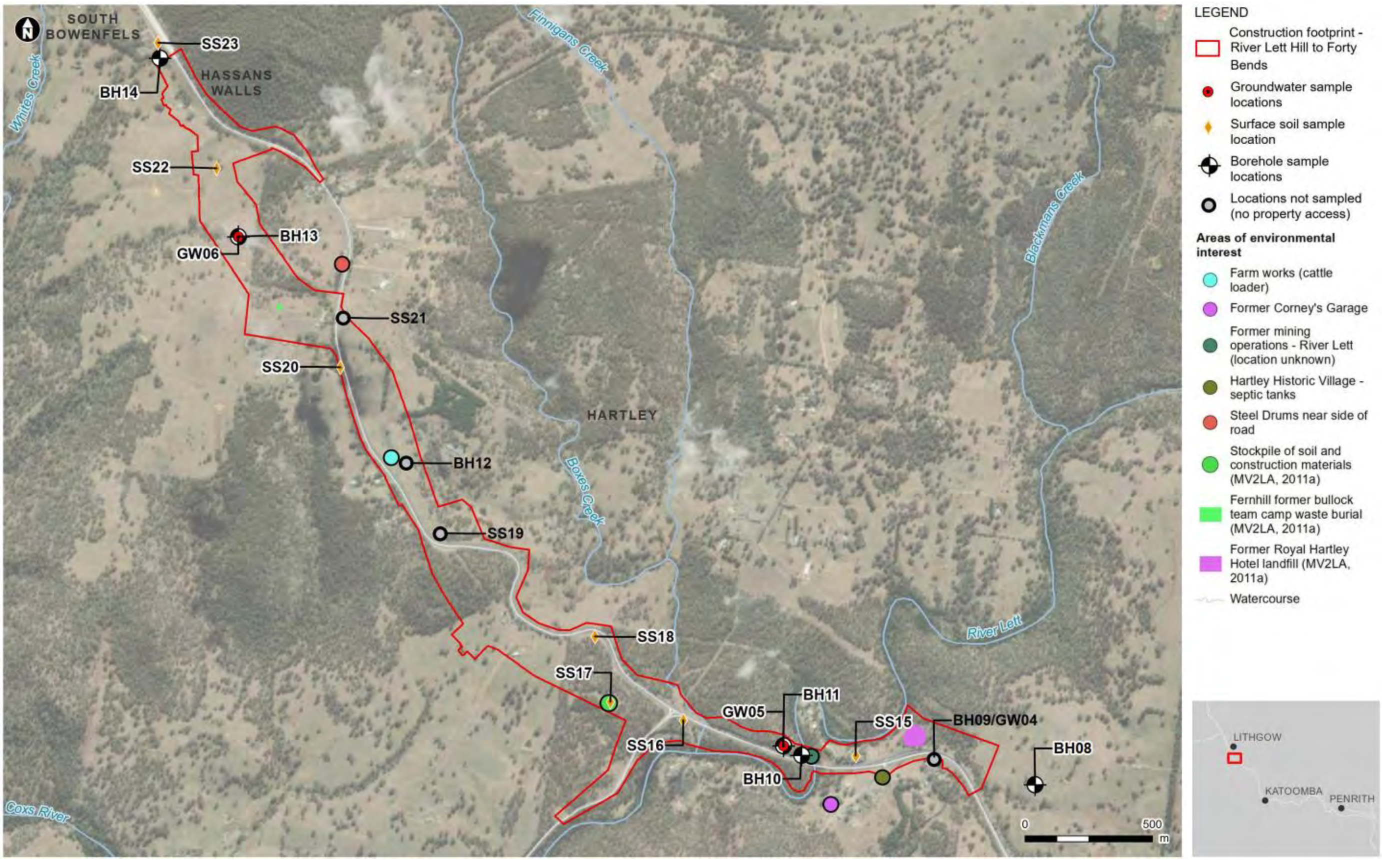

Figure 4.3: Sampling locations for R2F study area

Figure 4.4: Sampling locations for F2L study area

4.1.1 Boreholes

The borehole investigation strategy and sample locations are outlined in **Table 4.1** below and in **Figure 4.1** to **Figure 4.4**.

Table 4.1: Summary of borehole sample locations

Study area	Sample ID	Location	Rationale	Maximum borehole depth (metres below ground level (mbgl))	Sample depths (mbgl)	Analytical Schedule
L2R/CRR	BH02	Grassed area behind former service station site	Targeting potential impacts from the former service station – Little Hartley	1.2	0.05, 0.5, 1.0	Heavy metals (As, Cd, Cr, Cu, Hg, Ni, Pb, Zn), hydrocarbons (TRH, BTEXN, PAH), pesticides (OCP/OPP), asbestos (presence/absence).
	BH03			0.95	0.05, 0.5, 0.9	
	BH04	Adjacent to road on agricultural property	Targeting potential impacts from agriculture	13.5	0.05, 0.5, 1.0 to 11.0	Heavy metals (As, Cd, Cr, Cu, Hg, Ni, Pb, Zn), hydrocarbons (TRH, BTEXN, PAH), pesticides (OCP/OPP), asbestos (presence/absence), , microbiological (total coliforms).
	BH05	Grassed area on road verge opposite cemetery	Targeting potential impacts from the Hartley Cemetery	8.0	0.05, 0.5, 1.0, 2.0, 3.0, 4.0, 5.0, 6.0, 8.0	Heavy metals (As, Cd, Cr, Cu, Hg, Ni, Pb, Zn), formaldehyde, nutrients (nitrite, nitrate, total kjeldahl nitrogen (TKN), total nitrogen, phosphorus).
L2R	BH06	Grassed area on agricultural property	Targeting potential impacts from agriculture	0.82	0.05, 0.5, 0.82	Heavy metals (As, Cd, Cr, Cu, Hg, Ni, Pb, Zn), hydrocarbons (TRH, BTEXN, PAH), pesticides (OCP/OPP), asbestos (presence/absence), microbiological (total coliforms).
	BH07			0.76	0.05, 0.5, 0.76	
	BH08			1.1	0.05, 0.5, 1.0	
R2F	BH10	Vegetated area on crown land adjacent to road	Targeting potential impacts from former mining operations near River Lett	1.05	0.05, 0.5, 1.0	Heavy metals (As, Cd, Cr, Cu, Hg, Ni, Pb, Zn), cyanide.
	BH11			1.65	0.05, 0.5, 1.0	
	BH13	Grassed area on agricultural land (next to stream)	Targeting potential impacts from agriculture	0.7	0.05, 0.5	Heavy metals (As, Cd, Cr, Cu, Hg, Ni, Pb, Zn), hydrocarbons (TRH, BTEXN, PAH), pesticides

Study area	Sample ID	Location	Rationale	Maximum borehole depth (metres below ground level (mbgl))	Sample depths (mbgl)	Analytical Schedule
						(OCP/OPP), asbestos (presence/absence), microbiological (total coliforms).
F2L	BH14	Grassed area on agricultural land (adjacent to driveway)		1.5	0.05, 0.5, 1.0, 1.5	Heavy metals (As, Cd, Cr, Cu, Hg, Ni, Pb, Zn), hydrocarbons (TRH, BTEXN, PAH), pesticides (OCP/OPP), asbestos (presence/absence).
	BH15	Grassed area behind property		6	0.05, 0.5, 1.0, 2.0	Heavy metals (As, Cd, Cr, Cu, Hg, Ni, Pb, Zn), hydrocarbons (TRH, BTEXN, PAH), pesticides (OCP/OPP), asbestos (presence/absence), microbiological (total coliforms).
	BH16	Grassed area on agricultural land		1.5	0.05, 0.5, 1.0, 1.5	Heavy metals (As, Cd, Cr, Cu, Hg, Ni, Pb, Zn), hydrocarbons (TRH, BTEXN, PAH), pesticides (OCP/OPP), asbestos (presence/absence).
	BH17	Adjacent to road in front of residential properties	Targeting potential impacts from the former service station – South Bowenfels	8.1	0.05, 0.5, 1.0, 2.5, 4.5, 6.0, 7.0	Heavy metals (As, Cd, Cr, Cu, Hg, Ni, Pb, Zn), hydrocarbons (TRH, BTEXN, PAH).

4.1.2 Surface Soil

The surface soil investigation strategy and sample locations are outlined in **Table 4.2** below and in **Figure 4.1** to **Figure 4.4**.

Table 4.2: Summary of surface soil sample locations

Study area	Sample ID	Location	Rationale	Sample depths (m)	Analytical Schedule
L2R	SS01	Road verge	Targeting potential impacts from the operation of the road corridor	0.05	Heavy metals (As, Cd, Cr, Cu, Hg, Ni, Pb, Zn), hydrocarbons (TRH, BTEXN, PAH).
	SS02			0.05	

Study area	Sample ID	Location	Rationale	Sample depths (m)	Analytical Schedule
	SS03		Targeting potential impacts of unknown soil stockpile	0.10	Heavy metals (As, Cd, Cr, Cu, Hg, Ni, Pb, Zn), hydrocarbons (TRH, BTEXN, PAH), pesticides (OCP/OPP), asbestos (presence/absence).
	SS04		Targeting potential impacts from the operation of the road corridor	0.05	Heavy metals (As, Cd, Cr, Cu, Hg, Ni, Pb, Zn), hydrocarbons (TRH, BTEXN, PAH).
L2R/CRR	SS05	Grassed area on agricultural land	Targeting potential impacts from agriculture	0.05	Heavy metals (As, Cd, Cr, Cu, Hg, Ni, Pb, Zn), hydrocarbons (TRH, BTEXN, PAH), pesticides (OCP/OPP), asbestos (presence/absence).
	SS06			0.05	
	SS07	Grassed area behind property	Targeting potential impacts from the former airfield	0.05	Heavy metals (As, Cd, Cr, Cu, Hg, Ni, Pb, Zn), hydrocarbons (TRH, BTEXN, PAH), per-and polyfluoroalkyl substances (PFAS) extended-suite.
	SS08			0.05	
	SS09			0.05	
	SS10			0.05	
	SS11	Agricultural land adjacent to road	Targeting potential impacts from agriculture	0.05	Heavy metals (As, Cd, Cr, Cu, Hg, Ni, Pb, Zn), hydrocarbons (TRH, BTEXN, PAH), pesticides (OCP/OPP), asbestos (presence/absence).
	SS12	Road verge	Targeting potential impacts from the operation of the road corridor	0.05	Heavy metals (As, Cd, Cr, Cu, Hg, Ni, Pb, Zn), hydrocarbons (TRH, BTEXN, PAH).
L2R	SS13	Grassed area on agricultural land	Targeting potential impacts from agriculture	0.05	Heavy metals (As, Cd, Cr, Cu, Hg, Ni, Pb, Zn), hydrocarbons (TRH, BTEXN, PAH), pesticides (OCP/OPP), asbestos (presence/absence), microbiological (total coliforms).
	SS14	Road verge	Targeting potential impacts from the operation of the road corridor	0.05	Heavy metals (As, Cd, Cr, Cu, Hg, Ni, Pb, Zn), hydrocarbons (TRH, BTEXN, PAH).

Study area	Sample ID	Location	Rationale	Sample depths (m)	Analytical Schedule
R2F	SS15	Grassed area behind property	Targeting potential impacts from agriculture	0.05	Heavy metals (As, Cd, Cr, Cu, Hg, Ni, Pb, Zn), hydrocarbons (TRH, BTEXN, PAH), pesticides (OCP/OPP), asbestos (presence/absence).
	SS16	Road verge	Targeting potential impacts from the operation of the road corridor	0.05	Heavy metals (As, Cd, Cr, Cu, Hg, Ni, Pb, Zn), hydrocarbons (TRH, BTEXN, PAH).
	SS17	Project standdown area	Targeting potential impacts of unknown soil stockpile	0.10	Heavy metals (As, Cd, Cr, Cu, Hg, Ni, Pb, Zn), hydrocarbons (TRH, BTEXN, PAH), pesticides (OCP/OPP), asbestos (presence/absence).
	SS18	Road verge	Targeting potential impacts from the operation of the road corridor	0.05	Heavy metals (As, Cd, Cr, Cu, Hg, Ni, Pb, Zn), hydrocarbons (TRH, BTEXN, PAH).
	SS20		Targeting potential impacts from the operation of the road corridor	0.05	
	SS22	Grassed area on agricultural land	Targeting potential impacts from agriculture	0.05	Heavy metals (As, Cd, Cr, Cu, Hg, Ni, Pb, Zn), hydrocarbons (TRH, BTEXN, PAH), pesticides (OCP/OPP), asbestos (presence/absence), microbiological (total coliforms).
F2L	SS23	Grassed area adjacent to road	Targeting potential impacts from the operation of the road corridor	0.05	Heavy metals (As, Cd, Cr, Cu, Hg, Ni, Pb, Zn), hydrocarbons (TRH, BTEXN, PAH).
	SS24	Road verge	Targeting potential impacts of unknown soil stockpile	0.05, 0.10	Heavy metals (As, Cd, Cr, Cu, Hg, Ni, Pb, Zn), hydrocarbons (TRH, BTEXN, PAH), pesticides (OCP/OPP), asbestos (presence/absence).
	SS25		Targeting potential impacts of unknown soil stockpile	0.10	
	SS26	Grassed area on agricultural land	Targeting potential impacts from agriculture	0.05	
	SS27	Road verge	Targeting potential impacts from the	0.05	Heavy metals (As, Cd, Cr, Cu, Hg, Ni, Pb, Zn),

Study area	Sample ID	Location	Rationale	Sample depths (m)	Analytical Schedule
			operation of the road corridor		hydrocarbons (TRH, BTEXN, PAH).
	SS28	Driveway adjacent to road	Targeting potential impacts of unknown soil stockpile	0.05	Heavy metals (As, Cd, Cr, Cu, Hg, Ni, Pb, Zn), hydrocarbons (TRH, BTEXN, PAH), pesticides (OCP/OPP), asbestos (presence/absence).
	SS29	Grassed area adjacent to road	Targeting potential impacts from agriculture	0.05	

4.1.3 Groundwater

- The groundwater investigation strategy and sample locations are outlined in **Table 4.3** below and in **Figure 4.1** to **Figure 4.4**..

Table 4.3: Summary of groundwater sample locations

Study area	Sample ID	Location	Rationale	Maximum well depth (mbgl)	Sample depth (mbgl)	Analytical Schedule
L2R/CRR	GW01	Gravel driveway behind former service station site	Targeting potential impacts from the former service station – Little Hartley	10.9	9.9	Dissolved heavy metals (As, Cd, Cr, Cu, Hg, Ni, Pb, Zn), hydrocarbons (TRH, BTEXN, PAH).
	GW02	Adjacent to road on agricultural property	Targeting potential impacts from agriculture	13.4	7.5	Dissolved heavy metals (As, Cd, Cr, Cu, Hg, Ni, Pb, Zn), hydrocarbons (TRH, BTEXN, PAH), pesticides (OCP/OPP), microbiological (total coliforms).
	GW03	Grassed area on road verge opposite cemetery	Targeting potential impacts from the Hartley Cemetery	7.6	6	Dissolved heavy metals (As, Cd, Cr, Cu, Hg, Ni, Pb, Zn), formaldehyde, nutrients (nitrite, nitrate, TKN, total nitrogen, phosphorus).
R2F	GW05	Vegetated area on crown land adjacent to road	Targeting potential impacts from former mining operations near River Lett	14.4	11	Dissolved heavy metals (As, Cd, Cr, Cu, Hg, Ni, Pb, Zn), total cyanide.
R2F	GW06	Grassed area on agricultural land (next to stream)	Targeting potential impacts from agriculture	8.1	5	Dissolved heavy metals (As, Cd, Cr, Cu, Hg, Ni, Pb, Zn), hydrocarbons (TRH,

Study area	Sample ID	Location	Rationale	Maximum well depth (mbgl)	Sample depth (mbgl)	Analytical Schedule
						BTEXN, PAH), pesticides (OCP/OPP), microbiological (total coliforms).
F2L	GW07	Adjacent to road in front of residential properties	Targeting potential impacts from the former service station – South Bowenfels	8	6	Dissolved heavy metals (As, Cd, Cr, Cu, Hg, Ni, Pb, Zn), hydrocarbons (TRH, BTEXN, PAH).

4.2 Soil investigation

The soil sampling program consisted of the 27 surface soil locations, nine hand auger locations and the drilling of five soil boreholes, four of which were completed as groundwater wells. The soils boreholes were drilled using a Comacchio drill rig to varying depths.

All soil sampling was undertaken in general accordance with Australian Standards AS4482.1:2005. Jacobs Standard Work Instructions were followed during the investigation. All sampling for PFAS was carried out in accordance with Jacobs Standard Operating Procedures.

4.2.1 Sample collection

Surface soil samples were collected directly from the soil surface as grab samples to a maximum depth of approximately 0.10 mbgl. Borehole soil samples were collected using a decontaminated hand auger or Standard Penetration Tests (SPTs) to a maximum depth of 11 mbgl. Samples for laboratory analysis were collected using new nitrile gloves for each sample. Collected samples were placed into the laboratory supplied sample containers and labelled with a unique identifier. Only samples for non-PFAS analysis were placed in containers with Teflon lined lids. The soil sample containers, once filled with sample and sealed, were immediately placed in an esky/cool box with a cooling medium (i.e. ice) to keep the samples below a temperature of approximately 4°C. At the end of the sampling program the samples in the esky/cool box will were transported to a National Association of Testing Authorities Australia (NATA) accredited laboratory for analysis.

All boreholes not used for the construction of groundwater wells, were reinstated with the excavated material. Care was taken to reinstate boreholes with materials in the order in which they were excavated.

4.2.2 Aesthetic assessment

Aesthetics at each investigation location were monitored during sampling to determine the presence of observable odours, discoloration and erroneous wastes materials in soil which could possibly indicate contamination. All observations were recorded on the field sheets for the relevant investigation location.

4.2.3 Sample logging and documentation

Soil logs were completed during the field investigation. The soil logs recorded (as a minimum) the following data:

- Soil lithology, as well as indications of moisture or contamination (odours, discoloration, staining, oil sheen etc)
- Sample ID and depth
- Date

- Method of collection
- Photoionisation Detector (PID) readings.

4.2.4 Photoionisation detection

A PID was used to detect potential organic vapours in open air and from soils during the investigative works. A PID operates on the principal that many organic compounds can be ionised when subjected to UV light. The greater the quantity of organic vapours in the sample, the larger the reading obtained from the PID.

The PID used for this investigation was a 'PhoCheck Tiger' PID. The tests were conducted during the site investigation works using headspace analysis. Headspace analysis involved placing subject soils into a ziplock bag. The bag was filled halfway with the soil which allowed air space for the potential volatile compounds to accumulate. Soil samples were allowed to reach ambient air temperature prior to undertaking the PID screening.

The screening of samples was based upon the criteria outlined in **Table 4.4**. The calibration certificates for the PIDs used are presented as **Appendix E.**

Table 4.4: PID Screening Criteria

PID Reading	**Generalised Soil Volatiles Content** ***(description relating to petroleum hydrocarbon contamination)***
<20 ppm	Negligible
20 – 60 ppm	Low
60 – 300 ppm	Moderate
>300 ppm	Significant

4.3 Groundwater investigation

The groundwater sampling program consisted of the sampling of groundwater from six groundwater well locations. Four of these were installed from boreholes as part of this Stage 2 contamination investigation and two were existing wells installed by the JAJV as part of geotechnical investigations.

The groundwater investigation comprised:

- Construction of groundwater wells using 50mm Class 18UPVC screen and casing, graded sand, bentonite and completed flush with ground level with a gatic cover
- Gauging of groundwater levels within all wells to assess depth to groundwater
- Development and sampling (using Hydrasleeve™ samplers) of existing and newly installed groundwater wells.

Groundwater well installation details are included in the field sheets provided in **Appendix C.**

Fieldwork was undertaken in accordance with documented Jacobs procedures by experienced staff. The groundwater wells were developed using a submersible pump alongside a dedicated PVC bailer for each well. Following development, the wells were allowed to stabilise for a minimum of five days before being sampled.

4.3.1 Sample collection

Groundwater wells were sampled using a Hydrasleeve™ sampler. Each Hydrasleeve™ sampler was left in the well to equilibrate for at least five days prior to sampling. Care was taken to minimise the potential for volatile losses during sampling.

The electrodes of a calibrated water quality meter (calibration certificates are presented as **Appendix E**) were used to measure pH, redox potential (Eh), electrical conductivity, dissolved oxygen and temperature in water purged and sampled from the wells. Hydrasleeve™ samplers were installed following stabilisation of these water quality parameters (generally ± 10%).

All samples were collected with new disposable nitrile gloves. Dedicated/single use tubing (for purging) and Hydrasleeve™ samplers (sampling) were used negating the requirement to decontaminate equipment during the groundwater sampling event.

All groundwater samples were placed within laboratory provided sample containers (unpreserved glass and plastic and preserved glass and plastic) with Teflon lids. Samples for dissolved metals analysis were field filtered with a single use 0.45 micron filter. Samples for PFAS analysis were placed in laboratory supplied PFAS containers. All sample containers were labelled with the sample number, project number, date obtained and site name.

Once filled, the caps of the sample bottles were checked to ensure that they are secure (and that there are no air bubbles/head space) then placed within an esky / cool box in which a cooling medium had been added (i.e. ice) to keep the samples at a temperature of approximately 4ºC.

4.3.2 Sample logging and documentation

Groundwater sampling logs were completed during the field investigation. The groundwater logs record (as a minimum) the following data:

- Well Installation details
- Sample ID and sampling depth
- Water quality parameters
- Water level details
- Date
- Method of collection.

4.4 Coal Tar investigation

Asphalt samples were taken from select pavement cores within the study area and analysed for the presence of coal tar. Details of this investigation are outlined in Appendix H.

4.5 Decontamination procedures

All field equipment that came into contact with multiple samples (i.e. hand auger and SPT) was decontaminated between samples in accordance with the Jacobs Standard Work Instructions, taking into account PFAS-specific requirements outlined in Jacobs Standard Operating Procedures.

4.6 Laboratory analysis

Jacobs commissioned Australian Laboratory Services (ALS) and Envirolab as the primary laboratories and Eurofins as the secondary laboratory. ALS, Envirolab and Eurofins are NATA accredited for the testing undertaken. A total of 60 primary soil, six primary groundwater and three waste classification samples were analysed by the primary laboratory. A total of five samples were analysed by the secondary laboratories.

Quality assurance and quality control (QAQC) samples were also collected, including five blind replicate soil samples, four split replicate soil samples and one blind replicate and one split replicate groundwater sample. Blind and split replicate samples were analysed for the same contaminants as the associated primary sample.

Seven trip blanks (one for each sample batch submitted to the laboratory) were analysed for BTEXN. Eight rinsate samples (one per piece of equipment for each week of sampling) were analysed for the same contaminants as the primary samples. Further detail regarding QAQC samples is presented in **Section 6.**

The laboratory certificates associated with the Stage 2 assessment are summarised below and located in Appendix D.

Envirolab

- 276682
- 277534.

ALS

- ES2132166
- ES2132601
- ES2132942
- ES2133844
- ES2134103
- ES2134640
- ES2135804.

Eurofins

- 820973
- 822697
- 824081
- 824119
- 826682
- 826760
- 826833.

Two samples (WC_S01 and WC_S02) which form part of the analysis completed in ALS laboratory batch ES2135804 were analysed for PFAS leachability as part of a waste classification for excess spoil generated from soil boreholes during the investigation. These samples have not been assessed as part of this investigation as they were only necessary for the appropriate classification of excess soil generated during the contamination assessment and were not targeting any of the AEIs.

Laboratory reports are presented as **Appendix D,** and results tables are presented as **Appendix B.**

4.7 Departures from SAQP methodology

Based on the site conditions and constraints applied to the scope of works, a number of departures from the SAQP (JAJV, 2021a) were recorded during the Stage 2 contamination assessment. The departures are discussed in **Table 4.5**.

Table 4.5: SAQP Departures

SAQP Requirement	SAQP Departure	Rationale and implications of departure
Trip spikes will be submitted with every batch of soil and water samples delivered to the primary laboratory.	Only analysis of one trip spike sample was completed	The trip spike sample analysed reported recovery percentages within the acceptance limits (70-130%). All other samples were handled and transported in the same manner by suitably experienced environmental scientists. It can be expected that trip spike recoveries would be similar for other samples. Therefore, this departure is not expected to impact upon the quality of the data.
Collection of rinsate blanks from reusable sampling equipment at a rate of 1 per day, per matrix, per set of equipment	Rinsate blanks were completed at a rate of 1 per week, per matrix, per set of equipment	The rinsate blank samples analysed all reported values below the Limit of Reporting (LOR). All reusable equipment was decontaminated in the same manner by suitably experienced environmental scientists and contaminant concentrations were generally low in all samples collected and analysed as part of this investigation (i.e. no gross contamination). Therefore, this departure is not expected to impact upon the quality of the data.
Utilise four geotechnical test pits where possible for soil sampling.	Test pit sample locations replaced with hand augers.	Due to project delays and scheduling issues, alignment with geotechnical test pits was not possible. Locations were instead sampled using a hand auger to 1.5m (or refusal). Soil samples were still able to be collected at the respective investigation locations from the specified depths. This is unlikely to affect the usability/reliance of the data set.
All nominated soil sampling locations to be sampled and analysed for proposed contaminants of concern.	No soil sampling at investigation locations BH01, BH09, BH12, SS19, SS21.	Locations were unable to be sampled due to project constraints (property access). This departure was unavoidable and will reduce the coverage of this assessment, with some data gaps in areas with access issues.
All nominated groundwater sampling locations to be sampled and analysed for proposed contaminants of concern.	No groundwater sampling at well GW04.	Location GW04 was unable to be sampled due to project constraints (property access). However, as intersection with groundwater is not expected in this location, this is not expected to impact on the assessment.

5. Site Assessment Criteria

To address potential human health and environmental impacts at the site, Jacobs compared the analytical test results against a set of health and ecological based soil and groundwater investigation levels to be referred to as SAC appropriate for the proposed land use (i.e. commercial/industrial). Commercial/industrial land use is considered applicable to the construction and operation of the project based on the following:

- Likely short-term exposure to contamination (if present) to workers and site users during construction
- Limited access to contamination (if present) during operation as the project area is likely to comprise a sealed highway and associated structures (e.g. sealed rest areas, vegetated embankments, water quality ponds etc.).

That is, the SAC have been set at levels that provide confidence that contaminant concentrations below the SAC will not adversely affect human health or terrestrial/aquatic ecosystems associated with the construction and operation of the project.

The SAC developed for the investigation was derived from the following guidelines:

- *Schedule B1 Guideline on Investigation levels for Soil and Groundwater* (NEPC, 2013).
- *PFAS National Environmental Management Plan (PFAS NEMP) – Version 2 (HEPA, 2020)*
- *Australian and New Zealand Guidelines for Fresh and Marine Water Quality (ANZG, 2018)*
- *National Water Quality Management Strategy Paper No. 4 – Australian and New Zealand Guidelines for Fresh and Marine Water Quality* (ANZECC 200) (where guideline values are not provided by ANZG (2018))
- *National Water Quality Management Strategy, Australian Drinking Water Guidelines 6, 2011 - Version 3.5 Updated August 2018* (NMHRC, 2018)
- *Environmental Guidelines: Use and disposal of biosolids products. (NSW EPA, 2000)*
- *Technical Direction 21: coal tar asphalt handling and disposal procedure.* (NSW RMS, 2015)
- *Test method T542: Identification of tar or pitch in asphalt.* (NSW RMS, 2012)

5.1 Soil

5.1.1 Aesthetics

Aesthetics on sites relates to the presence of observable odours, discoloration and erroneous wastes materials in soil which could possibly indicate contamination. Such olfactory evidence can point to how receptors can be impacted by vapours on and migrating from the site. Odour threshold for organic substances can be exceeded in off-site settings (through groundwater transmission of hydrocarbons) and whilst may not represent a direct health risk, could possibly prompt civil action. Aesthetics were continually assessed during the investigation and reported on the field logs (where present).

5.1.2 Ecological Investigation Levels

The NEPM (NEPC, 2013) presents ecological investigation levels (EILs) that are applicable for assessing potential risk to terrestrial ecosystems. The EILs have been developed for selected metals (arsenic, copper, chromium III, nickel, lead and zinc) and organic substances (DDT and naphthalene). The EILs are dependent on specific soil physiochemical properties (i.e. pH, cation exchange capacity [CEC] and % clay) and land use scenarios. EILs generally apply to the top 2 m of soil.

EILs were generated using the NEPC (2013) – Volume 2 – Table 1B (1-7). For this site it has been assessed that the EILs will apply to contaminants within the top 2 metres of soil at the surface / ground level which corresponds to the root zone and habitation zone of many species. Additionally, for this site the typical background concentrations are required to be calculated in order to derive EILs. To generate the EILs for the site, JAJV have used the methodology as described in **Appendix G.**

Sands and clays were the predominant soil types found underlying the site during the investigation. For the purpose of this assessment, and as a conservative approach, sand soil type has been adopted for the soil profile at the site.

The PFAS NEMP (HEPA, 2020) presents ecological investigation levels (EILs) that are applicable for assessing potential risk of PFAS to terrestrial ecosystems. The EILs for ecological protected that are provided in the PFAS NEMP – Table 3 (HEPA, 2020) have been adopted for this investigation.

Based on a commercial/industrial land use, the EILs adopted are summarised in **Table 5.1.**

Table 5.1: Ecological Investigation Levels (expressed as mg/kg).

Substance	**Ecological Investigation Level**
Arsenic	160[2]
Cadmium	No criteria provided.
Chromium	542[1]
Copper	145[1]
Lead	1105[1]
Mercury	No criteria provided.
Nickel	57[1]
Zinc	215[1]
DDT	640[2]
Naphthalene	370[2]
PFOS	0.01[3]
PFOA	10[3]

[1] EILs derived from NEPC 2013 equation ABC+ACL.

[2] Generic EILs for aged arsenic, DDT and Naphthalene from **Table 1B (5)** of NEPC 2013 for commercial and industrial land use**.**

[3] EILs derived for PFAS from **Table 3** of HEPA 2020.

5.1.3 Ecological Screening Levels

The NEPM (NEPC, 2013) presents Ecological Screening Levels (ESLs) that are applicable for assessing potential risk to terrestrial ecosystems.

ESLs are focused on petroleum hydrocarbon and total recoverable hydrocarbon (TRH) compounds and are compared against actual site conditions (sub-surface materials and depth) to assess the potential risk to terrestrial ecosystems. For the purposes of calculating the ESLs, the generic soil type (i.e. three broad classes of sands, silts or clays) and land use need to be defined. EILs generally apply to the top 2 metres of soil.

Sands and clays were the predominant soil types found underlying the site during the investigation. For the purpose of this assessment, and as a conservative approach, sand (coarse grained) soil type has been adopted for the soil profile at the site.

Based on a commercial/industrial land use, the ESL adopted are summarised in **Table 5.2.**

Table 5.2: ESLs for Petroleum Based Fractions (mg/kg)

Fraction	**Ecological Screening Level[1]**
F1 (C_6 - C_{10})	215

Fraction	Ecological Screening Level[1]
F2 (>C_{10} - C_{16})	170
F3 (>C_{16} - C_{34})	1700
F4 (>C_{34} - C_{40})	3300
Benzene	75
Toluene	135
Ethylbenzene	165
Xylenes	180
Benzo(a)pyrene	0.7

[1]Table 1B(6) ESLs for TPH fractions F1 - F4, BTEX and Benzo(a)pyrene in soils - NEPM (2013).

5.1.4 Health Investigation Levels

To address potential health impacts at the site, Jacobs compared the analytical testing results against a set of health-based Soil Investigation Levels (SILs) appropriate for commercial/industrial land use in context of the proposed site use (i.e. construction activities and highway) and taken into consideration the potential for contamination in soil to impact upon groundwater and generate vapours which could impact upon on site and off site human receptors. The health based SILs are a combination of Health Investigation Levels (HILs) and Health Screening Levels (HSLs). The adopted SILs for the site are summarised in **Table 5.3.**

HILs have been developed for a broad range of metals and organic substances. The HILs are applicable for assessing human health risk via all relevant pathways of exposure. The HILs are generic to all soil types and apply generally to a depth of 3 metres below the surface for residential use.

HSLs have been developed for selected petroleum compounds and fractions and are applicable to assessing human health risk via the inhalation and direct contact pathways. The HSLs depend on specific soil physico-chemical properties, land use scenarios, and the characteristics of building structures. They apply to different soil types, and depths below surface to >4 m. Further detail on their use is provided in Friebel and Nadebaum (2011a, 2011b & 2011c). The HSLs defined within the NEPC 2013 relate only to the volatile fractions of the petroleum hydrocarbons range i.e. BTEX, naphthalene and TRH C6 – C10, TRH C10 – C16.

HSLs for total coliforms have been adopted based on the Biosolids Stabilisation Grade A Microbiological Standards from NSW EPA (2000) *Environmental Guidelines: Use and disposal of biosolids products*. While these guidelines do not strictly apply to a commercial/industrial land use, they provide and understanding of the potential exposure risks associated with total coliforms in soil. The SAC for faecal coliforms were adopted as a conservative approach in the absence of specific total coliform criteria.

The sites proposed land use is commercial/industrial and has been classed as such for the purpose of this assessment. Therefore, Jacobs has adopted the value from the following criteria:

- NEPC (2013) and HEPA (2020) Health Investigation Levels recommended for exposure setting 'D' which includes shops, offices, factories and industrial sites
- Biosolids Stabilisation Grade A Microbiological Standards from *Environmental Guidelines: Use and disposal of biosolids products.* (NSW EPA, 2000).

Table 5.3: Soil Investigation Levels (expressed as mg/kg)

Compounds	Soil Investigation Levels
Metals/Metalloids	
Arsenic	3000[1]
Cadmium	900[1]

Compounds	**Soil Investigation Levels**			
Chromium	3600[1]			
Copper	240000[1]			
Lead	1500[1]			
Mercury (inorganic)	730[1]			
Nickel	6000[1]			
Zinc	400000[1]			
Cyanide	1500[1]			
Polycyclic Aromatic Hydrocarbons (PAHs)				
Naphthelene	370[6]			
BaP TEQ	40[1]			
Total PAH	4000[1]			
Total Recoverable Hydrocarbons (TRH)				
C6-C10 (F1)	215[2] / 260[3]			
>C10-C16 (F2)	170[2] / NL[3]			
>C16-C34 (F3)	1700[2]			
>C34-C40 (F4)	3300[2]			
Asbestos				
Asbestos (all forms)	No detectable asbestos			
Organochlorine Pesticides[1]				
DDT+DDE+DDD	3600			
Aldrin and dieldrin	45			
Chlordane	530			
Endosulfan	2000			
Endrin	100			
Heptachlor	50			
HCB	80			
Methoxychlor	2500			
F1, F2 and BTEX (based on sand soil type)[3]				
Depth (m)	**0 - <1**	**1 - <2**	**2 - <4**	**>4**
F1 (C6-C10)	260	370	630	NL
F2 (>C10-C16)	NL	NL	NL	NL
Benzene	3	3	3	3
Toluene	NL	NL	NL	NL
Ethylbenzene	NL	NL	NL	NL
Xylenes	230	NL	NL	NL
Naphthalene	NL	NL	NL	NL
PFAS[4]				
Sum of PFOS and PFHxS	20			
PFOA	50			
Microbiological[5]				
Total coliforms	1000 CFU/g			

Compounds	Soil Investigation Levels
Semi Volatile Organic Compounds (SVOC's)	
Formaldehyde	NL

[1]NEPC (2013) Table 1 A (1) Health investigations levels for soil contaminants – Commercial/industrial D.

[2]NEPC (2013) Table 1 B (6) ESLs for TPH fractions F1-F4, BTEX and benzo(a)pyrene in soil – Commercial and Industrial, coarse grained soil texture.

[3]NEPC (2013) Table 1 A (3) Soil HSLs for vapour intrusion – Commercial/Industrial, sand.

[4]HEPA (2020) Table 2 Human health investigation levels for soil

[5]EPA (2000), Table 3-5, Biosolids Stabilisation Grade A Microbiological Standards (criteria for thermotolerant coliforms [faecal coliforms] adopted as a conservative trigger value)

[6]NEPC (2013) Table 1B(1-5) EIL Comm Ind Default (Aged)

NL – NL indicates the HSL is not limiting.

5.1.5 Asbestos

NEPM (NEPC, 2013) provides health-based screening levels for different forms of asbestos contamination in soil. To apply these screening levels, significant investigations, excavation and sample volumes are required to assess the volume of asbestos relative to soil. Jacobs have adopted a high-level criterion to assess the presence/ absence of asbestos in soil samples and to determine whether additional investigations are required to assess the risk to site users. The high-level criterion adopted by Jacobs is that there should be no asbestos in any form present in soil samples or observed on surface soils and in excavated materials.

5.2 Groundwater

Groundwater investigation levels (GILs) are the concentrations of a contaminant in groundwater above which further investigation (point of extraction) or a response (point of use) is required. GILs are based on Australian water quality guidelines and drinking water guidelines and are applicable for assessing human health risk and ecological risk from direct contact (including consumption) with groundwater.

5.2.1 Groundwater Investigation Levels – Human Health

The NSW EPA has endorsed the use of the water quality trigger levels given in the Australia New Zealand Guidelines for fresh and marine water quality (ANZG, 2018). These GILs will be applied for the protection of human health at the site.

For the protection of human health in relation to groundwater, the protection levels for recreational use and drinking water were applied (although acknowledged to be overly conservative). Recreational use GIL's were considered applicable due to the potential external exposure (secondary contact) of construction workers to contaminated groundwater (if present). Drinking water GILs were considered applicable (albeit conservative) due to the potential for accidental ingestion of contaminated groundwater (if present) by construction workers.

The SAC for thermotolerant coliforms were adopted as a conservative approach in the absence of specific total coliform criteria. A summary of the adopted GILs for human health are provided in **Table 5.4.**

Table 5.4: Groundwater Investigation levels (expressed as ug/L)

Compounds	Groundwater Investigation Levels – Human Health	
	Recreational[1]	Drinking Water[2]
Metals and metalloids		
Arsenic	100	10

Compounds	Groundwater Investigation Levels – Human Health	
	Recreational[1]	Drinking Water[2]
Cadmium	20	2
Chromium	50[5]	-
Copper	20000	2000
Lead	100	10
Mercury	10	1
Nickel	200	20
Zinc	5000[5]	-
Non-metal Inorganics (mg/L)		
Ammonia	10[5]	-
Cyanide	0.8	0.08
Nitrogen	-	-
Phosphorus	-	-
Nitrite (as N)	10[5]	11.29
Nitrate (as N)	1[5]	0.91
Polycyclic Aromatic Hydrocarbons (PAH)		
Naphthalene	16[6]	-
Benzo (a) pyrene	0.1	0.01
PAH's	-	0.01
Total Recoverable Hydrocarbons (TRH)		
TRH C_6-C_{10}	-	-
TRH C_{10}-C_{16}	-	-
Benzene	10	1
Ethylbenzene	3000	300
Toluene	8000	800
Xylene Total	6000	600
Semi Volatile Organic Compounds (SVOC)		
Formaldehyde	5	0.5
Organochlorine pesticides (OCP)		
Aldrin + Dendrin	3	0.3
Chlordane	20	2
DDT	200	9
g-BHC (Lindane)	200	10
Heptachlor	3	0.3
Methoxychlor	3000	-
Organophosphate pesticides (OPP)		
Azinophos methyl	30	30
Bromophos-ethyl	100	10

Compounds	Groundwater Investigation Levels – Human Health	
	Recreational[1]	Drinking Water[2]
Carbophenothion	5	0.5
Chlorfenvinphos	50	2
Chlorpyrifos	100	10
Diazinon	30	4
Dichlorvos	10	5
Dimethoate	500	7
Ethion	30	4
Fenamiphos	3	0.5
Fenthion	-	7
Malathion	-	70
Methyl parathion	1000	0.7
Monocrotophos	10	2
Parathion	100	20
Pirimphos-ethyl	5	0.5
Microbiological		
Total Coliforms	-	150CFU/100mL[5]

[1] Criteria obtained from NHMRC (2018) - Australian Drinking Water Guidelines (multiplied by a factor of 10).

[2] NMHRC (2018) - Australian Drinking Water Guidelines

[3] ANZG (2018) – unknown toxicant levels

[4] NEPC (2013) GILS

[5] ANZECC & ARMCANZ (2000) – Recreational water guidelines

[6] Criteria obtained from NEPC (2013) GILS (multiplied by a factor of 10).

- No guideline value available.

HSLs have been developed for selected petroleum compounds and fractions and are applicable to assessing human health risk via the inhalation and direct contact pathways. The HSLs depend on specific soil physio-chemical properties, land use scenarios, and the characteristics of building structures. They apply to different soil types, and depths below surface to >4 metres. Further details on their use are provided in Friebel and Nadebaum (2011a, 2011b & 2011c).

The HSLs defined within the NEPC (2013) relate only to the volatile fractions of the petroleum hydrocarbons range i.e. BTEX, naphthalene and TRH C6 – C10, TRH C10 – C16.

For the purpose of this assessment, and as a conservative approach, sand soil type has been adopted for the soil profile at the site.

The adopted groundwater HSLs are summarised in **Table 5.5**.

Table 5.5: Groundwater HSL's for vapour intrusion (ug/L)

Contaminants	Groundwater investigation levels (HILs / HSLs)		
	Commercial / Industrial (D)		
F1, F2 and BTEX (Based on a SAND soil type)			
Depth (m)	**1 - <4**	**4 - <8**	**8m+**
F1 (C6-C10)	6000	6000	7000
F2 (>C10-C16)	NL	NL	NL
Benzene	5	5	5
Toluene	NL	NL	NL
Ethylbenzene	NL	NL	NL
Xylenes	NL	NL	NL
Naphthalene	NL	NL	NL

NL – Not Limiting

5.2.2 Groundwater Investigation Levels – Ecosystem Protection

For the protection of the aquatic ecosystems, the most appropriate GILs were considered generally the 95% protection levels for freshwater given in the ANZG (2018) guideline. Where the guideline does not provide these criteria or the guideline considers the 95% protection level is inappropriate, GILs were sourced by using:

- The 99% protection levels for freshwater ecosystems provided in the ANZG 2018 guidelines (where applicable/available).
- NEPC (2013) prescribed GILs.
- Low reliability trigger values provided in the ANZG 2018 and ANZECC 2000 guidelines.

A summary of the adopted GILs are provided in **Table 5.6.**

Table 5.6: Groundwater Investigation levels (expressed as ug/L)

Compounds	Groundwater Investigation Levels – Ecosystem Protection
Metals and metalloids	
Arsenic	24[1]
Cadmium	0.2[1]
Chromium	1[1]
Copper	1.4[1]
Lead	3.4[1]
Mercury	0.6[1]
Nickel	11[1]
Zinc	8[1]
Non-metal Inorganics	
Ammonia as N	900[1]
Cyanide	7[1]
Nitrogen	250[5]

Compounds	Groundwater Investigation Levels – Ecosystem Protection
Phosphorus	20[5]
Nitrite (as NO_3)	13[5]
Nitrate (as NO_3)	13[5]
Polycyclic Aromatic Hydrocarbons	
Naphthalene	16[1]
Benzo (a) pyrene	200[1]
Fluoranthene	1[3]
Phenanthrene	0.6[3]
BTEXN	
Benzene	950[1]
Ethylbenzene	80[3]
Touluene	180[3]
Xylene (o)	350[1]
Organochlorine Pesticides (OCPs)	
a-BHC	0.03[3]
Aldrin + Dieldrin	0.001[3]
Chlordane	0.08[1]
DDT	0.01[1]
Dieldrin	0.01[3]
Endrin	0.02[1]
g-BHC (Lindane)	0.2[1]
Heptachlor	0.09[1]
Methoxychlor	0.005[3]
Organophosphate Pesticides (OPP)	
Azinophos methyl	0.02[1]
Chlorpyrifos	0.01[1]
Demeton-S-methyl	4[3]
Diazinon	0.01[1]
Dimethoate	0.15[1]
Malathion	0.05[1]
Parathion	0.004[1]
Halogenated Benzenes	
Hexachlorobenzene	0.05[3]

[1] ANZG (2018) Freshwater 95%

[2] ANZG (2018) Freshwater 99%

[3] ANZG (2018) Freshwater unknown

[4] NEPC 2013 GILs

[5] ANZECC & ARMCANZ (2000)

5.3 Coal tar

The site assessment criteria for coal tar follows a quantitative approach based on the presence or absence of coal tar in the sample. The presence of coal is determined using the NSW Government - Transport Roads and Maritime Services (2012) Test method T542: Identification of tar or pitch in asphalt (NSW RMS, 2012).

6. Quality Assurance and Quality Control (QAQC)

Field and laboratory Quality Assurance and Quality Control (QAQC) requirements (where applicable) compliant with NEPC (2013) requirements undertaken as part of the field work program are outlined below.

All soil and groundwater samples were collected by an experienced JAJV scientist, under established Jacobs protocols. JAJV personnel have been trained in sample collection and handling techniques.

For the purpose of assessing the quality of data presented in this report, the JAJV collected and analysed a Quality Control (QC) samples (field QC sample), while the laboratory completed their own internal QC. This section of the report is focused on the presentation of results of these QC samples, adherence to Quality Assurance (QA) systems and discussion of deviations, if any.

6.1 Data acceptance criteria

Acceptance criteria for quality control samples collected in the field as well as internal laboratory samples are outlined in **Table 6.1** below.

Table 6.1: Summary of acceptance criteria for quality assurance procedures

QAQC sample	Objectives	Acceptance Criteria
Field QAQC		
Standard procedures	▪ All sampling undertaken by suitably qualified and experienced Jacobs personnel ▪ Adherence to the relevant Jacobs Work Instructions or Standard Operating Procedure, including record keeping	▪ No deviation from standard procedure, unless deviation provides greater certainty and is reported ▪ All appropriate field records kept and maintained
Sample collection, preservation, handling and analysis	▪ All analysis within holding times ▪ Samples collected in appropriate containers for the analysis with suitable preservation applied upon collection ▪ Samples received at the laboratory in good condition, appropriately chilled and chain of custody intact ▪ Compliance with WA DER (2017) for PFAS sampling	▪ Use of laboratory supplied sample containers including polypropylene or high-density polyethylene (HDPE) containers for PFAS analysis. ▪ Preservation and storage of samples chilled in ice chests and transported to laboratories under chain of custody documentation. ▪ Samples received at laboratory appropriately chilled (<5°C), with ice. Samples remain not waterlogged and in separate bags to ice. ▪ Samples extracted and analysed within holding times relevant for the sample matrix: - For soil and sediment samples, the samples are to be extracted within 60 days of sample collection and analysed within 30 days of extraction (US EPA 821-R-11-007) - For water samples, the samples are to be extracted within 14 days of sample collection and analysed within 28 days of extraction (US EPA 537) ▪ Comply with PFAS NEMP (2020) for PFAS sampling ▪ Use of NATA accredited laboratories for all analysis undertaken
Decontamination	▪ Prevention of cross-contamination between sampling locations ▪ Collection and analysis of rinsate blanks from reusable sampling equipment	▪ Decontamination using a triple wash system for all reusable equipment prior to sampling and between sampling locations ▪ Collection of rinsate blanks from reusable sampling equipment at a rate of 1 per day, per matrix, per set of equipment
Collection of field quality control samples	▪ Field quality control sampling in accordance with AS 4482.1 – 2005	▪ Collection of blind replicate samples for analysis by the primary laboratory at a rate of 1 per 20 primary samples, and 1 per 10 primary samples for PFAS analysis

QAQC sample	Objectives	Acceptance Criteria
		▪ Collection of split duplicates for analysis by the secondary laboratory at a rate of 1 per 20 primary samples, and 1 per 10 primary samples for PFAS analysis. ▪ Collection of trip blanks and trip spikes at a rate of one per laboratory batch per sample matrix. ▪ Collection of rinsate blanks from reusable equipment at a rate of one per day when sampling equipment may come into contact with multiple samples
Calibration	▪ Calibration of field measuring equipment as specified by the manufacturer and retaining of calibration records.	▪ All equipment will be calibrated prior to use in the field. ▪ Calibration of equipment if observed to be outside of acceptable range from standard ▪ Calibration of field measuring equipment at the rate specified by the manufacturer ▪ Calibration records retained
Data handling	▪ Appropriate labelling of sampling containers ▪ Central database of correct field and laboratory data.	▪ Labelling of sample containers to include a unique sample identification number, date of collection, sampler's initials and project number ▪ Field data and laboratory reports undergo secondary check
Laboratory QAQC		
Analytical methods	▪ NATA accredited methods used for all analyses undertaken.	▪ Primary and secondary laboratories NATA accredited methods for all analyses undertaken.
Analysis of laboratory QAQC samples	▪ Laboratory QAQC samples are undertaken at a rate according to their NATA accreditation.	▪ Analysis of laboratory method blanks at a rate of one per 20 samples or one per batch, whichever is greater. ▪ Analysis of laboratory duplicates at a rate of one per 20 samples. ▪ Analysis of matrix spikes at a rate of one per sample batch, or one per 20 samples, whichever is greater.
Intra- and inter-lab duplicate samples	▪ To ensure the primary data is reliable and fit for purpose. ▪ The assessment of blind replicate and split samples is undertaken by calculating the Relative Percent Difference (RPD) of the replicate or split concentration compared with the original sample concentration. ▪ The RPD is defined as: $RPD = 100 \times \frac{(X1 - X2)}{average}$	▪ Analysed for the same analytes as the primary sample. ▪ Typical RPDs are noted in AS 4482.1-2005 as between 30 – 50%. Higher RPDs may be acceptable for heterogeneous material or where concentrations are close to the LOR (i.e. less than 10 times the LOR)

QAQC sample	Objectives	Acceptance Criteria
	Where, X1 and X2 are the concentration of the original and replicate samples.	
Trip blanks and rinsate samples	▪ Ensure that cross contamination has not occurred from sampling equipment, sampling procedure, or during storage and transport of samples	▪ Each trip blank and rinsate sample is analysed for the same analytes as the primary samples ▪ Analytical result < LOR
Laboratory duplicates	▪ To ensure precision of the analysis method and replicability of analysis due to potential sample heterogeneity. ▪ Assessment as per blind replicates and split samples	▪ As per laboratory quality control report
Matrix spike recoveries	▪ To assess the effect of the matrix on the accuracy of the analytical method used. ▪ Assessment is undertaken by determining the percent recovery of the known spike or addition to the sample. $\% Recovery = 100 \times \frac{C - A}{B}$ ▪ Where, A = concentration of analyte determined in the original sample, B = added concentration, and C = calculated concentration	▪ As per laboratory quality control report
Method blanks	▪ To assess potential bias introduced by the laboratory analytical method for a relevant analyte. A method blank assesses the component of the analytical result introduced from laboratory equipment. ▪ Each blank is analysed as per the original samples.	▪ Analytical result < LOR

6.2 Field quality assurance

All samples were collected by experienced contaminated site staff under established Jacobs protocols. Adherence to Jacobs protocols by experienced field staff trained in sample collection and handling techniques ensures the quality and representativeness of the samples collected.

Specific assessment of the field QA is discussed below:

- Standard procedures: Sampling was completed in accordance with standard procedures. Field records were kept and maintained
- Sample collection, preservation, handling and analysis: All analysis was undertaken within holding times with the exception of those outlined in **Section 6.4.6**, samples were collected into appropriate containers for the analysis with suitable preservation upon collection, samples were received at the laboratory in good condition and appropriately chilled and laboratories were NATA accredited
- Decontamination: All sampling equipment was decontaminated (triple washed) between investigation locations. Rinsate blanks were collected at a rate less than the DAC as outlined in **Section 6.2.3**
- Calibration: All equipment requiring calibration was calibrated to NATA specifications prior to commencing fieldwork. Calibration certificates are shown in **Appendix E**

- Data handling: All samples were appropriately labelled. Laboratory data was reviewed and processed using ESDat.

6.2.1 Blind replicate sample

Six blind replicate samples (four soil, one soil PFAS and one groundwater) were analysed to assess the quality control during the field sampling program. This equates to 7.1% blind replicate soil analysis, 25% blind replicate soil PFAS analysis, and 16.67% blind replicate groundwater analysis. This blind replicate analysis exceeds and therefore conforms to the requirements of the NEPC (2013) of 5% and the PFAS NEMP (2020) of 10% (for PFAS samples).

A summary of the blind replicate samples which reported an RPD exceedance above the data quality objectives is presented in **Table 6.2.**

Table 6.2: Summary of blind replicate RPD exceedances

Sample ID	Replicate Sample ID	Analyte	Conc. primary	Conc. replicate	RPD %	Comment
GW02	QC101_210921	Total Coliforms	100 CFU/100ml	200 CFU/100ml	67	A difference in these values is likely due to the sensitive nature of this analyte. They are very sensitive to temperature and other changes over time as well as differences between samples collected. The replicate result falls above the screening criteria for total coliforms (150 CFU/100ml.) and thus will be treated as an exceedance of the SAC for this location and adopted as the concentration for this sample.
SS13_0.05	QC101_210906	Total Coliforms	2900MPN/g	7200MPN/g	85	A difference in these values is likely due to the sensitive nature of this analyte. They are very sensitive to temperature and other changes over time as well as differences between samples collected. The replicate result falls above the screening criteria for total coliforms (1000MPN/g) and thus will be treated as an exceedance of the SAC for this location and adopted as the concentration for this sample.

Note: this does not include calculated results (for example Sum of total PAHs), only individually reported analyses.

6.2.2 Split replicate sample

Five split replicate samples (three soil, one soil PFAS and one groundwater) were analysed to assess the quality control during the field sampling program. This equates to 5% split replicate soil analysis, 25% split replicate soil PFAS analysis, and 16.67% split replicate groundwater analysis. This split replicate analysis meets and exceeds, respectively, and therefore conforms to the requirements of the NEPC (2013) of 5% and the PFAS NEMP (2020) of 10% (for PFAS samples).

A summary of the split replicate samples which reported an RPD exceedance above the data quality objectives is presented in **Table 6.3.**

Table 6.3: Summary of split replicate RPD exceedances

Sample ID	Replicate Sample ID	Analyte	Conc. primary	Conc. replicate	RPD %	Comment
BH03_0.05	QC201_210826	Chromium (III+VI)	15 mg/kg	33 mg/kg	75	Concentrations reported in the primary and replicate samples were consistently below the screening criteria for chromium. However, as a conservative measure, the higher concentration (replicate) for this sample was adopted. This is not expected to impact upon the outcomes of the investigation.
BH08_0.5	QC201_210916	Chromium (III+VI)	2 mg/kg	9.1 mg/kg	128	Concentrations reported in the primary and replicate samples were consistently below the screening criteria for chromium. However, as a conservative measure, the higher concentration (replicate) for this sample was adopted. This is not expected to impact upon the outcomes of the investigation.
BH08_0.5	QC201_210916	Zinc	<5 mg/kg	35 mg/kg	150	Concentrations reported in the primary and replicate samples were consistently below the screening criteria for zinc. However, as a conservative measure, the higher concentration (replicate) for this sample was adopted.

Sample ID	Replicate Sample ID	Analyte	Conc. primary	Conc. replicate	RPD %	Comment
						This is not expected to impact upon the outcomes of the investigation.

Note: this does not include calculated results (for example Sum of total PAHs), only individually reported analyses.

All RPD results are presented in **Table 3** of **Appendix B**.

6.2.3 Rinsates

All rinsate samples reported analyte concentrations below the laboratory LOR. The sampling rates of rinsate samples were lower than outlined in the SAQP and therefore did not conform to the DAC. Details of this non-conformance are presented in **Section 4.7.**

6.2.4 Trip blanks

All trip blank samples reported analyte concentrations below the laboratory LOR and therefore conformed to the DAC.

6.2.5 Trip spike

The trip spike sample collected reported analyte recovery percentages within the sampling rates of trip spike samples were lower than outlined in the SAQP and therefore did not conform to the DAC. Details of this non-conformance are presented in **Section 4.7**.

6.3 Laboratory quality assurance

All analysis was undertaken by NATA accredited laboratories using NATA accredited analytical methods.

6.4 Laboratory quality control

Laboratory QC data is presented in full in the laboratory certificates in **Appendix D.**

6.4.1 Laboratory duplicates

RPDs for all laboratory duplicates for soil and groundwater samples conformed to the DAC, with the exception of the following:

- SS25_0.10 (276682-14) – RPD exceeded for copper, chromium, nickel and zinc. Due to this exceedance, a triplicate result was issued by the lab (276682-33).
- SS17a_0.10 (276682-11) – RPD exceeded for lead. Due to this exceedance, a triplicate result was issued by the lab (276682-34).

  SS01_0.05 (276682-1) – RPD exceeded for chromium and nickel. Due to this exceedance, a triplicate result was issued by the lab (276682-35).

The frequency of all laboratory duplicates met the laboratory QAQC acceptance criteria, with the exception of the following:

- PAH/Phenols (ES2132166, ES2132601, ES2132942, ES2133844, and ES2134103)
- Pesticides (ES2132166, ES2132601, and ES2134103)
- TRH (ES2132166, ES2132601, ES2132942, ES2133844, and ES2134103)

- PFAS (ES2134103 and ES2135804).

The frequency of laboratory duplicates did not conform to the laboratory's QAQC acceptance criteria as a result of the low number of samples submitted per respective batches. The acceptable results for these compounds returned by the blind replicate analysis would indicate that this non-conformance is unlikely to affect the usability of the data set.

6.4.2 Laboratory control samples

Recoveries for all laboratory control samples for soil and groundwater conformed to the DAC.

6.4.3 Surrogates

Recoveries for all laboratory surrogate samples conformed to the DAC with the exception of the following:

- DEF (64.4%) in sample GW06 exceeded the laboratory control limits of 66.5-111%
- TRH Soil C10-C40 NEPM in sample SS28_0.05 - recovery not determined due to matrix interference
- Dibutylchlorendate and Triphenylphosphate in sample QC201_210916 - recovery not determined due to matrix interference
- p-Terphenyl-d14, Dibutylchlorendate, Tetrachloro-m-xylene, and Triphenylphosphate in sample QC201_210921 - recovery not determined due to matrix interference.

A review was undertaken of the results for the analytes above and all were below the laboratory LOR. Jacobs considers that the surrogate sample recoveries exceeding the criteria are unlikely to affect the usability of the data set.

6.4.4 Matrix spikes

Recoveries for all matrix spike control samples conformed to the DAC with the exception of the following outlined in **Table 6.4** below.

Table 6.4: Matrix spike recoveries

Laboratory Sample ID	Primary Sample ID	Analyte	Recovery %	Comment
276682-16	SS28_0.05	TRH Soil C10-C40 NEPM	Not determined	The matrix spike for the listed analytes was not determined due to background level being greater than or equal to 4 x the spike level. These results are considered a minor non-conformance which is unlikely to have affected the overall dataset given that concentrations for the listed analytes were reported below the SAC for all samples analysed for those analytes.
M21-Se26456	Anonymous	Zinc	382	The recovery for the analytes listed reported less than the lower data quality objective. An acceptable recovery was obtained in the laboratory control samples for these compounds, indicating the recovery outliers were due to matrix interference, and therefore, the non-determination of these compounds is
		Arsenic	139	

Laboratory Sample ID	Primary Sample ID	Analyte	Recovery %	Comment
				considered not to affect the usability of the data set.

The frequency of all matrix spikes met the laboratory QAQC acceptance criteria with the exception of the following:

- PAH/Phenols (ES2132166, ES2132601, ES2132942, ES2133844, and ES2134103)
- Pesticides (ES2132166, ES2132601, and ES2134103)
- TRH (ES2132166, ES2132601, ES2132942, ES2133844, and ES2134103)
- PFAS (ES2134103 and ES2135804).

The frequency of matrix spikes did not conform to the laboratory's QAQC acceptance criteria as a result of the low number of samples submitted per respective batches. The acceptable results returned by the matrix spike recovery analysis for all other analytes within the respective batches would indicate that this non-conformance is unlikely to affect the usability of the data set.

6.4.5 Method blanks

All method blanks for samples conformed to the DAC.

6.4.6 Sample holding times

All samples were extracted and analysed within the specified holding times with the exception of the following:

- Samples BH06_0.05, BH06_0.82, BH04_2.0, BH04_4.0, SS13_0.05, QC101_210906, QC201_210916, BH07_0.05, BH07_0.5, BH15_0.05, BH15_2.0, BH13_0.05, BH13_0.5, SS22_0.05, BH08_0.5, QC101_210916, BH11_0.05, BH11_0.5 for total coliforms.
- Sample QC501_210831 for nutrients
- Samples BH11_0.05 and BH11_0.5 for cyanide
- Samples BH16_1.5 and BH08_1.0 for pH
- Sample BH16_1.5 for CEC.

Holding time for nutrients and total coliforms were exceeded due to project logistical constraints. Given the remote location of the site and there were lengthy courier delays during the fieldwork due to COVID restrictions, submitting these samples to the laboratory within the 24-hour holding time was unachievable.

Holding times for cyanide were exceeded due to miscommunications with the lab relating to the required analysis. This analysis was requested at a later date once the oversight had been recognised.

Holding times for pH and CEC were exceed as these were requested after the initial fieldwork run in order to complete the determination of the appropriate EILs for the site.

These non-conformances (total coliforms, nutrients, cyanide, pH and CEC) are considered not to overly affect the usability of the data set, noting that samples were kept refrigerated at the laboratories, within laboratory provided and preserved containers (where applicable).

6.4.7 Sample condition

All samples were received by the analytical laboratories in correctly preserved and chilled containers with no reported breakages.

6.5 Data Quality Indicators (DQI)

6.5.1 Precision

An assessment of the RPDs of the field and laboratory duplicates indicated the sampling, laboratory and analytical precision was within acceptable limits with the exception of the exceedances described in **Table 6.2**, **Table 6.3** and **Section 6.4.1.** All other duplicates provided confidence of limited variability and high reproducibility of the data set.

6.5.2 Accuracy

Laboratory accuracy was assessed by the analysis of laboratory control samples and method blanks and percent recoveries of matrix spikes and surrogates. The assessment of the results of these laboratory control samples indicated the accuracy of the analytical results, with the exception of those described in **Section 6.4,** were acceptable and represent an accurate measure of the reported data.

6.5.3 Representativeness

JAJV consider the samples collected from the site to be representative of the soils being targeted as part of this investigation. JAJV staff ensured that samples collected were representative of the soils and groundwater observed in each soil groundwater sampling location.

6.5.4 Completeness

All samples were collected and analysed in accordance with the SAQP (JAJV, 2021a) with the exception of the deviations described in **Section 4.7.** All other required QAQC data, including both field and laboratory data, as outlined in the SAQP (JAJV, 2021a), is also provided and complete.

6.5.5 Comparability

Samples were collected by experienced JAJV environmental scientists in accordance with the SAQP (JAJV, 2021a) with the exception of the departures described in **Section 4.7**, using appropriate Jacobs protocols and analysed in accordance with NATA accredited laboratory methods to maintain consistency and ensure comparability of data with the previous monitoring results. The comparability of the data should be consistent as sampling protocols were employed throughout the duration of the fieldwork and analysis was undertaken by NATA registered laboratories using accredited analytical methods.

6.6 QAQC Assessment

It is concluded that the laboratory data are of acceptable quality and are considered useable in making conclusions and recommendations regarding the contamination at the site.

7. Assessment Results

7.1 Soil

7.1.1 Site stratigraphy

A generalised site stratigraphic log for each study area is provided in **Table 7.1.** Bore logs and a summary of surface sample observations are presented in **Appendix C.**

Soil encountered at the investigation locations to a maximum depth of 13.5 mbgl consisted of a mixture of sandy clays, silty clays and clayey sands with some gravels and weathered rock. Due to the presence of shallow rock across the site, refusal on rock at approximately 1 mbgl was common for hand auger locations.

Table 7.1: Generalised site stratigraphic log

Study Area	Material	Depth (top of unit - mbgl)	Depth (bottom of unit - mbgl)
L2R/CRR	Fill: Clayey sand	0.0 (BH02, BH03, BH04)	0.5 (BH04)
	Natural: Sandy clay	0.02 (BH02)	4.5 (BH04)
	Natural: Silty clay	0.00 (BH06)	3.8 (BH04)
	Natural: Weathered rock	0.76 (BH07)	13.5 (BH04)
R2F	Natural: Clayey silt	0.0 (BH13)	0.4 (BH13)
	Natural: Clayey sand/Sandy clay	0.0 (BH11)	1.5 (BH11)
	Natural: Silty sand	0.3 (BH10)	1.65 (BH11)
	Natural: sand	0.6 (BH13	1.05 (BH10)
F2L	Fill: Silty/Sandy Clay	0.0 (BH15, BH14)	1.1 (BH15)
	Natural: Clay	0.5 (BH15, BH16)	7.0 (BH17)
	Natural: Weathered rock	1.76 (BH15)	6.55 (BH17)

7.1.2 Aesthetics

Aesthetic issues (i.e. presence of erroneous waste and visual indications of potential contamination) within the sample locations were observed during the fieldwork program as detailed in **Table 7.2.** An inspection of the site surface was undertaken at each sample location and of the materials excavated at each location.

Table 7.2: Aesthetic Issues

Study Area	Investigation Location	Depth (mbgl)	Aesthetic Issues
L2R	SS01	0.05	Minor bitumen roadbase
	SS03a	0.1	Minor bitumen roadbase
	SS04	0.05	Minor bitumen roadbase
L2R/CRR	SS12	0.05	Minor bitumen roadbase
L2R	SS14	0.05	Minor bitumen roadbase

Study Area	Investigation Location	Depth (mbgl)	Aesthetic Issues
R2F	SS16	0.05	Minor bitumen roadbase. Slight hydrocarbon odour.
	SS22	0.05	Slight organic odour.
F2L	SS27	0.05	Minor bitumen roadbase.
	SS28	0.05	Minor bitumen roadbase.
	SS29	0.05	Slight hydrocarbon odour.

7.1.3 PID headspace results

Results of the PID headspace analysis ranged from 0.0 ppm to a maximum of 2.2 ppm (BH11 at 0.5 mbgl). All concentrations of vapour (as Volatile Organic Compounds) were detected as negligible across the site.

7.1.4 Soil analytical results

Soil analytical results from samples collected from the borehole and surface sample investigation locations in comparison to the SAC are discussed below.

Soil analytical results are provided in **Table A** presented in **Appendix B.** Laboratory certificates of analysis are presented in **Appendix D.**

7.1.4.1 Heavy metals

Concentrations of heavy metals in all soil samples analysed were below the SAC for all locations across all study areas.

7.1.4.2 BTEX

Concentrations of BTEX in all soil samples analysed were below the LOR and below the SAC for all locations across all study areas.

7.1.4.3 TRH/TPH

Concentrations of TRH/TPH in all soil samples analysed were below the SAC for all locations across all study areas.

7.1.4.4 PAH

Concentrations of PAH in all soil samples analysed were below the SAC for all locations across all study areas.

7.1.4.5 Pesticides (OCP/OPP)

Concentrations of pesticide compounds in all soil samples analysed were below the SAC for all locations across all study areas.

7.1.4.6 PFAS

Concentrations of PFAS in all soil samples analysed were below the SAC for all locations across all study areas.

7.1.4.7 Asbestos

No asbestos or respirable fibres were identified in any of the soil samples submitted for asbestos identification.

7.1.4.8 Formaldehyde

Concentrations of formaldehyde in all soil samples analysed were below LOR and below the SAC for all locations across all study areas.

7.1.4.9 Cyanide

Concentrations of cyanide in all soil samples analysed were below the LOR and below the SAC for all locations across all study areas.

7.1.4.10 Nutrients

Concentrations of nutrients found in soil were below the LOR with the exception of those listed in Table 7.3 below. There are no endorsed contamination guidelines for nutrients in soil.

Table 7.3: Summary of nutrients concentrations in soil (mg/kg)

Study Area	AEI	Sample ID	Nitrite + Nitrate as N	Kjeldahl Nitrogen Total (TKN)	Nitrogen (Total)	Phosphorus
L2R/CRR	General: Agriculture	BH04_2.0	0.2	200	200	171
		BH04_4.0	0.2	320	320	367
	AEI 5: Hartley Cemetery	BH05_0.5	-	1000	1000	207
		BH05_5.0	0.2	480	480	229
L2R	General: Agriculture	BH06_0.05	2.4	2420	2420	325
		BH06_0.82	2.1	310	310	305

7.1.4.11 Microbiological

Concentrations of microbiological compounds (total coliforms) in all soil samples were below the SAC with the exception of those listed in **Table 7.4** below.

Table 7.4: Summary of total coliform exceedances in soil (CFU/g)

Study Area	AEI	Sample ID	Total Coliforms (CFU/g)
L2R	General: Agriculture	BH06_0.05	>31 000
		BH07_0.05	1800
		SS13_0.05	7200[2]
R2F		SS22_0.05	14 000
F2L		BH15_0.05	>34 000
Exceeded SAC			**Biosolids Stabilisation Grade A Microbiological Standards (1000 CFU/g)**

[1] Environmental Guidelines: Use and Disposal of Biosolids Products, EPA (2000), Table 3-5, Biosolids Stabilisation Grade A Microbiological Standards

[2] Duplicate value from QC101_210906 adopted as primary due to RPD exceedance.

7.2 Groundwater

7.2.1 Intrinsic groundwater parameters

The general water quality parameters and standing water levels measured at the respective groundwater well locations at the time of sampling are presented in Table 7.5.

Table 7.5: Intrinsic groundwater quality parameters (in field measurements sampled 20/09/21 to 21/09/21)

Study Area	Location	Standing Water Level (metres below top of casing (mBTOC))	EC (uS/cm)	pH	Redox (mV)	DO (mg/L)	Temperature (°C)
L2R/CRR	GW01	4.5	1249	7.03	15.1	1.39	15.8
	GW02	4.986	1610	6.54	-16.5	1.07	12.8
	GW03	3.035	2946	5.20	119.1	0.37	19.7
R2F	GW05	8.145	369.6	7.81	-9.6	1.36	17.2
	GW06	1.998	2357	7.06	88.3	0.66	11.2
F2L	GW07	2.462	535.0	6.82	-68.4	2.31	18.2

[1]SWL value taken from approximate water table levels as outlined in the groundwater technical paper (JAJV, 2021c).

Groundwater field data sheets are provided in **Appendix C.**

7.2.2 Groundwater analytical results

Groundwater analytical results from samples collected from groundwater well locations in comparison to the SAC are discussed below.

Groundwater analytical results are provided in **Table B** presented in **Appendix B.** Laboratory certificates of analysis are presented in **Appendix D.**

7.2.2.1 Heavy metals

Concentrations of heavy metals in all groundwater samples analysed were below the SAC for all locations across all study areas with the exception of those listed in **Table 7.6** below.

Table 7.6: Summary of heavy metal exceedances in groundwater (ug/L)

Study Area	AEI	Sample ID	Cadmium (0.2)	Copper (1.4)	Nickel (11)	Zinc (8)
L2R/CRR	AEI 3: Former Service Station	GW01	**0.2** [1]			**29**[1]
	General: Agriculture	GW02			**19**[1]	**57**[1]

Study Area	AEI	Sample ID	Cadmium (0.2)	Copper (1.4)	Nickel (11)	Zinc (8)
	AEI 5: Hartley Cemetery	GW03	**0.3** [1]		**83**[1,2]	**229**[1]
R2F	AEI 12: Mining Operations	GW05		**4**[1]		**8**[1]
F2L	AEI 10: Former Service Station	GW07				**33**[1]
Exceeded SAC			**ANZG (2018) Freshwater 95% toxicant DGVs**[1] **NEPC (2013) Drinking Water GIL**[2]			

7.2.2.2 BTEX

Concentrations of BTEX in all groundwater samples analysed were below the SAC for all locations across all study areas.

7.2.2.3 TRH

Concentrations of TRH in all groundwater samples analysed were below the SAC for all locations across all study areas.

7.2.2.4 PAH

Concentrations of PAH compounds in all groundwater samples analysed were below the SAC for all locations across all study areas.

7.2.2.5 Pesticides (OCP/OPP)

Concentrations of pesticides in all groundwater samples analysed were below the SAC for all locations across all study areas.

7.2.2.6 Formaldehyde

Concentrations of formaldehyde in all groundwater samples analysed were below the SAC for all locations across all study areas with the exception of those listed in **Table 7.7** below.

Table 7.7: Summary of formaldehyde exceedances in groundwater (ug/L)

Study Area	AEI	Sample ID	Formaldehyde (0.5)
L2R/CRR	AEI 5: Hartley Cemetery	GW03	1.6
Exceeded SAC			**NEPM 2013 Table 1C GILs, Drinking Water**

7.2.2.7 Cyanide

Concentrations of cyanide in all groundwater samples analysed were below the SAC for all locations across all study areas.

7.2.2.8 Nutrients

Concentrations of nutrients in all groundwater samples analysed were below the SAC for all locations across all study areas with the exception of those listed in **Table 7.8** below.

Table 7.8: Summary of nutrients exceedances in groundwater (ug/L)

Study Area	AEI	Sample ID	Total Nitrogen (250)
L2R/CRR	AEI 5: Hartley Cemetery	GW03	400
Exceeded SAC			**NEPM 2013 Table 1C GILs, Fresh Waters**

7.2.2.9 Microbiological

Concentrations of total coliforms in all groundwater samples analysed were below the SAC for all locations across all study areas with the exception of those listed in **Table 7.9** below.

Table 7.9: Summary of microbiological exceedances in groundwater (CFU/100mL)

Study Area	AEI	Sample ID	Total Coliforms (150)
L2R/CRR	General: Agriculture	GW02	200[1]
Exceeded SAC			**ANZECC (2000) Guidelines for recreational water quality**

[1] Duplicate value from QC101_210921 adopted as primary result due to RPD exceedance

7.3 Coal Tar

Coal tar was detected within asphalt in the current road corridor at select locations and depths in the L2R/CRR and R2F study areas. Details of this contamination are outlined in Appendix H.

8. Revised conceptual site model

Based on the findings of this Stage 2 assessment, revised conceptual site models (CSM) have been developed to reflect the updated findings. As part of this revision, the contamination impact rankings at each site have been updated, taking into account the contamination potential matrix presented in **Table 3.1,** the results of the Stage 2 assessment, an appreciation of activities associated with construction and operation of the project and likely contamination exposure scenarios. Information from the groundwater technical paper (JAJV, 2021c) relating to the project design and groundwater flows has also been used to assess the impact on groundwater at each location.

The revised CSMs have are presented in **Table 8.1** to **Table 8.3**.

For locations that are considered to have a medium, it is recommended that they undergo further mitigation and management measures during construction and operation as outlined in **Section 9.** These locations are shown in **Figure 8.1** to **Figure 8.4** below.

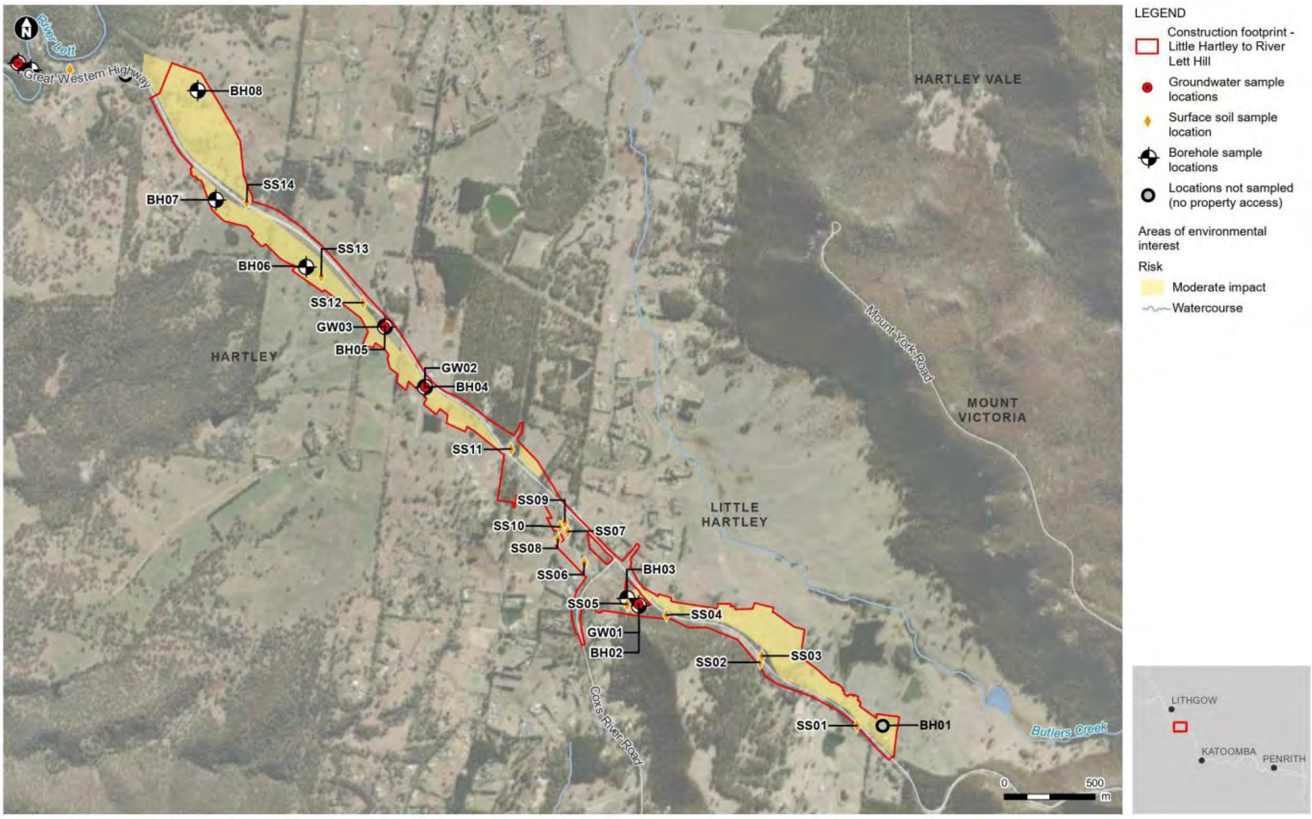

Figure 8.1: Summary of areas with moderate or above contamination risk for L2R study area

Figure 8.2: Summary of areas with moderate or above contamination risk for CRR study area

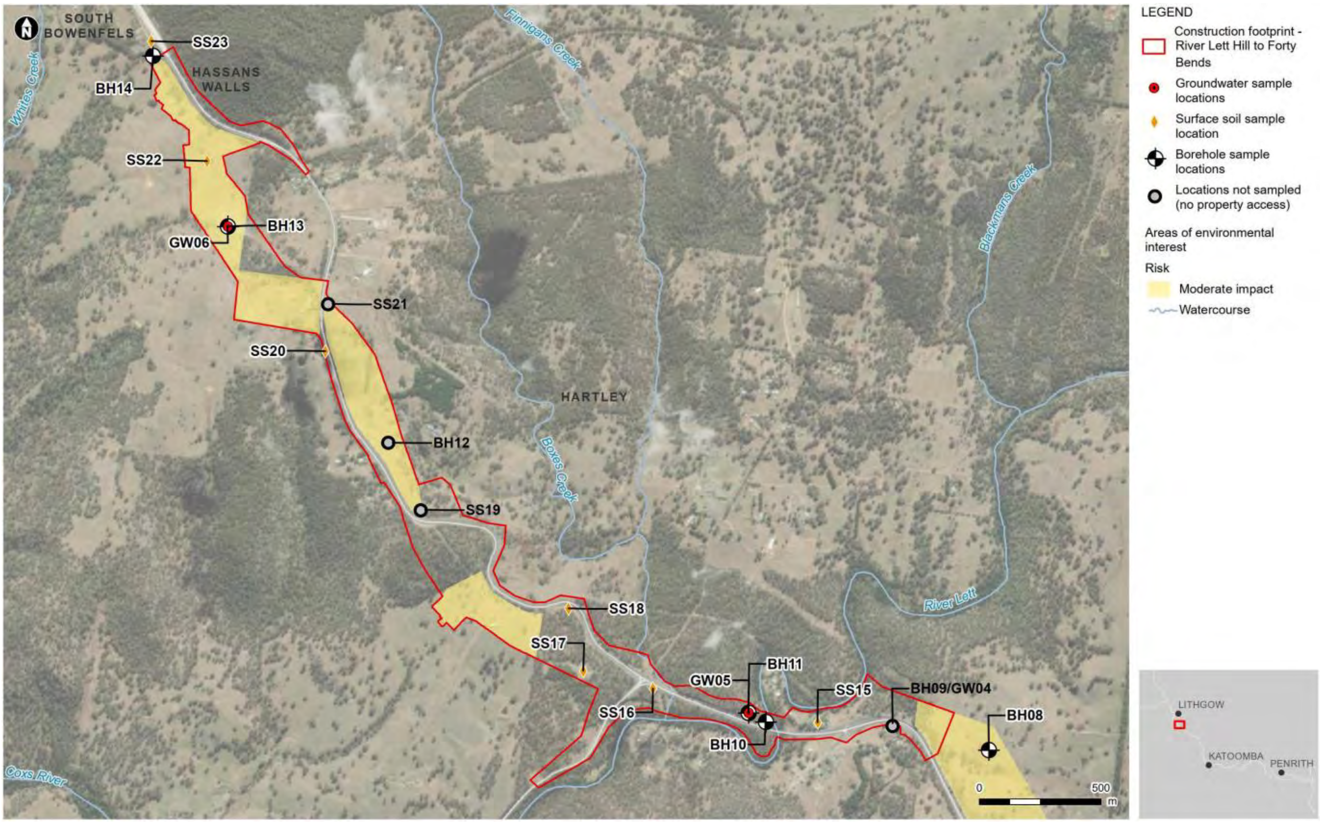

Figure 8.3: Summary of areas with moderate or above contamination risk for R2F study area

Figure 8.4: Summary of areas with moderate or above contamination risk for F2L study area

8.1 Little Hartley to River Lett (L2R) and Coxs River Road (CRR)

Table 8.1: Revised conceptual site model - L2R and CRR study areas

Site of concern and potential source of contamination	Construction element and anticipated depth	Contamination severity and extent assessment				Pathways and receptors Assessment of relationship to construction footprint and scope				Revised contamination impact
		Media	**COPCs**	**Contamination status**	**Refer to Table 3-1**	**Location relative to project**	**Potential for contamination to be intersected by project**	**Exposure pathways (der – direct contact, ing – ingestion or inh – inhalation)**	**Refer to Table 3-1**	
AEI 1: Royal Hartley Hotel waste burial. Likely inert waste such as glass, metal, ceramics. Given age of waste burial unlikely to be remaining organic matter degradation.	Filling batters. Construction of twin bridges to the west at Jenolan Caves Rd. Construction of water quality basin to the south west.	Soil	General inert waste, heavy metals, hydrocarbons (TRH, BTEX, PAH), pesticides (OCP, OPP)	Contamination possibly present in the media of concern at concentrations above the relevant assessment criteria and limited in extent	SE2	Within construction footprint.	Soil contamination from source (if present) may be disturbed during construction however would be limited to shallow soil earthworks required for pavement and filling.	Soil contamination unlikely to be exposed during construction within waste burial area as activities relate to filling, therefore unlikely to impact upon human and ecological receptors during construction or operation.	PR1	**Low –** No change (not investigated as part of Stage 2 assessment due to low ranking in preliminary CSM)
		Groundwater		Low potential for contamination to be present in the media of concern at concentrations above the relevant assessment criteria and limited in extent	SE1		Groundwater contamination (if present) unlikely to be exposed during construction based on depth of groundwater and proposed design in this location.	Groundwater contamination (if present) unlikely to be exposed during construction and therefore unlikely to impact upon human and ecological receptors during construction or operation.	PR1	**Very low –** No change (not investigated as part of Stage 2 assessment due to low ranking in preliminary CSM)
AEI 2: Stockpiles. Potential contamination associated with bitumen, asphalt, asbestos or other miscellaneous wastes or contaminated soil.	Filling; pavement (side road/truck rest); filling	Surface soils	Heavy metals, hydrocarbons (TRH, BTEX, PAH), pesticides, herbicides, asbestos	Contamination possibly present in the media of concern at concentrations above the relevant assessment criteria and limited in extent	SE2	Within and adjacent to construction footprint	Contamination within stockpiles (if present) may be disturbed during construction while levelling sites or during subsurface works.	Construction workers could be exposed to soil contamination via contact (der, ing, inh) with contaminated soils and dust. Adjacent site users could be exposed to soil contamination via dust emissions (inh), namely asbestos. Ecological receptors may be exposed if runoff to surface waterways occurs. Potential for exposure during operation if stockpiles remain in	PR3	**Low –** Contamination above the SAC was not reported in the soil samples collected for this AEI .

Site of concern and potential source of contamination	Construction element and anticipated depth	Contamination severity and extent assessment				Pathways and receptors Assessment of relationship to construction footprint and scope				Revised contamination impact
		Media	COPCs	Contamination status	Refer to Table 3-1	Location relative to project	Potential for contamination to be intersected by project	Exposure pathways (der – direct contact, ing – ingestion or inh – inhalation)	Refer to Table 3-1	
								place and are contaminated.		
AEI 3: Former service station (Little Hartley). Potential contamination associated with fuel storage and use or workshop activities. Underground fuel storage tanks potentially still present adjoining current highway (MV2L, 2011)	Cutting (~2 - 3 m) and embankment filling, construction of new bridge over highway to the east, construction of water quality control basins, construction of grade separated interchange at CRR (potential for piling).	Soil	Heavy metals, hydrocarbons (TRH, BTEX, PAH)	Contamination possibly present in the media of concern at concentrations above the relevant assessment criteria and potentially widespread	SE3	Adjacent to construction footprint	Soil contamination (if present) could be exposed during excavation based on construction design.	Construction workers could be exposed to soil contamination via contact (der, ing, inh) with contaminated soils and vapour. Exposure to adjacent site users possible via vapour (inh). Sensitive environmental receptors may be exposed if sediment runoff to surface waterways occurs. Exposure unlikely to occur during operation.	PR3	**Low –** Contamination above the SAC was not reported in the soil samples collected for this AEI.
		Groundwater					Groundwater contamination (if present) could be exposed during excavation based on construction design and potential for shallow groundwater in area.	Construction workers could be exposed to contamination via contact with contaminated groundwater (der, ing). Sensitive environmental receptors may be exposed if groundwater runoff to surface waterways occurs. Exposure unlikely to occur during operation.		**Moderate –** Concentrations of cadmium and zinc were detected above the SAC (ecological protection) in groundwater located adjacent to the former service station (Little Hartley) (GW01). Interaction with groundwater is possible at this location due to the cutting proposed in this area (up to 6.5 mbgl), the depth of the water table at this location (approximately 4.5 mbgl). There is a potential contamination impact to aquatic ecosystems should groundwater seepage exposed

Site of concern and potential source of contamination	Construction element and anticipated depth	Contamination severity and extent assessment				Pathways and receptors Assessment of relationship to construction footprint and scope				Revised contamination impact
		Media	COPCs	Contamination status	Refer to Table 3-1	Location relative to project	Potential for contamination to be intersected by project	Exposure pathways (der – direct contact, ing – ingestion or inh – inhalation)	Refer to Table 3-1	
										by construction and operation of the project be discharged to local waterways. Increased impact is likely to be associated with undiluted and large volume groundwater seepage discharges to waterways. However, this impact is unlikely as calculated groundwater inflow rates are very low and discharged groundwater would be diluted by surface water. (JAJV, 2021c).
		Vapour					Vapour from hydrocarbon contamination in soil and/or groundwater (if present) may be released during excavation works near the source site.	Construction workers and operational users of road could be exposed to vapour via inhalation (inh). Exposure unlikely to occur during operation.		**Low** – Contamination above the SAC was not reported in the soil samples collected for this AEI.
AEI 4: Former Little Hartley Airfield. Potential contamination associated with refuelling, maintenance or incident fire fighting however these activities appear to have been on a small scale (if occurred).	Embankment filling. Construction of water quality control basins south of the new road.	Soil	Heavy metals, hydrocarbons (TRH, BTEX, PAH), PFAS	Contamination possibly present in the media of concern at concentrations above the relevant assessment criteria and potentially widespread	SE3	Partially within construction footprint	Disturbance of soil contamination from source (if present) would be limited to shallow soil earthworks required for pavement and filling or within water quality basin location.	Construction workers could be exposed to shallow soil contamination via contact (der, ing) with contaminated soils and dust. Exposure to adjacent site users unlikely. Sensitive environmental receptors may be exposed if sediment runoff to surface waterways occurs. Exposure unlikely to occur during operation.	PR2	**Low** - Contamination above the SAC was not reported in the soil samples collected for this AEI.
		Groundwater					Groundwater contamination (if present) unlikely to be exposed during construction based on depth of groundwater and proposed design in this location.	Groundwater contamination (if present) unlikely to be exposed during construction and therefore unlikely to impact upon human and ecological	PR1	**Low** – No change (not investigated as part of Stage 2 assessment due to low ranking in preliminary CSM)

Site of concern and potential source of contamination	**Construction element and anticipated depth**	**Contamination severity and extent assessment**				**Pathways and receptors Assessment of relationship to construction footprint and scope**				**Revised contamination impact**
		Media	**COPCs**	**Contamination status**	**Refer to Table 3-1**	**Location relative to project**	**Potential for contamination to be intersected by project**	**Exposure pathways (der – direct contact, ing – ingestion or inh – inhalation)**	**Refer to Table 3-1**	
								receptors during construction or operation.		
AEI 5: Hartley Cemetery. Potential contamination associated with breakdown of organic sources.	Cutting (1 - 2 m) and embankment filling. Construction of water quality control basins south of the new road.	Soil	Heavy metals, nutrients, formaldehyde	Contamination possibly present in the media of concern at concentrations above the relevant assessment criteria and limited in extent	SE2	Adjacent to construction footprint	Soil contamination (if present) unlikely to be disturbed during construction as likely to be localised to cemetery site within soil (outside footprint).	Soil contamination unlikely to be exposed during construction and therefore unlikely to impact upon human and ecological receptors during construction or operation	PR1	**Low** - Contamination above the SAC was not reported in the soil samples collected for this AEI.
		Groundwater					Groundwater contamination (if present) may be disturbed during construction if shallow groundwater intersects cut. Flow direction away from alignment however means groundwater (if intersected) unlikely to be contaminated from source site.	Construction workers or ongoing users of road could be exposed to contaminated groundwater via contact (der, ing), if contaminated shallow groundwater encountered and seepage from cut occurs. Sensitive environmental receptors may be exposed if groundwater runoff to surface waterways occurs.	PR2	**Low**– Concentrations of cadmium, nickel, zinc and nitrogen were detected in groundwater above the SAC for ecological protection adjacent to the Hartley Cemetery (GW03). Concentrations of nickel and formaldehyde were also detected in groundwater at GW03 above the SAC for human health (drinking water). Interaction with groundwater is unlikely due to shallow depth of the proposed cutting in this area (2 mgbl) in relation to the measured groundwater depth (SWL) of approximately 3mbgl at GW03. With the unlikely interaction with the groundwater at this location, the impact to human health and/or ecological receptors from the elevated concentrations of cadmium, nickel, zinc, nitrogen and formaldehyde detected in groundwater at this location is likely to be low.

Site of concern and potential source of contamination	Construction element and anticipated depth	Contamination severity and extent assessment				Pathways and receptors Assessment of relationship to construction footprint and scope				Revised contamination impact
		Media	**COPCs**	**Contamination status**	**Refer to Table 3-1**	**Location relative to project**	**Potential for contamination to be intersected by project**	**Exposure pathways (der – direct contact, ing – ingestion or inh – inhalation)**	**Refer to Table 3-1**	
AEI 6: Former Little Hartley Motors. Potential contamination associated with workshop activities including oil/fuel storage and use.	Embankment filling. Construction of water quality control basins south of the new road.	Soil	Heavy metals, hydrocarbons (TRH, BTEX, PAH)	Contamination possibly present in the media of concern at concentrations above the relevant assessment criteria and limited in extent	SE2	Adjacent to construction footprint	Soil contamination from source (if present) unlikely to be disturbed during construction as most likely localised to source site where no excavation occurring.	Soil, groundwater or vapour contamination unlikely to be exposed during construction and therefore unlikely to impact upon human and ecological receptors during construction or operation	PR1	**Low –** No change (not investigated as part of Stage 2 assessment due to low ranking in preliminary CSM)
		Groundwater					Groundwater contamination (if present) unlikely to be exposed during construction based on depth of groundwater and proposed design in this location.			
		Vapour					Vapour from hydrocarbon contamination in soil and/or groundwater (if present) is unlikely to be released as subsurface works not proposed near source site.			
AEI 7: Former Corney's Garage. Potential contamination associated with workshop activities including oil/fuel storage and use.	Cutting (~0.5 m) on service road, construction of twin bridges to the north at Jenolan Caves Rd/GWH intersection.	Soil	Heavy metals, hydrocarbons (TRH, BTEX, PAH)	Contamination possibly present in the media of concern at concentrations above the relevant assessment criteria and limited in extent	SE2	Adjacent to construction footprint on service road	Soil contamination from source (if present) unlikely to be disturbed during construction as most likely localised to source site where no excavation occurring.	Soil, groundwater or vapour contamination unlikely to be exposed during construction and therefore unlikely to impact upon human and ecological receptors during construction or operation	PR1	**Low –** No change (not investigated as part of Stage 2 assessment due to low ranking in preliminary CSM)
		Groundwater					Groundwater contamination (if present) unlikely to be exposed during construction based on depth of groundwater and proposed design in this location.			
		Vapour					Vapour from hydrocarbon contamination in soil and/or groundwater (if present) is unlikely to be released as subsurface works not proposed near source site.			

Site of concern and potential source of contamination	Construction element and anticipated depth	Contamination severity and extent assessment				Pathways and receptors Assessment of relationship to construction footprint and scope				Revised contamination impact
		Media	**COPCs**	**Contamination status**	**Refer to Table 3-1**	**Location relative to project**	**Potential for contamination to be intersected by project**	**Exposure pathways (der – direct contact, ing – ingestion or inh – inhalation)**	**Refer to Table 3-1**	
General: agricultural land use. Potential contamination associated with use of herbicides, pesticides, fuel, machinery, sheep/cattle dips, and waste disposal.	Various - cutting (BH06) and embankment filling	Soil	Heavy metals, hydrocarbons (TRH, BTEX, PAH), pesticides, herbicides, asbestos, microbiological	Contamination possibly present in the media of concern at concentrations above the relevant assessment criteria and limited in extent	SE2	Within and adjacent to construction footprint	Soil contamination (if present) may be disturbed during construction however would likely be limited to shallow soil.	Construction workers could be exposed to shallow soil contamination via contact (der, ing, inh) with contaminated soils and dust. Adjacent site users could be exposed to contamination via dust emissions (inh), namely asbestos if encountered. Ecological receptors may be exposed if sediment runoff to surface waterways occurs. Exposure unlikely to occur during operation.	PR3	**Moderate –** Concentrations of total coliforms were detected in soil above the SAC within areas of agricultural land use (BH06, BH07 and SS13). With the absence of total coliform criteria within the NEPC (2013) guidelines, biosolids criteria for faecal coliforms for unrestricted use from the EPA (2000) guidelines were adopted. These guidelines are likely to be conservative in consideration of the organism type (faecal vs total) and the unrestricted use. There is the potential for possible short term/acute human health impacts from incidental ingestion of soil material containing total coliforms associated with the disturbance of surface soils during both cutting and filling construction activities proposed in these locations.
		Groundwater					Groundwater contamination (if present) may be exposed during construction where cuts intersect groundwater and a point source is present in immediate vicinity (e.g. sheep/cattle dip, fuel storage).	Construction workers could be exposed to contaminated groundwater via contact (der, ing), if groundwater is intersected and point source nearby. Sensitive environmental receptors may be exposed if runoff to surface waterways occurs. Exposure unlikely to occur during operation.		**Low -** Concentrations of nickel and zinc were detected in groundwater above the SAC for ecological protection opposite the former Hartley Saddlery (GW02). Concentrations of total coliforms were detected above the SAC for human health (recreational water) at GW02. Interaction with groundwater is unlikely due to shallow depth of the proposed cutting in this area (2.5 mgbl) in relation to measured groundwater levels

Site of concern and potential source of contamination	Construction element and anticipated depth	Contamination severity and extent assessment				Pathways and receptors Assessment of relationship to construction footprint and scope				Revised contamination impact
		Media	COPCs	Contamination status	Refer to Table 3-1	Location relative to project	Potential for contamination to be intersected by project	Exposure pathways (der – direct contact, ing – ingestion or inh – inhalation)	Refer to Table 3-1	
										(SWL) of approximately 5mbgl at GW02. With the unlikely interaction with the groundwater at this location, the impact to human health and/or ecological receptors from the elevated concentrations of nickel, zinc and total coliforms detected in groundwater at this location is likely to be low.
General: current road corridor. Potential contamination associated with vehicle emissions, fuel spills, and bitumen surface.	Various - cutting and embankment filling	Surface soils	Heavy metals, hydrocarbons (TRH, BTEX, PAH)	Contamination possibly present in the media of concern at concentrations above the relevant assessment criteria and limited in extent	SE2	Within construction footprint.	Shallow soil or sediment contamination (if present) may be disturbed during construction within current roadway, particularly within road verges	Construction workers and ongoing users of site could be exposed to soil/sediment contamination via contact (der, ing) with contaminated soils and dust. Exposure to adjacent site users unlikely. Sensitive environmental receptors may be exposed if sediment runoff to surface waterways occurs.	PR3	**Low** - Contamination above the SAC was not reported in the soil samples collected for this AEI.
		Road material (asphalt)	Coal tar				Coal tar within the existing road pavement (where present) may be disturbed during construction within current roadway	Construction workers and ongoing users of site could be exposed to coal tar via contact (der, ing) with existing pavement material containing coal tar. Exposure to adjacent site users unlikely. Sensitive environmental receptors may be exposed if asphalt dust runoff to surface waterways occur	PR3	**Moderate –** Coal tar was detected for this AEI (see **Appendix H** for details).

8.2 River Lett to Forty Bends (R2F)

Table 8.2: Revised conceptual site model – R2F study area

Site of concern and potential source of contamination	Construction element and anticipated depth	Contamination severity and extent assessment				Pathways and receptors Assessment of relationship to construction footprint and scope				Revised contamination impact
		Media	**COPCs**	**Contamination status**	**Refer to Table 3-1**	**Location relative to project**	**Potential for contamination to be intersected by project**	**Exposure pathways (der – direct contact, ing – ingestion or inh – inhalation)**	**Refer to Table 3-1**	
General: septic tanks including in Hartley Village. Potential contamination associated with leaks or spills.	Cutting (~0.5m) and embankment filling	Soil	Heavy metals, nutrients, microbiological	Low potential for contamination to be present in the media of concern at concentrations above the relevant assessment criteria and limited in extent	SE1	Potentially within construction footprint associated with farm houses/ buildings.	Low potential for soil contamination to be present associated with this AEI.	Soil contamination unlikely to be present and therefore unlikely to impact upon human and ecological receptors during construction or operation	PR2	**Low –** No change (not investigated as part of Stage 2 assessment due to low ranking in preliminary CSM)
		Groundwater		Contamination possibly present in the media of concern at concentrations above the relevant assessment criteria and limited in extent	SE2		Groundwater contamination (if present) may be exposed during construction if septic tank present adjacent to or within areas of excavation/cutting.	Construction workers could be exposed to groundwater contamination via contact (der, ing) with contaminated water (if encountered). Exposure to adjacent site users unlikely. Sensitive environmental receptors may be exposed if water runoff to surface waterways occurs. Exposure unlikely to occur during operation.	PR2	**Moderate –** Investigation of septic tanks not completed as part of Stage 2 Assessment. There is the potential for exposure during cutting construction activities within this area where groundwater is intersected.
AEI 8: Waste disposal at Fernhill. Likely inert waste such as glass, metal, ceramics. Given age of waste burial (19-20th C) unlikely to be remaining organic matter degradation.	Pavement (side road)	Soil	General inert waste, heavy metals, hydrocarbons (TRH, BTEX, PAH), pesticides (OCP, OPP)	Contamination possibly present in the media of concern at concentrations above the relevant assessment criteria and limited in extent	SE2	Within construction footprint.	Soil contamination from source (if present) unlikely to be disturbed during construction based on proposed design.	Soil and groundwater contamination (if present) unlikely to be exposed during construction and therefore unlikely to impact upon human and ecological receptors	PR1	**Low –** No change (not investigated as part of Stage 2 assessment due to low ranking in preliminary CSM)

Site of concern and potential source of contamination	**Construction element and anticipated depth**	**Contamination severity and extent assessment**				**Pathways and receptors** **Assessment of relationship to construction footprint and scope**				**Revised contamination impact**
		Media	**COPCs**	**Contamination status**	**Refer to Table 3-1**	**Location relative to project**	**Potential for contamination to be intersected by project**	**Exposure pathways (der – direct contact, ing – ingestion or inh – inhalation)**	**Refer to Table 3-1**	
		Groundwater		Low potential for contamination to be present in the media of concern at concentrations above the relevant assessment criteria and limited in extent	SE1		Groundwater contamination (if present) unlikely to be exposed during construction based on depth of groundwater and proposed design in this location.	during construction or operation	PR1	**Very low –** No change (not investigated as part of Stage 2 assessment due to low ranking in preliminary CSM)
AEI 12: Mining Operations, River Lett. Potential contamination associated with mining operations. No ore processing understood to have occurred or visual evidence of tailings/stockpiles.	Cutting (7 - 16 m west of the river) and embankment filling, construction of new twin bridges and refurbishment of current bridge (potential for piling)	Soil	Heavy metals and cyanide	Contamination possibly present in the media of concern at concentrations above the relevant assessment criteria and potentially widespread	SE3	Likely outside construction footprint however location unknown	Soil contamination (if present) may be disturbed during construction of cutting and new bridges in this area.	Construction workers could be exposed to soil contamination via contact (der, ing) with contaminated soils and dust. Exposure to adjacent site users unlikely. Sensitive environmental receptors may be exposed if sediment runoff to surface waterways including River Lett occurs. Exposure unlikely to occur during operation.	PR2	**Low** - Contamination above the SAC was not reported in the soil samples collected for this AEI.
		Groundwater		Contamination possibly present in the media of concern at concentrations above the relevant assessment criteria and limited in extent	SE2		Groundwater contamination (if present) may be disturbed during construction if groundwater intersected in cutting or bridge construction.	Construction workers could be exposed to groundwater contamination via contact (der, ing) with contaminated water Exposure to adjacent site users unlikely. Sensitive environmental receptors may be exposed if water runoff to surface waterways including River Lett occurs. Exposure during operation could occur if road users exposed to groundwater contamination (der, ing), if seepage from cuts occurs.		**Low** - Concentrations of copper and zinc were detected in groundwater above the SAC for ecological protection adjacent to the historical mining operations at River Lett (GW05). Exposure from interaction with groundwater is unlikely due to depth (7.5mgbl) and location of the cutting as it is location at a topographic high point in relation to River Lett. Groundwater levels were measured at approximately 8.1mbgl. With the unlikely interaction with the groundwater at this

Site of concern and potential source of contamination	**Construction element and anticipated depth**	**Contamination severity and extent assessment**				**Pathways and receptors Assessment of relationship to construction footprint and scope**				**Revised contamination impact**
		Media	**COPCs**	**Contamination status**	**Refer to Table 3-1**	**Location relative to project**	**Potential for contamination to be intersected by project**	**Exposure pathways (der – direct contact, ing – ingestion or inh – inhalation)**	**Refer to Table 3-1**	
										location, the impact to ecological receptors from the elevated concentrations of copper and zinc detected in groundwater at this location is likely to be low.
General: agricultural land use. Potential contamination associated with use of herbicides, pesticides, fuel, machinery, sheep/cattle dips, and waste disposal.	Various - cutting and embankment filling	Soil	Heavy metals, hydrocarbons (TRH, BTEX, PAH), pesticides, herbicides, asbestos, microbiological	Contamination possibly present in the media of concern at concentrations above the relevant assessment criteria and limited in extent	SE2	Within and adjacent to construction footprint	Soil contamination (if present) may be disturbed during construction however would likely be limited to shallow soil.	Construction workers could be exposed to shallow soil contamination via contact (der, ing, inh) with contaminated soils and dust. Adjacent site users could be exposed to contamination via dust emissions (inh), namely asbestos if encountered. Ecological receptors may be exposed if sediment runoff to surface waterways occurs. Exposure unlikely to occur during operation.	PR3	**Moderate –** Concentrations of total coliforms were detected above the SAC within areas of agricultural land use (SS22). An odour was also observed for this sample. With the absence of total coliform criteria within the NEPC (2013) guidelines, biosolids criteria for faecal coliforms for unrestricted use from the EPA (2000) guidelines were adopted. These guidelines are likely to be conservative in consideration of the organism type (faecal vs total) and the unrestricted use. There is the potential for possible short term/acute human health impacts from incidental ingestion of soil material containing total coliforms associated with the disturbance of surface soils during both cutting and filling construction activities proposed in these locations.

Site of concern and potential source of contamination	Construction element and anticipated depth	Contamination severity and extent assessment				Pathways and receptors Assessment of relationship to construction footprint and scope				Revised contamination impact
		Media	**COPCs**	**Contamination status**	**Refer to Table 3-1**	**Location relative to project**	**Potential for contamination to be intersected by project**	**Exposure pathways (der – direct contact, ing – ingestion or inh – inhalation)**	**Refer to Table 3-1**	
		Groundwater					Groundwater contamination (if present) may be exposed during construction where cuts intersect groundwater and a point source is present in immediate vicinity (e.g. sheep/cattle dip, fuel storage).	Construction workers could be exposed to contaminated groundwater via contact (der, ing), if groundwater is intersected and point source nearby. Sensitive environmental receptors may be exposed if runoff to surface waterways occurs. Exposure unlikely to occur during operation.		**Low** - Contamination above the SAC was not reported in the soil samples collected for this AEI.
General: current road corridor. Potential contamination associated with vehicle emissions, fuel spills, and bitumen surface.	Various - cutting and embankment filling	Surface soils	Heavy metals, hydrocarbons (TRH, BTEX, PAH)	Contamination possibly present in the media of concern at concentrations above the relevant assessment criteria and limited in extent	SE2	Within construction footprint.	Shallow soil or sediment contamination (if present) may be disturbed during construction within current roadway, particularly within road verges	"Construction workers and ongoing users of site could be exposed to soil/sediment contamination via contact (der, ing) with contaminated soils and dust. Exposure to adjacent site users unlikely. Sensitive environmental receptors may be exposed if sediment runoff to surface waterways occurs."	PR3	**Low** - Contamination above the SAC was not reported in the soil samples collected for this AEI.
		Road material (asphalt)	Coal tar				Coal tar within the existing road pavement (where present) may be disturbed during construction within current roadway	Construction workers and ongoing users of site could be exposed to coal tar via contact (der, ing) with existing pavement material containing coal tar. Exposure to adjacent site users unlikely. Sensitive environmental receptors may be exposed if asphalt dust runoff to surface waterways occur	PR3	**Moderate –** Coal tar was detected for this AEI (see **Appendix H** for details).

8.3 Forty Bends to Lithgow (F2L)

Table 8.3: Revised conceptual site model – F2L study area

Site of concern and potential source of contamination	Construction element and anticipated depth	Contamination severity and extent assessment				Pathways and receptors Assessment of relationship to construction footprint and scope				Revised contamination impact
		Media	**COPCs**	**Contamination status**	**Refer to Table 3-1**	**Location relative to project**	**Potential for contamination to be intersected by project**	**Exposure pathways (der – direct contact, ing – ingestion or inh – inhalation)**	**Refer to Table 2-1**	
AEI 9: Shell Coles Express South Bowenfels. Potential contamination associated with fuel storage. EPA notified site but not regulated - contamination unlikely to be widespread but may be present	Embankment filling / pavement	Soil	Heavy metals, hydrocarbons (TRH, BTEX, PAH)	Contamination possibly present in the media of concern at concentrations above the relevant assessment criteria and limited in extent	SE2	Approx. 50 m from construction footprint.	Soil contamination (if present) unlikely to be disturbed during construction as likely to be localised to service station site within soil (outside footprint).	Soil, groundwater or vapour contamination (if present) unlikely to be exposed during construction and therefore unlikely to impact upon human and ecological receptors during construction or operation	PR1	**Low** – No change (not investigated as part of Stage 2 assessment due to low ranking in preliminary CSM)
		Groundwater					Groundwater contamination (if present) unlikely to be exposed during construction based on depth of groundwater, flow direction and proposed design near this location.			
		Vapour					Vapour from hydrocarbon contamination in soil and/or groundwater (if present) is unlikely to be released as subsurface works not proposed near source site.			
AEI 10: Former service station South Bowenfels. Known groundwater contamination associated with fuel storage.	Filling batters / pavement	Soil	Heavy metals, hydrocarbons (TRH, BTEX, PAH)	Contamination possibly present in the media of concern at concentrations above the relevant assessment criteria and limited in extent	SE2	Approx. 50 m from construction footprint.	Soil contamination unlikely to be disturbed during construction as likely to be localised to service station site within soil (outside footprint), and based on construction activities nearest to source site (no subsurface work)	Soil, groundwater or vapour contamination unlikely to be exposed during construction and therefore unlikely to impact upon human and ecological receptors during construction or operation	PR1	**Very Low** - Contamination above the SAC was not reported in the soil samples collected for this AEI.
		Groundwater		Known contamination present in the media of concern at concentrations above the relevant assessment criteria and limited in extent	SE4		Groundwater contamination unlikely to be exposed during construction based on depth of groundwater, flow direction and proposed design near this location (no subsurface work).			**Low** - Concentrations of zinc were detected above the SAC for ecological protection adjacent to the former service station – South Bowenfels (GW07). The impact of elevated zinc in groundwater during construction at this location is likely to be low based on the spatial separation between the well location and construction works.
		Vapour		Contamination possibly present in the media of concern at concentrations above the relevant	SE3		Vapour unlikely to be exposed during construction based on proposed design near this location.			**Low** – No change (not investigated as part of Stage 2 assessment due

Site of concern and potential source of contamination	Construction element and anticipated depth	Contamination severity and extent assessment				Pathways and receptors Assessment of relationship to construction footprint and scope				Revised contamination impact
		Media	COPCs	Contamination status	Refer to Table 3-1	Location relative to project	Potential for contamination to be intersected by project	Exposure pathways (der – direct contact, ing – ingestion or inh – inhalation)	Refer to Table 2-1	
				assessment criteria and potentially widespread						to low ranking in preliminary CSM)
AEI 11: Cemetery South Bowenfels. Potential contamination associated with breakdown of organic sources.	Filling batters / pavement	Soil	Heavy metals, nutrients, formaldehyde	Contamination possibly present in the media of concern at concentrations above the relevant assessment criteria and limited in extent	SE2	Adjacent to construction footprint	Soil contamination (if present) unlikely to be disturbed during construction as likely to be localised to cemetery within soil (outside footprint).	Soil and groundwater contamination (if present) unlikely to be exposed during construction and therefore unlikely to impact upon human and ecological receptors during construction or operation	PR1	**Low** – No change (not investigated as part of Stage 2 assessment due to low ranking in preliminary CSM)
		Groundwater					Groundwater contamination (if present) unlikely to be exposed during construction based on depth of groundwater, flow direction and proposed design near this location (no subsurface works).			
General: agricultural land use. Potential contamination associated with use of herbicides, pesticides, fuel, machinery, sheep/cattle dips, and waste disposal.	Various - cutting and embankment filling	Soil	Heavy metals, hydrocarbons (TRH, BTEX, PAH), pesticides, herbicides, asbestos, microbiological	Contamination possibly present in the media of concern at concentrations above the relevant assessment criteria and limited in extent	SE2	Within and adjacent to construction footprint	Soil contamination (if present) may be disturbed during construction however would likely be limited to shallow soil.	Construction workers could be exposed to shallow soil contamination via contact (der, ing, inh) with contaminated soils and dust. Adjacent site users could be exposed to contamination via dust emissions (inh), namely asbestos if encountered. Ecological receptors may be exposed if sediment runoff to surface waterways occurs. Exposure unlikely to occur during operation.	PR3	**Moderate –** Concentrations of total coliforms were detected in soil above the SAC within areas of agricultural land use (BH15). With the absence of total coliform criteria within the NEPC (2013) guidelines, biodsolids criteria for faecal coliforms for unrestricted use from the EPA (2000) guidelines were adopted. These guidelines are likely to be conservative in consideration of the organism type (faecal vs total) and the unrestricted use. There is the potential for possible short term/acute human health impacts from incidental ingestion of soil material containing total coliforms

Site of concern and potential source of contamination	Construction element and anticipated depth	Contamination severity and extent assessment				Pathways and receptors Assessment of relationship to construction footprint and scope				Revised contamination impact
		Media	COPCs	Contamination status	Refer to Table 3-1	Location relative to project	Potential for contamination to be intersected by project	Exposure pathways (der – direct contact, ing – ingestion or inh – inhalation)	Refer to Table 2-1	
										associated with the disturbance of surface soils during both cutting and filling construction activities proposed in these locations.
		Groundwater					Groundwater contamination (if present) may be exposed during construction where cuts intersect groundwater and a point source is present in immediate vicinity (e.g. sheep/cattle dip, fuel storage).	Construction workers could be exposed to contaminated groundwater via contact (der, ing), if groundwater is intersected and point source nearby. Sensitive environmental receptors may be exposed if runoff to surface waterways occurs. Exposure unlikely to occur during operation.		**Low** - Contamination above the SAC was not reported in the soil samples collected for this AEI.
General: current road corridor. Potential contamination associated with vehicle emissions, fuel spills, and bitumen surface.	Various - cutting and embankment filling	Surface soils	Heavy metals, hydrocarbons (TRH, BTEX, PAH)	Contamination possibly present in the media of concern at concentrations above the relevant assessment criteria and limited in extent	SE2	Within construction footprint.	Shallow soil or sediment contamination (if present) may be disturbed during construction within current roadway, particularly within road verges	Construction workers and ongoing users of site could be exposed to soil/sediment contamination via contact (der, ing) with contaminated soils and dust. Exposure to adjacent site users unlikely. Sensitive environmental receptors may be exposed if sediment runoff to surface waterways occurs.	PR3	**Low** - Contamination above the SAC was not reported in the soil samples collected for this AEI.
		Road material (asphalt)	Coal tar				Coal tar within the existing road pavement (where present) may be disturbed during construction within current roadway	Construction workers and ongoing users of site could be exposed to coal tar via contact (der, ing) with existing pavement material containing coal tar. Exposure to adjacent site users unlikely. Sensitive environmental receptors may be exposed if asphalt dust runoff to surface waterways occur	PR3	**Moderate** – Coal tar was detected for this AEI (see **Appendix H** for details).

9. Mitigation Measures

The following section provides the proposed framework for managing the potential impact of this project through the creation of Construction Environmental Management Plans (CEMP) and sub-plans which set out specific impact mitigation and management measures. A summary of the recommended mitigation measures is outlined in **Table 9.1** below. The areas that have been classified as moderate or above impact and require management are shown in **Figure 8.1** to **Figure 8.4.**

Table 9.1: Summary of environmental mitigation measures

Impact	Reference	Original measure (from REF)	Reference	Updated measure	Responsibility	Timing
General						
General construction management	GEN01	A CEMP will be prepared and implemented for the project in accordance with the Department of Infrastructure, Planning and Natural Resources Guideline for the Preparation of Environmental Management Plans (DIPNR 2004), for the ongoing management of environmental issues during construction of the project.	GEN01	No change	Contractor	Prior to construction and during construction
Soils and surface water						
Erosion and sedimentation of soils / Surface water quality	SW01	A Construction Soil and Water Management Plan (CSWMP) would be developed as a subplan to the CEMP and will outline measures to manage water quality impacts associated with construction work. The CWSMP will provide: ▪ An Erosion and Sediment Control Plan (ESCP) including measures to mitigate erosion and sediment transport both within the construction footprint and offsite including requirements for the preparation of erosion and sediment control plans for all progressive stages of construction and the implementation of erosion and sediment control measures including the use of sediment basins. ▪ Erosion and sediment control measures which would be implemented and maintained in accordance with Managing Urban Stormwater – Soils and Construction, Volume 1 (Landcom, 2004) and Volume 2D (DECC, 2008). ▪ Measures to manage stockpiles including locations, separation of waste types, sediment controls and stabilisation. ▪ Measures to manage waste including classification and handling of spoil. ▪ Measures to manage tannin leachates. ▪ Measures to manage accidental spills including requirement to maintain materials such as spill kits, an emergency response procedures and regular visual water quality checks when working near waterways. ▪ Controls for sensitive receiving environments which may include but not be limited to designation of 'no go' zone for construction plant and equipment (where application).		Emergency response protocols and procedures will be included in the Project Construction Environmental Management Plan Project (CEMP) and implemented in the event of a contaminant spill or leak.	Contractor	Prior to construction and during construction
ContaminationDetailed site investigation	CN01	A Detailed Site Investigation (DSI) is being undertaken prior to construction to better understand the nature and extent of contamination in accordance with the NEPM (2013) and other guidelines made or endorsed by the NSW EPA.		Removed as DSI is now complete		
Management of low-risk contamination	CN02	Where site investigation data confirms that contamination is likely to have a very low, low or moderate impact potential, the site would then be managed in accordance with Construction Environmental Management Framework.	CN02	~~Where site investigation data confirms that contamination is likely to have a very low, low or moderate impact potential, the site would then be managed in accordance with Construction Environmental Management Framework.~~ ▪ A Contaminated Land Management Plan (CLMP) will be prepared. The CLMP will include: ▪ Control measures to manage identified areas of elevated total coliforms, including surface soils in the vicinity of BH06, BH07 and SS13 (L2R/CRR),	Contractor	Prior to construction

Impact	Reference	Original measure (from REF)	Reference	Updated measure	Responsibility	Timing
				SS22 (R2F) and BH15 (F2L) containing elevated total coliforms. ▪ Control measures to manage potential contamination in agricultural areas from including limiting soil contact, use of correct personal protective equipment and education of contractors. ▪ Control measures to manage identified elevated cadmium and zinc in groundwater in the vicinity of GW01 and appropriately manage inflows prior to discharge or disposal. ▪ Control measures to manage potentially impacted groundwater (where intersected) from septic systems within F2L. ▪ Management of groundwater encountered during excavation where dewatering is required as outlined in CN06 ▪ Where coal tar is present, material should be managed/disposed of off-site in accordance with the NSW Government (2015) Technical Direction 21: coal tar asphalt handling and disposal procedure. ▪ Procedures for unexpected contamination as outlined in CN06A. Requirements for the disposal of contaminated waste in accordance with the POEO Act and the Protection of the Environment Operations (Waste) Regulation 2014.		
Remediation action plan	CN03	If identified as required following detailed site investigations, a Remedial Action Plan (RAP) would be developed for identified risk areas within the construction footprint. Each RAP would detail the remediation works required to mitigate risks from contamination throughout and following completion of construction. The RAP would be prepared in accordance with relevant NSW EPA guidelines and where applicable, detail remediation methodologies in accordance with Australian Standards and other relevant government guidelines and codes of practice.		Removed as Stage 2 Contamination Assessment (DSI) has confirmed that a RAP is not required.	N/A	N/A
Site audit statement	CN04	If identified as required following detailed site investigations, an accredited Site Auditor would review and approve the RAP and remediation activities and will develop a Site Audit Statement (SAS) and Site Audit Report (SAR) upon completion of remediation.		Removed as Stage 2 Contamination Assessment has confirmed that a RAP and a site audit statement is not required.	N/A	N/A
Unexpected finds procedure		New safeguard included for an unexpected finds procedure.	CN06	An 'unexpected finds' protocol should be implemented as part of the CLMP to plan for and accommodate potential contamination impacts. Contingency measures as part of this procedure should include: ▪ Stop work procedures: a suitably qualified and experienced consultant should then assess whether material is or is not contaminated.	Contractor	During construction

Impact	Reference	Original measure (from REF)	Reference	Updated measure	Responsibility	Timing
				▪ Treat suspected contaminated material as actually contaminated material and employ adequate environmental and safety controls. ▪ Procedures for managing groundwater inflows, particularly in the vicinity of sceptic tanks, including minimising worker exposure, testing and appropriate disposal.		

10. Conclusions and Recommendations

JAJV have undertaken a Stage 2 contamination assessment for the Great Western Highway Upgrade Program: Little Hartley to Lithgow (West Section) to further understand the potential for contamination to be present at the site to inform decision making relating to contamination exposure impacts to construction workers, site users and ecological receptors, both during construction and operation of the proposed highway upgrade.

10.1 Conclusions

The key findings of the Stage 2 contamination assessment are as follows:

- Soil contamination impact across the four study areas is expected to pose a generally low risk to human health and ecological receptors associated with the proposed construction and operation of the project. Only five areas of agricultural land use across all study areas exhibited elevated total coliforms when compared to the biosolids guidelines (NSW EPA, 2000). The elevated total coliform numbers is likely due to the presence of livestock and other fauna in these areas
- No other soil sample collected and analysed as part of this investigation reported concentrations of contamination exceeding the adopted SAC
- ACM was not detected in any soil samples submitted for laboratory identification. No potential ACM was observed in the material excavated or in the near vicinity of the investigation locations
- Aesthetics were monitored at all investigation locations. Only minor visual signs of potential contamination (e.g. bitumen and minor organic/hydrocarbon odours) were observed and primarily related to surface samples adjacent to the road corridor and agriculture, not contamination at depth. Samples analysed in material where visual signs of potential contamination were observed did not report contamination levels above the adopted SAC with the exception of SS22, which reported elevated levels of total coliforms and a slight organic odour
- Concentrations of cadmium, copper, nickel, zinc, total nitrogen, formaldehyde and total coliforms at selected groundwater well locations were reported above the adopted SAC (protection of aquatic ecosystems and drinking water). With the exception of well GW01 in L2R/CRR, groundwater in other areas (where investigated) is unlikely to be intersected as part of construction and operations so the impact potential from the elevated contaminant concentrations in groundwater is considered to be low. Construction in the vicinity of well GW01 may intersect groundwater seepage containing elevated concentrations of cadmium and zinc which could impact upon aquatic ecosystems in receiving waterways if not managed. However, this impact is unlikely as calculated groundwater inflow rates are very low and discharged groundwater would be diluted by surface water. (JAJV, 2021c). Groundwater impacts are expected to pose a low risk to human health across the site
- Contamination related to septic tanks is possible across the site (namely R2F), however due to a lack of information from this investigation due to project constraints they have been assessed as having a moderate potential impact. These impacts should continue to be assessed and managed as/if septic tanks are discovered during construction under a CLMP.
- Coal tar is present in asphalt at select locations and depths (see Appendix H) within the existing road corridor in the L2R/CRR and R2F study areas.
- Overall, based on the results of the investigation undertaken at the site the contamination impacts to human health and ecological receptors during construction and operation of the site are low and there are only specific areas of moderate impact that should be managed appropriately as outlined in **Section 9** and **Figure 8.1** to **Figure 8.4,** which are:
  - Groundwater at the former station at Little Hartley (GW01)
  - Soil in select agricultural areas across all study areas (BH06, BH07, SS13, SS22 and BH15). All agricultural areas to be disturbed within the construction footprint should be managed under the same mitigation measures

- Given there are limited exposure risks to known contaminants during the operation of the proposal and the nature of the site (multilane highway), impacts to operation of the proposal from contaminated soil and/or groundwater (where present) are expected to be low.

10.2 Recommendations

Based on the results of the Stage 2 contamination assessment, the following recommendations are made based on the findings of this assessment:

- Implementation of location specific mitigation measures as part of a CLMP as outlined in **Table 9.1**
- In consideration of the construction activities to be undertaken across the site the adoption of an 'unexpected finds' protocol within the CLMP should be implemented to plan for and accommodate potential contamination impacts that may be encountered
- Where groundwater is encountered during excavations and dewatering is undertaken, water should be tested and appropriately managed. These measures can be managed under a CLMP.
- Where coal tar is present (as outlined in Appendix H), material should be managed / disposed off-site under a CEMP prepared in accordance with the NSW Government (2015) Technical Direction 21: coal tar asphalt handling and disposal procedure. . Additional testing should be undertaken to gain a better understanding of the lateral and vertical extent of coal within the road material, as outlined in Appendix H.
- Where locations of know or potential contamination are intersected, in particular those that have been identified as high impact, proper care should be taken to ensure minimal exposure to construction workers (exposure and ingestion) as well as preventing flow into surrounding waterways. Contingency measures should be considered as part of a CLMP to manage potentially contaminated material including:
    - Stop work procedures: a suitably qualified and experienced consultant should then assess whether material is or is not contaminated
    - Treat suspected contaminated material as actually contaminated material and employ adequate environmental and safety controls.
- Areas of the study area that were unable to be investigated due to property access constraints (see **Section 4.7**) should be managed using one of the following approaches:
    - Adopt management measures for the similar AEIs investigated in other areas (e.g. adopt mitigation measures for agricultural AEIs for all agricultural areas that are to be disturbed within the construction footprint)

  or

    - Undertake the proposed investigations when properties are accessible.

11. References

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Appendix A. Site Photographs

Appendix A - Site photographs

Photograph 1 – Former Fuel Bowser located at the Lolly Bug

Photograph 2 – Location of exisitng groundwater well (GW01) behind the Lolly Bug

Photograph 3 – Gauging of water depth at GW06

Photograph 4 – Former Little Hartley Airfield (AEI 4)

Photograph 5 – Hartley Cemetery (AEI 5) – adjacent to GW03

Photograph 6 – Newly installed groundwater well

Photograph 7 – Groundwater well adjacent to the Former Service Station – South Bowenfels (AEI 10)

Photograph 8 – Remediated site of Former Service Station – South Bowenfels (AEI 10)

Photograph 9 – Animal excrement found on groundwater well cap (GW06)

Photograph 10 – Location of BH06 in the middle of a paddock

Appendix B. Tables

Table 1 - Soil Analytical Results

				Biological		Polycyclic aromatic hydrocarbons (PAHs)																						Metals					
				E.coli by MPN	Total Coliforms by MF	Benzo(a)pyrene TEQ calc (zero)	Benzo(a)pyrene TEQ calc(half)	Benzo(a)pyrene TEQ calc(PQL)	Benzo[b+j]fluoranthene	Acenaphthene	Acenaphthylene	Anthracene	Benz(a)anthracene	Benzo(a) pyrene	Benzo(b+j) & Benzo(k)fluoranthene	Benzo(g,h,i)perylene	Benzo(k)fluoranthene	Chrysene	Dibenz(a,h)anthracene	Fluoranthene	Fluorene	Indeno(1,2,3-c,d)pyrene	Naphthalene	Phenanthrene	Pyrene	PAHs (Sum of total)	Total +ve PAHs	Arsenic	Cadmium	Chromium (III+VI)	Copper	Lead	Mercury
				MPN/g	MPN/100g	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg
EQL				10		0.5	0.5	0.5	0.5	0.1	0.1	0.1	0.1	0.05	0.2	0.1	0.5	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.5	0.05	4	0.4	1	1	1	0.1
PFAS NEMP 2020 Table 2 Industrial/ commercial (HIL D)																																	
PFAS NEMP 2020 Table 3 Ecological direct exposure																																	
PFAS NEMP 2020 Table 3 Ecological indirect exposure																																	
NEPM 2013 Table 1A(1) HIL D Soil								**40**																		**4,000$^{\#1}$**		**3,000$^{\#2}$**	**900**	**3600**	**240,000**	**1,500$^{\#3}$**	**730$^{\#4}$**
NEPM 2013 Table 1A(3) HSL D Sand for Vapour Intrusion																																	
>=0m, <1m																							**NL**										
>=1m, <2m																							**NL**										
>=2m, <4m																							**NL**										
>=4m																							**NL**										
NEPM 2013 Table 1B(1-5) EIL Comm Ind Default (Aged)																							370$^{\#7}$					160$^{\#7}$			280$^{\#8}$	1,800$^{\#9}$	
NEPM 2013 Table 1B(6) ESL, Coarse Soil, Commercial/Industrial														1.4																			
EPA (2000), Table 3-5, Biosolids Stabilisation Grade A Microbiological Standards					1500																												
Location Code	**Field ID**	**Date**	**Lab Report Number**																														
BH02	BH02_0.05	26/08/2021	276682	-	-	<0.5	<0.5	<0.5	-	<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	-	<0.05	**5**	<0.4	**17**	**18**	**15**	<0.1
BH02	BH02_0.5	26/08/2021	276682	-	-	<0.5	<0.5	<0.5	-	<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	-	<0.05	**5**	<0.4	**16**	**19**	**16**	<0.1
BH03	BH03_0.05	26/08/2021	276682	-	-	<0.5	<0.5	<0.5	-	<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	-	<0.05	**11**	<0.4	**33**	**22**	**63**	**0.1**
BH03	BH03_0.9	26/08/2021	276682	-	-	<0.5	<0.5	<0.5	-	<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	-	<0.05	**17**	<0.4	**16**	**22**	**26**	<0.1
BH04	BH04_0.50	31/08/2021	277534	-	<200	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
BH04	BH04_1.0	31/08/2021	277534	-	<200	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
BH04	BH04_2.0	31/08/2021	ES2132166	-	-	<0.5	**0.6**	**1.2**	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	-	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	-	<5	<1	**9**	<5	**15**	<0.1
BH04	BH04_2.0	31/08/2021	ES2132166	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
BH04	BH04_4.0	31/08/2021	ES2132166	-	-	<0.5	**0.6**	**1.2**	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	-	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	-	**6**	<1	**12**	**5**	**14**	<0.1
BH04	BH04_4.0	31/08/2021	ES2132166	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
BH05	BH05_0.05	1/09/2021	ES2132166	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	**6**	<1	**20**	<5	**10**	<0.1
BH05	BH05_5.0	1/09/2021	ES2132166	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	**12**	<1	**23**	**13**	**11**	<0.1
BH06	BH06_0.05	2/09/2021	ES2132166	-	-	<0.5	**0.6**	**1.2**	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	-	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	-	**5**	<1	**10**	<5	**7**	<0.1
BH06	BH06_0.05	2/09/2021	ES2132166	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
BH06	BH06_0.82	2/09/2021	ES2132166	-	-	<0.5	**0.6**	**1.2**	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	-	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	-	<5	<1	**4**	**6**	**15**	<0.1
BH06	BH06_0.82	2/09/2021	ES2132166	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
BH07	BH07_0.05	7/09/2021	ES2132601	<11	-	<0.5	**0.6**	**1.2**	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	-	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	-	<5	<1	<2	<5	<5	<0.1
BH07	BH07_0.5	7/09/2021	ES2132601	<12	-	<0.5	**0.6**	**1.2**	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	-	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	-	<5	<1	**9**	<5	<5	<0.1
BH08	BH08_0.05	16/09/2021	ES2133844	-	-	<0.5	**0.6**	**1.2**	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	-	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	-	<5	<1	<2	<5	<5	<0.1
BH08	BH08_0.5	16/09/2021	ES2133844	-	-	<0.5	**0.6**	**1.2**	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	-	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	-	<5	<1	**9.1**	<5	<5	<0.1
BH10	BH10_0.05	16/09/2021	ES2133844	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	<5	<1	**2**	<5	**14**	<0.1
BH10	BH10_1.0	16/09/2021	ES2133844	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	<5	<1	**2**	<5	**7**	<0.1
BH11	BH11_0.05	2/09/2021	ES2132166	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	<5	<1	<2	<5	**51**	<0.1
BH11	BH11_0.5	2/09/2021	ES2132166	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	<5	<1	**2**	<5	**10**	<0.1
BH11	BH11_0.05	2/09/2021	ES2134640	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
BH11	BH11_0.5	2/09/2021	ES2134640	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
BH13	BH13_0.05	15/09/2021	ES2133844	-	-	<0.5	**0.6**	**1.2**	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	-	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	-	<5	<1	**5**	<5	**9**	<0.1
BH13	BH13_0.5	15/09/2021	ES2133844	-	-	<0.5	**0.6**	**1.2**	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	-	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	-	**5**	<1	**12**	<5	**7**	<0.1
BH14	BH14_0.5	26/08/2021	276682	-	-	<0.5	**0.5**	**0.6**	-	<0.1	<0.1	**0.2**	**0.4**	**0.4**	**0.6**	**0.1**	-	**0.4**	<0.1	**0.9**	<0.1	**0.1**	<0.1	**0.6**	**0.9**	-	**4.7**	**8**	<0.4	**11**	**20**	**24**	<0.1
BH14	BH14_1.5	26/08/2021	276682	-	-	<0.5	<0.5	<0.5	-	<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	-	<0.05	**7**	<0.4	**19**	**8**	**14**	<0.1
BH15	BH15_0.05	8/09/2021	ES2132601	<14	-	<0.5	**0.6**	**1.2**	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	-	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	-	**10**	<1	**14**	**10**	**22**	<0.1
BH15	BH15_2.0	8/09/2021	ES2132601	<11	-	<0.5	**0.6**	**1.2**	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	-	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	-	**26**	<1	**19**	**20**	**18**	<0.1
BH16	BH16_0.05	13/09/2021	ES2133844	-	-	<0.5	**0.6**	**1.2**	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	-	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	-	<5	<1	**5**	**12**	**16**	<0.1
BH16	BH16_1.5	13/09/2021	ES2133844	-	-	<0.5	**0.6**	**1.2**	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	-	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	-	**9**	<1	**11**	**11**	**17**	<0.1
BH16	SS16_0.05	17/09/2021	ES2133844	-	-	<0.5	**0.6**	**1.2**	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	-	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	-	<5	<1	**16**	**18**	**22**	<0.1
BH17	BH17-0.05	9/09/2021	ES2132942	-	-	<0.5	**0.6**	**1.2**	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	-	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	-	<5	<1	**6**	**6**	**6**	<0.1
BH17	BH17-6.0	10/09/2021	ES2132942	-	-	<0.5	**0.6**	**1.2**	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	-	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	-	**6**	<1	**17**	**15**	**17**	<0.1
SS01	SS01_0.05	24/08/2021	276682	-	-	<0.5	<0.5	<0.5	-	<0.1	<0.1	<0.1	<0.1	**0.1**	**0.3**	**0.1**	-	<0.1	<0.1	**0.2**	<0.1	<0.1	<0.1	<0.1	**0.2**	-	**0.84**	<4	<0.4	**6**	**7**	**17**	<0.1
SS02	SS02_0.05	24/08/2021	276682	-	-	<0.5	<0.5	<0.5	-	<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	-	<0.05	<4	**0.5**	**2**	**7**	**36**	<0.1
SS03a	SS03a_0.10	24/08/2021	276682	-	-	<0.5	<0.5	**0.5**	-	<0.1	**0.4**	**0.2**	**0.2**	**0.4**	**0.4**	**0.3**	-	**0.2**	<0.1	**0.2**	<0.1	**0.3**	**0.1**	**0.2**	**0.3**	-	**3.1**	<4	<0.4	**17**	**14**	**11**	<0.1
SS03a	SS03a_0.10	24/08/2021	276682	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	<1	-	-	-	-	-	-	-	-	-	-
SS03b	SS03b_0.10	27/08/2021	276682	-	-	<0.5	<0.5	<0.5	-	<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	**0.2**	<0.1	-	**0.2**	**5**	<0.4	**12**	**11**	**17**	<0.1
SS04	SS04_0.05	24/08/2021	276682	-	-	<0.5	<0.5	<0.5	-	<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	-	<0.05	<4	**0.6**	**3**	**8**	**72**	<0.1
SS05	SS05_0.05	26/08/2021	276682	-	-	<0.5	**0.5**	**0.6**	-	<0.1	<0.1	<0.1	**0.6**	**0.4**	**0.3**	**0.2**	-	**0.5**	<0.1	**0.5**	<0.1	**0.2**	<0.1	**0.2**	**0.6**	-	**3.2**	**13**	<0.4	**16**	**21**	**48**	<0.1
SS06	SS06_0.05	17/09/2021	ES2133844	-	-	<0.5	**0.6**	**1.2**	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	-	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	-	<5	<1	**4**	<5	**10**	<0.1
SS07	SS07_0.05	17/09/2021	ES2133844	-	-	<0.5	**0.6**	**1.2**	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	-	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	-	<5	<1	**6**	**6**	**12**	<0.1
SS08	SS08_0.05	17/09/2021	ES2133844	-	-	<0.5	**0.6**	**1.2**	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	-	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	-	<5	<1	**4**	<5	<5	<0.1
SS09	SS09_0.05	17/09/2021	ES2133844	-	-	<0.5	**0.6**	**1.2**	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	-	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	-	<5	<1	**8**	**6**	**18**	<0.1

Table 1 - Soil Analytical Results

				Nickel	Zinc
				mg/kg	mg/kg
EQL				1	1
PFAS NEMP 2020 Table 2 Industrial/ commercial (HIL D)					
PFAS NEMP 2020 Table 3 Ecological direct exposure					
PFAS NEMP 2020 Table 3 Ecological indirect exposure					
NEPM 2013 Table 1A(1) HIL D Soil				**6,000**	**400,000**
NEPM 2013 Table 1A(3) HSL D Sand for Vapour Intrusion					
>=0m, <1m					
>=1m, <2m					
>=2m, <4m					
>=4m					
NEPM 2013 Table 1B(1-5) EIL Comm Ind Default (Aged)				460[#10]	920[#11]
NEPM 2013 Table 1B(6) ESL, Coarse Soil, Commercial/Industrial					
EPA (2000), Table 3-5, Biosolids Stabilisation Grade A Microbiological Standards					
Location Code	**Field ID**	**Date**	**Lab Report Number**		
BH02	BH02_0.05	26/08/2021	276682	**15**	**62**
BH02	BH02_0.5	26/08/2021	276682	**10**	**59**
BH03	BH03_0.05	26/08/2021	276682	**11**	**140**
BH03	BH03_0.9	26/08/2021	276682	**9**	**62**
BH04	BH04_0.50	31/08/2021	277534	-	-
BH04	BH04_1.0	31/08/2021	277534	-	-
BH04	BH04_2.0	31/08/2021	ES2132166	<2	<5
BH04	BH04_2.0	31/08/2021	ES2132166	-	-
BH04	BH04_4.0	31/08/2021	ES2132166	<2	<5
BH04	BH04_4.0	31/08/2021	ES2132166	-	-
BH05	BH05_0.05	1/09/2021	ES2132166	<2	**6**
BH05	BH05_5.0	1/09/2021	ES2132166	**28**	**84**
BH06	BH06_0.05	2/09/2021	ES2132166	<2	**10**
BH06	BH06_0.05	2/09/2021	ES2132166	-	-
BH06	BH06_0.82	2/09/2021	ES2132166	<2	**6**
BH06	BH06_0.82	2/09/2021	ES2132166	-	-
BH07	BH07_0.05	7/09/2021	ES2132601	<2	<5
BH07	BH07_0.5	7/09/2021	ES2132601	**3**	**18**
BH08	BH08_0.05	16/09/2021	ES2133844	<2	<5
BH08	BH08_0.5	16/09/2021	ES2133844	<2	**35**
BH10	BH10_0.05	16/09/2021	ES2133844	<2	**12**
BH10	BH10_1.0	16/09/2021	ES2133844	<2	**14**
BH11	BH11_0.05	2/09/2021	ES2132166	<2	**26**
BH11	BH11_0.5	2/09/2021	ES2132166	<2	**9**
BH11	BH11_0.05	2/09/2021	ES2134640	-	-
BH11	BH11_0.5	2/09/2021	ES2134640	-	-
BH13	BH13_0.05	15/09/2021	ES2133844	**5**	**17**
BH13	BH13_0.5	15/09/2021	ES2133844	**3**	**8**
BH14	BH14_0.5	26/08/2021	276682	**21**	**83**
BH14	BH14_1.5	26/08/2021	276682	**12**	**44**
BH15	BH15_0.05	8/09/2021	ES2132601	**4**	**55**
BH15	BH15_2.0	8/09/2021	ES2132601	**6**	**33**
BH16	BH16_0.05	13/09/2021	ES2133844	**3**	**13**
BH16	BH16_1.5	13/09/2021	ES2133844	**3**	**24**
BH16	SS16_0.05	17/09/2021	ES2133844	**15**	**75**
BH17	BH17-0.05	9/09/2021	ES2132942	**3**	**31**
BH17	BH17-6.0	10/09/2021	ES2132942	**13**	**75**
SS01	SS01_0.05	24/08/2021	276682	**4**	**56**
SS02	SS02_0.05	24/08/2021	276682	**2**	**68**
SS03a	SS03a_0.10	24/08/2021	276682	**24**	**110**
SS03a	SS03a_0.10	24/08/2021	276682	-	-
SS03b	SS03b_0.10	27/08/2021	276682	**17**	**58**
SS04	SS04_0.05	24/08/2021	276682	**2**	**71**
SS05	SS05_0.05	26/08/2021	276682	**10**	**94**
SS06	SS06_0.05	17/09/2021	ES2133844	<2	**15**
SS07	SS07_0.05	17/09/2021	ES2133844	<2	**23**
SS08	SS08_0.05	17/09/2021	ES2133844	**2**	**31**
SS09	SS09_0.05	17/09/2021	ES2133844	**2**	**36**

Table 1 - Soil Analytical Results

				Inorganics						TRH - NEPM 2013 Fractions							TPH - NEPM 1999 Fractions					BTEXN						
				Moisture Content	Nitrite + Nitrate as N (soluble)	Cyanide Total	Kjeldahl Nitrogen Total	Nitrogen (Total)	Phosphorus	TRH >C6 - C10	TRH >C10 - C16	TRH >C16 - C34	TRH >C34 - C40	TRH >C10 - C40 (Sum of total)	TRH >C6 - C10 less BTEX (F1)	TRH >C10 - C16 less Naphthalene (F2)	TPH C6 - C9	TPH C10 - C14	TPH C15 - C28	TPH C29-C36	TPH C10 - C36 (Sum of total)	Benzene	Ethylbenzene	Toluene	Total BTEX	Xylene (m & p)	Xylene (o)	Xylene 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	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg
EQL				0.1	0.1	1	20	20	2	10	50	100	100	50	10	50	10	50	100	100	50	0.2	0.5	0.5	0.2	0.5	0.5	0.5
PFAS NEMP 2020 Table 2 Industrial/ commercial (HIL D)																												
PFAS NEMP 2020 Table 3 Ecological direct exposure																												
PFAS NEMP 2020 Table 3 Ecological indirect exposure																												
NEPM 2013 Table 1A(1) HIL D Soil						**1500**																						
NEPM 2013 Table 1A(3) HSL D Sand for Vapour Intrusion																							**NL**	**NL**				**230**#5
>=0m, <1m															**260**#6	**NL**						**3**	**NL**	**NL**				**230**
>=1m, <2m															**370**	**NL**						**3**	**NL**	**NL**				**NL**
>=2m, <4m															**630**	**NL**						**3**	**NL**	**NL**				**NL**
>=4m															**NL**	**NL**						**3**	**NL**	**NL**				**NL**
NEPM 2013 Table 1B(1-5) EIL Comm Ind Default (Aged)																												
NEPM 2013 Table 1B(6) ESL, Coarse Soil, Commercial/Industrial												1,700	3,300		215	170						75	165	135				180
EPA (2000), Table 3-5, Biosolids Stabilisation Grade A Microbiological Standards																												
Location Code	**Field ID**	**Date**	**Lab Report Number**																									
BH02	BH02_0.05	26/08/2021	276682	**14**	-	-	-	-	-	<25	<50	<100	<100	<50	<25	<50	<25	<50	<100	<100	<50	<0.2	<1	<0.5	-	<2	<1	<3
BH02	BH02_0.5	26/08/2021	276682	**9.4**	-	-	-	-	-	<25	<50	<100	<100	<50	<25	<50	<25	<50	<100	<100	<50	<0.2	<1	<0.5	-	<2	<1	<3
BH03	BH03_0.05	26/08/2021	276682	**19**	-	-	-	-	-	<25	<50	<100	<100	<50	<25	<50	<25	<50	<100	<100	<50	<0.2	<1	<0.5	-	<2	<1	<3
BH03	BH03_0.9	26/08/2021	276682	**13**	-	-	-	-	-	<25	<50	<100	<100	<50	<25	<50	<25	<50	<100	<100	<50	<0.2	<1	<0.5	-	<2	<1	<3
BH04	BH04_0.50	31/08/2021	277534	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
BH04	BH04_1.0	31/08/2021	277534	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
BH04	BH04_2.0	31/08/2021	ES2132166	**17.9**	**0.2**	-	**200**	**200**	**171**	<10	<50	<100	<100	<50	<10	<50	<10	<50	<100	<100	<50	<0.2	<0.5	<0.5	<0.2	<0.5	<0.5	<0.5
BH04	BH04_2.0	31/08/2021	ES2132166	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
BH04	BH04_4.0	31/08/2021	ES2132166	**13.5**	**0.2**	-	**320**	**320**	**367**	<10	<50	<100	<100	<50	<10	<50	<10	<50	<100	<100	<50	<0.2	<0.5	<0.5	<0.2	<0.5	<0.5	<0.5
BH04	BH04_4.0	31/08/2021	ES2132166	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
BH05	BH05_0.05	1/09/2021	ES2132166	**23.5**	<0.1	-	**1,000**	**1,000**	**207**	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
BH05	BH05_5.0	1/09/2021	ES2132166	**15.1**	**0.2**	-	**480**	**480**	**229**	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
BH06	BH06_0.05	2/09/2021	ES2132166	**22.1**	**2.4**	-	**2,420**	**2,420**	**325**	<10	<50	<100	<100	<50	<10	<50	<10	<50	<100	<100	<50	<0.2	<0.5	<0.5	<0.2	<0.5	<0.5	<0.5
BH06	BH06_0.05	2/09/2021	ES2132166	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
BH06	BH06_0.82	2/09/2021	ES2132166	**9.6**	**2.1**	-	**310**	**310**	**305**	<10	<50	<100	<100	<50	<10	<50	<10	<50	<100	<100	<50	<0.2	<0.5	<0.5	<0.2	<0.5	<0.5	<0.5
BH06	BH06_0.82	2/09/2021	ES2132166	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
BH07	BH07_0.05	7/09/2021	ES2132601	**9.9**	-	-	-	-	-	<10	<50	<100	<100	<50	<10	<50	<10	<50	<100	<100	<50	<0.2	<0.5	<0.5	<0.2	<0.5	<0.5	<0.5
BH07	BH07_0.5	7/09/2021	ES2132601	**19.1**	-	-	-	-	-	<10	<50	<100	<100	<50	<10	<50	<10	<50	<100	<100	<50	<0.2	<0.5	<0.5	<0.2	<0.5	<0.5	<0.5
BH08	BH08_0.05	16/09/2021	ES2133844	**14.5**	-	-	-	-	-	<10	<50	<100	<100	<50	<10	<50	<10	<50	<100	<100	<50	<0.2	<0.5	<0.5	<0.2	<0.5	<0.5	<0.5
BH08	BH08_0.5	16/09/2021	ES2133844	**5.4**	-	-	-	-	-	<10	<50	<100	<100	<50	<10	<50	<10	<50	<100	<100	<50	<0.2	<0.5	<0.5	<0.2	<0.5	<0.5	<0.5
BH10	BH10_0.05	16/09/2021	ES2133844	**18.5**	-	<1	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
BH10	BH10_1.0	16/09/2021	ES2133844	**8.6**	-	<1	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
BH11	BH11_0.05	2/09/2021	ES2132166	**10.6**	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
BH11	BH11_0.5	2/09/2021	ES2132166	**7.9**	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
BH11	BH11_0.05	2/09/2021	ES2134640	**10.7**	-	<1	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
BH11	BH11_0.5	2/09/2021	ES2134640	**8.2**	-	<1	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
BH13	BH13_0.05	15/09/2021	ES2133844	**16.8**	-	-	-	-	-	<10	<50	<100	<100	<50	<10	<50	<10	<50	<100	<100	<50	<0.2	<0.5	<0.5	<0.2	<0.5	<0.5	<0.5
BH13	BH13_0.5	15/09/2021	ES2133844	**9.6**	-	-	-	-	-	<10	<50	<100	<100	<50	<10	<50	<10	<50	<100	<100	<50	<0.2	<0.5	<0.5	<0.2	<0.5	<0.5	<0.5
BH14	BH14_0.5	26/08/2021	276682	**20**	-	-	-	-	-	<25	<50	**150**	<100	**150**	<25	<50	<25	<50	**100**	<100	**100**	<0.2	<1	<0.5	-	<2	<1	<3
BH14	BH14_1.5	26/08/2021	276682	**19**	-	-	-	-	-	<25	<50	<100	<100	<50	<25	<50	<25	<50	<100	<100	<50	<0.2	<1	<0.5	-	<2	<1	<3
BH15	BH15_0.05	8/09/2021	ES2132601	**24.1**	-	-	-	-	-	<10	<50	<100	<100	<50	<10	<50	<10	<50	<100	<100	<50	<0.2	<0.5	<0.5	<0.2	<0.5	<0.5	<0.5
BH15	BH15_2.0	8/09/2021	ES2132601	**9.7**	-	-	-	-	-	<10	<50	<100	<100	<50	<10	<50	<10	<50	<100	<100	<50	<0.2	<0.5	<0.5	<0.2	<0.5	<0.5	<0.5
BH16	BH16_0.05	13/09/2021	ES2133844	**25.7**	-	-	-	-	-	<10	<50	<100	<100	<50	<10	<50	<10	<50	<100	<100	<50	<0.2	<0.5	<0.5	<0.2	<0.5	<0.5	<0.5
BH16	BH16_1.5	13/09/2021	ES2133844	**15.0**	-	-	-	-	-	<10	<50	<100	<100	<50	<10	<50	<10	<50	<100	<100	<50	<0.2	<0.5	<0.5	<0.2	<0.5	<0.5	<0.5
BH16	SS16_0.05	17/09/2021	ES2133844	**3.7**	-	-	-	-	-	<10	<50	<100	<100	<50	<10	<50	<10	<50	<100	<100	<50	<0.2	<0.5	<0.5	<0.2	<0.5	<0.5	<0.5
BH17	BH17-0.05	9/09/2021	ES2132942	**15.3**	-	-	-	-	-	<10	<50	<100	<100	<50	<10	<50	<10	<50	<100	<100	<50	<0.2	<0.5	<0.5	<0.2	<0.5	<0.5	<0.5
BH17	BH17-6.0	10/09/2021	ES2132942	**12.8**	-	-	-	-	-	<10	<50	<100	<100	<50	<10	<50	<10	<50	<100	<100	<50	<0.2	<0.5	<0.5	<0.2	<0.5	<0.5	<0.5
SS01	SS01_0.05	24/08/2021	276682	**13**	-	-	-	-	-	<25	<50	**170**	**110**	**280**	<25	<50	<25	<50	<100	**140**	**140**	<0.2	<1	<0.5	-	<2	<1	<3
SS02	SS02_0.05	24/08/2021	276682	**11**	-	-	-	-	-	<25	<50	<100	<100	<50	<25	<50	<25	<50	<100	<100	<50	<0.2	<1	<0.5	-	<2	<1	<3
SS03a	SS03a_0.10	24/08/2021	276682	**6.4**	-	-	-	-	-	<25	<50	**400**	**500**	**900**	<25	<50	<25	<50	**130**	**380**	**510**	<0.2	<1	<0.5	-	<2	<1	<3
SS03a	SS03a_0.10	24/08/2021	276682	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
SS03b	SS03b_0.10	27/08/2021	276682	**11**	-	-	-	-	-	<25	<50	<100	<100	<50	<25	<50	<25	<50	<100	<100	<50	<0.2	<1	<0.5	-	<2	<1	<3
SS04	SS04_0.05	24/08/2021	276682	**11**	-	-	-	-	-	<25	<50	<100	<100	<50	<25	<50	<25	<50	<100	<100	<50	<0.2	<1	<0.5	-	<2	<1	<3
SS05	SS05_0.05	26/08/2021	276682	**29**	-	-	-	-	-	<25	<50	**130**	<100	**130**	<25	<50	<25	<50	<100	<100	<50	<0.2	<1	<0.5	-	<2	<1	<3
SS06	SS06_0.05	17/09/2021	ES2133844	**24.1**	-	-	-	-	-	<10	<50	<100	<100	<50	<10	<50	<10	<50	<100	<100	<50	<0.2	<0.5	<0.5	<0.2	<0.5	<0.5	<0.5
SS07	SS07_0.05	17/09/2021	ES2133844	**26.2**	-	-	-	-	-	<10	<50	<100	<100	<50	<10	<50	<10	<50	<100	<100	<50	<0.2	<0.5	<0.5	<0.2	<0.5	<0.5	<0.5
SS08	SS08_0.05	17/09/2021	ES2133844	**14.9**	-	-	-	-	-	<10	<50	<100	<100	<50	<10	<50	<10	<50	<100	<100	<50	<0.2	<0.5	<0.5	<0.2	<0.5	<0.5	<0.5
SS09	SS09_0.05	17/09/2021	ES2133844	**19.8**	-	-	-	-	-	<10	<50	<100	<100	<50	<10	<50	<10	<50	<100	<100	<50	<0.2	<0.5	<0.5	<0.2	<0.5	<0.5	<0.5

Table 1 - Soil Analytical Results

				Organochlorine Pesticides (OCPs)																							
				4,4-DDE	a-BHC	Aldrin	Aldrin + Dieldrin	b-BHC	Chlordane	Chlordane (cis)	Chlordane (trans)	d-BHC	DDD	DDT	DDT+DDE+DDD	Dieldrin	Endosulfan	Endosulfan I	Endosulfan II	Endosulfan sulfate	Endrin	Endrin aldehyde	Endrin ketone	g-BHC (Lindane)	Heptachlor	Heptachlor epoxide	Methoxychlor
				mg/kg	µg/kg	mg/kg	mg/kg	µg/kg	µg/kg	µg/kg	µg/kg	µg/kg	µg/kg	µg/kg	µg/kg	mg/kg	µg/kg	µg/kg	µg/kg	µg/kg	µg/kg	µg/kg	µg/kg	µg/kg	µg/kg	µg/kg	mg/kg
EQL				0.05	50	0.05	0.05	50	50	50	50	50	50	100	50	0.05	50	50	50	50	50	50	50	50	50	50	0.1
PFAS NEMP 2020 Table 2 Industrial/ commercial (HIL D)																											
PFAS NEMP 2020 Table 3 Ecological direct exposure																											
PFAS NEMP 2020 Table 3 Ecological indirect exposure																											
NEPM 2013 Table 1A(1) HIL D Soil							**45**		**530,000**						**3,600,000**		**2,000,000**				**100,000**				**50,000**		**2,500**
NEPM 2013 Table 1A(3) HSL D Sand for Vapour Intrusion																											
>=0m, <1m																											
>=1m, <2m																											
>=2m, <4m																											
>=4m																											
NEPM 2013 Table 1B(1-5) EIL Comm Ind Default (Aged)														640,000[#7]													
NEPM 2013 Table 1B(6) ESL, Coarse Soil, Commercial/Industrial																											
EPA (2000), Table 3-5, Biosolids Stabilisation Grade A Microbiological Standards																											
Location Code	**Field ID**	**Date**	**Lab Report Number**																								
BH02	BH02_0.05	26/08/2021	276682	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
BH02	BH02_0.5	26/08/2021	276682	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
BH03	BH03_0.05	26/08/2021	276682	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
BH03	BH03_0.9	26/08/2021	276682	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
BH04	BH04_0.50	31/08/2021	277534	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
BH04	BH04_1.0	31/08/2021	277534	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
BH04	BH04_2.0	31/08/2021	ES2132166	<0.05	<50	<0.05	<0.05	<50	<50	<50	<50	<50	<50	<200	<50	<0.05	<50	<50	<50	<50	<50	<50	<50	<50	<50	<50	<0.2
BH04	BH04_2.0	31/08/2021	ES2132166	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
BH04	BH04_4.0	31/08/2021	ES2132166	<0.05	<50	<0.05	<0.05	<50	<50	<50	<50	<50	<50	<200	<50	<0.05	<50	<50	<50	<50	<50	<50	<50	<50	<50	<50	<0.2
BH04	BH04_4.0	31/08/2021	ES2132166	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
BH05	BH05_0.05	1/09/2021	ES2132166	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
BH05	BH05_5.0	1/09/2021	ES2132166	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
BH06	BH06_0.05	2/09/2021	ES2132166	<0.05	<50	<0.05	<0.05	<50	<50	<50	<50	<50	<50	<200	<50	<0.05	<50	<50	<50	<50	<50	<50	<50	<50	<50	<50	<0.2
BH06	BH06_0.05	2/09/2021	ES2132166	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
BH06	BH06_0.82	2/09/2021	ES2132166	<0.05	<50	<0.05	<0.05	<50	<50	<50	<50	<50	<50	<200	<50	<0.05	<50	<50	<50	<50	<50	<50	<50	<50	<50	<50	<0.2
BH06	BH06_0.82	2/09/2021	ES2132166	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
BH07	BH07_0.05	7/09/2021	ES2132601	<0.05	<50	<0.05	<0.05	<50	<50	<50	<50	<50	<50	<200	<50	<0.05	<50	<50	<50	<50	<50	<50	<50	<50	<50	<50	<0.2
BH07	BH07_0.5	7/09/2021	ES2132601	<0.05	<50	<0.05	<0.05	<50	<50	<50	<50	<50	<50	<200	<50	<0.05	<50	<50	<50	<50	<50	<50	<50	<50	<50	<50	<0.2
BH08	BH08_0.05	16/09/2021	ES2133844	<0.05	<50	<0.05	<0.05	<50	<50	<50	<50	<50	<50	<200	<50	<0.05	<50	<50	<50	<50	<50	<50	<50	<50	<50	<50	<0.2
BH08	BH08_0.5	16/09/2021	ES2133844	<0.05	<50	<0.05	<0.05	<50	<50	<50	<50	<50	<50	<200	<50	<0.05	<50	<50	<50	<50	<50	<50	<50	<50	<50	<50	<0.2
BH10	BH10_0.05	16/09/2021	ES2133844	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
BH10	BH10_1.0	16/09/2021	ES2133844	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
BH11	BH11_0.05	2/09/2021	ES2132166	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
BH11	BH11_0.5	2/09/2021	ES2132166	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
BH11	BH11_0.05	2/09/2021	ES2134640	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
BH11	BH11_0.5	2/09/2021	ES2134640	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
BH13	BH13_0.05	15/09/2021	ES2133844	<0.05	<50	<0.05	<0.05	<50	<50	<50	<50	<50	<50	<200	<50	<0.05	<50	<50	<50	<50	<50	<50	<50	<50	<50	<50	<0.2
BH13	BH13_0.5	15/09/2021	ES2133844	<0.05	<50	<0.05	<0.05	<50	<50	<50	<50	<50	<50	<200	<50	<0.05	<50	<50	<50	<50	<50	<50	<50	<50	<50	<50	<0.2
BH14	BH14_0.5	26/08/2021	276682	<0.1	<100	<0.1	-	<100	-	<100	<100	<100	<100	<100	<100	<0.1	-	<100	<100	<100	<100	<100	-	<100	<100	<100	<0.1
BH14	BH14_1.5	26/08/2021	276682	<0.1	<100	<0.1	-	<100	-	<100	<100	<100	<100	<100	<100	<0.1	-	<100	<100	<100	<100	<100	-	<100	<100	<100	<0.1
BH15	BH15_0.05	8/09/2021	ES2132601	<0.05	<50	<0.05	<0.05	<50	<50	<50	<50	<50	<50	<200	<50	<0.05	<50	<50	<50	<50	<50	<50	<50	<50	<50	<50	<0.2
BH15	BH15_2.0	8/09/2021	ES2132601	<0.05	<50	<0.05	<0.05	<50	<50	<50	<50	<50	<50	<200	<50	<0.05	<50	<50	<50	<50	<50	<50	<50	<50	<50	<50	<0.2
BH16	BH16_0.05	13/09/2021	ES2133844	<0.05	<50	<0.05	<0.05	<50	<50	<50	<50	<50	<50	<200	<50	<0.05	<50	<50	<50	<50	<50	<50	<50	<50	<50	<50	<0.2
BH16	BH16_1.5	13/09/2021	ES2133844	<0.05	<50	<0.05	<0.05	<50	<50	<50	<50	<50	<50	<200	<50	<0.05	<50	<50	<50	<50	<50	<50	<50	<50	<50	<50	<0.2
BH16	SS16_0.05	17/09/2021	ES2133844	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
BH17	BH17-0.05	9/09/2021	ES2132942	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
BH17	BH17-6.0	10/09/2021	ES2132942	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
SS01	SS01_0.05	24/08/2021	276682	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
SS02	SS02_0.05	24/08/2021	276682	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
SS03a	SS03a_0.10	24/08/2021	276682	<0.1	<100	<0.1	-	<100	-	<100	<100	<100	<100	<100	<100	<0.1	-	<100	<100	<100	<100	<100	-	<100	<100	<100	<0.1
SS03a	SS03a_0.10	24/08/2021	276682	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
SS03b	SS03b_0.10	27/08/2021	276682	<0.1	<100	<0.1	-	<100	-	<100	<100	<100	<100	<100	<100	<0.1	-	<100	<100	<100	<100	<100	-	<100	<100	<100	<0.1
SS04	SS04_0.05	24/08/2021	276682	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
SS05	SS05_0.05	26/08/2021	276682	<0.1	<100	<0.1	-	<100	-	<100	<100	<100	<100	<100	<100	<0.1	-	<100	<100	<100	<100	<100	-	<100	<100	<100	<0.1
SS06	SS06_0.05	17/09/2021	ES2133844	<0.05	<50	<0.05	<0.05	<50	<50	<50	<50	<50	<50	<200	<50	<0.05	<50	<50	<50	<50	<50	<50	<50	<50	<50	<50	<0.2
SS07	SS07_0.05	17/09/2021	ES2133844	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
SS08	SS08_0.05	17/09/2021	ES2133844	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
SS09	SS09_0.05	17/09/2021	ES2133844	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-

Table 1 - Soil Analytical Results

				Organophosphorous Pesticides (OPPs)																					Semi Volatile Organic Compounds (SVOCs)
				Azinophos methyl	Bromophos-ethyl	Carbophenothion	Chlorfenvinphos	Chlorpyrifos	Chlorpyrifos-methyl	Demeton-S-methyl	Diazinon	Dichlorvos	Dimethoate	Ethion	Fenamiphos	Fenitrothion	Fenthion	Malathion	Methyl parathion	Monocrotophos	Parathion	Pirimphos-ethyl	Prothiofos	Ronnel	Formaldehyde
				mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg
EQL				0.05	0.05	0.05	0.05	0.05	0.05	0.05	0.05	0.05	0.05	0.05	0.05	0.1	0.05	0.05	0.2	0.2	0.1	0.05	0.05	0.1	2
PFAS NEMP 2020 Table 2 Industrial/ commercial (HIL D)																									
PFAS NEMP 2020 Table 3 Ecological direct exposure																									
PFAS NEMP 2020 Table 3 Ecological indirect exposure																									
NEPM 2013 Table 1A(1) HIL D Soil								2,000																	
NEPM 2013 Table 1A(3) HSL D Sand for Vapour Intrusion																									
>=0m, <1m																									
>=1m, <2m																									
>=2m, <4m																									
>=4m																									
NEPM 2013 Table 1B(1-5) EIL Comm Ind Default (Aged)																									
NEPM 2013 Table 1B(6) ESL, Coarse Soil, Commercial/Industrial																									
EPA (2000), Table 3-5, Biosolids Stabilisation Grade A Microbiological Standards																									
Location Code	**Field ID**	**Date**	**Lab Report Number**																						
BH02	BH02_0.05	26/08/2021	276682	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
BH02	BH02_0.5	26/08/2021	276682	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
BH03	BH03_0.05	26/08/2021	276682	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
BH03	BH03_0.9	26/08/2021	276682	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
BH04	BH04_0.50	31/08/2021	277534	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
BH04	BH04_1.0	31/08/2021	277534	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
BH04	BH04_2.0	31/08/2021	ES2132166	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	-	<0.05	<0.05	<0.2	<0.2	<0.2	<0.05	<0.05	-	-
BH04	BH04_2.0	31/08/2021	ES2132166	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
BH04	BH04_4.0	31/08/2021	ES2132166	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	-	<0.05	<0.05	<0.2	<0.2	<0.2	<0.05	<0.05	-	-
BH04	BH04_4.0	31/08/2021	ES2132166	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
BH05	BH05_0.05	1/09/2021	ES2132166	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	<2
BH05	BH05_5.0	1/09/2021	ES2132166	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	<2
BH06	BH06_0.05	2/09/2021	ES2132166	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	-	<0.05	<0.05	<0.2	<0.2	<0.2	<0.05	<0.05	-	-
BH06	BH06_0.05	2/09/2021	ES2132166	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
BH06	BH06_0.82	2/09/2021	ES2132166	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	-	<0.05	<0.05	<0.2	<0.2	<0.2	<0.05	<0.05	-	-
BH06	BH06_0.82	2/09/2021	ES2132166	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
BH07	BH07_0.05	7/09/2021	ES2132601	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	-	<0.05	<0.05	<0.2	<0.2	<0.2	<0.05	<0.05	-	-
BH07	BH07_0.5	7/09/2021	ES2132601	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	-	<0.05	<0.05	<0.2	<0.2	<0.2	<0.05	<0.05	-	-
BH08	BH08_0.05	16/09/2021	ES2133844	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	-	<0.05	<0.05	<0.2	<0.2	<0.2	<0.05	<0.05	-	-
BH08	BH08_0.5	16/09/2021	ES2133844	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	-	<0.05	<0.05	<0.2	<0.2	<0.2	<0.05	<0.05	-	-
BH10	BH10_0.05	16/09/2021	ES2133844	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
BH10	BH10_1.0	16/09/2021	ES2133844	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
BH11	BH11_0.05	2/09/2021	ES2132166	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	<2
BH11	BH11_0.5	2/09/2021	ES2132166	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	<2
BH11	BH11_0.05	2/09/2021	ES2134640	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
BH11	BH11_0.5	2/09/2021	ES2134640	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
BH13	BH13_0.05	15/09/2021	ES2133844	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	-	<0.05	<0.05	<0.2	<0.2	<0.2	<0.05	<0.05	-	-
BH13	BH13_0.5	15/09/2021	ES2133844	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	-	<0.05	<0.05	<0.2	<0.2	<0.2	<0.05	<0.05	-	-
BH14	BH14_0.5	26/08/2021	276682	<0.1	<0.1	-	-	<0.1	<0.1	-	<0.1	<0.1	<0.1	<0.1	-	<0.1	-	<0.1	-	-	<0.1	-	-	<0.1	-
BH14	BH14_1.5	26/08/2021	276682	<0.1	<0.1	-	-	<0.1	<0.1	-	<0.1	<0.1	<0.1	<0.1	-	<0.1	-	<0.1	-	-	<0.1	-	-	<0.1	-
BH15	BH15_0.05	8/09/2021	ES2132601	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	-	<0.05	<0.05	<0.2	<0.2	<0.2	<0.05	<0.05	-	-
BH15	BH15_2.0	8/09/2021	ES2132601	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	-	<0.05	<0.05	<0.2	<0.2	<0.2	<0.05	<0.05	-	-
BH16	BH16_0.05	13/09/2021	ES2133844	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	-	<0.05	<0.05	<0.2	<0.2	<0.2	<0.05	<0.05	-	-
BH16	BH16_1.5	13/09/2021	ES2133844	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	-	<0.05	<0.05	<0.2	<0.2	<0.2	<0.05	<0.05	-	-
BH16	SS16_0.05	17/09/2021	ES2133844	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
BH17	BH17-0.05	9/09/2021	ES2132942	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
BH17	BH17-6.0	10/09/2021	ES2132942	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
SS01	SS01_0.05	24/08/2021	276682	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
SS02	SS02_0.05	24/08/2021	276682	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
SS03a	SS03a_0.10	24/08/2021	276682	<0.1	<0.1	-	-	<0.1	<0.1	-	<0.1	<0.1	<0.1	<0.1	-	<0.1	-	<0.1	-	-	<0.1	-	-	<0.1	-
SS03a	SS03a_0.10	24/08/2021	276682	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
SS03b	SS03b_0.10	27/08/2021	276682	<0.1	<0.1	-	-	<0.1	<0.1	-	<0.1	<0.1	<0.1	<0.1	-	<0.1	-	<0.1	-	-	<0.1	-	-	<0.1	-
SS04	SS04_0.05	24/08/2021	276682	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
SS05	SS05_0.05	26/08/2021	276682	<0.1	<0.1	-	-	<0.1	<0.1	-	<0.1	<0.1	<0.1	<0.1	-	<0.1	-	<0.1	-	-	<0.1	-	-	<0.1	-
SS06	SS06_0.05	17/09/2021	ES2133844	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	-	<0.05	<0.05	<0.2	<0.2	<0.2	<0.05	<0.05	-	-
SS07	SS07_0.05	17/09/2021	ES2133844	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
SS08	SS08_0.05	17/09/2021	ES2133844	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
SS09	SS09_0.05	17/09/2021	ES2133844	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-

Table 1 - Soil Analytical Results

				Per- and Poly-fluoroalkyl Substances (PFAS)																												
				Perfluorooctanesulfonic acid (PFOS)	Perfluorooctanoic acid (PFOA)	Perfluorooctanesulfonamide (PFOSA)	Perfluoropentane sulfonic acid (PFPeS)	Perfluoro-n-pentanoic acid (PFPeA)	Perfluorononanoic acid (PFNA)	Perfluorohexanoic acid (PFHxA)	Perfluorohexanesulfonic acid (PFHxS)	Perfluoroheptanoic acid (PFHpA)	Perfluorododecanoic acid (PFDoA)	Perfluorodecanoic acid (PFDA)	Perfluoroheptane sulfonic acid (PFHpS)	Perfluorobutanesulfonic acid (PFBS)	Perfluorodecanesulfonic acid (PFDS)	Perfluorotetradecanoic acid (PFTeDA)	Perfluorotridecanoic acid (PFTrDA)	Perfluoroundecanoic acid (PFUnA)	Perfluorobutanoic acid (PFBA)	1H.1H.2H.2H-perfluorohexanesulfonic acid (4:2 FTS)	1H.1H.2H.2H-perfluorooctanesulfonic acid (6:2 FTS)	1H.1H.2H.2H-perfluorodecanesulfonic acid (8:2 FTS)	1H.1H.2H.2H-perfluorododecanesulfonic acid (10:2)	N-ethyl perfluorooctane sulfonamido acetic acid	N-ethyl perfluorooctane sulfonamide	N-methyl perfluorooctanesulfonamido ethanol	N-ethyl perfluorooctanesulfonamido ethanol	N-Methyl perfluorooctane sulfonamide	N-methyl perfluorooctane sulfonamido acetic acid	Sum (PFHxS + PFOS)
				mg/kg	mg/kg	mg/kg	µg/kg	µg/kg	mg/kg	µg/kg	mg/kg	mg/kg	µg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	µg/kg	µg/kg	mg/kg	µg/kg	mg/kg	mg/kg	µg/kg	mg/kg	µg/kg	mg/kg	µg/kg	µg/kg	µg/kg
EQL				0.0001	0.0001	0.0002	0.1	0.2	0.0001	0.1	0.0001	0.0001	0.2	0.0002	0.0001	0.0001	0.0002	0.0005	0.0002	0.2	0.2	0.0001	0.1	0.0002	0.0002	0.2	0.0005	0.5	0.0005	0.5	0.2	0.1
PFAS NEMP 2020 Table 2 Industrial/ commercial (HIL D)					50																											20,000
PFAS NEMP 2020 Table 3 Ecological direct exposure				1	10																											
PFAS NEMP 2020 Table 3 Ecological indirect exposure				0.01																												
NEPM 2013 Table 1A(1) HIL D Soil																																
NEPM 2013 Table 1A(3) HSL D Sand for Vapour Intrusion																																
>=0m, <1m																																
>=1m, <2m																																
>=2m, <4m																																
>=4m																																
NEPM 2013 Table 1B(1-5) EIL Comm Ind Default (Aged)																																
NEPM 2013 Table 1B(6) ESL, Coarse Soil, Commercial/Industrial																																
EPA (2000), Table 3-5, Biosolids Stabilisation Grade A Microbiological Standards																																
Location Code	**Field ID**	**Date**	**Lab Report Number**																													
BH02	BH02_0.05	26/08/2021	276682	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
BH02	BH02_0.5	26/08/2021	276682	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
BH03	BH03_0.05	26/08/2021	276682	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
BH03	BH03_0.9	26/08/2021	276682	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
BH04	BH04_0.50	31/08/2021	277534	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
BH04	BH04_1.0	31/08/2021	277534	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
BH04	BH04_2.0	31/08/2021	ES2132166	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
BH04	BH04_2.0	31/08/2021	ES2132166	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
BH04	BH04_4.0	31/08/2021	ES2132166	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
BH04	BH04_4.0	31/08/2021	ES2132166	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
BH05	BH05_0.05	1/09/2021	ES2132166	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
BH05	BH05_5.0	1/09/2021	ES2132166	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
BH06	BH06_0.05	2/09/2021	ES2132166	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
BH06	BH06_0.05	2/09/2021	ES2132166	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
BH06	BH06_0.82	2/09/2021	ES2132166	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
BH06	BH06_0.82	2/09/2021	ES2132166	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
BH07	BH07_0.05	7/09/2021	ES2132601	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
BH07	BH07_0.5	7/09/2021	ES2132601	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
BH08	BH08_0.05	16/09/2021	ES2133844	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
BH08	BH08_0.5	16/09/2021	ES2133844	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
BH10	BH10_0.05	16/09/2021	ES2133844	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
BH10	BH10_1.0	16/09/2021	ES2133844	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
BH11	BH11_0.05	2/09/2021	ES2132166	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
BH11	BH11_0.5	2/09/2021	ES2132166	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
BH11	BH11_0.05	2/09/2021	ES2134640	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
BH11	BH11_0.5	2/09/2021	ES2134640	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
BH13	BH13_0.05	15/09/2021	ES2133844	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
BH13	BH13_0.5	15/09/2021	ES2133844	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
BH14	BH14_0.5	26/08/2021	276682	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
BH14	BH14_1.5	26/08/2021	276682	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
BH15	BH15_0.05	8/09/2021	ES2132601	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
BH15	BH15_2.0	8/09/2021	ES2132601	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
BH16	BH16_0.05	13/09/2021	ES2133844	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
BH16	BH16_1.5	13/09/2021	ES2133844	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
BH16	SS16_0.05	17/09/2021	ES2133844	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
BH17	BH17-0.05	9/09/2021	ES2132942	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
BH17	BH17-6.0	10/09/2021	ES2132942	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
SS01	SS01_0.05	24/08/2021	276682	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
SS02	SS02_0.05	24/08/2021	276682	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
SS03a	SS03a_0.10	24/08/2021	276682	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
SS03a	SS03a_0.10	24/08/2021	276682	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
SS03b	SS03b_0.10	27/08/2021	276682	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
SS04	SS04_0.05	24/08/2021	276682	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
SS05	SS05_0.05	26/08/2021	276682	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
SS06	SS06_0.05	17/09/2021	ES2133844	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
SS07	SS07_0.05	17/09/2021	ES2133844	**0.0006**	<0.0002	<0.0002	<0.2	<0.2	<0.0002	<0.2	<0.0002	<0.0002	<0.2	<0.0002	<0.0002	<0.0002	<0.0002	<0.0005	<0.0002	<0.2	<1	<0.0005	<0.5	<0.0005	<0.0005	<0.2	<0.0005	<0.5	<0.0005	<0.5	<0.2	**0.6**
SS08	SS08_0.05	17/09/2021	ES2133844	<0.0002	<0.0002	<0.0002	<0.2	<0.2	<0.0002	<0.2	<0.0002	<0.0002	<0.2	<0.0002	<0.0002	<0.0002	<0.0002	<0.0005	<0.0002	<0.2	<1	<0.0005	<0.5	<0.0005	<0.0005	<0.2	<0.0005	<0.5	<0.0005	<0.5	<0.2	<0.2
SS09	SS09_0.05	17/09/2021	ES2133844	**0.0003**	<0.0002	<0.0002	<0.2	<0.2	<0.0002	<0.2	<0.0002	<0.0002	<0.2	<0.0002	<0.0002	<0.0002	<0.0002	<0.0005	<0.0002	<0.2	<1	<0.0005	<0.5	<0.0005	<0.0005	<0.2	<0.0005	<0.5	<0.0005	<0.5	<0.2	**0.3**

Table 1 - Soil Analytical Results

						Biological	Halogenated Benzenes	Asbestos							
				Sum of PFAS	Sum of US EPA PFAS (PFOS + PFOA)*	Coliform	Hexachlorobenzene	Organic Fibre	Synthetic Mineral Fibre	Sample Weight	Description	Approved Identifier	Asbestos fibres	Asbestos (Trace)	Asbestos Type
				mg/kg	µg/kg	-	µg/kg	g/kg	g/kg	g	-	-	-	Fibres	Comment
EQL				0.0001	0.1	10	50	0.1	0.1	0.01			0.1	5	
PFAS NEMP 2020 Table 2 Industrial/ commercial (HIL D)															
PFAS NEMP 2020 Table 3 Ecological direct exposure															
PFAS NEMP 2020 Table 3 Ecological indirect exposure															
NEPM 2013 Table 1A(1) HIL D Soil							**80,000**								
NEPM 2013 Table 1A(3) HSL D Sand for Vapour Intrusion															
>=0m, <1m															
>=1m, <2m															
>=2m, <4m															
>=4m															
NEPM 2013 Table 1B(1-5) EIL Comm Ind Default (Aged)															
NEPM 2013 Table 1B(6) ESL, Coarse Soil, Commercial/Industrial															
EPA (2000), Table 3-5, Biosolids Stabilisation Grade A Microbiological Standards						**1500**									
Location Code	**Field ID**	**Date**	**Lab Report Number**												
BH02	BH02_0.05	26/08/2021	276682	-	-	-	-	-	-	-	-	-	-	-	-
BH02	BH02_0.5	26/08/2021	276682	-	-	-	-	-	-	-	-	-	-	-	-
BH03	BH03_0.05	26/08/2021	276682	-	-	-	-	-	-	-	-	-	-	-	-
BH03	BH03_0.9	26/08/2021	276682	-	-	-	-	-	-	-	-	-	-	-	-
BH04	BH04_0.50	31/08/2021	277534	-	-	-	-	-	-	-	-	-	-	-	-
BH04	BH04_1.0	31/08/2021	277534	-	-	-	-	-	-	-	-	-	-	-	-
BH04	BH04_2.0	31/08/2021	ES2132166	-	-	-	<50	**0**[#12]	**0**[#12]	**185**	**1**[#13]	**1**[#14]	**0**[#12]	**0**[#12]	**1**[#15]
BH04	BH04_2.0	31/08/2021	ES2132166	-	-	<12	-	-	-	-	-	-	-	-	-
BH04	BH04_4.0	31/08/2021	ES2132166	-	-	-	<50	**0**[#12]	**0**[#12]	**171**	**1**[#13]	**1**[#14]	**0**[#12]	**0**[#12]	**1**[#15]
BH04	BH04_4.0	31/08/2021	ES2132166	-	-	**35**	-	-	-	-	-	-	-	-	-
BH05	BH05_0.05	1/09/2021	ES2132166	-	-	-	-	-	-	-	-	-	-	-	-
BH05	BH05_5.0	1/09/2021	ES2132166	-	-	-	-	-	-	-	-	-	-	-	-
BH06	BH06_0.05	2/09/2021	ES2132166	-	-	-	<50	**0**[#12]	**0**[#12]	**89.6**	**1**[#13]	**1**[#14]	**0**[#12]	**0**[#12]	**1**[#15]
BH06	BH06_0.05	2/09/2021	ES2132166	-	-	**>31,000**	-	-	-	-	-	-	-	-	-
BH06	BH06_0.82	2/09/2021	ES2132166	-	-	-	<50	**0**[#12]	**0**[#12]	**145**	**1**[#13]	**1**[#14]	**0**[#12]	**0**[#12]	**1**[#15]
BH06	BH06_0.82	2/09/2021	ES2132166	-	-	<11	-	-	-	-	-	-	-	-	-
BH07	BH07_0.05	7/09/2021	ES2132601	-	-	**1,800**	<50	**0**[#12]	**0**[#12]	**171**	**1**[#13]	**1**[#14]	**0**[#12]	**0**[#12]	**1**[#15]
BH07	BH07_0.5	7/09/2021	ES2132601	-	-	<12	<50	**0**[#12]	**0**[#12]	**126**	**1**[#13]	**1**[#14]	**0**[#12]	**0**[#12]	**1**[#15]
BH08	BH08_0.05	16/09/2021	ES2133844	-	-	-	<50	**0**[#12]	**0**[#12]	**121**	**1**[#13]	**1**[#14]	**0**[#12]	**0**[#12]	**1**[#15]
BH08	BH08_0.5	16/09/2021	ES2133844	-	-	**33**	<50	**0**[#12]	**0**[#12]	**110**	**1**[#13]	**1**[#14]	**0**[#12]	**0**[#12]	**1**[#15]
BH10	BH10_0.05	16/09/2021	ES2133844	-	-	-	-	-	-	-	-	-	-	-	-
BH10	BH10_1.0	16/09/2021	ES2133844	-	-	-	-	-	-	-	-	-	-	-	-
BH11	BH11_0.05	2/09/2021	ES2132166	-	-	-	-	-	-	-	-	-	-	-	-
BH11	BH11_0.5	2/09/2021	ES2132166	-	-	-	-	-	-	-	-	-	-	-	-
BH11	BH11_0.05	2/09/2021	ES2134640	-	-	-	-	-	-	-	-	-	-	-	-
BH11	BH11_0.5	2/09/2021	ES2134640	-	-	-	-	-	-	-	-	-	-	-	-
BH13	BH13_0.05	15/09/2021	ES2133844	-	-	**590**	<50	**0**[#12]	**0**[#12]	**80.3**	**1**[#13]	**1**[#14]	**0**[#12]	**0**[#12]	**1**[#15]
BH13	BH13_0.5	15/09/2021	ES2133844	-	-	<11	<50	**0**[#12]	**0**[#12]	**111**	**1**[#13]	**1**[#14]	**0**[#12]	**0**[#12]	**1**[#15]
BH14	BH14_0.5	26/08/2021	276682	-	-	-	<100	-	-	-	-	-	**0**	-	-
BH14	BH14_1.5	26/08/2021	276682	-	-	-	<100	-	-	-	-	-	**0**	-	-
BH15	BH15_0.05	8/09/2021	ES2132601	-	-	**>34,000**	<50	**0**[#12]	**0**[#12]	**132**	**1**[#13]	**1**[#14]	**0**[#12]	**0**[#12]	**1**[#15]
BH15	BH15_2.0	8/09/2021	ES2132601	-	-	<11	<50	-	-	-	-	-	-	-	-
BH16	BH16_0.05	13/09/2021	ES2133844	-	-	-	<50	**0**[#12]	**0**[#12]	**98.8**	**1**[#13]	**1**[#14]	**0**[#12]	**0**[#12]	**1**[#15]
BH16	BH16_1.5	13/09/2021	ES2133844	-	-	-	<50	**0**[#12]	**0**[#12]	**105**	**1**[#13]	**1**[#14]	**0**[#12]	**0**[#12]	**1**[#15]
BH16	SS16_0.05	17/09/2021	ES2133844	-	-	-	-	-	-	-	-	-	-	-	-
BH17	BH17-0.05	9/09/2021	ES2132942	-	-	-	-	-	-	-	-	-	-	-	-
BH17	BH17-6.0	10/09/2021	ES2132942	-	-	-	-	-	-	-	-	-	-	-	-
SS01	SS01_0.05	24/08/2021	276682	-	-	-	-	-	-	-	-	-	-	-	-
SS02	SS02_0.05	24/08/2021	276682	-	-	-	-	-	-	-	-	-	-	-	-
SS03a	SS03a_0.10	24/08/2021	276682	-	-	-	<100	-	-	-	-	-	**0**	-	-
SS03a	SS03a_0.10	24/08/2021	276682	-	-	-	-	-	-	-	-	-	-	-	-
SS03b	SS03b_0.10	27/08/2021	276682	-	-	-	<100	-	-	-	-	-	**0**	-	-
SS04	SS04_0.05	24/08/2021	276682	-	-	-	-	-	-	-	-	-	-	-	-
SS05	SS05_0.05	26/08/2021	276682	-	-	-	<100	-	-	-	-	-	**0**	-	-
SS06	SS06_0.05	17/09/2021	ES2133844	-	-	-	<50	**0**[#12]	**0**[#12]	**98.1**	**1**[#13]	**1**[#14]	**0**[#12]	**0**[#12]	**1**[#15]
SS07	SS07_0.05	17/09/2021	ES2133844	**0.0006**	-	-	-	-	-	-	-	-	-	-	-
SS08	SS08_0.05	17/09/2021	ES2133844	<0.0002	-	-	-	-	-	-	-	-	-	-	-
SS09	SS09_0.05	17/09/2021	ES2133844	**0.0003**	-	-	-	-	-	-	-	-	-	-	-

Table 1 - Soil Analytical Results

				Biological		Polycyclic aromatic hydrocarbons (PAHs)																						Metals					
				E.coli by MPN	Total Coliforms by MF	Benzo(a)pyrene TEQ calc (zero)	Benzo(a)pyrene TEQ calc(half)	Benzo(a)pyrene TEQ calc(PQL)	Benzo[b+j]fluoranthene	Acenaphthene	Acenaphthylene	Anthracene	Benz(a)anthracene	Benzo(a) pyrene	Benzo(b+j) & Benzo(k)fluoranthene	Benzo(g,h,i)perylene	Benzo(k)fluoranthene	Chrysene	Dibenz(a,h)anthracene	Fluoranthene	Fluorene	Indeno(1,2,3-c,d)pyrene	Naphthalene	Phenanthrene	Pyrene	PAHs (Sum of total)	Total +ve PAHs	Arsenic	Cadmium	Chromium (III+VI)	Copper	Lead	Mercury
				MPN/g	MPN/100g	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg
EQL				10		0.5	0.5	0.5	0.5	0.1	0.1	0.1	0.1	0.05	0.2	0.1	0.5	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.5	0.05	4	0.4	1	1	1	0.1
PFAS NEMP 2020 Table 2 Industrial/ commercial (HIL D)																																	
PFAS NEMP 2020 Table 3 Ecological direct exposure																																	
PFAS NEMP 2020 Table 3 Ecological indirect exposure																																	
NEPM 2013 Table 1A(1) HIL D Soil								**40**																		**4,000[#1]**		**3,000[#2]**	**900**	**3600**	**240,000**	**1,500[#3]**	**730[#4]**
NEPM 2013 Table 1A(3) HSL D Sand for Vapour Intrusion																																	
>=0m, <1m																							**NL**										
>=1m, <2m																							**NL**										
>=2m, <4m																							**NL**										
>=4m																							**NL**										
NEPM 2013 Table 1B(1-5) EIL Comm Ind Default (Aged)																							370[#7]					160[#7]			280[#8]	1,800[#9]	
NEPM 2013 Table 1B(6) ESL, Coarse Soil, Commercial/Industrial														1.4																			
SS10	SS10_0.05	25/08/2021	276682	-	-	<0.5	<0.5	<0.5	-	<0.1	<0.1	<0.1	**0.2**	**0.2**	<0.2	<0.1	-	**0.2**	<0.1	**0.2**	<0.1	<0.1	<0.1	<0.1	**0.3**	-	**1.2**	**4**	<0.4	**12**	**6**	**15**	<0.1
SS11	SS11_0.05	24/08/2021	276682	-	-	<0.5	<0.5	<0.5	-	<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	-	<0.05	<4	<0.4	**20**	**17**	**18**	<0.1
SS12	SS12_0.05	24/08/2021	276682	-	-	<0.5	<0.5	**0.5**	-	<0.1	<0.1	<0.1	**0.2**	**0.3**	**0.6**	**0.3**	-	**0.2**	<0.1	**0.5**	<0.1	**0.2**	<0.1	**0.2**	**0.5**	-	**3.2**	<4	<0.4	**12**	**13**	**18**	<0.1
SS13	SS13_0.05	6/09/2021	ES2132601	<12	-	<0.5	**0.6**	**1.2**	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	-	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	-	<5	<1	**4**	<5	**5**	<0.1
SS14	SS14_0.05	24/08/2021	276682	-	-	<0.5	<0.5	<0.5	-	<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	-	**0.05**	**5**	<0.4	**14**	**10**	**20**	<0.1
SS15	SS15_0.05	26/08/2021	276682	-	-	<0.5	<0.5	<0.5	-	<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	-	**0.1**	<4	<0.4	**4**	**12**	**25**	<0.1
SS17a	SS17a_0.10	25/08/2021	276682	-	-	<0.5	<0.5	<0.5	-	<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	-	<0.05	**6**	<0.4	**7**	**20**	**20**	<0.1
SS17b	SS176_0.10	30/08/2021	ES2132166	-	-	<0.5	**0.6**	**1.2**	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	-	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	-	<5	<1	**7**	**21**	**24**	<0.1
SS18	SS18_0.05	24/08/2021	276682	-	-	<0.5	<0.5	<0.5	-	<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	-	<0.05	<4	<0.4	**1**	**3**	**8**	<0.1
SS20	SS20_0.05	17/09/2021	ES2133844	-	-	<0.5	**0.6**	**1.2**	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	-	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	-	<5	<1	**8**	<5	**20**	<0.1
SS22	SS22_0.05	15/09/2021	ES2133844	-	-	<0.5	**0.6**	**1.2**	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	-	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	-	**7**	<1	**12**	**11**	**12**	<0.1
SS23	SS23_0.05	24/08/2021	276682	-	-	<0.5	<0.5	<0.5	-	<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	-	<0.05	**6**	<0.4	**10**	**13**	**17**	<0.1
SS24	SS24_0.05	7/09/2021	ES2132601	-	-	<0.5	**0.6**	**1.2**	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	-	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	-	**8**	<1	**14**	**7**	**26**	<0.1
SS24	SS24_0.10	7/09/2021	ES2132601	-	-	<0.5	**0.6**	**1.2**	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	-	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	-	**8**	<1	**12**	**7**	**21**	<0.1
SS25	SS25_0.10	24/08/2021	276682	-	-	<0.5	<0.5	<0.5	-	<0.1	<0.1	**0.1**	**0.3**	**0.2**	**0.3**	<0.1	-	**0.2**	<0.1	**0.5**	<0.1	**0.1**	<0.1	**0.3**	**0.4**	-	**2.5**	**10**	<0.4	**16**	**17**	**20**	<0.1
SS26	SS26_0.05	7/09/2021	ES2132601	-	-	<0.5	**0.6**	**1.2**	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	-	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	-	**13**	<1	**16**	**9**	**15**	<0.1
SS27	SS27_0.05	27/08/2021	276682	-	-	<0.5	<0.5	<0.5	-	<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	-	<0.05	<4	<0.4	**22**	**26**	**16**	<0.1
SS28	SS28_0.05	27/08/2021	276682	-	-	<0.5	<0.5	<0.5	-	<0.1	<0.1	<0.1	<0.1	**0.08**	**0.3**	**0.1**	-	**0.1**	<0.1	<0.1	<0.1	**0.1**	<0.1	<0.1	<0.1	-	**0.74**	<4	<0.4	**9**	**12**	**5**	<0.1
SS29	SS29_0.05	17/09/2021	ES2133844	-	-	<0.5	**0.6**	**1.2**	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	-	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	-	**6**	<1	**9**	**15**	**19**	<0.1

Comments

#1 Total PAHs: Based on sum of 16 most common reported (WHO 98). HIL application should consider presence of carcinogenic PAHs (should meet BaP TEQ HIL) & napthalene (should meet relevant HSL)
#2 Arsenic: HIL assumes 70% oral bioavailability. Site-specific bioavailability maybe important and should be considered where appropriate (refer Shedule B7).
#3 Lead: HILs A,B,C based on blood lead models (IEUBK & HIL D on adult lead model for where 50% bioavailability considered. Site-specific bioavailability should be considered where appropriate.
#4 Elemental mercury: HIL does not address elemental mercury. a site specific assessment should be considered if elemental mercury is present, or suspected to be present.
#5 Derived soil HSL exceeds soil saturation concentration
#6 To obtain F1 subtract the sum of BTEX concentrations from the C6 - C10 fraction.
#7 Refer Table 1B(5)
#8 Assumed pH=6, refer Table 1B(2)
#9 Refer Table 1B(4)
#10 Assumed CEC=20cmol/kg, refer Table 1B(3)
#11 Assumed CEC=20cmol/kg and pH=6.5, refer Table 1B(1)
#12 No
#13 Soil sample.
#14 A. SMYLIE
#15 -

Environmental Standards

HEPA, January 2020, PFAS NEMP 2020 Table 2 Industrial/ commercial (HIL D)
HEPA, January 2020, PFAS NEMP 2020 Table 3 Ecological direct exposure
HEPA, January 2020, PFAS NEMP 2020 Table 3 Ecological indirect exposure
NEPM, April 2013, NEPM 2013 Table 1A(1) HIL D Soil
NEPM, April 2013, NEPM 2013 Table 1A(3) HSL D Sand for Vapour Intrusion
NEPM, April 2013, NEPM 2013 Table 1B(1-5) EIL Comm Ind Default (Aged)
NEPM, April 2013, NEPM 2013 Table 1B(6) ESL, Coarse Soil, Commercial/Industrial

				Nickel	Zinc
				mg/kg	mg/kg
EQL				1	1
PFAS NEMP 2020 Table 2 Industrial/ commercial (HIL D)					
PFAS NEMP 2020 Table 3 Ecological direct exposure					
PFAS NEMP 2020 Table 3 Ecological indirect exposure					
NEPM 2013 Table 1A(1) HIL D Soil				**6,000**	**400,000**
NEPM 2013 Table 1A(3) HSL D Sand for Vapour Intrusion					
>=0m, <1m					
>=1m, <2m					
>=2m, <4m					
>=4m					
NEPM 2013 Table 1B(1-5) EIL Comm Ind Default (Aged)				460[#10]	920[#11]
NEPM 2013 Table 1B(6) ESL, Coarse Soil, Commercial/Industrial					
SS10	SS10_0.05	25/08/2021	276682	**3**	**15**
SS11	SS11_0.05	24/08/2021	276682	**3**	**22**
SS12	SS12_0.05	24/08/2021	276682	**10**	**45**
SS13	SS13_0.05	6/09/2021	ES2132601	<2	<5
SS14	SS14_0.05	24/08/2021	276682	**5**	**39**
SS15	SS15_0.05	26/08/2021	276682	**2**	**69**
SS17a	SS17a_0.10	25/08/2021	276682	**6**	**38**
SS17b	SS176_0.10	30/08/2021	ES2132166	**8**	**54**
SS18	SS18_0.05	24/08/2021	276682	**1**	**49**
SS20	SS20_0.05	17/09/2021	ES2133844	**2**	**27**
SS22	SS22_0.05	15/09/2021	ES2133844	**11**	**22**
SS23	SS23_0.05	24/08/2021	276682	**9**	**45**
SS24	SS24_0.05	7/09/2021	ES2132601	**6**	**25**
SS24	SS24_0.10	7/09/2021	ES2132601	**6**	**26**
SS25	SS25_0.10	24/08/2021	276682	**13**	**54**
SS26	SS26_0.05	7/09/2021	ES2132601	**8**	**26**
SS27	SS27_0.05	27/08/2021	276682	**28**	**140**
SS28	SS28_0.05	27/08/2021	276682	**10**	**23**
SS29	SS29_0.05	17/09/2021	ES2133844	**3**	**26**

Comments

#1 Total PAHs: Based on sum of 16 most common reported (WHO 98). HIL application s
#2 Arsenic: HIL assumes 70% oral bioavailability. Site-specific bioavailability maybe imp
#3 Lead: HILs A,B,C based on blood lead models (IEUBK & HIL D on adult lead model for
#4 Elemental mercury: HIL does not address elemental mercury. a site specific assessme
#5 Derived soil HSL exceeds soil saturation concentration
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#7 Refer Table 1B(5)
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#12 No
#13 Soil sample.
#14 A. SMYLIE
#15 -

Environmental Standards

HEPA, January 2020, PFAS NEMP 2020 Table 2 Industrial/ commercial (HIL D)
HEPA, January 2020, PFAS NEMP 2020 Table 3 Ecological direct exposure
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NEPM, April 2013, NEPM 2013 Table 1A(1) HIL D Soil
NEPM, April 2013, NEPM 2013 Table 1A(3) HSL D Sand for Vapour Intrusion
NEPM, April 2013, NEPM 2013 Table 1B(1-5) EIL Comm Ind Default (Aged)
NEPM, April 2013, NEPM 2013 Table 1B(6) ESL, Coarse Soil, Commercial/Industrial

Table 1 - Soil Analytical Results

				Inorganics						TRH - NEPM 2013 Fractions							TPH - NEPM 1999 Fractions					BTEXN						
				Moisture Content	Nitrite + Nitrate as N (soluble)	Cyanide Total	Kjeldahl Nitrogen Total	Nitrogen (Total)	Phosphorus	TRH >C6 - C10	TRH >C10 - C16	TRH >C16 - C34	TRH >C34 - C40	TRH >C10 - C40 (Sum of total)	TRH >C6 - C10 less BTEX (F1)	TRH >C10 - C16 less Naphthalene (F2)	TPH C6 - C9	TPH C10 - C14	TPH C15 - C28	TPH C29-C36	TPH C10 - C36 (Sum of total)	Benzene	Ethylbenzene	Toluene	Total BTEX	Xylene (m & p)	Xylene (o)	Xylene 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	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg
EQL				0.1	0.1	1	20	20	2	10	50	100	100	50	10	50	10	50	100	100	50	0.2	0.5	0.5	0.2	0.5	0.5	0.5
PFAS NEMP 2020 Table 2 Industrial/ commercial (HIL D)																												
PFAS NEMP 2020 Table 3 Ecological direct exposure																												
PFAS NEMP 2020 Table 3 Ecological indirect exposure																												
NEPM 2013 Table 1A(1) HIL D Soil						**1500**																						
NEPM 2013 Table 1A(3) HSL D Sand for Vapour Intrusion																							**NL**	**NL**				**230[#5]**
>=0m, <1m															**260[#6]**	**NL**						**3**	**NL**	**NL**				**230**
>=1m, <2m															**370**	**NL**						**3**	**NL**	**NL**				**NL**
>=2m, <4m															**630**	**NL**						**3**	**NL**	**NL**				**NL**
>=4m															**NL**	**NL**						**3**	**NL**	**NL**				**NL**
NEPM 2013 Table 1B(1-5) EIL Comm Ind Default (Aged)																												
NEPM 2013 Table 1B(6) ESL, Coarse Soil, Commercial/Industrial												1,700	3,300		215	170						75	165	135				180
SS10	SS10_0.05	25/08/2021	276682	**16**	-	-	-	-	-	<25	<50	**110**	<100	**110**	<25	<50	<25	<50	<100	<100	<50	<0.2	<1	<0.5	-	<2	<1	<3
SS11	SS11_0.05	24/08/2021	276682	**22**	-	-	-	-	-	<25	<50	<100	<100	<50	<25	<50	<25	<50	<100	<100	<50	<0.2	<1	<0.5	-	<2	<1	<3
SS12	SS12_0.05	24/08/2021	276682	**17**	-	-	-	-	-	<25	<50	**160**	<100	**160**	<25	<50	<25	<50	<100	**130**	**130**	<0.2	<1	<0.5	-	<2	<1	<3
SS13	SS13_0.05	6/09/2021	ES2132601	**14.9**	-	-	-	-	-	<10	<50	<100	<100	<50	<10	<50	<10	<50	<100	<100	<50	<0.2	<0.5	<0.5	<0.2	<0.5	<0.5	<0.5
SS14	SS14_0.05	24/08/2021	276682	**20**	-	-	-	-	-	<25	<50	<100	<100	<50	<25	<50	<25	<50	<100	<100	<50	<0.2	<1	<0.5	-	<2	<1	<3
SS15	SS15_0.05	26/08/2021	276682	**23**	-	-	-	-	-	<25	<50	**130**	<100	**130**	<25	<50	<25	<50	<100	<100	<50	<0.2	<1	<0.5	-	<2	<1	<3
SS17a	SS17a_0.10	25/08/2021	276682	**15**	-	-	-	-	-	<25	<50	**160**	**180**	**340**	<25	<50	<25	<50	<100	**150**	**150**	<0.2	<1	<0.5	-	<2	<1	<3
SS17b	SS176_0.10	30/08/2021	ES2132166	**15.9**	-	-	-	-	-	<10	<50	<100	<100	<50	<10	<50	<10	<50	<100	<100	<50	<0.2	<0.5	<0.5	<0.2	<0.5	<0.5	<0.5
SS18	SS18_0.05	24/08/2021	276682	**9.7**	-	-	-	-	-	<25	<50	<100	<100	<50	<25	<50	<25	<50	<100	<100	<50	<0.2	<1	<0.5	-	<2	<1	<3
SS20	SS20_0.05	17/09/2021	ES2133844	**6.4**	-	-	-	-	-	<10	<50	<100	<100	<50	<10	<50	<10	<50	<100	<100	<50	<0.2	<0.5	<0.5	<0.2	<0.5	<0.5	<0.5
SS22	SS22_0.05	15/09/2021	ES2133844	**17.1**	-	-	-	-	-	<10	<50	<100	<100	<50	<10	<50	<10	<50	<100	<100	<50	<0.2	<0.5	<0.5	<0.2	<0.5	<0.5	<0.5
SS23	SS23_0.05	24/08/2021	276682	**23**	-	-	-	-	-	<25	<50	**110**	<100	**110**	<25	<50	<25	<50	<100	<100	<50	<0.2	<1	<0.5	-	<2	<1	<3
SS24	SS24_0.05	7/09/2021	ES2132601	**12.1**	-	-	-	-	-	<10	<50	<100	<100	<50	<10	<50	<10	<50	<100	<100	<50	<0.2	<0.5	<0.5	<0.2	<0.5	<0.5	<0.5
SS24	SS24_0.10	7/09/2021	ES2132601	**10.6**	-	-	-	-	-	<10	<50	<100	<100	<50	<10	<50	<10	<50	<100	<100	<50	<0.2	<0.5	<0.5	<0.2	<0.5	<0.5	<0.5
SS25	SS25_0.10	24/08/2021	276682	**49**	-	-	-	-	-	<25	<50	**360**	**160**	**520**	<25	<50	<25	<50	**190**	**250**	**440**	<0.2	<1	<0.5	-	<2	<1	<3
SS26	SS26_0.05	7/09/2021	ES2132601	**17.8**	-	-	-	-	-	<10	<50	<100	<100	<50	<10	<50	<10	<50	<100	<100	<50	<0.2	<0.5	<0.5	<0.2	<0.5	<0.5	<0.5
SS27	SS27_0.05	27/08/2021	276682	**18**	-	-	-	-	-	<25	<50	**490**	**320**	**810**	<25	<50	<25	<50	**170**	**480**	**650**	<0.2	<1	<0.5	-	<2	<1	<3
SS28	SS28_0.05	27/08/2021	276682	**2.7**	-	-	-	-	-	<25	<50	<100	<100	<50	<25	<50	<25	<50	<100	<100	<50	<0.2	<1	<0.5	-	<2	<1	<3
SS29	SS29_0.05	17/09/2021	ES2133844	**19.6**	-	-	-	-	-	<10	<50	<100	<100	<50	<10	<50	<10	<50	<100	<100	<50	<0.2	<0.5	<0.5	<0.2	<0.5	<0.5	<0.5

Comments
#1 Total PAHs: Based on sum of 16 most common reported (WHO 98). HIL application s
#2 Arsenic: HIL assumes 70% oral bioavailability. Site-specific bioavailability maybe imp
#3 Lead: HILs A,B,C based on blood lead models (IEUBK & HIL D on adult lead model for
#4 Elemental mercury: HIL does not address elemental mercury. a site specific assessme
#5 Derived soil HSL exceeds soil saturation concentration
#6 To obtain F1 subtract the sum of BTEX concentrations from the C6 - C10 fraction.
#7 Refer Table 1B(5)
#8 Assumed pH=6, refer Table 1B(2)
#9 Refer Table 1B(4)
#10 Assumed CEC=20cmol/kg, refer Table 1B(3)
#11 Assumed CEC=20cmol/kg and pH=6.5, refer Table 1B(1)
#12 No
#13 Soil sample.
#14 A. SMYLIE
#15 -

Environmental Standards
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NEPM, April 2013, NEPM 2013 Table 1B(6) ESL, Coarse Soil, Commercial/Industrial

Table 1 - Soil Analytical Results

				Organochlorine Pesticides (OCPs)																							
				4,4-DDE	a-BHC	Aldrin	Aldrin + Dieldrin	b-BHC	Chlordane	Chlordane (cis)	Chlordane (trans)	d-BHC	DDD	DDT	DDT+DDE+DDD	Dieldrin	Endosulfan	Endosulfan I	Endosulfan II	Endosulfan sulfate	Endrin	Endrin aldehyde	Endrin ketone	g-BHC (Lindane)	Heptachlor	Heptachlor epoxide	Methoxychlor
				mg/kg	µg/kg	mg/kg	mg/kg	µg/kg	µg/kg	µg/kg	µg/kg	µg/kg	µg/kg	µg/kg	µg/kg	mg/kg	µg/kg	µg/kg	µg/kg	µg/kg	µg/kg	µg/kg	µg/kg	µg/kg	µg/kg	µg/kg	mg/kg
EQL				0.05	50	0.05	0.05	50	50	50	50	50	50	100	50	0.05	50	50	50	50	50	50	50	50	50	50	0.1
PFAS NEMP 2020 Table 2 Industrial/ commercial (HIL D)																											
PFAS NEMP 2020 Table 3 Ecological direct exposure																											
PFAS NEMP 2020 Table 3 Ecological indirect exposure																											
NEPM 2013 Table 1A(1) HIL D Soil							**45**		**530,000**						**3,600,000**		**2,000,000**				**100,000**				**50,000**		**2,500**
NEPM 2013 Table 1A(3) HSL D Sand for Vapour Intrusion																											
>=0m, <1m																											
>=1m, <2m																											
>=2m, <4m																											
>=4m																											
NEPM 2013 Table 1B(1-5) EIL Comm Ind Default (Aged)														640,000[#7]													
NEPM 2013 Table 1B(6) ESL, Coarse Soil, Commercial/Industrial																											
SS10	SS10_0.05	25/08/2021	276682	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
SS11	SS11_0.05	24/08/2021	276682	<0.1	<100	<0.1	-	<100	-	<100	<100	<100	<100	<100	<100	<0.1	-	<100	<100	<100	<100	<100	-	<100	<100	<100	<0.1
SS12	SS12_0.05	24/08/2021	276682	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
SS13	SS13_0.05	6/09/2021	ES2132601	<0.05	<50	<0.05	<0.05	<50	<50	<50	<50	<50	<50	<200	<50	<0.05	<50	<50	<50	<50	<50	<50	<50	<50	<50	<50	<0.2
SS14	SS14_0.05	24/08/2021	276682	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
SS15	SS15_0.05	26/08/2021	276682	<0.1	<100	<0.1	-	<100	-	<100	<100	<100	<100	<100	<100	<0.1	-	<100	<100	<100	<100	<100	-	<100	<100	<100	<0.1
SS17a	SS17a_0.10	25/08/2021	276682	<0.1	<100	<0.1	-	<100	-	<100	<100	<100	<100	<100	<100	<0.1	-	<100	<100	<100	<100	<100	-	<100	<100	<100	<0.1
SS17b	SS176_0.10	30/08/2021	ES2132166	<0.05	<50	<0.05	<0.05	<50	<50	<50	<50	<50	<50	<200	<50	<0.05	<50	<50	<50	<50	<50	<50	<50	<50	<50	<50	<0.2
SS18	SS18_0.05	24/08/2021	276682	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
SS20	SS20_0.05	17/09/2021	ES2133844	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
SS22	SS22_0.05	15/09/2021	ES2133844	<0.05	<50	<0.05	<0.05	<50	<50	<50	<50	<50	<50	<200	<50	<0.05	<50	<50	<50	<50	<50	<50	<50	<50	<50	<50	<0.2
SS23	SS23_0.05	24/08/2021	276682	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
SS24	SS24_0.05	7/09/2021	ES2132601	<0.05	<50	<0.05	<0.05	<50	<50	<50	<50	<50	<50	<200	<50	<0.05	<50	<50	<50	<50	<50	<50	<50	<50	<50	<50	<0.2
SS24	SS24_0.10	7/09/2021	ES2132601	<0.05	<50	<0.05	<0.05	<50	<50	<50	<50	<50	<50	<200	<50	<0.05	<50	<50	<50	<50	<50	<50	<50	<50	<50	<50	<0.2
SS25	SS25_0.10	24/08/2021	276682	<0.1	<100	<0.1	-	<100	-	<100	<100	<100	<100	<100	<100	<0.1	-	<100	<100	<100	<100	<100	-	<100	<100	<100	<0.1
SS26	SS26_0.05	7/09/2021	ES2132601	<0.05	<50	<0.05	<0.05	<50	<50	<50	<50	<50	<50	<200	<50	<0.05	<50	<50	<50	<50	<50	<50	<50	<50	<50	<50	<0.2
SS27	SS27_0.05	27/08/2021	276682	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
SS28	SS28_0.05	27/08/2021	276682	<0.1	<100	<0.1	-	<100	-	<100	<100	<100	<100	<100	<100	<0.1	-	<100	<100	<100	<100	<100	-	<100	<100	<100	<0.1
SS29	SS29_0.05	17/09/2021	ES2133844	<0.05	<50	<0.05	<0.05	<50	<50	<50	<50	<50	<50	<200	<50	<0.05	<50	<50	<50	<50	<50	<50	<50	<50	<50	<50	<0.2

Comments

#1 Total PAHs: Based on sum of 16 most common reported (WHO 98). HIL application s
#2 Arsenic: HIL assumes 70% oral bioavailability. Site-specific bioavailability maybe imp
#3 Lead: HILs A,B,C based on blood lead models (IEUBK & HIL D on adult lead model for
#4 Elemental mercury: HIL does not address elemental mercury. a site specific assessme
#5 Derived soil HSL exceeds soil saturation concentration
#6 To obtain F1 subtract the sum of BTEX concentrations from the C6 - C10 fraction.
#7 Refer Table 1B(5)
#8 Assumed pH=6, refer Table 1B(2)
#9 Refer Table 1B(4)
#10 Assumed CEC=20cmol/kg, refer Table 1B(3)
#11 Assumed CEC=20cmol/kg and pH=6.5, refer Table 1B(1)
#12 No
#13 Soil sample.
#14 A. SMYLIE
#15 -

Environmental Standards

HEPA, January 2020, PFAS NEMP 2020 Table 2 Industrial/ commercial (HIL D)
HEPA, January 2020, PFAS NEMP 2020 Table 3 Ecological direct exposure
HEPA, January 2020, PFAS NEMP 2020 Table 3 Ecological indirect exposure
NEPM, April 2013, NEPM 2013 Table 1A(1) HIL D Soil
NEPM, April 2013, NEPM 2013 Table 1A(3) HSL D Sand for Vapour Intrusion
NEPM, April 2013, NEPM 2013 Table 1B(1-5) EIL Comm Ind Default (Aged)
NEPM, April 2013, NEPM 2013 Table 1B(6) ESL, Coarse Soil, Commercial/Industrial

Table 1 - Soil Analytical Results

				Organophosphorous Pesticides (OPPs)																					Semi Volatile Organic Compounds (SVOCs)
				Azinophos methyl	Bromophos-ethyl	Carbophenothion	Chlorfenvinphos	Chlorpyrifos	Chlorpyrifos-methyl	Demeton-S-methyl	Diazinon	Dichlorvos	Dimethoate	Ethion	Fenamiphos	Fenitrothion	Fenthion	Malathion	Methyl parathion	Monocrotophos	Parathion	Pirimphos-ethyl	Prothiofos	Ronnel	Formaldehyde
				mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg
EQL				0.05	0.05	0.05	0.05	0.05	0.05	0.05	0.05	0.05	0.05	0.05	0.05	0.1	0.05	0.05	0.2	0.2	0.1	0.05	0.05	0.1	2
PFAS NEMP 2020 Table 2 Industrial/ commercial (HIL D)																									
PFAS NEMP 2020 Table 3 Ecological direct exposure																									
PFAS NEMP 2020 Table 3 Ecological indirect exposure																									
NEPM 2013 Table 1A(1) HIL D Soil								**2,000**																	
NEPM 2013 Table 1A(3) HSL D Sand for Vapour Intrusion																									
>=0m, <1m																									
>=1m, <2m																									
>=2m, <4m																									
>=4m																									
NEPM 2013 Table 1B(1-5) EIL Comm Ind Default (Aged)																									
NEPM 2013 Table 1B(6) ESL, Coarse Soil, Commercial/Industrial																									
SS10	SS10_0.05	25/08/2021	276682	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
SS11	SS11_0.05	24/08/2021	276682	<0.1	<0.1	-	-	<0.1	<0.1	-	<0.1	<0.1	<0.1	<0.1	-	<0.1	-	<0.1	-	-	<0.1	-	-	<0.1	-
SS12	SS12_0.05	24/08/2021	276682	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
SS13	SS13_0.05	6/09/2021	ES2132601	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	-	<0.05	<0.05	<0.2	<0.2	<0.2	<0.05	<0.05	-	-
SS14	SS14_0.05	24/08/2021	276682	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
SS15	SS15_0.05	26/08/2021	276682	<0.1	<0.1	-	-	<0.1	<0.1	-	<0.1	<0.1	<0.1	<0.1	-	<0.1	-	<0.1	-	-	<0.1	-	-	<0.1	-
SS17a	SS17a_0.10	25/08/2021	276682	<0.1	<0.1	-	-	<0.1	<0.1	-	<0.1	<0.1	<0.1	<0.1	-	<0.1	-	<0.1	-	-	<0.1	-	-	<0.1	-
SS17b	SS176_0.10	30/08/2021	ES2132166	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	-	<0.05	<0.05	<0.2	<0.2	<0.2	<0.05	<0.05	-	-
SS18	SS18_0.05	24/08/2021	276682	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
SS20	SS20_0.05	17/09/2021	ES2133844	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
SS22	SS22_0.05	15/09/2021	ES2133844	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	-	<0.05	<0.05	<0.2	<0.2	<0.2	<0.05	<0.05	-	-
SS23	SS23_0.05	24/08/2021	276682	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
SS24	SS24_0.05	7/09/2021	ES2132601	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	-	<0.05	<0.05	<0.2	<0.2	<0.2	<0.05	<0.05	-	-
SS24	SS24_0.10	7/09/2021	ES2132601	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	-	<0.05	<0.05	<0.2	<0.2	<0.2	<0.05	<0.05	-	-
SS25	SS25_0.10	24/08/2021	276682	<0.1	<0.1	-	-	<0.1	<0.1	-	**0.1**	<0.1	<0.1	<0.1	-	<0.1	-	<0.1	-	-	<0.1	-	-	<0.1	-
SS26	SS26_0.05	7/09/2021	ES2132601	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	-	<0.05	<0.05	<0.2	<0.2	<0.2	<0.05	<0.05	-	-
SS27	SS27_0.05	27/08/2021	276682	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
SS28	SS28_0.05	27/08/2021	276682	<0.1	<0.1	-	-	<0.1	<0.1	-	<0.1	<0.1	<0.1	<0.1	-	<0.1	-	<0.1	-	-	<0.1	-	-	<0.1	-
SS29	SS29_0.05	17/09/2021	ES2133844	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	-	<0.05	<0.05	<0.2	<0.2	<0.2	<0.05	<0.05	-	-

Comments

#1 Total PAHs: Based on sum of 16 most common reported (WHO 98). HIL application s
#2 Arsenic: HIL assumes 70% oral bioavailability. Site-specific bioavailability maybe imp
#3 Lead: HILs A,B,C based on blood lead models (IEUBK & HIL D on adult lead model for
#4 Elemental mercury: HIL does not address elemental mercury. a site specific assessme
#5 Derived soil HSL exceeds soil saturation concentration
#6 To obtain F1 subtract the sum of BTEX concentrations from the C6 - C10 fraction.
#7 Refer Table 1B(5)
#8 Assumed pH=6, refer Table 1B(2)
#9 Refer Table 1B(4)
#10 Assumed CEC=20cmol/kg, refer Table 1B(3)
#11 Assumed CEC=20cmol/kg and pH=6.5, refer Table 1B(1)
#12 No
#13 Soil sample.
#14 A. SMYLIE
#15 -

Environmental Standards

HEPA, January 2020, PFAS NEMP 2020 Table 2 Industrial/ commercial (HIL D)
HEPA, January 2020, PFAS NEMP 2020 Table 3 Ecological direct exposure
HEPA, January 2020, PFAS NEMP 2020 Table 3 Ecological indirect exposure
NEPM, April 2013, NEPM 2013 Table 1A(1) HIL D Soil
NEPM, April 2013, NEPM 2013 Table 1A(3) HSL D Sand for Vapour Intrusion
NEPM, April 2013, NEPM 2013 Table 1B(1-5) EIL Comm Ind Default (Aged)
NEPM, April 2013, NEPM 2013 Table 1B(6) ESL, Coarse Soil, Commercial/Industrial

Table 1 - Soil Analytical Results

				Per- and Poly-fluoroalkyl Substances (PFAS)													
				Perfluorooctanesulfonic acid (PFOS)	Perfluorooctanoic acid (PFOA)	Perfluorooctanesulfonamide (PFOSA)	Perfluoropentane sulfonic acid (PFPeS)	Perfluoro-n-pentanoic acid (PFPeA)	Perfluorononanoic acid (PFNA)	Perfluorohexanoic acid (PFHxA)	Perfluorohexanesulfonic acid (PFHxS)	Perfluoroheptanoic acid (PFHpA)	Perfluorododecanoic acid (PFDoA)	Perfluorodecanoic acid (PFDA)	Perfluoroheptane sulfonic acid (PFHpS)	Perfluorobutanesulfonic acid (PFBS)	Perfluorodecanesulfonic acid (PFDS)
				mg/kg	mg/kg	mg/kg	µg/kg	µg/kg	mg/kg	µg/kg	mg/kg	mg/kg	µg/kg	mg/kg	mg/kg	mg/kg	mg/kg
EQL				0.0001	0.0001	0.0002	0.1	0.2	0.0001	0.1	0.0001	0.0001	0.2	0.0002	0.0001	0.0001	0.0002
PFAS NEMP 2020 Table 2 Industrial/ commercial (HIL D)					50												
PFAS NEMP 2020 Table 3 Ecological direct exposure				1	10												
PFAS NEMP 2020 Table 3 Ecological indirect exposure				0.01													
NEPM 2013 Table 1A(1) HIL D Soil																	
NEPM 2013 Table 1A(3) HSL D Sand for Vapour Intrusion																	
>=0m, <1m																	
>=1m, <2m																	
>=2m, <4m																	
>=4m																	
NEPM 2013 Table 1B(1-5) EIL Comm Ind Default (Aged)																	
NEPM 2013 Table 1B(6) ESL, Coarse Soil, Commercial/Industrial																	
SS10	SS10_0.05	25/08/2021	276682	<0.0001	<0.0001	<0.001	<0.1	<0.2	<0.0001	<0.1	<0.0001	<0.0001	<0.5	<0.0005	<0.0001	<0.0001	<0.0002
SS11	SS11_0.05	24/08/2021	276682	-	-	-	-	-	-	-	-	-	-	-	-	-	-
SS12	SS12_0.05	24/08/2021	276682	-	-	-	-	-	-	-	-	-	-	-	-	-	-
SS13	SS13_0.05	6/09/2021	ES2132601	-	-	-	-	-	-	-	-	-	-	-	-	-	-
SS14	SS14_0.05	24/08/2021	276682	-	-	-	-	-	-	-	-	-	-	-	-	-	-
SS15	SS15_0.05	26/08/2021	276682	-	-	-	-	-	-	-	-	-	-	-	-	-	-
SS17a	SS17a_0.10	25/08/2021	276682	-	-	-	-	-	-	-	-	-	-	-	-	-	-
SS17b	SS176_0.10	30/08/2021	ES2132166	-	-	-	-	-	-	-	-	-	-	-	-	-	-
SS18	SS18_0.05	24/08/2021	276682	-	-	-	-	-	-	-	-	-	-	-	-	-	-
SS20	SS20_0.05	17/09/2021	ES2133844	-	-	-	-	-	-	-	-	-	-	-	-	-	-
SS22	SS22_0.05	15/09/2021	ES2133844	-	-	-	-	-	-	-	-	-	-	-	-	-	-
SS23	SS23_0.05	24/08/2021	276682	-	-	-	-	-	-	-	-	-	-	-	-	-	-
SS24	SS24_0.05	7/09/2021	ES2132601	-	-	-	-	-	-	-	-	-	-	-	-	-	-
SS24	SS24_0.10	7/09/2021	ES2132601	-	-	-	-	-	-	-	-	-	-	-	-	-	-
SS25	SS25_0.10	24/08/2021	276682	-	-	-	-	-	-	-	-	-	-	-	-	-	-
SS26	SS26_0.05	7/09/2021	ES2132601	-	-	-	-	-	-	-	-	-	-	-	-	-	-
SS27	SS27_0.05	27/08/2021	276682	-	-	-	-	-	-	-	-	-	-	-	-	-	-
SS28	SS28_0.05	27/08/2021	276682	-	-	-	-	-	-	-	-	-	-	-	-	-	-
SS29	SS29_0.05	17/09/2021	ES2133844	-	-	-	-	-	-	-	-	-	-	-	-	-	-

				Per- and Poly-fluoroalkyl Substances (PFAS)														
				Perfluorotetradecanoic aicd (PFTeDA)	Perfluorotridecanoic acid (PFTrDA)	Perfluoroundecanoic acid (PFUnA)	Perfluorobutanoic acid (PFBA)	1H.1H.2H.2H-perfluorohexanesulfonic acid (4:2 FTS)	1H.1H.2H.2H-perfluorooctanesulfonic acid (6:2 FTS)	1H.1H.2H.2H-perfluorodecanesulfonic acid (8:2 FTS)	1H.1H.2H.2H-perfluorododecanesulfonic acid (10:2)	N-ethyl perfluorooctane sulfonamido acetic acid	N-ethyl perfluorooctane sulfonamide	N-methyl perfluorooctanesulfonamido ethanol	N-ethyl perfluorooctanesulfonamido ethanol	N-Methyl perfluorooctane sulfonamide	N-methyl perfluorooctane sulfonamido acetic acid	Sum (PFHxS + PFOS)
				mg/kg	mg/kg	µg/kg	µg/kg	mg/kg	µg/kg	mg/kg	mg/kg	µg/kg	mg/kg	µg/kg	mg/kg	µg/kg	µg/kg	µg/kg
EQL				0.0005	0.0002	0.2	0.2	0.0001	0.1	0.0002	0.0002	0.2	0.0005	0.5	0.0005	0.5	0.2	0.1
PFAS NEMP 2020 Table 2 Industrial/ commercial (HIL D)																		20,000
PFAS NEMP 2020 Table 3 Ecological direct exposure																		
PFAS NEMP 2020 Table 3 Ecological indirect exposure																		
NEPM 2013 Table 1A(1) HIL D Soil																		
NEPM 2013 Table 1A(3) HSL D Sand for Vapour Intrusion																		
>=0m, <1m																		
>=1m, <2m																		
>=2m, <4m																		
>=4m																		
NEPM 2013 Table 1B(1-5) EIL Comm Ind Default (Aged)																		
NEPM 2013 Table 1B(6) ESL, Coarse Soil, Commercial/Industrial																		
SS10	SS10_0.05	25/08/2021	276682	<0.005	<0.0005	<0.5	<0.2	<0.0001	<0.1	<0.0002	<0.0002	<0.2	<0.001	<1	<0.005	<1	<0.2	<0.1
SS11	SS11_0.05	24/08/2021	276682	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
SS12	SS12_0.05	24/08/2021	276682	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
SS13	SS13_0.05	6/09/2021	ES2132601	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
SS14	SS14_0.05	24/08/2021	276682	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
SS15	SS15_0.05	26/08/2021	276682	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
SS17a	SS17a_0.10	25/08/2021	276682	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
SS17b	SS176_0.10	30/08/2021	ES2132166	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
SS18	SS18_0.05	24/08/2021	276682	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
SS20	SS20_0.05	17/09/2021	ES2133844	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
SS22	SS22_0.05	15/09/2021	ES2133844	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
SS23	SS23_0.05	24/08/2021	276682	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
SS24	SS24_0.05	7/09/2021	ES2132601	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
SS24	SS24_0.10	7/09/2021	ES2132601	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
SS25	SS25_0.10	24/08/2021	276682	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
SS26	SS26_0.05	7/09/2021	ES2132601	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
SS27	SS27_0.05	27/08/2021	276682	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
SS28	SS28_0.05	27/08/2021	276682	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
SS29	SS29_0.05	17/09/2021	ES2133844	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-

Comments

#1 Total PAHs: Based on sum of 16 most common reported (WHO 98). HIL application s
#2 Arsenic: HIL assumes 70% oral bioavailability. Site-specific bioavailability maybe imp
#3 Lead: HILs A,B,C based on blood lead models (IEUBK & HIL D on adult lead model for
#4 Elemental mercury: HIL does not address elemental mercury. a site specific assessme
#5 Derived soil HSL exceeds soil saturation concentration
#6 To obtain F1 subtract the sum of BTEX concentrations from the C6 - C10 fraction.
#7 Refer Table 1B(5)
#8 Assumed pH=6, refer Table 1B(2)
#9 Refer Table 1B(4)
#10 Assumed CEC=20cmol/kg, refer Table 1B(3)
#11 Assumed CEC=20cmol/kg and pH=6.5, refer Table 1B(1)
#12 No
#13 Soil sample.
#14 A. SMYLIE
#15 -

Environmental Standards

HEPA, January 2020, PFAS NEMP 2020 Table 2 Industrial/ commercial (HIL D)
HEPA, January 2020, PFAS NEMP 2020 Table 3 Ecological direct exposure
HEPA, January 2020, PFAS NEMP 2020 Table 3 Ecological indirect exposure
NEPM, April 2013, NEPM 2013 Table 1A(1) HIL D Soil
NEPM, April 2013, NEPM 2013 Table 1A(3) HSL D Sand for Vapour Intrusion
NEPM, April 2013, NEPM 2013 Table 1B(1-5) EIL Comm Ind Default (Aged)
NEPM, April 2013, NEPM 2013 Table 1B(6) ESL, Coarse Soil, Commercial/Industrial

Table 1 - Soil Analytical Results

						Biological	Halogenated Benzenes	Asbestos							
				Sum of PFAS	Sum of US EPA PFAS (PFOS + PFOA)*	Coliform	Hexachlorobenzene	Organic Fibre	Synthetic Mineral Fibre	Sample Weight	Description	Approved Identifier	Asbestos fibres	Asbestos (Trace)	Asbestos Type
				mg/kg	µg/kg	-	µg/kg	g/kg	g/kg	g	-	-	-	Fibres	Comment
EQL				0.0001	0.1	10	50	0.1	0.1	0.01			0.1	5	
PFAS NEMP 2020 Table 2 Industrial/ commercial (HIL D)															
PFAS NEMP 2020 Table 3 Ecological direct exposure															
PFAS NEMP 2020 Table 3 Ecological indirect exposure															
NEPM 2013 Table 1A(1) HIL D Soil							**80,000**								
NEPM 2013 Table 1A(3) HSL D Sand for Vapour Intrusion															
>=0m, <1m															
>=1m, <2m															
>=2m, <4m															
>=4m															
NEPM 2013 Table 1B(1-5) EIL Comm Ind Default (Aged)															
NEPM 2013 Table 1B(6) ESL, Coarse Soil, Commercial/Industrial															
SS10	SS10_0.05	25/08/2021	276682	<0.0001	<0.1	-	-	-	-	-	-	-	-	-	-
SS11	SS11_0.05	24/08/2021	276682	-	-	-	<100	-	-	-	-	-	**0**	-	-
SS12	SS12_0.05	24/08/2021	276682	-	-	-	-	-	-	-	-	-	-	-	-
SS13	SS13_0.05	6/09/2021	ES2132601	-	-	**2,900**	<50	**0**[#12]	**0**[#12]	**113**	**1**[#13]	**1**[#14]	**0**[#12]	**0**[#12]	**1**[#15]
SS14	SS14_0.05	24/08/2021	276682	-	-	-	-	-	-	-	-	-	-	-	-
SS15	SS15_0.05	26/08/2021	276682	-	-	-	<100	-	-	-	-	-	**0**	-	-
SS17a	SS17a_0.10	25/08/2021	276682	-	-	-	<100	-	-	-	-	-	**0**	-	-
SS17b	SS176_0.10	30/08/2021	ES2132166	-	-	-	<50	**0**[#12]	**0**[#12]	**220**	**1**[#13]	**1**[#14]	**0**[#12]	**0**[#12]	**1**[#15]
SS18	SS18_0.05	24/08/2021	276682	-	-	-	-	-	-	-	-	-	-	-	-
SS20	SS20_0.05	17/09/2021	ES2133844	-	-	-	-	-	-	-	-	-	-	-	-
SS22	SS22_0.05	15/09/2021	ES2133844	-	-	**14,000**	<50	**0**[#12]	**0**[#12]	**95.7**	**1**[#13]	**1**[#14]	**0**[#12]	**0**[#12]	**1**[#15]
SS23	SS23_0.05	24/08/2021	276682	-	-	-	-	-	-	-	-	-	-	-	-
SS24	SS24_0.05	7/09/2021	ES2132601	-	-	-	<50	**0**[#12]	**0**[#12]	**162**	**1**[#13]	**1**[#14]	**0**[#12]	**0**[#12]	**1**[#15]
SS24	SS24_0.10	7/09/2021	ES2132601	-	-	-	<50	**0**[#12]	**0**[#12]	**146**	**1**[#13]	**1**[#14]	**0**[#12]	**0**[#12]	**1**[#15]
SS25	SS25_0.10	24/08/2021	276682	-	-	-	<100	-	-	-	-	-	**0**	-	-
SS26	SS26_0.05	7/09/2021	ES2132601	-	-	-	<50	**0**[#12]	**0**[#12]	**111**	**1**[#13]	**1**[#14]	**0**[#12]	**0**[#12]	**1**[#15]
SS27	SS27_0.05	27/08/2021	276682	-	-	-	-	-	-	-	-	-	-	-	-
SS28	SS28_0.05	27/08/2021	276682	-	-	-	<100	-	-	-	-	-	**0**	-	-
SS29	SS29_0.05	17/09/2021	ES2133844	-	-	-	<50	**0**[#12]	**0**[#12]	**90.6**	**1**[#13]	**1**[#14]	**0**[#12]	**0**[#12]	**1**[#15]

Comments

#1 Total PAHs: Based on sum of 16 most common reported (WHO 98). HIL application s
#2 Arsenic: HIL assumes 70% oral bioavailability. Site-specific bioavailability maybe imp
#3 Lead: HILs A,B,C based on blood lead models (IEUBK & HIL D on adult lead model for
#4 Elemental mercury: HIL does not address elemental mercury. a site specific assessme
#5 Derived soil HSL exceeds soil saturation concentration
#6 To obtain F1 subtract the sum of BTEX concentrations from the C6 - C10 fraction.
#7 Refer Table 1B(5)
#8 Assumed pH=6, refer Table 1B(2)
#9 Refer Table 1B(4)
#10 Assumed CEC=20cmol/kg, refer Table 1B(3)
#11 Assumed CEC=20cmol/kg and pH=6.5, refer Table 1B(1)
#12 No
#13 Soil sample.
#14 A. SMYLIE
#15 -

Environmental Standards

HEPA, January 2020, PFAS NEMP 2020 Table 2 Industrial/ commercial (HIL D)
HEPA, January 2020, PFAS NEMP 2020 Table 3 Ecological direct exposure
HEPA, January 2020, PFAS NEMP 2020 Table 3 Ecological indirect exposure
NEPM, April 2013, NEPM 2013 Table 1A(1) HIL D Soil
NEPM, April 2013, NEPM 2013 Table 1A(3) HSL D Sand for Vapour Intrusion
NEPM, April 2013, NEPM 2013 Table 1B(1-5) EIL Comm Ind Default (Aged)
NEPM, April 2013, NEPM 2013 Table 1B(6) ESL, Coarse Soil, Commercial/Industrial

Table 2 - Groundwater Analytical Results

				Polycyclic aromatic hydrocarbons (PAHs)																		Metals							
				Benzo(a)pyrene TEQ calc (zero)	Benzo[b+j]fluoranthene	Acenaphthene	Acenaphthylene	Anthracene	Benz(a)anthracene	Benzo(a) pyrene	Benzo(g,h,i)perylene	Benzo(k)fluoranthene	Chrysene	Dibenz(a,h)anthracene	Fluoranthene	Fluorene	Indeno(1,2,3-c,d)pyrene	Naphthalene	Phenanthrene	Pyrene	PAHs (Sum of total)	Arsenic (filtered)	Cadmium (filtered)	Chromium (III+VI) (filtered)	Copper (filtered)	Lead (filtered)	Mercury (filtered)	Nickel (filtered)	Zinc (filtered)
				mg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L
EQL				0.0005	1	1	1	1	1	0.5	1	1	1	1	1	1	1	1	1	1	0.5	1	0.1	1	1	1	0.1	1	5
ADWG 2018 Health										**0.01**											**0.01**	**10**	**2**		**2,000**	**10**	**1**	**20**	
Recreational Water (ADWG 2018 Health multiplied by a factor of 10)										**0.1**												**100**	**20**		**20,000**	**100**	**10**	**200**	
NEPM 2013 Table 1A(4) HSL D GW, Sand for Vapour Intrusion																													
NEPM 2013 Table 1C GILs, Drinking Water										**0.01**												**10**	**$2^{\#5}$**		**$2,000^{\#5}$**	**$10^{\#5}$**	**1**	**$20^{\#5}$**	
NEPM 2013 Table 1C GILs, Fresh Waters																		**16**					**$0.2^{\#5}$**		**$1.4^{\#5}$**	**$3.4^{\#5}$**	**$0.06^{\#6}$**	**$11^{\#5}$**	**$8^{\#5}$**
ANZG (2018) Freshwater (unknown reliability) toxicant DGVs								0.1		0.1					1				0.6										
ANZG (2018) Freshwater 99% toxicant DGVs																		$2.5^{\#9}$							$1^{\#10}$	$1^{\#11}$	$0.06^{\#9}$	$8^{\#9}$	$2.4^{\#12}$
ANZG (2018) Freshwater 95% toxicant DGVs																		$16^{\#9}$					$0.2^{\#10}$		$1.4^{\#10}$	$3.4^{\#11}$	$0.6^{\#9}$	$11^{\#9}$	$8^{\#12}$
ANZECC & ARMCANZ (2000) – Recreational water guidelines																								50					5000
Location Code	**Field ID**	**Date**	**Lab Report Number**																										
BH04	GW02	21/09/2021	ES2134103	<0.0005	<1.0	<1.0	<1.0	<1.0	<1.0	<0.5	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<0.5	<1	<0.1	<1	<1	<1	<0.1	**19**	**57**
BH05	GW03	20/09/2021	ES2134103	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	<1	**0.3**	<1	<1	<1	<0.1	**83**	**229**
BH11	GW05	20/09/2021	ES2134103	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	<1	**0.1**	<1	**4**	<1	<0.1	**6**	**8**
BH13	GW06	21/09/2021	ES2134103	<0.0005	<1.0	<1.0	<1.0	<1.0	<1.0	<0.5	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<0.5	<1	<0.1	<1	<1	<1	<0.1	**2**	<5
BH17	GW07	20/09/2021	ES2134103	<0.0005	<1.0	<1.0	<1.0	<1.0	<1.0	<0.5	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<0.5	<1	<0.1	<1	<1	<1	<0.1	**8**	**33**
GW01	GW01	20/09/2021	ES2134103	<0.0005	<1.0	<1.0	<1.0	<1.0	<1.0	<0.5	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<0.5	<1	**0.2**	<1	<1	<1	<0.1	**9**	**29**

Comments

#1 Converted from Nitrate as NO3 (50 mg/L)
#2 Converted from Nitrite as NO2 (3 mg/L)
#3 To obtain F1 subtract the sum of BTEX concentrations from the C6 - C10 fraction.
#4 To obtain F2 subtract napthalene from the >C10 - C16 fraction.
#5 Values calculated using hardness of 30 mg/L CaCO3. Refer ANZECC & ARMCANZ (2000) for site specific hardness guidance
#6 Chemical for which possible bioaccumulation and secondary poisoning effects should be considered, refer to ANZECC & ARMCANZ (2000) for further guidance.
#7 refer to guideline
#8 Figure may not protect key species from chronic toxicity, refer to ANZECC & ARMCANZ (2000) for further guidance.
#9 Low reliability
#10 Very high reliability
#11 Moderate reliability
#12 High reliability
#13 High reliability. Ammonia as total ammonia, measured as [NH3-N] at pH 8.
#14 High reliability. Ammonia as total ammonia, measured as [NH3-N] at pH 8. DGV may not protect key test species from chronic toxicity (this refers to experimental chronic values or geometric mean for species).
#15 Result value is an approximate.

Environmental Standards

NHMRC, NRMMC, August 2018, ADWG 2018 Health
NHMRC, February 2008, NHMRC Guidelines for Managing Risks in Recreational Water 2008
NEPM, April 2013, NEPM 2013 Table 1A(4) HSL D GW, Sand for Vapour Intrusion
NEPM, April 2013, NEPM 2013 Table 1C GILs, Drinking Water
NEPM, April 2013, NEPM 2013 Table 1C GILs, Fresh Waters
ANZG, 2018, ANZG (2018) Freshwater (unknown reliability) toxicant DGVs
ANZECC & ARMCANZ (2000)

Table 2 - Groundwater Analytical Results

				Inorganics								TRH - NEPM 2013 Fractions							TPH - NEPM 1999 Fractions					BTEXN						
				Ammonia as N	Cyanide Total	Kjeldahl Nitrogen Total	Nitrate & Nitrite (as N)	Nitrate (as N)	Nitrite (as N)	Nitrogen (Total)	Phosphorus	TRH >C6 - C10	TRH >C10 - C16	TRH >C16 - C34	TRH >C34 - C40	TRH >C10 - C40 (Sum of total)	TRH >C6 - C10 less BTEX (F1)	TRH >C10 - C16 less Naphthalene (F2)	TPH C6 - C9	TPH C10 - C14	TPH C15 - C28	TPH C29-C36	TPH C10 - C36 (Sum of total)	Benzene	Ethylbenzene	Toluene	Total BTEX	Xylene (m & p)	Xylene (o)	Xylene Total
				mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	µg/L	mg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	mg/L	µg/L	µg/L	µg/L
EQL				0.01	0.004	0.1	0.01	0.01	0.01	100	0.01	20	100	100	100	100	20	100	20	50	100	50	50	1	2	2	0.001	2	2	2
ADWG 2018 Health					**0.08**			**11.29#1**	**0.91#2**															**1**	**300**	**800**				**600**
Recreational Water (ADWG 2018 Health multiplied by a factor of 10)					**0.8**																			**10**	**3000**	**8000**				**6000**
NEPM 2013 Table 1A(4) HSL D GW, Sand for Vapour Intrusion																	7,000#3	NL						5000						
NEPM 2013 Table 1C GILs, Drinking Water					**0.08**																			**1**	**300**	**800**				**600**
NEPM 2013 Table 1C GILs, Fresh Waters					**0.007**					**250**	**20**													**950**					**350**	
ANZG (2018) Freshwater (unknown reliability) toxicant DGVs																									80	180				
ANZG (2018) Freshwater 99% toxicant DGVs				0.32#13																				600#11					200#9	
ANZG (2018) Freshwater 95% toxicant DGVs				0.9#14																				950#11					350#9	
ANZECC & ARMCANZ (2000) – Recreational water guidelines								10	1																					
Location Code	**Field ID**	**Date**	**Lab Report Number**																											
BH04	GW02	21/09/2021	ES2134103	-	-	-	-	-	-	-	-	<20	<100	<100	<100	<100	<20	<100	<20	<50	<100	<50	<50	<1	<2	<2	<0.001	<2	<2	<2
BH05	GW03	20/09/2021	ES2134103	**0.04**	-	**0.4**	**0.03**	**0.03**	<0.01	**400**	**0.17**	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
BH11	GW05	20/09/2021	ES2134103	-	<0.004	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
BH13	GW06	21/09/2021	ES2134103	-	-	-	-	-	-	-	-	<20	<100	<100	<100	<100	<20	<100	<20	<50	<100	<50	<50	<1	<2	<2	<0.001	<2	<2	<2
BH17	GW07	20/09/2021	ES2134103	-	-	-	-	-	-	-	-	<20	<100	<100	<100	<100	<20	<100	<20	<50	<100	<50	<50	<1	<2	<2	<0.001	<2	<2	<2
GW01	GW01	20/09/2021	ES2134103	-	-	-	-	-	-	-	-	<20	**1,120**	**260**	<100	**1,380**	<20	**1,120**	<20	**1,120**	**240**	<50	**1,360**	<1	<2	<2	<0.001	<2	<2	<2

Comments

#1 Converted from Nitrate as NO3 (50 mg/L)
#2 Converted from Nitrite as NO2 (3 mg/L)
#3 To obtain F1 subtract the sum of BTEX concentrations from the C6 - C1
#4 To obtain F2 subtract napthalene from the >C10 - C16 fraction.
#5 Values calculated using hardness of 30 mg/L CaCO3. Refer ANZECC & AF
#6 Chemical for which possible bioaccumulation and secondary poisoning
#7 refer to guideline
#8 Figure may not protect key species from chronic toxicity, refer to ANZE
#9 Low reliability
#10 Very high reliability
#11 Moderate reliability
#12 High reliability
#13 High reliability. Ammonia as total ammonia, measured as [NH3-N] at p
#14 High reliability. Ammonia as total ammonia, measured as [NH3-N] at p
#15 Result value is an approximate.

Environmental Standards

NHMRC, NRMMC, August 2018, ADWG 2018 Health
NHMRC, February 2008, NHMRC Guidelines for Managing Risks in Recreati
NEPM, April 2013, NEPM 2013 Table 1A(4) HSL D GW, Sand for Vapour Intr
NEPM, April 2013, NEPM 2013 Table 1C GILs, Drinking Water
NEPM, April 2013, NEPM 2013 Table 1C GILs, Fresh Waters
ANZG, 2018, ANZG (2018) Freshwater (unknown reliability) toxicant DGVs
ANZECC & ARMCANZ (2000)

Table 2 - Groundwater Analytical Results

				Organochlorine Pesticides (OCPs)																					
				a-BHC	Aldrin	Aldrin + Dieldrin	b-BHC	Chlordane	Chlordane (cis)	Chlordane (trans)	d-BHC	DDD	DDT	DDT+DDE+DDD	Dieldrin	Endosulfan I	Endosulfan II	Endosulfan sulfate	Endrin	Endrin aldehyde	Endrin ketone	g-BHC (Lindane)	Heptachlor	Heptachlor epoxide	Methoxychlor
				µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L
EQL				0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5	2	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5	2
ADWG 2018 Health						**0.3**		**2**					**9**									**10**	**0.3**		
Recreational Water (ADWG 2018 Health multiplied by a factor of 10)						**3**		**20**					**90**									**20**	**0.3**		**300**
NEPM 2013 Table 1A(4) HSL D GW, Sand for Vapour Intrusion																									
NEPM 2013 Table 1C GILs, Drinking Water						**0.3**		**2**					**9**									**10**		**0.3**	
NEPM 2013 Table 1C GILs, Fresh Waters								**0.03[#6]**					**0.006[#6]**						**0.01[#6]**			**0.2**	**0.01[#6]**		
ANZG (2018) Freshwater (unknown reliability) toxicant DGVs					0.001										0.01										0.005
ANZG (2018) Freshwater 99% toxicant DGVs								0.03[#11]					0.006[#11]						0.01[#11]			0.07[#11]	0.01[#11]		
ANZG (2018) Freshwater 95% toxicant DGVs								0.08[#11]					0.01[#11]						0.02[#11]			0.2[#11]	0.09[#11]		
ANZECC & ARMCANZ (2000) – Recreational water guidelines																									
Location Code	**Field ID**	**Date**	**Lab Report Number**																						
BH04	GW02	21/09/2021	ES2134103	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<2.0	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<2.0
BH05	GW03	20/09/2021	ES2134103	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
BH11	GW05	20/09/2021	ES2134103	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
BH13	GW06	21/09/2021	ES2134103	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<2.0	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<2.0
BH17	GW07	20/09/2021	ES2134103	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
GW01	GW01	20/09/2021	ES2134103	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-

Comments

#1 Converted from Nitrate as NO3 (50 mg/L)
#2 Converted from Nitrite as NO2 (3 mg/L)
#3 To obtain F1 subtract the sum of BTEX concentrations from the C6 - C1
#4 To obtain F2 subtract napthalene from the >C10 - C16 fraction.
#5 Values calculated using hardness of 30 mg/L CaCO3. Refer ANZECC & A
#6 Chemical for which possible bioaccumulation and secondary poisoning
#7 refer to guideline
#8 Figure may not protect key species from chronic toxicity, refer to ANZE
#9 Low reliability
#10 Very high reliability
#11 Moderate reliability
#12 High reliability
#13 High reliability. Ammonia as total ammonia, measured as [NH3-N] at p
#14 High reliability. Ammonia as total ammonia, measured as [NH3-N] at p
#15 Result value is an approximate.

Environmental Standards

NHMRC, NRMMC, August 2018, ADWG 2018 Health
NHMRC, February 2008, NHMRC Guidelines for Managing Risks in Recreati
NEPM, April 2013, NEPM 2013 Table 1A(4) HSL D GW, Sand for Vapour Intr
NEPM, April 2013, NEPM 2013 Table 1C GILs, Drinking Water
NEPM, April 2013, NEPM 2013 Table 1C GILs, Fresh Waters
ANZG, 2018, ANZG (2018) Freshwater (unknown reliability) toxicant DGVs
ANZECC & ARMCANZ (2000)

Table 2 - Groundwater Analytical Results

				Organophosphorous Pesticides (OPPs)																			Semi Volatile Organic Compounds (SVOCs)	Biological	Halogenated Benzenes
				Azinophos methyl	Bromophos-ethyl	Carbophenothion	Chlorfenvinphos	Chlorpyrifos	Chlorpyrifos-methyl	Demeton-S-methyl	Diazinon	Dichlorvos	Dimethoate	Ethion	Fenamiphos	Fenthion	Malathion	Methyl parathion	Monocrotophos	Parathion	Pirimphos-ethyl	Prothiofos	Formaldehyde	Coliform	Hexachlorobenzene
				µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	mg/L	cfu/100 ml	µg/L
EQL				0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5	2	2	2	0.5	0.5	0.1	1	0.5
ADWG 2018 Health				30	10	0.5	2	10			4	5	7	4	0.5	7	70	0.7	2	20	0.5		0.5		
Recreational Water (ADWG 2018 Health multiplied by a factor of 10)				3	10	0.5	5	10			3	1	50	3	0.3			100	1	10	0.5		5		
NEPM 2013 Table 1A(4) HSL D GW, Sand for Vapour Intrusion																									
NEPM 2013 Table 1C GILs, Drinking Water				30			2	10			4	5	7	4	0.5	7	70	0.7		20			0.5		
NEPM 2013 Table 1C GILs, Fresh Waters								0.01[#6]			0.01		0.15				0.05			0.004[#8]					
ANZG (2018) Freshwater (unknown reliability) toxicant DGVs										4															0.05
ANZG (2018) Freshwater 99% toxicant DGVs				0.01[#11]				0.00004[#9]			0.00003[#11]		0.1[#9]				0.002[#11]			0.0007[#11]					
ANZG (2018) Freshwater 95% toxicant DGVs				0.02[#11]				0.01[#9]			0.01[#11]		0.15[#9]				0.05[#11]			0.004[#11]					
ANZECC & ARMCANZ (2000) – Recreational water guidelines																								150	
Location Code	**Field ID**	**Date**	**Lab Report Number**																						
BH04	GW02	21/09/2021	ES2134103	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<2.0	<2.0	<2.0	<0.5	<0.5	-	**100[#15]**	<0.5
BH05	GW03	20/09/2021	ES2134103	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	**2.6**	-	-
BH11	GW05	20/09/2021	ES2134103	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
BH13	GW06	21/09/2021	ES2134103	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<2.0	<2.0	<2.0	<0.5	<0.5	-	**100[#15]**	<0.5
BH17	GW07	20/09/2021	ES2134103	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
GW01	GW01	20/09/2021	ES2134103	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-

Comments

#1 Converted from Nitrate as NO3 (50 mg/L)
#2 Converted from Nitrite as NO2 (3 mg/L)
#3 To obtain F1 subtract the sum of BTEX concentrations from the C6 - C1
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Environmental Standards

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NEPM, April 2013, NEPM 2013 Table 1C GILs, Fresh Waters
ANZG, 2018, ANZG (2018) Freshwater (unknown reliability) toxicant DGVs
ANZECC & ARMCANZ (2000)

Table 3a - Field Duplicate RPDs - Soil

Field ID			RPD	BH03_0.05	QC101_210826	RPD	BH03_0.05	QC201_210826	RPD	BH05_0.05	QC101_210901	RPD	BH05_0.05	QC201_210901	RPD	SS13_0.05	QC101_210906	RPD	SS13_0.05	QC201_210906	RPD	BH08_0.5	QC101_210916	RPD
Sample Type				Normal	Field_D		Normal	Interlab_D		Normal	Field_D		Normal	Interlab_D		Normal	Field_D		Normal	Interlab_D		Normal	Field_D	
Matrix Type				Soil	Soil		Soil	Soil		Soil	Soil		Soil	Soil		Soil	Soil		Soil	Soil		Soil	Soil	
Date				26/08/2021	26/08/2021		26/08/2021	26/08/2021		1/09/2021	1/09/2021		1/09/2021	1/09/2021		6/09/2021	6/09/2021		6/09/2021	6/09/2021		16/09/2021	16/09/2021	
Lab Report Number				276682	276682		276682	820973		ES2132166	ES2132166		ES2132166	822697/824119		ES2132601	ES2132601		ES2132601	824081		ES2133844	ES2133844	
	Unit	EQL																						
NA																								
E.coli by MPN	MPN/g	10	-	-	-	-	-	-	-	-	-	-	-	-	-	<12	<12	0	<12	-	-	-	-	-
Polycyclic aromatic hydrocarbons (PAHs)																								
Benzo(a)pyrene TEQ calc (zero)	mg/kg	0.5	-	<0.5	<0.5	0	<0.5	<0.5	0	-	-	-	-	-	-	<0.5	<0.5	0	<0.5	<0.5	0	<0.5	<0.5	0
Benzo(a)pyrene TEQ calc(half)	mg/kg	0.5	-	<0.5	<0.5	0	<0.5	**0.6**	18	-	-	-	-	-	-	**0.6**	**0.6**	0	**0.6**	**0.6**	0	**0.6**	**0.6**	0
Benzo(a)pyrene TEQ calc(PQL)	mg/kg	0.5	-	<0.5	<0.5	0	<0.5	**1.2**	82	-	-	-	-	-	-	**1.2**	**1.2**	0	**1.2**	**1.2**	0	**1.2**	**1.2**	0
Benzo[b+j]fluoranthene	mg/kg	0.5	-	-	-	-	-	<0.5	-	-	-	-	-	-	-	<0.5	<0.5	0	<0.5	<0.5	0	<0.5	<0.5	0
Acenaphthene	mg/kg	0.1	-	<0.1	<0.1	0	<0.1	<0.5	0	-	-	-	-	-	-	<0.5	<0.5	0	<0.5	<0.5	0	<0.5	<0.5	0
Acenaphthylene	mg/kg	0.1	-	<0.1	<0.1	0	<0.1	<0.5	0	-	-	-	-	-	-	<0.5	<0.5	0	<0.5	<0.5	0	<0.5	<0.5	0
Anthracene	mg/kg	0.1	-	<0.1	<0.1	0	<0.1	<0.5	0	-	-	-	-	-	-	<0.5	<0.5	0	<0.5	<0.5	0	<0.5	<0.5	0
Benz(a)anthracene	mg/kg	0.1	-	<0.1	<0.1	0	<0.1	<0.5	0	-	-	-	-	-	-	<0.5	<0.5	0	<0.5	<0.5	0	<0.5	<0.5	0
Benzo(a) pyrene	mg/kg	0.05	-	<0.05	<0.05	0	<0.05	<0.5	0	-	-	-	-	-	-	<0.5	<0.5	0	<0.5	<0.5	0	<0.5	<0.5	0
Benzo(b+j) & Benzo(k)fluoranthene	mg/kg	0.2	-	<0.2	<0.2	0	<0.2	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Benzo(g,h,i)perylene	mg/kg	0.1	-	<0.1	<0.1	0	<0.1	<0.5	0	-	-	-	-	-	-	<0.5	<0.5	0	<0.5	<0.5	0	<0.5	<0.5	0
Benzo(k)fluoranthene	mg/kg	0.5	-	-	-	-	-	<0.5	-	-	-	-	-	-	-	<0.5	<0.5	0	<0.5	<0.5	0	<0.5	<0.5	0
Chrysene	mg/kg	0.1	-	<0.1	<0.1	0	<0.1	<0.5	0	-	-	-	-	-	-	<0.5	<0.5	0	<0.5	<0.5	0	<0.5	<0.5	0
Dibenz(a,h)anthracene	mg/kg	0.1	-	<0.1	<0.1	0	<0.1	<0.5	0	-	-	-	-	-	-	<0.5	<0.5	0	<0.5	<0.5	0	<0.5	<0.5	0
Fluoranthene	mg/kg	0.1	-	<0.1	<0.1	0	<0.1	<0.5	0	-	-	-	-	-	-	<0.5	<0.5	0	<0.5	<0.5	0	<0.5	<0.5	0
Fluorene	mg/kg	0.1	-	<0.1	<0.1	0	<0.1	<0.5	0	-	-	-	-	-	-	<0.5	<0.5	0	<0.5	<0.5	0	<0.5	<0.5	0
Indeno(1,2,3-c,d)pyrene	mg/kg	0.1	-	<0.1	<0.1	0	<0.1	<0.5	0	-	-	-	-	-	-	<0.5	<0.5	0	<0.5	<0.5	0	<0.5	<0.5	0
Naphthalene	mg/kg	0.1	-	<0.1	<0.1	0	<0.1	<0.5	0	-	-	-	-	-	-	<0.5	<0.5	0	<0.5	<0.5	0	<0.5	<0.5	0
Phenanthrene	mg/kg	0.1	-	<0.1	<0.1	0	<0.1	<0.5	0	-	-	-	-	-	-	<0.5	<0.5	0	<0.5	<0.5	0	<0.5	<0.5	0
Pyrene	mg/kg	0.1	-	<0.1	<0.1	0	<0.1	<0.5	0	-	-	-	-	-	-	<0.5	<0.5	0	<0.5	<0.5	0	<0.5	<0.5	0
PAHs (Sum of total)	mg/kg	0.5	-	-	-	-	-	<0.5	-	-	-	-	-	-	-	<0.5	<0.5	0	<0.5	<0.5	0	<0.5	<0.5	0
Total +ve PAHs	mg/kg	0.05	-	<0.05	<0.05	0	<0.05	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Metals																								
Arsenic	mg/kg	2	29	**11**	**11**	0	**11**	**10**	10	**6**	**6**	0	**6**	**6.1**	2	<5	<5	0	<5	**2.3**	0	<5	<5	0
Cadmium	mg/kg	0.4	0	<0.4	<0.4	0	<0.4	<0.4	0	<1	<1	0	<1	<0.4	0	<1	<1	0	<1	<0.4	0	<1	<1	0
Chromium (III+VI)	mg/kg	1	35	**15**	**15**	0	**15**	**33**	75	**20**	**22**	10	**20**	**25**	22	**4**	**6**	40	**4**	**7.0**	55	**2**	<2	0
Copper	mg/kg	1	30	**22**	**23**	4	**22**	**24**	9	<5	<5	0	<5	<5	0	<5	<5	0	<5	<5	0	<5	<5	0
Lead	mg/kg	1	26	**63**	**58**	8	**63**	**59**	7	**10**	**12**	18	**10**	**15**	40	**5**	**6**	18	**5**	**5.7**	13	<5	<5	0
Mercury	mg/kg	0.1	0	**0.1**	<0.1	0	**0.1**	**0.1**	0	<0.1	<0.1	0	<0.1	<0.1	0	<0.1	<0.1	0	<0.1	<0.1	0	<0.1	<0.1	0
Nickel	mg/kg	1	15	**11**	**10**	10	**11**	**16**	37	<2	<2	0	<2	<5	0	<2	<2	0	<2	<5	0	<2	<2	0
Zinc	mg/kg	1	3	**140**	**150**	7	**140**	**140**	0	**6**	**12**	67	**6**	**13**	74	<5	<5	0	<5	<5	0	<5	<5	0
Inorganics																								
Moisture Content	%	0.1	-	**19**	**20**	5	**19**	-	-	**23.5**	**22.7**	3	**23.5**	-	-	**14.9**	**15.6**	5	**14.9**	-	-	**5.4**	**4.9**	10
Nitrite + Nitrate as N (soluble)	mg/kg	0.1	-	-	-	-	-	-	-	<0.1	**0.2**	67	<0.1	-	-	-	-	-	-	-	-	-	-	-
Kjeldahl Nitrogen Total	mg/kg	10	-	-	-	-	-	-	-	**1,000**	**1,630**	48	**1,000**	**1,500**	40	-	-	-	-	-	-	-	-	-
Moisture Content (dried @ 103°C)	%	1	-	-	-	-	-	**17**	-	-	-	-	-	**24**	-	-	-	-	-	**16**	-	-	-	-
Nitrate & Nitrite (as N)	mg/kg	5	-	-	-	-	-	-	-	-	-	-	-	<5	-	-	-	-	-	-	-	-	-	-
Nitrogen (Total)	mg/kg	10	-	-	-	-	-	-	-	**1,000**	**1,630**	48	**1,000**	**1,500**	40	-	-	-	-	-	-	-	-	-
Phosphorus	mg/kg	2	-	-	-	-	-	-	-	**207**	**223**	7	**207**	**180**	14	-	-	-	-	-	-	-	-	-
TRH - NEPM 2013 Fractions																								
TRH >C6 - C10	mg/kg	10	-	<25	<25	0	<25	<20	0	-	-	-	-	-	-	<10	<10	0	<10	<20	0	<10	<10	0
TRH >C10 - C16	mg/kg	50	-	<50	<50	0	<50	<50	0	-	-	-	-	-	-	<50	<50	0	<50	<50	0	<50	<50	0
TRH >C16 - C34	mg/kg	100	-	<100	**180**	57	<100	**140**	33	-	-	-	-	-	-	<100	<100	0	<100	<100	0	<100	<100	0
TRH >C34 - C40	mg/kg	100	-	<100	**110**	10	<100	<100	0	-	-	-	-	-	-	<100	<100	0	<100	<100	0	<100	<100	0
TRH >C10 - C40 (Sum of total)	mg/kg	50	-	<50	**290**	141	<50	**140**	95	-	-	-	-	-	-	<50	<50	0	<50	<100	0	<50	<50	0
TRH >C6 - C10 less BTEX (F1)	mg/kg	10	-	<25	<25	0	<25	<20	0	-	-	-	-	-	-	<10	<10	0	<10	<20	0	<10	<10	0
TRH >C10 - C16 less Naphthalene (F2)	mg/kg	50	-	<50	<50	0	<50	<50	0	-	-	-	-	-	-	<50	<50	0	<50	<50	0	<50	<50	0
TPH - NEPM 1999 Fractions																								
TPH C6 - C9	mg/kg	10	-	<25	<25	0	<25	<20	0	-	-	-	-	-	-	<10	<10	0	<10	<20	0	<10	<10	0
TPH C10 - C14	mg/kg	20	-	<50	<50	0	<50	<20	0	-	-	-	-	-	-	<50	<50	0	<50	<20	0	<50	<50	0
TPH C15 - C28	mg/kg	50	-	<100	<100	0	<100	<50	0	-	-	-	-	-	-	<100	<100	0	<100	<50	0	<100	<100	0
TPH C29-C36	mg/kg	50	-	<100	**150**	40	<100	**120**	18	-	-	-	-	-	-	<100	<100	0	<100	<50	0	<100	<100	0
TPH C10 - C36 (Sum of total)	mg/kg	50	-	<50	**150**	100	<50	**120**	82	-	-	-	-	-	-	<50	<50	0	<50	<50	0	<50	<50	0
BTEXN																								
Benzene	mg/kg	0.1	-	<0.2	<0.2	0	<0.2	<0.1	0	-	-	-	-	-	-	<0.2	<0.2	0	<0.2	<0.1	0	<0.2	<0.2	0
Ethylbenzene	mg/kg	0.1	-	<1	<1	0	<1	<0.1	0	-	-	-	-	-	-	<0.5	<0.5	0	<0.5	<0.1	0	<0.5	<0.5	0
Toluene	mg/kg	0.1	-	<0.5	<0.5	0	<0.5	<0.1	0	-	-	-	-	-	-	<0.5	<0.5	0	<0.5	<0.1	0	<0.5	<0.5	0
Total BTEX	mg/kg	0.2	-	-	-	-	-	-	-	-	-	-	-	-	-	<0.2	<0.2	0	<0.2	-	-	<0.2	<0.2	0
Xylene (m & p)	mg/kg	0.2	-	<2	<2	0	<2	<0.2	0	-	-	-	-	-	-	<0.5	<0.5	0	<0.5	<0.2	0	<0.5	<0.5	0
Xylene (o)	mg/kg	0.1	-	<1	<1	0	<1	<0.1	0	-	-	-	-	-	-	<0.5	<0.5	0	<0.5	<0.1	0	<0.5	<0.5	0
Xylene Total	mg/kg	0.3	-	<3	<3	0	<3	<0.3	0	-	-	-	-	-	-	<0.5	<0.5	0	<0.5	<0.3	0	<0.5	<0.5	0
Organochlorine Pesticides (OCPs)																								
Organochlorine Pesticides (Lab Reported)	mg/kg	0.1	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	<0.1	-	-	-	-
4,4-DDE	mg/kg	0.05	-	-	-	-	-	-	-	-	-	-	-	-	-	<0.05	<0.05	0	<0.05	<0.05	0	<0.05	<0.05	0
a-BHC	µg/kg	50	-	-	-	-	-	-	-	-	-	-	-	-	-	<50	<50	0	<50	<50	0	<50	<50	0
Aldrin	mg/kg	0.05	-	-	-	-	-	-	-	-	-	-	-	-	-	<0.05	<0.05	0	<0.05	<0.05	0	<0.05	<0.05	0
Aldrin + Dieldrin	mg/kg	0.05	-	-	-	-	-	-	-	-	-	-	-	-	-	<0.05	<0.05	0	<0.05	<0.05	0	<0.05	<0.05	0
b-BHC	µg/kg	50	-	-	-	-	-	-	-	-	-	-	-	-	-	<50	<50	0	<50	<50	0	<50	<50	0

Table 3a - Field Duplicate RPDs - Soil

Field ID			BH08_0.5	QC201_210916	RPD	SS08_0.05	QC101_210917	RPD	SS01_0.05	SS01_0.05 - [TRIPLICATE]	RPD	SS25_0.10	SS25_0.10 - [TRIPLICATE]	RPD	SS17a_0.10	SS17a_0.10 - [TRIPLICATE]	RPD
Sample Type			Normal	Interlab_D		Normal	Field_D		Normal	Field_D		Normal	Field_D		Normal	Field_D	
Matrix Type			Soil	Soil		Soil	Soil		Soil	Soil		Soil	Soil		Soil	Soil	
Date			16/09/2021	16/09/2021		17/09/2021	17/09/2021		24/08/2021	24/08/2021		24/08/2021	24/08/2021		25/08/2021	25/08/2021	
Lab Report Number			ES2133844	826760		ES2133844	ES2133844		276682	276682		276682	276682		276682	276682	
	Unit	EQL															
NA																	
E.coli by MPN	MPN/g	10	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Polycyclic aromatic hydrocarbons (PAHs)																	
Benzo(a)pyrene TEQ calc (zero)	mg/kg	0.5	<0.5	<0.5	0	<0.5	<0.5	0	<0.5	-	-	<0.5	-	-	<0.5	-	-
Benzo(a)pyrene TEQ calc(half)	mg/kg	0.5	**0.6**	**0.6**	0	**0.6**	**0.6**	0	<0.5	-	-	<0.5	-	-	<0.5	-	-
Benzo(a)pyrene TEQ calc(PQL)	mg/kg	0.5	**1.2**	**1.2**	0	**1.2**	**1.2**	0	<0.5	-	-	<0.5	-	-	<0.5	-	-
Benzo[b+j]fluoranthene	mg/kg	0.5	<0.5	<0.5	0	<0.5	<0.5	0	-	-	-	-	-	-	-	-	-
Acenaphthene	mg/kg	0.1	<0.5	<0.5	0	<0.5	<0.5	0	<0.1	-	-	<0.1	-	-	<0.1	-	-
Acenaphthylene	mg/kg	0.1	<0.5	<0.5	0	<0.5	<0.5	0	<0.1	-	-	<0.1	-	-	<0.1	-	-
Anthracene	mg/kg	0.1	<0.5	<0.5	0	<0.5	<0.5	0	<0.1	-	-	**0.1**	-	-	<0.1	-	-
Benz(a)anthracene	mg/kg	0.1	<0.5	<0.5	0	<0.5	<0.5	0	<0.1	-	-	**0.3**	-	-	<0.1	-	-
Benzo(a) pyrene	mg/kg	0.05	<0.5	<0.5	0	<0.5	<0.5	0	**0.1**	-	-	**0.2**	-	-	<0.05	-	-
Benzo(b+j) & Benzo(k)fluoranthene	mg/kg	0.2	-	-	-	-	-	-	**0.3**	-	-	**0.3**	-	-	<0.2	-	-
Benzo(g,h,i)perylene	mg/kg	0.1	<0.5	<0.5	0	<0.5	<0.5	0	**0.1**	-	-	<0.1	-	-	<0.1	-	-
Benzo(k)fluoranthene	mg/kg	0.5	<0.5	<0.5	0	<0.5	<0.5	0	-	-	-	-	-	-	-	-	-
Chrysene	mg/kg	0.1	<0.5	<0.5	0	<0.5	<0.5	0	<0.1	-	-	**0.2**	-	-	<0.1	-	-
Dibenz(a,h)anthracene	mg/kg	0.1	<0.5	<0.5	0	<0.5	<0.5	0	<0.1	-	-	<0.1	-	-	<0.1	-	-
Fluoranthene	mg/kg	0.1	<0.5	<0.5	0	<0.5	<0.5	0	**0.2**	-	-	**0.5**	-	-	<0.1	-	-
Fluorene	mg/kg	0.1	<0.5	<0.5	0	<0.5	<0.5	0	<0.1	-	-	<0.1	-	-	<0.1	-	-
Indeno(1,2,3-c,d)pyrene	mg/kg	0.1	<0.5	<0.5	0	<0.5	<0.5	0	<0.1	-	-	**0.1**	-	-	<0.1	-	-
Naphthalene	mg/kg	0.1	<0.5	<0.5	0	<0.5	<0.5	0	<0.1	-	-	<0.1	-	-	<0.1	-	-
Phenanthrene	mg/kg	0.1	<0.5	<0.5	0	<0.5	<0.5	0	<0.1	-	-	**0.3**	-	-	<0.1	-	-
Pyrene	mg/kg	0.1	<0.5	<0.5	0	<0.5	<0.5	0	**0.2**	-	-	**0.4**	-	-	<0.1	-	-
PAHs (Sum of total)	mg/kg	0.5	<0.5	<0.5	0	<0.5	<0.5	0	-	-	-	-	-	-	-	-	-
Total +ve PAHs	mg/kg	0.05	-	-	-	-	-	-	**0.84**	-	-	**2.5**	-	-	<0.05	-	-
Metals																	
Arsenic	mg/kg	2	<5	<2	0	<5	<5	0	<4	<4	0	**10**	**5**	67	**6**	**8**	29
Cadmium	mg/kg	0.4	<1	<0.4	0	<1	<1	0	<0.4	<0.4	0	<0.4	<0.4	0	<0.4	<0.4	0
Chromium (III+VI)	mg/kg	1	**2**	**9.1**	128	**4**	**7**	55	**6**	**10**	50	**16**	**9**	56	**7**	**10**	35
Copper	mg/kg	1	<5	**5.6**	11	<5	**5**	0	**7**	**14**	67	**17**	**10**	52	**20**	**27**	30
Lead	mg/kg	1	<5	**7.5**	40	<5	**8**	46	**17**	**17**	0	**20**	**18**	11	**20**	**26**	26
Mercury	mg/kg	0.1	<0.1	<0.1	0	<0.1	<0.1	0	<0.1	<0.1	0	<0.1	<0.1	0	<0.1	<0.1	0
Nickel	mg/kg	1	<2	<5	0	**2**	**3**	40	**4**	**9**	77	**13**	**8**	48	**6**	**7**	15
Zinc	mg/kg	1	<5	**35**	150	**31**	**40**	25	**56**	**53**	6	**54**	**29**	60	**38**	**39**	3
Inorganics																	
Moisture Content	%	0.1	**5.4**	-	-	**14.9**	**17.6**	17	**13**	-	-	**49**	-	-	**15**	-	-
Nitrite + Nitrate as N (soluble)	mg/kg	0.1	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Kjeldahl Nitrogen Total	mg/kg	10	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Moisture Content (dried @ 103°C)	%	1	-	**47**	-	-	-	-	-	-	-	-	-	-	-	-	-
Nitrate & Nitrite (as N)	mg/kg	5	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Nitrogen (Total)	mg/kg	10	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Phosphorus	mg/kg	2	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
TRH - NEPM 2013 Fractions																	
TRH >C6 - C10	mg/kg	10	<10	<20	0	<10	<10	0	<25	-	-	<25	-	-	<25	-	-
TRH >C10 - C16	mg/kg	50	<50	<50	0	<50	<50	0	<50	-	-	<50	-	-	<50	-	-
TRH >C16 - C34	mg/kg	100	<100	**120**	18	<100	<100	0	**170**	-	-	**360**	-	-	**160**	-	-
TRH >C34 - C40	mg/kg	100	<100	<100	0	<100	<100	0	**110**	-	-	**160**	-	-	**180**	-	-
TRH >C10 - C40 (Sum of total)	mg/kg	50	<50	**120**	82	<50	<50	0	**280**	-	-	**520**	-	-	**340**	-	-
TRH >C6 - C10 less BTEX (F1)	mg/kg	10	<10	<20	0	<10	<10	0	<25	-	-	<25	-	-	<25	-	-
TRH >C10 - C16 less Naphthalene (F2)	mg/kg	50	<50	<50	0	<50	<50	0	<50	-	-	<50	-	-	<50	-	-
TPH - NEPM 1999 Fractions																	
TPH C6 - C9	mg/kg	10	<10	<20	0	<10	<10	0	<25	-	-	<25	-	-	<25	-	-
TPH C10 - C14	mg/kg	20	<50	<20	0	<50	<50	0	<50	-	-	<50	-	-	<50	-	-
TPH C15 - C28	mg/kg	50	<100	**72**	0	<100	<100	0	<100	-	-	**190**	-	-	<100	-	-
TPH C29-C36	mg/kg	50	<100	**73**	0	<100	<100	0	**140**	-	-	**250**	-	-	**150**	-	-
TPH C10 - C36 (Sum of total)	mg/kg	50	<50	**145**	97	<50	<50	0	**140**	-	-	**440**	-	-	**150**	-	-
BTEXN																	
Benzene	mg/kg	0.1	<0.2	<0.1	0	<0.2	<0.2	0	<0.2	-	-	<0.2	-	-	<0.2	-	-
Ethylbenzene	mg/kg	0.1	<0.5	<0.1	0	<0.5	<0.5	0	<1	-	-	<1	-	-	<1	-	-
Toluene	mg/kg	0.1	<0.5	<0.1	0	<0.5	<0.5	0	<0.5	-	-	<0.5	-	-	<0.5	-	-
Total BTEX	mg/kg	0.2	<0.2	-	-	<0.2	<0.2	0	-	-	-	-	-	-	-	-	-
Xylene (m & p)	mg/kg	0.2	<0.5	<0.2	0	<0.5	<0.5	0	<2	-	-	<2	-	-	<2	-	-
Xylene (o)	mg/kg	0.1	<0.5	<0.1	0	<0.5	<0.5	0	<1	-	-	<1	-	-	<1	-	-
Xylene Total	mg/kg	0.3	<0.5	<0.3	0	<0.5	<0.5	0	<3	-	-	<3	-	-	<3	-	-
Organochlorine Pesticides (OCPs)																	
Organochlorine Pesticides (Lab Reported)	mg/kg	0.1	-	<1	-	-	-	-	-	-	-	-	-	-	-	-	-
4,4-DDE	mg/kg	0.05	<0.05	<0.5	0	-	-	-	-	-	-	<0.1	-	-	<0.1	-	-
a-BHC	µg/kg	50	<50	<500	0	-	-	-	-	-	-	<100	-	-	<100	-	-
Aldrin	mg/kg	0.05	<0.05	<0.5	0	-	-	-	-	-	-	<0.1	-	-	<0.1	-	-
Aldrin + Dieldrin	mg/kg	0.05	<0.05	<0.5	0	-	-	-	-	-	-	-	-	-	-	-	-
b-BHC	µg/kg	50	<50	<500	0	-	-	-	-	-	-	<100	-	-	<100	-	-

Table 3a - Field Duplicate RPDs - Soil

Field ID			RPD	BH03_0.05	QC101_210826	RPD	BH03_0.05	QC201_210826	RPD	BH05_0.05	QC101_210901	RPD	BH05_0.05	QC201_210901	RPD	SS13_0.05	QC101_210906	RPD	SS13_0.05	QC201_210906	RPD	BH08_0.5	QC101_210916	RPD
Sample Type				Normal	Field_D		Normal	Interlab_D		Normal	Field_D		Normal	Interlab_D		Normal	Field_D		Normal	Interlab_D		Normal	Field_D	
Matrix Type				Soil	Soil		Soil	Soil		Soil	Soil		Soil	Soil		Soil	Soil		Soil	Soil		Soil	Soil	
Date				26/08/2021	26/08/2021		26/08/2021	26/08/2021		1/09/2021	1/09/2021		1/09/2021	1/09/2021		6/09/2021	6/09/2021		6/09/2021	6/09/2021		16/09/2021	16/09/2021	
Lab Report Number				276682	276682		276682	820973		ES2132166	ES2132166		ES2132166	822697/824119		ES2132601	ES2132601		ES2132601	824081		ES2133844	ES2133844	
	Unit	EQL																						
NA																								
Chlordane	µg/kg	50	-	-	-	-	-	-	-	-	-	-	-	-	-	<50	<50	0	<50	<100	0	<50	<50	0
Chlordane (cis)	µg/kg	50	-	-	-	-	-	-	-	-	-	-	-	-	-	<50	<50	0	<50	-	-	<50	<50	0
Chlordane (trans)	µg/kg	50	-	-	-	-	-	-	-	-	-	-	-	-	-	<50	<50	0	<50	-	-	<50	<50	0
d-BHC	µg/kg	50	-	-	-	-	-	-	-	-	-	-	-	-	-	<50	<50	0	<50	<50	0	<50	<50	0
DDD	µg/kg	50	-	-	-	-	-	-	-	-	-	-	-	-	-	<50	<50	0	<50	<50	0	<50	<50	0
DDT	µg/kg	50	-	-	-	-	-	-	-	-	-	-	-	-	-	<200	<200	0	<200	<50	0	<200	<200	0
DDT+DDE+DDD	µg/kg	50	-	-	-	-	-	-	-	-	-	-	-	-	-	<50	<50	0	<50	<50	0	<50	<50	0
Dieldrin	mg/kg	0.05	-	-	-	-	-	-	-	-	-	-	-	-	-	<0.05	<0.05	0	<0.05	<0.05	0	<0.05	<0.05	0
Endosulfan	µg/kg	50	-	-	-	-	-	-	-	-	-	-	-	-	-	<50	<50	0	<50	-	-	<50	<50	0
Endosulfan I	µg/kg	50	-	-	-	-	-	-	-	-	-	-	-	-	-	<50	<50	0	<50	<50	0	<50	<50	0
Endosulfan II	µg/kg	50	-	-	-	-	-	-	-	-	-	-	-	-	-	<50	<50	0	<50	<50	0	<50	<50	0
Endosulfan sulfate	µg/kg	50	-	-	-	-	-	-	-	-	-	-	-	-	-	<50	<50	0	<50	<50	0	<50	<50	0
Endrin	µg/kg	50	-	-	-	-	-	-	-	-	-	-	-	-	-	<50	<50	0	<50	<50	0	<50	<50	0
Endrin aldehyde	µg/kg	50	-	-	-	-	-	-	-	-	-	-	-	-	-	<50	<50	0	<50	<50	0	<50	<50	0
Endrin ketone	µg/kg	50	-	-	-	-	-	-	-	-	-	-	-	-	-	<50	<50	0	<50	<50	0	<50	<50	0
g-BHC (Lindane)	µg/kg	50	-	-	-	-	-	-	-	-	-	-	-	-	-	<50	<50	0	<50	<50	0	<50	<50	0
Heptachlor	µg/kg	50	-	-	-	-	-	-	-	-	-	-	-	-	-	<50	<50	0	<50	<50	0	<50	<50	0
Heptachlor epoxide	µg/kg	50	-	-	-	-	-	-	-	-	-	-	-	-	-	<50	<50	0	<50	<50	0	<50	<50	0
Methoxychlor	mg/kg	0.05	-	-	-	-	-	-	-	-	-	-	-	-	-	<0.2	<0.2	0	<0.2	<0.05	0	<0.2	<0.2	0
Toxaphene	mg/kg	0.5	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	<0.5	-	-	-	-
Organophosphorous Pesticides (OPPs)																								
Azinophos methyl	mg/kg	0.05	-	-	-	-	-	-	-	-	-	-	-	-	-	<0.05	<0.05	0	<0.05	<0.2	0	<0.05	<0.05	0
Bolstar (Sulprofos)	mg/kg	0.2	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	<0.2	-	-	-	-
Bromophos-ethyl	mg/kg	0.05	-	-	-	-	-	-	-	-	-	-	-	-	-	<0.05	<0.05	0	<0.05	-	-	<0.05	<0.05	0
Carbophenothion	mg/kg	0.05	-	-	-	-	-	-	-	-	-	-	-	-	-	<0.05	<0.05	0	<0.05	-	-	<0.05	<0.05	0
Chlorfenvinphos	mg/kg	0.05	-	-	-	-	-	-	-	-	-	-	-	-	-	<0.05	<0.05	0	<0.05	<0.2	0	<0.05	<0.05	0
Chlorpyrifos	mg/kg	0.05	-	-	-	-	-	-	-	-	-	-	-	-	-	<0.05	<0.05	0	<0.05	<0.2	0	<0.05	<0.05	0
Chlorpyrifos-methyl	mg/kg	0.05	-	-	-	-	-	-	-	-	-	-	-	-	-	<0.05	<0.05	0	<0.05	<0.2	0	<0.05	<0.05	0
Coumaphos	mg/kg	2	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	<2	-	-	-	-
Demeton-O	mg/kg	0.2	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	<0.2	-	-	-	-
Demeton-S	mg/kg	0.2	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	<0.2	-	-	-	-
Demeton-S-methyl	mg/kg	0.05	-	-	-	-	-	-	-	-	-	-	-	-	-	<0.05	<0.05	0	<0.05	-	-	<0.05	<0.05	0
Diazinon	mg/kg	0.05	-	-	-	-	-	-	-	-	-	-	-	-	-	<0.05	<0.05	0	<0.05	<0.2	0	<0.05	<0.05	0
Dichlorvos	mg/kg	0.05	-	-	-	-	-	-	-	-	-	-	-	-	-	<0.05	<0.05	0	<0.05	<0.2	0	<0.05	<0.05	0
Dimethoate	mg/kg	0.05	-	-	-	-	-	-	-	-	-	-	-	-	-	<0.05	<0.05	0	<0.05	<0.2	0	<0.05	<0.05	0
Disulfoton	mg/kg	0.2	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	<0.2	-	-	-	-
EPN	mg/kg	0.2	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	<0.2	-	-	-	-
Ethion	mg/kg	0.05	-	-	-	-	-	-	-	-	-	-	-	-	-	<0.05	<0.05	0	<0.05	<0.2	0	<0.05	<0.05	0
Ethoprop	mg/kg	0.2	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	<0.2	-	-	-	-
Fenamiphos	mg/kg	0.05	-	-	-	-	-	-	-	-	-	-	-	-	-	<0.05	<0.05	0	<0.05	-	-	<0.05	<0.05	0
Fenitrothion	mg/kg	0.1	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	<0.2	-	-	-	-
Fensulfothion	mg/kg	0.2	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	<0.2	-	-	-	-
Fenthion	mg/kg	0.05	-	-	-	-	-	-	-	-	-	-	-	-	-	<0.05	<0.05	0	<0.05	<0.2	0	<0.05	<0.05	0
Malathion	mg/kg	0.05	-	-	-	-	-	-	-	-	-	-	-	-	-	<0.05	<0.05	0	<0.05	<0.2	0	<0.05	<0.05	0
Merphos	mg/kg	0.2	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	<0.2	-	-	-	-
Methyl parathion	mg/kg	0.2	-	-	-	-	-	-	-	-	-	-	-	-	-	<0.2	<0.2	0	<0.2	<0.2	0	<0.2	<0.2	0
Mevinphos (Phosdrin)	mg/kg	0.2	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	<0.2	-	-	-	-
Monocrotophos	mg/kg	0.2	-	-	-	-	-	-	-	-	-	-	-	-	-	<0.2	<0.2	0	<0.2	<2	0	<0.2	<0.2	0
Naled (Dibrom)	mg/kg	0.2	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	<0.2	-	-	-	-
Omethoate	mg/kg	2	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	<2	-	-	-	-
Parathion	mg/kg	0.1	-	-	-	-	-	-	-	-	-	-	-	-	-	<0.2	<0.2	0	<0.2	<0.2	0	<0.2	<0.2	0
Phorate	mg/kg	0.2	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	<0.2	-	-	-	-
Pirimiphos-methyl	mg/kg	0.2	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	<0.2	-	-	-	-
Pirimphos-ethyl	mg/kg	0.05	-	-	-	-	-	-	-	-	-	-	-	-	-	<0.05	<0.05	0	<0.05	-	-	<0.05	<0.05	0
Prothiofos	mg/kg	0.05	-	-	-	-	-	-	-	-	-	-	-	-	-	<0.05	<0.05	0	<0.05	-	-	<0.05	<0.05	0
Pyrazophos	mg/kg	0.2	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	<0.2	-	-	-	-
Ronnel	mg/kg	0.1	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	<0.2	-	-	-	-
Terbufos	mg/kg	0.2	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	<0.2	-	-	-	-
Tokuthion	mg/kg	0.2	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	<0.2	-	-	-	-
Trichloronate	mg/kg	0.2	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	<0.2	-	-	-	-
Tetrachlorvinphos	mg/kg	0.2	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	<0.2	-	-	-	-
Semi Volatile Organic Compounds (SVOCs)																								
Formaldehyde	mg/kg	2	-	-	-	-	-	-	-	<2	<2	0	<2	<10	0	-	-	-	-	-	-	-	-	-
Per- and Poly-fluoroalkyl Substances (PFAS)																								
Perfluorooctanesulfonic acid (PFOS)	mg/kg	0.0002	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Perfluorooctanoic acid (PFOA)	mg/kg	0.0002	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Perfluorooctanesulfonamide (PFOSA)	mg/kg	0.0002	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Perfluoropentane sulfonic acid (PFPeS)	µg/kg	0.2	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Perfluoro-n-pentanoic acid (PFPeA)	µg/kg	0.2	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Perfluorononanoic acid (PFNA)	mg/kg	0.0002	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Perfluorohexanoic acid (PFHxA)	µg/kg	0.2	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-

Table 3a - Field Duplicate RPDs - Soil

		Field ID	BH08_0.5	QC201_210916	RPD	SS08_0.05	QC101_210917	RPD	SS01_0.05	SS01_0.05 - [TRIPLICATE]	RPD	SS25_0.10	SS25_0.10 - [TRIPLICATE]	RPD	SS17a_0.10	SS17a_0.10 - [TRIPLICATE]	RPD
		Sample Type	Normal	Interlab_D		Normal	Field_D		Normal	Field_D		Normal	Field_D		Normal	Field_D	
		Matrix Type	Soil	Soil		Soil	Soil		Soil	Soil		Soil	Soil		Soil	Soil	
		Date	16/09/2021	16/09/2021		17/09/2021	17/09/2021		24/08/2021	24/08/2021		24/08/2021	24/08/2021		25/08/2021	25/08/2021	
		Lab Report Number	ES2133844	826760		ES2133844	ES2133844		276682	276682		276682	276682		276682	276682	
	Unit	EQL															
NA																	
Chlordane	µg/kg	50	<50	<1,000	0	-	-	-	-	-	-	-	-	-	-	-	-
Chlordane (cis)	µg/kg	50	<50	-	-	-	-	-	-	-	-	<100	-	-	<100	-	-
Chlordane (trans)	µg/kg	50	<50	-	-	-	-	-	-	-	-	<100	-	-	<100	-	-
d-BHC	µg/kg	50	<50	<500	0	-	-	-	-	-	-	<100	-	-	<100	-	-
DDD	µg/kg	50	<50	<500	0	-	-	-	-	-	-	<100	-	-	<100	-	-
DDT	µg/kg	50	<200	<500	0	-	-	-	-	-	-	<100	-	-	<100	-	-
DDT+DDE+DDD	µg/kg	50	<50	<500	0	-	-	-	-	-	-	<100	-	-	<100	-	-
Dieldrin	mg/kg	0.05	<0.05	<0.5	0	-	-	-	-	-	-	<0.1	-	-	<0.1	-	-
Endosulfan	µg/kg	50	<50	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Endosulfan I	µg/kg	50	<50	<500	0	-	-	-	-	-	-	<100	-	-	<100	-	-
Endosulfan II	µg/kg	50	<50	<500	0	-	-	-	-	-	-	<100	-	-	<100	-	-
Endosulfan sulfate	µg/kg	50	<50	<500	0	-	-	-	-	-	-	<100	-	-	<100	-	-
Endrin	µg/kg	50	<50	<500	0	-	-	-	-	-	-	<100	-	-	<100	-	-
Endrin aldehyde	µg/kg	50	<50	<500	0	-	-	-	-	-	-	<100	-	-	<100	-	-
Endrin ketone	µg/kg	50	<50	<500	0	-	-	-	-	-	-	-	-	-	-	-	-
g-BHC (Lindane)	µg/kg	50	<50	<500	0	-	-	-	-	-	-	<100	-	-	<100	-	-
Heptachlor	µg/kg	50	<50	<500	0	-	-	-	-	-	-	<100	-	-	<100	-	-
Heptachlor epoxide	µg/kg	50	<50	<500	0	-	-	-	-	-	-	<100	-	-	<100	-	-
Methoxychlor	mg/kg	0.05	<0.2	<0.5	0	-	-	-	-	-	-	<0.1	-	-	<0.1	-	-
Toxaphene	mg/kg	0.5	-	<10	-	-	-	-	-	-	-	-	-	-	-	-	-
Organophosphorous Pesticides (OPPs)																	
Azinophos methyl	mg/kg	0.05	<0.05	<0.5	0	-	-	-	-	-	-	<0.1	-	-	<0.1	-	-
Bolstar (Sulprofos)	mg/kg	0.2	-	<0.5	-	-	-	-	-	-	-	-	-	-	-	-	-
Bromophos-ethyl	mg/kg	0.05	<0.05	-	-	-	-	-	-	-	-	<0.1	-	-	<0.1	-	-
Carbophenothion	mg/kg	0.05	<0.05	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Chlorfenvinphos	mg/kg	0.05	<0.05	<0.5	0	-	-	-	-	-	-	-	-	-	-	-	-
Chlorpyrifos	mg/kg	0.05	<0.05	<0.5	0	-	-	-	-	-	-	<0.1	-	-	<0.1	-	-
Chlorpyrifos-methyl	mg/kg	0.05	<0.05	<0.5	0	-	-	-	-	-	-	<0.1	-	-	<0.1	-	-
Coumaphos	mg/kg	2	-	<5	-	-	-	-	-	-	-	-	-	-	-	-	-
Demeton-O	mg/kg	0.2	-	<0.5	-	-	-	-	-	-	-	-	-	-	-	-	-
Demeton-S	mg/kg	0.2	-	<0.5	-	-	-	-	-	-	-	-	-	-	-	-	-
Demeton-S-methyl	mg/kg	0.05	<0.05	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Diazinon	mg/kg	0.05	<0.05	<0.5	0	-	-	-	-	-	-	**0.1**	-	-	<0.1	-	-
Dichlorvos	mg/kg	0.05	<0.05	<0.5	0	-	-	-	-	-	-	<0.1	-	-	<0.1	-	-
Dimethoate	mg/kg	0.05	<0.05	<0.5	0	-	-	-	-	-	-	<0.1	-	-	<0.1	-	-
Disulfoton	mg/kg	0.2	-	<0.5	-	-	-	-	-	-	-	-	-	-	-	-	-
EPN	mg/kg	0.2	-	<0.5	-	-	-	-	-	-	-	-	-	-	-	-	-
Ethion	mg/kg	0.05	<0.05	<0.5	0	-	-	-	-	-	-	<0.1	-	-	<0.1	-	-
Ethoprop	mg/kg	0.2	-	<0.5	-	-	-	-	-	-	-	-	-	-	-	-	-
Fenamiphos	mg/kg	0.05	<0.05	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Fenitrothion	mg/kg	0.1	-	<0.5	-	-	-	-	-	-	-	<0.1	-	-	<0.1	-	-
Fensulfothion	mg/kg	0.2	-	<0.5	-	-	-	-	-	-	-	-	-	-	-	-	-
Fenthion	mg/kg	0.05	<0.05	<0.5	0	-	-	-	-	-	-	-	-	-	-	-	-
Malathion	mg/kg	0.05	<0.05	<0.5	0	-	-	-	-	-	-	<0.1	-	-	<0.1	-	-
Merphos	mg/kg	0.2	-	<0.5	-	-	-	-	-	-	-	-	-	-	-	-	-
Methyl parathion	mg/kg	0.2	<0.2	<0.5	0	-	-	-	-	-	-	-	-	-	-	-	-
Mevinphos (Phosdrin)	mg/kg	0.2	-	<0.5	-	-	-	-	-	-	-	-	-	-	-	-	-
Monocrotophos	mg/kg	0.2	<0.2	<5	0	-	-	-	-	-	-	-	-	-	-	-	-
Naled (Dibrom)	mg/kg	0.2	-	<0.5	-	-	-	-	-	-	-	-	-	-	-	-	-
Omethoate	mg/kg	2	-	<5	-	-	-	-	-	-	-	-	-	-	-	-	-
Parathion	mg/kg	0.1	<0.2	<0.5	0	-	-	-	-	-	-	<0.1	-	-	<0.1	-	-
Phorate	mg/kg	0.2	-	<0.5	-	-	-	-	-	-	-	-	-	-	-	-	-
Pirimiphos-methyl	mg/kg	0.2	-	<0.5	-	-	-	-	-	-	-	-	-	-	-	-	-
Pirimphos-ethyl	mg/kg	0.05	<0.05	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Prothiofos	mg/kg	0.05	<0.05	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Pyrazophos	mg/kg	0.2	-	<0.5	-	-	-	-	-	-	-	-	-	-	-	-	-
Ronnel	mg/kg	0.1	-	<0.5	-	-	-	-	-	-	-	<0.1	-	-	<0.1	-	-
Terbufos	mg/kg	0.2	-	<0.5	-	-	-	-	-	-	-	-	-	-	-	-	-
Tokuthion	mg/kg	0.2	-	<0.5	-	-	-	-	-	-	-	-	-	-	-	-	-
Trichloronate	mg/kg	0.2	-	<0.5	-	-	-	-	-	-	-	-	-	-	-	-	-
Tetrachlorvinphos	mg/kg	0.2	-	<0.5	-	-	-	-	-	-	-	-	-	-	-	-	-
Semi Volatile Organic Compounds (SVOCs)																	
Formaldehyde	mg/kg	2	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Per- and Poly-fluoroalkyl Substances (PFAS)																	
Perfluorooctanesulfonic acid (PFOS)	mg/kg	0.0002	-	-	-	<0.0002	<0.0002	0	-	-	-	-	-	-	-	-	-
Perfluorooctanoic acid (PFOA)	mg/kg	0.0002	-	-	-	<0.0002	<0.0002	0	-	-	-	-	-	-	-	-	-
Perfluorooctanesulfonamide (PFOSA)	mg/kg	0.0002	-	-	-	<0.0002	<0.0002	0	-	-	-	-	-	-	-	-	-
Perfluoropentane sulfonic acid (PFPeS)	µg/kg	0.2	-	-	-	<0.2	<0.2	0	-	-	-	-	-	-	-	-	-
Perfluoro-n-pentanoic acid (PFPeA)	µg/kg	0.2	-	-	-	<0.2	<0.2	0	-	-	-	-	-	-	-	-	-
Perfluorononanoic acid (PFNA)	mg/kg	0.0002	-	-	-	<0.0002	<0.0002	0	-	-	-	-	-	-	-	-	-
Perfluorohexanoic acid (PFHxA)	µg/kg	0.2	-	-	-	<0.2	<0.2	0	-	-	-	-	-	-	-	-	-

Table 3a - Field Duplicate RPDs - Soil

		Field ID	RPD	BH03_0.05	QC101_210826	RPD	BH03_0.05	QC201_210826	RPD	BH05_0.05	QC101_210901	RPD	BH05_0.05	QC201_210901	RPD	SS13_0.05	QC101_210906	RPD	SS13_0.05	QC201_210906	RPD	BH08_0.5	QC101_210916	RPD
		Sample Type		Normal	Field_D		Normal	Interlab_D		Normal	Field_D		Normal	Interlab_D		Normal	Field_D		Normal	Interlab_D		Normal	Field_D	
		Matrix Type		Soil	Soil		Soil	Soil		Soil	Soil		Soil	Soil		Soil	Soil		Soil	Soil		Soil	Soil	
		Date		26/08/2021	26/08/2021		26/08/2021	26/08/2021		1/09/2021	1/09/2021		1/09/2021	1/09/2021		6/09/2021	6/09/2021		6/09/2021	6/09/2021		16/09/2021	16/09/2021	
		Lab Report Number		276682	276682		276682	820973		ES2132166	ES2132166		ES2132166	822697/824119		ES2132601	ES2132601		ES2132601	824081		ES2133844	ES2133844	
	Unit	EQL																						
NA																								
Perfluorohexanesulfonic acid (PFHxS)	mg/kg	0.0002	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Perfluoroheptanoic acid (PFHpA)	mg/kg	0.0002	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Perfluorododecanoic acid (PFDoA)	µg/kg	0.2	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Perfluorodecanoic acid (PFDA)	mg/kg	0.0002	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Perfluoroheptane sulfonic acid (PFHpS)	mg/kg	0.0002	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Perfluorobutanesulfonic acid (PFBS)	mg/kg	0.0002	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Perfluorodecanesulfonic acid (PFDS)	mg/kg	0.0002	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Perfluorotetradecanoic aicd (PFTeDA)	mg/kg	0.0005	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Perfluorotridecanoic acid (PFTrDA)	mg/kg	0.0002	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Perfluoroundecanoic acid (PFUnA)	µg/kg	0.2	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Perfluorobutanoic acid (PFBA)	µg/kg	1	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
1H.1H.2H.2H-perfluorohexanesulfonic acid (4:2 FTS)	mg/kg	0.0005	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
1H.1H.2H.2H-perfluorooctanesulfonic acid (6:2 FTS)	µg/kg	0.5	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
1H.1H.2H.2H-perfluorodecanesulfonic acid (8:2 FTS)	mg/kg	0.0005	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
1H.1H.2H.2H-perfluorododecanesulfonic acid (10:2)	mg/kg	0.0005	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
N-ethyl perfluorooctane sulfonamido acetic acid	µg/kg	0.2	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
N-ethyl perfluorooctane sulfonamide	mg/kg	0.0005	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
N-methyl perfluorooctanesulfonamido ethanol	µg/kg	0.5	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
N-ethyl perfluorooctanesulfonamido ethanol	mg/kg	0.0005	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
N-Methyl perfluorooctane sulfonamide	µg/kg	0.5	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
N-methyl perfluorooctane sulfonamido acetic acid	µg/kg	0.2	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Sum (PFHxS + PFOS)	µg/kg	0.2	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Sum of PFAS	mg/kg	0.0002	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Biological																								
Coliform	-	10	-	-	-	-	-	-	-	-	-	-	-	-	-	**2,900**	**7,200**	85	**2,900**	-	-	**33**	**11**	100
Halogenated Benzenes																								
Hexachlorobenzene	µg/kg	50	-	-	-	-	-	-	-	-	-	-	-	-	-	<50	<50	0	<50	<50	0	<50	<50	0
Asbestos																								
Asbestos (Fines and Fibrous FA+AF)	%w/w		-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	**0.0000**	-	-	-	-
Asbestos Reported Result	Comment		-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	**$1^{\#5}$**	-	-	-	-
Organic Fibre	g/kg	0.1	-	-	-	-	-	-	-	-	-	-	-	-	-	**$0^{\#1}$**	**$0^{\#1}$**	-	**$0^{\#1}$**	-	-	**$0^{\#1}$**	-	-
Synthetic Mineral Fibre	g/kg	0.1	-	-	-	-	-	-	-	-	-	-	-	-	-	**$0^{\#1}$**	**$0^{\#1}$**	-	**$0^{\#1}$**	-	-	**$0^{\#1}$**	-	-
Sample Weight	g	0.01	-	-	-	-	-	-	-	-	-	-	-	-	-	**113**	**124**	9	**113**	-	-	**110**	-	-
Description	-		-	-	-	-	-	-	-	-	-	-	-	-	-	**$1^{\#2}$**	**$1^{\#2}$**	0	**$1^{\#2}$**	-	-	**$1^{\#2}$**	-	-
Asbestos (FA) - Comment	Comment		-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	**$1^{\#6}$**	-	-	-	-
Approved Identifier	-		-	-	-	-	-	-	-	-	-	-	-	-	-	**$1^{\#3}$**	**$1^{\#3}$**	0	**$1^{\#3}$**	-	-	**$1^{\#3}$**	-	-
Approximate Sample Mass	g		-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	**115**	-	-	-	-
ACM - Comment	Comment		-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	**$1^{\#6}$**	-	-	-	-
Asbestos fibres	-	0.1	-	-	-	-	-	-	-	-	-	-	-	-	-	**$0^{\#1}$**	**$0^{\#1}$**	-	**$0^{\#1}$**	-	-	**$0^{\#1}$**	-	-
Asbestos from ACM in Soil	%w/w		-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	**0.0000**	-	-	-	-
Asbestos (Trace)	Fibres	5	-	-	-	-	-	-	-	-	-	-	-	-	-	**$0^{\#1}$**	**$0^{\#1}$**	-	**$0^{\#1}$**	-	-	**$0^{\#1}$**	-	-
Asbestos Type	Comment		-	-	-	-	-	-	-	-	-	-	-	-	-	**$1^{\#4}$**	**$1^{\#4}$**	0	**$1^{\#4}$**	-	-	**$1^{\#4}$**	-	-
Asbestos Fines (AF) - Comment	Comment		-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	**$1^{\#6}$**	-	-	-	-
Organic Fibres - Comment	Comment		-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	**$1^{\#7}$**	-	-	-	-
Respirable Fibres - Comment	Comment		-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	**$1^{\#8}$**	-	-	-	-
Synthetic Fibres - Comment	Comment		-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	**$1^{\#6}$**	-	-	-	-
ACM (Mass)	g		-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	**0.0000**	-	-	-	-
Asbestos (AF) - Mass	g		-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	**0.0000**	-	-	-	-
Asbestos in AF (Mass)	g		-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	**0.0000**	-	-	-	-
Asbestos in FA & AF (Mass)	g		-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Asbestos (FA) - Mass	g		-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Asbestos in ACM (Mass)	g		-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Asbestos in FA (Mass)	g		-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
EPA 621 Classification of Wastes																								

Table 3a - Field Duplicate RPDs - Soil

Field ID			BH08_0.5	QC201_210916	RPD	SS08_0.05	QC101_210917	RPD	SS01_0.05	SS01_0.05 - [TRIPLICATE]	RPD	SS25_0.10	SS25_0.10 - [TRIPLICATE]	RPD	SS17a_0.10	SS17a_0.10 - [TRIPLICATE]	RPD
Sample Type			Normal	Interlab_D		Normal	Field_D		Normal	Field_D		Normal	Field_D		Normal	Field_D	
Matrix Type			Soil	Soil		Soil	Soil		Soil	Soil		Soil	Soil		Soil	Soil	
Date			16/09/2021	16/09/2021		17/09/2021	17/09/2021		24/08/2021	24/08/2021		24/08/2021	24/08/2021		25/08/2021	25/08/2021	
Lab Report Number			ES2133844	826760		ES2133844	ES2133844		276682	276682		276682	276682		276682	276682	
	Unit	EQL															
NA																	
Perfluorohexanesulfonic acid (PFHxS)	mg/kg	0.0002	-	-	-	<0.0002	<0.0002	0	-	-	-	-	-	-	-	-	-
Perfluoroheptanoic acid (PFHpA)	mg/kg	0.0002	-	-	-	<0.0002	<0.0002	0	-	-	-	-	-	-	-	-	-
Perfluorododecanoic acid (PFDoA)	µg/kg	0.2	-	-	-	<0.2	<0.2	0	-	-	-	-	-	-	-	-	-
Perfluorodecanoic acid (PFDA)	mg/kg	0.0002	-	-	-	<0.0002	<0.0002	0	-	-	-	-	-	-	-	-	-
Perfluoroheptane sulfonic acid (PFHpS)	mg/kg	0.0002	-	-	-	<0.0002	<0.0002	0	-	-	-	-	-	-	-	-	-
Perfluorobutanesulfonic acid (PFBS)	mg/kg	0.0002	-	-	-	<0.0002	<0.0002	0	-	-	-	-	-	-	-	-	-
Perfluorodecanesulfonic acid (PFDS)	mg/kg	0.0002	-	-	-	<0.0002	<0.0002	0	-	-	-	-	-	-	-	-	-
Perfluorotetradecanoic aicd (PFTeDA)	mg/kg	0.0005	-	-	-	<0.0005	<0.0005	0	-	-	-	-	-	-	-	-	-
Perfluorotridecanoic acid (PFTrDA)	mg/kg	0.0002	-	-	-	<0.0002	<0.0002	0	-	-	-	-	-	-	-	-	-
Perfluoroundecanoic acid (PFUnA)	µg/kg	0.2	-	-	-	<0.2	<0.2	0	-	-	-	-	-	-	-	-	-
Perfluorobutanoic acid (PFBA)	µg/kg	1	-	-	-	<1	<1	0	-	-	-	-	-	-	-	-	-
1H.1H.2H.2H-perfluorohexanesulfonic acid (4:2 FTS)	mg/kg	0.0005	-	-	-	<0.0005	<0.0005	0	-	-	-	-	-	-	-	-	-
1H.1H.2H.2H-perfluorooctanesulfonic acid (6:2 FTS)	µg/kg	0.5	-	-	-	<0.5	<0.5	0	-	-	-	-	-	-	-	-	-
1H.1H.2H.2H-perfluorodecanesulfonic acid (8:2 FTS)	mg/kg	0.0005	-	-	-	<0.0005	<0.0005	0	-	-	-	-	-	-	-	-	-
1H.1H.2H.2H-perfluorododecanesulfonic acid (10:2)	mg/kg	0.0005	-	-	-	<0.0005	<0.0005	0	-	-	-	-	-	-	-	-	-
N-ethyl perfluorooctane sulfonamido acetic acid	µg/kg	0.2	-	-	-	<0.2	<0.2	0	-	-	-	-	-	-	-	-	-
N-ethyl perfluorooctane sulfonamide	mg/kg	0.0005	-	-	-	<0.0005	<0.0005	0	-	-	-	-	-	-	-	-	-
N-methyl perfluorooctanesulfonamido ethanol	µg/kg	0.5	-	-	-	<0.5	<0.5	0	-	-	-	-	-	-	-	-	-
N-ethyl perfluorooctanesulfonamido ethanol	mg/kg	0.0005	-	-	-	<0.0005	<0.0005	0	-	-	-	-	-	-	-	-	-
N-Methyl perfluorooctane sulfonamide	µg/kg	0.5	-	-	-	<0.5	<0.5	0	-	-	-	-	-	-	-	-	-
N-methyl perfluorooctane sulfonamido acetic acid	µg/kg	0.2	-	-	-	<0.2	<0.2	0	-	-	-	-	-	-	-	-	-
Sum (PFHxS + PFOS)	µg/kg	0.2	-	-	-	<0.2	<0.2	0	-	-	-	-	-	-	-	-	-
Sum of PFAS	mg/kg	0.0002	-	-	-	<0.0002	<0.0002	0	-	-	-	-	-	-	-	-	-
Biological																	
Coliform	-	10	**33**	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Halogenated Benzenes																	
Hexachlorobenzene	µg/kg	50	<50	<500	0	-	-	-	-	-	-	<100	-	-	<100	-	-
Asbestos																	
Asbestos (Fines and Fibrous FA+AF)	%w/w		-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Asbestos Reported Result	Comment		-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Organic Fibre	g/kg	0.1	**0**$^{\#1}$	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Synthetic Mineral Fibre	g/kg	0.1	**0**$^{\#1}$	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Sample Weight	g	0.01	**110**	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Description	-		**1**$^{\#2}$	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Asbestos (FA) - Comment	Comment		-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Approved Identifier	-		**1**$^{\#3}$	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Approximate Sample Mass	g		-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
ACM - Comment	Comment		-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Asbestos fibres	-	0.1	**0**$^{\#1}$	-	-	-	-	-	-	-	-	**0**	-	-	**0**	-	-
Asbestos from ACM in Soil	%w/w		-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Asbestos (Trace)	Fibres	5	**0**$^{\#1}$	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Asbestos Type	Comment		**1**$^{\#4}$	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Asbestos Fines (AF) - Comment	Comment		-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Organic Fibres - Comment	Comment		-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Respirable Fibres - Comment	Comment		-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Synthetic Fibres - Comment	Comment		-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
ACM (Mass)	g		-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Asbestos (AF) - Mass	g		-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Asbestos in AF (Mass)	g		-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Asbestos in FA & AF (Mass)	g		-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Asbestos (FA) - Mass	g		-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Asbestos in ACM (Mass)	g		-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Asbestos in FA (Mass)	g		-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
EPA 621 Classification of Wastes																	

Table 3a - Field Duplicate RPDs - Soil

		Field ID	RPD	BH03_0.05	QC101_210826	RPD	BH03_0.05	QC201_210826	RPD	BH05_0.05	QC101_210901	RPD	BH05_0.05	QC201_210901	RPD	SS13_0.05	QC101_210906	RPD	SS13_0.05	QC201_210906	RPD	BH08_0.5	QC101_210916	RPD
		Sample Type		Normal	Field_D		Normal	Interlab_D		Normal	Field_D		Normal	Interlab_D		Normal	Field_D		Normal	Interlab_D		Normal	Field_D	
		Matrix Type		Soil	Soil		Soil	Soil		Soil	Soil		Soil	Soil		Soil	Soil		Soil	Soil		Soil	Soil	
		Date		26/08/2021	26/08/2021		26/08/2021	26/08/2021		1/09/2021	1/09/2021		1/09/2021	1/09/2021		6/09/2021	6/09/2021		6/09/2021	6/09/2021		16/09/2021	16/09/2021	
		Lab Report Number		276682	276682		276682	820973		ES2132166	ES2132166		ES2132166	822697/824119		ES2132601	ES2132601		ES2132601	824081		ES2133844	ES2133844	
	Unit	EQL																						
NA																								
Other OCPs (IWRG Lab Reported)	mg/kg	0.1	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	<0.1	-	-	-	-

Comments
#1 No
#2 Soil sample.
#3 A. SMYLIE
#4 -
#5 No asbestos detected at the reporting limit of 0.01% w/w.Organic fibre detected.No trace asbestos detected.
#6 Nil
#7 Organic fibres detected.
#8 No trace asbestos detected.

***RPDs have only been considered where a concentration is greater than 1 times the EQL.**
****Elevated RPDs are highlighted as per QAQC Profile settings (Acceptable RPDs for each EQL multiplier range are: 80 (1 - 10 x EQL); 50 (10 - 30 x EQL); 30 (> 30 x EQL))**
*****Interlab Duplicates are matched on a per compound basis as methods vary between laboratories. Any methods in the row header relate to those used in the primary laboratory**

Table 3a - Field Duplicate RPDs - Soil

Field ID			BH08_0.5	QC201_210916	RPD	SS08_0.05	QC101_210917	RPD	SS01_0.05	SS01_0.05 - [TRIPLICATE]	RPD	SS25_0.10	SS25_0.10 - [TRIPLICATE]	RPD	SS17a_0.10	SS17a_0.10 - [TRIPLICATE]	RPD
Sample Type			Normal	Interlab_D		Normal	Field_D		Normal	Field_D		Normal	Field_D		Normal	Field_D	
Matrix Type			Soil	Soil		Soil	Soil		Soil	Soil		Soil	Soil		Soil	Soil	
Date			16/09/2021	16/09/2021		17/09/2021	17/09/2021		24/08/2021	24/08/2021		24/08/2021	24/08/2021		25/08/2021	25/08/2021	
Lab Report Number			ES2133844	826760		ES2133844	ES2133844		276682	276682		276682	276682		276682	276682	
	Unit	EQL															
NA																	
Other OCPs (IWRG Lab Reported)	mg/kg	0.1	-	<1	-	-	-	-	-	-	-	-	-	-	-	-	-

Comments
#1 No
#2 Soil sample.
#3 A. SMYLIE
#4 -
#5 No asbestos detected at the reporting limit of 0.01% w/w.Orga
#6 Nil
#7 Organic fibres detected.
#8 No trace asbestos detected.

***RPDs have only been considered where a concentration is grea**
****Elevated RPDs are highlighted as per QAQC Profile settings (A**
*****Interlab Duplicates are matched on a per compound basis as**

Table 3b - Field Duplicate RPDs - Water

Field ID			GW02	QC201_210921	RPD	GW02	QC101_210921	RPD
Sample Type			Normal	Interlab_D		Normal	Field_D	
Matrix Type			Water	Water		Water	Water	
Date			20/09/2021	21/09/2021		21/09/2021	21/09/2021	
Lab Report Number			ES2134103	826833		ES2134103	ES2134103	
	Unit	EQL						
Polycyclic aromatic hydrocarbons (PAHs)								
Benzo(a)pyrene TEQ calc (zero)	mg/L	0.0005	<0.0005	-	-	<0.0005	<0.0005	0
Benzo[b+j]fluoranthene	µg/L	1	<1.0	<1	0	<1.0	<1.0	0
Acenaphthene	µg/L	1	<1.0	<1	0	<1.0	<1.0	0
Acenaphthylene	µg/L	1	<1.0	<1	0	<1.0	<1.0	0
Anthracene	µg/L	1	<1.0	<1	0	<1.0	<1.0	0
Benz(a)anthracene	µg/L	1	<1.0	<1	0	<1.0	<1.0	0
Benzo(a) pyrene	µg/L	0.5	<0.5	<1	0	<0.5	<0.5	0
Benzo(g,h,i)perylene	µg/L	1	<1.0	<1	0	<1.0	<1.0	0
Benzo(k)fluoranthene	µg/L	1	<1.0	<1	0	<1.0	<1.0	0
Chrysene	µg/L	1	<1.0	<1	0	<1.0	<1.0	0
Dibenz(a,h)anthracene	µg/L	1	<1.0	<1	0	<1.0	<1.0	0
Fluoranthene	µg/L	1	<1.0	<1	0	<1.0	<1.0	0
Fluorene	µg/L	1	<1.0	<1	0	<1.0	<1.0	0
Indeno(1,2,3-c,d)pyrene	µg/L	1	<1.0	<1	0	<1.0	<1.0	0
Naphthalene	µg/L	1	<1.0	<1	0	<1.0	<1.0	0
Phenanthrene	µg/L	1	<1.0	<1	0	<1.0	<1.0	0
Pyrene	µg/L	1	<1.0	<1	0	<1.0	<1.0	0
PAHs (Sum of total)	µg/L	0.5	<0.5	<1	0	<0.5	<0.5	0
Metals								
Arsenic (filtered)	µg/L	1	<1	**2**	67	<1	<1	0
Cadmium (filtered)	µg/L	0.1	<0.1	<0.2	0	<0.1	<0.1	0
Chromium (III+VI) (filtered)	µg/L	1	<1	<1	0	<1	<1	0
Copper (filtered)	µg/L	1	<1	<1	0	<1	<1	0
Lead (filtered)	µg/L	1	<1	<1	0	<1	<1	0
Mercury (filtered)	µg/L	0.1	<0.1	<0.1	0	<0.1	<0.1	0
Nickel (filtered)	µg/L	1	**19**	**17**	11	**19**	**21**	10
Zinc (filtered)	µg/L	5	**57**	**48**	17	**57**	**53**	7
TRH - NEPM 2013 Fractions								
TRH >C6 - C10	µg/L	20	<20	<20	0	<20	<20	0
TRH >C10 - C16	µg/L	50	<100	<50	0	<100	<100	0
TRH >C16 - C34	µg/L	100	<100	<100	0	<100	<100	0
TRH >C34 - C40	µg/L	100	<100	<100	0	<100	<100	0
TRH >C10 - C40 (Sum of total)	µg/L	100	<100	<100	0	<100	<100	0
TRH >C6 - C10 less BTEX (F1)	µg/L	20	<20	<20	0	<20	<20	0
TRH >C10 - C16 less Naphthalene (F2)	µg/L	50	<100	<50	0	<100	<100	0
TPH - NEPM 1999 Fractions								
TPH C6 - C9	µg/L	20	<20	<20	0	<20	<20	0
TPH C10 - C14	µg/L	50	<50	<50	0	<50	<50	0
TPH C15 - C28	µg/L	100	<100	<100	0	<100	<100	0
TPH C29-C36	µg/L	50	<50	<100	0	<50	<50	0
TPH C10 - C36 (Sum of total)	µg/L	50	<50	<100	0	<50	<50	0
BTEXN								
Benzene	µg/L	1	<1	<1	0	<1	<1	0
Ethylbenzene	µg/L	1	<2	<1	0	<2	<2	0
Toluene	µg/L	1	<2	<1	0	<2	<2	0
Total BTEX	mg/L	0.001	<0.001	-	-	<0.001	<0.001	0
Xylene (m & p)	µg/L	2	<2	<2	0	<2	<2	0
Xylene (o)	µg/L	1	<2	<1	0	<2	<2	0
Xylene Total	µg/L	2	<2	<3	0	<2	<2	0
Organochlorine Pesticides (OCPs)								
Organochlorine Pesticides (Lab Reported)	mg/l	0.002	-	<0.002	-	-	-	-
4,4-DDE	µg/L	0.2	<0.5	<0.2	0	<0.5	<0.5	0
a-BHC	µg/L	0.2	<0.5	<0.2	0	<0.5	<0.5	0
Aldrin	µg/L	0.2	<0.5	<0.2	0	<0.5	<0.5	0
Aldrin + Dieldrin	µg/L	0.2	<0.5	<0.2	0	<0.5	<0.5	0
b-BHC	µg/L	0.2	<0.5	<0.2	0	<0.5	<0.5	0
Chlordane	µg/L	0.5	<0.5	<2	0	<0.5	<0.5	0
Chlordane (cis)	µg/L	0.5	<0.5	-	-	<0.5	<0.5	0
Chlordane (trans)	µg/L	0.5	<0.5	-	-	<0.5	<0.5	0
d-BHC	µg/L	0.2	<0.5	<0.2	0	<0.5	<0.5	0
DDD	µg/L	0.2	<0.5	<0.2	0	<0.5	<0.5	0
DDT	µg/L	0.2	<2.0	<0.2	0	<2.0	<2.0	0
DDT+DDE+DDD	µg/L	0.2	<0.5	<0.2	0	<0.5	<0.5	0
Dieldrin	µg/L	0.2	<0.5	<0.2	0	<0.5	<0.5	0
Endosulfan I	µg/L	0.2	<0.5	<0.2	0	<0.5	<0.5	0
Endosulfan II	µg/L	0.2	<0.5	<0.2	0	<0.5	<0.5	0
Endosulfan sulfate	µg/L	0.2	<0.5	<0.2	0	<0.5	<0.5	0
Endrin	µg/L	0.2	<0.5	<0.2	0	<0.5	<0.5	0
Endrin aldehyde	µg/L	0.2	<0.5	<0.2	0	<0.5	<0.5	0
Endrin ketone	µg/L	0.2	<0.5	<0.2	0	<0.5	<0.5	0
g-BHC (Lindane)	µg/L	0.2	<0.5	<0.2	0	<0.5	<0.5	0
Heptachlor	µg/L	0.2	<0.5	<0.2	0	<0.5	<0.5	0
Heptachlor epoxide	µg/L	0.2	<0.5	<0.2	0	<0.5	<0.5	0
Methoxychlor	µg/L	0.2	<2.0	<0.2	0	<2.0	<2.0	0
Toxaphene	µg/L	5	-	<5	-	-	-	-
Organophosphorous Pesticides (OPPs)								
Azinophos methyl	µg/L	0.5	<0.5	<2	0	<0.5	<0.5	0
Bolstar (Sulprofos)	µg/L	2	-	<2	-	-	-	-
Bromophos-ethyl	µg/L	0.5	<0.5	-	-	<0.5	<0.5	0
Carbophenothion	µg/L	0.5	<0.5	-	-	<0.5	<0.5	0
Chlorfenvinphos	µg/L	0.5	<0.5	<20	0	<0.5	<0.5	0
Chlorpyrifos	µg/L	0.5	<0.5	<2	0	<0.5	<0.5	0
Chlorpyrifos-methyl	µg/L	0.5	<0.5	<2	0	<0.5	<0.5	0
Coumaphos	µg/L	20	-	<20	-	-	-	-
Demeton-O	µg/L	2	-	<2	-	-	-	-
Demeton-S	µg/L	2	-	<2	-	-	-	-
Demeton-S-methyl	µg/L	0.5	<0.5	-	-	<0.5	<0.5	0
Diazinon	µg/L	0.5	<0.5	<2	0	<0.5	<0.5	0
Dichlorvos	µg/L	0.5	<0.5	<2	0	<0.5	<0.5	0
Dimethoate	µg/L	0.5	<0.5	<2	0	<0.5	<0.5	0
Disulfoton	µg/L	2	-	<2	-	-	-	-
EPN	µg/L	2	-	<2	-	-	-	-
Ethion	µg/L	0.5	<0.5	<2	0	<0.5	<0.5	0
Ethoprop	µg/L	2	-	<2	-	-	-	-
Fenamiphos	µg/L	0.5	<0.5	-	-	<0.5	<0.5	0
Fenitrothion	µg/L	2	-	<2	-	-	-	-
Fensulfothion	µg/L	2	-	<2	-	-	-	-
Fenthion	µg/L	0.5	<0.5	<2	0	<0.5	<0.5	0
Malathion	µg/L	0.5	<0.5	<2	0	<0.5	<0.5	0
Merphos	mg/L	0.002	-	<0.002	-	-	-	-
Methyl parathion	µg/L	2	<2.0	<2	0	<2.0	<2.0	0
Mevinphos (Phosdrin)	µg/L	2	-	<2	-	-	-	-
Monocrotophos	µg/L	2	<2.0	<2	0	<2.0	<2.0	0
Naled (Dibrom)	µg/L	2	-	<2	-	-	-	-
Omethoate	µg/L	20	-	<20	-	-	-	-
Parathion	µg/L	2	<2.0	<2	0	<2.0	<2.0	0
Phorate	µg/L	2	-	<2	-	-	-	-
Pirimiphos-methyl	µg/L	20	-	<20	-	-	-	-
Pirimphos-ethyl	µg/L	0.5	<0.5	-	-	<0.5	<0.5	0
Prothiofos	µg/L	0.5	<0.5	-	-	<0.5	<0.5	0
Pyrazophos	µg/L	2	-	<2	-	-	-	-
Ronnel	µg/L	2	-	<2	-	-	-	-

Table 3b - Field Duplicate RPDs - Water

		Field ID	GW02	QC201_210921	RPD	GW02	QC101_210921	RPD
		Sample Type	Normal	Interlab_D		Normal	Field_D	
		Matrix Type	Water	Water		Water	Water	
		Date	20/09/2021	21/09/2021		21/09/2021	21/09/2021	
		Lab Report Number	ES2134103	826833		ES2134103	ES2134103	
	Unit	EQL						
Terbufos	µg/L	2	-	<2	-	-	-	-
Tokuthion	mg/L	0.002	-	<0.002	-	-	-	-
Trichloronate	µg/L	2	-	<2	-	-	-	-
Tetrachlorvinphos	µg/L	2	-	<2	-	-	-	-
Biological								
Coliform	cfu/100 ml	1	**100[#1]**	-	-	**100[#1]**	**200[#1]**	**67**
Halogenated Benzenes								
Hexachlorobenzene	µg/L	0.2	<0.5	<0.2	0	<0.5	<0.5	0
EPA 621 Classification of Wastes								
Other OCPs (IWRG Lab Reported)	mg/l	0.002	-	<0.002	-	-	-	-

Comments
#1 Result value is an approximate.

***RPDs have only been considered where a concentration is greater than 1 times the EQL.**
****Elevated RPDs are highlighted as per QAQC Profile settings (Acceptable RPDs for each EQL multiplier range are: 80 (1 - 10 x EQL); 50 (10 - 30 x EQL); 30 (> 30 x EQL))**
*****Interlab Duplicates are matched on a per compound basis as methods vary between laboratories. Any methods in the row header relate to those used in the primary laboratory**

Table 4a - Trip Blank and Trip Spike results - Soil

				Polycyclic aromatic hydrocarbons (PAHs)	TRH - NEPM 2013 Fractions		TPH - NEPM 1999 Fractions	BTEXN											
				Naphthalene	TRH >C6 - C10	TRH >C6 - C10 less BTEX (F1)	TPH C6 - C9	Benzene	Benzene	Ethylbenzene	Ethylbenzene	Toluene	Toluene	Xylene (m & p)	Xylene (m & p)	Xylene (o)	Xylene (o)	Total BTEX	Xylene Total
				mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	% Recovery	mg/kg	% Recovery	mg/kg	% Recovery	mg/kg	% Recovery	mg/kg	% Recovery	mg/kg	mg/kg
EQL				1	10	10	10	0.2	-	0.5	0.5	0.5	-	0.5	-	0.5	-	0.2	0.5
Field ID	**Sample Type**	**Date**	**Lab Report Number**																
QC300_210825	Trip_B	25/08/2021	276682	<1	-	-	-	<0.2	-	<1	-	<0.5	-	<2	-	<1	-	-	<3
QC300_210903	Trip_B	2/09/2021	ES2132166	<1	-	-	-	<0.2	-	<0.5	-	<0.5	-	<0.5	-	<0.5	-	<0.2	<0.5
QC300_210908	Trip_B	3/09/2021	ES2132601	<1	-	-	-	<0.2	-	<0.5	-	<0.5	-	<0.5	-	<0.5	-	<0.2	<0.5
QC300_210910	Trip_B	9/09/2021	ES2132942	<1	<10	<10	<10	<0.2	-	<0.5	-	<0.5	-	<0.5	-	<0.5	-	<0.2	<0.5
QC300_210917	Trip_B	17/09/2021	ES2133844	<1	<10	<10	<10	<0.2	-	<0.5	-	<0.5	-	<0.5	-	<0.5	-	<0.2	<0.5
QC400_210825	Trip_S	25/08/2021	276682	-	-	-	-	-	122	-	124	-	119	-	124	-	123	-	-

Table 4b - Equipment Blank and Trip Blank results - Water

					Polycyclic aromatic hydrocarbons (PAHs)																		
				Total Coliforms by MF	Benzo(a)pyrene TEQ	Benzo(a)pyrene TEQ calc (zero)	Benzo[b+j]fluoranthene	Acenaphthene	Acenaphthylene	Anthracene	Benz(a)anthracene	Benzo(a) pyrene	Benzo(b+j) & Benzo(k)fluoranthene	Benzo(g,h,i)perylene	Benzo(k)fluoranthene	Chrysene	Dibenz(a,h)anthracene	Fluoranthene	Fluorene	Indeno(1,2,3-c,d)pyrene	Naphthalene	Phenanthrene	Pyrene
				CFU/100mL	µg/L	mg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L
EQL					5	0.0005	1	1	1	1	1	0.5	2	1	1	1	1	1	1	1	1	1	1
Field ID	**Sample Type**	**Date**	**Lab Report Number**																				
QC300_210921	Trip_B	10/09/2021	ES2134103	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	<5	-	-
QC501-210910	Rinsate	10/09/2021	ES2132942	-	-	<0.0005	<1.0	<1.0	<1.0	<1.0	<1.0	<0.5	-	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0
QC501_210826	Rinsate	26/08/2021	276682	-	<5	-	-	<1	<1	<1	<1	<1	<2	<1	-	<1	<1	<1	<1	<1	<1	<1	<1
QC501_210827	Rinsate	27/08/2021	276682	-	<5	-	-	<1	<1	<1	<1	<1	<2	<1	-	<1	<1	<1	<1	<1	<1	<1	<1
QC501_210831	Rinsate	31/08/2021	277534	<1	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
QC501_210831	Rinsate	31/08/2021	ES2132166	-	-	<0.0005	<1.0	<1.0	<1.0	<1.0	<1.0	<0.5	-	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0
QC501_210908	Rinsate	8/09/2021	ES2132601	-	-	<0.0005	<1.0	<1.0	<1.0	<1.0	<1.0	<0.5	-	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0
QC501_210917	Rinsate	17/09/2021	ES2133844	-	-	<0.0005	<1.0	<1.0	<1.0	<1.0	<1.0	<0.5	-	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0
QC501_210917	Rinsate	17/09/2021	ES2134103	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
QC501_210921	Rinsate	21/09/2021	ES2134103	-	-	<0.0005	<1.0	<1.0	<1.0	<1.0	<1.0	<0.5	-	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0
QC502_210917	Rinsate	17/09/2021	ES2133844	-	-	<0.0005	<1.0	<1.0	<1.0	<1.0	<1.0	<0.5	-	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0

Comments

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Table 4b - Equipment Blank and Trip Blank results - Water

						Metals															
				PAHs (Sum of total)	Total +ve PAHs	Arsenic	Arsenic (filtered)	Cadmium	Cadmium (filtered)	Chromium (III+VI)	Chromium (III+VI) (filtered)	Copper	Copper (filtered)	Lead	Lead (filtered)	Mercury	Mercury (filtered)	Nickel	Nickel (filtered)	Zinc	Zinc (filtered)
				µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L
EQL				0.5	1	1	1	0.1	0.1	1	1	1	1	1	1	0.1	0.1	1	1	5	5
Field ID	**Sample Type**	**Date**	**Lab Report Number**																		
QC300_210921	Trip_B	10/09/2021	ES2134103	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
QC501-210910	Rinsate	10/09/2021	ES2132942	<0.5	-	<1	-	<0.1	-	<1	-	<1	-	<1	-	<0.1	-	<1	-	<5	-
QC501_210826	Rinsate	26/08/2021	276682	-	**0**[#1]	-	<50	-	<10	-	<10	-	<10	-	<30	-	<0.5	-	<20	-	<20
QC501_210827	Rinsate	27/08/2021	276682	-	**0**[#1]	-	<50	-	<10	-	<10	-	<10	-	<30	-	<0.5	-	<20	-	<20
QC501_210831	Rinsate	31/08/2021	277534	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
QC501_210831	Rinsate	31/08/2021	ES2132166	<0.5	-	<1	-	<0.1	-	<1	-	<1	-	<1	-	<0.1	-	<1	-	<5	-
QC501_210908	Rinsate	8/09/2021	ES2132601	<0.5	-	<1	-	<0.1	-	<1	-	<1	-	<1	-	<0.1	-	<1	-	<5	-
QC501_210917	Rinsate	17/09/2021	ES2133844	<0.5	-	<1	-	<0.1	-	<1	-	<1	-	<1	-	<0.1	-	<1	-	<5	-
QC501_210917	Rinsate	17/09/2021	ES2134103	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
QC501_210921	Rinsate	21/09/2021	ES2134103	<0.5	-	-	<1	-	<0.1	-	<1	-	<1	-	<1	-	<0.1	-	<1	-	<5
QC502_210917	Rinsate	17/09/2021	ES2133844	<0.5	-	<1	-	<0.1	-	<1	-	<1	-	<1	-	<0.1	-	<1	-	<5	-

Comments

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Table 4b - Equipment Blank and Trip Blank results - Water

				Inorganics				TRH - NEPM 2013 Fractions							TPH - NEPM 1999 Fractions					BTEXN						
				Kjeldahl Nitrogen Total	Nitrate & Nitrite (as N)	Nitrogen (Total)	Phosphorus	TRH >C6 - C10	TRH >C10 - C16	TRH >C16 - C34	TRH >C34 - C40	TRH >C10 - C40 (Sum of total)	TRH >C6 - C10 less BTEX (F1)	TRH >C10 - C16 less Naphthalene (F2)	TPH C6 - C9	TPH C10 - C14	TPH C15 - C28	TPH C29-C36	TPH C10 - C36 (Sum of total)	Benzene	Ethylbenzene	Toluene	Total BTEX	Xylene (m & p)	Xylene (o)	Xylene Total
				mg/L	mg/L	µg/L	mg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	mg/L	µg/L	µg/L	µg/L
EQL				0.1	0.01	100	0.01	10	50	100	100	50	10	50	10	50	100	50	50	1	1	1	0.001	2	1	2
Field ID	**Sample Type**	**Date**	**Lab Report Number**																							
QC300_210921	Trip_B	10/09/2021	ES2134103	-	-	-	-	<20	-	-	-	-	<20	-	<20	-	-	-	-	<1	<2	<2	<0.001	<2	<2	<2
QC501-210910	Rinsate	10/09/2021	ES2132942	-	-	-	-	<20	<100	<100	<100	<100	<20	<100	<20	<50	<100	<50	<50	<1	<2	<2	<0.001	<2	<2	<2
QC501_210826	Rinsate	26/08/2021	276682	-	-	-	-	<10	<50	<100	<100	<50	<10	<50	<10	<50	<100	<100	<50	<1	<1	<1	-	<2	<1	-
QC501_210827	Rinsate	27/08/2021	276682	-	-	-	-	<10	<50	<100	<100	<50	<10	<50	<10	<50	<100	<100	<50	<1	<1	<1	-	<2	<1	-
QC501_210831	Rinsate	31/08/2021	277534	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
QC501_210831	Rinsate	31/08/2021	ES2132166	<0.1	<0.01	<100	<0.01	<20	<100	<100	<100	<100	<20	<100	<20	<50	<100	<50	<50	<1	<2	<2	<0.001	<2	<2	<2
QC501_210908	Rinsate	8/09/2021	ES2132601	-	-	-	-	<20	<100	<100	<100	<100	<20	<100	<20	<50	<100	<50	<50	<1	<2	<2	<0.001	<2	<2	<2
QC501_210917	Rinsate	17/09/2021	ES2133844	-	-	-	-	<20	<100	<100	<100	<100	<20	<100	<20	<50	<100	<50	<50	<1	<2	<2	<0.001	<2	<2	<2
QC501_210917	Rinsate	17/09/2021	ES2134103	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
QC501_210921	Rinsate	21/09/2021	ES2134103	-	-	-	-	<20	<100	<100	<100	<100	<20	<100	<20	<50	<100	<50	<50	<1	<2	<2	<0.001	<2	<2	<2
QC502_210917	Rinsate	17/09/2021	ES2133844	-	-	-	-	<20	<100	<100	<100	<100	<20	<100	<20	<50	<100	<50	<50	<1	<2	<2	<0.001	<2	<2	<2

Comments

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Table 4b - Equipment Blank and Trip Blank results - Water

				Organochlorine Pesticides (OCPs)																						
				4,4-DDE	a-BHC	Aldrin	Aldrin + Dieldrin	b-BHC	Chlordane	Chlordane (cis)	Chlordane (trans)	d-BHC	DDD	DDT	DDT+DDE+DDD	Dieldrin	Endosulfan I	Endosulfan II	Endosulfan sulfate	Endrin	Endrin aldehyde	Endrin ketone	g-BHC (Lindane)	Heptachlor	Heptachlor epoxide	Methoxychlor
				µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L
EQL				0.2	0.2	0.2	0.5	0.2	0.5	0.2	0.2	0.2	0.2	0.2	0.5	0.2	0.2	0.2	0.2	0.2	0.2	0.5	0.2	0.2	0.2	0.2
Field ID	**Sample Type**	**Date**	**Lab Report Number**																							
QC300_210921	Trip_B	10/09/2021	ES2134103	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
QC501-210910	Rinsate	10/09/2021	ES2132942	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
QC501_210826	Rinsate	26/08/2021	276682	<0.2	<0.2	<0.2	-	<0.2	-	<0.2	<0.2	<0.2	<0.2	<0.2	-	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	-	<0.2	<0.2	<0.2	<0.2
QC501_210827	Rinsate	27/08/2021	276682	<0.2	<0.2	<0.2	-	<0.2	-	<0.2	<0.2	<0.2	<0.2	<0.2	-	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	-	<0.2	<0.2	<0.2	<0.2
QC501_210831	Rinsate	31/08/2021	277534	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
QC501_210831	Rinsate	31/08/2021	ES2132166	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<2.0	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<2.0
QC501_210908	Rinsate	8/09/2021	ES2132601	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<2.0	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<2.0
QC501_210917	Rinsate	17/09/2021	ES2133844	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
QC501_210917	Rinsate	17/09/2021	ES2134103	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
QC501_210921	Rinsate	21/09/2021	ES2134103	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
QC502_210917	Rinsate	17/09/2021	ES2133844	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-

Comments

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Table 4b - Equipment Blank and Trip Blank results - Water

				Organophosphorous Pesticides (OPPs)																				
				Azinophos methyl	Bromophos-ethyl	Carbophenothion	Chlorfenvinphos	Chlorpyrifos	Chlorpyrifos-methyl	Demeton-S-methyl	Diazinon	Dichlorvos	Dimethoate	Ethion	Fenamiphos	Fenitrothion	Fenthion	Malathion	Methyl parathion	Monocrotophos	Parathion	Pirimphos-ethyl	Prothiofos	Ronnel
				µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L
EQL				0.2	0.2	0.5	0.5	0.2	0.2	0.5	0.2	0.2	0.2	0.2	0.5	0.2	0.5	0.2	2	2	0.2	0.5	0.5	0.2
Field ID	**Sample Type**	**Date**	**Lab Report Number**																					
QC300_210921	Trip_B	10/09/2021	ES2134103	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
QC501-210910	Rinsate	10/09/2021	ES2132942	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
QC501_210826	Rinsate	26/08/2021	276682	<0.2	<0.2	-	-	<0.2	<0.2	-	<0.2	<0.2	<0.2	<0.2	-	<0.2	-	<0.2	-	-	<0.2	-	-	<0.2
QC501_210827	Rinsate	27/08/2021	276682	<0.2	<0.2	-	-	<0.2	<0.2	-	<0.2	<0.2	<0.2	<0.2	-	<0.2	-	<0.2	-	-	<0.2	-	-	<0.2
QC501_210831	Rinsate	31/08/2021	277534	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
QC501_210831	Rinsate	31/08/2021	ES2132166	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	-	<0.5	<0.5	<2.0	<2.0	<2.0	<0.5	<0.5	-
QC501_210908	Rinsate	8/09/2021	ES2132601	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	-	<0.5	<0.5	<2.0	<2.0	<2.0	<0.5	<0.5	-
QC501_210917	Rinsate	17/09/2021	ES2133844	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
QC501_210917	Rinsate	17/09/2021	ES2134103	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
QC501_210921	Rinsate	21/09/2021	ES2134103	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
QC502_210917	Rinsate	17/09/2021	ES2133844	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-

Comments

#1 NIL (+)VE

Table 4b - Equipment Blank and Trip Blank results - Water

				Per- and Poly-fluoroalkyl Substances (PFAS)																									
				Perfluorooctanesulfonic acid (PFOS)	Perfluorooctanoic acid (PFOA)	Perfluorooctanesulfonamide (PFOSA)	Perfluoropentane sulfonic acid (PFPeS)	Perfluoro-n-pentanoic acid (PFPeA)	Perfluorononanoic acid (PFNA)	Perfluorohexanoic acid (PFHxA)	Perfluorohexanesulfonic acid (PFHxS)	Perfluoroheptanoic acid (PFHpA)	Perfluorododecanoic acid (PFDoA)	Perfluorodecanoic acid (PFDA)	Perfluoroheptane sulfonic acid (PFHpS)	Perfluorobutanesulfonic acid (PFBS)	Perfluorodecanesulfonic acid (PFDS)	Perfluorotetradecanoic aicd (PFTeDA)	Perfluorotridecanoic acid (PFTrDA)	Perfluoroundecanoic acid (PFUnA)	Perfluorobutanoic acid (PFBA)	1H.1H.2H.2H-perfluorohexanesulfonic	1H.1H.2H.2H-perfluorooctanesulfonic acid	1H.1H.2H.2H-perfluorodecanesulfonic	1H.1H.2H.2H-perfluorododecanesulfonic	N-ethyl perfluorooctane sulfonamido acetic acid	N-ethyl perfluorooctane sulfonamide	N-methyl perfluorooctanesulfonamido	N-ethyl perfluorooctanesulfonamido
				µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L
EQL				0.01	0.01	0.02	0.02	0.02	0.02	0.02	0.02	0.02	0.02	0.02	0.02	0.02	0.02	0.05	0.02	0.02	0.1	0.05	0.05	0.05	0.05	0.02	0.05	0.05	0.05
Field ID	**Sample Type**	**Date**	**Lab Report Number**																										
QC300_210921	Trip_B	10/09/2021	ES2134103	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
QC501-210910	Rinsate	10/09/2021	ES2132942	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
QC501_210826	Rinsate	26/08/2021	276682	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
QC501_210827	Rinsate	27/08/2021	276682	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
QC501_210831	Rinsate	31/08/2021	277534	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
QC501_210831	Rinsate	31/08/2021	ES2132166	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
QC501_210908	Rinsate	8/09/2021	ES2132601	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
QC501_210917	Rinsate	17/09/2021	ES2133844	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
QC501_210917	Rinsate	17/09/2021	ES2134103	<0.01	<0.01	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.05	<0.02	<0.02	<0.1	<0.05	<0.05	<0.05	<0.05	<0.02	<0.05	<0.05	<0.05
QC501_210921	Rinsate	21/09/2021	ES2134103	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
QC502_210917	Rinsate	17/09/2021	ES2133844	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-

Comments
#1 NIL (+)VE

Table 4b - Equipment Blank and Trip Blank results - Water

								Halogenated Benzenes
				N-Methyl perfluorooctane sulfonamide	N-methyl perfluorooctane sulfonamido acetic acid	Sum (PFHxS + PFOS)	Sum of PFAS	Hexachlorobenzene
				µg/L	µg/L	µg/L	µg/L	µg/L
EQL				0.05	0.02	0.01	0.01	0.2
Field ID	**Sample Type**	**Date**	**Lab Report Number**					
QC300_210921	Trip_B	10/09/2021	ES2134103	-	-	-	-	-
QC501-210910	Rinsate	10/09/2021	ES2132942	-	-	-	-	-
QC501_210826	Rinsate	26/08/2021	276682	-	-	-	-	<0.2
QC501_210827	Rinsate	27/08/2021	276682	-	-	-	-	<0.2
QC501_210831	Rinsate	31/08/2021	277534	-	-	-	-	-
QC501_210831	Rinsate	31/08/2021	ES2132166	-	-	-	-	<0.5
QC501_210908	Rinsate	8/09/2021	ES2132601	-	-	-	-	<0.5
QC501_210917	Rinsate	17/09/2021	ES2133844	-	-	-	-	-
QC501_210917	Rinsate	17/09/2021	ES2134103	<0.05	<0.02	<0.01	<0.01	-
QC501_210921	Rinsate	21/09/2021	ES2134103	-	-	-	-	-
QC502_210917	Rinsate	17/09/2021	ES2133844	-	-	-	-	-

Comments

#1 NIL (+)VE

Appendix C. Field sheets

Jacobs

BOREHOLE ID BH02

PROJECT NUMBER	IA254001	**DRILLING METHOD** Hand Auger	**COORDINATES** 240793mE, 6281856mN
PROJECT NAME	GWHU - Stage 2 Contamination Assessment	**TOTAL DEPTH (m)** 1.2	**COORD SYS** GDA94_MGA_zone_56
DRILLING DATE	26 Aug 2021	**DIAMETER (mm)** 100	
LOGGED BY	KM	**SURFACE CONDITIONS** Grass	
CHECKED BY	MS		

COMMENTS

Depth (m)	Sample ID	PID (ppm)	Graphic Log	Material Description	Moisture	Consistency	Additional Observations
				FILL: sand, dark brown, fine grained, some fine gravel (angular), rootlets	SM	L	No staining, No odour
	BH02_0.05	0		Sandy CLAY, light brown, low plasticity, fine grained, some fine to coarse gravel (angular to sub-angular)	SM	S	No staining, No odour
0.1				At 0.1m, colour change to orange and light brown, trace rootlets present	M	S	
0.2					VM	VS	
0.3							
0.4				At 0.4m, colour change to orange and grey, trace fine to medium-coarse gravel (sub-angular) present	M	S	
0.5	BH02_0.5	0		At 0.5m, some rock (weathered shale/siltstone) present	SM	F	No staining, No odour
0.6				At 0.6m, colour change to light brown and light grey	D-SM	St	
0.7							
0.8							
0.9							
1	BH02_1.0	0					
				At 1.05m, tree root present			
1.1				WEATHERED ROCK	D	H	
1.2				Termination at: 1.2 m. Refusal on rock			
1.3							
1.4							

FIELD DATA ABBREVIATIONS

PID	Photo Ionisation Detector (ppm)
QA/QC	Quality Assurance/Quality Control

GROUNDWATER SYMBOLS

▼	Water level (static)
▽	Water level (drilling)

MOISTURE CONDITION

D	Dry
M	Moist
W	Wet
SM	Slightly Moist

DENSITY (N-value)

VL	(very loose)	<10
L	(loose)	10-20
MD	(medium dense)	20-30
D	(dense)	30-50
VD	(very dense)	>50
CO	(compact)	50/150mm

CONSISTENCY (Su)

VS	(very soft)	<12 kPa
S	(soft)	12-25
F	(firm)	25-50
St	(stiff)	50-100
VSt	(very stiff)	100-200
H	(hard)	>200 kPa

Disclaimer This log is intended for environmental not geotechnical purposes.

produced by ESlog.ESdat.net on 01 Nov 2021

BOREHOLE ID BH03

PROJECT NUMBER	IA254001	**DRILLING METHOD**	Hand Auger	**COORDINATES**	240728mE, 6281898mN
PROJECT NAME	GWHU - Stage 2 Contamination Assessment	**TOTAL DEPTH (m)**	0.95	**COORD SYS**	GDA94_MGA_zone_56
DRILLING DATE	26 Aug 2021	**DIAMETER (mm)**	100		
LOGGED BY	KM	**SRFACE CONDITIONS**	Grass		
CHECKED BY	MS				

0.1	BH03_0.05 QC101_210826 QC201_210826	0		FILL: clayey sand, brown, very low plasticity, trace fine gravel (angular), rootlets, glass fragment
0.2				
0.3				FILL: sandy clay, light brown and brown, with highly weathered shale fragments
0.4				
0.5	BH03_0.5	0		At 0.5m, some larger rock fragments
0.6				
0.7				At 0.7m, reduced shale content
0.8				
0.9	BH03_0.9	0		
1				Termination Depth at: 0.95 m. Refusal on rock
1.1				
1.2				
1.3				
1.4				

FIELD DATA ABBREVIATIONS

PID	Photo Ionisation Detector (ppm)
QA/QC	Quality Assurance/Quality Control

GROUNDWATER SYMBOLS

▼	Water level (static)
▽	Water level (drilling)

MOISTURE CONDITION

D	Dry
M	Moist
W	Wet
SM	Slightly Moist

DENSITY (N-value)

VL	(very loose)	<10
L	(loose)	10-20
MD	(medium dense)	20-30
D	(dense)	30-50
VD	(very dense)	>50
CO	(compact)	50/150mm

CONSISTENCY (Su)

VS	(very soft)	<12 kPa
S	(soft)	12-25
F	(firm)	25-50
St	(stiff)	50-100
VSt	(very stiff)	100-200
H	(hard)	>200 kPa

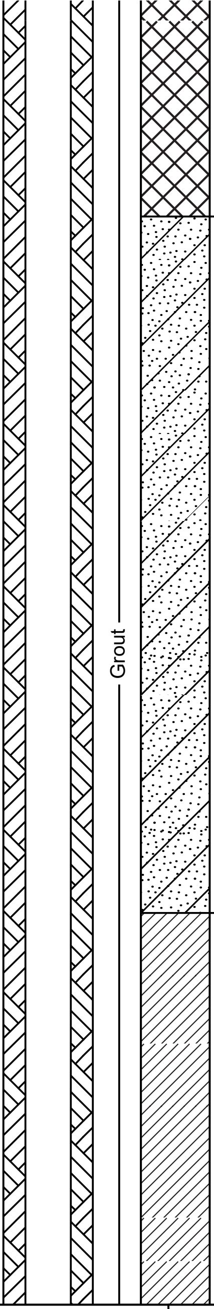
Disclaimer This log is intended for environmental not geotechnical purposes.

produced by ESlog.ESdat.net on 03 Nov 2021

BOREHOLE ID BH04/GW02

PROJECT NUMBER	IA254001	**DRILLING COMPANY**	Macquarie Geotech	**COORDINATES**	239614mE, 6283061mN
PROJECT NAME	GWHU - Stage 2 Contamination Assessment	**DRILL RIG**	Comacchio	**COORD SYS**	GDA94_MGA_zone_56
DRILLING DATE	31 Aug 2021	**DRILLING METHOD**	Solid Auger	**WELL ID**	GW02
LOGGED BY	KM	**TOTAL DEPTH (m)**	13.5		
CHECKED BY	MS	**DIAMETER (mm)**	100		
		SURFACE CONDITIONS	Grass/Gravel		

COMMENTS



Depth (m)	Sample ID	PID	Material Description	Moisture	Consistency	Additional Observations
	BH04_0.05	0	FILL: clayey sand, dark brown, fine grained, some fine to medium-coarse gravel (sub-angular), rootlets	M	L	No staining, No odour
0.2			At 0.05m, brown, trace fine to medium-coarse gravel (sub-angular), some rootlets			
0.4						
	BH04_0.50	0.1	Sandy CLAY, light brown mottled red, very low plasticity, fine grained, trace rootlets	D-SM	S	No staining, No odour
0.6			At 0.6m, minor orange, low plasticity		F	
0.8						
			At 0.9m, minor grey			
1	BH04_1.0	0	At 1.0m, light brown and grey with minor orange/red brown			No staining, No odour
1.2			At 1.2m, minor red, trace fine gravel (rounded)			
1.4						
1.6			At 1.6m, light red/brown and grey	D	F/St	
1.8						
2	BH04_2.0	0				
			Silty CLAY, grey, low plasticity, fine grained, some weathered rock (reddish brown/red)	D	St	No staining, No odour
2.2						
2.4			At 2.4m, increased weathered rock			
2.6						
2.8			At 2.8m, reduced weather rock			
			At 2.9m, light grey, very low plasticity	D	F	
	BH04_3.0	0				

FIELD DATA ABBREVIATIONS

PID	Photo Ionisation Detector (ppm)
QA/QC	Quality Assurance/Quality Control

GROUNDWATER SYMBOLS

▼	Water level (static)
▽	Water level (drilling)

MOISTURE CONDITION

D	Dry
M	Moist
W	Wet
SM	Slightly Moist

DENSITY (N-value)

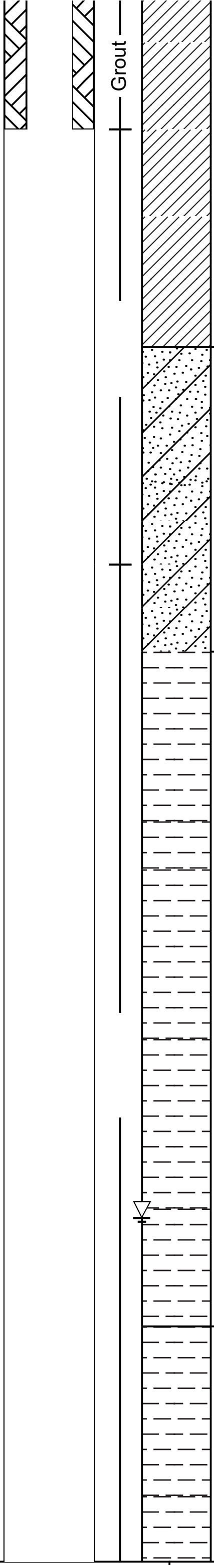
VL	(very loose)	<10
L	(loose)	10-20
MD	(medium dense)	20-30
D	(dense)	30-50
VD	(very dense)	>50
CO	(compact)	50/150mm

CONSISTENCY (Su)

VS	(very soft)	<12 kPa
S	(soft)	12-25
F	(firm)	25-50
St	(stiff)	50-100
VSt	(very stiff)	100-200
H	(hard)	>200 kPa

Disclaimer This log is intended for environmental not geotechnical purposes.

BOREHOLE ID BH04/GW02



Depth (m)	Sample ID	PID	Material Description	Moisture	Consistency	Additional Observations
			At 3.1m, decaying root present			
3.2						
			At 3.3, trace brown/orange			
3.4						
			At 3.5m, trace fine gravel (rounded)			
3.6						
3.8			Silty Sandy CLAY, light red and orange and grey, very low plasticity, fine grained			
4	BH04_4.0	0.1				
4.2			At 4.2m, light grey			
			At 4.3m, light grey and red and trace yellow, with weathered rock			
4.4			At 4.4m, grey and trace orange			
			WEATHERED ROCK, light grey and orange, very low plasticity, medium grained, some fine quartz gravel/sand			
4.6						
4.8						
5	BH04_5.0	0	At 5.0m, light brown and minor red, trace coarse river stone (rounded)			
5.2						
5.4						
5.6						
5.8						
6	BH04_6.0					
			WEATHERED ROCK, dark grey/black			
6.2						
6.4						

FIELD DATA ABBREVIATIONS

PID	Photo Ionisation Detector (ppm)
QA/QC	Quality Assurance/Quality Control

GROUNDWATER SYMBOLS

▼	Water level (static)
∇	Water level (drilling)

MOISTURE CONDITION

D	Dry
M	Moist
W	Wet
SM	Slightly Moist

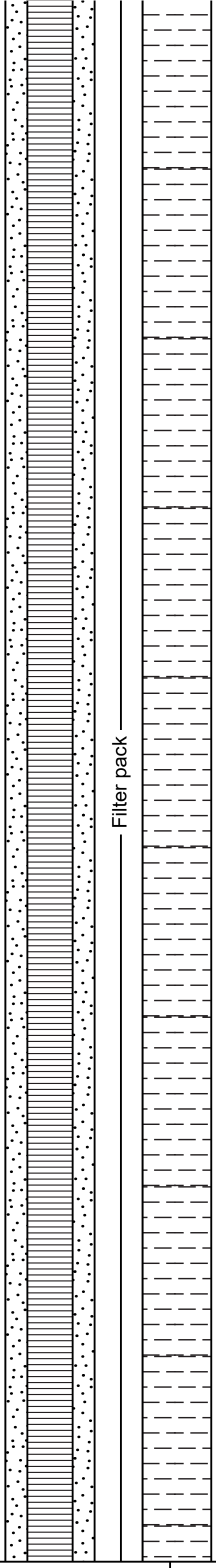
DENSITY (N-value)

VL	(very loose)	<10
L	(loose)	10-20
MD	(medium dense)	20-30
D	(dense)	30-50
VD	(very dense)	>50
CO	(compact)	50/150mm

CONSISTENCY (Su)

VS	(very soft)	<12 kPa
S	(soft)	12-25
F	(firm)	25-50
St	(stiff)	50-100
VSt	(very stiff)	100-200
H	(hard)	>200 kPa

Disclaimer This log is intended for environmental not geotechnical purposes.



Depth (m)	Sample ID	PID	Well Installation Details	Graphic Log	Material Description	Moisture	Consistency	Additional Observations
6.6								
6.8								
7	BH04_7.0							
7.2								
7.4								
7.6								
7.8								
8	BH04_8.0	0						
8.2								
8.4								
8.6								
8.8								
9	BH04_9.0							
9.2								
9.4								
9.6								
9.8								
10	BH04_10.0							

FIELD DATA ABBREVIATIONS

PID	Photo Ionisation Detector (ppm)
QA/QC	Quality Assurance/Quality Control

GROUNDWATER SYMBOLS

▼	Water level (static)
▽	Water level (drilling)

MOISTURE CONDITION

D	Dry
M	Moist
W	Wet
SM	Slightly Moist

DENSITY (N-value)

VL	(very loose)	<10
L	(loose)	10-20
MD	(medium dense)	20-30
D	(dense)	30-50
VD	(very dense)	>50
CO	(compact)	50/150mm

CONSISTENCY (Su)

VS	(very soft)	<12 kPa
S	(soft)	12-25
F	(firm)	25-50
St	(stiff)	50-100
VSt	(very stiff)	100-200
H	(hard)	>200 kPa

Disclaimer This log is intended for environmental not geotechnical purposes.

Depth (m)

10.2
10.4
10.6
10.8
11
11.2
11.4
11.6
11.8
12
12.2
12.4
12.6
12.8
13
13.2
13.4
13.6

FIELD DATA ABBREVIATIONS	
PID	Photo Ionisation Detector (ppm)
QA/QC	Quality Assurance/Quality Control

GROUNDWATER SYMBOLS	
▼	Water level (static)
▽	Water level (drilling)

MOISTURE CONDITION	
D	Dry
M	Moist
W	Wet
SM	Slightly Moist

DENSITY (N-value)		
VL	(very loose)	<10
L	(loose)	10-20
MD	(medium dense)	20-30
D	(dense)	30-50
VD	(very dense)	>50
CO	(compact)	50/150mm

CONSISTENCY (Su)		
VS	(very soft)	<12 kPa
S	(soft)	12-25
F	(firm)	25-50
St	(stiff)	50-100
VSt	(very stiff)	100-200
H	(hard)	>200 kPa

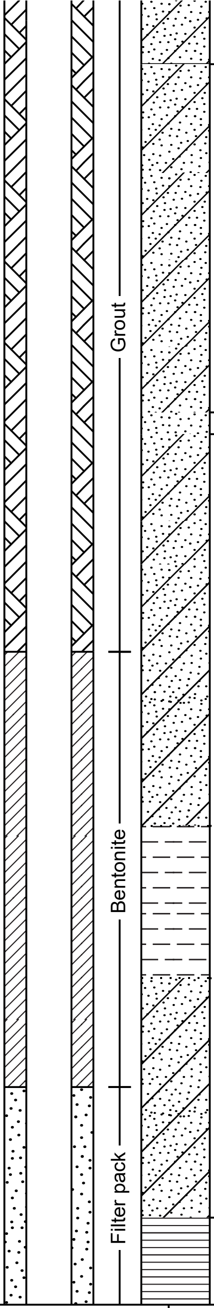
Disclaimer This log is intended for environmental not geotechnical purposes.

BOREHOLE ID BH05/GW03

PROJECT NUMBER	IA254001	**DRILLING COMPANY**	Macquarie Geotech	**COORDINATES**	239393mE, 6283392mN
PROJECT NAME	GWHU - Stage 2 Contamination Assessment	**DRILL RIG**	Comacchio	**COORD SYS**	GDA94_MGA_zone_56
DRILLING DATE	01 Sep 2021	**DRILLING METHOD**	Solid Auger	**WELL ID**	GW03
LOGGED BY	KM	**TOTAL DEPTH (m)**	8.0		
CHECKED BY	MS	**DIAMETER (mm)**	100		
		SURFACE CONDITIONS	Grass		

COMMENTS

Well Installation Details / **Graphic Log**



Depth (m)	Sample ID	PID	Material Description	Moisture	Consistency	Additional Observations
	BH05_0.05 QC101_210901 QC201_210901	0	FILL: clayey sand, dark brown, fine grained, trace fine to coarse gravel (sub-angular), rootlets,	SM	L	No staining, No odour
			Sandy CLAY, orange brown, low plasticity, trace fine gravel (sub-angular), some rootlets	SM	S	No staining, No odour
0.2						
0.4			At 0.4m, light brown and orange, low plasticity, with fine gravel (rounded)	D	F	
	BH05_0.5	0				
0.6			At 0.6m, minor red			
0.8			At 0.8m, grey			
			WEATHERED SANDSTONE, red and brown red, fine grained	D	St-VSt	
1	BH05_1.0	0	Sandy CLAY, light grey mottled orange, very low plasticity, with interbedded weathered sandstone (red/brown mottled grey)	D	St	No staining, No odour
1.2			At 1.2m, decaying root			
			At 1.3m, light grey and reddish brown			
1.4						
1.6						
1.8						
			WEATHERED SILTSTONE, grey and red/purple brown, very low plasticity, very fine grained, trace quartz	D		No staining, No odour
2	BH05_2.0	0				
			At 2.1m, brownish red			
2.2						
			Silty Sandy CLAY, brownish red, very low plasticity	D	St-VSt	No staining, No odour
2.4						
2.6						
2.8			WEATHERED SHALE, grey and brown, very low plasticity, fine grained	D	VSt-H	No staining, No odour
	BH05_3.0	0				

FIELD DATA ABBREVIATIONS

PID	Photo Ionisation Detector (ppm)
QA/QC	Quality Assurance/Quality Control

GROUNDWATER SYMBOLS

▼	Water level (static)
▽	Water level (drilling)

MOISTURE CONDITION

D	Dry
M	Moist
W	Wet
SM	Slightly Moist

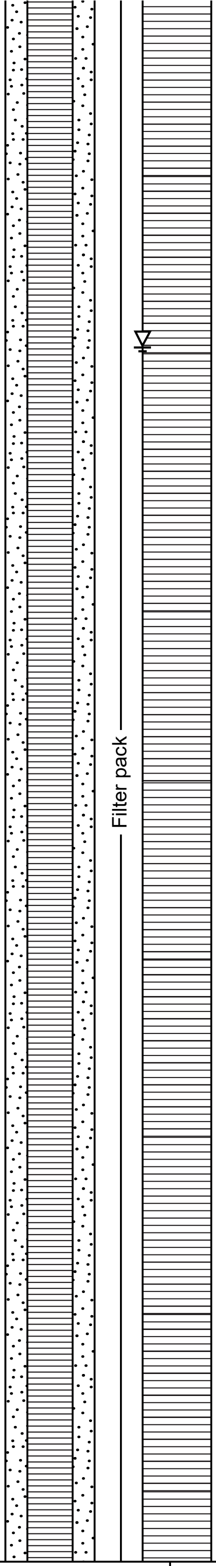
DENSITY (N-value)

VL	(very loose)	<10
L	(loose)	10-20
MD	(medium dense)	20-30
D	(dense)	30-50
VD	(very dense)	>50
CO	(compact)	50/150mm

CONSISTENCY (Su)

VS	(very soft)	<12 kPa
S	(soft)	12-25
F	(firm)	25-50
St	(stiff)	50-100
VSt	(very stiff)	100-200
H	(hard)	>200 kPa

Disclaimer This log is intended for environmental not geotechnical purposes.



Depth (m)	Sample ID	PID	Material Description	Moisture	Consistency	Additional Observations
3.2						
3.4						
3.6						
3.8						
4	BH05_4.0	0	At 4.0m, dark grey and brown			No staining, No odour
4.2						
4.4						
4.6						
4.8			At 4.8m, dark grey and black, fine grained	D	H	No staining, No odour
5	BH05_5.0 BH05_5.0					
5.2						
5.4						
5.6						
5.8						
6	BH05_6.0					
6.2						
6.4						

FIELD DATA ABBREVIATIONS

PID	Photo Ionisation Detector (ppm)
QA/QC	Quality Assurance/Quality Control

GROUNDWATER SYMBOLS

▼	Water level (static)
▽	Water level (drilling)

MOISTURE CONDITION

D	Dry
M	Moist
W	Wet
SM	Slightly Moist

DENSITY (N-value)

VL	(very loose)	<10
L	(loose)	10-20
MD	(medium dense)	20-30
D	(dense)	30-50
VD	(very dense)	>50
CO	(compact)	50/150mm

CONSISTENCY (Su)

VS	(very soft)	<12 kPa
S	(soft)	12-25
F	(firm)	25-50
St	(stiff)	50-100
VSt	(very stiff)	100-200
H	(hard)	>200 kPa

Disclaimer This log is intended for environmental not geotechnical purposes.

Depth (m)

6.6
6.8
7
7.2
7.4
7.6
7.8
8
8.2
8.4
8.6
8.8
9
9.2
9.4
9.6
9.8
10

FIELD DATA ABBREVIATIONS

PID	Photo Ionisation Detector (ppm)
QA/QC	Quality Assurance/Quality Control

GROUNDWATER SYMBOLS

▼	Water level (static)
▽	Water level (drilling)

MOISTURE CONDITION

D	Dry
M	Moist
W	Wet
SM	Slightly Moist

DENSITY (N-value)

VL	(very loose)	<10
L	(loose)	10-20
MD	(medium dense)	20-30
D	(dense)	30-50
VD	(very dense)	>50
CO	(compact)	50/150mm

CONSISTENCY (Su)

VS	(very soft)	<12 kPa
S	(soft)	12-25
F	(firm)	25-50
St	(stiff)	50-100
VSt	(very stiff)	100-200
H	(hard)	>200 kPa

Disclaimer This log is intended for environmental not geotechnical purposes.

BOREHOLE ID BH06

PROJECT NUMBER IA254001
PROJECT NAME GWHU - Stage 2 Contamination Assessment
DRILLING DATE 02 Sep 2021
LOGGED BY NK
CHECKED BY MS

DRILLING METHOD Hand Auger
TOTAL DEPTH (m) 0.86
DIAMETER (mm) 50
SURFACE CONDITIONS Grass

COORDINATES 238960mE, 6283722mN
COORD SYS GDA94_MGA_zone_56

Depth (m)	Sample ID	PID	Graphic Log	Material Description	Moisture	Consistency	Additional Observations
	BH06_0.05	0.1	▩	FILL: silty clay, dark brown, low plasticity, fine grained, some rootlets	M	S	No staining, No odour
0.1			▩	At 0.1m, brown mottled orange			
0.2			▩				
0.3			▨	CLAY, pale brown mottled orange, low plasticity, fine grained, with sand	W	S	No staining, No odour
0.4			▨	At 0.4m, orange, very low plasticity	M		No staining, No odour
0.5	BH06_0.5	0	▨				
0.6			▨				
0.7			▨	At 0.7m, orange mottled white, with medium gravel (angular)			No staining, No odour
0.8	BH06_0.82	0	▨	WEATHERED SANDSTONE			
0.9				Termination Depth at: 0.86 m. Refusal on weathered sandstone			
1							
1.1							
1.2							
1.3							
1.4							

FIELD DATA ABBREVIATIONS

PID	Photo Ionisation Detector (ppm)
QA/QC	Quality Assurance/Quality Control

GROUNDWATER SYMBOLS

▼	Water level (static)
▽	Water level (drilling)

MOISTURE CONDITION

D	Dry
M	Moist
W	Wet
SM	Slightly Moist

DENSITY (N-value)

VL	(very loose)	<10
L	(loose)	10-20
MD	(medium dense)	20-30
D	(dense)	30-50
VD	(very dense)	>50
CO	(compact)	50/150mm

CONSISTENCY (Su)

VS	(very soft)	<12 kPa
S	(soft)	12-25
F	(firm)	25-50
St	(stiff)	50-100
VSt	(very stiff)	100-200
H	(hard)	>200 kPa

BOREHOLE ID BH07

PROJECT NUMBER	IA254001	**DRILLING METHOD**	Hand Auger	**COORDINATES**	238463mE, 6284091mN
PROJECT NAME	GWHU - Stage 2 Contamination Assessment	**TOTAL DEPTH (m)**	0.76	**COORD SYS**	GDA94_MGA_zone_56
DRILLING DATE	07 Sep 2021	**DIAMETER (mm)**	50		
LOGGED BY	NK	**SURFACE CONDITIONS**	Grass		
CHECKED BY	MS				

Depth (m)	Sample ID	PID	Graphic Log	Material Description	Moisture	Consistency	Additional Observations
0.1	BH07_0.05	0.3	▩	FILL: sandy clay, brown and dark brown, low plasticity, fine grained, with fine to medium gravel (sub-rounded), some rootlets	SM	S	No staining, No odour
0.2 0.3 0.4			▨	Clayey SAND, light brown, coarse grained, with increased gravel	W	S	No staining, No odour
0.5 0.6	BH07_0.5	0.4	░	CLAY, light brown mottled orange, with fine sand and gravel (sub-rounded)	W	VSt	No staining, No odour
0.7	BH07_0.76			CLAY, light brown and orange, with sand	M	VSt	No staining, No odour
0.8 0.9 1 1.1 1.2 1.3 1.4				Termination Depth at: 0.76 m. Refusal on weathered sandstone			

FIELD DATA ABBREVIATIONS

PID	Photo Ionisation Detector (ppm)
QA/QC	Quality Assurance/Quality Control

GROUNDWATER SYMBOLS

▼	Water level (static)
▽	Water level (drilling)

MOISTURE CONDITION

D	Dry
M	Moist
W	Wet
SM	Slightly Moist

DENSITY (N-value)

VL	(very loose)	<10
L	(loose)	10-20
MD	(medium dense)	20-30
D	(dense)	30-50
VD	(very dense)	>50
CO	(compact)	50/150mm

CONSISTENCY (Su)

VS	(very soft)	<12 kPa
S	(soft)	12-25
F	(firm)	25-50
St	(stiff)	50-100
VSt	(very stiff)	100-200
H	(hard)	>200 kPa

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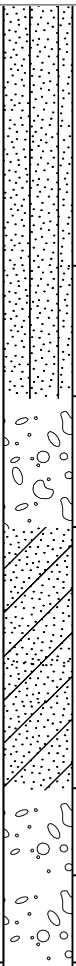
Jacobs

BOREHOLE ID BH08

PROJECT NUMBER	IA254001	**DRILLING METHOD**	Hand Auger	**COORDINATES**	238363mE, 6284693mN
PROJECT NAME	GWHU - Stage 2 Contamination Assessment	**TOTAL DEPTH (m)**	1.1	**COORD SYS**	GDA94_MGA_zone_56
DRILLING DATE	16 Sep 2021	**DIAMETER (mm)**	50		
LOGGED BY	NK	**SURFACE CONDITIONS**	Grass		
CHECKED BY	MS				



	BH08_0.05	0.1	Sandy SILT, brown, fine grained, some clay	D	MD	No staining, No odour
0.1						
0.2						
0.3			Silty SAND, pale brown mottled orange, fine to medium grained, some clay	M	MD	No staining, No odour
0.4						
			Sandy GRAVEL, orange, medium to coarse grained, sub-rounded	M	L	No staining, No odour
0.5	BH08_0.5 QC101_210916 QC201_210916	0.1				
0.6			CLAY, pale brown mottled orange, fine grained, some fine quartz gravel (sub-rounded)	M	VSt	No staining, No odour
0.7						
0.8			At 0.8m, orange and pale yellow, increased gravel and sand content			
0.9			Sandy GRAVEL, orange, medium to coarse grained, sub-rounded, some clay, some quartz gravel	D	L	No staining, No odour
1	BH08_1.0	0.1	SAND, orange, with medium to coarse gravel (sub-angular)	D	L	No staining, No odour
1.1			Termination Depth at: 1.1 m. Refusal on weathered sandstone			
1.2						
1.3						
1.4						

FIELD DATA ABBREVIATIONS

PID	Photo Ionisation Detector (ppm)
QA/QC	Quality Assurance/Quality Control

GROUNDWATER SYMBOLS

▼	Water level (static)
▽	Water level (drilling)

MOISTURE CONDITION

D	Dry
M	Moist
W	Wet
SM	Slightly Moist

DENSITY (N-value)

VL	(very loose)	<10
L	(loose)	10-20
MD	(medium dense)	20-30
D	(dense)	30-50
VD	(very dense)	>50
CO	(compact)	50/150mm

CONSISTENCY (Su)

VS	(very soft)	<12 kPa
S	(soft)	12-25
F	(firm)	25-50
St	(stiff)	50-100
VSt	(very stiff)	100-200
H	(hard)	>200 kPa

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Jacobs

BOREHOLE ID BH10

PROJECT NUMBER	IA254001	**DRILLING METHOD**	Hand Auger	**COORDINATES**	237447mE, 6284807mN
PROJECT NAME	GWHU - Stage 2 Contamination Assessment	**TOTAL DEPTH (m)**	1.1	**COORD SYS**	GDA94_MGA_zone_56
DRILLING DATE	16 Sep 2021	**DIAMETER (mm)**	50		
LOGGED BY	NK	**SURFACE CONDITIONS**	Grass		
CHECKED BY	MS				

			FILL: sandy silt, brown, fine grained, some rootlets	D	VS	No staining, No odour
	BH10_0.05	0.5				
0.1						
0.2						
0.3			Silty SAND, light brown mottled black, medium grained, some clay	M	L	No staining, No odour
0.4						
0.5	BH10_0.5	0.1				
0.6						
0.7						
0.8			At 0.8m, orange, coarse grained, with medium gravel (rounded)	M	L	No staining, No odour
0.9						
1	BH10_1.0	0.3	SAND, orange mottled black, coarse grained, some medium gravel (rounded)	M	L	No staining, No odour
1.1			Termination Depth at: 1.1 m. Auger refusal			
1.2						
1.3						
1.4						

FIELD DATA ABBREVIATIONS

PID	Photo Ionisation Detector (ppm)
QA/QC	Quality Assurance/Quality Control

GROUNDWATER SYMBOLS

▼	Water level (static)
▽	Water level (drilling)

MOISTURE CONDITION

D	Dry
M	Moist
W	Wet
SM	Slightly Moist

DENSITY (N-value)

VL	(very loose)	<10
L	(loose)	10-20
MD	(medium dense)	20-30
D	(dense)	30-50
VD	(very dense)	>50
CO	(compact)	50/150mm

CONSISTENCY (Su)

VS	(very soft)	<12 kPa
S	(soft)	12-25
F	(firm)	25-50
St	(stiff)	50-100
VSt	(very stiff)	100-200
H	(hard)	>200 kPa

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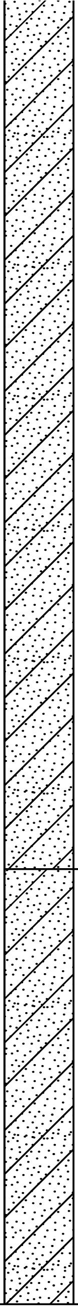
BOREHOLE ID BH11

PROJECT NUMBER	IA254001	**DRILLING COMPANY**	Macquarie Geotech	**COORDINATES**	237376mE, 6284845mN
PROJECT NAME	GWHU - Stage 2 Contamination Assessment	**DRILL RIG**	Comacchio	**COORD SYS**	GDA94_MGA_zone_56
DRILLING DATE	02 Sep 2021	**DRILLING METHOD**	Solid Auger	**WELL ID**	GW05
LOGGED BY	NK	**TOTAL DEPTH (m)**	1.65		
CHECKED BY	MS	**DIAMETER (mm)**	100		
		SURFACE CONDITIONS	Dirt/Grass		



Depth (m)	Sample ID	PID	Graphic Log	Material Description	Moisture	Consistency	Additional Observations
		0		Clayey SAND, brown, medium grained, some rootlets	D	L	No staining, No odour
0.1							
0.2							
0.3							
0.4							
0.5		2.2					
0.6							
0.7							
0.8							
0.9							
1	BH11_1.0	0.3		Sandy CLAY, light brown, coarse grained, with fine gravel (sub-rounded)	M	MD	No staining, No odour
1.1							
1.2							
1.3							
1.4							

FIELD DATA ABBREVIATIONS

PID	Photo Ionisation Detector (ppm)
QA/QC	Quality Assurance/Quality Control

GROUNDWATER SYMBOLS

▼	Water level (static)
▽	Water level (drilling)

MOISTURE CONDITION

D	Dry
M	Moist
W	Wet
SM	Slightly Moist

DENSITY (N-value)

VL	(very loose)	<10
L	(loose)	10-20
MD	(medium dense)	20-30
D	(dense)	30-50
VD	(very dense)	>50
CO	(compact)	50/150mm

CONSISTENCY (Su)

VS	(very soft)	<12 kPa
S	(soft)	12-25
F	(firm)	25-50
St	(stiff)	50-100
VSt	(very stiff)	100-200
H	(hard)	>200 kPa

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Depth (m)					
1.6		0.1		Silty SAND, light brown, medium grained	
1.7 1.8 1.9 2 2.1 2.2 2.3 2.4 2.5 2.6 2.7 2.8 2.9 3 3.1 3.2				Termination Depth of Soil Bore at: 1.7 m. Refusal on rock. Borehole continued by geotechnical team.	

FIELD DATA ABBREVIATIONS

PID	Photo Ionisation Detector (ppm)
QA/QC	Quality Assurance/Quality Control

GROUNDWATER SYMBOLS

▼	Water level (static)
▽	Water level (drilling)

MOISTURE CONDITION

D	Dry
M	Moist
W	Wet
SM	Slightly Moist

DENSITY (N-value)

VL	(very loose)	<10
L	(loose)	10-20
MD	(medium dense)	20-30
D	(dense)	30-50
VD	(very dense)	>50
CO	(compact)	50/150mm

CONSISTENCY (Su)

VS	(very soft)	<12 kPa
S	(soft)	12-25
F	(firm)	25-50
St	(stiff)	50-100
VSt	(very stiff)	100-200
H	(hard)	>200 kPa

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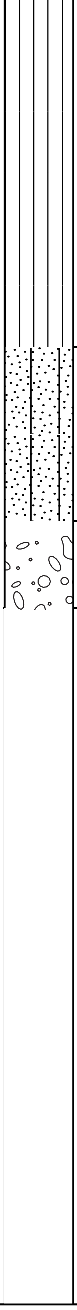
BOREHOLE ID BH13

PROJECT NUMBER	IA254001	**DRILLING METHOD**	Hand Auger	**COORDINATES**	235238mE, 6286840mN
PROJECT NAME	GWHU - Stage 2 Contamination Assessment	**TOTAL DEPTH (m)**	0.7	**COORD SYS**	GDA94_MGA_zone_56
DRILLING DATE	15 Sep 2021	**DIAMETER (mm)**	50		
LOGGED BY	NK	**SURFACE CONDITIONS**	Grass		
CHECKED BY	MS				

COMMENTS

Depth (m)	**Sample ID**	**PID**	**Graphic Log**	**Material Description**	**Moisture**	**Consistency**	**Additional Observations**
0.1	BH13_0.05	0		Clayey SILT, dark brown, fine grained, some medium to coarse gravel (sub-rounded), some rootlets, burnt wood fragements	D	VS	No staining, No odour
0.2 0.3				At 0.2m, brown, low plasticity, trace sand	M		No staining, No odour
0.4				Silty SAND, brown, medium grained, with clay (low plasticity), some medium gravel (sub-angular)	M	L	No staining, No odour
0.5	BH13_0.5	0		At 0.5m, increased gravel content			
0.6	BH13_0.7	0.1		SAND, light brown mottled orange, medium grained, with medium to coarse gravel (rounded)	W	L	No staining, No odour
0.7 0.8 0.9 1 1.1 1.2 1.3 1.4				Termination Depth at: 0.7 m. Refusal on rock			

FIELD DATA ABBREVIATIONS

PID	Photo Ionisation Detector (ppm)
QA/QC	Quality Assurance/Quality Control

GROUNDWATER SYMBOLS

▼	Water level (static)
▽	Water level (drilling)

MOISTURE CONDITION

D	Dry
M	Moist
W	Wet
SM	Slightly Moist

DENSITY (N-value)

VL	(very loose)	<10
L	(loose)	10-20
MD	(medium dense)	20-30
D	(dense)	30-50
VD	(very dense)	>50
CO	(compact)	50/150mm

CONSISTENCY (Su)

VS	(very soft)	<12 kPa
S	(soft)	12-25
F	(firm)	25-50
St	(stiff)	50-100
VSt	(very stiff)	100-200
H	(hard)	>200 kPa

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Jacobs

BOREHOLE ID BH14

PROJECT NUMBER	IA254001	**DRILLING METHOD**	Hand Auger	**COORDINATES**	234931mE, 6287541mN
PROJECT NAME	GWHU - Stage 2 Contamination Assessment	**TOTAL DEPTH (m)**	1.5	**COORD SYS**	GDA94_MGA_zone_56
DRILLING DATE	26 Aug 2021	**DIAMETER (mm)**	100		
LOGGED BY	KM	**SURFACE CONDITIONS**	Grass		
CHECKED BY	MS				

COMMENTS

Depth (m)	Sample ID	PID	Graphic Log	Material Description	Moisture	Consistency	Additional Observations
	BH14_0.05	0		Sandy CLAY, dark brown, low plasticity, fine to medium grained, some fine to coarse gravel (sub-angular to angular), rootlets	M	S	No staining, No odour
0.1				Sandy CLAY, dark brown, fine to medium grained, some gravel and sandstone rubble, trace rocks, trace rootlets	M	S	
0.2							
0.3							
0.4				Sandy CLAY, brown, low plasticity, some medium coarse gravel (sub-angular to angular), trace black coal fines	VM	S	No staining, No odour
0.5	BH14_0.5	0					
0.6				At 0.6m, dark brown	W	VS	
0.7				At 0.7m, dark brown and dark grey	M	VS	
0.8				At 0.8m, dark grey and black			
0.9							
1	BH14_1.0	0		At 1.0m, dark brown			No staining, No odour
1.1				At 1.1m, grey			
1.2				At 1.2m, grey and brown mottled orange, low plasticity, some weathered sandstone gravels (grey)	M	St	
1.3							
1.4				At 1.4m, orange and brown			No staining, No odour
1.5	BH14_1.5	0		Termination Depth at: 1.5 m. Target depth.			

FIELD DATA ABBREVIATIONS

PID	Photo Ionisation Detector (ppm)
QA/QC	Quality Assurance/Quality Control

GROUNDWATER SYMBOLS

▼	Water level (static)
▽	Water level (drilling)

MOISTURE CONDITION

D	Dry
M	Moist
W	Wet
SM	Slightly Moist

DENSITY (N-value)

VL	(very loose)	<10
L	(loose)	10-20
MD	(medium dense)	20-30
D	(dense)	30-50
VD	(very dense)	>50
CO	(compact)	50/150mm

CONSISTENCY (Su)

VS	(very soft)	<12 kPa
S	(soft)	12-25
F	(firm)	25-50
St	(stiff)	50-100
VSt	(very stiff)	100-200
H	(hard)	>200 kPa

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BOREHOLE ID BH15

PROJECT NUMBER	IA254001	**DRILLING COMPANY**	Macquarie Geotech	**COORDINATES**	233266mE, 6287693mN
PROJECT NAME	GWHU - Stage 2 Contamination Assessment	**DRILL RIG**	Comacchio	**COORD SYS**	GDA94_MGA_zone_56
DRILLING DATE	08 Sep 2021	**DRILLING METHOD**	Solid Auger		
LOGGED BY	NK	**TOTAL DEPTH (m)**	6.0		
CHECKED BY	MS	**DIAMETER (mm)**	100		

Depth	Sample	PID	Description
	BH15_0.05	0.3	FILL: clay, brown, fine grained, with silt, some medium gravel (sub-angular), some rootlets
			CLAY, orange, fine grained
0.1			
0.2			
0.3			
0.4			
0.5	BH15_0.5	0.1	Silty CLAY, orange mottled grey, some medium gravel (sub-angular)
0.6			
0.7			
0.8			
0.9			
1	BH15_1.0	0	
1.1			
1.2			
1.3			
1.4			

FIELD DATA ABBREVIATIONS

PID	Photo Ionisation Detector (ppm)
QA/QC	Quality Assurance/Quality Control

GROUNDWATER SYMBOLS

▼	Water level (static)
▽	Water level (drilling)

MOISTURE CONDITION

D	Dry
M	Moist
W	Wet
SM	Slightly Moist

DENSITY (N-value)

VL	(very loose)	<10
L	(loose)	10-20
MD	(medium dense)	20-30
D	(dense)	30-50
VD	(very dense)	>50
CO	(compact)	50/150mm

CONSISTENCY (Su)

VS	(very soft)	<12 kPa
S	(soft)	12-25
F	(firm)	25-50
St	(stiff)	50-100
VSt	(very stiff)	100-200
H	(hard)	>200 kPa

Disclaimer This log is intended for environmental not geotechnical purposes.

Depth (m)

1.6
1.7
1.8
1.9
2
2.1
2.2
2.3
2.4
2.5
2.6
2.7
2.8
2.9
3
3.1
3.2

FIELD DATA ABBREVIATIONS

PID	Photo Ionisation Detector (ppm)
QA/QC	Quality Assurance/Quality Control

GROUNDWATER SYMBOLS

▼	Water level (static)
▽	Water level (drilling)

MOISTURE CONDITION

D	Dry
M	Moist
W	Wet
SM	Slightly Moist

DENSITY (N-value)

VL	(very loose)	<10
L	(loose)	10-20
MD	(medium dense)	20-30
D	(dense)	30-50
VD	(very dense)	>50
CO	(compact)	50/150mm

CONSISTENCY (Su)

VS	(very soft)	<12 kPa
S	(soft)	12-25
F	(firm)	25-50
St	(stiff)	50-100
VSt	(very stiff)	100-200
H	(hard)	>200 kPa

Disclaimer This log is intended for environmental not geotechnical purposes.

Depth (m)			
3.3			
3.4			
3.5			
3.6			
3.7			
3.8			
3.9			
4		At 4.0m, light grey	
4.1			
4.2			
4.3			
4.4			
4.5			
4.6			
4.7			
4.8			
4.9			
5			

FIELD DATA ABBREVIATIONS

PID	Photo Ionisation Detector (ppm)
QA/QC	Quality Assurance/Quality Control

GROUNDWATER SYMBOLS

▼	Water level (static)
▽	Water level (drilling)

MOISTURE CONDITION

D	Dry
M	Moist
W	Wet
SM	Slightly Moist

DENSITY (N-value)

VL	(very loose)	<10
L	(loose)	10-20
MD	(medium dense)	20-30
D	(dense)	30-50
VD	(very dense)	>50
CO	(compact)	50/150mm

CONSISTENCY (Su)

VS	(very soft)	<12 kPa
S	(soft)	12-25
F	(firm)	25-50
St	(stiff)	50-100
VSt	(very stiff)	100-200
H	(hard)	>200 kPa

Disclaimer This log is intended for environmental not geotechnical purposes.

Depth (m)	Sample ID	PID	Graphic Log	Material Description	Moisture	Consistency	Additional Observations
5.1 5.2 5.3 5.4 5.5 5.6 5.7 5.8 5.9							
6 6.1 6.2 6.3 6.4 6.5 6.6 6.7 6.8				Termination Depth at: 6.0 m. Auger Refusal			

FIELD DATA ABBREVIATIONS

PID	Photo Ionisation Detector (ppm)
QA/QC	Quality Assurance/Quality Control

GROUNDWATER SYMBOLS

▼	Water level (static)
▽	Water level (drilling)

MOISTURE CONDITION

D	Dry
M	Moist
W	Wet
SM	Slightly Moist

DENSITY (N-value)

VL	(very loose)	<10
L	(loose)	10-20
MD	(medium dense)	20-30
D	(dense)	30-50
VD	(very dense)	>50
CO	(compact)	50/150mm

CONSISTENCY (Su)

VS	(very soft)	<12 kPa
S	(soft)	12-25
F	(firm)	25-50
St	(stiff)	50-100
VSt	(very stiff)	100-200
H	(hard)	>200 kPa

Disclaimer This log is intended for environmental not geotechnical purposes.

BOREHOLE ID BH16

PROJECT NUMBER	IA254001	**DRILLING METHOD**	Hand Auger	**COORDINATES**	232729mE, 6288451mN
PROJECT NAME	GWHU - Stage 2 Contamination Assessment	**TOTAL DEPTH (m)**	1.5	**COORD SYS**	GDA94_MGA_zone_56
DRILLING DATE	13 Sep 2021	**DIAMETER (mm)**	50		
LOGGED BY	NK	**SURFACE CONDITIONS**	Grass		
CHECKED BY	MS				

Depth (m)	Sample ID	PID	Graphic Log	Material Description	Moisture	Consistency	Additional Observations
				FILL: Silty CLAY, dark brown, low plasticity, fine grained, some rootlets	M	S	No staining, No odour
		0					
0.1							
0.2							
0.3				At 0.3m, with sand			
0.4				CLAY, grey mottled orange, fine grained, some sand	M	St	No staining, No odour
0.5		0		At 0.5m, light brown mottled orange, trace medium gravel (angular)			No staining, No odour
0.6							
				At 0.65m, grey mottled orange	M	VSt	
0.7							
				CLAY, with sand			
0.8							
0.9				At 0.9m, grey mottled dark brown and orange			No staining, No odour
1		0					
1.1							
1.2				Silty CLAY, orange mottled grey, low plasticity, fine grained, with sand	D	S	No staining, No odour
1.3							
1.4							
1.5				Termination Depth at: 1.5 m. Target depth.			

FIELD DATA ABBREVIATIONS

PID	Photo Ionisation Detector (ppm)
QA/QC	Quality Assurance/Quality Control

GROUNDWATER SYMBOLS

▼	Water level (static)
▽	Water level (drilling)

MOISTURE CONDITION

D	Dry
M	Moist
W	Wet
SM	Slightly Moist

DENSITY (N-value)

VL	(very loose)	<10
L	(loose)	10-20
MD	(medium dense)	20-30
D	(dense)	30-50
VD	(very dense)	>50
CO	(compact)	50/150mm

CONSISTENCY (Su)

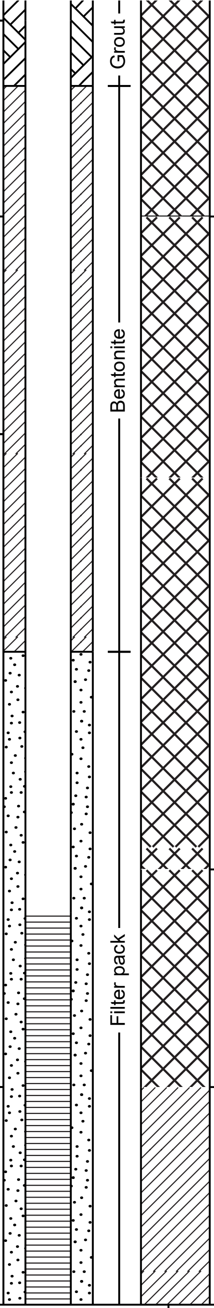
VS	(very soft)	<12 kPa
S	(soft)	12-25
F	(firm)	25-50
St	(stiff)	50-100
VSt	(very stiff)	100-200
H	(hard)	>200 kPa

Disclaimer This log is intended for environmental not geotechnical purposes.

BOREHOLE ID BH17/GW07

PROJECT NUMBER	IA254001	**DRILLING COMPANY**	Macquarie Geotech	**COORDINATES**	232901mE, 6288798mN
PROJECT NAME	GWHU - Stage 2 Contamination Assessment	**DRILL RIG**	Comacchio	**COORD SYS**	GDA94_MGA_zone_56
DRILLING DATE	09 Sep 2021	**DRILLING METHOD**	Solid Auger	**WELL ID**	GW07
LOGGED BY	NK	**TOTAL DEPTH (m)**	8.1		
CHECKED BY	MS	**DIAMETER (mm)**	100		
		SURFACE CONDITIONS	Grass/Gravel		

COMMENTS



Depth (m)	Sample ID	PID	Well Installation Details	Graphic Log	Material Description	Moisture	Consistency	Additional Observations
	BH17_0.05	0.1	Grout		FILL: sandy silt, dark brown, fine to medium grained, some clay, some fine gravel (sub-angular),	D	L	No staining, No odour
0.2			Bentonite					
0.4	BH17_0.5	0						
					FILL:sand , light orange, medium grained, some clay, some medium to coarse gravel (sub-angular)	D	L	No staining, No odour
1	BH17_1.0	0						
					At 1.1m, some weathered sandstone			
1.6			Filter pack					
2					FILL: BLUE METAL, dark grey, medium to coarse grained, angular, with sand, some clay	D	L	No staining, No odour
2.4	BH17_2.5	0						
					CLAY, grey mottled orange, medium plasticity, fine grained	M	S	No staining, No odour
2.8								

FIELD DATA ABBREVIATIONS

PID	Photo Ionisation Detector (ppm)
QA/QC	Quality Assurance/Quality Control

GROUNDWATER SYMBOLS

▼	Water level (static)
▽	Water level (drilling)

MOISTURE CONDITION

D	Dry
M	Moist
W	Wet
SM	Slightly Moist

DENSITY (N-value)

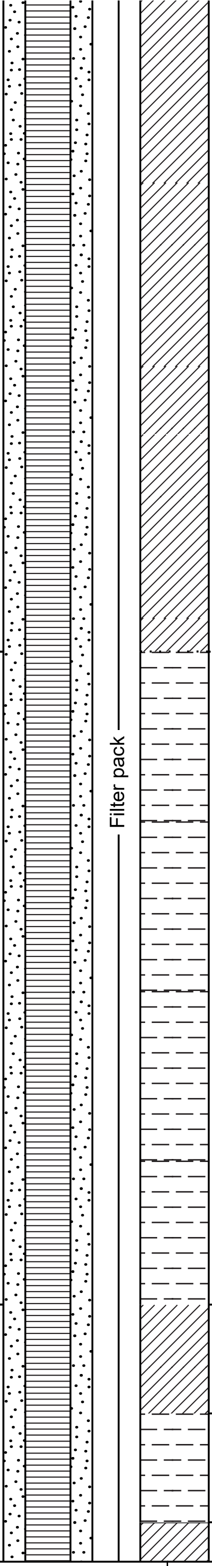
VL	(very loose)	<10
L	(loose)	10-20
MD	(medium dense)	20-30
D	(dense)	30-50
VD	(very dense)	>50
CO	(compact)	50/150mm

CONSISTENCY (Su)

VS	(very soft)	<12 kPa
S	(soft)	12-25
F	(firm)	25-50
St	(stiff)	50-100
VSt	(very stiff)	100-200
H	(hard)	>200 kPa

Disclaimer This log is intended for environmental not geotechnical purposes.

BOREHOLE ID BH17/GW07



Depth (m)	Sample ID	PID	Well Installation Details	Graphic Log	Material Description	Moisture	Consistency	Additional Observations
					At 4.0m, grey mottled brown, low plasticity, fine grained, with medium gravel (angular)	M	F	No staining, No odour
	BH17_4.5	0.5			WEATHERED SILTSTONE, grey	D	L	
	BH17_6.0	0.1			CLAY, grey, low plasticity, fine grained, with silt, some fine gravel (angular)	W	S	No staining, No odour
					WEATHERED SILTSTONE, grey	M	H	
					CLAY, light grey, low plasticity, fine grained, with fine to medium gravel (sub-angular)	W	S	No staining, No odour

Depth scale: 3.2, 3.4, 3.6, 3.8, 4, 4.2, 4.4, 4.6, 4.8, 5, 5.2, 5.4, 5.6, 5.8, 6, 6.2, 6.4

FIELD DATA ABBREVIATIONS

PID	Photo Ionisation Detector (ppm)
QA/QC	Quality Assurance/Quality Control

GROUNDWATER SYMBOLS

▼	Water level (static)
▽	Water level (drilling)

MOISTURE CONDITION

D	Dry
M	Moist
W	Wet
SM	Slightly Moist

DENSITY (N-value)

VL	(very loose)	<10
L	(loose)	10-20
MD	(medium dense)	20-30
D	(dense)	30-50
VD	(very dense)	>50
CO	(compact)	50/150mm

CONSISTENCY (Su)

VS	(very soft)	<12 kPa
S	(soft)	12-25
F	(firm)	25-50
St	(stiff)	50-100
VSt	(very stiff)	100-200
H	(hard)	>200 kPa

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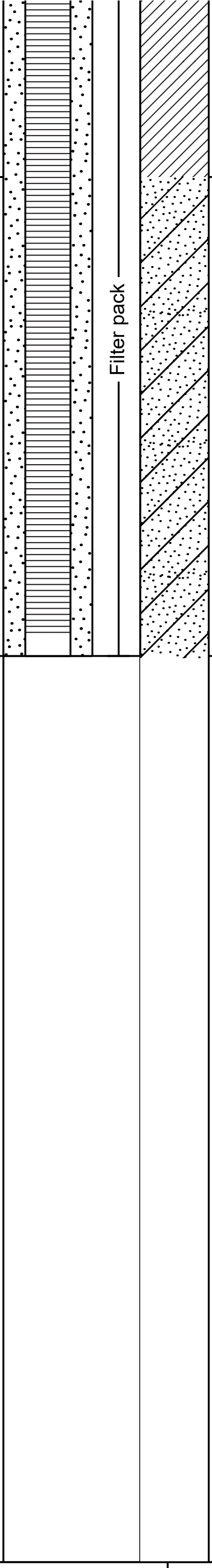

Depth (m)	Sample ID	PID	Well Installation Details	Graphic Log	Material Description	Moisture	Consistency	Additional Observations
6.6 6.8 7	BH17_7.0	0.1						
7 7.2 7.4 7.6 7.8 8			Filter pack		Sandy CLAY, grey mottled white, low plasticity, fine to medium grained, with fine to medium gravel (angular)	M	F	
8.2 8.4 8.6 8.8 9 9.2 9.4 9.6 9.8 10					Termination Depth at: 8.1 m. Auger Refusal			

FIELD DATA ABBREVIATIONS

PID	Photo Ionisation Detector (ppm)
QA/QC	Quality Assurance/Quality Control

GROUNDWATER SYMBOLS

▼	Water level (static)
▽	Water level (drilling)

MOISTURE CONDITION

D	Dry
M	Moist
W	Wet
SM	Slightly Moist

DENSITY (N-value)

VL	(very loose)	<10
L	(loose)	10-20
MD	(medium dense)	20-30
D	(dense)	30-50
VD	(very dense)	>50
CO	(compact)	50/150mm

CONSISTENCY (Su)

VS	(very soft)	<12 kPa
S	(soft)	12-25
F	(firm)	25-50
St	(stiff)	50-100
VSt	(very stiff)	100-200
H	(hard)	>200 kPa

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WELL DEVELOPMENT, GAUGING AND SAMPLING DATA SHEET

WELL No : 6W01

Jacobs

Project No : IA254001
Project Name : 6WHO

Gauging

Date : 9/4/21
Performed By : NK
Gauging Method : interface meter
Well Diameter : 50mm
Time : 0900
Bore Depth : 10.873
LNAPL Present : Y / [✓ N]
SWL : 5.665
Depth to LNAPL : -
(If yes, thickness) :
Comments : ~~[illegible]~~
DNAPL Present : Y / [✓ N]
(If yes, thickness) :
Maintainance required :
Visual confirmation with bailer : Y / N
Photo Number :

Purging / Development

Date : 9/4/21
Performed By : Nk
Well Diameter : 50mm
Purge Method : submersible pump / bailer
Time Started : ~~0~~0905
SWL (start) : 5.665
Volume Removed :
Bore Depth (start) :
Time Stopped :
SWL (end) :
Discharge Rate :
Bore Depth (end) :
Comments : 3x well vol = ~~[illegible]~~ 31L
NAPL Present : Y / N
(If yes, thickness) :

Sampling

Date : 14/9/21 / 20/9/21
Performed By : NK
Well Diameter : 50mm
Sampling Method : Hydasleeve
Time Started : 11am / ~~[illegible]~~ 14:00
Sampling Depth : bottom of well
Time Stopped : 16:43
SWL (start) : 9.915
Tubing Type :
SWL (end) : 10.325
Comments : - well not recharging
Duplicate Sample Collected? Y / [✓ N]
Duplicate Sample ID :

Field Analyses

Time	Volume Removed (L)	EC (uS/cm)	pH	Temp (C)	Redox (mV)	Dissolved Oxygen %	Dissolved Oxygen mg/L	SWL (m)	Comments (colour, turbidity, odours, sheen etc)
0940	20	1149	7.05	15.9	-20.6	17.4	1.70	9.672	grey turbid
0950	21	1175	7.06	15.9	-30.5	34.7	3.32	9.625	slightly turbid, grey
10:10								9.860	—
10:20								9.821	—
10:30	21.5	615	7.08	15.9	76.1	37.5	3.67	9.937	clear
10:35								9.945	
10:41								9.935	
10:43	22.5	1192	7.05	16.1	-1.1	34.2	3.34	10.297	
									left to re-draw
14/9/21 11:08								9.915	
Stabilisation Criteria		+/- 3%	+/- 0.05		+/- 10mV	+/- 10%			

paused @ 10:49 am

Well Volume Calculations

Casing Diameter	25mm	50mm	100mm	125mm	150mm	200mm	250mm	300mm
Conversion Factor	0.98	1.96	7.85	31.4	49.1	70.7	125.7	196.3

TOTAL WELL DEPTH (-) WATER LEVEL (=) *WATER COLUMN*
10.873 m (-) 5.665 (=) 5.208

WATER COLUMN (X) CONVERSION FACTOR (=) LITRES PER WELL VOLUME
5.208 (X) 1.96 (=) 10.208 L

sampling

16:44	23.5	1249	7.03	15.8	15.1	14.2	1.39	10.325	slightly turbid brown

1of 2

WELL DEVELOPMENT, GAUGING AND SAMPLING DATA SHEET

WELL No : GW02.

Jacobs

Project No : 1A254001
Project Name : GWHU

Gauging

Date : 3.9.21
Performed By : KM & NK.
Gauging Method : Solinst IM.
Well Diameter : 50
Time : 7:30
Bore Depth : 10.895.
LNAPL Present : Y [✓ N]
SWL : 2.585
Depth to LNAPL :
(If yes, thickness) :
Comments : Silted bottom - silt >2mbg.
DNAPL Present : Y [✓ N]
(If yes, thickness) :
Maintainance required :
Visual confirmation with bailer : Y [✓ N]
Photo Number :

Purging / Development

Date : 3.9.21
Performed By : KM & NK
Well Diameter : 50
Purge Method : Submersible Pump. /bailer
Time Started :
SWL (start) :
Volume Removed :
Bore Depth (start) : 10.895.
Time Stopped :
SWL (end) :
Discharge Rate :
Bore Depth (end) : 13.353
Comments : 3x well vol = 63.316
changed method to bailer at 135L
(well cleaned, collect WQ)
NAPL Present : Y [✓ N]
(If yes, thickness) :

Sampling

Date : 9/9/2 /21/9/21
Performed By : NK
Well Diameter : 50
Sampling Method : Hydrasleeve - 7-8m
Time Started : 1700 / 0915
Sampling Depth : 7- 8m
Time Stopped : 1000
SWL (start) : 8.005 / 4.986
Tubing Type :
SWL (end) : 5.917
Comments :

Duplicate Sample Collected? [✓ Y] / N
Duplicate Sample ID : QC101-210921, QC201-210921

Field Analyses

Time	Volume Removed (L)	EC (uS/cm)	pH	Temp (C)	Redox (mV)	Dissolved Oxygen (mg/L)	Dissolved Oxygen (% sat)	SWL (m)	Comments (colour, turbidity, odours, sheen etc)
07:55	85	2227	6.38	16.5	44.2	0.98	10.1	5.42	turbid, grey,
08:14	135	2219	6.37	16.4	35.5	0.88	9.2	5.383	turbid, grey
08:24	136	2179	6.34	16.3	22.9	1.39	14.3	5.297	~~[illegible]~~ '' ''
08:27	137	2190	6.34	16.3	20.4	1.35	13.8	5.325	'' ''
08:31	138	2162	6.37	16.1	17.4	1.54	15.8	5.308	'' ''
08:35	139	2145	6.38	16.0	14.3	1.34	13.7	5.~~[illegible]~~	282. '' '
08:39	140	2259	6.37	16.2	0.71	7.2	11.0	5.272	'' ''
8:43	141	2236	6.37	16.3	9.8	0.89	9.0	5.268	'' ''
8:47	142	2211	6.40	16.2	10.7	~~1.30~~ 1.26	~~[illegible]~~ 12.9	5.259	'' ''
8:50	143	2188	6.39	16.1	10.4	1.00	11.2	5.245	'' ''
Stabilisation Criteria		+/- 3%	+/- 0.05		+/- 10mV	+/- 10%			

Paused @ 85L well clearing.

Purged @ 135L

Well Volume Calculations

Casing Diameter	25mm	[✓ 50mm]	100mm	125mm	150mm	200mm	250mm	300mm
Conversion Factor	0.98	[✓ 1.96]	7.85	31.4	49.1	70.7	125.7	196.3

TOTAL WELL DEPTH (-) WATER LEVEL (=) *WATER COLUMN*
13.353 m (-) 2.585 (=) 10.768

WATER COLUMN (X) CONVERSION FACTOR (=) LITRES PER WELL VOLUME
10.768 (X) 1.96 (=) 21.11 L

2 of 2.

WELL DEVELOPMENT, GAUGING AND SAMPLING DATA SHEET

WELL No : GW02

Jacobs

Project No : ____________________ Project Name : ____________________

Gauging

Date : ____________ Performed By : ____________
Gauging Method : ____________ Well Diameter : ____________
Time : ____________ Bore Depth : ____________ LNAPL Present : Y / N
SWL : ____________ Depth to LNAPL : ____________ (If yes, thickness) : ____________
Comments : ____________ DNAPL Present : Y / N
(If yes, thickness) : ____________
Maintainance required : ____________ Visual confirmation with bailer : Y / N
Photo Number : ____________

Purging / Development

Date : ____________ Performed By : ____________ Well Diameter : ____________
Purge Method : ____________
Time Started : ____________ SWL (start) : ____________ Volume Removed : ____________ Bore Depth (start) : ____________
Time Stopped : ____________ SWL (end) : ____________ Discharge Rate : ____________ Bore Depth (end) : ____________
Comments : ____________ NAPL Present : Y / N
(If yes, thickness) : ____________

Sampling

Date : ____________ Performed By : ____________ Well Diameter : ____________
Sampling Method : ____________
Time Started : ____________ Sampling Depth : ____________
Time Stopped : ____________ SWL (start) : ____________
Tubing Type : ____________ SWL (end) : ____________
Comments : ____________
Duplicate Sample Collected? Y / N Duplicate Sample ID : ____________

Field Analyses

Time	Volume Removed (L)	EC (uS/cm)	pH	Temp (C)	Redox (mV)	Dissolved Oxygen (mg/L)	Dissolved Oxygen (% sat)	SWL (m)	Comments (colour, turbidity, odours, sheen etc)
8:53	144	2247	6.38	16.2	8.5	0.82	8.4	5.238	" "
8:58	145	2245	8.40	16.1	6.1	1.04	10.6	5.233	" "
8.59	146	2274	8.41	16.1	5.0	0.96	9.8	5.229	" "
9:01	147	2307	8.41	16.2	5.3	0.91	9.3	5.219	" "
9:36	?							5.178	
Sampling 9:55	-	1610	6.54	12.8	-16.5	1.07	10.1	5.917	" "
Stabilisation Criteria		+/- 3%	+/- 0.05		+/- 10mV	+/- 10%			

Develop again Monday.

Well Volume Calculations

Casing Diameter	25mm	[✓ 50mm]	100mm	125mm	150mm	200mm	250mm	300mm
Conversion Factor	0.98	[✓ 1.96]	7.85	31.4	49.1	70.7	125.7	196.3

TOTAL WELL DEPTH (-) WATER LEVEL (=) *WATER COLUMN*
____________ m (-) ____________ (=) ____________

WATER COLUMN (X) CONVERSION FACTOR (=) LITRES PER WELL VOLUME
____________ (X) ____________ (=) ____________ L

WELL DEVELOPMENT, GAUGING AND SAMPLING DATA SHEET

WELL No : 6W03

Jacobs

Project No : IA254001
Project Name : GWH4

Gauging

Date : 3/9/21
Performed By : NK + RM
Gauging Method : Solinst IM
Well Diameter : 50
Time : 10:20
Bore Depth : 7.614
LNAPL Present : Y / [✓ N]
SWL : 2.816
Depth to LNAPL : ~
(If yes, thickness) :
Comments :
DNAPL Present : Y / [✓ N]
(If yes, thickness) :
Maintainance required :
Visual confirmation with bailer : Y / [✓ N]
Photo Number :

Above the screen.

Purging / Development

Date : 3/9/21.
Performed By : NK
Well Diameter : 50
Purge Method : submersible pump/bailer
Time Started : 10.28
SWL (start) : 2.816
Volume Removed : 83L
Bore Depth (start) : 7.614
Time Stopped : 1255
SWL (end) : 3.141
Discharge Rate :
Bore Depth (end) : 8.096
Comments : 3x well vol = 28.212 L
switched to bailor at 75L
NAPL Present : Y / [✓ N]
(If yes, thickness) :

Sampling

Date : 9/9/21 . /30/9/21
Performed By :
Well Diameter : 5G
Sampling Method : Hydrasleeve installed at 6-7m
Time Started : 11:40 / 11:15
Sampling Depth :
Time Stopped : 13:45
SWL (start) : 3.043 / 3.035
Tubing Type :
SWL (end) : 3.035
Comments :

Duplicate Sample Collected? Y [✓ N]
Duplicate Sample ID :

Field Analyses

Time	Volume Removed (L)	EC (uS/cm)	pH	Temp (C)	Redox (mV)	Dissolved Oxygen (%)	Dissolved Oxygen (mg/L)	SWL (m)	Comments (colour, turbidity, odours, sheen etc)
10:42	10L							3.901	grey, turbid
1154	75L							3.901	11 11
11:56	76L	2594	4.98	16.4	181.9	61.4	4.93	3.225	11 11
12:06	77L	2521	5.01	15.5	197.1	14.1	1.38	3.176	brown turbid
12:15	78L	2502	4.91	14.7	186.9	8.7	0.86	3.205	brown, turbid
12:20	79L			[illegible]				3.161	brown, turbid
12:30	80L	2418	5.20	15.2	181.4	15.6	1.52	3.165	11 11
12:33	81L	2426	5.31	14.7	180.7	25.6	2.30	3.162	11 11
12:40	82L	2394	5.29	14.9	180.2	14.4	1.67	3.156	11 11
12:50	83L	352.7						3.155	11 11
Stabilisation Criteria		+/- 3%	+/- 0.05		+/- 10mV	+/- 10%			

switch to bailor

Purged dry @ 10:42 (3.901) ~10-11L.
Purged 60L

end 3.141m

WQ Meter screen fogged up, unable to continue

Well Volume Calculations

Casing Diameter	25mm	[✓ 50mm]	100mm	125mm	150mm	200mm	250mm	300mm
Conversion Factor	0.98	[✓ 1.96]	7.85	31.4	49.1	70.7	125.7	196.3

TOTAL WELL DEPTH (-) WATER LEVEL (=) *WATER COLUMN*
7.614 m (-) 2.816 (=) 4.798

WATER COLUMN (X) CONVERSION FACTOR (=) LITRES PER WELL VOLUME
4.798 (X) 1.96 (=) 9.404 L

sampling 13:30 | 84L | 2946 | 5.20 | 19.7 | 119.1 | 3.6 | 0.37 | 3.05 | 11 11

WELL DEVELOPMENT, GAUGING AND SAMPLING DATA SHEET

WELL No : GW05

Jacobs

Project No : IA254001

Project Name : GWHU

Gauging

Date : 14/9/21

Performed By : NK

Gauging Method : interface probe

Well Diameter : 50mm

Time : 1556

Bore Depth : 14.389

LNAPL Present : Y / [✓ N]

SWL : 7.805

Depth to LNAPL : –

(If yes, thickness) :

Comments :

DNAPL Present : Y / [✓ N]

(If yes, thickness) :

Maintainance required :

Visual confirmation with bailer : Y / [✓ N]

Photo Number :

Purging / Development

Date : 14/9/21

Performed By : NK

Well Diameter : 50mm

Purge Method : Submergible pump / bailor

Time Started : 15:57

SWL (start) : 7.805

Volume Removed : 19L

Bore Depth (start) : 14.389

Time Stopped : 17:30

SWL (end) : 9.245

Discharge Rate :

Bore Depth (end) : 14.389

Comments : 3x well vol = 39L

NAPL Present : Y / [✓ N]

(If yes, thickness) :

Sampling

Date : 14/9/21 / 20/9/21

Performed By : NK

Well Diameter : 50mm

Sampling Method : hydrasleev

Time Started : 17:30 / 14:10

Sampling Depth : 11m

Time Stopped : 14.50

SWL (start) : 9.245 / 8.145

Tubing Type :

SWL (end) :

Comments :

Duplicate Sample Collected? Y [✓ N]

Duplicate Sample ID :

Field Analyses

Time	Volume Removed (L)	EC (uS/cm)	pH	Temp (C)	Redox (mV)	Dissolved Oxygen ~~(ppm)~~ (%)	Dissolved Oxygen (mg/L)	SWL (m)	Comments (colour, turbidity, odours, sheen etc)
16:16	5L							8.779	milky, white cloudy (pump
16:17	6L	334.6	8.27	15.0	51.7	13.3	1.35	8.889	brown, turbid bailor
16:30	12L							9.237	" " pump
16:35	13L	377.5	7.90	14.8	63.9	24.3	2.46	9.246	brown, slightly turbid
16:40	14L	379.4	7.89	15.1	60.3	25.0	2.51	9.246	white clear, very slightly turbid
16:45	15L	406.4	7.80	14.9	61.1	27.6	2.76	9.247	cloudy, slightly turbid
16:50	16L	436.1	7.71	14.8	60.7	27.7	2.79	9.249	slightly cloudy
17:00	17L	448.6	7.70	14.8	60.5	28.6	2.90	9.238	very slightly cloudy
17.05	18L	453.9	7.68	14.6	61.3	29.5	2.97	9.245	very slightly turbid
17.25	19L	437.4	7.72	15.0	61.0	28.6	2.89	9.257	" "
Stabilisation Criteria		+/- 3%	+/- 0.05		+/- 10mV	+/- 10%			

Well Volume Calculations

Casing Diameter	25mm	50mm	100mm	125mm	150mm	200mm	250mm	300mm
Conversion Factor	0.98	1.96	7.85	31.4	49.1	70.7	125.7	196.3

TOTAL WELL DEPTH (-) WATER LEVEL (=) *WATER COLUMN*
14.384 m (-) 7.805 (=) 6.584

WATER COLUMN (X) CONVERSION FACTOR (=) LITRES PER WELL VOLUME
6.584 (X) 1.96 (=) 12.905 L

20L | 369.6 | 7.81 | 17.2 | -9.6 | 14.2 | 1.36 | clear brown [illegible]

WELL DEVELOPMENT, GAUGING AND SAMPLING DATA SHEET

WELL No : GW06 **Jacobs**

Project No : JA254001
Project Name : GW HU

Gauging

Date : 15/9/21
Gauging Method : interface probe
Time : 11:10
SWL : 1.975
Comments :
Maintainance required :
Photo Number :
Performed By :
Bore Depth : 8.116
Depth to LNAPL : –
Well Diameter : 50mm
LNAPL Present : Y / [✓ N]
(If yes, thickness) :
DNAPL Present : Y / [✓ N]
(If yes, thickness) :
Visual confirmation with bailer : Y / [✓ N]

Purging / Development

Date : 15/9/21
Purge Method : bailer / submersible
Time Started : 11:10
Time Stopped : 15:48
Comments : 3x well vol = 36L, water still silty
Performed By :
SWL (start) : 1.975
SWL (end) : 2.517
Volume Removed : 91L
Discharge Rate :
Well Diameter :
Bore Depth (start) : 8.116
Bore Depth (end) : 8.646
NAPL Present : Y / N
(If yes, thickness) :

Sampling

Date : 15/9/21 / 21/9/21
Sampling Method : hydrasleeve
Time Started : 1545 / 10:30
Time Stopped : 11am
Tubing Type :
Comments :
Performed By : NK
Well Diameter : 50mm
Sampling Depth : 5m
SWL (start) : 2.517 / 1.998
SWL (end) : 2.111
Duplicate Sample Collected? Y / [✓ N]
Duplicate Sample ID :

Field Analyses

Time	Volume Removed (L)	EC (uS/cm)	pH	Temp (C)	Redox (mV)	Dissolved Oxygen % ~~(ppm)~~	Dissolved Oxygen (mg/L)	SWL (m)	Comments (colour, turbidity, odours, sheen etc)
11:20	12							7.258	brown, silty, turbid
1125	14							7.859	" "
1130	15							7.796	" "
13:20	17							1.205	
13:45	40L	2673	6.89	14.3	109.8	25.25	2.55	3.114	" "
13:55	41L	2745	7.05	13.1	108.3	24.	2.53	2.354	" "
14:00	42L	2680	7.03	12.8	108.8	16.5	1.60	2.351	" "
1409	43L	2735	7.01	12.8	110.5	16.7	1.79	2.29	" "
1440								2.025	" "
15:20	85L	3018	6.88	14.8	142.6	39.6	3.97	4.349	" "
Stabilisation Criteria		+/- 3%	+/- 0.05		+/- 10mV	+/- 10%			

restarted w/ submersible

– stopped for dor

Well Volume Calculations

Casing Diameter	25mm	50mm	100mm	125mm	150mm	200mm	250mm	300mm
Conversion Factor	0.98	1.96	7.85	31.4	49.1	70.7	125.7	196.3

TOTAL WELL DEPTH (-) WATER LEVEL (=) WATER COLUMN
8.116 m (-) 1.975 (=) 6.141

WATER COLUMN (X) CONVERSION FACTOR (=) LITRES PER WELL VOLUME
6.141 (X) 1.96 (=) 12.04 L

[redacted]

WELL DEVELOPMENT, GAUGING AND SAMPLING DATA SHEET

WELL No : GW06

Jacobs

Project No : ____________ Project Name : ____________

Gauging

Date : ____________ Performed By : ____________

Gauging Method : ____________ Well Diameter : ____________

Time : ____________ Bore Depth : ____________ LNAPL Present : Y / N

SWL : ____________ Depth to LNAPL : ____________ (If yes, thickness) : ____________

Comments : ____________ DNAPL Present : Y / N

(If yes, thickness) : ____________

Maintainance required : ____________ Visual confirmation with bailer : Y / N

Photo Number : ____________

Purging / Development

Date : ____________ Performed By : ____________ Well Diameter : ____________

Purge Method : ____________

Time Started : ____________ SWL (start) : ____________ Volume Removed : ____________ Bore Depth (start) : ____________

Time Stopped : ____________ SWL (end) : ____________ Discharge Rate : ____________ Bore Depth (end) : ____________

Comments : ____________ NAPL Present : Y / N

(If yes, thickness) : ____________

Sampling

Date : ____________ Performed By : ____________ Well Diameter : ____________

Sampling Method : ____________

Time Started : ____________ Sampling Depth : ____________

Time Stopped : ____________ SWL (start) : ____________

Tubing Type : ____________ SWL (end) : ____________

Comments : ____________

Duplicate Sample Collected? Y / N Duplicate Sample ID : ____________

Field Analyses

	Time	Volume Removed (L)	EC (uS/cm)	pH	Temp (C)	Redox (mV)	Dissolved Oxygen ~~(ppm)~~ %	Dissolved Oxygen (mg/L)	SWL (m)	Comments (colour, turbidity, odours, sheen etc)	
	15.25	86L	2712	7.03	13.1	131.3	43.0	4.48	3.413	" "	
	15.29	87L	2764	7.02	12.7	129.8	20.2	2.11	3.101	" "	
	15.30	88L	2795	6.92	12.8	129.8	20.6	2.16	3.002	" "	
	15:35	89L	2807	6.98	12.7	127.9	21.0	2.21	2.804	" "	
	15.37	90L	2826	7.01	12.6	126.5	22.0	2.30	2.709	" "	
	15:42	91L	2844	6.99	12.7	125.6	19.4	201	2.517	" "	3 x well vol
stable											
sampling	1059	93	2357	7.06	11.2	88.3	6.1	0.66	2.111	" "	
	Stabilisation Criteria		+/- 3%	+/- 0.05		+/- 10mV	+/- 10%				

Well Volume Calculations

Casing Diameter	25mm	50mm	100mm	125mm	150mm	200mm	250mm	300mm
Conversion Factor	0.98	1.96	7.85	31.4	49.1	70.7	125.7	196.3

TOTAL WELL DEPTH (-) WATER LEVEL (=) *WATER COLUMN*

____________ m (-) ____________ (=) ____________

WATER COLUMN (X) CONVERSION FACTOR (=) LITRES PER WELL VOLUME

____________ (X) ____________ (=) ____________ L

[redacted]

WELL DEVELOPMENT, GAUGING AND SAMPLING DATA SHEET

WELL No : GW07

Jacobs

Project No : IA254001

Project Name : GWHG

Screen 8-8m

Gauging

Date : 14/9/21
Performed By : NK
Gauging Method : interface probe
Well Diameter : 50mm
Time : 11:50
Bore Depth : 8.045
LNAPL Present : Y / [✓ N]
SWL : 2.357
Depth to LNAPL : -
(If yes, thickness) :
Comments : silt at bottom
DNAPL Present : Y / [✓ N]
(If yes, thickness) :
Maintainance required :
Visual confirmation with bailer : Y / [✓ N]
Photo Number :

Purging / Development

Date : 14/9/21
Performed By : NK
Well Diameter : 50mm
Purge Method : submersible pump/bailer
Time Started : 12:08
SWL (start) : 2.357
Volume Removed : 24L
Bore Depth (start) : 8.045
Time Stopped : 1400
SWL (end) : 6.054
Discharge Rate :
Bore Depth (end) : 8.019
Comments : 3x well vol = 33L
NAPL Present : Y / [✓ N]
(If yes, thickness) :

Sampling

Date : 14/9/21 / 20/9/21
Performed By : NK
Well Diameter : 50mm
Sampling Method : hydrasleeve
Time Started : 1400 / 10.45
Sampling Depth : 7m
Time Stopped : 11:20
SWL (start) : 6.054 - 3.462
Tubing Type :
SWL (end) : 2.669
Comments :

Duplicate Sample Collected? Y / [✓ N]
Duplicate Sample ID :

Field Analyses

Time	Volume Removed (L)	EC (uS/cm)	pH	Temp (C)	Redox (mV)	Dissolved Oxygen		SWL (m)	Comments (colour, turbidity, odours, sheen etc)
						%	(mg/L)		
12:08	10L							7.058	brown, turbid
12:30								5.921	" "
12:39	11L	702	7.20	13.8	-58.6	45.8	4.71	5.911	" "
13:24								3.551	" "
13:30	21L	630.4	7.06	13.4	-59.0	31.3	3.29	7.025	" "
13:40	22L	643.5	6.96	13.4	-37.3	52.7	5.49	6.007	" "
1354	23L	540	6.95	13.5	-34.0	53.6	5.58	6.054	" "
1400	24L	539.4	6.96	13.7	-33.4	54.3	5.60	6.029	" "
11:15	25L	535.0	6.82	18.2	-68.4	25.0	2.37	2.669	clear/brown, slightly turbid
Stabilisation Criteria		+/- 3%	+/- 0.05		+/- 10mV	+/- 10%			

switched to bailer

parameters stable.

9m Sampling

Well Volume Calculations

Casing Diameter	25mm	50mm	100mm	125mm	150mm	200mm	250mm	300mm
Conversion Factor	0.98	1.96	7.85	31.4	49.1	70.7	125.7	196.3

TOTAL WELL DEPTH (-) WATER LEVEL (=) WATER COLUMN
8.045 m (-) 2.357 (=) 5.688

WATER COLUMN (X) CONVERSION FACTOR (=) LITRES PER WELL VOLUME
5.688 (X) 1.96 (=) 11.148 L

3029 GWHW - red gate - drive past house - veer left - shut gate (cattle)

Study Area	Location	Date	Sampler	Depth	PID	QAQC	Description	Density	Consistency	Visual Ranking	Odour Ranking
L2R	SS01	24/08/2021	KM	0.05	0	-	Gravelly clayey SAND, brown, fine grained. Gravels (fine to coarse, angular). Minor bitumen roadbase. Some rootlets.	L	-	1	A
L2R	SS02	24/08/2021	KM	0.05	0	-	Sandy GRAVEL, light brown, fine to medium-coarse grained. Sands (fine grained). Rootlets present.	L	-	0	A
L2R	SS03a	24/08/2021	KM	0.1	0	-	Gravelly SAND, brown, fine grained. Gravels (fine to coarse, sub-angular to angular). Some bitumen road base. Minor rootlets.	MD	-	1	A
L2R	SS03b	27/08/2021	KM	0.1	0	-	SAND, brown, fine grained. Some gravel (fine to medium-coarse, sub-angular to angular). Dry to slightly moist. Rootlets.	MD	-	0	A
L2R	SS04	24/08/2021	KM	0.05	0	-	Gravelly SAND, light brown, fine grained. Gravels (fine to medium-coarse, sub-angular to angular). Minor bitumen road base. Minor rootlets.	L	-	1	A
L2R/CRR	SS05	26/08/2021	KM	0.05	0	-	Clayey SAND, brown, fine grained. Slightly moist. Rootlets.	MD	-	0	A
L2R/CRR	SS06	17/09/2021	NK	0.05	0	-	Clayey SILT, dark brown, fine grained. Rootlets. Moist.	L	-	0	A
L2R/CRR	SS07	17/09/2021	NK	0.05	0.1	-	Clayey SILT, dark brown, fine grained. Rootlets. Moist.	L	-	0	A
L2R/CRR	SS08	17/09/2021	NK	0.05	0.1	QC101_210917, QC201_210918	FILL: silty clay, brown, fine grained. With gravel (medium, rounded). Some sand (medium grained). Rootlets and worms present. Low plasticity.	MD	S	0	A
L2R/CRR	SS09	17/09/2021	NK	0.05	0	-	Clayey SILT, dark brown, fine grained. Rootlets. Dry.	L	-	0	A
L2R/CRR	SS10	25/08/2021	KM	0.05	0	-	Clayey SAND, brown, fine grained. Dry. Trace rootlets.	D	-	0	A
L2R/CRR	SS11	24/08/2021	KM	0.05	0	-	Sandy CLAY, brown, low plasticity. Minor gravels (fine, sub angular to angular). Some rootlets.	-	S	0	A
L2R/CRR	SS12	24/08/2021	KM	0.05	0	-	Clayey SAND, brown, fine grained. Some gravel (Fine to medium-coarse, sub-angular to angular). Minor bitumen road base. Rootlets. Wet.	L	-	0	A
L2R	SS13	6/09/2021	NK	0.05	0	QC101_210906, QC201_210906	Clayey SILT, brown, fine grained. Some gravel (fine to medium, sub-rounded). Slightly moist. Rootlets.	L	-	0	C
L2R	SS14	24/08/2021	KM	0.05	0	-	Clayey SAND with gravel, brown, fine grained. Gravel (Fine to medium-coarse, sub-angular to angular). Minor bitumen road base. Rootlets. Wet.	MD	-	1	A
R2F	SS15	26/08/2021	KM	0.05	0	-	TOPSOIL, SAND (loamy), dark brown, fine grained. Slightly moist. Rootlets	L	-	0	A
R2F	SS16	17/09/2021	NK	0.05	0.7	-	FILL: gravelly silt, brown. Gravel (medium-coarse, angular). Dry. Bitumen, wood chips present	L	-	1	B
R2F	SS17a	25/08/2021	KM	0.1	0	-	Clayey SAND with gravel, brown, fine grained. Gravel (Fine to coarse with rock, angular). Wood and roots present. Slightly moist. Slight hydrocarbon odour.	L	-	0	A
R2F	SS17b	30/08/2021	KM	0.1	0	-	Clayey SAND with gravel, brown, fine grained. Gravel (Fine to coarse with rock, angular). Wood and roots present. Slightly moist.	L	-	0	A
R2F	SS18	24/08/2021	KM	0.05	0	-	Sandy GRAVEL, light brown, fine to medium-coarse grained. Sands (fine grained).Some road base gravel (fine, sub-angular). Wet.	L	-	0	A
R2F	SS20	17/09/2021	NK	0.05	0.1	-	FILL: silt, brown. With gravel (medium, sub-angular to angular). Dry. Rootlets present.	L		0	A
R2F	SS22	7/09/2021	NK	0.05	0.3	-	SILT, dark brown, fine grained. Rootlets. Dry. Hydrocarbon odour.	L	-	0	B
F2L	SS23	24/08/2021	KM	0.05	0	-	Clayey SAND/Sandy CLAY, brown, fine grained. Very low plasticity. Some gravel (Fine to medium-coarse, sub-angular to angular). Rootlets and woodchips.	L	S	0	A
F2L	SS24	7/09/2021	NK	0.05	0.8	-	FILL: clayey silt, brown, fine grained. With gravel (fine to medium, sub-rounded). Dry. Rootlets.	L	-	0	A

Study Area	Location	Date	Sampler	Depth	PID	QAQC	Description	Density	Consistency	Visual Ranking	Odour Ranking
F2L	SS24	7/09/2021	NK	0.1	0.4	-	FILL: clayey silt, brown, fine grained. With gravel (fine to medium, sub-rounded). Dry. Rootlets.	L	-	0	A
F2L	SS25	24/08/2021	KM	0.05	0	-	Clayey SAND/Sandy CLAY, brown, fine grained. Very low plasticity. Minor gravel (Fine to medium-coarse, sub-angular to angular). Minor rootlets and woodchips.	L	S	0	A
F2L	SS26	7/09/2021	NK	0.05	0.4	-	Clayey SILT, brown, fine grained. Some gravel (fine to medium, sub-rounded). Dry. Rootlets.	L	-	0	A
F2L	SS27	27/08/2021	KM	0.05	0	-	Gravelly SAND, black, fine grained. Slightly moist. Rootlets. Gravels (fine to coarse, sub-angular to angular). Bitumen road base gravels present.	L	-	1	A
F2L	SS28	27/08/2021	KM	0.05	0.1	-	Gravelly SAND, dark brown, fine grained. Dry. Rootlets. Gravels (fine to medium, rounded to angular). Some road base gravels present.	D	-	1	A
F2L	SS29	17/09/2021	NK	0.05	0.6	-	FILL: silt, brown. Dry. Rootlets present. Slight hydrocarbon odour.	L	-	0	B

Appendix D. Laboratory reports

CERTIFICATE OF ANALYSIS

Work Order : **ES2132166**
Amendment : **1**
Client : **Jacobs Arcadis Joint Venture**
Contact : Amanda Mullen
Address : Level 16 580 George Street
Sydney 2000
Telephone : ----
Project : IA254001
Order number : ----
C-O-C number : ----
Sampler : ----
Site : ----
Quote number : EN/222
No. of samples received : 46
No. of samples analysed : 18

Page : 1 of 18
Laboratory : Environmental Division Sydney
Contact : Customer Services ES
Address : 277-289 Woodpark Road Smithfield NSW Australia 2164
Telephone : +61-2-8784 8555
Date Samples Received : 03-Sep-2021 17:19
Date Analysis Commenced : 06-Sep-2021
Issue Date : 24-Sep-2021 10:29

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

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

This Certificate of Analysis contains the following information:

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

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

Signatories

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

Signatories	*Position*	*Accreditation Category*
Alana Smylie	Asbestos Identifier	Newcastle - Asbestos, Mayfield West, NSW
Ankit Joshi	Inorganic Chemist	Sydney Inorganics, Smithfield, NSW
Edwandy Fadjar	Organic Coordinator	Sydney Organics, Smithfield, NSW
Ivan Taylor	Analyst	Sydney Inorganics, Smithfield, NSW
Sanjeshni Jyoti	Senior Chemist Volatiles	Sydney Organics, Smithfield, NSW
Uma Nagendiram	Subcontracting Coordinator	WRG Subcontracting, Smithfield, NSW

General Comments

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

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

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

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

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

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

Key : CAS Number = CAS registry number from database maintained by Chemical Abstracts Services. The Chemical Abstracts Service is a division of the American Chemical Society.
LOR = Limit of reporting
^ = This result is computed from individual analyte detections at or above the level of reporting
ø = ALS is not NATA accredited for these tests.
~ = Indicates an estimated value.

- EP075 (SIM): Where reported, Benzo(a)pyrene Toxicity Equivalent Quotient (TEQ) per the NEPM (2013) is the sum total of the concentration of the eight carcinogenic PAHs multiplied by their Toxicity Equivalence Factor (TEF) relative to Benzo(a)pyrene. TEF values are provided in brackets as follows: Benz(a)anthracene (0.1), Chrysene (0.01), Benzo(b+j) & Benzo(k)fluoranthene (0.1), Benzo(a)pyrene (1.0), Indeno(1.2.3.cd)pyrene (0.1), Dibenz(a.h)anthracene (1.0), Benzo(g.h.i)perylene (0.01). Less than LOR results for 'TEQ Zero' are treated as zero.
- Benzo(a)pyrene Toxicity Equivalent Quotient (TEQ) per the NEPM (2013) is the sum total of the concentration of the eight carcinogenic PAHs multiplied by their Toxicity Equivalence Factor (TEF) relative to Benzo(a)pyrene. TEF values are provided in brackets as follows: Benz(a)anthracene (0.1), Chrysene (0.01), Benzo(b+j) & Benzo(k)fluoranthene (0.1), Benzo(a)pyrene (1.0), Indeno(1.2.3.cd)pyrene (0.1), Dibenz(a.h)anthracene (1.0), Benzo(g.h.i)perylene (0.01). Less than LOR results for 'TEQ Zero' are treated as zero, for 'TEQ 1/2LOR' are treated as half the reported LOR, and for 'TEQ LOR' are treated as being equal to the reported LOR. Note: TEQ 1/2LOR and TEQ LOR will calculate as 0.6mg/Kg and 1.2mg/Kg respectively for samples with non-detects for all of the eight TEQ PAHs.
- EP080: Where reported, Total Xylenes is the sum of the reported concentrations of m&p-Xylene and o-Xylene at or above the LOR.
- EP068: Where reported, Total Chlordane (sum) is the sum of the reported concentrations of cis-Chlordane and trans-Chlordane at or above the LOR.
- EP068: Where reported, Total OCP is the sum of the reported concentrations of all Organochlorine Pesticides at or above LOR.
- EP075(SIM): Where reported, Total Cresol is the sum of the reported concentrations of 2-Methylphenol and 3- & 4-Methylphenol at or above the LOR.
- MM868 (Coliforms & E. coli in Soils by MPN using Aquachrom ECC) - Analysis is conducted by ALS Scoresby NATA accreditation no. 992, site no. 989.
- Amendment (16/09/2021: This report has been amended to change billing details . All analysis results are as per the previous report.
- EA200 'Am' Amosite (brown asbestos)
- EA200 'Cr' Crocidolite (blue asbestos)
- EA200 'Trace' - Asbestos fibres ("Free Fibres") detected by trace analysis per AS4964. The result can be interpreted that the sample contains detectable 'respirable' asbestos fibres
- EA200: Asbestos Identification Samples were analysed by Polarised Light Microscopy including dispersion staining.
- EA200 Legend
- EA200 'Ch' Chrysotile (white asbestos)
- EA200: 'UMF' Unknown Mineral Fibres. "-" indicates fibres detected may or may not be asbestos fibres. Confirmation by alternative techniques is recommended.
- EA200: For samples larger than 30g, the <2mm fraction may be sub-sampled prior to trace analysis as outlined in ISO23909:2008(E) Sect 6.3.2-2
- EA200: 'Yes' - Asbestos detected by polarised light microscopy including dispersion staining.
- EA200: 'No*' - No asbestos found, at the reporting limit of 0.1g/kg, by polarised light microscopy including dispersion staining. Asbestos material was detected and positively identified at concentrations estimated to be below 0.1g/kg.
- EA200: 'No' - No asbestos found at the reporting limit 0.1g/kg, by polarised light microscopy including dispersion staining.

Analytical Results

Sub-Matrix: **SOIL** (Matrix: **SOIL**)			*Sample ID*	**BH09_0.5**	**BH09_2.0**	**SS176_0.10**	**BH04_2.0**	**BH04_4.0**
			Sampling date / time	30-Aug-2021 00:00	30-Aug-2021 00:00	30-Aug-2021 00:00	31-Aug-2021 00:00	31-Aug-2021 00:00
Compound	*CAS Number*	*LOR*	*Unit*	**ES2132166-002**	**ES2132166-004**	**ES2132166-009**	**ES2132166-013**	**ES2132166-015**
				Result	Result	Result	Result	Result
EA055: Moisture Content (Dried @ 105-110°C)								
Moisture Content	----	1.0	%	**10.4**	**13.2**	**15.9**	**17.9**	**13.5**
EA200: AS 4964 - 2004 Identification of Asbestos in Soils								
Asbestos Detected	1332-21-4	0.1	g/kg	----	----	**No**	**No**	**No**
Asbestos (Trace)	1332-21-4	5	Fibres	----	----	**No**	**No**	**No**
Asbestos Type	1332-21-4	-	--	----	----	**-**	**-**	**-**
Sample weight (dry)	----	0.01	g	----	----	**220**	**185**	**171**
APPROVED IDENTIFIER:	----	-	--	----	----	**A. SMYLIE**	**A. SMYLIE**	**A. SMYLIE**
Synthetic Mineral Fibre	----	0.1	g/kg	----	----	**No**	**No**	**No**
Organic Fibre	----	0.1	g/kg	----	----	**No**	**No**	**No**
EG005(ED093)T: Total Metals by ICP-AES								
Arsenic	7440-38-2	5	mg/kg	<5	<5	<5	<5	**6**
Cadmium	7440-43-9	1	mg/kg	<1	<1	<1	<1	<1
Chromium	7440-47-3	2	mg/kg	**3**	**6**	**7**	**9**	**12**
Copper	7440-50-8	5	mg/kg	<5	**6**	**21**	<5	**5**
Lead	7439-92-1	5	mg/kg	**8**	**8**	**24**	**15**	**14**
Nickel	7440-02-0	2	mg/kg	<2	**4**	**8**	<2	<2
Zinc	7440-66-6	5	mg/kg	**23**	**24**	**54**	<5	<5
EG035T: Total Recoverable Mercury by FIMS								
Mercury	7439-97-6	0.1	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
EK059G: Nitrite plus Nitrate as N (NOx) by Discrete Analyser								
Nitrite + Nitrate as N (Sol.)	----	0.1	mg/kg	**0.3**	**0.2**	----	**0.2**	**0.2**
EK061G: Total Kjeldahl Nitrogen By Discrete Analyser								
Total Kjeldahl Nitrogen as N	----	20	mg/kg	**200**	**80**	----	**200**	**320**
EK062: Total Nitrogen as N (TKN + NOx)								
^ **Total Nitrogen as N**	----	20	mg/kg	**200**	**80**	----	**200**	**320**
EK067G: Total Phosphorus as P by Discrete Analyser								
Total Phosphorus as P	----	2	mg/kg	**308**	**426**	----	**171**	**367**
EP068A: Organochlorine Pesticides (OC)								
alpha-BHC	319-84-6	0.05	mg/kg	----	----	<0.05	<0.05	<0.05
Hexachlorobenzene (HCB)	118-74-1	0.05	mg/kg	----	----	<0.05	<0.05	<0.05
beta-BHC	319-85-7	0.05	mg/kg	----	----	<0.05	<0.05	<0.05
gamma-BHC	58-89-9	0.05	mg/kg	----	----	<0.05	<0.05	<0.05
delta-BHC	319-86-8	0.05	mg/kg	----	----	<0.05	<0.05	<0.05
Heptachlor	76-44-8	0.05	mg/kg	----	----	<0.05	<0.05	<0.05

Analytical Results

Sub-Matrix: **SOIL** (Matrix: **SOIL**)			Sample ID	**BH09_0.5**	**BH09_2.0**	**SS176_0.10**	**BH04_2.0**	**BH04_4.0**
			Sampling date / time	30-Aug-2021 00:00	30-Aug-2021 00:00	30-Aug-2021 00:00	31-Aug-2021 00:00	31-Aug-2021 00:00
Compound	CAS Number	LOR	Unit	**ES2132166-002**	**ES2132166-004**	**ES2132166-009**	**ES2132166-013**	**ES2132166-015**
				Result	Result	Result	Result	Result
EP068A: Organochlorine Pesticides (OC) - Continued								
Aldrin	309-00-2	0.05	mg/kg	----	----	<0.05	<0.05	<0.05
Heptachlor epoxide	1024-57-3	0.05	mg/kg	----	----	<0.05	<0.05	<0.05
^ **Total Chlordane (sum)**	----	0.05	mg/kg	----	----	<0.05	<0.05	<0.05
trans-Chlordane	5103-74-2	0.05	mg/kg	----	----	<0.05	<0.05	<0.05
alpha-Endosulfan	959-98-8	0.05	mg/kg	----	----	<0.05	<0.05	<0.05
cis-Chlordane	5103-71-9	0.05	mg/kg	----	----	<0.05	<0.05	<0.05
Dieldrin	60-57-1	0.05	mg/kg	----	----	<0.05	<0.05	<0.05
4.4`-DDE	72-55-9	0.05	mg/kg	----	----	<0.05	<0.05	<0.05
Endrin	72-20-8	0.05	mg/kg	----	----	<0.05	<0.05	<0.05
beta-Endosulfan	33213-65-9	0.05	mg/kg	----	----	<0.05	<0.05	<0.05
^ **Endosulfan (sum)**	115-29-7	0.05	mg/kg	----	----	<0.05	<0.05	<0.05
4.4`-DDD	72-54-8	0.05	mg/kg	----	----	<0.05	<0.05	<0.05
Endrin aldehyde	7421-93-4	0.05	mg/kg	----	----	<0.05	<0.05	<0.05
Endosulfan sulfate	1031-07-8	0.05	mg/kg	----	----	<0.05	<0.05	<0.05
4.4`-DDT	50-29-3	0.2	mg/kg	----	----	<0.2	<0.2	<0.2
Endrin ketone	53494-70-5	0.05	mg/kg	----	----	<0.05	<0.05	<0.05
Methoxychlor	72-43-5	0.2	mg/kg	----	----	<0.2	<0.2	<0.2
^ **Sum of Aldrin + Dieldrin**	309-00-2/60-57-1	0.05	mg/kg	----	----	<0.05	<0.05	<0.05
^ **Sum of DDD + DDE + DDT**	72-54-8/72-55-9/50-2	0.05	mg/kg	----	----	<0.05	<0.05	<0.05
EP068B: Organophosphorus Pesticides (OP)								
Dichlorvos	62-73-7	0.05	mg/kg	----	----	<0.05	<0.05	<0.05
Demeton-S-methyl	919-86-8	0.05	mg/kg	----	----	<0.05	<0.05	<0.05
Monocrotophos	6923-22-4	0.2	mg/kg	----	----	<0.2	<0.2	<0.2
Dimethoate	60-51-5	0.05	mg/kg	----	----	<0.05	<0.05	<0.05
Diazinon	333-41-5	0.05	mg/kg	----	----	<0.05	<0.05	<0.05
Chlorpyrifos-methyl	5598-13-0	0.05	mg/kg	----	----	<0.05	<0.05	<0.05
Parathion-methyl	298-00-0	0.2	mg/kg	----	----	<0.2	<0.2	<0.2
Malathion	121-75-5	0.05	mg/kg	----	----	<0.05	<0.05	<0.05
Fenthion	55-38-9	0.05	mg/kg	----	----	<0.05	<0.05	<0.05
Chlorpyrifos	2921-88-2	0.05	mg/kg	----	----	<0.05	<0.05	<0.05
Parathion	56-38-2	0.2	mg/kg	----	----	<0.2	<0.2	<0.2
Pirimphos-ethyl	23505-41-1	0.05	mg/kg	----	----	<0.05	<0.05	<0.05
Chlorfenvinphos	470-90-6	0.05	mg/kg	----	----	<0.05	<0.05	<0.05
Bromophos-ethyl	4824-78-6	0.05	mg/kg	----	----	<0.05	<0.05	<0.05

Analytical Results

Sub-Matrix: **SOIL** (Matrix: **SOIL**)			Sample ID	**BH09_0.5**	**BH09_2.0**	**SS176_0.10**	**BH04_2.0**	**BH04_4.0**
			Sampling date / time	30-Aug-2021 00:00	30-Aug-2021 00:00	30-Aug-2021 00:00	31-Aug-2021 00:00	31-Aug-2021 00:00
Compound	CAS Number	LOR	Unit	**ES2132166-002**	**ES2132166-004**	**ES2132166-009**	**ES2132166-013**	**ES2132166-015**
				Result	Result	Result	Result	Result
EP068B: Organophosphorus Pesticides (OP) - Continued								
Fenamiphos	22224-92-6	0.05	mg/kg	----	----	<0.05	<0.05	<0.05
Prothiofos	34643-46-4	0.05	mg/kg	----	----	<0.05	<0.05	<0.05
Ethion	563-12-2	0.05	mg/kg	----	----	<0.05	<0.05	<0.05
Carbophenothion	786-19-6	0.05	mg/kg	----	----	<0.05	<0.05	<0.05
Azinphos Methyl	86-50-0	0.05	mg/kg	----	----	<0.05	<0.05	<0.05
EP075(SIM)B: Polynuclear Aromatic Hydrocarbons								
Naphthalene	91-20-3	0.5	mg/kg	----	----	<0.5	<0.5	<0.5
Acenaphthylene	208-96-8	0.5	mg/kg	----	----	<0.5	<0.5	<0.5
Acenaphthene	83-32-9	0.5	mg/kg	----	----	<0.5	<0.5	<0.5
Fluorene	86-73-7	0.5	mg/kg	----	----	<0.5	<0.5	<0.5
Phenanthrene	85-01-8	0.5	mg/kg	----	----	<0.5	<0.5	<0.5
Anthracene	120-12-7	0.5	mg/kg	----	----	<0.5	<0.5	<0.5
Fluoranthene	206-44-0	0.5	mg/kg	----	----	<0.5	<0.5	<0.5
Pyrene	129-00-0	0.5	mg/kg	----	----	<0.5	<0.5	<0.5
Benz(a)anthracene	56-55-3	0.5	mg/kg	----	----	<0.5	<0.5	<0.5
Chrysene	218-01-9	0.5	mg/kg	----	----	<0.5	<0.5	<0.5
Benzo(b+j)fluoranthene	205-99-2 205-82-3	0.5	mg/kg	----	----	<0.5	<0.5	<0.5
Benzo(k)fluoranthene	207-08-9	0.5	mg/kg	----	----	<0.5	<0.5	<0.5
Benzo(a)pyrene	50-32-8	0.5	mg/kg	----	----	<0.5	<0.5	<0.5
Indeno(1.2.3.cd)pyrene	193-39-5	0.5	mg/kg	----	----	<0.5	<0.5	<0.5
Dibenz(a.h)anthracene	53-70-3	0.5	mg/kg	----	----	<0.5	<0.5	<0.5
Benzo(g.h.i)perylene	191-24-2	0.5	mg/kg	----	----	<0.5	<0.5	<0.5
^ **Sum of polycyclic aromatic hydrocarbons**	----	0.5	mg/kg	----	----	<0.5	<0.5	<0.5
^ **Benzo(a)pyrene TEQ (zero)**	----	0.5	mg/kg	----	----	<0.5	<0.5	<0.5
^ **Benzo(a)pyrene TEQ (half LOR)**	----	0.5	mg/kg	----	----	**0.6**	**0.6**	**0.6**
^ **Benzo(a)pyrene TEQ (LOR)**	----	0.5	mg/kg	----	----	**1.2**	**1.2**	**1.2**
EP080/071: Total Petroleum Hydrocarbons								
C6 - C9 Fraction	----	10	mg/kg	----	----	<10	<10	<10
C10 - C14 Fraction	----	50	mg/kg	----	----	<50	<50	<50
C15 - C28 Fraction	----	100	mg/kg	----	----	<100	<100	<100
C29 - C36 Fraction	----	100	mg/kg	----	----	<100	<100	<100
^ **C10 - C36 Fraction (sum)**	----	50	mg/kg	----	----	<50	<50	<50
EP080/071: Total Recoverable Hydrocarbons - NEPM 2013 Fractions								
C6 - C10 Fraction	C6_C10	10	mg/kg	----	----	<10	<10	<10

Analytical Results

Sub-Matrix: **SOIL** (Matrix: **SOIL**)			*Sample ID*	**BH09_0.5**	**BH09_2.0**	**SS176_0.10**	**BH04_2.0**	**BH04_4.0**
			Sampling date / time	30-Aug-2021 00:00	30-Aug-2021 00:00	30-Aug-2021 00:00	31-Aug-2021 00:00	31-Aug-2021 00:00
Compound	*CAS Number*	*LOR*	*Unit*	**ES2132166-002**	**ES2132166-004**	**ES2132166-009**	**ES2132166-013**	**ES2132166-015**
				Result	Result	Result	Result	Result
EP080/071: Total Recoverable Hydrocarbons - NEPM 2013 Fractions - Continued								
^ **C6 - C10 Fraction minus BTEX (F1)**	C6_C10-BTEX	10	mg/kg	----	----	<10	<10	<10
>C10 - C16 Fraction	----	50	mg/kg	----	----	<50	<50	<50
>C16 - C34 Fraction	----	100	mg/kg	----	----	<100	<100	<100
>C34 - C40 Fraction	----	100	mg/kg	----	----	<100	<100	<100
^ **>C10 - C40 Fraction (sum)**	----	50	mg/kg	----	----	<50	<50	<50
^ **>C10 - C16 Fraction minus Naphthalene (F2)**	----	50	mg/kg	----	----	<50	<50	<50
EP080: BTEXN								
Benzene	71-43-2	0.2	mg/kg	----	----	<0.2	<0.2	<0.2
Toluene	108-88-3	0.5	mg/kg	----	----	<0.5	<0.5	<0.5
Ethylbenzene	100-41-4	0.5	mg/kg	----	----	<0.5	<0.5	<0.5
meta- & para-Xylene	108-38-3 106-42-3	0.5	mg/kg	----	----	<0.5	<0.5	<0.5
ortho-Xylene	95-47-6	0.5	mg/kg	----	----	<0.5	<0.5	<0.5
^ **Sum of BTEX**	----	0.2	mg/kg	----	----	<0.2	<0.2	<0.2
^ **Total Xylenes**	----	0.5	mg/kg	----	----	<0.5	<0.5	<0.5
Naphthalene	91-20-3	1	mg/kg	----	----	<1	<1	<1
EP068S: Organochlorine Pesticide Surrogate								
Dibromo-DDE	21655-73-2	0.05	%	----	----	**85.1**	**96.2**	**90.3**
EP068T: Organophosphorus Pesticide Surrogate								
DEF	78-48-8	0.05	%	----	----	**99.4**	**73.0**	**64.0**
EP075(SIM)S: Phenolic Compound Surrogates								
Phenol-d6	13127-88-3	0.5	%	----	----	**99.8**	**81.0**	**80.2**
2-Chlorophenol-D4	93951-73-6	0.5	%	----	----	**98.9**	**82.6**	**83.4**
2.4.6-Tribromophenol	118-79-6	0.5	%	----	----	**94.2**	**70.2**	**74.9**
EP075(SIM)T: PAH Surrogates								
2-Fluorobiphenyl	321-60-8	0.5	%	----	----	**103**	**87.5**	**89.9**
Anthracene-d10	1719-06-8	0.5	%	----	----	**109**	**95.5**	**96.8**
4-Terphenyl-d14	1718-51-0	0.5	%	----	----	**104**	**90.9**	**93.9**
EP080S: TPH(V)/BTEX Surrogates								
1.2-Dichloroethane-D4	17060-07-0	0.2	%	----	----	**100**	**90.0**	**100**
Toluene-D8	2037-26-5	0.2	%	----	----	**96.3**	**98.2**	**115**
4-Bromofluorobenzene	460-00-4	0.2	%	----	----	**104**	**93.2**	**105**

Analytical Results

Sub-Matrix: **SOIL**
(Matrix: **SOIL**)

Compound	CAS Number	LOR	Unit	BH05_0.05	BH05_5.0	QC101_210901	BH11_0.05	BH11_0.5
Sampling date / time				01-Sep-2021 00:00	01-Sep-2021 00:00	01-Sep-2021 00:00	02-Sep-2021 00:00	02-Sep-2021 00:00
				ES2132166-024	ES2132166-029	ES2132166-033	ES2132166-035	ES2132166-036
				Result	Result	Result	Result	Result
EA055: Moisture Content (Dried @ 105-110°C)								
Moisture Content	----	1.0	%	**23.5**	**15.1**	**22.7**	**10.6**	**7.9**
EG005(ED093)T: Total Metals by ICP-AES								
Arsenic	7440-38-2	5	mg/kg	**6**	**12**	**6**	<5	<5
Cadmium	7440-43-9	1	mg/kg	<1	<1	<1	<1	<1
Chromium	7440-47-3	2	mg/kg	**20**	**23**	**22**	<2	**2**
Copper	7440-50-8	5	mg/kg	<5	**13**	<5	<5	<5
Lead	7439-92-1	5	mg/kg	**10**	**11**	**12**	**51**	**10**
Nickel	7440-02-0	2	mg/kg	<2	**28**	<2	<2	<2
Zinc	7440-66-6	5	mg/kg	**6**	**84**	**12**	**26**	**9**
EG035T: Total Recoverable Mercury by FIMS								
Mercury	7439-97-6	0.1	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
EK059G: Nitrite plus Nitrate as N (NOx) by Discrete Analyser								
Nitrite + Nitrate as N (Sol.)	----	0.1	mg/kg	<0.1	**0.2**	**0.2**	----	----
EK061G: Total Kjeldahl Nitrogen By Discrete Analyser								
Total Kjeldahl Nitrogen as N	----	20	mg/kg	**1000**	**480**	**1630**	----	----
EK062: Total Nitrogen as N (TKN + NOx)								
^ **Total Nitrogen as N**	----	20	mg/kg	**1000**	**480**	**1630**	----	----
EK067G: Total Phosphorus as P by Discrete Analyser								
Total Phosphorus as P	----	2	mg/kg	**207**	**229**	**223**	----	----
EP010: Formaldehyde								
Formaldehyde	50-00-0	2	mg/kg	<2	<2	<2	<2	<2

Analytical Results

Sub-Matrix: **SOIL** (Matrix: **SOIL**)			Sample ID	**BH06_0.05**	**BH06_0.82**	**QC300_210903**	**BH04_2.0 Total Coliforms**	**BH04_4.0 Total Coliforms**
			Sampling date / time	02-Sep-2021 00:00	02-Sep-2021 00:00	02-Sep-2021 00:00	31-Aug-2021 00:00	31-Aug-2021 00:00
Compound	CAS Number	LOR	Unit	**ES2132166-039**	**ES2132166-041**	**ES2132166-042**	**ES2132166-044**	**ES2132166-045**
				Result	Result	Result	Result	Result
EA055: Moisture Content (Dried @ 105-110°C)								
Moisture Content	----	1.0	%	**22.1**	**9.6**	----	----	----
EA200: AS 4964 - 2004 Identification of Asbestos in Soils								
Asbestos Detected	1332-21-4	0.1	g/kg	**No**	**No**	----	----	----
Asbestos (Trace)	1332-21-4	5	Fibres	**No**	**No**	----	----	----
Asbestos Type	1332-21-4	-	--	**-**	**-**	----	----	----
Sample weight (dry)	----	0.01	g	**89.6**	**145**	----	----	----
APPROVED IDENTIFIER:	----	-	--	**A. SMYLIE**	**A. SMYLIE**	----	----	----
Synthetic Mineral Fibre	----	0.1	g/kg	**No**	**No**	----	----	----
Organic Fibre	----	0.1	g/kg	**No**	**No**	----	----	----
EG005(ED093)T: Total Metals by ICP-AES								
Arsenic	7440-38-2	5	mg/kg	**5**	<5	----	----	----
Cadmium	7440-43-9	1	mg/kg	<1	<1	----	----	----
Chromium	7440-47-3	2	mg/kg	**10**	**4**	----	----	----
Copper	7440-50-8	5	mg/kg	<5	**6**	----	----	----
Lead	7439-92-1	5	mg/kg	**7**	**15**	----	----	----
Nickel	7440-02-0	2	mg/kg	<2	<2	----	----	----
Zinc	7440-66-6	5	mg/kg	**10**	**6**	----	----	----
EG035T: Total Recoverable Mercury by FIMS								
Mercury	7439-97-6	0.1	mg/kg	<0.1	<0.1	----	----	----
EK059G: Nitrite plus Nitrate as N (NOx) by Discrete Analyser								
Nitrite + Nitrate as N (Sol.)	----	0.1	mg/kg	**2.4**	**2.1**	----	----	----
EK061G: Total Kjeldahl Nitrogen By Discrete Analyser								
Total Kjeldahl Nitrogen as N	----	20	mg/kg	**2420**	**310**	----	----	----
EK062: Total Nitrogen as N (TKN + NOx)								
^ **Total Nitrogen as N**	----	20	mg/kg	**2420**	**310**	----	----	----
EK067G: Total Phosphorus as P by Discrete Analyser								
Total Phosphorus as P	----	2	mg/kg	**325**	**305**	----	----	----
EP068A: Organochlorine Pesticides (OC)								
alpha-BHC	319-84-6	0.05	mg/kg	<0.05	<0.05	----	----	----
Hexachlorobenzene (HCB)	118-74-1	0.05	mg/kg	<0.05	<0.05	----	----	----
beta-BHC	319-85-7	0.05	mg/kg	<0.05	<0.05	----	----	----
gamma-BHC	58-89-9	0.05	mg/kg	<0.05	<0.05	----	----	----
delta-BHC	319-86-8	0.05	mg/kg	<0.05	<0.05	----	----	----

Analytical Results

Sub-Matrix: **SOIL** (Matrix: **SOIL**)			*Sample ID*	**BH06_0.05**	**BH06_0.82**	**QC300_210903**	**BH04_2.0** **Total Coliforms**	**BH04_4.0** **Total Coliforms**
			Sampling date / time	02-Sep-2021 00:00	02-Sep-2021 00:00	02-Sep-2021 00:00	31-Aug-2021 00:00	31-Aug-2021 00:00
Compound	*CAS Number*	*LOR*	*Unit*	**ES2132166-039**	**ES2132166-041**	**ES2132166-042**	**ES2132166-044**	**ES2132166-045**
				Result	Result	Result	Result	Result
EP068A: Organochlorine Pesticides (OC) - Continued								
Heptachlor	76-44-8	0.05	mg/kg	<0.05	<0.05	----	----	----
Aldrin	309-00-2	0.05	mg/kg	<0.05	<0.05	----	----	----
Heptachlor epoxide	1024-57-3	0.05	mg/kg	<0.05	<0.05	----	----	----
^ **Total Chlordane (sum)**	----	0.05	mg/kg	<0.05	<0.05	----	----	----
trans-Chlordane	5103-74-2	0.05	mg/kg	<0.05	<0.05	----	----	----
alpha-Endosulfan	959-98-8	0.05	mg/kg	<0.05	<0.05	----	----	----
cis-Chlordane	5103-71-9	0.05	mg/kg	<0.05	<0.05	----	----	----
Dieldrin	60-57-1	0.05	mg/kg	<0.05	<0.05	----	----	----
4.4`-DDE	72-55-9	0.05	mg/kg	<0.05	<0.05	----	----	----
Endrin	72-20-8	0.05	mg/kg	<0.05	<0.05	----	----	----
beta-Endosulfan	33213-65-9	0.05	mg/kg	<0.05	<0.05	----	----	----
^ **Endosulfan (sum)**	115-29-7	0.05	mg/kg	<0.05	<0.05	----	----	----
4.4`-DDD	72-54-8	0.05	mg/kg	<0.05	<0.05	----	----	----
Endrin aldehyde	7421-93-4	0.05	mg/kg	<0.05	<0.05	----	----	----
Endosulfan sulfate	1031-07-8	0.05	mg/kg	<0.05	<0.05	----	----	----
4.4`-DDT	50-29-3	0.2	mg/kg	<0.2	<0.2	----	----	----
Endrin ketone	53494-70-5	0.05	mg/kg	<0.05	<0.05	----	----	----
Methoxychlor	72-43-5	0.2	mg/kg	<0.2	<0.2	----	----	----
^ **Sum of Aldrin + Dieldrin**	309-00-2/60-57-1	0.05	mg/kg	<0.05	<0.05	----	----	----
^ **Sum of DDD + DDE + DDT**	72-54-8/72-55-9/50-2	0.05	mg/kg	<0.05	<0.05	----	----	----
EP068B: Organophosphorus Pesticides (OP)								
Dichlorvos	62-73-7	0.05	mg/kg	<0.05	<0.05	----	----	----
Demeton-S-methyl	919-86-8	0.05	mg/kg	<0.05	<0.05	----	----	----
Monocrotophos	6923-22-4	0.2	mg/kg	<0.2	<0.2	----	----	----
Dimethoate	60-51-5	0.05	mg/kg	<0.05	<0.05	----	----	----
Diazinon	333-41-5	0.05	mg/kg	<0.05	<0.05	----	----	----
Chlorpyrifos-methyl	5598-13-0	0.05	mg/kg	<0.05	<0.05	----	----	----
Parathion-methyl	298-00-0	0.2	mg/kg	<0.2	<0.2	----	----	----
Malathion	121-75-5	0.05	mg/kg	<0.05	<0.05	----	----	----
Fenthion	55-38-9	0.05	mg/kg	<0.05	<0.05	----	----	----
Chlorpyrifos	2921-88-2	0.05	mg/kg	<0.05	<0.05	----	----	----
Parathion	56-38-2	0.2	mg/kg	<0.2	<0.2	----	----	----
Pirimphos-ethyl	23505-41-1	0.05	mg/kg	<0.05	<0.05	----	----	----

Analytical Results

Sub-Matrix: **SOIL** (Matrix: **SOIL**)			*Sample ID*	**BH06_0.05**	**BH06_0.82**	**QC300_210903**	**BH04_2.0** **Total Coliforms**	**BH04_4.0** **Total Coliforms**
			Sampling date / time	02-Sep-2021 00:00	02-Sep-2021 00:00	02-Sep-2021 00:00	31-Aug-2021 00:00	31-Aug-2021 00:00
Compound	*CAS Number*	*LOR*	*Unit*	**ES2132166-039**	**ES2132166-041**	**ES2132166-042**	**ES2132166-044**	**ES2132166-045**
				Result	Result	Result	Result	Result
EP068B: Organophosphorus Pesticides (OP) - Continued								
Chlorfenvinphos	470-90-6	0.05	mg/kg	<0.05	<0.05	----	----	----
Bromophos-ethyl	4824-78-6	0.05	mg/kg	<0.05	<0.05	----	----	----
Fenamiphos	22224-92-6	0.05	mg/kg	<0.05	<0.05	----	----	----
Prothiofos	34643-46-4	0.05	mg/kg	<0.05	<0.05	----	----	----
Ethion	563-12-2	0.05	mg/kg	<0.05	<0.05	----	----	----
Carbophenothion	786-19-6	0.05	mg/kg	<0.05	<0.05	----	----	----
Azinphos Methyl	86-50-0	0.05	mg/kg	<0.05	<0.05	----	----	----
EP075(SIM)B: Polynuclear Aromatic Hydrocarbons								
Naphthalene	91-20-3	0.5	mg/kg	<0.5	<0.5	----	----	----
Acenaphthylene	208-96-8	0.5	mg/kg	<0.5	<0.5	----	----	----
Acenaphthene	83-32-9	0.5	mg/kg	<0.5	<0.5	----	----	----
Fluorene	86-73-7	0.5	mg/kg	<0.5	<0.5	----	----	----
Phenanthrene	85-01-8	0.5	mg/kg	<0.5	<0.5	----	----	----
Anthracene	120-12-7	0.5	mg/kg	<0.5	<0.5	----	----	----
Fluoranthene	206-44-0	0.5	mg/kg	<0.5	<0.5	----	----	----
Pyrene	129-00-0	0.5	mg/kg	<0.5	<0.5	----	----	----
Benz(a)anthracene	56-55-3	0.5	mg/kg	<0.5	<0.5	----	----	----
Chrysene	218-01-9	0.5	mg/kg	<0.5	<0.5	----	----	----
Benzo(b+j)fluoranthene	205-99-2 205-82-3	0.5	mg/kg	<0.5	<0.5	----	----	----
Benzo(k)fluoranthene	207-08-9	0.5	mg/kg	<0.5	<0.5	----	----	----
Benzo(a)pyrene	50-32-8	0.5	mg/kg	<0.5	<0.5	----	----	----
Indeno(1.2.3.cd)pyrene	193-39-5	0.5	mg/kg	<0.5	<0.5	----	----	----
Dibenz(a.h)anthracene	53-70-3	0.5	mg/kg	<0.5	<0.5	----	----	----
Benzo(g.h.i)perylene	191-24-2	0.5	mg/kg	<0.5	<0.5	----	----	----
^ **Sum of polycyclic aromatic hydrocarbons**	----	0.5	mg/kg	<0.5	<0.5	----	----	----
^ **Benzo(a)pyrene TEQ (zero)**	----	0.5	mg/kg	<0.5	<0.5	----	----	----
^ **Benzo(a)pyrene TEQ (half LOR)**	----	0.5	mg/kg	**0.6**	**0.6**	----	----	----
^ **Benzo(a)pyrene TEQ (LOR)**	----	0.5	mg/kg	**1.2**	**1.2**	----	----	----
EP080/071: Total Petroleum Hydrocarbons								
C6 - C9 Fraction	----	10	mg/kg	<10	<10	----	----	----
C10 - C14 Fraction	----	50	mg/kg	<50	<50	----	----	----
C15 - C28 Fraction	----	100	mg/kg	<100	<100	----	----	----
C29 - C36 Fraction	----	100	mg/kg	<100	<100	----	----	----
^ **C10 - C36 Fraction (sum)**	----	50	mg/kg	<50	<50	----	----	----

Analytical Results

Sub-Matrix: **SOIL** (Matrix: **SOIL**)			*Sample ID*	**BH06_0.05**	**BH06_0.82**	**QC300_210903**	**BH04_2.0 Total Coliforms**	**BH04_4.0 Total Coliforms**
			Sampling date / time	02-Sep-2021 00:00	02-Sep-2021 00:00	02-Sep-2021 00:00	31-Aug-2021 00:00	31-Aug-2021 00:00
Compound	*CAS Number*	*LOR*	*Unit*	**ES2132166-039**	**ES2132166-041**	**ES2132166-042**	**ES2132166-044**	**ES2132166-045**
				Result	Result	Result	Result	Result
EP080/071: Total Recoverable Hydrocarbons - NEPM 2013 Fractions								
C6 - C10 Fraction	C6_C10	10	mg/kg	<10	<10	----	----	----
^ **C6 - C10 Fraction minus BTEX (F1)**	C6_C10-BTEX	10	mg/kg	<10	<10	----	----	----
>C10 - C16 Fraction	----	50	mg/kg	<50	<50	----	----	----
>C16 - C34 Fraction	----	100	mg/kg	<100	<100	----	----	----
>C34 - C40 Fraction	----	100	mg/kg	<100	<100	----	----	----
^ **>C10 - C40 Fraction (sum)**	----	50	mg/kg	<50	<50	----	----	----
^ **>C10 - C16 Fraction minus Naphthalene (F2)**	----	50	mg/kg	<50	<50	----	----	----
EP080: BTEXN								
Benzene	71-43-2	0.2	mg/kg	<0.2	<0.2	<0.2	----	----
Toluene	108-88-3	0.5	mg/kg	<0.5	<0.5	<0.5	----	----
Ethylbenzene	100-41-4	0.5	mg/kg	<0.5	<0.5	<0.5	----	----
meta- & para-Xylene	108-38-3 106-42-3	0.5	mg/kg	<0.5	<0.5	<0.5	----	----
ortho-Xylene	95-47-6	0.5	mg/kg	<0.5	<0.5	<0.5	----	----
^ **Sum of BTEX**	----	0.2	mg/kg	<0.2	<0.2	<0.2	----	----
^ **Total Xylenes**	----	0.5	mg/kg	<0.5	<0.5	<0.5	----	----
Naphthalene	91-20-3	1	mg/kg	<1	<1	<1	----	----
MM868: Coliforms & E.coli by MPN using Aquachrom ECC								
Total Coliforms by MPN	----	10	MPN/g	----	----	----	<12	**35**
EP068S: Organochlorine Pesticide Surrogate								
Dibromo-DDE	21655-73-2	0.05	%	**98.4**	**116**	----	----	----
EP068T: Organophosphorus Pesticide Surrogate								
DEF	78-48-8	0.05	%	**101**	**73.7**	----	----	----
EP075(SIM)S: Phenolic Compound Surrogates								
Phenol-d6	13127-88-3	0.5	%	**94.5**	**98.1**	----	----	----
2-Chlorophenol-D4	93951-73-6	0.5	%	**91.0**	**97.1**	----	----	----
2.4.6-Tribromophenol	118-79-6	0.5	%	**84.0**	**83.0**	----	----	----
EP075(SIM)T: PAH Surrogates								
2-Fluorobiphenyl	321-60-8	0.5	%	**99.5**	**111**	----	----	----
Anthracene-d10	1719-06-8	0.5	%	**105**	**102**	----	----	----
4-Terphenyl-d14	1718-51-0	0.5	%	**101**	**100**	----	----	----
EP080S: TPH(V)/BTEX Surrogates								
1.2-Dichloroethane-D4	17060-07-0	0.2	%	**94.0**	**102**	**101**	----	----

Analytical Results

Sub-Matrix: **SOIL** (Matrix: **SOIL)**			Sample ID	**BH06_0.05**	**BH06_0.82**	**QC300_210903**	**BH04_2.0** **Total Coliforms**	**BH04_4.0** **Total Coliforms**
			Sampling date / time	02-Sep-2021 00:00	02-Sep-2021 00:00	02-Sep-2021 00:00	31-Aug-2021 00:00	31-Aug-2021 00:00
Compound	CAS Number	LOR	Unit	**ES2132166-039**	**ES2132166-041**	**ES2132166-042**	**ES2132166-044**	**ES2132166-045**
				Result	Result	Result	Result	Result
EP080S: TPH(V)/BTEX Surrogates - Continued								
Toluene-D8	2037-26-5	0.2	%	**92.8**	**96.9**	**117**	----	----
4-Bromofluorobenzene	460-00-4	0.2	%	**100.0**	**105**	**113**	----	----

Analytical Results

Sub-Matrix: **SOIL** (Matrix: **SOIL)**			Sample ID	**BH06_0.05** **Total Coliforms**	**BH06_0.82** **Total Coliforms**	**----**	**----**	**----**
			Sampling date / time	02-Sep-2021 00:00	02-Sep-2021 00:00	----	----	----
Compound	CAS Number	LOR	Unit	**ES2132166-046**	**ES2132166-047**	**--------**	**--------**	**--------**
				Result	Result	----	----	----
MM868: Coliforms & E.coli by MPN using Aquachrom ECC								
Total Coliforms by MPN	----	10	MPN/g	**>31000**	<11	**----**	**----**	**----**

Analytical Results

Sub-Matrix: **WATER** (Matrix: **WATER**)			Sample ID	**QC501_210831**	----	----	----	----
			Sampling date / time	31-Aug-2021 00:00	----	----	----	----
Compound	CAS Number	LOR	Unit	**ES2132166-023**	--------	--------	--------	--------
				Result	----	----	----	----
EG020T: Total Metals by ICP-MS								
Arsenic	7440-38-2	0.001	mg/L	<0.001	----	----	----	----
Cadmium	7440-43-9	0.0001	mg/L	<0.0001	----	----	----	----
Chromium	7440-47-3	0.001	mg/L	<0.001	----	----	----	----
Copper	7440-50-8	0.001	mg/L	<0.001	----	----	----	----
Lead	7439-92-1	0.001	mg/L	<0.001	----	----	----	----
Nickel	7440-02-0	0.001	mg/L	<0.001	----	----	----	----
Zinc	7440-66-6	0.005	mg/L	<0.005	----	----	----	----
EG035T: Total Recoverable Mercury by FIMS								
Mercury	7439-97-6	0.0001	mg/L	<0.0001	----	----	----	----
EK059G: Nitrite plus Nitrate as N (NOx) by Discrete Analyser								
Nitrite + Nitrate as N	----	0.01	mg/L	<0.01	----	----	----	----
EK061G: Total Kjeldahl Nitrogen By Discrete Analyser								
Total Kjeldahl Nitrogen as N	----	0.1	mg/L	<0.1	----	----	----	----
EK062G: Total Nitrogen as N (TKN + NOx) by Discrete Analyser								
^ **Total Nitrogen as N**	----	0.1	mg/L	<0.1	----	----	----	----
EK067G: Total Phosphorus as P by Discrete Analyser								
Total Phosphorus as P	----	0.01	mg/L	<0.01	----	----	----	----
EP068A: Organochlorine Pesticides (OC)								
alpha-BHC	319-84-6	0.5	µg/L	<0.5	----	----	----	----
Hexachlorobenzene (HCB)	118-74-1	0.5	µg/L	<0.5	----	----	----	----
beta-BHC	319-85-7	0.5	µg/L	<0.5	----	----	----	----
gamma-BHC	58-89-9	0.5	µg/L	<0.5	----	----	----	----
delta-BHC	319-86-8	0.5	µg/L	<0.5	----	----	----	----
Heptachlor	76-44-8	0.5	µg/L	<0.5	----	----	----	----
Aldrin	309-00-2	0.5	µg/L	<0.5	----	----	----	----
Heptachlor epoxide	1024-57-3	0.5	µg/L	<0.5	----	----	----	----
trans-Chlordane	5103-74-2	0.5	µg/L	<0.5	----	----	----	----
alpha-Endosulfan	959-98-8	0.5	µg/L	<0.5	----	----	----	----
cis-Chlordane	5103-71-9	0.5	µg/L	<0.5	----	----	----	----
Dieldrin	60-57-1	0.5	µg/L	<0.5	----	----	----	----
4.4`-DDE	72-55-9	0.5	µg/L	<0.5	----	----	----	----
Endrin	72-20-8	0.5	µg/L	<0.5	----	----	----	----
beta-Endosulfan	33213-65-9	0.5	µg/L	<0.5	----	----	----	----
4.4`-DDD	72-54-8	0.5	µg/L	<0.5	----	----	----	----

Analytical Results

Sub-Matrix: **WATER** (Matrix: **WATER**)			*Sample ID*	**QC501_210831**	**----**	**----**	**----**	**----**
			Sampling date / time	31-Aug-2021 00:00	----	----	----	----
Compound	*CAS Number*	*LOR*	*Unit*	**ES2132166-023**	**--------**	**--------**	**--------**	**--------**
				Result	----	----	----	----
EP068A: Organochlorine Pesticides (OC) - Continued								
Endrin aldehyde	7421-93-4	0.5	µg/L	<0.5	----	----	----	----
Endosulfan sulfate	1031-07-8	0.5	µg/L	<0.5	----	----	----	----
4.4`-DDT	50-29-3	2.0	µg/L	<2.0	----	----	----	----
Endrin ketone	53494-70-5	0.5	µg/L	<0.5	----	----	----	----
Methoxychlor	72-43-5	2.0	µg/L	<2.0	----	----	----	----
^ **Total Chlordane (sum)**	----	0.5	µg/L	<0.5	----	----	----	----
^ **Sum of DDD + DDE + DDT**	72-54-8/72-55-9/50-2	0.5	µg/L	<0.5	----	----	----	----
^ **Sum of Aldrin + Dieldrin**	309-00-2/60-57-1	0.5	µg/L	<0.5	----	----	----	----
EP068B: Organophosphorus Pesticides (OP)								
Dichlorvos	62-73-7	0.5	µg/L	<0.5	----	----	----	----
Demeton-S-methyl	919-86-8	0.5	µg/L	<0.5	----	----	----	----
Monocrotophos	6923-22-4	2.0	µg/L	<2.0	----	----	----	----
Dimethoate	60-51-5	0.5	µg/L	<0.5	----	----	----	----
Diazinon	333-41-5	0.5	µg/L	<0.5	----	----	----	----
Chlorpyrifos-methyl	5598-13-0	0.5	µg/L	<0.5	----	----	----	----
Parathion-methyl	298-00-0	2.0	µg/L	<2.0	----	----	----	----
Malathion	121-75-5	0.5	µg/L	<0.5	----	----	----	----
Fenthion	55-38-9	0.5	µg/L	<0.5	----	----	----	----
Chlorpyrifos	2921-88-2	0.5	µg/L	<0.5	----	----	----	----
Parathion	56-38-2	2.0	µg/L	<2.0	----	----	----	----
Pirimphos-ethyl	23505-41-1	0.5	µg/L	<0.5	----	----	----	----
Chlorfenvinphos	470-90-6	0.5	µg/L	<0.5	----	----	----	----
Bromophos-ethyl	4824-78-6	0.5	µg/L	<0.5	----	----	----	----
Fenamiphos	22224-92-6	0.5	µg/L	<0.5	----	----	----	----
Prothiofos	34643-46-4	0.5	µg/L	<0.5	----	----	----	----
Ethion	563-12-2	0.5	µg/L	<0.5	----	----	----	----
Carbophenothion	786-19-6	0.5	µg/L	<0.5	----	----	----	----
Azinphos Methyl	86-50-0	0.5	µg/L	<0.5	----	----	----	----
EP075(SIM)B: Polynuclear Aromatic Hydrocarbons								
Naphthalene	91-20-3	1.0	µg/L	<1.0	----	----	----	----
Acenaphthylene	208-96-8	1.0	µg/L	<1.0	----	----	----	----
Acenaphthene	83-32-9	1.0	µg/L	<1.0	----	----	----	----
Fluorene	86-73-7	1.0	µg/L	<1.0	----	----	----	----
Phenanthrene	85-01-8	1.0	µg/L	<1.0	----	----	----	----

Analytical Results

Sub-Matrix: **WATER** (Matrix: **WATER**)			Sample ID	**QC501_210831**	----	----	----	----
			Sampling date / time	31-Aug-2021 00:00	----	----	----	----
Compound	CAS Number	LOR	Unit	**ES2132166-023**	--------	--------	--------	--------
				Result	----	----	----	----
EP075(SIM)B: Polynuclear Aromatic Hydrocarbons - Continued								
Anthracene	120-12-7	1.0	µg/L	<1.0	----	----	----	----
Fluoranthene	206-44-0	1.0	µg/L	<1.0	----	----	----	----
Pyrene	129-00-0	1.0	µg/L	<1.0	----	----	----	----
Benz(a)anthracene	56-55-3	1.0	µg/L	<1.0	----	----	----	----
Chrysene	218-01-9	1.0	µg/L	<1.0	----	----	----	----
Benzo(b+j)fluoranthene	205-99-2 205-82-3	1.0	µg/L	<1.0	----	----	----	----
Benzo(k)fluoranthene	207-08-9	1.0	µg/L	<1.0	----	----	----	----
Benzo(a)pyrene	50-32-8	0.5	µg/L	<0.5	----	----	----	----
Indeno(1.2.3.cd)pyrene	193-39-5	1.0	µg/L	<1.0	----	----	----	----
Dibenz(a.h)anthracene	53-70-3	1.0	µg/L	<1.0	----	----	----	----
Benzo(g.h.i)perylene	191-24-2	1.0	µg/L	<1.0	----	----	----	----
^ **Sum of polycyclic aromatic hydrocarbons**	----	0.5	µg/L	<0.5	----	----	----	----
^ **Benzo(a)pyrene TEQ (zero)**	----	0.5	µg/L	<0.5	----	----	----	----
EP080/071: Total Petroleum Hydrocarbons								
C6 - C9 Fraction	----	20	µg/L	<20	----	----	----	----
C10 - C14 Fraction	----	50	µg/L	<50	----	----	----	----
C15 - C28 Fraction	----	100	µg/L	<100	----	----	----	----
C29 - C36 Fraction	----	50	µg/L	<50	----	----	----	----
^ **C10 - C36 Fraction (sum)**	----	50	µg/L	<50	----	----	----	----
EP080/071: Total Recoverable Hydrocarbons - NEPM 2013 Fractions								
C6 - C10 Fraction	C6_C10	20	µg/L	<20	----	----	----	----
^ **C6 - C10 Fraction minus BTEX (F1)**	C6_C10-BTEX	20	µg/L	<20	----	----	----	----
>C10 - C16 Fraction	----	100	µg/L	<100	----	----	----	----
>C16 - C34 Fraction	----	100	µg/L	<100	----	----	----	----
>C34 - C40 Fraction	----	100	µg/L	<100	----	----	----	----
^ **>C10 - C40 Fraction (sum)**	----	100	µg/L	<100	----	----	----	----
^ **>C10 - C16 Fraction minus Naphthalene (F2)**	----	100	µg/L	<100	----	----	----	----
EP080: BTEXN								
Benzene	71-43-2	1	µg/L	<1	----	----	----	----
Toluene	108-88-3	2	µg/L	<2	----	----	----	----
Ethylbenzene	100-41-4	2	µg/L	<2	----	----	----	----
meta- & para-Xylene	108-38-3 106-42-3	2	µg/L	<2	----	----	----	----

Analytical Results

Sub-Matrix: **WATER** (Matrix: **WATER**)			Sample ID	**QC501_210831**	----	----	----	----
			Sampling date / time	31-Aug-2021 00:00	----	----	----	----
Compound	CAS Number	LOR	Unit	**ES2132166-023**	--------	--------	--------	--------
				Result	----	----	----	----
EP080: BTEXN - Continued								
ortho-Xylene	95-47-6	2	µg/L	<2	----	----	----	----
^ **Total Xylenes**	----	2	µg/L	<2	----	----	----	----
^ **Sum of BTEX**	----	1	µg/L	<1	----	----	----	----
Naphthalene	91-20-3	5	µg/L	<5	----	----	----	----
EP068S: Organochlorine Pesticide Surrogate								
Dibromo-DDE	21655-73-2	0.5	%	**91.0**	----	----	----	----
EP068T: Organophosphorus Pesticide Surrogate								
DEF	78-48-8	0.5	%	**77.5**	----	----	----	----
EP075(SIM)S: Phenolic Compound Surrogates								
Phenol-d6	13127-88-3	1.0	%	**16.9**	----	----	----	----
2-Chlorophenol-D4	93951-73-6	1.0	%	**39.7**	----	----	----	----
2.4.6-Tribromophenol	118-79-6	1.0	%	**30.4**	----	----	----	----
EP075(SIM)T: PAH Surrogates								
2-Fluorobiphenyl	321-60-8	1.0	%	**50.0**	----	----	----	----
Anthracene-d10	1719-06-8	1.0	%	**69.8**	----	----	----	----
4-Terphenyl-d14	1718-51-0	1.0	%	**87.5**	----	----	----	----
EP080S: TPH(V)/BTEX Surrogates								
1.2-Dichloroethane-D4	17060-07-0	2	%	**109**	----	----	----	----
Toluene-D8	2037-26-5	2	%	**99.4**	----	----	----	----
4-Bromofluorobenzene	460-00-4	2	%	**107**	----	----	----	----

Analytical Results

Descriptive Results

Sub-Matrix: **SOIL**

Method: Compound	Sample ID - Sampling date / time	Analytical Results
EA200: AS 4964 - 2004 Identification of Asbestos in Soils		
EA200: Description	BH04_2.0 - 31-Aug-2021 00:00	Soil sample.
EA200: Description	BH04_4.0 - 31-Aug-2021 00:00	Soil sample.
EA200: Description	SS176_0.10 - 30-Aug-2021 00:00	Soil sample.
EA200: Description	BH06_0.05 - 02-Sep-2021 00:00	Soil sample.
EA200: Description	BH06_0.82 - 02-Sep-2021 00:00	Soil sample.

Surrogate Control Limits

Sub-Matrix: **SOIL**

Compound	CAS Number	Recovery Limits (%) Low	Recovery Limits (%) High
EP068S: Organochlorine Pesticide Surrogate			
Dibromo-DDE	21655-73-2	49	147
EP068T: Organophosphorus Pesticide Surrogate			
DEF	78-48-8	35	143
EP075(SIM)S: Phenolic Compound Surrogates			
Phenol-d6	13127-88-3	63	123
2-Chlorophenol-D4	93951-73-6	66	122
2.4.6-Tribromophenol	118-79-6	40	138
EP075(SIM)T: PAH Surrogates			
2-Fluorobiphenyl	321-60-8	70	122
Anthracene-d10	1719-06-8	66	128
4-Terphenyl-d14	1718-51-0	65	129
EP080S: TPH(V)/BTEX Surrogates			
1.2-Dichloroethane-D4	17060-07-0	73	133
Toluene-D8	2037-26-5	74	132
4-Bromofluorobenzene	460-00-4	72	130

Sub-Matrix: **WATER**

Compound	CAS Number	Recovery Limits (%) Low	Recovery Limits (%) High
EP068S: Organochlorine Pesticide Surrogate			
Dibromo-DDE	21655-73-2	67	111
EP068T: Organophosphorus Pesticide Surrogate			
DEF	78-48-8	67	111
EP075(SIM)S: Phenolic Compound Surrogates			
Phenol-d6	13127-88-3	10	44
2-Chlorophenol-D4	93951-73-6	14	94
2.4.6-Tribromophenol	118-79-6	17	125
EP075(SIM)T: PAH Surrogates			
2-Fluorobiphenyl	321-60-8	20	104
Anthracene-d10	1719-06-8	27	113
4-Terphenyl-d14	1718-51-0	32	112
EP080S: TPH(V)/BTEX Surrogates			
1.2-Dichloroethane-D4	17060-07-0	71	137
Toluene-D8	2037-26-5	79	131
4-Bromofluorobenzene	460-00-4	70	128

Inter-Laboratory Testing

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

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

QUALITY CONTROL REPORT

Work Order	: **ES2132166**	Page	: 1 of 19
Amendment	: **1**		
Client	: **Jacobs Arcadis Joint Venture**	Laboratory	: Environmental Division Sydney
Contact	: Amanda Mullen	Contact	: Customer Services ES
Address	: Level 16 580 George Street Sydney 2000	Address	: 277-289 Woodpark Road Smithfield NSW Australia 2164
Telephone	: ----	Telephone	: +61-2-8784 8555
Project	: IA254001	Date Samples Received	: 03-Sep-2021
Order number	: ----	Date Analysis Commenced	: 06-Sep-2021
C-O-C number	: ----	Issue Date	: 24-Sep-2021
Sampler	: ----		
Site	: ----		
Quote number	: EN/222		
No. of samples received	: 46		
No. of samples analysed	: 18		

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

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

This Quality Control Report contains the following information:

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

Signatories

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

Signatories	*Position*	*Accreditation Category*
Alana Smylie	Asbestos Identifier	Newcastle - Asbestos, Mayfield West, NSW
Ankit Joshi	Inorganic Chemist	Sydney Inorganics, Smithfield, NSW
Edwandy Fadjar	Organic Coordinator	Sydney Organics, Smithfield, NSW
Ivan Taylor	Analyst	Sydney Inorganics, Smithfield, NSW
Sanjeshni Jyoti	Senior Chemist Volatiles	Sydney Organics, Smithfield, NSW
Uma Nagendiram	Subcontracting Coordinator	WRG Subcontracting, Smithfield, NSW

General Comments

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

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

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

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

Laboratory Duplicate (DUP) Report

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

Sub-Matrix**: SOIL**

				Laboratory Duplicate (DUP) Report					
Laboratory sample ID	***Sample ID***	***Method: Compound***	***CAS Number***	***LOR***	***Unit***	***Original Result***	***Duplicate Result***	***RPD (%)***	***Acceptable RPD (%)***
EG005(ED093)T: Total Metals by ICP-AES (QC Lot: 3889708)									
ES2132071-001	Anonymous	EG005T: Cadmium	7440-43-9	1	mg/kg	<1	<1	0.0	No Limit
		EG005T: Chromium	7440-47-3	2	mg/kg	16	12	29.2	No Limit
		EG005T: Nickel	7440-02-0	2	mg/kg	9	6	28.5	No Limit
		EG005T: Arsenic	7440-38-2	5	mg/kg	<5	<5	0.0	No Limit
		EG005T: Copper	7440-50-8	5	mg/kg	21	21	0.0	No Limit
		EG005T: Lead	7439-92-1	5	mg/kg	5	7	22.6	No Limit
		EG005T: Zinc	7440-66-6	5	mg/kg	498	487	2.3	0% - 20%
ES2132157-003	Anonymous	EG005T: Cadmium	7440-43-9	1	mg/kg	<1	<1	0.0	No Limit
		EG005T: Chromium	7440-47-3	2	mg/kg	7	6	0.0	No Limit
		EG005T: Nickel	7440-02-0	2	mg/kg	4	3	0.0	No Limit
		EG005T: Arsenic	7440-38-2	5	mg/kg	<5	<5	0.0	No Limit
		EG005T: Copper	7440-50-8	5	mg/kg	7	8	16.3	No Limit
		EG005T: Lead	7439-92-1	5	mg/kg	8	8	0.0	No Limit
		EG005T: Zinc	7440-66-6	5	mg/kg	22	22	0.0	No Limit
EG005(ED093)T: Total Metals by ICP-AES (QC Lot: 3889711)									
ES2132186-006	Anonymous	EG005T: Cadmium	7440-43-9	1	mg/kg	4	4	0.0	No Limit
		EG005T: Chromium	7440-47-3	2	mg/kg	120	113	6.2	0% - 20%
		EG005T: Nickel	7440-02-0	2	mg/kg	34	32	6.8	0% - 50%
		EG005T: Arsenic	7440-38-2	5	mg/kg	<5	<5	0.0	No Limit
		EG005T: Copper	7440-50-8	5	mg/kg	25	24	6.6	No Limit
		EG005T: Lead	7439-92-1	5	mg/kg	10	8	18.0	No Limit
		EG005T: Zinc	7440-66-6	5	mg/kg	37100	35000	5.8	0% - 20%
ES2132166-036	BH11_0.5	EG005T: Cadmium	7440-43-9	1	mg/kg	<1	<1	0.0	No Limit
		EG005T: Chromium	7440-47-3	2	mg/kg	2	2	0.0	No Limit

Sub-Matrix: **SOIL**

				Laboratory Duplicate (DUP) Report					
Laboratory sample ID	*Sample ID*	*Method: Compound*	*CAS Number*	*LOR*	*Unit*	*Original Result*	*Duplicate Result*	*RPD (%)*	*Acceptable RPD (%)*
EG005(ED093)T: Total Metals by ICP-AES (QC Lot: 3889711) - continued									
ES2132166-036	BH11_0.5	EG005T: Nickel	7440-02-0	2	mg/kg	<2	<2	0.0	No Limit
		EG005T: Arsenic	7440-38-2	5	mg/kg	<5	<5	0.0	No Limit
		EG005T: Copper	7440-50-8	5	mg/kg	<5	<5	0.0	No Limit
		EG005T: Lead	7439-92-1	5	mg/kg	10	9	0.0	No Limit
		EG005T: Zinc	7440-66-6	5	mg/kg	9	11	25.6	No Limit
EA055: Moisture Content (Dried @ 105-110°C) (QC Lot: 3889715)									
ES2132109-002	Anonymous	EA055: Moisture Content	----	0.1	%	15.2	14.4	4.9	0% - 50%
ES2132157-002	Anonymous	EA055: Moisture Content	----	0.1	%	11.2	10.8	4.0	0% - 50%
EA055: Moisture Content (Dried @ 105-110°C) (QC Lot: 3889716)									
ES2132166-033	QC101_210901	EA055: Moisture Content	----	0.1	%	22.7	22.6	0.0	0% - 20%
ES2132231-001	Anonymous	EA055: Moisture Content	----	0.1	%	0.3	0.4	28.2	No Limit
EG035T: Total Recoverable Mercury by FIMS (QC Lot: 3889709)									
ES2132071-001	Anonymous	EG035T: Mercury	7439-97-6	0.1	mg/kg	<0.1	<0.1	0.0	No Limit
ES2132157-003	Anonymous	EG035T: Mercury	7439-97-6	0.1	mg/kg	<0.1	<0.1	0.0	No Limit
EG035T: Total Recoverable Mercury by FIMS (QC Lot: 3889712)									
ES2132166-036	BH11_0.5	EG035T: Mercury	7439-97-6	0.1	mg/kg	<0.1	<0.1	0.0	No Limit
EK059G: Nitrite plus Nitrate as N (NOx) by Discrete Analyser (QC Lot: 3889703)									
ES2132166-024	BH05_0.05	EK059G: Nitrite + Nitrate as N (Sol.)	----	0.1	mg/kg	<0.1	<0.1	0.0	No Limit
EK061G: Total Kjeldahl Nitrogen By Discrete Analyser (QC Lot: 3894762)									
ES2131710-001	Anonymous	EK061G: Total Kjeldahl Nitrogen as N	----	20	mg/kg	330	370	13.3	0% - 50%
ES2132166-015	BH04_4.0	EK061G: Total Kjeldahl Nitrogen as N	----	20	mg/kg	320	300	5.9	0% - 50%
EK067G: Total Phosphorus as P by Discrete Analyser (QC Lot: 3894761)									
ES2131710-001	Anonymous	EK067G: Total Phosphorus as P	----	2	mg/kg	90	80	11.8	0% - 20%
ES2132166-015	BH04_4.0	EK067G: Total Phosphorus as P	----	2	mg/kg	367	362	1.4	0% - 20%
EP010: Formaldehyde (QC Lot: 3889704)									
ES2132166-024	BH05_0.05	EP010: Formaldehyde	50-00-0	2	mg/kg	<2	<2	0.0	No Limit
EP068A: Organochlorine Pesticides (OC) (QC Lot: 3885378)									
ES2132166-009	SS176_0.10	EP068: alpha-BHC	319-84-6	0.05	mg/kg	<0.05	<0.05	0.0	No Limit
		EP068: Hexachlorobenzene (HCB)	118-74-1	0.05	mg/kg	<0.05	<0.05	0.0	No Limit
		EP068: beta-BHC	319-85-7	0.05	mg/kg	<0.05	<0.05	0.0	No Limit
		EP068: gamma-BHC	58-89-9	0.05	mg/kg	<0.05	<0.05	0.0	No Limit
		EP068: delta-BHC	319-86-8	0.05	mg/kg	<0.05	<0.05	0.0	No Limit
		EP068: Heptachlor	76-44-8	0.05	mg/kg	<0.05	<0.05	0.0	No Limit
		EP068: Aldrin	309-00-2	0.05	mg/kg	<0.05	<0.05	0.0	No Limit
		EP068: Heptachlor epoxide	1024-57-3	0.05	mg/kg	<0.05	<0.05	0.0	No Limit
		EP068: trans-Chlordane	5103-74-2	0.05	mg/kg	<0.05	<0.05	0.0	No Limit
		EP068: alpha-Endosulfan	959-98-8	0.05	mg/kg	<0.05	<0.05	0.0	No Limit
		EP068: cis-Chlordane	5103-71-9	0.05	mg/kg	<0.05	<0.05	0.0	No Limit

Sub-Matrix: **SOIL**

				Laboratory Duplicate (DUP) Report					
Laboratory sample ID	*Sample ID*	*Method: Compound*	*CAS Number*	*LOR*	*Unit*	*Original Result*	*Duplicate Result*	*RPD (%)*	*Acceptable RPD (%)*
EP068A: Organochlorine Pesticides (OC) (QC Lot: 3885378) - continued									
ES2132166-009	SS176_0.10	EP068: Dieldrin	60-57-1	0.05	mg/kg	<0.05	<0.05	0.0	No Limit
		EP068: 4.4`-DDE	72-55-9	0.05	mg/kg	<0.05	<0.05	0.0	No Limit
		EP068: Endrin	72-20-8	0.05	mg/kg	<0.05	<0.05	0.0	No Limit
		EP068: beta-Endosulfan	33213-65-9	0.05	mg/kg	<0.05	<0.05	0.0	No Limit
		EP068: 4.4`-DDD	72-54-8	0.05	mg/kg	<0.05	<0.05	0.0	No Limit
		EP068: Endrin aldehyde	7421-93-4	0.05	mg/kg	<0.05	<0.05	0.0	No Limit
		EP068: Endosulfan sulfate	1031-07-8	0.05	mg/kg	<0.05	<0.05	0.0	No Limit
		EP068: Endrin ketone	53494-70-5	0.05	mg/kg	<0.05	<0.05	0.0	No Limit
		EP068: 4.4`-DDT	50-29-3	0.2	mg/kg	<0.2	<0.2	0.0	No Limit
		EP068: Methoxychlor	72-43-5	0.2	mg/kg	<0.2	<0.2	0.0	No Limit
EP068B: Organophosphorus Pesticides (OP) (QC Lot: 3885378)									
ES2132166-009	SS176_0.10	EP068: Dichlorvos	62-73-7	0.05	mg/kg	<0.05	<0.05	0.0	No Limit
		EP068: Demeton-S-methyl	919-86-8	0.05	mg/kg	<0.05	<0.05	0.0	No Limit
		EP068: Dimethoate	60-51-5	0.05	mg/kg	<0.05	<0.05	0.0	No Limit
		EP068: Diazinon	333-41-5	0.05	mg/kg	<0.05	<0.05	0.0	No Limit
		EP068: Chlorpyrifos-methyl	5598-13-0	0.05	mg/kg	<0.05	<0.05	0.0	No Limit
		EP068: Malathion	121-75-5	0.05	mg/kg	<0.05	<0.05	0.0	No Limit
		EP068: Fenthion	55-38-9	0.05	mg/kg	<0.05	<0.05	0.0	No Limit
		EP068: Chlorpyrifos	2921-88-2	0.05	mg/kg	<0.05	<0.05	0.0	No Limit
		EP068: Pirimphos-ethyl	23505-41-1	0.05	mg/kg	<0.05	<0.05	0.0	No Limit
		EP068: Chlorfenvinphos	470-90-6	0.05	mg/kg	<0.05	<0.05	0.0	No Limit
		EP068: Bromophos-ethyl	4824-78-6	0.05	mg/kg	<0.05	<0.05	0.0	No Limit
		EP068: Fenamiphos	22224-92-6	0.05	mg/kg	<0.05	<0.05	0.0	No Limit
		EP068: Prothiofos	34643-46-4	0.05	mg/kg	<0.05	<0.05	0.0	No Limit
		EP068: Ethion	563-12-2	0.05	mg/kg	<0.05	<0.05	0.0	No Limit
		EP068: Carbophenothion	786-19-6	0.05	mg/kg	<0.05	<0.05	0.0	No Limit
		EP068: Azinphos Methyl	86-50-0	0.05	mg/kg	<0.05	<0.05	0.0	No Limit
		EP068: Monocrotophos	6923-22-4	0.2	mg/kg	<0.2	<0.2	0.0	No Limit
		EP068: Parathion-methyl	298-00-0	0.2	mg/kg	<0.2	<0.2	0.0	No Limit
		EP068: Parathion	56-38-2	0.2	mg/kg	<0.2	<0.2	0.0	No Limit
EP075(SIM)B: Polynuclear Aromatic Hydrocarbons (QC Lot: 3885376)									
ES2132166-009	SS176_0.10	EP075(SIM): Naphthalene	91-20-3	0.5	mg/kg	<0.5	<0.5	0.0	No Limit
		EP075(SIM): Acenaphthylene	208-96-8	0.5	mg/kg	<0.5	<0.5	0.0	No Limit
		EP075(SIM): Acenaphthene	83-32-9	0.5	mg/kg	<0.5	<0.5	0.0	No Limit
		EP075(SIM): Fluorene	86-73-7	0.5	mg/kg	<0.5	<0.5	0.0	No Limit
		EP075(SIM): Phenanthrene	85-01-8	0.5	mg/kg	<0.5	<0.5	0.0	No Limit
		EP075(SIM): Anthracene	120-12-7	0.5	mg/kg	<0.5	<0.5	0.0	No Limit
		EP075(SIM): Fluoranthene	206-44-0	0.5	mg/kg	<0.5	<0.5	0.0	No Limit
		EP075(SIM): Pyrene	129-00-0	0.5	mg/kg	<0.5	<0.5	0.0	No Limit
		EP075(SIM): Benz(a)anthracene	56-55-3	0.5	mg/kg	<0.5	<0.5	0.0	No Limit

Sub-Matrix: **SOIL**

				Laboratory Duplicate (DUP) Report					
Laboratory sample ID	*Sample ID*	*Method: Compound*	*CAS Number*	*LOR*	*Unit*	*Original Result*	*Duplicate Result*	*RPD (%)*	*Acceptable RPD (%)*
EP075(SIM)B: Polynuclear Aromatic Hydrocarbons (QC Lot: 3885376) - continued									
ES2132166-009	SS176_0.10	EP075(SIM): Chrysene	218-01-9	0.5	mg/kg	<0.5	<0.5	0.0	No Limit
		EP075(SIM): Benzo(b+j)fluoranthene	205-99-2 205-82-3	0.5	mg/kg	<0.5	<0.5	0.0	No Limit
		EP075(SIM): Benzo(k)fluoranthene	207-08-9	0.5	mg/kg	<0.5	<0.5	0.0	No Limit
		EP075(SIM): Benzo(a)pyrene	50-32-8	0.5	mg/kg	<0.5	<0.5	0.0	No Limit
		EP075(SIM): Indeno(1.2.3.cd)pyrene	193-39-5	0.5	mg/kg	<0.5	<0.5	0.0	No Limit
		EP075(SIM): Dibenz(a.h)anthracene	53-70-3	0.5	mg/kg	<0.5	<0.5	0.0	No Limit
		EP075(SIM): Benzo(g.h.i)perylene	191-24-2	0.5	mg/kg	<0.5	<0.5	0.0	No Limit
		EP075(SIM): Sum of polycyclic aromatic hydrocarbons	----	0.5	mg/kg	<0.5	<0.5	0.0	No Limit
		EP075(SIM): Benzo(a)pyrene TEQ (zero)	----	0.5	mg/kg	<0.5	<0.5	0.0	No Limit
EP075(SIM)B: Polynuclear Aromatic Hydrocarbons (QC Lot: 3886400)									
ES2132157-003	Anonymous	EP075(SIM): Naphthalene	91-20-3	0.5	mg/kg	<0.5	<0.5	0.0	No Limit
		EP075(SIM): Acenaphthylene	208-96-8	0.5	mg/kg	<0.5	<0.5	0.0	No Limit
		EP075(SIM): Acenaphthene	83-32-9	0.5	mg/kg	<0.5	<0.5	0.0	No Limit
		EP075(SIM): Fluorene	86-73-7	0.5	mg/kg	<0.5	<0.5	0.0	No Limit
		EP075(SIM): Phenanthrene	85-01-8	0.5	mg/kg	<0.5	<0.5	0.0	No Limit
		EP075(SIM): Anthracene	120-12-7	0.5	mg/kg	<0.5	<0.5	0.0	No Limit
		EP075(SIM): Fluoranthene	206-44-0	0.5	mg/kg	<0.5	<0.5	0.0	No Limit
		EP075(SIM): Pyrene	129-00-0	0.5	mg/kg	<0.5	<0.5	0.0	No Limit
		EP075(SIM): Benz(a)anthracene	56-55-3	0.5	mg/kg	<0.5	<0.5	0.0	No Limit
		EP075(SIM): Chrysene	218-01-9	0.5	mg/kg	<0.5	<0.5	0.0	No Limit
		EP075(SIM): Benzo(b+j)fluoranthene	205-99-2 205-82-3	0.5	mg/kg	<0.5	<0.5	0.0	No Limit
		EP075(SIM): Benzo(k)fluoranthene	207-08-9	0.5	mg/kg	<0.5	<0.5	0.0	No Limit
		EP075(SIM): Benzo(a)pyrene	50-32-8	0.5	mg/kg	<0.5	<0.5	0.0	No Limit
		EP075(SIM): Indeno(1.2.3.cd)pyrene	193-39-5	0.5	mg/kg	<0.5	<0.5	0.0	No Limit
		EP075(SIM): Dibenz(a.h)anthracene	53-70-3	0.5	mg/kg	<0.5	<0.5	0.0	No Limit
		EP075(SIM): Benzo(g.h.i)perylene	191-24-2	0.5	mg/kg	<0.5	<0.5	0.0	No Limit
		EP075(SIM): Sum of polycyclic aromatic hydrocarbons	----	0.5	mg/kg	<0.5	<0.5	0.0	No Limit
		EP075(SIM): Benzo(a)pyrene TEQ (zero)	----	0.5	mg/kg	<0.5	<0.5	0.0	No Limit
ES2132109-001	Anonymous	EP075(SIM): Naphthalene	91-20-3	0.5	mg/kg	<0.5	<0.5	0.0	No Limit
		EP075(SIM): Acenaphthylene	208-96-8	0.5	mg/kg	<0.5	<0.5	0.0	No Limit
		EP075(SIM): Acenaphthene	83-32-9	0.5	mg/kg	<0.5	<0.5	0.0	No Limit
		EP075(SIM): Fluorene	86-73-7	0.5	mg/kg	<0.5	<0.5	0.0	No Limit
		EP075(SIM): Phenanthrene	85-01-8	0.5	mg/kg	<0.5	<0.5	0.0	No Limit
		EP075(SIM): Anthracene	120-12-7	0.5	mg/kg	<0.5	<0.5	0.0	No Limit
		EP075(SIM): Fluoranthene	206-44-0	0.5	mg/kg	<0.5	<0.5	0.0	No Limit
		EP075(SIM): Pyrene	129-00-0	0.5	mg/kg	<0.5	<0.5	0.0	No Limit

Sub-Matrix: **SOIL**

				Laboratory Duplicate (DUP) Report					
Laboratory sample ID	*Sample ID*	*Method: Compound*	*CAS Number*	*LOR*	*Unit*	*Original Result*	*Duplicate Result*	*RPD (%)*	*Acceptable RPD (%)*
EP075(SIM)B: Polynuclear Aromatic Hydrocarbons (QC Lot: 3886400) - continued									
ES2132109-001	Anonymous	EP075(SIM): Benz(a)anthracene	56-55-3	0.5	mg/kg	<0.5	<0.5	0.0	No Limit
		EP075(SIM): Chrysene	218-01-9	0.5	mg/kg	<0.5	<0.5	0.0	No Limit
		EP075(SIM): Benzo(b+j)fluoranthene	205-99-2 205-82-3	0.5	mg/kg	<0.5	<0.5	0.0	No Limit
		EP075(SIM): Benzo(k)fluoranthene	207-08-9	0.5	mg/kg	<0.5	<0.5	0.0	No Limit
		EP075(SIM): Benzo(a)pyrene	50-32-8	0.5	mg/kg	<0.5	<0.5	0.0	No Limit
		EP075(SIM): Indeno(1.2.3.cd)pyrene	193-39-5	0.5	mg/kg	<0.5	<0.5	0.0	No Limit
		EP075(SIM): Dibenz(a.h)anthracene	53-70-3	0.5	mg/kg	<0.5	<0.5	0.0	No Limit
		EP075(SIM): Benzo(g.h.i)perylene	191-24-2	0.5	mg/kg	<0.5	<0.5	0.0	No Limit
		EP075(SIM): Sum of polycyclic aromatic hydrocarbons	----	0.5	mg/kg	<0.5	<0.5	0.0	No Limit
		EP075(SIM): Benzo(a)pyrene TEQ (zero)	----	0.5	mg/kg	<0.5	<0.5	0.0	No Limit
EP080/071: Total Petroleum Hydrocarbons (QC Lot: 3885123)									
ES2132151-001	Anonymous	EP080: C6 - C9 Fraction	----	10	mg/kg	<10	<10	0.0	No Limit
EP080/071: Total Petroleum Hydrocarbons (QC Lot: 3885377)									
ES2132166-009	SS176_0.10	EP071: C15 - C28 Fraction	----	100	mg/kg	<100	<100	0.0	No Limit
		EP071: C29 - C36 Fraction	----	100	mg/kg	<100	<100	0.0	No Limit
		EP071: C10 - C14 Fraction	----	50	mg/kg	<50	<50	0.0	No Limit
EP080/071: Total Petroleum Hydrocarbons (QC Lot: 3886399)									
ES2132157-003	Anonymous	EP071: C15 - C28 Fraction	----	100	mg/kg	<100	<100	0.0	No Limit
		EP071: C29 - C36 Fraction	----	100	mg/kg	180	170	6.2	No Limit
		EP071: C10 - C14 Fraction	----	50	mg/kg	<50	<50	0.0	No Limit
ES2132109-001	Anonymous	EP071: C15 - C28 Fraction	----	100	mg/kg	<100	<100	0.0	No Limit
		EP071: C29 - C36 Fraction	----	100	mg/kg	<100	<100	0.0	No Limit
		EP071: C10 - C14 Fraction	----	50	mg/kg	<50	<50	0.0	No Limit
EP080/071: Total Petroleum Hydrocarbons (QC Lot: 3889593)									
ES2132166-013	BH04_2.0	EP080: C6 - C9 Fraction	----	10	mg/kg	<10	<10	0.0	No Limit
ES2131986-008	Anonymous	EP080: C6 - C9 Fraction	----	10	mg/kg	<10	<10	0.0	No Limit
EP080/071: Total Recoverable Hydrocarbons - NEPM 2013 Fractions (QC Lot: 3885123)									
ES2132151-001	Anonymous	EP080: C6 - C10 Fraction	C6_C10	10	mg/kg	<10	<10	0.0	No Limit
EP080/071: Total Recoverable Hydrocarbons - NEPM 2013 Fractions (QC Lot: 3885377)									
ES2132166-009	SS176_0.10	EP071: >C16 - C34 Fraction	----	100	mg/kg	<100	<100	0.0	No Limit
		EP071: >C34 - C40 Fraction	----	100	mg/kg	<100	<100	0.0	No Limit
		EP071: >C10 - C16 Fraction	----	50	mg/kg	<50	<50	0.0	No Limit
EP080/071: Total Recoverable Hydrocarbons - NEPM 2013 Fractions (QC Lot: 3886399)									
ES2132157-003	Anonymous	EP071: >C16 - C34 Fraction	----	100	mg/kg	200	220	6.5	No Limit
		EP071: >C34 - C40 Fraction	----	100	mg/kg	140	120	13.7	No Limit
		EP071: >C10 - C16 Fraction	----	50	mg/kg	<50	<50	0.0	No Limit
ES2132109-001	Anonymous	EP071: >C16 - C34 Fraction	----	100	mg/kg	<100	<100	0.0	No Limit

Sub-Matrix: **SOIL**

				Laboratory Duplicate (DUP) Report					
Laboratory sample ID	*Sample ID*	*Method: Compound*	*CAS Number*	*LOR*	*Unit*	*Original Result*	*Duplicate Result*	*RPD (%)*	*Acceptable RPD (%)*
EP080/071: Total Recoverable Hydrocarbons - NEPM 2013 Fractions (QC Lot: 3886399) - continued									
ES2132109-001	Anonymous	EP071: >C34 - C40 Fraction	----	100	mg/kg	<100	<100	0.0	No Limit
		EP071: >C10 - C16 Fraction	----	50	mg/kg	<50	<50	0.0	No Limit
EP080/071: Total Recoverable Hydrocarbons - NEPM 2013 Fractions (QC Lot: 3889593)									
ES2132166-013	BH04_2.0	EP080: C6 - C10 Fraction	C6_C10	10	mg/kg	<10	<10	0.0	No Limit
ES2131986-008	Anonymous	EP080: C6 - C10 Fraction	C6_C10	10	mg/kg	<10	<10	0.0	No Limit
EP080: BTEXN (QC Lot: 3885123)									
ES2132151-001	Anonymous	EP080: Benzene	71-43-2	0.2	mg/kg	<0.2	<0.2	0.0	No Limit
		EP080: Toluene	108-88-3	0.5	mg/kg	<0.5	<0.5	0.0	No Limit
		EP080: Ethylbenzene	100-41-4	0.5	mg/kg	<0.5	<0.5	0.0	No Limit
		EP080: meta- & para-Xylene	108-38-3 106-42-3	0.5	mg/kg	<0.5	<0.5	0.0	No Limit
		EP080: ortho-Xylene	95-47-6	0.5	mg/kg	<0.5	<0.5	0.0	No Limit
		EP080: Naphthalene	91-20-3	1	mg/kg	<1	<1	0.0	No Limit
EP080: BTEXN (QC Lot: 3889593)									
ES2132166-013	BH04_2.0	EP080: Benzene	71-43-2	0.2	mg/kg	<0.2	<0.2	0.0	No Limit
		EP080: Toluene	108-88-3	0.5	mg/kg	<0.5	<0.5	0.0	No Limit
		EP080: Ethylbenzene	100-41-4	0.5	mg/kg	<0.5	<0.5	0.0	No Limit
		EP080: meta- & para-Xylene	108-38-3 106-42-3	0.5	mg/kg	<0.5	<0.5	0.0	No Limit
		EP080: ortho-Xylene	95-47-6	0.5	mg/kg	<0.5	<0.5	0.0	No Limit
		EP080: Naphthalene	91-20-3	1	mg/kg	<1	<1	0.0	No Limit
ES2131986-008	Anonymous	EP080: Benzene	71-43-2	0.2	mg/kg	<0.2	<0.2	0.0	No Limit
		EP080: Toluene	108-88-3	0.5	mg/kg	<0.5	<0.5	0.0	No Limit
		EP080: Ethylbenzene	100-41-4	0.5	mg/kg	<0.5	<0.5	0.0	No Limit
		EP080: meta- & para-Xylene	108-38-3 106-42-3	0.5	mg/kg	<0.5	<0.5	0.0	No Limit
		EP080: ortho-Xylene	95-47-6	0.5	mg/kg	<0.5	<0.5	0.0	No Limit
		EP080: Naphthalene	91-20-3	1	mg/kg	<1	<1	0.0	No Limit

Sub-Matrix: **WATER**

				Laboratory Duplicate (DUP) Report					
Laboratory sample ID	*Sample ID*	*Method: Compound*	*CAS Number*	*LOR*	*Unit*	*Original Result*	*Duplicate Result*	*RPD (%)*	*Acceptable RPD (%)*
EG020T: Total Metals by ICP-MS (QC Lot: 3891896)									
ES2132342-001	Anonymous	EG020A-T: Cadmium	7440-43-9	0.0001	mg/L	<0.0001	<0.0001	0.0	No Limit
		EG020A-T: Arsenic	7440-38-2	0.001	mg/L	0.001	0.001	0.0	No Limit
		EG020A-T: Chromium	7440-47-3	0.001	mg/L	0.005	0.005	0.0	No Limit
		EG020A-T: Copper	7440-50-8	0.001	mg/L	0.003	0.002	0.0	No Limit
		EG020A-T: Lead	7439-92-1	0.001	mg/L	0.002	0.002	0.0	No Limit
		EG020A-T: Nickel	7440-02-0	0.001	mg/L	0.002	0.001	0.0	No Limit
		EG020A-T: Zinc	7440-66-6	0.005	mg/L	0.006	0.007	0.0	No Limit
ES2132569-002	Anonymous	EG020A-T: Cadmium	7440-43-9	0.0001	mg/L	<0.0010	<0.0010	0.0	No Limit

Sub-Matrix: **WATER**

				Laboratory Duplicate (DUP) Report					
Laboratory sample ID	*Sample ID*	*Method: Compound*	*CAS Number*	*LOR*	*Unit*	*Original Result*	*Duplicate Result*	*RPD (%)*	*Acceptable RPD (%)*
EG020T: Total Metals by ICP-MS (QC Lot: 3891896) - continued									
ES2132569-002	Anonymous	EG020A-T: Arsenic	7440-38-2	0.001	mg/L	<0.010	<0.010	0.0	No Limit
		EG020A-T: Chromium	7440-47-3	0.001	mg/L	<0.010	<0.010	0.0	No Limit
		EG020A-T: Copper	7440-50-8	0.001	mg/L	<0.010	<0.010	0.0	No Limit
		EG020A-T: Lead	7439-92-1	0.001	mg/L	<0.010	<0.010	0.0	No Limit
		EG020A-T: Nickel	7440-02-0	0.001	mg/L	<0.010	<0.010	0.0	No Limit
		EG020A-T: Zinc	7440-66-6	0.005	mg/L	<0.052	<0.052	0.0	No Limit
EG035T: Total Recoverable Mercury by FIMS (QC Lot: 3891928)									
ES2132166-023	QC501_210831	EG035T: Mercury	7439-97-6	0.0001	mg/L	<0.0001	<0.0001	0.0	No Limit
EK059G: Nitrite plus Nitrate as N (NOx) by Discrete Analyser (QC Lot: 3894947)									
ES2131870-001	Anonymous	EK059G: Nitrite + Nitrate as N	----	0.01	mg/L	0.02	0.02	0.0	No Limit
ES2132452-001	Anonymous	EK059G: Nitrite + Nitrate as N	----	0.01	mg/L	0.05	0.01	121	No Limit
EK061G: Total Kjeldahl Nitrogen By Discrete Analyser (QC Lot: 3894943)									
ES2131870-001	Anonymous	EK061G: Total Kjeldahl Nitrogen as N	----	0.1	mg/L	46.6	42.2	10.0	0% - 20%
ES2132361-001	Anonymous	EK061G: Total Kjeldahl Nitrogen as N	----	0.1	mg/L	1.0	1.0	0.0	0% - 50%
EK067G: Total Phosphorus as P by Discrete Analyser (QC Lot: 3894942)									
ES2131870-001	Anonymous	EK067G: Total Phosphorus as P	----	0.01	mg/L	<0.01	<0.01	0.0	No Limit
ES2132361-001	Anonymous	EK067G: Total Phosphorus as P	----	0.01	mg/L	0.06	0.07	0.0	No Limit
EP080/071: Total Petroleum Hydrocarbons (QC Lot: 3888784)									
EB2125061-001	Anonymous	EP080: C6 - C9 Fraction	----	20	µg/L	<20	<20	0.0	No Limit
ES2132367-001	Anonymous	EP080: C6 - C9 Fraction	----	20	µg/L	20	30	0.0	No Limit
EP080/071: Total Recoverable Hydrocarbons - NEPM 2013 Fractions (QC Lot: 3888784)									
EB2125061-001	Anonymous	EP080: C6 - C10 Fraction	C6_C10	20	µg/L	<20	<20	0.0	No Limit
ES2132367-001	Anonymous	EP080: C6 - C10 Fraction	C6_C10	20	µg/L	20	30	0.0	No Limit
EP080: BTEXN (QC Lot: 3888784)									
EB2125061-001	Anonymous	EP080: Benzene	71-43-2	1	µg/L	<1	<1	0.0	No Limit
		EP080: Toluene	108-88-3	2	µg/L	<2	<2	0.0	No Limit
		EP080: Ethylbenzene	100-41-4	2	µg/L	<2	<2	0.0	No Limit
		EP080: meta- & para-Xylene	108-38-3 106-42-3	2	µg/L	<2	<2	0.0	No Limit
		EP080: ortho-Xylene	95-47-6	2	µg/L	<2	<2	0.0	No Limit
		EP080: Naphthalene	91-20-3	5	µg/L	<5	<5	0.0	No Limit
ES2132367-001	Anonymous	EP080: Benzene	71-43-2	1	µg/L	<1	<1	0.0	No Limit
		EP080: Toluene	108-88-3	2	µg/L	<2	<2	0.0	No Limit
		EP080: Ethylbenzene	100-41-4	2	µg/L	<2	<2	0.0	No Limit
		EP080: meta- & para-Xylene	108-38-3 106-42-3	2	µg/L	<2	<2	0.0	No Limit
		EP080: ortho-Xylene	95-47-6	2	µg/L	<2	<2	0.0	No Limit
		EP080: Naphthalene	91-20-3	5	µg/L	<5	<5	0.0	No Limit

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

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

Sub-Matrix: **SOIL**

				Method Blank (MB) Report	Laboratory Control Spike (LCS) Report			
					Spike	Spike Recovery (%)	Acceptable Limits (%)	
Method: Compound	*CAS Number*	*LOR*	*Unit*	*Result*	*Concentration*	*LCS*	*Low*	*High*
EG005(ED093)T: Total Metals by ICP-AES (QCLot: 3889708)								
EG005T: Arsenic	7440-38-2	5	mg/kg	<5	121.1 mg/kg	93.9	88.0	113
EG005T: Cadmium	7440-43-9	1	mg/kg	<1	0.74 mg/kg	99.9	70.0	130
EG005T: Chromium	7440-47-3	2	mg/kg	<2	19.6 mg/kg	106	68.0	132
EG005T: Copper	7440-50-8	5	mg/kg	<5	52.9 mg/kg	108	89.0	111
EG005T: Lead	7439-92-1	5	mg/kg	<5	60.8 mg/kg	93.4	82.0	119
EG005T: Nickel	7440-02-0	2	mg/kg	<2	15.3 mg/kg	97.7	80.0	120
EG005T: Zinc	7440-66-6	5	mg/kg	<5	139.3 mg/kg	94.4	66.0	133
EG005(ED093)T: Total Metals by ICP-AES (QCLot: 3889711)								
EG005T: Arsenic	7440-38-2	5	mg/kg	<5	121.1 mg/kg	100	88.0	113
EG005T: Cadmium	7440-43-9	1	mg/kg	<1	0.74 mg/kg	92.0	70.0	130
EG005T: Chromium	7440-47-3	2	mg/kg	<2	19.6 mg/kg	109	68.0	132
EG005T: Copper	7440-50-8	5	mg/kg	<5	52.9 mg/kg	104	89.0	111
EG005T: Lead	7439-92-1	5	mg/kg	<5	60.8 mg/kg	97.5	82.0	119
EG005T: Nickel	7440-02-0	2	mg/kg	<2	15.3 mg/kg	98.1	80.0	120
EG005T: Zinc	7440-66-6	5	mg/kg	<5	139.3 mg/kg	89.8	66.0	133
EG035T: Total Recoverable Mercury by FIMS (QCLot: 3889709)								
EG035T: Mercury	7439-97-6	0.1	mg/kg	<0.1	0.087 mg/kg	111	70.0	125
EG035T: Total Recoverable Mercury by FIMS (QCLot: 3889712)								
EG035T: Mercury	7439-97-6	0.1	mg/kg	<0.1	0.087 mg/kg	96.6	70.0	125
EK059G: Nitrite plus Nitrate as N (NOx) by Discrete Analyser (QCLot: 3889703)								
EK059G: Nitrite + Nitrate as N (Sol.)	----	0.1	mg/kg	<0.1	2.5 mg/kg	100	88.0	118
EK061G: Total Kjeldahl Nitrogen By Discrete Analyser (QCLot: 3894762)								
EK061G: Total Kjeldahl Nitrogen as N	----	20	mg/kg	<20	1000 mg/kg	95.9	72.0	106
				<20	100 mg/kg	99.2	70.0	122
				<20	500 mg/kg	99.8	70.0	130
EK067G: Total Phosphorus as P by Discrete Analyser (QCLot: 3894761)								
EK067G: Total Phosphorus as P	----	2	mg/kg	<2	442 mg/kg	104	76.0	108
				<2	44.2 mg/kg	103	70.0	118
				<2	100 mg/kg	109	70.0	130
EP010: Formaldehyde (QCLot: 3889704)								
EP010: Formaldehyde	50-00-0	2	mg/kg	<2	10 mg/kg	92.5	74.0	116
EP068A: Organochlorine Pesticides (OC) (QCLot: 3885378)								
EP068: alpha-BHC	319-84-6	0.05	mg/kg	<0.05	0.5 mg/kg	83.7	69.0	113

Sub-Matrix: **SOIL**

				Method Blank (MB) Report	Laboratory Control Spike (LCS) Report			
					Spike	Spike Recovery (%)	Acceptable Limits (%)	
Method: Compound	*CAS Number*	*LOR*	*Unit*	*Result*	*Concentration*	*LCS*	*Low*	*High*
EP068A: Organochlorine Pesticides (OC) (QCLot: 3885378) - continued								
EP068: Hexachlorobenzene (HCB)	118-74-1	0.05	mg/kg	<0.05	0.5 mg/kg	85.4	65.0	117
EP068: beta-BHC	319-85-7	0.05	mg/kg	<0.05	0.5 mg/kg	87.2	67.0	119
EP068: gamma-BHC	58-89-9	0.05	mg/kg	<0.05	0.5 mg/kg	88.7	68.0	116
EP068: delta-BHC	319-86-8	0.05	mg/kg	<0.05	0.5 mg/kg	81.4	65.0	117
EP068: Heptachlor	76-44-8	0.05	mg/kg	<0.05	0.5 mg/kg	84.4	67.0	115
EP068: Aldrin	309-00-2	0.05	mg/kg	<0.05	0.5 mg/kg	89.8	69.0	115
EP068: Heptachlor epoxide	1024-57-3	0.05	mg/kg	<0.05	0.5 mg/kg	91.6	62.0	118
EP068: trans-Chlordane	5103-74-2	0.05	mg/kg	<0.05	0.5 mg/kg	92.4	63.0	117
EP068: alpha-Endosulfan	959-98-8	0.05	mg/kg	<0.05	0.5 mg/kg	91.1	66.0	116
EP068: cis-Chlordane	5103-71-9	0.05	mg/kg	<0.05	0.5 mg/kg	88.0	64.0	116
EP068: Dieldrin	60-57-1	0.05	mg/kg	<0.05	0.5 mg/kg	88.9	66.0	116
EP068: 4.4`-DDE	72-55-9	0.05	mg/kg	<0.05	0.5 mg/kg	91.3	67.0	115
EP068: Endrin	72-20-8	0.05	mg/kg	<0.05	0.5 mg/kg	84.4	67.0	123
EP068: beta-Endosulfan	33213-65-9	0.05	mg/kg	<0.05	0.5 mg/kg	101	69.0	115
EP068: 4.4`-DDD	72-54-8	0.05	mg/kg	<0.05	0.5 mg/kg	95.6	69.0	121
EP068: Endrin aldehyde	7421-93-4	0.05	mg/kg	<0.05	0.5 mg/kg	90.0	56.0	120
EP068: Endosulfan sulfate	1031-07-8	0.05	mg/kg	<0.05	0.5 mg/kg	88.4	62.0	124
EP068: 4.4`-DDT	50-29-3	0.2	mg/kg	<0.2	0.5 mg/kg	85.0	66.0	120
EP068: Endrin ketone	53494-70-5	0.05	mg/kg	<0.05	0.5 mg/kg	90.0	64.0	122
EP068: Methoxychlor	72-43-5	0.2	mg/kg	<0.2	0.5 mg/kg	82.8	54.0	130
EP068B: Organophosphorus Pesticides (OP) (QCLot: 3885378)								
EP068: Dichlorvos	62-73-7	0.05	mg/kg	<0.05	0.5 mg/kg	101	59.0	119
EP068: Demeton-S-methyl	919-86-8	0.05	mg/kg	<0.05	0.5 mg/kg	91.6	62.0	128
EP068: Monocrotophos	6923-22-4	0.2	mg/kg	<0.2	0.5 mg/kg	107	54.0	126
EP068: Dimethoate	60-51-5	0.05	mg/kg	<0.05	0.5 mg/kg	88.7	67.0	119
EP068: Diazinon	333-41-5	0.05	mg/kg	<0.05	0.5 mg/kg	86.4	70.0	120
EP068: Chlorpyrifos-methyl	5598-13-0	0.05	mg/kg	<0.05	0.5 mg/kg	84.8	72.0	120
EP068: Parathion-methyl	298-00-0	0.2	mg/kg	<0.2	0.5 mg/kg	83.1	68.0	120
EP068: Malathion	121-75-5	0.05	mg/kg	<0.05	0.5 mg/kg	82.2	68.0	122
EP068: Fenthion	55-38-9	0.05	mg/kg	<0.05	0.5 mg/kg	86.1	69.0	117
EP068: Chlorpyrifos	2921-88-2	0.05	mg/kg	<0.05	0.5 mg/kg	87.1	76.0	118
EP068: Parathion	56-38-2	0.2	mg/kg	<0.2	0.5 mg/kg	87.5	64.0	122
EP068: Pirimphos-ethyl	23505-41-1	0.05	mg/kg	<0.05	0.5 mg/kg	88.3	70.0	116
EP068: Chlorfenvinphos	470-90-6	0.05	mg/kg	<0.05	0.5 mg/kg	87.0	69.0	121
EP068: Bromophos-ethyl	4824-78-6	0.05	mg/kg	<0.05	0.5 mg/kg	89.3	66.0	118
EP068: Fenamiphos	22224-92-6	0.05	mg/kg	<0.05	0.5 mg/kg	87.2	68.0	124
EP068: Prothiofos	34643-46-4	0.05	mg/kg	<0.05	0.5 mg/kg	85.7	62.0	112
EP068: Ethion	563-12-2	0.05	mg/kg	<0.05	0.5 mg/kg	86.8	68.0	120
EP068: Carbophenothion	786-19-6	0.05	mg/kg	<0.05	0.5 mg/kg	82.0	65.0	127

Sub-Matrix: **SOIL**

Method: Compound	CAS Number	LOR	Unit	Method Blank (MB) Report	Laboratory Control Spike (LCS) Report			
					Spike	Spike Recovery (%)	Acceptable Limits (%)	
				Result	Concentration	LCS	Low	High
EP068B: Organophosphorus Pesticides (OP) (QCLot: 3885378) - continued								
EP068: Azinphos Methyl	86-50-0	0.05	mg/kg	<0.05	0.5 mg/kg	72.4	41.0	123
EP075(SIM): Naphthalene	91-20-3	0.5	mg/kg	<0.5	6 mg/kg	97.9	77.0	125
EP075(SIM): Acenaphthylene	208-96-8	0.5	mg/kg	<0.5	6 mg/kg	90.4	72.0	124
EP075(SIM): Acenaphthene	83-32-9	0.5	mg/kg	<0.5	6 mg/kg	97.7	73.0	127
EP075(SIM): Fluorene	86-73-7	0.5	mg/kg	<0.5	6 mg/kg	94.0	72.0	126
EP075(SIM): Phenanthrene	85-01-8	0.5	mg/kg	<0.5	6 mg/kg	96.6	75.0	127
EP075(SIM): Anthracene	120-12-7	0.5	mg/kg	<0.5	6 mg/kg	98.3	77.0	127
EP075(SIM): Fluoranthene	206-44-0	0.5	mg/kg	<0.5	6 mg/kg	96.8	73.0	127
EP075(SIM): Pyrene	129-00-0	0.5	mg/kg	<0.5	6 mg/kg	96.4	74.0	128
EP075(SIM): Benz(a)anthracene	56-55-3	0.5	mg/kg	<0.5	6 mg/kg	87.5	69.0	123
EP075(SIM): Chrysene	218-01-9	0.5	mg/kg	<0.5	6 mg/kg	94.7	75.0	127
EP075(SIM): Benzo(b+j)fluoranthene	205-99-2 205-82-3	0.5	mg/kg	<0.5	6 mg/kg	88.1	68.0	116
EP075(SIM): Benzo(k)fluoranthene	207-08-9	0.5	mg/kg	<0.5	6 mg/kg	91.7	74.0	126
EP075(SIM): Benzo(a)pyrene	50-32-8	0.5	mg/kg	<0.5	6 mg/kg	92.6	70.0	126
EP075(SIM): Indeno(1.2.3.cd)pyrene	193-39-5	0.5	mg/kg	<0.5	6 mg/kg	85.3	61.0	121
EP075(SIM): Dibenz(a.h)anthracene	53-70-3	0.5	mg/kg	<0.5	6 mg/kg	88.3	62.0	118
EP075(SIM): Benzo(g.h.i)perylene	191-24-2	0.5	mg/kg	<0.5	6 mg/kg	89.4	63.0	121
EP075(SIM)B: Polynuclear Aromatic Hydrocarbons (QCLot: 3886400)								
EP075(SIM): Naphthalene	91-20-3	0.5	mg/kg	<0.5	6 mg/kg	91.7	77.0	125
EP075(SIM): Acenaphthylene	208-96-8	0.5	mg/kg	<0.5	6 mg/kg	83.2	72.0	124
EP075(SIM): Acenaphthene	83-32-9	0.5	mg/kg	<0.5	6 mg/kg	90.7	73.0	127
EP075(SIM): Fluorene	86-73-7	0.5	mg/kg	<0.5	6 mg/kg	87.4	72.0	126
EP075(SIM): Phenanthrene	85-01-8	0.5	mg/kg	<0.5	6 mg/kg	89.7	75.0	127
EP075(SIM): Anthracene	120-12-7	0.5	mg/kg	<0.5	6 mg/kg	90.3	77.0	127
EP075(SIM): Fluoranthene	206-44-0	0.5	mg/kg	<0.5	6 mg/kg	89.0	73.0	127
EP075(SIM): Pyrene	129-00-0	0.5	mg/kg	<0.5	6 mg/kg	89.1	74.0	128
EP075(SIM): Benz(a)anthracene	56-55-3	0.5	mg/kg	<0.5	6 mg/kg	79.1	69.0	123
EP075(SIM): Chrysene	218-01-9	0.5	mg/kg	<0.5	6 mg/kg	87.4	75.0	127
EP075(SIM): Benzo(b+j)fluoranthene	205-99-2 205-82-3	0.5	mg/kg	<0.5	6 mg/kg	83.3	68.0	116
EP075(SIM): Benzo(k)fluoranthene	207-08-9	0.5	mg/kg	<0.5	6 mg/kg	83.1	74.0	126
EP075(SIM): Benzo(a)pyrene	50-32-8	0.5	mg/kg	<0.5	6 mg/kg	82.6	70.0	126
EP075(SIM): Indeno(1.2.3.cd)pyrene	193-39-5	0.5	mg/kg	<0.5	6 mg/kg	79.6	61.0	121
EP075(SIM): Dibenz(a.h)anthracene	53-70-3	0.5	mg/kg	<0.5	6 mg/kg	82.2	62.0	118
EP075(SIM): Benzo(g.h.i)perylene	191-24-2	0.5	mg/kg	<0.5	6 mg/kg	82.9	63.0	121
EP080/071: Total Petroleum Hydrocarbons (QCLot: 3885123)								

Sub-Matrix: **SOIL**

				Method Blank (MB) Report	Laboratory Control Spike (LCS) Report			
					Spike	Spike Recovery (%)	Acceptable Limits (%)	
Method: Compound	*CAS Number*	*LOR*	*Unit*	*Result*	*Concentration*	*LCS*	*Low*	*High*
EP080/071: Total Petroleum Hydrocarbons (QCLot: 3885123) - continued								
EP080: C6 - C9 Fraction	----	10	mg/kg	<10	26 mg/kg	86.7	68.4	128
EP080/071: Total Petroleum Hydrocarbons (QCLot: 3885377)								
EP071: C10 - C14 Fraction	----	50	mg/kg	<50	300 mg/kg	111	75.0	129
EP071: C15 - C28 Fraction	----	100	mg/kg	<100	450 mg/kg	102	77.0	131
EP071: C29 - C36 Fraction	----	100	mg/kg	<100	300 mg/kg	103	71.0	129
EP080/071: Total Petroleum Hydrocarbons (QCLot: 3886399)								
EP071: C10 - C14 Fraction	----	50	mg/kg	<50	300 mg/kg	97.0	75.0	129
EP071: C15 - C28 Fraction	----	100	mg/kg	<100	450 mg/kg	96.0	77.0	131
EP071: C29 - C36 Fraction	----	100	mg/kg	<100	300 mg/kg	95.5	71.0	129
EP080/071: Total Petroleum Hydrocarbons (QCLot: 3889593)								
EP080: C6 - C9 Fraction	----	10	mg/kg	<10	26 mg/kg	82.2	68.4	128
EP080/071: Total Recoverable Hydrocarbons - NEPM 2013 Fractions (QCLot: 3885123)								
EP080: C6 - C10 Fraction	C6_C10	10	mg/kg	<10	31 mg/kg	87.5	68.4	128
EP080/071: Total Recoverable Hydrocarbons - NEPM 2013 Fractions (QCLot: 3885377)								
EP071: >C10 - C16 Fraction	----	50	mg/kg	<50	375 mg/kg	110	77.0	125
EP071: >C16 - C34 Fraction	----	100	mg/kg	<100	525 mg/kg	101	74.0	138
EP071: >C34 - C40 Fraction	----	100	mg/kg	<100	225 mg/kg	104	63.0	131
EP080/071: Total Recoverable Hydrocarbons - NEPM 2013 Fractions (QCLot: 3886399)								
EP071: >C10 - C16 Fraction	----	50	mg/kg	<50	375 mg/kg	99.7	77.0	125
EP071: >C16 - C34 Fraction	----	100	mg/kg	<100	525 mg/kg	94.5	74.0	138
EP071: >C34 - C40 Fraction	----	100	mg/kg	<100	225 mg/kg	96.6	63.0	131
EP080/071: Total Recoverable Hydrocarbons - NEPM 2013 Fractions (QCLot: 3889593)								
EP080: C6 - C10 Fraction	C6_C10	10	mg/kg	<10	31 mg/kg	79.4	68.4	128
EP080: BTEXN (QCLot: 3885123)								
EP080: Benzene	71-43-2	0.2	mg/kg	<0.2	1 mg/kg	94.0	62.0	116
EP080: Toluene	108-88-3	0.5	mg/kg	<0.5	1 mg/kg	92.4	67.0	121
EP080: Ethylbenzene	100-41-4	0.5	mg/kg	<0.5	1 mg/kg	91.8	65.0	117
EP080: meta- & para-Xylene	108-38-3 106-42-3	0.5	mg/kg	<0.5	2 mg/kg	90.6	66.0	118
EP080: ortho-Xylene	95-47-6	0.5	mg/kg	<0.5	1 mg/kg	91.4	68.0	120
EP080: Naphthalene	91-20-3	1	mg/kg	<1	1 mg/kg	85.6	63.0	119
EP080: BTEXN (QCLot: 3889593)								
EP080: Benzene	71-43-2	0.2	mg/kg	<0.2	1 mg/kg	102	62.0	116
EP080: Toluene	108-88-3	0.5	mg/kg	<0.5	1 mg/kg	102	67.0	121
EP080: Ethylbenzene	100-41-4	0.5	mg/kg	<0.5	1 mg/kg	97.7	65.0	117
EP080: meta- & para-Xylene	108-38-3 106-42-3	0.5	mg/kg	<0.5	2 mg/kg	96.8	66.0	118

Sub-Matrix: **SOIL**

				Method Blank (MB) Report	*Laboratory Control Spike (LCS) Report*			
					Spike	*Spike Recovery (%)*	*Acceptable Limits (%)*	
Method: Compound	*CAS Number*	*LOR*	*Unit*	*Result*	*Concentration*	*LCS*	*Low*	*High*
EP080: BTEXN (QCLot: 3889593) - continued								
EP080: ortho-Xylene	95-47-6	0.5	mg/kg	<0.5	1 mg/kg	94.8	68.0	120
EP080: Naphthalene	91-20-3	1	mg/kg	<1	1 mg/kg	80.3	63.0	119

Sub-Matrix: **WATER**

				Method Blank (MB) Report	*Laboratory Control Spike (LCS) Report*			
					Spike	*Spike Recovery (%)*	*Acceptable Limits (%)*	
Method: Compound	*CAS Number*	*LOR*	*Unit*	*Result*	*Concentration*	*LCS*	*Low*	*High*
EG020T: Total Metals by ICP-MS (QCLot: 3891896)								
EG020A-T: Arsenic	7440-38-2	0.001	mg/L	<0.001	0.1 mg/L	94.3	82.0	114
EG020A-T: Cadmium	7440-43-9	0.0001	mg/L	<0.0001	0.1 mg/L	96.2	84.0	112
EG020A-T: Chromium	7440-47-3	0.001	mg/L	<0.001	0.1 mg/L	92.7	86.0	116
EG020A-T: Copper	7440-50-8	0.001	mg/L	<0.001	0.1 mg/L	94.3	83.0	118
EG020A-T: Lead	7439-92-1	0.001	mg/L	<0.001	0.1 mg/L	93.6	85.0	115
EG020A-T: Nickel	7440-02-0	0.001	mg/L	<0.001	0.1 mg/L	96.9	84.0	116
EG020A-T: Zinc	7440-66-6	0.005	mg/L	<0.005	0.1 mg/L	88.3	79.0	117
EG035T: Total Recoverable Mercury by FIMS (QCLot: 3891928)								
EG035T: Mercury	7439-97-6	0.0001	mg/L	<0.0001	0.01 mg/L	97.5	77.0	111
EK059G: Nitrite plus Nitrate as N (NOx) by Discrete Analyser (QCLot: 3894947)								
EK059G: Nitrite + Nitrate as N	----	0.01	mg/L	<0.01	0.5 mg/L	98.6	91.0	113
EK061G: Total Kjeldahl Nitrogen By Discrete Analyser (QCLot: 3894943)								
EK061G: Total Kjeldahl Nitrogen as N	----	0.1	mg/L	<0.1	10 mg/L	97.1	69.0	101
				<0.1	1 mg/L	94.1	70.0	118
				<0.1	5 mg/L	96.6	70.0	130
EK067G: Total Phosphorus as P by Discrete Analyser (QCLot: 3894942)								
EK067G: Total Phosphorus as P	----	0.01	mg/L	<0.01	4.42 mg/L	99.0	71.0	101
				<0.01	0.442 mg/L	97.0	72.0	108
				<0.01	1 mg/L	103	70.0	130
EP068A: Organochlorine Pesticides (OC) (QCLot: 3885267)								
EP068: alpha-BHC	319-84-6	0.5	µg/L	<0.5	5 µg/L	81.0	64.9	107
EP068: Hexachlorobenzene (HCB)	118-74-1	0.5	µg/L	<0.5	5 µg/L	78.4	58.3	111
EP068: beta-BHC	319-85-7	0.5	µg/L	<0.5	5 µg/L	95.0	69.0	117
EP068: gamma-BHC	58-89-9	0.5	µg/L	<0.5	5 µg/L	91.8	70.0	112
EP068: delta-BHC	319-86-8	0.5	µg/L	<0.5	5 µg/L	106	68.9	110
EP068: Heptachlor	76-44-8	0.5	µg/L	<0.5	5 µg/L	84.4	65.2	108
EP068: Aldrin	309-00-2	0.5	µg/L	<0.5	5 µg/L	92.4	65.8	109
EP068: Heptachlor epoxide	1024-57-3	0.5	µg/L	<0.5	5 µg/L	99.5	67.1	107
EP068: trans-Chlordane	5103-74-2	0.5	µg/L	<0.5	5 µg/L	100	64.1	110
EP068: alpha-Endosulfan	959-98-8	0.5	µg/L	<0.5	5 µg/L	102	66.7	112
EP068: cis-Chlordane	5103-71-9	0.5	µg/L	<0.5	5 µg/L	91.6	63.2	111
EP068: Dieldrin	60-57-1	0.5	µg/L	<0.5	5 µg/L	101	65.2	113

Sub-Matrix: **WATER**

				Method Blank (MB) Report	Laboratory Control Spike (LCS) Report			
					Spike	Spike Recovery (%)	Acceptable Limits (%)	
Method: Compound	CAS Number	LOR	Unit	Result	Concentration	LCS	Low	High
EP068A: Organochlorine Pesticides (OC) (QCLot: 3885267) - continued								
EP068: 4.4`-DDE	72-55-9	0.5	µg/L	<0.5	5 µg/L	102	66.0	112
EP068: Endrin	72-20-8	0.5	µg/L	<0.5	5 µg/L	96.9	65.2	113
EP068: beta-Endosulfan	33213-65-9	0.5	µg/L	<0.5	5 µg/L	101	67.3	114
EP068: 4.4`-DDD	72-54-8	0.5	µg/L	<0.5	5 µg/L	102	72.0	122
EP068: Endrin aldehyde	7421-93-4	0.5	µg/L	<0.5	5 µg/L	92.2	66.9	109
EP068: Endosulfan sulfate	1031-07-8	0.5	µg/L	<0.5	5 µg/L	84.5	65.2	112
EP068: 4.4`-DDT	50-29-3	2	µg/L	<2.0	5 µg/L	88.5	65.2	112
EP068: Endrin ketone	53494-70-5	0.5	µg/L	<0.5	5 µg/L	93.1	63.8	110
EP068: Methoxychlor	72-43-5	2	µg/L	<2.0	5 µg/L	87.8	61.1	114
EP068B: Organophosphorus Pesticides (OP) (QCLot: 3885267)								
EP068: Dichlorvos	62-73-7	0.5	µg/L	<0.5	5 µg/L	102	65.6	114
EP068: Demeton-S-methyl	919-86-8	0.5	µg/L	<0.5	5 µg/L	81.2	63.7	113
EP068: Monocrotophos	6923-22-4	2	µg/L	<2.0	5 µg/L	24.1	19.7	48.0
EP068: Dimethoate	60-51-5	0.5	µg/L	<0.5	5 µg/L	91.0	69.5	110
EP068: Diazinon	333-41-5	0.5	µg/L	<0.5	5 µg/L	96.8	71.1	110
EP068: Chlorpyrifos-methyl	5598-13-0	0.5	µg/L	<0.5	5 µg/L	95.6	77.0	119
EP068: Parathion-methyl	298-00-0	2	µg/L	<2.0	5 µg/L	97.6	70.0	124
EP068: Malathion	121-75-5	0.5	µg/L	<0.5	5 µg/L	104	68.4	116
EP068: Fenthion	55-38-9	0.5	µg/L	<0.5	5 µg/L	97.7	68.6	112
EP068: Chlorpyrifos	2921-88-2	0.5	µg/L	<0.5	5 µg/L	98.4	75.0	119
EP068: Parathion	56-38-2	2	µg/L	<2.0	5 µg/L	99.8	67.0	121
EP068: Pirimphos-ethyl	23505-41-1	0.5	µg/L	<0.5	5 µg/L	99.3	69.0	121
EP068: Chlorfenvinphos	470-90-6	0.5	µg/L	<0.5	5 µg/L	100	71.8	110
EP068: Bromophos-ethyl	4824-78-6	0.5	µg/L	<0.5	5 µg/L	102	67.5	112
EP068: Fenamiphos	22224-92-6	0.5	µg/L	<0.5	5 µg/L	106	64.1	116
EP068: Prothiofos	34643-46-4	0.5	µg/L	<0.5	5 µg/L	95.2	67.8	114
EP068: Ethion	563-12-2	0.5	µg/L	<0.5	5 µg/L	98.6	74.0	120
EP068: Carbophenothion	786-19-6	0.5	µg/L	<0.5	5 µg/L	87.1	66.2	114
EP068: Azinphos Methyl	86-50-0	0.5	µg/L	<0.5	5 µg/L	96.7	51.6	128
EP075(SIM)B: Polynuclear Aromatic Hydrocarbons (QCLot: 3885265)								
EP075(SIM): Naphthalene	91-20-3	1	µg/L	<1.0	5 µg/L	66.8	50.0	94.0
EP075(SIM): Acenaphthylene	208-96-8	1	µg/L	<1.0	5 µg/L	75.5	63.6	114
EP075(SIM): Acenaphthene	83-32-9	1	µg/L	<1.0	5 µg/L	67.5	62.2	113
EP075(SIM): Fluorene	86-73-7	1	µg/L	<1.0	5 µg/L	66.1	63.9	115
EP075(SIM): Phenanthrene	85-01-8	1	µg/L	<1.0	5 µg/L	85.7	62.6	116
EP075(SIM): Anthracene	120-12-7	1	µg/L	<1.0	5 µg/L	97.4	64.3	116
EP075(SIM): Fluoranthene	206-44-0	1	µg/L	<1.0	5 µg/L	93.0	63.6	118
EP075(SIM): Pyrene	129-00-0	1	µg/L	<1.0	5 µg/L	93.4	63.1	118
EP075(SIM): Benz(a)anthracene	56-55-3	1	µg/L	<1.0	5 µg/L	71.5	64.1	117

Sub-Matrix: **WATER**

				Method Blank (MB) Report	Laboratory Control Spike (LCS) Report			
					Spike	Spike Recovery (%)	Acceptable Limits (%)	
Method: Compound	*CAS Number*	*LOR*	*Unit*	*Result*	*Concentration*	*LCS*	*Low*	*High*
EP075(SIM)B: Polynuclear Aromatic Hydrocarbons (QCLot: 3885265) - continued								
EP075(SIM): Chrysene	218-01-9	1	µg/L	<1.0	5 µg/L	74.3	62.5	116
EP075(SIM): Benzo(b+j)fluoranthene	205-99-2 205-82-3	1	µg/L	<1.0	5 µg/L	74.8	61.7	119
EP075(SIM): Benzo(k)fluoranthene	207-08-9	1	µg/L	<1.0	5 µg/L	71.4	63.0	115
EP075(SIM): Benzo(a)pyrene	50-32-8	0.5	µg/L	<0.5	5 µg/L	78.4	63.3	117
EP075(SIM): Indeno(1.2.3.cd)pyrene	193-39-5	1	µg/L	<1.0	5 µg/L	75.5	59.9	118
EP075(SIM): Dibenz(a.h)anthracene	53-70-3	1	µg/L	<1.0	5 µg/L	71.5	61.2	117
EP075(SIM): Benzo(g.h.i)perylene	191-24-2	1	µg/L	<1.0	5 µg/L	73.3	59.1	118
EP080/071: Total Petroleum Hydrocarbons (QCLot: 3885266)								
EP071: C10 - C14 Fraction	----	50	µg/L	<50	400 µg/L	76.2	55.8	112
EP071: C15 - C28 Fraction	----	100	µg/L	<100	600 µg/L	76.4	71.6	113
EP071: C29 - C36 Fraction	----	50	µg/L	<50	400 µg/L	76.8	56.0	121
EP080/071: Total Petroleum Hydrocarbons (QCLot: 3888784)								
EP080: C6 - C9 Fraction	----	20	µg/L	<20	260 µg/L	86.5	75.0	127
EP080/071: Total Recoverable Hydrocarbons - NEPM 2013 Fractions (QCLot: 3885266)								
EP071: >C10 - C16 Fraction	----	100	µg/L	<100	500 µg/L	72.7	57.9	119
EP071: >C16 - C34 Fraction	----	100	µg/L	<100	700 µg/L	83.9	62.5	110
EP071: >C34 - C40 Fraction	----	100	µg/L	<100	300 µg/L	67.7	61.5	121
EP080/071: Total Recoverable Hydrocarbons - NEPM 2013 Fractions (QCLot: 3888784)								
EP080: C6 - C10 Fraction	C6_C10	20	µg/L	<20	310 µg/L	87.8	75.0	127
EP080: BTEXN (QCLot: 3888784)								
EP080: Benzene	71-43-2	1	µg/L	<1	10 µg/L	91.3	70.0	122
EP080: Toluene	108-88-3	2	µg/L	<2	10 µg/L	84.3	69.0	123
EP080: Ethylbenzene	100-41-4	2	µg/L	<2	10 µg/L	84.5	70.0	120
EP080: meta- & para-Xylene	108-38-3 106-42-3	2	µg/L	<2	10 µg/L	84.4	69.0	121
EP080: ortho-Xylene	95-47-6	2	µg/L	<2	10 µg/L	85.1	72.0	122
EP080: Naphthalene	91-20-3	5	µg/L	<5	10 µg/L	87.7	70.0	120

Matrix Spike (MS) Report

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

Sub-Matrix: **SOIL**

				Matrix Spike (MS) Report			
				Spike	SpikeRecovery(%)	Acceptable Limits (%)	
Laboratory sample ID	*Sample ID*	*Method: Compound*	*CAS Number*	*Concentration*	*MS*	*Low*	*High*
EG005(ED093)T: Total Metals by ICP-AES (QCLot: 3889708)							
ES2132071-001	Anonymous	EG005T: Arsenic	7440-38-2	50 mg/kg	91.7	70.0	130

Sub-Matrix: **SOIL**

				Matrix Spike (MS) Report			
				Spike	*SpikeRecovery(%)*	*Acceptable Limits (%)*	
Laboratory sample ID	*Sample ID*	*Method: Compound*	*CAS Number*	*Concentration*	*MS*	*Low*	*High*
EG005(ED093)T: Total Metals by ICP-AES (QCLot: 3889708) - continued							
ES2132071-001	Anonymous	EG005T: Cadmium	7440-43-9	50 mg/kg	98.0	70.0	130
		EG005T: Chromium	7440-47-3	50 mg/kg	96.5	68.0	132
		EG005T: Copper	7440-50-8	250 mg/kg	99.5	70.0	130
		EG005T: Lead	7439-92-1	250 mg/kg	100	70.0	130
		EG005T: Nickel	7440-02-0	50 mg/kg	91.9	70.0	130
		EG005T: Zinc	7440-66-6	250 mg/kg	109	66.0	133
EG005(ED093)T: Total Metals by ICP-AES (QCLot: 3889711)							
ES2132166-036	BH11_0.5	EG005T: Arsenic	7440-38-2	50 mg/kg	88.7	70.0	130
		EG005T: Cadmium	7440-43-9	50 mg/kg	95.0	70.0	130
		EG005T: Chromium	7440-47-3	50 mg/kg	94.1	68.0	132
		EG005T: Copper	7440-50-8	250 mg/kg	95.5	70.0	130
		EG005T: Lead	7439-92-1	250 mg/kg	96.3	70.0	130
		EG005T: Nickel	7440-02-0	50 mg/kg	92.2	70.0	130
		EG005T: Zinc	7440-66-6	250 mg/kg	94.7	66.0	133
EG035T: Total Recoverable Mercury by FIMS (QCLot: 3889709)							
ES2132071-001	Anonymous	EG035T: Mercury	7439-97-6	5 mg/kg	107	70.0	130
EG035T: Total Recoverable Mercury by FIMS (QCLot: 3889712)							
ES2132166-036	BH11_0.5	EG035T: Mercury	7439-97-6	5 mg/kg	108	70.0	130
EK059G: Nitrite plus Nitrate as N (NOx) by Discrete Analyser (QCLot: 3889703)							
ES2132166-002	BH09_0.5	EK059G: Nitrite + Nitrate as N (Sol.)	----	2.5 mg/kg	97.7	70.0	130
EK061G: Total Kjeldahl Nitrogen By Discrete Analyser (QCLot: 3894762)							
ES2131710-001	Anonymous	EK061G: Total Kjeldahl Nitrogen as N	----	500 mg/kg	99.5	70.0	130
EK067G: Total Phosphorus as P by Discrete Analyser (QCLot: 3894761)							
ES2131710-001	Anonymous	EK067G: Total Phosphorus as P	----	100 mg/kg	77.0	70.0	130
EP010: Formaldehyde (QCLot: 3889704)							
ES2132166-024	BH05_0.05	EP010: Formaldehyde	50-00-0	12.5 mg/kg	95.6	70.0	130
EP068A: Organochlorine Pesticides (OC) (QCLot: 3885378)							
ES2132166-009	SS176_0.10	EP068: gamma-BHC	58-89-9	0.5 mg/kg	82.5	70.0	130
		EP068: Heptachlor	76-44-8	0.5 mg/kg	80.3	70.0	130
		EP068: Aldrin	309-00-2	0.5 mg/kg	80.2	70.0	130
		EP068: Dieldrin	60-57-1	0.5 mg/kg	84.9	70.0	130
		EP068: Endrin	72-20-8	2 mg/kg	91.9	70.0	130
		EP068: 4.4`-DDT	50-29-3	2 mg/kg	94.9	70.0	130
EP068B: Organophosphorus Pesticides (OP) (QCLot: 3885378)							
ES2132166-009	SS176_0.10	EP068: Diazinon	333-41-5	0.5 mg/kg	82.7	70.0	130
		EP068: Chlorpyrifos-methyl	5598-13-0	0.5 mg/kg	78.1	70.0	130

Sub-Matrix: **SOIL**

				Matrix Spike (MS) Report			
				Spike	SpikeRecovery(%)	Acceptable Limits (%)	
Laboratory sample ID	Sample ID	Method: Compound	CAS Number	Concentration	MS	Low	High
EP068B: Organophosphorus Pesticides (OP) (QCLot: 3885378) - continued							
ES2132166-009	SS176_0.10	EP068: Pirimphos-ethyl	23505-41-1	0.5 mg/kg	89.4	70.0	130
		EP068: Bromophos-ethyl	4824-78-6	0.5 mg/kg	74.4	70.0	130
		EP068: Prothiofos	34643-46-4	0.5 mg/kg	71.7	70.0	130
EP075(SIM)B: Polynuclear Aromatic Hydrocarbons (QCLot: 3885376)							
ES2132166-009	SS176_0.10	EP075(SIM): Acenaphthene	83-32-9	10 mg/kg	87.0	70.0	130
		EP075(SIM): Pyrene	129-00-0	10 mg/kg	94.0	70.0	130
EP075(SIM)B: Polynuclear Aromatic Hydrocarbons (QCLot: 3886400)							
ES2132109-001	Anonymous	EP075(SIM): Acenaphthene	83-32-9	10 mg/kg	80.4	70.0	130
		EP075(SIM): Pyrene	129-00-0	10 mg/kg	85.9	70.0	130
EP080/071: Total Petroleum Hydrocarbons (QCLot: 3885123)							
ES2132151-001	Anonymous	EP080: C6 - C9 Fraction	----	32.5 mg/kg	102	70.0	130
EP080/071: Total Petroleum Hydrocarbons (QCLot: 3885377)							
ES2132166-009	SS176_0.10	EP071: C10 - C14 Fraction	----	480 mg/kg	103	73.0	137
		EP071: C15 - C28 Fraction	----	3100 mg/kg	104	53.0	131
		EP071: C29 - C36 Fraction	----	2060 mg/kg	110	52.0	132
EP080/071: Total Petroleum Hydrocarbons (QCLot: 3886399)							
ES2132109-001	Anonymous	EP071: C10 - C14 Fraction	----	480 mg/kg	122	73.0	137
		EP071: C15 - C28 Fraction	----	3100 mg/kg	118	53.0	131
		EP071: C29 - C36 Fraction	----	2060 mg/kg	124	52.0	132
EP080/071: Total Petroleum Hydrocarbons (QCLot: 3889593)							
ES2131986-008	Anonymous	EP080: C6 - C9 Fraction	----	32.5 mg/kg	76.2	70.0	130
EP080/071: Total Recoverable Hydrocarbons - NEPM 2013 Fractions (QCLot: 3885123)							
ES2132151-001	Anonymous	EP080: C6 - C10 Fraction	C6_C10	37.5 mg/kg	100	70.0	130
EP080/071: Total Recoverable Hydrocarbons - NEPM 2013 Fractions (QCLot: 3885377)							
ES2132166-009	SS176_0.10	EP071: >C10 - C16 Fraction	----	860 mg/kg	107	73.0	137
		EP071: >C16 - C34 Fraction	----	4320 mg/kg	114	53.0	131
		EP071: >C34 - C40 Fraction	----	890 mg/kg	102	52.0	132
EP080/071: Total Recoverable Hydrocarbons - NEPM 2013 Fractions (QCLot: 3886399)							
ES2132109-001	Anonymous	EP071: >C10 - C16 Fraction	----	860 mg/kg	120	73.0	137
		EP071: >C16 - C34 Fraction	----	4320 mg/kg	125	53.0	131
		EP071: >C34 - C40 Fraction	----	890 mg/kg	104	52.0	132
EP080/071: Total Recoverable Hydrocarbons - NEPM 2013 Fractions (QCLot: 3889593)							
ES2131986-008	Anonymous	EP080: C6 - C10 Fraction	C6_C10	37.5 mg/kg	73.7	70.0	130
EP080: BTEXN (QCLot: 3885123)							
ES2132151-001	Anonymous	EP080: Benzene	71-43-2	2.5 mg/kg	99.8	70.0	130

Sub-Matrix: **SOIL**

				Matrix Spike (MS) Report			
				Spike	*SpikeRecovery(%)*	*Acceptable Limits (%)*	
Laboratory sample ID	*Sample ID*	*Method: Compound*	*CAS Number*	*Concentration*	*MS*	*Low*	*High*
EP080: BTEXN (QCLot: 3885123) - continued							
ES2132151-001	Anonymous	EP080: Toluene	108-88-3	2.5 mg/kg	92.6	70.0	130
		EP080: Ethylbenzene	100-41-4	2.5 mg/kg	94.4	70.0	130
		EP080: meta- & para-Xylene	108-38-3 106-42-3	2.5 mg/kg	93.0	70.0	130
		EP080: ortho-Xylene	95-47-6	2.5 mg/kg	92.3	70.0	130
		EP080: Naphthalene	91-20-3	2.5 mg/kg	85.0	70.0	130
EP080: BTEXN (QCLot: 3889593)							
ES2131986-008	Anonymous	EP080: Benzene	71-43-2	2.5 mg/kg	76.8	70.0	130
		EP080: Toluene	108-88-3	2.5 mg/kg	79.8	70.0	130
		EP080: Ethylbenzene	100-41-4	2.5 mg/kg	80.1	70.0	130
		EP080: meta- & para-Xylene	108-38-3 106-42-3	2.5 mg/kg	79.5	70.0	130
		EP080: ortho-Xylene	95-47-6	2.5 mg/kg	79.6	70.0	130
		EP080: Naphthalene	91-20-3	2.5 mg/kg	83.7	70.0	130

Sub-Matrix: **WATER**

				Matrix Spike (MS) Report			
				Spike	*SpikeRecovery(%)*	*Acceptable Limits (%)*	
Laboratory sample ID	*Sample ID*	*Method: Compound*	*CAS Number*	*Concentration*	*MS*	*Low*	*High*
EG020T: Total Metals by ICP-MS (QCLot: 3891896)							
ES2131870-002	Anonymous	EG020A-T: Arsenic	7440-38-2	1 mg/L	90.0	70.0	130
		EG020A-T: Cadmium	7440-43-9	0.25 mg/L	92.5	70.0	130
		EG020A-T: Chromium	7440-47-3	1 mg/L	93.6	70.0	130
		EG020A-T: Copper	7440-50-8	1 mg/L	91.0	70.0	130
		EG020A-T: Lead	7439-92-1	1 mg/L	90.0	70.0	130
		EG020A-T: Nickel	7440-02-0	1 mg/L	75.5	70.0	130
		EG020A-T: Zinc	7440-66-6	1 mg/L	83.8	70.0	130
EG035T: Total Recoverable Mercury by FIMS (QCLot: 3891928)							
ES2132166-023	QC501_210831	EG035T: Mercury	7439-97-6	0.01 mg/L	91.1	70.0	130
EK059G: Nitrite plus Nitrate as N (NOx) by Discrete Analyser (QCLot: 3894947)							
ES2131870-001	Anonymous	EK059G: Nitrite + Nitrate as N	----	0.5 mg/L	95.8	70.0	130
EK061G: Total Kjeldahl Nitrogen By Discrete Analyser (QCLot: 3894943)							
ES2131870-002	Anonymous	EK061G: Total Kjeldahl Nitrogen as N	----	5 mg/L	89.1	70.0	130
EK067G: Total Phosphorus as P by Discrete Analyser (QCLot: 3894942)							
ES2131870-002	Anonymous	EK067G: Total Phosphorus as P	----	1 mg/L	103	70.0	130
EP080/071: Total Petroleum Hydrocarbons (QCLot: 3888784)							
EB2125061-001	Anonymous	EP080: C6 - C9 Fraction	----	325 µg/L	108	70.0	130
EP080/071: Total Recoverable Hydrocarbons - NEPM 2013 Fractions (QCLot: 3888784)							

Sub-Matrix: **WATER**

Laboratory sample ID	Sample ID	Method: Compound	CAS Number	Matrix Spike (MS) Report Spike Concentration	SpikeRecovery(%) MS	Acceptable Limits (%) Low	High
EP080/071: Total Recoverable Hydrocarbons - NEPM 2013 Fractions (QCLot: 3888784) - continued							
EB2125061-001	Anonymous	EP080: C6 - C10 Fraction	C6_C10	375 µg/L	107	70.0	130
EP080: BTEXN (QCLot: 3888784)							
EB2125061-001	Anonymous	EP080: Benzene	71-43-2	25 µg/L	88.9	70.0	130
		EP080: Toluene	108-88-3	25 µg/L	87.0	70.0	130
		EP080: Ethylbenzene	100-41-4	25 µg/L	90.4	70.0	130
		EP080: meta- & para-Xylene	108-38-3 106-42-3	25 µg/L	92.5	70.0	130
		EP080: ortho-Xylene	95-47-6	25 µg/L	90.4	70.0	130
		EP080: Naphthalene	91-20-3	25 µg/L	89.4	70.0	130

QA/QC Compliance Assessment to assist with Quality Review

Work Order	: **ES2132166**	Page	: 1 of 13
Amendment	: **1**		
Client	: **Jacobs Arcadis Joint Venture**	Laboratory	: Environmental Division Sydney
Contact	: Amanda Mullen	Telephone	: +61-2-8784 8555
Project	: IA254001	Date Samples Received	: 03-Sep-2021
Site	: ----	Issue Date	: 24-Sep-2021
Sampler	: ----	No. of samples received	: 46
Order number	: ----	No. of samples analysed	: 18

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

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

Summary of Outliers

Outliers : Quality Control Samples

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

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

Outliers : Analysis Holding Time Compliance

- **Analysis Holding Time Outliers exist - please see following pages for full details.**

Outliers : Frequency of Quality Control Samples

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

Outliers : Analysis Holding Time Compliance

Matrix: **SOIL**

Method **Container** / Client Sample ID(s)	*Extraction / Preparation* *Date extracted*	 *Due for extraction*	 **Days overdue**	*Analysis* *Date analysed*	 *Due for analysis*	 **Days overdue**
MM868: Coliforms & E.coli by MPN using Aquachrom ECC						
Sterile Plastic Bottle - Sodium Thiosulfate BH06_0.05 - Total Coliforms, BH06_0.82 - Total Coliforms	----	----	----	08-Sep-2021	06-Sep-2021	**2**
Sterile Plastic Bottle - Sodium Thiosulfate BH04_2.0 - Total Coliforms, BH04_4.0 - Total Coliforms	----	----	----	08-Sep-2021	04-Sep-2021	**4**

Matrix: **WATER**

Method **Container** / Client Sample ID(s)	*Extraction / Preparation* *Date extracted*	 *Due for extraction*	 **Days overdue**	*Analysis* *Date analysed*	 *Due for analysis*	 **Days overdue**
EK059G: Nitrite plus Nitrate as N (NOx) by Discrete Analyser						
Clear Plastic Bottle - Natural QC501_210831	----	----	----	10-Sep-2021	02-Sep-2021	**8**
EK061G: Total Kjeldahl Nitrogen By Discrete Analyser						
Clear Plastic Bottle - Natural QC501_210831	10-Sep-2021	01-Sep-2021	**9**	----	----	----
EK067G: Total Phosphorus as P by Discrete Analyser						
Clear Plastic Bottle - Natural QC501_210831	10-Sep-2021	02-Sep-2021	**8**	----	----	----

Outliers : Frequency of Quality Control Samples

Matrix: **WATER**

Method	Count QC	 Regular	Rate (%) Actual	 Expected	Quality Control Specification
PAH/Phenols (GC/MS - SIM)	0	7	0.00	10.00	NEPM 2013 B3 & ALS QC Standard
Pesticides by GCMS	0	1	0.00	10.00	NEPM 2013 B3 & ALS QC Standard
TRH - Semivolatile Fraction	0	8	0.00	10.00	NEPM 2013 B3 & ALS QC Standard
PAH/Phenols (GC/MS - SIM)	0	7	0.00	5.00	NEPM 2013 B3 & ALS QC Standard
Pesticides by GCMS	0	1	0.00	5.00	NEPM 2013 B3 & ALS QC Standard
TRH - Semivolatile Fraction	0	8	0.00	5.00	NEPM 2013 B3 & ALS QC Standard

Analysis Holding Time Compliance

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

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

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

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

Matrix: **SOIL**

Evaluation: × = Holding time breach ; ✓ = Within holding time.

Method *Container / Client Sample ID(s)*	*Sample Date*	*Extraction / Preparation*			*Analysis*		
		Date extracted	*Due for extraction*	*Evaluation*	*Date analysed*	*Due for analysis*	*Evaluation*
EA055: Moisture Content (Dried @ 105-110°C)							
Soil Glass Jar - Unpreserved (EA055) BH05_0.05, BH05_5.0, QC101_210901	**01-Sep-2021**	----	----	----	**08-Sep-2021**	15-Sep-2021	✓
Soil Glass Jar - Unpreserved (EA055) BH11_0.05, BH11_0.5, BH06_0.05, BH06_0.82	**02-Sep-2021**	----	----	----	**08-Sep-2021**	16-Sep-2021	✓
Soil Glass Jar - Unpreserved (EA055) BH09_0.5, BH09_2.0, SS176_0.10	**30-Aug-2021**	----	----	----	**08-Sep-2021**	13-Sep-2021	✓
Soil Glass Jar - Unpreserved (EA055) BH04_2.0, BH04_4.0	**31-Aug-2021**	----	----	----	**08-Sep-2021**	14-Sep-2021	✓
EA200: AS 4964 - 2004 Identification of Asbestos in Soils							
Snap Lock Bag (EA200) BH06_0.05	**02-Sep-2021**	----	----	----	**06-Sep-2021**	01-Mar-2022	✓
Snap Lock Bag (EA200) SS176_0.10	**30-Aug-2021**	----	----	----	**06-Sep-2021**	26-Feb-2022	✓
Snap Lock Bag (EA200) BH04_2.0, BH04_4.0	**31-Aug-2021**	----	----	----	**06-Sep-2021**	27-Feb-2022	✓
Soil Glass Jar - Unpreserved (EA200) BH06_0.82	**02-Sep-2021**	----	----	----	**06-Sep-2021**	01-Mar-2022	✓
EG005(ED093)T: Total Metals by ICP-AES							
Soil Glass Jar - Unpreserved (EG005T) BH05_0.05, BH05_5.0, QC101_210901	**01-Sep-2021**	**08-Sep-2021**	28-Feb-2022	✓	**08-Sep-2021**	28-Feb-2022	✓
Soil Glass Jar - Unpreserved (EG005T) BH11_0.05, BH11_0.5, BH06_0.05, BH06_0.82	**02-Sep-2021**	**08-Sep-2021**	01-Mar-2022	✓	**08-Sep-2021**	01-Mar-2022	✓
Soil Glass Jar - Unpreserved (EG005T) BH09_0.5, BH09_2.0, SS176_0.10	**30-Aug-2021**	**08-Sep-2021**	26-Feb-2022	✓	**08-Sep-2021**	26-Feb-2022	✓
Soil Glass Jar - Unpreserved (EG005T) BH04_2.0, BH04_4.0	**31-Aug-2021**	**08-Sep-2021**	27-Feb-2022	✓	**08-Sep-2021**	27-Feb-2022	✓

Matrix: **SOIL**

Evaluation: × = Holding time breach ; ✓ = Within holding time.

Method *Container / Client Sample ID(s)*	*Sample Date*	*Extraction / Preparation*			*Analysis*		
		Date extracted	*Due for extraction*	*Evaluation*	*Date analysed*	*Due for analysis*	*Evaluation*
EG035T: Total Recoverable Mercury by FIMS							
Soil Glass Jar - Unpreserved (EG035T) BH05_0.05, BH05_5.0, QC101_210901	**01-Sep-2021**	**08-Sep-2021**	29-Sep-2021	✓	**09-Sep-2021**	29-Sep-2021	✓
Soil Glass Jar - Unpreserved (EG035T) BH11_0.05, BH11_0.5, BH06_0.05, BH06_0.82	**02-Sep-2021**	**08-Sep-2021**	30-Sep-2021	✓	**09-Sep-2021**	30-Sep-2021	✓
Soil Glass Jar - Unpreserved (EG035T) BH09_0.5, BH09_2.0, SS176_0.10	**30-Aug-2021**	**08-Sep-2021**	27-Sep-2021	✓	**09-Sep-2021**	27-Sep-2021	✓
Soil Glass Jar - Unpreserved (EG035T) BH04_2.0, BH04_4.0	**31-Aug-2021**	**08-Sep-2021**	28-Sep-2021	✓	**09-Sep-2021**	28-Sep-2021	✓
EK059G: Nitrite plus Nitrate as N (NOx) by Discrete Analyser							
Soil Glass Jar - Unpreserved (EK059G) BH05_0.05, BH05_5.0, QC101_210901	**01-Sep-2021**	**08-Sep-2021**	29-Sep-2021	✓	**09-Sep-2021**	10-Sep-2021	✓
Soil Glass Jar - Unpreserved (EK059G) BH06_0.05, BH06_0.82	**02-Sep-2021**	**08-Sep-2021**	30-Sep-2021	✓	**09-Sep-2021**	10-Sep-2021	✓
Soil Glass Jar - Unpreserved (EK059G) BH09_0.5, BH09_2.0	**30-Aug-2021**	**08-Sep-2021**	27-Sep-2021	✓	**09-Sep-2021**	10-Sep-2021	✓
Soil Glass Jar - Unpreserved (EK059G) BH04_2.0, BH04_4.0	**31-Aug-2021**	**08-Sep-2021**	28-Sep-2021	✓	**09-Sep-2021**	10-Sep-2021	✓
EK061G: Total Kjeldahl Nitrogen By Discrete Analyser							
Soil Glass Jar - Unpreserved (EK061G) BH05_0.05, BH05_5.0, QC101_210901	**01-Sep-2021**	**10-Sep-2021**	29-Sep-2021	✓	**10-Sep-2021**	08-Oct-2021	✓
Soil Glass Jar - Unpreserved (EK061G) BH06_0.05, BH06_0.82	**02-Sep-2021**	**10-Sep-2021**	30-Sep-2021	✓	**10-Sep-2021**	08-Oct-2021	✓
Soil Glass Jar - Unpreserved (EK061G) BH09_0.5, BH09_2.0	**30-Aug-2021**	**10-Sep-2021**	27-Sep-2021	✓	**10-Sep-2021**	08-Oct-2021	✓
Soil Glass Jar - Unpreserved (EK061G) BH04_2.0, BH04_4.0	**31-Aug-2021**	**10-Sep-2021**	28-Sep-2021	✓	**10-Sep-2021**	08-Oct-2021	✓
EK067G: Total Phosphorus as P by Discrete Analyser							
Soil Glass Jar - Unpreserved (EK067G) BH05_0.05, BH05_5.0, QC101_210901	**01-Sep-2021**	**10-Sep-2021**	29-Sep-2021	✓	**10-Sep-2021**	08-Oct-2021	✓
Soil Glass Jar - Unpreserved (EK067G) BH06_0.05, BH06_0.82	**02-Sep-2021**	**10-Sep-2021**	30-Sep-2021	✓	**10-Sep-2021**	08-Oct-2021	✓
Soil Glass Jar - Unpreserved (EK067G) BH09_0.5, BH09_2.0	**30-Aug-2021**	**10-Sep-2021**	27-Sep-2021	✓	**10-Sep-2021**	08-Oct-2021	✓
Soil Glass Jar - Unpreserved (EK067G) BH04_2.0, BH04_4.0	**31-Aug-2021**	**10-Sep-2021**	28-Sep-2021	✓	**10-Sep-2021**	08-Oct-2021	✓

Matrix: **SOIL**

Evaluation: × = Holding time breach ; ✓ = Within holding time.

Method ***Container*** */ Client Sample ID(s)*	***Sample Date***	*Extraction / Preparation* ***Date extracted***	 *Due for extraction*	 *Evaluation*	*Analysis* ***Date analysed***	 *Due for analysis*	 *Evaluation*
EP010: Formaldehyde							
Soil Glass Jar - Unpreserved (EP010) BH05_0.05, BH05_5.0, QC101_210901	**01-Sep-2021**	**08-Sep-2021**	28-Feb-2022	✓	**10-Sep-2021**	28-Feb-2022	✓
Soil Glass Jar - Unpreserved (EP010) BH11_0.05, BH11_0.5	**02-Sep-2021**	**08-Sep-2021**	01-Mar-2022	✓	**10-Sep-2021**	01-Mar-2022	✓
EP068A: Organochlorine Pesticides (OC)							
Soil Glass Jar - Unpreserved (EP068) BH06_0.05, BH06_0.82	**02-Sep-2021**	**07-Sep-2021**	16-Sep-2021	✓	**08-Sep-2021**	17-Oct-2021	✓
Soil Glass Jar - Unpreserved (EP068) SS176_0.10	**30-Aug-2021**	**07-Sep-2021**	13-Sep-2021	✓	**08-Sep-2021**	17-Oct-2021	✓
Soil Glass Jar - Unpreserved (EP068) BH04_2.0, BH04_4.0	**31-Aug-2021**	**07-Sep-2021**	14-Sep-2021	✓	**08-Sep-2021**	17-Oct-2021	✓
EP068B: Organophosphorus Pesticides (OP)							
Soil Glass Jar - Unpreserved (EP068) BH06_0.05, BH06_0.82	**02-Sep-2021**	**07-Sep-2021**	16-Sep-2021	✓	**08-Sep-2021**	17-Oct-2021	✓
Soil Glass Jar - Unpreserved (EP068) SS176_0.10	**30-Aug-2021**	**07-Sep-2021**	13-Sep-2021	✓	**08-Sep-2021**	17-Oct-2021	✓
Soil Glass Jar - Unpreserved (EP068) BH04_2.0, BH04_4.0	**31-Aug-2021**	**07-Sep-2021**	14-Sep-2021	✓	**08-Sep-2021**	17-Oct-2021	✓
EP075(SIM)B: Polynuclear Aromatic Hydrocarbons							
Soil Glass Jar - Unpreserved (EP075(SIM)) BH06_0.05, BH06_0.82	**02-Sep-2021**	**07-Sep-2021**	16-Sep-2021	✓	**08-Sep-2021**	17-Oct-2021	✓
Soil Glass Jar - Unpreserved (EP075(SIM)) SS176_0.10	**30-Aug-2021**	**07-Sep-2021**	13-Sep-2021	✓	**08-Sep-2021**	17-Oct-2021	✓
Soil Glass Jar - Unpreserved (EP075(SIM)) BH04_2.0, BH04_4.0	**31-Aug-2021**	**07-Sep-2021**	14-Sep-2021	✓	**08-Sep-2021**	17-Oct-2021	✓
EP080/071: Total Petroleum Hydrocarbons							
Soil Glass Jar - Unpreserved (EP080) BH06_0.05, BH06_0.82	**02-Sep-2021**	**06-Sep-2021**	16-Sep-2021	✓	**08-Sep-2021**	16-Sep-2021	✓
Soil Glass Jar - Unpreserved (EP071) BH06_0.05, BH06_0.82	**02-Sep-2021**	**07-Sep-2021**	16-Sep-2021	✓	**07-Sep-2021**	17-Oct-2021	✓
Soil Glass Jar - Unpreserved (EP080) SS176_0.10	**30-Aug-2021**	**06-Sep-2021**	13-Sep-2021	✓	**08-Sep-2021**	13-Sep-2021	✓
Soil Glass Jar - Unpreserved (EP071) SS176_0.10	**30-Aug-2021**	**07-Sep-2021**	13-Sep-2021	✓	**07-Sep-2021**	17-Oct-2021	✓
Soil Glass Jar - Unpreserved (EP071) BH04_2.0, BH04_4.0	**31-Aug-2021**	**07-Sep-2021**	14-Sep-2021	✓	**08-Sep-2021**	17-Oct-2021	✓
Soil Glass Jar - Unpreserved (EP080) BH04_2.0, BH04_4.0	**31-Aug-2021**	**08-Sep-2021**	14-Sep-2021	✓	**08-Sep-2021**	14-Sep-2021	✓

Matrix: **SOIL**

Evaluation: ✘ = Holding time breach ; ✓ = Within holding time.

Method *Container / Client Sample ID(s)*	*Sample Date*	*Extraction / Preparation*			*Analysis*		
		Date extracted	*Due for extraction*	*Evaluation*	*Date analysed*	*Due for analysis*	*Evaluation*
EP080/071: Total Recoverable Hydrocarbons - NEPM 2013 Fractions							
Soil Glass Jar - Unpreserved (EP080) BH06_0.05, BH06_0.82	**02-Sep-2021**	**06-Sep-2021**	16-Sep-2021	✓	**08-Sep-2021**	16-Sep-2021	✓
Soil Glass Jar - Unpreserved (EP071) BH06_0.05, BH06_0.82	**02-Sep-2021**	**07-Sep-2021**	16-Sep-2021	✓	**07-Sep-2021**	17-Oct-2021	✓
Soil Glass Jar - Unpreserved (EP080) SS176_0.10	**30-Aug-2021**	**06-Sep-2021**	13-Sep-2021	✓	**08-Sep-2021**	13-Sep-2021	✓
Soil Glass Jar - Unpreserved (EP071) SS176_0.10	**30-Aug-2021**	**07-Sep-2021**	13-Sep-2021	✓	**07-Sep-2021**	17-Oct-2021	✓
Soil Glass Jar - Unpreserved (EP071) BH04_2.0, BH04_4.0	**31-Aug-2021**	**07-Sep-2021**	14-Sep-2021	✓	**08-Sep-2021**	17-Oct-2021	✓
Soil Glass Jar - Unpreserved (EP080) BH04_2.0, BH04_4.0	**31-Aug-2021**	**08-Sep-2021**	14-Sep-2021	✓	**08-Sep-2021**	14-Sep-2021	✓
EP080: BTEXN							
Glass amber extract vial (EP080) QC300_210903	**02-Sep-2021**	**08-Sep-2021**	16-Sep-2021	✓	**08-Sep-2021**	16-Sep-2021	✓
Soil Glass Jar - Unpreserved (EP080) BH06_0.05, BH06_0.82	**02-Sep-2021**	**06-Sep-2021**	16-Sep-2021	✓	**08-Sep-2021**	16-Sep-2021	✓
Soil Glass Jar - Unpreserved (EP080) SS176_0.10	**30-Aug-2021**	**06-Sep-2021**	13-Sep-2021	✓	**08-Sep-2021**	13-Sep-2021	✓
Soil Glass Jar - Unpreserved (EP080) BH04_2.0, BH04_4.0	**31-Aug-2021**	**08-Sep-2021**	14-Sep-2021	✓	**08-Sep-2021**	14-Sep-2021	✓
MM868: Coliforms & E.coli by MPN using Aquachrom ECC							
Sterile Plastic Bottle - Sodium Thiosulfate (MM868) BH06_0.05 - Total Coliforms, BH06_0.82 - Total Coliforms	**02-Sep-2021**	**----**	----	----	**08-Sep-2021**	06-Sep-2021	✘
Sterile Plastic Bottle - Sodium Thiosulfate (MM868) BH04_2.0 - Total Coliforms, BH04_4.0 - Total Coliforms	**31-Aug-2021**	**----**	----	----	**08-Sep-2021**	04-Sep-2021	✘

Matrix: **WATER**

Evaluation: ✘ = Holding time breach ; ✓ = Within holding time.

Method *Container / Client Sample ID(s)*	*Sample Date*	*Extraction / Preparation*			*Analysis*		
		Date extracted	*Due for extraction*	*Evaluation*	*Date analysed*	*Due for analysis*	*Evaluation*
EG020T: Total Metals by ICP-MS							
Clear Plastic Bottle - Nitric Acid; Unfiltered (EG020A-T) QC501_210831	**31-Aug-2021**	**09-Sep-2021**	27-Feb-2022	✓	**09-Sep-2021**	27-Feb-2022	✓
EG035T: Total Recoverable Mercury by FIMS							
Clear Plastic Bottle - Nitric Acid; Unfiltered (EG035T) QC501_210831	**31-Aug-2021**	**----**	----	----	**09-Sep-2021**	28-Sep-2021	✓
EK059G: Nitrite plus Nitrate as N (NOx) by Discrete Analyser							
Clear Plastic Bottle - Natural (EK059G) QC501_210831	**31-Aug-2021**	**----**	----	----	**10-Sep-2021**	02-Sep-2021	✘
EK061G: Total Kjeldahl Nitrogen By Discrete Analyser							
Clear Plastic Bottle - Natural (EK061G) QC501_210831	**31-Aug-2021**	**10-Sep-2021**	01-Sep-2021	✘	**10-Sep-2021**	08-Oct-2021	✓

Matrix: **WATER**

Evaluation: ✘ = Holding time breach ; ✓ = Within holding time.

Method	***Sample Date***	*Extraction / Preparation*			*Analysis*		
***Container** / Client Sample ID(s)*		***Date extracted***	*Due for extraction*	*Evaluation*	***Date analysed***	*Due for analysis*	*Evaluation*
EK067G: Total Phosphorus as P by Discrete Analyser							
Clear Plastic Bottle - Natural (EK067G) QC501_210831	**31-Aug-2021**	**10-Sep-2021**	02-Sep-2021	✘	**10-Sep-2021**	08-Oct-2021	✓
EP068A: Organochlorine Pesticides (OC)							
Amber Glass Bottle - Unpreserved (EP068) QC501_210831	**31-Aug-2021**	**06-Sep-2021**	07-Sep-2021	✓	**08-Sep-2021**	16-Oct-2021	✓
EP068B: Organophosphorus Pesticides (OP)							
Amber Glass Bottle - Unpreserved (EP068) QC501_210831	**31-Aug-2021**	**06-Sep-2021**	07-Sep-2021	✓	**08-Sep-2021**	16-Oct-2021	✓
EP075(SIM)B: Polynuclear Aromatic Hydrocarbons							
Amber Glass Bottle - Unpreserved (EP075(SIM)) QC501_210831	**31-Aug-2021**	**06-Sep-2021**	07-Sep-2021	✓	**08-Sep-2021**	16-Oct-2021	✓
EP080/071: Total Petroleum Hydrocarbons							
Amber Glass Bottle - Unpreserved (EP071) QC501_210831	**31-Aug-2021**	**06-Sep-2021**	07-Sep-2021	✓	**08-Sep-2021**	16-Oct-2021	✓
Clear glass VOC vial - HCl (EP080) QC501_210831	**31-Aug-2021**	**10-Sep-2021**	14-Sep-2021	✓	**10-Sep-2021**	14-Sep-2021	✓
EP080/071: Total Recoverable Hydrocarbons - NEPM 2013 Fractions							
Amber Glass Bottle - Unpreserved (EP071) QC501_210831	**31-Aug-2021**	**06-Sep-2021**	07-Sep-2021	✓	**08-Sep-2021**	16-Oct-2021	✓
Clear glass VOC vial - HCl (EP080) QC501_210831	**31-Aug-2021**	**10-Sep-2021**	14-Sep-2021	✓	**10-Sep-2021**	14-Sep-2021	✓
EP080: BTEXN							
Clear glass VOC vial - HCl (EP080) QC501_210831	**31-Aug-2021**	**10-Sep-2021**	14-Sep-2021	✓	**10-Sep-2021**	14-Sep-2021	✓

Quality Control Parameter Frequency Compliance

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

Matrix: **SOIL**

Evaluation: × = Quality Control frequency not within specification ; ✓ = Quality Control frequency within specification.

Quality Control Sample Type		Count		Rate (%)			Quality Control Specification
Analytical Methods	*Method*	*QC*	*Regular*	***Actual***	***Expected***	*Evaluation*	
Laboratory Duplicates (DUP)							
Formaldehyde	EP010	1	5	**20.00**	**10.00**	✓	NEPM 2013 B3 & ALS QC Standard
Moisture Content	EA055	4	35	**11.43**	**10.00**	✓	NEPM 2013 B3 & ALS QC Standard
Nitrite and Nitrate as N (NOx)- Soluble by Discrete Analyser	EK059G	1	9	**11.11**	**10.00**	✓	NEPM 2013 B3 & ALS QC Standard
PAH/Phenols (SIM)	EP075(SIM)	3	21	**14.29**	**10.00**	✓	NEPM 2013 B3 & ALS QC Standard
Pesticides by GCMS	EP068	1	5	**20.00**	**10.00**	✓	NEPM 2013 B3 & ALS QC Standard
TKN as N By Discrete Analyser	EK061G	2	16	**12.50**	**9.52**	✓	NEPM 2013 B3 & ALS QC Standard
Total Mercury by FIMS	EG035T	3	30	**10.00**	**10.00**	✓	NEPM 2013 B3 & ALS QC Standard
Total Metals by ICP-AES	EG005T	4	30	**13.33**	**10.00**	✓	NEPM 2013 B3 & ALS QC Standard
Total Phosporus By Discrete Analyser	EK067G	2	19	**10.53**	**10.00**	✓	NEPM 2013 B3 & ALS QC Standard
TRH - Semivolatile Fraction	EP071	3	21	**14.29**	**10.00**	✓	NEPM 2013 B3 & ALS QC Standard
TRH Volatiles/BTEX	EP080	3	22	**13.64**	**10.00**	✓	NEPM 2013 B3 & ALS QC Standard
Laboratory Control Samples (LCS)							
Formaldehyde	EP010	1	5	**20.00**	**5.00**	✓	NEPM 2013 B3 & ALS QC Standard
Nitrite and Nitrate as N (NOx)- Soluble by Discrete Analyser	EK059G	1	9	**11.11**	**5.00**	✓	NEPM 2013 B3 & ALS QC Standard
PAH/Phenols (SIM)	EP075(SIM)	2	21	**9.52**	**5.00**	✓	NEPM 2013 B3 & ALS QC Standard
Pesticides by GCMS	EP068	1	5	**20.00**	**5.00**	✓	NEPM 2013 B3 & ALS QC Standard
TKN as N By Discrete Analyser	EK061G	3	16	**18.75**	**14.29**	✓	NEPM 2013 B3 & ALS QC Standard
Total Mercury by FIMS	EG035T	2	30	**6.67**	**5.00**	✓	NEPM 2013 B3 & ALS QC Standard
Total Metals by ICP-AES	EG005T	2	30	**6.67**	**5.00**	✓	NEPM 2013 B3 & ALS QC Standard
Total Phosporus By Discrete Analyser	EK067G	3	19	**15.79**	**15.00**	✓	NEPM 2013 B3 & ALS QC Standard
TRH - Semivolatile Fraction	EP071	2	21	**9.52**	**5.00**	✓	NEPM 2013 B3 & ALS QC Standard
TRH Volatiles/BTEX	EP080	2	22	**9.09**	**5.00**	✓	NEPM 2013 B3 & ALS QC Standard
Method Blanks (MB)							
Formaldehyde	EP010	1	5	**20.00**	**5.00**	✓	NEPM 2013 B3 & ALS QC Standard
Nitrite and Nitrate as N (NOx)- Soluble by Discrete Analyser	EK059G	1	9	**11.11**	**5.00**	✓	NEPM 2013 B3 & ALS QC Standard
PAH/Phenols (SIM)	EP075(SIM)	2	21	**9.52**	**5.00**	✓	NEPM 2013 B3 & ALS QC Standard
Pesticides by GCMS	EP068	1	5	**20.00**	**5.00**	✓	NEPM 2013 B3 & ALS QC Standard
TKN as N By Discrete Analyser	EK061G	1	16	**6.25**	**4.76**	✓	NEPM 2013 B3 & ALS QC Standard
Total Mercury by FIMS	EG035T	2	30	**6.67**	**5.00**	✓	NEPM 2013 B3 & ALS QC Standard
Total Metals by ICP-AES	EG005T	2	30	**6.67**	**5.00**	✓	NEPM 2013 B3 & ALS QC Standard
Total Phosporus By Discrete Analyser	EK067G	1	19	**5.26**	**5.00**	✓	NEPM 2013 B3 & ALS QC Standard
TRH - Semivolatile Fraction	EP071	2	21	**9.52**	**5.00**	✓	NEPM 2013 B3 & ALS QC Standard
TRH Volatiles/BTEX	EP080	2	22	**9.09**	**5.00**	✓	NEPM 2013 B3 & ALS QC Standard

Matrix: **SOIL**

Evaluation: ✗ = Quality Control frequency not within specification ; ✓ = Quality Control frequency within specification.

		Count		*Rate (%)*			*Quality Control Specification*
Analytical Methods	*Method*	*QC*	*Regular*	***Actual***	***Expected***	*Evaluation*	
Formaldehyde	EP010	1	5	**20.00**	**5.00**	✓	NEPM 2013 B3 & ALS QC Standard
Nitrite and Nitrate as N (NOx)- Soluble by Discrete Analyser	EK059G	1	9	**11.11**	**5.00**	✓	NEPM 2013 B3 & ALS QC Standard
PAH/Phenols (SIM)	EP075(SIM)	2	21	**9.52**	**5.00**	✓	NEPM 2013 B3 & ALS QC Standard
Pesticides by GCMS	EP068	1	5	**20.00**	**5.00**	✓	NEPM 2013 B3 & ALS QC Standard
TKN as N By Discrete Analyser	EK061G	1	16	**6.25**	**4.76**	✓	NEPM 2013 B3 & ALS QC Standard
Total Mercury by FIMS	EG035T	2	30	**6.67**	**5.00**	✓	NEPM 2013 B3 & ALS QC Standard
Total Metals by ICP-AES	EG005T	2	30	**6.67**	**5.00**	✓	NEPM 2013 B3 & ALS QC Standard
Total Phosporus By Discrete Analyser	EK067G	1	19	**5.26**	**5.00**	✓	NEPM 2013 B3 & ALS QC Standard
TRH - Semivolatile Fraction	EP071	2	21	**9.52**	**5.00**	✓	NEPM 2013 B3 & ALS QC Standard
TRH Volatiles/BTEX	EP080	2	22	**9.09**	**5.00**	✓	NEPM 2013 B3 & ALS QC Standard

Matrix: **WATER**

Evaluation: ✗ = Quality Control frequency not within specification ; ✓ = Quality Control frequency within specification.

		Count		*Rate (%)*			*Quality Control Specification*
Analytical Methods	*Method*	*QC*	*Regular*	***Actual***	***Expected***	*Evaluation*	
Nitrite and Nitrate as N (NOx) by Discrete Analyser	EK059G	2	20	**10.00**	**10.00**	✓	NEPM 2013 B3 & ALS QC Standard
PAH/Phenols (GC/MS - SIM)	EP075(SIM)	0	7	**0.00**	**10.00**	✗	NEPM 2013 B3 & ALS QC Standard
Pesticides by GCMS	EP068	0	1	**0.00**	**10.00**	✗	NEPM 2013 B3 & ALS QC Standard
Total Kjeldahl Nitrogen as N By Discrete Analyser	EK061G	2	20	**10.00**	**10.00**	✓	NEPM 2013 B3 & ALS QC Standard
Total Mercury by FIMS	EG035T	1	8	**12.50**	**10.00**	✓	NEPM 2013 B3 & ALS QC Standard
Total Metals by ICP-MS - Suite A	EG020A-T	2	11	**18.18**	**10.00**	✓	NEPM 2013 B3 & ALS QC Standard
Total Phosphorus as P By Discrete Analyser	EK067G	2	20	**10.00**	**10.00**	✓	NEPM 2013 B3 & ALS QC Standard
TRH - Semivolatile Fraction	EP071	0	8	**0.00**	**10.00**	✗	NEPM 2013 B3 & ALS QC Standard
TRH Volatiles/BTEX	EP080	2	20	**10.00**	**10.00**	✓	NEPM 2013 B3 & ALS QC Standard
Nitrite and Nitrate as N (NOx) by Discrete Analyser	EK059G	1	20	**5.00**	**5.00**	✓	NEPM 2013 B3 & ALS QC Standard
PAH/Phenols (GC/MS - SIM)	EP075(SIM)	1	7	**14.29**	**5.00**	✓	NEPM 2013 B3 & ALS QC Standard
Pesticides by GCMS	EP068	1	1	**100.00**	**5.00**	✓	NEPM 2013 B3 & ALS QC Standard
Total Kjeldahl Nitrogen as N By Discrete Analyser	EK061G	3	20	**15.00**	**15.00**	✓	NEPM 2013 B3 & ALS QC Standard
Total Mercury by FIMS	EG035T	1	8	**12.50**	**5.00**	✓	NEPM 2013 B3 & ALS QC Standard
Total Metals by ICP-MS - Suite A	EG020A-T	1	11	**9.09**	**5.00**	✓	NEPM 2013 B3 & ALS QC Standard
Total Phosphorus as P By Discrete Analyser	EK067G	3	20	**15.00**	**15.00**	✓	NEPM 2013 B3 & ALS QC Standard
TRH - Semivolatile Fraction	EP071	1	8	**12.50**	**5.00**	✓	NEPM 2013 B3 & ALS QC Standard
TRH Volatiles/BTEX	EP080	1	20	**5.00**	**5.00**	✓	NEPM 2013 B3 & ALS QC Standard
Nitrite and Nitrate as N (NOx) by Discrete Analyser	EK059G	1	20	**5.00**	**5.00**	✓	NEPM 2013 B3 & ALS QC Standard
PAH/Phenols (GC/MS - SIM)	EP075(SIM)	1	7	**14.29**	**5.00**	✓	NEPM 2013 B3 & ALS QC Standard
Pesticides by GCMS	EP068	1	1	**100.00**	**5.00**	✓	NEPM 2013 B3 & ALS QC Standard
Total Kjeldahl Nitrogen as N By Discrete Analyser	EK061G	1	20	**5.00**	**5.00**	✓	NEPM 2013 B3 & ALS QC Standard

Matrix: **WATER**

Evaluation: ✗ = Quality Control frequency not within specification ; ✓ = Quality Control frequency within specification.

		Count		Rate (%)			Quality Control Specification
Analytical Methods	*Method*	*QC*	*Regular*	***Actual***	***Expected***	*Evaluation*	
Total Mercury by FIMS	EG035T	1	8	**12.50**	**5.00**	✓	NEPM 2013 B3 & ALS QC Standard
Total Metals by ICP-MS - Suite A	EG020A-T	1	11	**9.09**	**5.00**	✓	NEPM 2013 B3 & ALS QC Standard
Total Phosphorus as P By Discrete Analyser	EK067G	1	20	**5.00**	**5.00**	✓	NEPM 2013 B3 & ALS QC Standard
TRH - Semivolatile Fraction	EP071	1	8	**12.50**	**5.00**	✓	NEPM 2013 B3 & ALS QC Standard
TRH Volatiles/BTEX	EP080	1	20	**5.00**	**5.00**	✓	NEPM 2013 B3 & ALS QC Standard
Nitrite and Nitrate as N (NOx) by Discrete Analyser	EK059G	1	20	**5.00**	**5.00**	✓	NEPM 2013 B3 & ALS QC Standard
PAH/Phenols (GC/MS - SIM)	EP075(SIM)	0	7	**0.00**	**5.00**	✗	NEPM 2013 B3 & ALS QC Standard
Pesticides by GCMS	EP068	0	1	**0.00**	**5.00**	✗	NEPM 2013 B3 & ALS QC Standard
Total Kjeldahl Nitrogen as N By Discrete Analyser	EK061G	1	20	**5.00**	**5.00**	✓	NEPM 2013 B3 & ALS QC Standard
Total Mercury by FIMS	EG035T	1	8	**12.50**	**5.00**	✓	NEPM 2013 B3 & ALS QC Standard
Total Metals by ICP-MS - Suite A	EG020A-T	1	11	**9.09**	**5.00**	✓	NEPM 2013 B3 & ALS QC Standard
Total Phosphorus as P By Discrete Analyser	EK067G	1	20	**5.00**	**5.00**	✓	NEPM 2013 B3 & ALS QC Standard
TRH - Semivolatile Fraction	EP071	0	8	**0.00**	**5.00**	✗	NEPM 2013 B3 & ALS QC Standard
TRH Volatiles/BTEX	EP080	1	20	**5.00**	**5.00**	✓	NEPM 2013 B3 & ALS QC Standard

Brief Method Summaries

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

Analytical Methods	*Method*	*Matrix*	*Method Descriptions*
Moisture Content	EA055	SOIL	In house: A gravimetric procedure based on weight loss over a 12 hour drying period at 105-110 degrees C. This method is compliant with NEPM Schedule B(3).
Asbestos Identification in Soils	EA200	SOIL	AS 4964 Method for the qualitative identification of asbestos in bulk samples Analysis by Polarised Light Microscopy including dispersion staining
Total Metals by ICP-AES	EG005T	SOIL	In house: Referenced to APHA 3120; USEPA SW 846 - 6010. Metals are determined following an appropriate acid digestion of the soil. The ICPAES technique ionises samples in a plasma, emitting a characteristic spectrum based on metals present. Intensities at selected wavelengths are compared against those of matrix matched standards. This method is compliant with NEPM Schedule B(3)
Total Mercury by FIMS	EG035T	SOIL	In house: Referenced to AS 3550, APHA 3112 Hg - B (Flow-injection (SnCl2) (Cold Vapour generation) AAS) FIM-AAS is an automated flameless atomic absorption technique. Mercury in solids are determined following an appropriate acid digestion. Ionic mercury is reduced online to atomic mercury vapour by SnCl2 which is then purged into a heated quartz cell. Quantification is by comparing absorbance against a calibration curve. This method is compliant with NEPM Schedule B(3)
Nitrite and Nitrate as N (NOx)- Soluble by Discrete Analyser	EK059G	SOIL	In house: Thermo Scientific Method D08727 and NEMI (National Environmental Method Index) Method ID: 9171. This method covers the determination of total oxidised nitrogen (NOx-N) and nitrate (NO3-N) by calculation, Combined oxidised Nitrogen (NO2+NO3) in a water extract is determined by direct colourimetry by Discrete Analyser.
TKN as N By Discrete Analyser	EK061G	SOIL	In house: Referenced to APHA 4500-Norg-D Soil samples are digested using Kjeldahl digestion followed by determination by Discrete Analyser.
Total Nitrogen as N (TKN + NOx) By Discrete Analyser	EK062G	SOIL	In house: Referenced to APHA 4500 Norg/NO3- Total Nitrogen is determined as the sum of TKN and Oxidised Nitrrogen, each determined seperately as N.
Total Phosporus By Discrete Analyser	EK067G	SOIL	In house: Referenced to APHA 4500 P-B&F This procedure involves sulfuric acid digestion and quantification using Discrete Analyser.
Formaldehyde	EP010	SOIL	In house: Referenced to ASTM D 6303-98. Determined on 1:5 soil / water extracts by colourimetry using NASH reagent. The Hantszch reaction method is based on the reaction of acetylacetone with formaldehyde in the presence of excess ammonium acetate to form a coloured compound.
Pesticides by GCMS	EP068	SOIL	In house: Referenced to USEPA SW 846 - 8270 Extracts are analysed by Capillary GC/MS and quantification is by comparison against an established 5 point calibration curve. This technique is compliant with NEPM Schedule B(3).
TRH - Semivolatile Fraction	EP071	SOIL	In house: Referenced to USEPA SW 846 - 8015 Sample extracts are analysed by Capillary GC/FID and quantified against alkane standards over the range C10 - C40. Compliant with NEPM Schedule B(3).
PAH/Phenols (SIM)	EP075(SIM)	SOIL	In house: Referenced to USEPA SW 846 - 8270. Extracts are analysed by Capillary GC/MS in Selective Ion Mode (SIM) and quantification is by comparison against an established 5 point calibration curve. This method is compliant with NEPM Schedule B(3)
TRH Volatiles/BTEX	EP080	SOIL	In house: Referenced to USEPA SW 846 - 8260. Extracts are analysed by Purge and Trap, Capillary GC/MS. Quantification is by comparison against an established 5 point calibration curve. Compliant with NEPM Schedule B(3) amended.

Analytical Methods	*Method*	*Matrix*	*Method Descriptions*
Coliforms & E.coli in Soils by MPN using Aquachrom ECC	MM868	SOIL	Microbiological analysis subcontracted to ALS Scoresby (NATA Accredited Laboratory No. 992).
Total Metals by ICP-MS - Suite A	EG020A-T	WATER	In house: Referenced to APHA 3125; USEPA SW846 - 6020, ALS QWI-EN/EG020. The ICPMS technique utilizes a highly efficient argon plasma to ionize selected elements. Ions are then passed into a high vacuum mass spectrometer, which separates the analytes based on their distinct mass to charge ratios prior to their measurement by a discrete dynode ion detector.
Total Mercury by FIMS	EG035T	WATER	In house: Referenced to AS 3550, APHA 3112 Hg - B (Flow-injection (SnCl2)(Cold Vapour generation) AAS) FIM-AAS is an automated flameless atomic absorption technique. A bromate/bromide reagent is used to oxidise any organic mercury compounds in the unfiltered sample. The ionic mercury is reduced online to atomic mercury vapour by SnCl2 which is then purged into a heated quartz cell. Quantification is by comparing absorbance against a calibration curve. This method is compliant with NEPM Schedule B(3).
Nitrite and Nitrate as N (NOx) by Discrete Analyser	EK059G	WATER	In house: Referenced to APHA 4500-NO3- F. Combined oxidised Nitrogen (NO2+NO3) is determined by Chemical Reduction and direct colourimetry by Discrete Analyser. This method is compliant with NEPM Schedule B(3)
Total Kjeldahl Nitrogen as N By Discrete Analyser	EK061G	WATER	In house: Referenced to APHA 4500-Norg D (In house). An aliquot of sample is digested using a high temperature Kjeldahl digestion to convert nitrogenous compounds to ammonia. Ammonia is determined colorimetrically by discrete analyser. This method is compliant with NEPM Schedule B(3)
Total Nitrogen as N (TKN + Nox) By Discrete Analyser	EK062G	WATER	In house: Referenced to APHA 4500-Norg / 4500-NO3-. This method is compliant with NEPM Schedule B(3)
Total Phosphorus as P By Discrete Analyser	EK067G	WATER	In house: Referenced to APHA 4500-P H, Jirka et al, Zhang et al. This procedure involves sulphuric acid digestion of a sample aliquot to break phosphorus down to orthophosphate. The orthophosphate reacts with ammonium molybdate and antimony potassium tartrate to form a complex which is then reduced and its concentration measured at 880nm using discrete analyser. This method is compliant with NEPM Schedule B(3)
Pesticides by GCMS	EP068	WATER	In house: Referenced to USEPA SW 846 - 8270 Sample extracts are analysed by Capillary GC/MS and quantification is by comparison against an established 5 point calibration curve. This method is compliant with NEPM Schedule B(3)
TRH - Semivolatile Fraction	EP071	WATER	In house: Referenced to USEPA SW 846 - 8015 The sample extract is analysed by Capillary GC/FID and quantification is by comparison against an established 5 point calibration curve of n-Alkane standards. This method is compliant with the QC requirements of NEPM Schedule B(3)
PAH/Phenols (GC/MS - SIM)	EP075(SIM)	WATER	In house: Referenced to USEPA SW 846 - 8270 Sample extracts are analysed by Capillary GC/MS in SIM Mode and quantification is by comparison against an established 5 point calibration curve. This method is compliant with NEPM Schedule B(3)
TRH Volatiles/BTEX	EP080	WATER	In house: Referenced to USEPA SW 846 - 8260 Water samples are directly purged prior to analysis by Capillary GC/MS and quantification is by comparison against an established 5 point calibration curve. Alternatively, a sample is equilibrated in a headspace vial and a portion of the headspace determined by GCMS analysis. This method is compliant with the QC requirements of NEPM Schedule B(3)

Preparation Methods	*Method*	*Matrix*	*Method Descriptions*
TKN/TP Digestion	EK061/EK067	SOIL	In house: Referenced to APHA 4500 Norg- D; APHA 4500 P - H. Macro Kjeldahl digestion.
1:5 solid / water leach for soluble analytes	EN34	SOIL	10 g of soil is mixed with 50 mL of reagent grade water and tumbled end over end for 1 hour. Water soluble salts are leached from the soil by the continuous suspension. Samples are settled and the water filtered off for analysis.

Preparation Methods	*Method*	*Matrix*	*Method Descriptions*
Hot Block Digest for metals in soils sediments and sludges	EN69	SOIL	In house: Referenced to USEPA 200.2. Hot Block Acid Digestion 1.0g of sample is heated with Nitric and Hydrochloric acids, then cooled. Peroxide is added and samples heated and cooled again before being filtered and bulked to volume for analysis. Digest is appropriate for determination of selected metals in sludge, sediments, and soils. This method is compliant with NEPM Schedule B(3).
Methanolic Extraction of Soils for Purge and Trap	ORG16	SOIL	In house: Referenced to USEPA SW 846 - 5030A. 5g of solid is shaken with surrogate and 10mL methanol prior to analysis by Purge and Trap - GC/MS.
Tumbler Extraction of Solids	ORG17	SOIL	In house: Mechanical agitation (tumbler). 10g of sample, Na2SO4 and surrogate are extracted with 30mL 1:1 DCM/Acetone by end over end tumble. The solvent is decanted, dehydrated and concentrated (by KD) to the desired volume for analysis.
TKN/TP Digestion	EK061/EK067	WATER	In house: Referenced to APHA 4500 Norg - D; APHA 4500 P - H. This method is compliant with NEPM Schedule B(3)
Digestion for Total Recoverable Metals	EN25	WATER	In house: Referenced to USEPA SW846-3005. Method 3005 is a Nitric/Hydrochloric acid digestion procedure used to prepare surface and ground water samples for analysis by ICPAES or ICPMS. This method is compliant with NEPM Schedule B(3)
Separatory Funnel Extraction of Liquids	ORG14	WATER	In house: Referenced to USEPA SW 846 - 3510 100 mL to 1L of sample is transferred to a separatory funnel and serially extracted three times using DCM for each extract. The resultant extracts are combined, dehydrated and concentrated for analysis. This method is compliant with NEPM Schedule B(3) . ALS default excludes sediment which may be resident in the container.
Volatiles Water Preparation	ORG16-W	WATER	A 5 mL aliquot or 5 mL of a diluted sample is added to a 40 mL VOC vial for purging.

Jessie Blake

From: Tyler Anderson
Sent: Monday, 6 September 2021 10:07 AM
To: Jessie Blake
Subject: FW: [EXTERNAL] - ES2132166 Adjustments/Query

Categories: Complete

Hi Jessie,

Are you able to make a few changes to this workorder:

1. Please log the micro – they are aware of the non-compliance with not having the sterile jars.
2. rename the TB sample to QC300_210903 and analyse for BTEX.
3. change all OCP/PCB analysis to OCP/OPP.
4. Add S-26 Analysis for BH04_2.0 and BH04_4.0

Subcon / Forward Lab / Split WO
Lab / Analysis: 13, 15, 39 + 41 total
Organised By / Date: Coliforms → Scoresby
Relinquished By / Date:
Connote / Courier:
WO No:
Attached By PO / Internal Sheet:

Please and thank you!

Kind regards,

Tyler Anderson

Client Services Coordinator, Environmental
Sydney

Please note that I am working remotely and can be contacted directly on (02) 8784 85

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D +61 2 8784 8501
tyler.anderson@alsglobal.com
277-289 Woodpark Road
Smithfield NSW 2164 AUSTRALIA

Environmental Division
Sydney
Work Order Reference
ES2132166

Telephone : +61-2-8784 8555

From: Keatley, Nick <Nick.Keatley@jacobs.com>
Sent: Monday, 6 September 2021 9:53 AM
To: Tyler Anderson <tyler.anderson@alsglobal.com>
Cc: Mullen, Amanda <Amanda.Mullen@jacobs.com>
Subject: [EXTERNAL] - ES2132166 Adjustments/Query

Hi,

I have just receive the SRN for samples dropped off last week (ES2132166) and had a few changes/queries.

I was told the samples to be tested for total coliforms would be OK in non-sterile containers as we have had to change labs mid week. Hence, not being able to use ALS sterile containers. I was advised by Christopher Redford that these would still be able to be analysed. Is this not the case?

Could you also please adjust the following:

- Could you please rename the TB sample to QC300_210903 and analyse for BTEX.
- Also if analysis has not already been completed could you change all OCP/PCB analysis to OCP/OPP.
- Add S-26 Analysis for BH04_2.0 and BH04_4.0

Please advise if any of these are not possible.

I was in a rush to submit these samples before close on Friday, so I apologise for the few errors.

Regards,

Nick Keatley| Jacobs| Graduate Environmental Scientist |
Contaminated Land Assessment and Remediation Eastern |
M:+61 421 201 294 | nick.keatley@jacobs.com

Jessie Blake

From: Tyler Anderson
Sent: Monday, 6 September 2021 12:07 PM
To: Jessie Blake
Subject: RE: [EXTERNAL] - ES2132166 Adjustments/Query

Categories: Follow up

"Thanks for this.

Please exclude QC501_210831 from the total coliform analysis.

Could you also add the following as recipients for the deliverables:

- jacobs.labresults@esdat.net
- EDMANZ@jacobs.com

The rest is fine."

Thanks Jessie!

Kind regards,

Tyler Anderson
Client Services Coordinator, Environmental
Sydney
Please note that I am working remotely and can be contacted directly on (02) 8784 8501.

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D +61 2 8784 8501
tyler.anderson@alsglobal.com
277-289 Woodpark Road
Smithfield NSW 2164 AUSTRALIA

From: Jessie Blake <jessie.blake@ALSGlobal.com>
Sent: Monday, 6 September 2021 10:24 AM
To: Tyler Anderson <tyler.anderson@alsglobal.com>
Subject: RE: [EXTERNAL] - ES2132166 Adjustments/Query

Hi Tyler,

CHAIN OF CUSTODY

ALS Laboratory: please tick →

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☐ WOLLONGONG 99 Kenny Street Wollongong NSW 2500
Ph: 02 4225 3125 E: portkembla@alsglobal.com

CLIENT: Jacobs Arcadis Joint Venture (JAJV)
OFFICE: Sydney
PROJECT: IA254001
ORDER NUMBER:
PROJECT MANAGER: Amanda Mullen
CONTACT PH: 0421201294
SAMPLER: Nick Keatley/Kyle McLean
SAMPLER MOBILE: 0421201294
COC emailed to ALS? (YES / [✓ NO])
EDD FORMAT (or default):
Email Reports to (will default to PM if no other addresses are listed): nick.keatley@jacobs.com, amanda.mullen@jacobs.com
Email Invoice to (will default to PM if no other addresses are listed): Nick / Amanda
COMMENTS/SPECIAL HANDLING/STORAGE OR DISPOSAL: [redacted] rinsate & TB from [redacted] envirolab

TURNAROUND REQUIREMENTS :
(Standard TAT may be longer for some tests e.g.. Ultra Trace Organics)
☒ Standard TAT (List due date):
☐ Non Standard or urgent TAT (List due date):
ALS QUOTE NO.:

COC SEQUENCE NUMBER (Circle)
COC: [✓ 1] 2 3 4 5 6 7
OF: 1 2 3 [✓ 4] 5 6 7

FOR LABORATORY USE ONLY (Circle)
Custody Seal Intact? [✓ Yes] No N/A
[✓ Free ice] / frozen ice bricks present upon [✓ receipt]? Yes No N/A
[✓ Random Sample Temperature on Receipt:] 4.5 °C
Other comment:

RELINQUISHED BY: NK
DATE/TIME: 3/9/21 5pm

RECEIVED BY: Juliana G T=4.5°C
DATE/TIME: 3/9/2 5:19

RELINQUISHED BY:
DATE/TIME:

RECEIVED BY: Sofiyya AS
DATE/TIME: 03/9/21 1830

ALS USE: LAB ID	SAMPLE DETAILS MATRIX: SOLID (S) WATER (W): SAMPLE ID	DATE / TIME	MATRIX	CONTAINER INFORMATION: TYPE & PRESERVATIVE (refer to codes below)	TOTAL CONTAINERS	[redacted]	NT-11S	S-11	S-2 (Digested M)	S-26 (Disolved M)	Asbestos (P/9)		Hold	Additional Information: Comments on likely contaminant levels, dilutions, or samples requiring specific QC analysis etc.
1	BH09_0.05	30/8/21	Soil		1								X	
2	BH09_0.5	↓	↓		↓		X		X					
3	BH09_1.0												X	
4	BH09_2.0						X		X					
5	BH09_3.0												X	
6	BH09_4.0												X	
7	BH09_5.0												X	
8	BH09_6.0												X	
9	SS176_0.10	↓			2			X		X	X			
10	BH04_0.05	31/8/21			↓								X	
11	BH04_0.5	↓											X	
12	BH04_1.0		↓		↓								X	
				TOTAL	16									

Subcon / Forward Lab / Split WO
Lab / Analysis: Asbestos → Newcastle
Organised By / Date: GC201 → [illegible]
Relinquished By / Date:
Connote / Courier:
WO No:
Attached By PO / Internal Sheet

Water Container Codes: P = Unpreserved Plastic; N = Nitric Preserved Plastic; ORC = Nitric Preserved ORC; SH = Sodium Hydroxide/Cd Preserved; S = Sodium Hydroxide Preserved Plastic; AG = Amber Glass Unpreserved; AP - Airfreight Unpreserved Plastic
V = VOA Vial HCl Preserved; VB = VOA Vial Sodium Bisulphate Preserved; VS = VOA Vial Sulfuric Preserved; AV = Airfreight Unpreserved Vial SG = Sulfuric Preserved Amber Glass; H = HCl preserved Plastic; HS = HCl preserved Speciation bottle; SP = Sulfuric Preserved Plastic;
Z = Zinc Acetate Preserved Bottle; E = EDTA Preserved Bottles; ST = Sterile Bottle; ASS = Plastic Bag for Acid Sulphate Soils; B = Unpreserved Bag.

Environmental Division
Sydney
Work Order Reference
ES2132166

Telephone : + 61-2-8784 8555

CHAIN OF CUSTODY

ALS Laboratory: please tick →

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☐WOLLONGONG 99 Kenny Street Wollongong NSW 2500
Ph: 02 4225 3125 E: portkembla@alsglobal.com

CLIENT: Jacobs Arcadis Joint Venture (JAJV)
OFFICE: Sydney
PROJECT: IA254001
ORDER NUMBER: –
PROJECT MANAGER: Amanda Mullen
CONTACT PH:
SAMPLER: NK/KM
SAMPLER MOBILE: 0421201294
COC emailed to ALS? (YES / NO)
EDD FORMAT (or default):
Email Reports to (will default to PM if no other addresses are listed): As pg 1
Email Invoice to (will default to PM if no other addresses are listed): As pg 1
COMMENTS/SPECIAL HANDLING/STORAGE OR DISPOSAL:

TURNAROUND REQUIREMENTS : (Standard TAT may be longer for some tests e.g.. Ultra Trace Organics)
☑ Standard TAT (List due date):
☐ Non Standard or urgent TAT (List due date):
ALS QUOTE NO.: –

COC SEQUENCE NUMBER (Circle)
COC: 1 [✓ 2] 3 4 5 6 7
OF: 1 2 3 [✓ 4] 5 6 7

FOR LABORATORY USE ONLY (Circle)
Custody Seal Intact? [✓ Yes] No N/A
[✓ Free ice] / frozen ice bricks present upon receipt? Yes No N/A
Random Sample Temperature on Receipt: 4.5 °C
Other comment:

RELINQUISHED BY:	RECEIVED BY:	RELINQUISHED BY:	RECEIVED BY:
NK	JulianaG T=4.5°C		SOSY AJ
DATE/TIME: 3/9/21 - 5pm	DATE/TIME: 3/9/21 5:19pm	DATE/TIME:	DATE/TIME: 03/09/21 1830

ALS USE	SAMPLE DETAILS MATRIX: SOLID (S) WATER (W)			CONTAINER INFORMATION		ANALYSIS REQUIRED including SUITES (NB. Suite Codes must be listed to attract suite price) Where Metals are required, specify Total (unfiltered bottle required) or Dissolved (field filtered bottle required).								Additional Information
LAB ID	SAMPLE ID	DATE / TIME	MATRIX	TYPE & PRESERVATIVE (refer to codes below)	TOTAL CONTAINERS	NT-11S	S-11	S-2 (Dissolved)	S-26 (Dissolved)	Asbestos (p/a)	Formaldehyde	Total Coliforms	Hold	Comments on likely contaminant levels, dilutions, or samples requiring specific QC analysis etc.
13	BH04_2.0	31/8/21	S		2	X	X			X		X		
14	BH04-3.0	↓	↓		↓								X	
15	BH04_4.0					X	X			X		X		
16	BH04_5.0				1								X	
17	BH04_6.0												X	
18	BH04_7.0												X	
19	BH04_8.0												X	
20	BH04_9.0												X	
21	BH04_10.0												X	
22	BH04_11.0												X	
23	QC501_210831		W		7	X	X		X	X		X		use equivalent (total M) water suite (rinsate)
24	BH05_0.05	1/8/21	S		1	X		X			X			
				TOTAL	21									

Water Container Codes: P = Unpreserved Plastic; N = Nitric Preserved Plastic; ORC = Nitric Preserved ORC; SH = Sodium Hydroxide/Cd Preserved; S = Sodium Hydroxide Preserved Plastic; AG = Amber Glass Unpreserved; AP - Airfreight Unpreserved Plastic
V = VOA Vial HCl Preserved; VB = VOA Vial Sodium Bisulphate Preserved; VS = VOA Vial Sulfuric Preserved; AV = Airfreight Unpreserved Vial SG = Sulfuric Preserved Amber Glass; H = HCl preserved Plastic; HS = HCl preserved Speciation bottle; SP = Sulfuric Preserved Plastic; F = Formaldehyde Preserved Glass;
Z = Zinc Acetate Preserved Bottle; E = EDTA Preserved Bottles; ST = Sterile Bottle; ASS = Plastic Bag for Acid Sulphate Soils; B = Unpreserved Bag.

CHAIN OF CUSTODY

ALS Laboratory: please tick →

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☐WOLLONGONG 99 Kenny Street Wollongong NSW 2500
Ph: 02 4225 3125 E: portkembla@alsglobal.com

CLIENT: Jacobs Arcadis Joint Venture
OFFICE: Sydney
PROJECT: IA254001
ORDER NUMBER: –
PROJECT MANAGER: Amanda Mullen
CONTACT PH:
SAMPLER: NK/KM
SAMPLER MOBILE: 0421 201 294
COC emailed to ALS? (YES / NO)
EDD FORMAT (or default):
Email Reports to (will default to PM if no other addresses are listed): As page 1
Email Invoice to (will default to PM if no other addresses are listed): As page 1

TURNAROUND REQUIREMENTS : (Standard TAT may be longer for some tests e.g.. Ultra Trace Organics)
☒ Standard TAT **(List due date):**
☐ Non Standard or urgent TAT **(List due date):**

ALS QUOTE NO.: –

COC SEQUENCE NUMBER (Circle)
COC: 1 2 [✓ 3] 4 5 6 7
OF: 1 2 3 [✓ 4] 5 6 7

FOR LABORATORY USE ONLY (Circle)
Custody Seal Intact? [✓ Yes] No N/A
Free ice / frozen ice bricks present upon receipt? Yes No N/A
Random Sample Temperature on Receipt: 4-5 °C
Other comment:

RELINQUISHED BY: NK
DATE/TIME: 3/9/21 5pm

RECEIVED BY: Juliana G
DATE/TIME: 3/9/21 5:19pm

RELINQUISHED BY:
DATE/TIME:

RECEIVED BY:
DATE/TIME: 03/9/21 1830

COMMENTS/SPECIAL HANDLING/STORAGE OR DISPOSAL:

ALS USE	SAMPLE DETAILS MATRIX: SOLID (S) WATER (W)			CONTAINER INFORMATION		ANALYSIS REQUIRED including SUITES (NB. Suite Codes must be listed to attract suite price) Where Metals are required, specify Total (unfiltered bottle required) or Dissolved (field filtered bottle required).								Additional Information
LAB ID	SAMPLE ID	DATE / TIME	MATRIX	TYPE & PRESERVATIVE (refer to codes below)	TOTAL CONTAINERS	S-2(dissolved)	Ni-11S	Formaldehyde					Hold	Comments on likely contaminant levels, dilutions, or samples requiring specific QC analysis etc.
25	BH05_1.0	1/9/21	S	[illegible]	1								X	
26	BH05_2.0												X	
27	BH05_3.0												X	
28	BH05_4.0												X	
29	BH05_5.0					X	X	X						
30	BH05_6.0												X	
31	BH05_7.0												X	
32	BH05_8.0												X	
33	QC101_210901				1	X	X	X						
34	QC201_210901				1	X	X	X						Send to eurofins
35	BH11_0.05	2/9/21				X		X						
36	BH11_0.5					X		X						
				TOTAL										

Water Container Codes: P = Unpreserved Plastic; N = Nitric Preserved Plastic; ORC = Nitric Preserved ORC; SH = Sodium Hydroxide/Cd Preserved; S = Sodium Hydroxide Preserved Plastic; AG = Amber Glass Unpreserved; AP - Airfreight Unpreserved Plastic
V = VOA Vial HCl Preserved; VB = VOA Vial Sodium Bisulphate Preserved; VS = VOA Vial Sulfuric Preserved; AV = Airfreight Unpreserved Vial SG = Sulfuric Preserved Amber Glass; H = HCl preserved Plastic; HS = HCl preserved Speciation bottle; SP = Sulfuric Preserved Plastic; F = Formaldehyde Preserved Glass;
Z = Zinc Acetate Preserved Bottle; E = EDTA Preserved Bottles; ST = Sterile Bottle; ASS = Plastic Bag for Acid Sulphate Soils; B = Unpreserved Bag.

CHAIN OF CUSTODY

ALS Laboratory: please tick →

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☐GLADSTONE 46 Callemondah Drive Clinton QLD 4680
Ph: 07 7471 5600 E: gladstone@alsglobal.com

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Ph: 08 9209 7655 E: samples.perth@alsglobal.com

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☐TOWNSVILLE 14-15 Desma Court Bohle QLD 4818
Ph: 07 4796 0600 E: townsville.environmental@alsglobal.com
☐WOLLONGONG 99 Kenny Street Wollongong NSW 2500
Ph: 02 4225 3125 E: portkembla@alsglobal.com

CLIENT: Jacobs Arcadis Joint Venture
OFFICE: Sydney
PROJECT: IA254001
ORDER NUMBER: –
PROJECT MANAGER: Amanda Mullen
CONTACT PH:
SAMPLER: NK/KM
SAMPLER MOBILE: 0421201294
COC emailed to ALS? (YES / NO)
EDD FORMAT (or default):
Email Reports to (will default to PM if no other addresses are listed): as pg 1
Email Invoice to (will default to PM if no other addresses are listed): as pg 1
COMMENTS/SPECIAL HANDLING/STORAGE OR DISPOSAL:

TURNAROUND REQUIREMENTS : (Standard TAT may be longer for some tests e.g.. Ultra Trace Organics)
☒ Standard TAT (List due date):
☐ Non Standard or urgent TAT (List due date):

ALS QUOTE NO.:

COC SEQUENCE NUMBER (Circle)
COC: 1 2 3 [✓ 4] 5 6 7
OF: 1 2 3 [✓ 4] 5 6 7

FOR LABORATORY USE ONLY (Circle)
Custody Seal Intact? [✓ Yes] No N/A
Free ice / frozen ice bricks present upon receipt? Yes No N/A
Random Sample Temperature on Receipt: °C
Other comment: 4.5

RELINQUISHED BY: NK
DATE/TIME: 3/9/21 - 5pm

RECEIVED BY: JulianaG
DATE/TIME: 3/9/21 5:19pm

RELINQUISHED BY:
DATE/TIME:

RECEIVED BY: Soddy/Ao
DATE/TIME: 03/9/21 1830

ALS USE	SAMPLE DETAILS MATRIX: SOLID (S) WATER (W)			CONTAINER INFORMATION		ANALYSIS REQUIRED including SUITES (NB. Suite Codes must be listed to attract suite price) Where Metals are required, specify Total (unfiltered bottle required) or Dissolved (field filtered bottle required).								Additional Information
LAB ID	SAMPLE ID	DATE / TIME	MATRIX	TYPE & PRESERVATIVE (refer to codes below)	TOTAL CONTAINERS	S-2 (dissolved)	NT-11S	Formaldehyde	S-11	S-26	Asbestos p/a	Total Coliforms	Hold	Comments on likely contaminant levels, dilutions, or samples requiring specific QC analysis etc.
37	BH11-1.0	2/9/21	S										X	
SNR 38	BH11_1.65	↓	S ↓										X	
39	BH06_0.05						X		X	X	X	X		
40	BH06_0.5												X	
41	BH06_0.82						X		X	X	X	X		
42	TB													trip blank
	Extra Sample													
	BH05_0S													
				TOTAL										

Water Container Codes: P = Unpreserved Plastic; N = Nitric Preserved Plastic; ORC = Nitric Preserved ORC; SH = Sodium Hydroxide/Cd Preserved; S = Sodium Hydroxide Preserved Plastic; AG = Amber Glass Unpreserved; AP - Airfreight Unpreserved Plastic
V = VOA Vial HCl Preserved; VB = VOA Vial Sodium Bisulphate Preserved; VS = VOA Vial Sulfuric Preserved; AV = Airfreight Unpreserved Vial SG = Sulfuric Preserved Amber Glass; H = HCl preserved Plastic; HS = HCl preserved Speciation bottle; SP = Sulfuric Preserved Plastic; F = Formaldehyde Preserved Glass;
Z = Zinc Acetate Preserved Bottle; E = EDTA Preserved Bottles; ST = Sterile Bottle; ASS = Plastic Bag for Acid Sulphate Soils; B = Unpreserved Bag.

Environmental

CERTIFICATE OF ANALYSIS

Work Order : **ES2132601**
Client : **Jacobs Arcadis Joint Venture**
Contact : Amanda Mullen
Address : Level 16 580 George Street
Sydney 2000
Telephone : ----
Project : IA254001
Order number : ----
C-O-C number : ----
Sampler : ----
Site : ----
Quote number : EN/222
No. of samples received : 14
No. of samples analysed : 11

Page : 1 of 15
Laboratory : Environmental Division Sydney
Contact : Customer Services ES
Address : 277-289 Woodpark Road Smithfield NSW Australia 2164
Telephone : +61-2-8784 8555
Date Samples Received : 08-Sep-2021 15:10
Date Analysis Commenced : 09-Sep-2021
Issue Date : 24-Sep-2021 10:30

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

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

This Certificate of Analysis contains the following information:

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

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

Signatories

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

Signatories	*Position*	*Accreditation Category*
Alana Smylie	Asbestos Identifier	Newcastle - Asbestos, Mayfield West, NSW
Edwandy Fadjar	Organic Coordinator	Sydney Inorganics, Smithfield, NSW
Edwandy Fadjar	Organic Coordinator	Sydney Organics, Smithfield, NSW
Ivan Taylor	Analyst	Sydney Inorganics, Smithfield, NSW
Uma Nagendiram	Subcontracting Coordinator	WRG Subcontracting, Smithfield, NSW

General Comments

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

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

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

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

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

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

Key : CAS Number = CAS registry number from database maintained by Chemical Abstracts Services. The Chemical Abstracts Service is a division of the American Chemical Society.
LOR = Limit of reporting
^ = This result is computed from individual analyte detections at or above the level of reporting
ø = ALS is not NATA accredited for these tests.
~ = Indicates an estimated value.

- EP075 (SIM): Where reported, Benzo(a)pyrene Toxicity Equivalent Quotient (TEQ) per the NEPM (2013) is the sum total of the concentration of the eight carcinogenic PAHs multiplied by their Toxicity Equivalence Factor (TEF) relative to Benzo(a)pyrene. TEF values are provided in brackets as follows: Benz(a)anthracene (0.1), Chrysene (0.01), Benzo(b+j) & Benzo(k)fluoranthene (0.1), Benzo(a)pyrene (1.0), Indeno(1.2.3.cd)pyrene (0.1), Dibenz(a.h)anthracene (1.0), Benzo(g.h.i)perylene (0.01). Less than LOR results for 'TEQ Zero' are treated as zero.
- Benzo(a)pyrene Toxicity Equivalent Quotient (TEQ) per the NEPM (2013) is the sum total of the concentration of the eight carcinogenic PAHs multiplied by their Toxicity Equivalence Factor (TEF) relative to Benzo(a)pyrene. TEF values are provided in brackets as follows: Benz(a)anthracene (0.1), Chrysene (0.01), Benzo(b+j) & Benzo(k)fluoranthene (0.1), Benzo(a)pyrene (1.0), Indeno(1.2.3.cd)pyrene (0.1), Dibenz(a.h)anthracene (1.0), Benzo(g.h.i)perylene (0.01). Less than LOR results for 'TEQ Zero' are treated as zero, for 'TEQ 1/2LOR' are treated as half the reported LOR, and for 'TEQ LOR' are treated as being equal to the reported LOR. Note: TEQ 1/2LOR and TEQ LOR will calculate as 0.6mg/Kg and 1.2mg/Kg respectively for samples with non-detects for all of the eight TEQ PAHs.
- EP080: Where reported, Total Xylenes is the sum of the reported concentrations of m&p-Xylene and o-Xylene at or above the LOR.
- EP068: Where reported, Total Chlordane (sum) is the sum of the reported concentrations of cis-Chlordane and trans-Chlordane at or above the LOR.
- EP068: Where reported, Total OCP is the sum of the reported concentrations of all Organochlorine Pesticides at or above LOR.
- EP075(SIM): Where reported, Total Cresol is the sum of the reported concentrations of 2-Methylphenol and 3- & 4-Methylphenol at or above the LOR.
- MM868 (Coliforms & E. coli in Soils by MPN using Aquachrom ECC) - Analysis is conducted by ALS Scoresby NATA accreditation no. 992, site no. 989.
- EA200 'Am' Amosite (brown asbestos)
- EA200 'Cr' Crocidolite (blue asbestos)
- EA200 'Trace' - Asbestos fibres ("Free Fibres") detected by trace analysis per AS4964. The result can be interpreted that the sample contains detectable 'respirable' asbestos fibres
- EA200: Asbestos Identification Samples were analysed by Polarised Light Microscopy including dispersion staining.
- EA200 Legend
- EA200 'Ch' Chrysotile (white asbestos)
- EA200: 'UMF' Unknown Mineral Fibres. "-" indicates fibres detected may or may not be asbestos fibres. Confirmation by alternative techniques is recommended.
- EA200: For samples larger than 30g, the <2mm fraction may be sub-sampled prior to trace analysis as outlined in ISO23909:2008(E) Sect 6.3.2-2
- EA200: 'Yes' - Asbestos detected by polarised light microscopy including dispersion staining.
- EA200: 'No*' - No asbestos found, at the reporting limit of 0.1g/kg, by polarised light microscopy including dispersion staining. Asbestos material was detected and positively identified at concentrations estimated to be below 0.1g/kg.
- EA200: 'No' - No asbestos found at the reporting limit 0.1g/kg, by polarised light microscopy including dispersion staining.

Analytical Results

Sub-Matrix: **SOIL** (Matrix: **SOIL**)			*Sample ID*	**SS13_0.05**	**QC101_210906**	**BH07_0.05**	**BH07_0.5**	**SS24_0.05**
			Sampling date / time	06-Sep-2021 00:00	06-Sep-2021 00:00	07-Sep-2021 00:00	07-Sep-2021 00:00	07-Sep-2021 00:00
Compound	*CAS Number*	*LOR*	*Unit*	**ES2132601-001**	**ES2132601-002**	**ES2132601-003**	**ES2132601-004**	**ES2132601-006**
				Result	Result	Result	Result	Result
EA055: Moisture Content (Dried @ 105-110°C)								
Moisture Content	----	1.0	%	**14.9**	**15.6**	**9.9**	**19.1**	**12.1**
EA200: AS 4964 - 2004 Identification of Asbestos in Soils								
Asbestos Detected	1332-21-4	0.1	g/kg	**No**	**No**	**No**	**No**	**No**
Asbestos (Trace)	1332-21-4	5	Fibres	**No**	**No**	**No**	**No**	**No**
Asbestos Type	1332-21-4	-	--	**-**	**-**	**-**	**-**	**-**
Synthetic Mineral Fibre	----	0.1	g/kg	**No**	**No**	**No**	**No**	**No**
Organic Fibre	----	0.1	g/kg	**No**	**No**	**No**	**No**	**No**
Sample weight (dry)	----	0.01	g	**113**	**124**	**171**	**126**	**162**
APPROVED IDENTIFIER:	----	-	--	**A. SMYLIE**	**A. SMYLIE**	**A. SMYLIE**	**A. SMYLIE**	**A. SMYLIE**
EG005(ED093)T: Total Metals by ICP-AES								
Arsenic	7440-38-2	5	mg/kg	<5	<5	<5	<5	**8**
Cadmium	7440-43-9	1	mg/kg	<1	<1	<1	<1	<1
Chromium	7440-47-3	2	mg/kg	**4**	**6**	<2	**9**	**14**
Copper	7440-50-8	5	mg/kg	<5	<5	<5	<5	**7**
Lead	7439-92-1	5	mg/kg	**5**	**6**	<5	<5	**26**
Nickel	7440-02-0	2	mg/kg	<2	<2	<2	**3**	**6**
Zinc	7440-66-6	5	mg/kg	<5	<5	<5	**18**	**25**
EG035T: Total Recoverable Mercury by FIMS								
Mercury	7439-97-6	0.1	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
EP068A: Organochlorine Pesticides (OC)								
alpha-BHC	319-84-6	0.05	mg/kg	<0.05	<0.05	<0.05	<0.05	<0.05
Hexachlorobenzene (HCB)	118-74-1	0.05	mg/kg	<0.05	<0.05	<0.05	<0.05	<0.05
beta-BHC	319-85-7	0.05	mg/kg	<0.05	<0.05	<0.05	<0.05	<0.05
gamma-BHC	58-89-9	0.05	mg/kg	<0.05	<0.05	<0.05	<0.05	<0.05
delta-BHC	319-86-8	0.05	mg/kg	<0.05	<0.05	<0.05	<0.05	<0.05
Heptachlor	76-44-8	0.05	mg/kg	<0.05	<0.05	<0.05	<0.05	<0.05
Aldrin	309-00-2	0.05	mg/kg	<0.05	<0.05	<0.05	<0.05	<0.05
Heptachlor epoxide	1024-57-3	0.05	mg/kg	<0.05	<0.05	<0.05	<0.05	<0.05
^ **Total Chlordane (sum)**	----	0.05	mg/kg	<0.05	<0.05	<0.05	<0.05	<0.05
trans-Chlordane	5103-74-2	0.05	mg/kg	<0.05	<0.05	<0.05	<0.05	<0.05
alpha-Endosulfan	959-98-8	0.05	mg/kg	<0.05	<0.05	<0.05	<0.05	<0.05
cis-Chlordane	5103-71-9	0.05	mg/kg	<0.05	<0.05	<0.05	<0.05	<0.05
Dieldrin	60-57-1	0.05	mg/kg	<0.05	<0.05	<0.05	<0.05	<0.05
4.4`-DDE	72-55-9	0.05	mg/kg	<0.05	<0.05	<0.05	<0.05	<0.05

Analytical Results

Sub-Matrix: **SOIL** (Matrix: **SOIL**)			Sample ID	**SS13_0.05**	**QC101_210906**	**BH07_0.05**	**BH07_0.5**	**SS24_0.05**
			Sampling date / time	06-Sep-2021 00:00	06-Sep-2021 00:00	07-Sep-2021 00:00	07-Sep-2021 00:00	07-Sep-2021 00:00
Compound	CAS Number	LOR	Unit	**ES2132601-001**	**ES2132601-002**	**ES2132601-003**	**ES2132601-004**	**ES2132601-006**
				Result	Result	Result	Result	Result
EP068A: Organochlorine Pesticides (OC) - Continued								
Endrin	72-20-8	0.05	mg/kg	<0.05	<0.05	<0.05	<0.05	<0.05
beta-Endosulfan	33213-65-9	0.05	mg/kg	<0.05	<0.05	<0.05	<0.05	<0.05
^ **Endosulfan (sum)**	115-29-7	0.05	mg/kg	<0.05	<0.05	<0.05	<0.05	<0.05
4.4`-DDD	72-54-8	0.05	mg/kg	<0.05	<0.05	<0.05	<0.05	<0.05
Endrin aldehyde	7421-93-4	0.05	mg/kg	<0.05	<0.05	<0.05	<0.05	<0.05
Endosulfan sulfate	1031-07-8	0.05	mg/kg	<0.05	<0.05	<0.05	<0.05	<0.05
4.4`-DDT	50-29-3	0.2	mg/kg	<0.2	<0.2	<0.2	<0.2	<0.2
Endrin ketone	53494-70-5	0.05	mg/kg	<0.05	<0.05	<0.05	<0.05	<0.05
Methoxychlor	72-43-5	0.2	mg/kg	<0.2	<0.2	<0.2	<0.2	<0.2
^ **Sum of Aldrin + Dieldrin**	309-00-2/60-57-1	0.05	mg/kg	<0.05	<0.05	<0.05	<0.05	<0.05
^ **Sum of DDD + DDE + DDT**	72-54-8/72-55-9/50-2	0.05	mg/kg	<0.05	<0.05	<0.05	<0.05	<0.05
EP068B: Organophosphorus Pesticides (OP)								
Dichlorvos	62-73-7	0.05	mg/kg	<0.05	<0.05	<0.05	<0.05	<0.05
Demeton-S-methyl	919-86-8	0.05	mg/kg	<0.05	<0.05	<0.05	<0.05	<0.05
Monocrotophos	6923-22-4	0.2	mg/kg	<0.2	<0.2	<0.2	<0.2	<0.2
Dimethoate	60-51-5	0.05	mg/kg	<0.05	<0.05	<0.05	<0.05	<0.05
Diazinon	333-41-5	0.05	mg/kg	<0.05	<0.05	<0.05	<0.05	<0.05
Chlorpyrifos-methyl	5598-13-0	0.05	mg/kg	<0.05	<0.05	<0.05	<0.05	<0.05
Parathion-methyl	298-00-0	0.2	mg/kg	<0.2	<0.2	<0.2	<0.2	<0.2
Malathion	121-75-5	0.05	mg/kg	<0.05	<0.05	<0.05	<0.05	<0.05
Fenthion	55-38-9	0.05	mg/kg	<0.05	<0.05	<0.05	<0.05	<0.05
Chlorpyrifos	2921-88-2	0.05	mg/kg	<0.05	<0.05	<0.05	<0.05	<0.05
Parathion	56-38-2	0.2	mg/kg	<0.2	<0.2	<0.2	<0.2	<0.2
Pirimphos-ethyl	23505-41-1	0.05	mg/kg	<0.05	<0.05	<0.05	<0.05	<0.05
Chlorfenvinphos	470-90-6	0.05	mg/kg	<0.05	<0.05	<0.05	<0.05	<0.05
Bromophos-ethyl	4824-78-6	0.05	mg/kg	<0.05	<0.05	<0.05	<0.05	<0.05
Fenamiphos	22224-92-6	0.05	mg/kg	<0.05	<0.05	<0.05	<0.05	<0.05
Prothiofos	34643-46-4	0.05	mg/kg	<0.05	<0.05	<0.05	<0.05	<0.05
Ethion	563-12-2	0.05	mg/kg	<0.05	<0.05	<0.05	<0.05	<0.05
Carbophenothion	786-19-6	0.05	mg/kg	<0.05	<0.05	<0.05	<0.05	<0.05
Azinphos Methyl	86-50-0	0.05	mg/kg	<0.05	<0.05	<0.05	<0.05	<0.05
EP075(SIM)B: Polynuclear Aromatic Hydrocarbons								
Naphthalene	91-20-3	0.5	mg/kg	<0.5	<0.5	<0.5	<0.5	<0.5
Acenaphthylene	208-96-8	0.5	mg/kg	<0.5	<0.5	<0.5	<0.5	<0.5

Analytical Results

Sub-Matrix: **SOIL** (Matrix: **SOIL**)			*Sample ID*	**SS13_0.05**	**QC101_210906**	**BH07_0.05**	**BH07_0.5**	**SS24_0.05**
			Sampling date / time	06-Sep-2021 00:00	06-Sep-2021 00:00	07-Sep-2021 00:00	07-Sep-2021 00:00	07-Sep-2021 00:00
Compound	*CAS Number*	*LOR*	*Unit*	**ES2132601-001**	**ES2132601-002**	**ES2132601-003**	**ES2132601-004**	**ES2132601-006**
				Result	Result	Result	Result	Result
EP075(SIM)B: Polynuclear Aromatic Hydrocarbons - Continued								
Acenaphthene	83-32-9	0.5	mg/kg	<0.5	<0.5	<0.5	<0.5	<0.5
Fluorene	86-73-7	0.5	mg/kg	<0.5	<0.5	<0.5	<0.5	<0.5
Phenanthrene	85-01-8	0.5	mg/kg	<0.5	<0.5	<0.5	<0.5	<0.5
Anthracene	120-12-7	0.5	mg/kg	<0.5	<0.5	<0.5	<0.5	<0.5
Fluoranthene	206-44-0	0.5	mg/kg	<0.5	<0.5	<0.5	<0.5	<0.5
Pyrene	129-00-0	0.5	mg/kg	<0.5	<0.5	<0.5	<0.5	<0.5
Benz(a)anthracene	56-55-3	0.5	mg/kg	<0.5	<0.5	<0.5	<0.5	<0.5
Chrysene	218-01-9	0.5	mg/kg	<0.5	<0.5	<0.5	<0.5	<0.5
Benzo(b+j)fluoranthene	205-99-2 205-82-3	0.5	mg/kg	<0.5	<0.5	<0.5	<0.5	<0.5
Benzo(k)fluoranthene	207-08-9	0.5	mg/kg	<0.5	<0.5	<0.5	<0.5	<0.5
Benzo(a)pyrene	50-32-8	0.5	mg/kg	<0.5	<0.5	<0.5	<0.5	<0.5
Indeno(1.2.3.cd)pyrene	193-39-5	0.5	mg/kg	<0.5	<0.5	<0.5	<0.5	<0.5
Dibenz(a.h)anthracene	53-70-3	0.5	mg/kg	<0.5	<0.5	<0.5	<0.5	<0.5
Benzo(g.h.i)perylene	191-24-2	0.5	mg/kg	<0.5	<0.5	<0.5	<0.5	<0.5
^ **Sum of polycyclic aromatic hydrocarbons**	----	0.5	mg/kg	<0.5	<0.5	<0.5	<0.5	<0.5
^ **Benzo(a)pyrene TEQ (zero)**	----	0.5	mg/kg	<0.5	<0.5	<0.5	<0.5	<0.5
^ **Benzo(a)pyrene TEQ (half LOR)**	----	0.5	mg/kg	**0.6**	**0.6**	**0.6**	**0.6**	**0.6**
^ **Benzo(a)pyrene TEQ (LOR)**	----	0.5	mg/kg	**1.2**	**1.2**	**1.2**	**1.2**	**1.2**
EP080/071: Total Petroleum Hydrocarbons								
C6 - C9 Fraction	----	10	mg/kg	<10	<10	<10	<10	<10
C10 - C14 Fraction	----	50	mg/kg	<50	<50	<50	<50	<50
C15 - C28 Fraction	----	100	mg/kg	<100	<100	<100	<100	<100
C29 - C36 Fraction	----	100	mg/kg	<100	<100	<100	<100	<100
^ **C10 - C36 Fraction (sum)**	----	50	mg/kg	<50	<50	<50	<50	<50
EP080/071: Total Recoverable Hydrocarbons - NEPM 2013 Fractions								
C6 - C10 Fraction	C6_C10	10	mg/kg	<10	<10	<10	<10	<10
^ **C6 - C10 Fraction minus BTEX (F1)**	C6_C10-BTEX	10	mg/kg	<10	<10	<10	<10	<10
>C10 - C16 Fraction	----	50	mg/kg	<50	<50	<50	<50	<50
>C16 - C34 Fraction	----	100	mg/kg	<100	<100	<100	<100	<100
>C34 - C40 Fraction	----	100	mg/kg	<100	<100	<100	<100	<100
^ **>C10 - C40 Fraction (sum)**	----	50	mg/kg	<50	<50	<50	<50	<50
^ **>C10 - C16 Fraction minus Naphthalene (F2)**	----	50	mg/kg	<50	<50	<50	<50	<50

Analytical Results

Sub-Matrix: **SOIL**
(Matrix: **SOIL)**

			Sample ID	SS13_0.05	QC101_210906	BH07_0.05	BH07_0.5	SS24_0.05
			Sampling date / time	06-Sep-2021 00:00	06-Sep-2021 00:00	07-Sep-2021 00:00	07-Sep-2021 00:00	07-Sep-2021 00:00
Compound	CAS Number	LOR	Unit	ES2132601-001	ES2132601-002	ES2132601-003	ES2132601-004	ES2132601-006
				Result	Result	Result	Result	Result
EP080: BTEXN								
Benzene	71-43-2	0.2	mg/kg	<0.2	<0.2	<0.2	<0.2	<0.2
Toluene	108-88-3	0.5	mg/kg	<0.5	<0.5	<0.5	<0.5	<0.5
Ethylbenzene	100-41-4	0.5	mg/kg	<0.5	<0.5	<0.5	<0.5	<0.5
meta- & para-Xylene	108-38-3 106-42-3	0.5	mg/kg	<0.5	<0.5	<0.5	<0.5	<0.5
ortho-Xylene	95-47-6	0.5	mg/kg	<0.5	<0.5	<0.5	<0.5	<0.5
^ Sum of BTEX	----	0.2	mg/kg	<0.2	<0.2	<0.2	<0.2	<0.2
^ Total Xylenes	----	0.5	mg/kg	<0.5	<0.5	<0.5	<0.5	<0.5
Naphthalene	91-20-3	1	mg/kg	<1	<1	<1	<1	<1
MM868: Coliforms & E.coli by MPN using Aquachrom ECC								
Total Coliforms by MPN	----	10	MPN/g	**2900**	**7200**	**1800**	<12	----
E.coli by MPN	----	10	MPN/g	<12	<12	<11	<12	----
EP068S: Organochlorine Pesticide Surrogate								
Dibromo-DDE	21655-73-2	0.05	%	**104**	**96.1**	**93.7**	**96.5**	**95.4**
EP068T: Organophosphorus Pesticide Surrogate								
DEF	78-48-8	0.05	%	**88.3**	**84.5**	**79.5**	**81.8**	**80.8**
EP075(SIM)S: Phenolic Compound Surrogates								
Phenol-d6	13127-88-3	0.5	%	**91.0**	**90.2**	**89.5**	**85.8**	**91.3**
2-Chlorophenol-D4	93951-73-6	0.5	%	**91.5**	**91.3**	**90.0**	**86.3**	**91.4**
2.4.6-Tribromophenol	118-79-6	0.5	%	**91.8**	**91.8**	**89.4**	**82.9**	**87.7**
EP075(SIM)T: PAH Surrogates								
2-Fluorobiphenyl	321-60-8	0.5	%	**89.8**	**89.6**	**88.7**	**84.8**	**90.3**
Anthracene-d10	1719-06-8	0.5	%	**102**	**103**	**102**	**96.4**	**103**
4-Terphenyl-d14	1718-51-0	0.5	%	**95.0**	**95.1**	**94.2**	**89.8**	**95.3**
EP080S: TPH(V)/BTEX Surrogates								
1.2-Dichloroethane-D4	17060-07-0	0.2	%	**88.3**	**93.9**	**94.9**	**82.6**	**95.0**
Toluene-D8	2037-26-5	0.2	%	**78.9**	**84.7**	**76.6**	**83.6**	**79.4**
4-Bromofluorobenzene	460-00-4	0.2	%	**88.6**	**97.2**	**91.2**	**84.9**	**93.6**

Analytical Results

Sub-Matrix: **SOIL** (Matrix: **SOIL**)			*Sample ID*	**SS24_0.10**	**SS26_0.05**	**BH15_0.05**	**BH15_2.0**	**QC300_210908**
			Sampling date / time	07-Sep-2021 00:00	07-Sep-2021 00:00	08-Sep-2021 00:00	08-Sep-2021 00:00	03-Sep-2021 00:00
Compound	*CAS Number*	*LOR*	*Unit*	**ES2132601-007**	**ES2132601-008**	**ES2132601-009**	**ES2132601-011**	**ES2132601-012**
				Result	Result	Result	Result	Result
EA055: Moisture Content (Dried @ 105-110°C)								
Moisture Content	----	1.0	%	**10.6**	**17.8**	**24.1**	**9.7**	----
EA200: AS 4964 - 2004 Identification of Asbestos in Soils								
Asbestos Detected	1332-21-4	0.1	g/kg	**No**	**No**	**No**	----	----
Asbestos (Trace)	1332-21-4	5	Fibres	**No**	**No**	**No**	----	----
Asbestos Type	1332-21-4	-	--	**-**	**-**	**-**	----	----
Synthetic Mineral Fibre	----	0.1	g/kg	**No**	**No**	**No**	----	----
Organic Fibre	----	0.1	g/kg	**No**	**No**	**No**	----	----
Sample weight (dry)	----	0.01	g	**146**	**111**	**132**	----	----
APPROVED IDENTIFIER:	----	-	--	**A. SMYLIE**	**A. SMYLIE**	**A. SMYLIE**	----	----
EG005(ED093)T: Total Metals by ICP-AES								
Arsenic	7440-38-2	5	mg/kg	**8**	**13**	**10**	**26**	----
Cadmium	7440-43-9	1	mg/kg	<1	<1	<1	<1	----
Chromium	7440-47-3	2	mg/kg	**12**	**16**	**14**	**19**	----
Copper	7440-50-8	5	mg/kg	**7**	**9**	**10**	**20**	----
Lead	7439-92-1	5	mg/kg	**21**	**15**	**22**	**18**	----
Nickel	7440-02-0	2	mg/kg	**6**	**8**	**4**	**6**	----
Zinc	7440-66-6	5	mg/kg	**26**	**26**	**55**	**33**	----
EG035T: Total Recoverable Mercury by FIMS								
Mercury	7439-97-6	0.1	mg/kg	<0.1	<0.1	<0.1	<0.1	----
EP068A: Organochlorine Pesticides (OC)								
alpha-BHC	319-84-6	0.05	mg/kg	<0.05	<0.05	<0.05	<0.05	----
Hexachlorobenzene (HCB)	118-74-1	0.05	mg/kg	<0.05	<0.05	<0.05	<0.05	----
beta-BHC	319-85-7	0.05	mg/kg	<0.05	<0.05	<0.05	<0.05	----
gamma-BHC	58-89-9	0.05	mg/kg	<0.05	<0.05	<0.05	<0.05	----
delta-BHC	319-86-8	0.05	mg/kg	<0.05	<0.05	<0.05	<0.05	----
Heptachlor	76-44-8	0.05	mg/kg	<0.05	<0.05	<0.05	<0.05	----
Aldrin	309-00-2	0.05	mg/kg	<0.05	<0.05	<0.05	<0.05	----
Heptachlor epoxide	1024-57-3	0.05	mg/kg	<0.05	<0.05	<0.05	<0.05	----
^ **Total Chlordane (sum)**	----	0.05	mg/kg	<0.05	<0.05	<0.05	<0.05	----
trans-Chlordane	5103-74-2	0.05	mg/kg	<0.05	<0.05	<0.05	<0.05	----
alpha-Endosulfan	959-98-8	0.05	mg/kg	<0.05	<0.05	<0.05	<0.05	----
cis-Chlordane	5103-71-9	0.05	mg/kg	<0.05	<0.05	<0.05	<0.05	----
Dieldrin	60-57-1	0.05	mg/kg	<0.05	<0.05	<0.05	<0.05	----
4.4`-DDE	72-55-9	0.05	mg/kg	<0.05	<0.05	<0.05	<0.05	----

Analytical Results

Sub-Matrix: **SOIL**
(Matrix: **SOIL**)

			Sample ID	**SS24_0.10**	**SS26_0.05**	**BH15_0.05**	**BH15_2.0**	**QC300_210908**
			Sampling date / time	07-Sep-2021 00:00	07-Sep-2021 00:00	08-Sep-2021 00:00	08-Sep-2021 00:00	03-Sep-2021 00:00
Compound	*CAS Number*	*LOR*	*Unit*	**ES2132601-007**	**ES2132601-008**	**ES2132601-009**	**ES2132601-011**	**ES2132601-012**
				Result	Result	Result	Result	Result
EP068A: Organochlorine Pesticides (OC) - Continued								
Endrin	72-20-8	0.05	mg/kg	<0.05	<0.05	<0.05	<0.05	----
beta-Endosulfan	33213-65-9	0.05	mg/kg	<0.05	<0.05	<0.05	<0.05	----
^ **Endosulfan (sum)**	115-29-7	0.05	mg/kg	<0.05	<0.05	<0.05	<0.05	----
4.4`-DDD	72-54-8	0.05	mg/kg	<0.05	<0.05	<0.05	<0.05	----
Endrin aldehyde	7421-93-4	0.05	mg/kg	<0.05	<0.05	<0.05	<0.05	----
Endosulfan sulfate	1031-07-8	0.05	mg/kg	<0.05	<0.05	<0.05	<0.05	----
4.4`-DDT	50-29-3	0.2	mg/kg	<0.2	<0.2	<0.2	<0.2	----
Endrin ketone	53494-70-5	0.05	mg/kg	<0.05	<0.05	<0.05	<0.05	----
Methoxychlor	72-43-5	0.2	mg/kg	<0.2	<0.2	<0.2	<0.2	----
^ **Sum of Aldrin + Dieldrin**	309-00-2/60-57-1	0.05	mg/kg	<0.05	<0.05	<0.05	<0.05	----
^ **Sum of DDD + DDE + DDT**	72-54-8/72-55-9/50-2	0.05	mg/kg	<0.05	<0.05	<0.05	<0.05	----
EP068B: Organophosphorus Pesticides (OP)								
Dichlorvos	62-73-7	0.05	mg/kg	<0.05	<0.05	<0.05	<0.05	----
Demeton-S-methyl	919-86-8	0.05	mg/kg	<0.05	<0.05	<0.05	<0.05	----
Monocrotophos	6923-22-4	0.2	mg/kg	<0.2	<0.2	<0.2	<0.2	----
Dimethoate	60-51-5	0.05	mg/kg	<0.05	<0.05	<0.05	<0.05	----
Diazinon	333-41-5	0.05	mg/kg	<0.05	<0.05	<0.05	<0.05	----
Chlorpyrifos-methyl	5598-13-0	0.05	mg/kg	<0.05	<0.05	<0.05	<0.05	----
Parathion-methyl	298-00-0	0.2	mg/kg	<0.2	<0.2	<0.2	<0.2	----
Malathion	121-75-5	0.05	mg/kg	<0.05	<0.05	<0.05	<0.05	----
Fenthion	55-38-9	0.05	mg/kg	<0.05	<0.05	<0.05	<0.05	----
Chlorpyrifos	2921-88-2	0.05	mg/kg	<0.05	<0.05	<0.05	<0.05	----
Parathion	56-38-2	0.2	mg/kg	<0.2	<0.2	<0.2	<0.2	----
Pirimphos-ethyl	23505-41-1	0.05	mg/kg	<0.05	<0.05	<0.05	<0.05	----
Chlorfenvinphos	470-90-6	0.05	mg/kg	<0.05	<0.05	<0.05	<0.05	----
Bromophos-ethyl	4824-78-6	0.05	mg/kg	<0.05	<0.05	<0.05	<0.05	----
Fenamiphos	22224-92-6	0.05	mg/kg	<0.05	<0.05	<0.05	<0.05	----
Prothiofos	34643-46-4	0.05	mg/kg	<0.05	<0.05	<0.05	<0.05	----
Ethion	563-12-2	0.05	mg/kg	<0.05	<0.05	<0.05	<0.05	----
Carbophenothion	786-19-6	0.05	mg/kg	<0.05	<0.05	<0.05	<0.05	----
Azinphos Methyl	86-50-0	0.05	mg/kg	<0.05	<0.05	<0.05	<0.05	----
EP075(SIM)B: Polynuclear Aromatic Hydrocarbons								
Naphthalene	91-20-3	0.5	mg/kg	<0.5	<0.5	<0.5	<0.5	----
Acenaphthylene	208-96-8	0.5	mg/kg	<0.5	<0.5	<0.5	<0.5	----

Analytical Results

Sub-Matrix: **SOIL** (Matrix: **SOIL**)			Sample ID	**SS24_0.10**	**SS26_0.05**	**BH15_0.05**	**BH15_2.0**	**QC300_210908**
			Sampling date / time	07-Sep-2021 00:00	07-Sep-2021 00:00	08-Sep-2021 00:00	08-Sep-2021 00:00	03-Sep-2021 00:00
Compound	CAS Number	LOR	Unit	**ES2132601-007**	**ES2132601-008**	**ES2132601-009**	**ES2132601-011**	**ES2132601-012**
				Result	Result	Result	Result	Result
EP075(SIM)B: Polynuclear Aromatic Hydrocarbons - Continued								
Acenaphthene	83-32-9	0.5	mg/kg	<0.5	<0.5	<0.5	<0.5	----
Fluorene	86-73-7	0.5	mg/kg	<0.5	<0.5	<0.5	<0.5	----
Phenanthrene	85-01-8	0.5	mg/kg	<0.5	<0.5	<0.5	<0.5	----
Anthracene	120-12-7	0.5	mg/kg	<0.5	<0.5	<0.5	<0.5	----
Fluoranthene	206-44-0	0.5	mg/kg	<0.5	<0.5	<0.5	<0.5	----
Pyrene	129-00-0	0.5	mg/kg	<0.5	<0.5	<0.5	<0.5	----
Benz(a)anthracene	56-55-3	0.5	mg/kg	<0.5	<0.5	<0.5	<0.5	----
Chrysene	218-01-9	0.5	mg/kg	<0.5	<0.5	<0.5	<0.5	----
Benzo(b+j)fluoranthene	205-99-2 205-82-3	0.5	mg/kg	<0.5	<0.5	<0.5	<0.5	----
Benzo(k)fluoranthene	207-08-9	0.5	mg/kg	<0.5	<0.5	<0.5	<0.5	----
Benzo(a)pyrene	50-32-8	0.5	mg/kg	<0.5	<0.5	<0.5	<0.5	----
Indeno(1.2.3.cd)pyrene	193-39-5	0.5	mg/kg	<0.5	<0.5	<0.5	<0.5	----
Dibenz(a.h)anthracene	53-70-3	0.5	mg/kg	<0.5	<0.5	<0.5	<0.5	----
Benzo(g.h.i)perylene	191-24-2	0.5	mg/kg	<0.5	<0.5	<0.5	<0.5	----
^ **Sum of polycyclic aromatic hydrocarbons**	----	0.5	mg/kg	<0.5	<0.5	<0.5	<0.5	----
^ **Benzo(a)pyrene TEQ (zero)**	----	0.5	mg/kg	<0.5	<0.5	<0.5	<0.5	----
^ **Benzo(a)pyrene TEQ (half LOR)**	----	0.5	mg/kg	**0.6**	**0.6**	**0.6**	**0.6**	----
^ **Benzo(a)pyrene TEQ (LOR)**	----	0.5	mg/kg	**1.2**	**1.2**	**1.2**	**1.2**	----
EP080/071: Total Petroleum Hydrocarbons								
C6 - C9 Fraction	----	10	mg/kg	<10	<10	<10	<10	----
C10 - C14 Fraction	----	50	mg/kg	<50	<50	<50	<50	----
C15 - C28 Fraction	----	100	mg/kg	<100	<100	<100	<100	----
C29 - C36 Fraction	----	100	mg/kg	<100	<100	<100	<100	----
^ **C10 - C36 Fraction (sum)**	----	50	mg/kg	<50	<50	<50	<50	----
EP080/071: Total Recoverable Hydrocarbons - NEPM 2013 Fractions								
C6 - C10 Fraction	C6_C10	10	mg/kg	<10	<10	<10	<10	----
^ **C6 - C10 Fraction minus BTEX (F1)**	C6_C10-BTEX	10	mg/kg	<10	<10	<10	<10	----
>C10 - C16 Fraction	----	50	mg/kg	<50	<50	<50	<50	----
>C16 - C34 Fraction	----	100	mg/kg	<100	<100	<100	<100	----
>C34 - C40 Fraction	----	100	mg/kg	<100	<100	<100	<100	----
^ **>C10 - C40 Fraction (sum)**	----	50	mg/kg	<50	<50	<50	<50	----
^ **>C10 - C16 Fraction minus Naphthalene (F2)**	----	50	mg/kg	<50	<50	<50	<50	----

Analytical Results

Sub-Matrix: **SOIL** (Matrix: **SOIL**)			Sample ID	**SS24_0.10**	**SS26_0.05**	**BH15_0.05**	**BH15_2.0**	**QC300_210908**
			Sampling date / time	07-Sep-2021 00:00	07-Sep-2021 00:00	08-Sep-2021 00:00	08-Sep-2021 00:00	03-Sep-2021 00:00
Compound	CAS Number	LOR	Unit	**ES2132601-007**	**ES2132601-008**	**ES2132601-009**	**ES2132601-011**	**ES2132601-012**
				Result	Result	Result	Result	Result
EP080: BTEXN								
Benzene	71-43-2	0.2	mg/kg	<0.2	<0.2	<0.2	<0.2	<0.2
Toluene	108-88-3	0.5	mg/kg	<0.5	<0.5	<0.5	<0.5	<0.5
Ethylbenzene	100-41-4	0.5	mg/kg	<0.5	<0.5	<0.5	<0.5	<0.5
meta- & para-Xylene	108-38-3 106-42-3	0.5	mg/kg	<0.5	<0.5	<0.5	<0.5	<0.5
ortho-Xylene	95-47-6	0.5	mg/kg	<0.5	<0.5	<0.5	<0.5	<0.5
^ **Sum of BTEX**	----	0.2	mg/kg	<0.2	<0.2	<0.2	<0.2	<0.2
^ **Total Xylenes**	----	0.5	mg/kg	<0.5	<0.5	<0.5	<0.5	<0.5
Naphthalene	91-20-3	1	mg/kg	<1	<1	<1	<1	<1
MM868: Coliforms & E.coli by MPN using Aquachrom ECC								
Total Coliforms by MPN	----	10	MPN/g	----	----	**>34000**	<11	----
E.coli by MPN	----	10	MPN/g	----	----	<14	<11	----
EP068S: Organochlorine Pesticide Surrogate								
Dibromo-DDE	21655-73-2	0.05	%	**94.3**	**87.3**	**96.6**	**94.6**	----
EP068T: Organophosphorus Pesticide Surrogate								
DEF	78-48-8	0.05	%	**88.7**	**74.3**	**81.3**	**75.5**	----
EP075(SIM)S: Phenolic Compound Surrogates								
Phenol-d6	13127-88-3	0.5	%	**92.0**	**90.2**	**92.0**	**91.3**	----
2-Chlorophenol-D4	93951-73-6	0.5	%	**92.6**	**89.8**	**92.7**	**91.6**	----
2.4.6-Tribromophenol	118-79-6	0.5	%	**88.4**	**91.0**	**94.7**	**90.8**	----
EP075(SIM)T: PAH Surrogates								
2-Fluorobiphenyl	321-60-8	0.5	%	**90.9**	**90.2**	**92.2**	**89.8**	----
Anthracene-d10	1719-06-8	0.5	%	**105**	**103**	**106**	**103**	----
4-Terphenyl-d14	1718-51-0	0.5	%	**96.1**	**95.7**	**98.0**	**95.0**	----
EP080S: TPH(V)/BTEX Surrogates								
1.2-Dichloroethane-D4	17060-07-0	0.2	%	**95.7**	**77.6**	**76.6**	**86.1**	**93.3**
Toluene-D8	2037-26-5	0.2	%	**81.4**	**80.9**	**83.1**	**93.2**	**80.5**
4-Bromofluorobenzene	460-00-4	0.2	%	**98.6**	**80.3**	**82.0**	**90.3**	**97.0**

Analytical Results

Sub-Matrix: **WATER** (Matrix: **WATER**)			Sample ID	**QC501_210908**	----	----	----	----
			Sampling date / time	08-Sep-2021 00:00	----	----	----	----
Compound	CAS Number	LOR	Unit	**ES2132601-013**	--------	--------	--------	--------
				Result	----	----	----	----
EG020T: Total Metals by ICP-MS								
Arsenic	7440-38-2	0.001	mg/L	<0.001	----	----	----	----
Cadmium	7440-43-9	0.0001	mg/L	<0.0001	----	----	----	----
Chromium	7440-47-3	0.001	mg/L	<0.001	----	----	----	----
Copper	7440-50-8	0.001	mg/L	<0.001	----	----	----	----
Lead	7439-92-1	0.001	mg/L	<0.001	----	----	----	----
Nickel	7440-02-0	0.001	mg/L	<0.001	----	----	----	----
Zinc	7440-66-6	0.005	mg/L	<0.005	----	----	----	----
EG035T: Total Recoverable Mercury by FIMS								
Mercury	7439-97-6	0.0001	mg/L	<0.0001	----	----	----	----
EP068A: Organochlorine Pesticides (OC)								
alpha-BHC	319-84-6	0.5	µg/L	<0.5	----	----	----	----
Hexachlorobenzene (HCB)	118-74-1	0.5	µg/L	<0.5	----	----	----	----
beta-BHC	319-85-7	0.5	µg/L	<0.5	----	----	----	----
gamma-BHC	58-89-9	0.5	µg/L	<0.5	----	----	----	----
delta-BHC	319-86-8	0.5	µg/L	<0.5	----	----	----	----
Heptachlor	76-44-8	0.5	µg/L	<0.5	----	----	----	----
Aldrin	309-00-2	0.5	µg/L	<0.5	----	----	----	----
Heptachlor epoxide	1024-57-3	0.5	µg/L	<0.5	----	----	----	----
trans-Chlordane	5103-74-2	0.5	µg/L	<0.5	----	----	----	----
alpha-Endosulfan	959-98-8	0.5	µg/L	<0.5	----	----	----	----
cis-Chlordane	5103-71-9	0.5	µg/L	<0.5	----	----	----	----
Dieldrin	60-57-1	0.5	µg/L	<0.5	----	----	----	----
4.4`-DDE	72-55-9	0.5	µg/L	<0.5	----	----	----	----
Endrin	72-20-8	0.5	µg/L	<0.5	----	----	----	----
beta-Endosulfan	33213-65-9	0.5	µg/L	<0.5	----	----	----	----
4.4`-DDD	72-54-8	0.5	µg/L	<0.5	----	----	----	----
Endrin aldehyde	7421-93-4	0.5	µg/L	<0.5	----	----	----	----
Endosulfan sulfate	1031-07-8	0.5	µg/L	<0.5	----	----	----	----
4.4`-DDT	50-29-3	2.0	µg/L	<2.0	----	----	----	----
Endrin ketone	53494-70-5	0.5	µg/L	<0.5	----	----	----	----
Methoxychlor	72-43-5	2.0	µg/L	<2.0	----	----	----	----
^ **Total Chlordane (sum)**	----	0.5	µg/L	<0.5	----	----	----	----
^ **Sum of DDD + DDE + DDT**	72-54-8/72-55-9/50-2	0.5	µg/L	<0.5	----	----	----	----
^ **Sum of Aldrin + Dieldrin**	309-00-2/60-57-1	0.5	µg/L	<0.5	----	----	----	----

Analytical Results

Sub-Matrix: **WATER** (Matrix: **WATER**)			*Sample ID*	**QC501_210908**	----	----	----	----
			Sampling date / time	08-Sep-2021 00:00	----	----	----	----
Compound	*CAS Number*	*LOR*	*Unit*	**ES2132601-013**	--------	--------	--------	--------
				Result	----	----	----	----
EP068A: Organochlorine Pesticides (OC) - Continued								
EP068B: Organophosphorus Pesticides (OP)								
Dichlorvos	62-73-7	0.5	µg/L	<0.5	----	----	----	----
Demeton-S-methyl	919-86-8	0.5	µg/L	<0.5	----	----	----	----
Monocrotophos	6923-22-4	2.0	µg/L	<2.0	----	----	----	----
Dimethoate	60-51-5	0.5	µg/L	<0.5	----	----	----	----
Diazinon	333-41-5	0.5	µg/L	<0.5	----	----	----	----
Chlorpyrifos-methyl	5598-13-0	0.5	µg/L	<0.5	----	----	----	----
Parathion-methyl	298-00-0	2.0	µg/L	<2.0	----	----	----	----
Malathion	121-75-5	0.5	µg/L	<0.5	----	----	----	----
Fenthion	55-38-9	0.5	µg/L	<0.5	----	----	----	----
Chlorpyrifos	2921-88-2	0.5	µg/L	<0.5	----	----	----	----
Parathion	56-38-2	2.0	µg/L	<2.0	----	----	----	----
Pirimphos-ethyl	23505-41-1	0.5	µg/L	<0.5	----	----	----	----
Chlorfenvinphos	470-90-6	0.5	µg/L	<0.5	----	----	----	----
Bromophos-ethyl	4824-78-6	0.5	µg/L	<0.5	----	----	----	----
Fenamiphos	22224-92-6	0.5	µg/L	<0.5	----	----	----	----
Prothiofos	34643-46-4	0.5	µg/L	<0.5	----	----	----	----
Ethion	563-12-2	0.5	µg/L	<0.5	----	----	----	----
Carbophenothion	786-19-6	0.5	µg/L	<0.5	----	----	----	----
Azinphos Methyl	86-50-0	0.5	µg/L	<0.5	----	----	----	----
EP075(SIM)B: Polynuclear Aromatic Hydrocarbons								
Naphthalene	91-20-3	1.0	µg/L	<1.0	----	----	----	----
Acenaphthylene	208-96-8	1.0	µg/L	<1.0	----	----	----	----
Acenaphthene	83-32-9	1.0	µg/L	<1.0	----	----	----	----
Fluorene	86-73-7	1.0	µg/L	<1.0	----	----	----	----
Phenanthrene	85-01-8	1.0	µg/L	<1.0	----	----	----	----
Anthracene	120-12-7	1.0	µg/L	<1.0	----	----	----	----
Fluoranthene	206-44-0	1.0	µg/L	<1.0	----	----	----	----
Pyrene	129-00-0	1.0	µg/L	<1.0	----	----	----	----
Benz(a)anthracene	56-55-3	1.0	µg/L	<1.0	----	----	----	----
Chrysene	218-01-9	1.0	µg/L	<1.0	----	----	----	----
Benzo(b+j)fluoranthene	205-99-2 205-82-3	1.0	µg/L	<1.0	----	----	----	----
Benzo(k)fluoranthene	207-08-9	1.0	µg/L	<1.0	----	----	----	----
Benzo(a)pyrene	50-32-8	0.5	µg/L	<0.5	----	----	----	----

Analytical Results

Sub-Matrix: **WATER** (Matrix: **WATER**)			*Sample ID*	**QC501_210908**	**----**	**----**	**----**	**----**
			Sampling date / time	08-Sep-2021 00:00	----	----	----	----
Compound	*CAS Number*	*LOR*	*Unit*	**ES2132601-013**	**--------**	**--------**	**--------**	**--------**
				Result	----	----	----	----
EP075(SIM)B: Polynuclear Aromatic Hydrocarbons - Continued								
Indeno(1.2.3.cd)pyrene	193-39-5	1.0	µg/L	<1.0	----	----	----	----
Dibenz(a.h)anthracene	53-70-3	1.0	µg/L	<1.0	----	----	----	----
Benzo(g.h.i)perylene	191-24-2	1.0	µg/L	<1.0	----	----	----	----
^ **Sum of polycyclic aromatic hydrocarbons**	----	0.5	µg/L	<0.5	----	----	----	----
^ **Benzo(a)pyrene TEQ (zero)**	----	0.5	µg/L	<0.5	----	----	----	----
EP080/071: Total Petroleum Hydrocarbons								
C6 - C9 Fraction	----	20	µg/L	<20	----	----	----	----
C10 - C14 Fraction	----	50	µg/L	<50	----	----	----	----
C15 - C28 Fraction	----	100	µg/L	<100	----	----	----	----
C29 - C36 Fraction	----	50	µg/L	<50	----	----	----	----
^ **C10 - C36 Fraction (sum)**	----	50	µg/L	<50	----	----	----	----
EP080/071: Total Recoverable Hydrocarbons - NEPM 2013 Fractions								
C6 - C10 Fraction	C6_C10	20	µg/L	<20	----	----	----	----
^ **C6 - C10 Fraction minus BTEX (F1)**	C6_C10-BTEX	20	µg/L	<20	----	----	----	----
>C10 - C16 Fraction	----	100	µg/L	<100	----	----	----	----
>C16 - C34 Fraction	----	100	µg/L	<100	----	----	----	----
>C34 - C40 Fraction	----	100	µg/L	<100	----	----	----	----
^ **>C10 - C40 Fraction (sum)**	----	100	µg/L	<100	----	----	----	----
^ **>C10 - C16 Fraction minus Naphthalene (F2)**	----	100	µg/L	<100	----	----	----	----
EP080: BTEXN								
Benzene	71-43-2	1	µg/L	<1	----	----	----	----
Toluene	108-88-3	2	µg/L	<2	----	----	----	----
Ethylbenzene	100-41-4	2	µg/L	<2	----	----	----	----
meta- & para-Xylene	108-38-3 106-42-3	2	µg/L	<2	----	----	----	----
ortho-Xylene	95-47-6	2	µg/L	<2	----	----	----	----
^ **Total Xylenes**	----	2	µg/L	<2	----	----	----	----
^ **Sum of BTEX**	----	1	µg/L	<1	----	----	----	----
Naphthalene	91-20-3	5	µg/L	<5	----	----	----	----
EP068S: Organochlorine Pesticide Surrogate								
Dibromo-DDE	21655-73-2	0.5	%	**107**	----	----	----	----
EP068T: Organophosphorus Pesticide Surrogate								
DEF	78-48-8	0.5	%	**87.1**	----	----	----	----

Analytical Results

Sub-Matrix: **WATER** (Matrix: **WATER**)			Sample ID	**QC501_210908**	**----**	**----**	**----**	**----**
			Sampling date / time	08-Sep-2021 00:00	----	----	----	----
Compound	CAS Number	LOR	Unit	**ES2132601-013**	--------	--------	--------	--------
				Result	----	----	----	----
EP075(SIM)S: Phenolic Compound Surrogates								
Phenol-d6	13127-88-3	1.0	%	**20.0**	----	----	----	----
2-Chlorophenol-D4	93951-73-6	1.0	%	**60.6**	----	----	----	----
2.4.6-Tribromophenol	118-79-6	1.0	%	**48.4**	----	----	----	----
EP075(SIM)T: PAH Surrogates								
2-Fluorobiphenyl	321-60-8	1.0	%	**55.7**	----	----	----	----
Anthracene-d10	1719-06-8	1.0	%	**89.9**	----	----	----	----
4-Terphenyl-d14	1718-51-0	1.0	%	**93.0**	----	----	----	----
EP080S: TPH(V)/BTEX Surrogates								
1.2-Dichloroethane-D4	17060-07-0	2	%	**97.8**	----	----	----	----
Toluene-D8	2037-26-5	2	%	**114**	----	----	----	----
4-Bromofluorobenzene	460-00-4	2	%	**103**	----	----	----	----

Analytical Results

Descriptive Results

Sub-Matrix: **SOIL**

Method: Compound	Sample ID - Sampling date / time	Analytical Results
EA200: AS 4964 - 2004 Identification of Asbestos in Soils		
EA200: Description	SS13_0.05 - 06-Sep-2021 00:00	Soil sample.
EA200: Description	QC101_210906 - 06-Sep-2021 00:00	Soil sample.
EA200: Description	BH07_0.05 - 07-Sep-2021 00:00	Soil sample.
EA200: Description	BH07_0.5 - 07-Sep-2021 00:00	Soil sample.
EA200: Description	SS24_0.05 - 07-Sep-2021 00:00	Soil sample.
EA200: Description	SS24_0.10 - 07-Sep-2021 00:00	Soil sample.
EA200: Description	SS26_0.05 - 07-Sep-2021 00:00	Soil sample.
EA200: Description	BH15_0.05 - 08-Sep-2021 00:00	Soil sample.

Surrogate Control Limits

Sub-Matrix: **SOIL**

Compound	CAS Number	Recovery Limits (%) Low	Recovery Limits (%) High
EP068S: Organochlorine Pesticide Surrogate			
Dibromo-DDE	21655-73-2	49	147
EP068T: Organophosphorus Pesticide Surrogate			
DEF	78-48-8	35	143
EP075(SIM)S: Phenolic Compound Surrogates			
Phenol-d6	13127-88-3	63	123
2-Chlorophenol-D4	93951-73-6	66	122
2.4.6-Tribromophenol	118-79-6	40	138
EP075(SIM)T: PAH Surrogates			
2-Fluorobiphenyl	321-60-8	70	122
Anthracene-d10	1719-06-8	66	128
4-Terphenyl-d14	1718-51-0	65	129
EP080S: TPH(V)/BTEX Surrogates			
1.2-Dichloroethane-D4	17060-07-0	73	133
Toluene-D8	2037-26-5	74	132
4-Bromofluorobenzene	460-00-4	72	130

Sub-Matrix: **WATER**

Compound	CAS Number	Recovery Limits (%) Low	Recovery Limits (%) High
EP068S: Organochlorine Pesticide Surrogate			
Dibromo-DDE	21655-73-2	67	111
EP068T: Organophosphorus Pesticide Surrogate			
DEF	78-48-8	67	111
EP075(SIM)S: Phenolic Compound Surrogates			
Phenol-d6	13127-88-3	10	44
2-Chlorophenol-D4	93951-73-6	14	94
2.4.6-Tribromophenol	118-79-6	17	125
EP075(SIM)T: PAH Surrogates			
2-Fluorobiphenyl	321-60-8	20	104
Anthracene-d10	1719-06-8	27	113
4-Terphenyl-d14	1718-51-0	32	112
EP080S: TPH(V)/BTEX Surrogates			
1.2-Dichloroethane-D4	17060-07-0	71	137
Toluene-D8	2037-26-5	79	131
4-Bromofluorobenzene	460-00-4	70	128

Inter-Laboratory Testing

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

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

CERTIFICATE OF ANALYSIS

Batch No:	**21-44346**	*Page*	Page 1 of 2
Final Report	916066	*Laboratory*	Scoresby Laboratory
		Address	Caribbean Business Park, 22 Dalmore Drive, Scoresby, VIC 3179
		Phone	03 8756 8000
Client:	**Australian Laboratory Services Pty Ltd**	*Fax*	03 9763 1862
Contact:	**Brenda Hong**	Contact:	Ximena Iglesias Client Manager Ximena.Iglesias@alsglobal.com
Address:	277-284 Woodpark Road SMITHFIELD NSW 2164 AUSTRALIA		
Client Program Ref:	**ES2132601**	Date Sampled:	06-Sep-2021 - 08-Sep-2021
ALS Program Ref:	**ALSNSW**	Date Samples Received:	13-Sep-2021
PO No:	**411505**	*Date Issued:*	**15-Sep-2021**

The hash (#) below indicates methods not covered by NATA accreditation in the performance of this service .

Analysis	*Method*	*Laboratory*	*Analysis*	*Method*	*Laboratory*	*Analysis*	*Method*	*Laboratory*
E.coli & TC MPN	# MM868	Scoresby						

Analysis conducted outside holding time due to late arrival or delayed extraction/analysis. Based on APHA, VICEPA, AS & NEPM

Late Sample Arrival - E.coli & TC MPN[7155048,7155049,7155050,7155051,7155052,7155053]

Signatories

Legionella species refers to Legionella species other than Legionella pneumophila

Measurement Uncertainties values for your compliance results are available at this link

Name	*Title*	*Name*	*Title*
Tanya Dukhno	**Analyst**		

Batch No: **21-44346**

Report Number: **916066**

Client: **Australian Laboratory Services Pty Ltd**

Client Program Ref: **ES2132601**

LOR = Limit of reporting. When a reported LOR is higher than the standard LOR, this may be due to high moisture content, insufficient sample or matrix interference.
CAS Number = Chemistry Abstract Services Number. The analytical procedures in this report (including in house methods) are developed from internationally recognised procedures such as those published by USEPA, APHA and NEPM.

				Sample No.	7155048	7155049	7155050	7155051	7155052	7155053
				Client Sample ID	ES2132601-001	ES2132601-002	ES2132604-003	ES2132604-004	ES2132601-009	ES2132601-011
				Sample Date	06/09/21	06/09/21	06/09/21	07/09/21	08/09/21	08/09/21
				Sample Type	SOIL	SOIL	SOIL	SOIL	SOIL	SOIL
Analysis	**Analyte**	**CAS #**	**LOR**							
E.coli & TC MPN	Total Coliforms MPN	Coliform	<10	MPN/g dry wt	2900	7200	1800	<12	>34000	<11
E.coli & TC MPN	E.coli MPN	E.Coli	<10	MPN/g dry wt	<12	<12	<11	<12	<14	<11

Samples not collected by ALS and are tested as received.

Samples are tested within holding time unless otherwise

A blank space indicates no test performed. Soil microbiological testing was commenced within 4 days from the day collected unless otherwise stated.
Water microbiological testing was commenced on the day received and within 24 hours of sampling unless otherwise stated.
MM524: Plate count results <10 per mL and >300 per mL are deemed as approximate.
MM526: Plate count results <2,500 per mL and >250,000 per mL are deemed as approximate.
Calculated results are based on raw data.

ALS Environmental

QUALITY CONTROL REPORT

Work Order : **ES2132601**

Client : **Jacobs Arcadis Joint Venture**
Contact : Amanda Mullen
Address : Level 16 580 George Street
Sydney 2000
Telephone : ----
Project : IA254001
Order number : ----
C-O-C number : ----
Sampler : ----
Site : ----
Quote number : EN/222
No. of samples received : 14
No. of samples analysed : 11

Page : 1 of 13

Laboratory : Environmental Division Sydney
Contact : Customer Services ES
Address : 277-289 Woodpark Road Smithfield NSW Australia 2164
Telephone : +61-2-8784 8555
Date Samples Received : 08-Sep-2021
Date Analysis Commenced : 09-Sep-2021
Issue Date : 24-Sep-2021

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

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

This Quality Control Report contains the following information:

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

Signatories

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

Signatories	*Position*	*Accreditation Category*
Alana Smylie	Asbestos Identifier	Newcastle - Asbestos, Mayfield West, NSW
Edwandy Fadjar	Organic Coordinator	Sydney Inorganics, Smithfield, NSW
Edwandy Fadjar	Organic Coordinator	Sydney Organics, Smithfield, NSW
Ivan Taylor	Analyst	Sydney Inorganics, Smithfield, NSW
Uma Nagendiram	Subcontracting Coordinator	WRG Subcontracting, Smithfield, NSW

General Comments

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

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

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

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

Laboratory Duplicate (DUP) Report

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

Sub-Matrix: **SOIL**

				Laboratory Duplicate (DUP) Report					
Laboratory sample ID	*Sample ID*	*Method: Compound*	*CAS Number*	*LOR*	*Unit*	*Original Result*	*Duplicate Result*	*RPD (%)*	*Acceptable RPD (%)*
EG005(ED093)T: Total Metals by ICP-AES (QC Lot: 3897286)									
ES2132601-001	SS13_0.05	EG005T: Cadmium	7440-43-9	1	mg/kg	<1	<1	0.0	No Limit
		EG005T: Chromium	7440-47-3	2	mg/kg	4	6	38.0	No Limit
		EG005T: Nickel	7440-02-0	2	mg/kg	<2	<2	0.0	No Limit
		EG005T: Arsenic	7440-38-2	5	mg/kg	<5	<5	0.0	No Limit
		EG005T: Copper	7440-50-8	5	mg/kg	<5	<5	0.0	No Limit
		EG005T: Lead	7439-92-1	5	mg/kg	5	5	0.0	No Limit
		EG005T: Zinc	7440-66-6	5	mg/kg	<5	<5	0.0	No Limit
ES2132641-003	Anonymous	EG005T: Cadmium	7440-43-9	1	mg/kg	<1	<1	0.0	No Limit
		EG005T: Chromium	7440-47-3	2	mg/kg	4	9	84.4	No Limit
		EG005T: Nickel	7440-02-0	2	mg/kg	2	9	113	No Limit
		EG005T: Arsenic	7440-38-2	5	mg/kg	<5	<5	0.0	No Limit
		EG005T: Copper	7440-50-8	5	mg/kg	70	72	2.9	0% - 50%
		EG005T: Lead	7439-92-1	5	mg/kg	39	55	34.5	0% - 50%
		EG005T: Zinc	7440-66-6	5	mg/kg	68	82	18.6	0% - 50%
EA055: Moisture Content (Dried @ 105-110°C) (QC Lot: 3897289)									
ES2132601-003	BH07_0.05	EA055: Moisture Content	----	0.1	%	9.9	10.3	4.0	0% - 50%
ES2132641-012	Anonymous	EA055: Moisture Content	----	0.1	%	1.6	1.5	0.0	No Limit
EG035T: Total Recoverable Mercury by FIMS (QC Lot: 3897285)									
ES2132601-001	SS13_0.05	EG035T: Mercury	7439-97-6	0.1	mg/kg	<0.1	<0.1	0.0	No Limit
ES2132641-003	Anonymous	EG035T: Mercury	7439-97-6	0.1	mg/kg	<0.1	<0.1	0.0	No Limit
EP068A: Organochlorine Pesticides (OC) (QC Lot: 3892436)									
ES2132601-001	SS13_0.05	EP068: alpha-BHC	319-84-6	0.05	mg/kg	<0.05	<0.05	0.0	No Limit
		EP068: Hexachlorobenzene (HCB)	118-74-1	0.05	mg/kg	<0.05	<0.05	0.0	No Limit

Sub-Matrix: **SOIL**

				Laboratory Duplicate (DUP) Report					
Laboratory sample ID	*Sample ID*	*Method: Compound*	*CAS Number*	*LOR*	*Unit*	*Original Result*	*Duplicate Result*	*RPD (%)*	*Acceptable RPD (%)*
EP068A: Organochlorine Pesticides (OC) (QC Lot: 3892436) - continued									
ES2132601-001	SS13_0.05	EP068: beta-BHC	319-85-7	0.05	mg/kg	<0.05	<0.05	0.0	No Limit
		EP068: gamma-BHC	58-89-9	0.05	mg/kg	<0.05	<0.05	0.0	No Limit
		EP068: delta-BHC	319-86-8	0.05	mg/kg	<0.05	<0.05	0.0	No Limit
		EP068: Heptachlor	76-44-8	0.05	mg/kg	<0.05	<0.05	0.0	No Limit
		EP068: Aldrin	309-00-2	0.05	mg/kg	<0.05	<0.05	0.0	No Limit
		EP068: Heptachlor epoxide	1024-57-3	0.05	mg/kg	<0.05	<0.05	0.0	No Limit
		EP068: trans-Chlordane	5103-74-2	0.05	mg/kg	<0.05	<0.05	0.0	No Limit
		EP068: alpha-Endosulfan	959-98-8	0.05	mg/kg	<0.05	<0.05	0.0	No Limit
		EP068: cis-Chlordane	5103-71-9	0.05	mg/kg	<0.05	<0.05	0.0	No Limit
		EP068: Dieldrin	60-57-1	0.05	mg/kg	<0.05	<0.05	0.0	No Limit
		EP068: 4.4`-DDE	72-55-9	0.05	mg/kg	<0.05	<0.05	0.0	No Limit
		EP068: Endrin	72-20-8	0.05	mg/kg	<0.05	<0.05	0.0	No Limit
		EP068: beta-Endosulfan	33213-65-9	0.05	mg/kg	<0.05	<0.05	0.0	No Limit
		EP068: 4.4`-DDD	72-54-8	0.05	mg/kg	<0.05	<0.05	0.0	No Limit
		EP068: Endrin aldehyde	7421-93-4	0.05	mg/kg	<0.05	<0.05	0.0	No Limit
		EP068: Endosulfan sulfate	1031-07-8	0.05	mg/kg	<0.05	<0.05	0.0	No Limit
		EP068: Endrin ketone	53494-70-5	0.05	mg/kg	<0.05	<0.05	0.0	No Limit
		EP068: 4.4`-DDT	50-29-3	0.2	mg/kg	<0.2	<0.2	0.0	No Limit
		EP068: Methoxychlor	72-43-5	0.2	mg/kg	<0.2	<0.2	0.0	No Limit
EP068B: Organophosphorus Pesticides (OP) (QC Lot: 3892436)									
ES2132601-001	SS13_0.05	EP068: Dichlorvos	62-73-7	0.05	mg/kg	<0.05	<0.05	0.0	No Limit
		EP068: Demeton-S-methyl	919-86-8	0.05	mg/kg	<0.05	<0.05	0.0	No Limit
		EP068: Dimethoate	60-51-5	0.05	mg/kg	<0.05	<0.05	0.0	No Limit
		EP068: Diazinon	333-41-5	0.05	mg/kg	<0.05	<0.05	0.0	No Limit
		EP068: Chlorpyrifos-methyl	5598-13-0	0.05	mg/kg	<0.05	<0.05	0.0	No Limit
		EP068: Malathion	121-75-5	0.05	mg/kg	<0.05	<0.05	0.0	No Limit
		EP068: Fenthion	55-38-9	0.05	mg/kg	<0.05	<0.05	0.0	No Limit
		EP068: Chlorpyrifos	2921-88-2	0.05	mg/kg	<0.05	<0.05	0.0	No Limit
		EP068: Pirimphos-ethyl	23505-41-1	0.05	mg/kg	<0.05	<0.05	0.0	No Limit
		EP068: Chlorfenvinphos	470-90-6	0.05	mg/kg	<0.05	<0.05	0.0	No Limit
		EP068: Bromophos-ethyl	4824-78-6	0.05	mg/kg	<0.05	<0.05	0.0	No Limit
		EP068: Fenamiphos	22224-92-6	0.05	mg/kg	<0.05	<0.05	0.0	No Limit
		EP068: Prothiofos	34643-46-4	0.05	mg/kg	<0.05	<0.05	0.0	No Limit
		EP068: Ethion	563-12-2	0.05	mg/kg	<0.05	<0.05	0.0	No Limit
		EP068: Carbophenothion	786-19-6	0.05	mg/kg	<0.05	<0.05	0.0	No Limit
		EP068: Azinphos Methyl	86-50-0	0.05	mg/kg	<0.05	<0.05	0.0	No Limit
		EP068: Monocrotophos	6923-22-4	0.2	mg/kg	<0.2	<0.2	0.0	No Limit
		EP068: Parathion-methyl	298-00-0	0.2	mg/kg	<0.2	<0.2	0.0	No Limit
		EP068: Parathion	56-38-2	0.2	mg/kg	<0.2	<0.2	0.0	No Limit
EP075(SIM)B: Polynuclear Aromatic Hydrocarbons (QC Lot: 3892435)									

Sub-Matrix: **SOIL**

				Laboratory Duplicate (DUP) Report					
Laboratory sample ID	*Sample ID*	*Method: Compound*	*CAS Number*	*LOR*	*Unit*	*Original Result*	*Duplicate Result*	*RPD (%)*	*Acceptable RPD (%)*
EP075(SIM)B: Polynuclear Aromatic Hydrocarbons (QC Lot: 3892435) - continued									
ES2132601-001	SS13_0.05	EP075(SIM): Naphthalene	91-20-3	0.5	mg/kg	<0.5	<0.5	0.0	No Limit
		EP075(SIM): Acenaphthylene	208-96-8	0.5	mg/kg	<0.5	<0.5	0.0	No Limit
		EP075(SIM): Acenaphthene	83-32-9	0.5	mg/kg	<0.5	<0.5	0.0	No Limit
		EP075(SIM): Fluorene	86-73-7	0.5	mg/kg	<0.5	<0.5	0.0	No Limit
		EP075(SIM): Phenanthrene	85-01-8	0.5	mg/kg	<0.5	<0.5	0.0	No Limit
		EP075(SIM): Anthracene	120-12-7	0.5	mg/kg	<0.5	<0.5	0.0	No Limit
		EP075(SIM): Fluoranthene	206-44-0	0.5	mg/kg	<0.5	<0.5	0.0	No Limit
		EP075(SIM): Pyrene	129-00-0	0.5	mg/kg	<0.5	<0.5	0.0	No Limit
		EP075(SIM): Benz(a)anthracene	56-55-3	0.5	mg/kg	<0.5	<0.5	0.0	No Limit
		EP075(SIM): Chrysene	218-01-9	0.5	mg/kg	<0.5	<0.5	0.0	No Limit
		EP075(SIM): Benzo(b+j)fluoranthene	205-99-2 205-82-3	0.5	mg/kg	<0.5	<0.5	0.0	No Limit
		EP075(SIM): Benzo(k)fluoranthene	207-08-9	0.5	mg/kg	<0.5	<0.5	0.0	No Limit
		EP075(SIM): Benzo(a)pyrene	50-32-8	0.5	mg/kg	<0.5	<0.5	0.0	No Limit
		EP075(SIM): Indeno(1.2.3.cd)pyrene	193-39-5	0.5	mg/kg	<0.5	<0.5	0.0	No Limit
		EP075(SIM): Dibenz(a.h)anthracene	53-70-3	0.5	mg/kg	<0.5	<0.5	0.0	No Limit
		EP075(SIM): Benzo(g.h.i)perylene	191-24-2	0.5	mg/kg	<0.5	<0.5	0.0	No Limit
		EP075(SIM): Sum of polycyclic aromatic hydrocarbons	----	0.5	mg/kg	<0.5	<0.5	0.0	No Limit
		EP075(SIM): Benzo(a)pyrene TEQ (zero)	----	0.5	mg/kg	<0.5	<0.5	0.0	No Limit
EP080/071: Total Petroleum Hydrocarbons (QC Lot: 3892434)									
ES2132601-001	SS13_0.05	EP071: C15 - C28 Fraction	----	100	mg/kg	<100	<100	0.0	No Limit
		EP071: C29 - C36 Fraction	----	100	mg/kg	<100	<100	0.0	No Limit
		EP071: C10 - C14 Fraction	----	50	mg/kg	<50	<50	0.0	No Limit
EP080/071: Total Petroleum Hydrocarbons (QC Lot: 3894958)									
ES2132601-001	SS13_0.05	EP080: C6 - C9 Fraction	----	10	mg/kg	<10	<10	0.0	No Limit
ES2132723-001	Anonymous	EP080: C6 - C9 Fraction	----	10	mg/kg	<10	<10	0.0	No Limit
EP080/071: Total Recoverable Hydrocarbons - NEPM 2013 Fractions (QC Lot: 3892434)									
ES2132601-001	SS13_0.05	EP071: >C16 - C34 Fraction	----	100	mg/kg	<100	<100	0.0	No Limit
		EP071: >C34 - C40 Fraction	----	100	mg/kg	<100	<100	0.0	No Limit
		EP071: >C10 - C16 Fraction	----	50	mg/kg	<50	<50	0.0	No Limit
EP080/071: Total Recoverable Hydrocarbons - NEPM 2013 Fractions (QC Lot: 3894958)									
ES2132601-001	SS13_0.05	EP080: C6 - C10 Fraction	C6_C10	10	mg/kg	<10	<10	0.0	No Limit
ES2132723-001	Anonymous	EP080: C6 - C10 Fraction	C6_C10	10	mg/kg	<10	<10	0.0	No Limit
EP080: BTEXN (QC Lot: 3894958)									
ES2132601-001	SS13_0.05	EP080: Benzene	71-43-2	0.2	mg/kg	<0.2	<0.2	0.0	No Limit
		EP080: Toluene	108-88-3	0.5	mg/kg	<0.5	<0.5	0.0	No Limit
		EP080: Ethylbenzene	100-41-4	0.5	mg/kg	<0.5	<0.5	0.0	No Limit

Sub-Matrix: **SOIL**

				Laboratory Duplicate (DUP) Report					
Laboratory sample ID	*Sample ID*	*Method: Compound*	*CAS Number*	*LOR*	*Unit*	*Original Result*	*Duplicate Result*	*RPD (%)*	*Acceptable RPD (%)*
EP080: BTEXN (QC Lot: 3894958) - continued									
ES2132601-001	SS13_0.05	EP080: meta- & para-Xylene	108-38-3 106-42-3	0.5	mg/kg	<0.5	<0.5	0.0	No Limit
		EP080: ortho-Xylene	95-47-6	0.5	mg/kg	<0.5	<0.5	0.0	No Limit
		EP080: Naphthalene	91-20-3	1	mg/kg	<1	<1	0.0	No Limit
ES2132723-001	Anonymous	EP080: Benzene	71-43-2	0.2	mg/kg	<0.2	<0.2	0.0	No Limit
		EP080: Toluene	108-88-3	0.5	mg/kg	<0.5	<0.5	0.0	No Limit
		EP080: Ethylbenzene	100-41-4	0.5	mg/kg	<0.5	<0.5	0.0	No Limit
		EP080: meta- & para-Xylene	108-38-3 106-42-3	0.5	mg/kg	<0.5	<0.5	0.0	No Limit
		EP080: ortho-Xylene	95-47-6	0.5	mg/kg	<0.5	<0.5	0.0	No Limit
		EP080: Naphthalene	91-20-3	1	mg/kg	<1	<1	0.0	No Limit

Sub-Matrix: **WATER**

				Laboratory Duplicate (DUP) Report					
Laboratory sample ID	*Sample ID*	*Method: Compound*	*CAS Number*	*LOR*	*Unit*	*Original Result*	*Duplicate Result*	*RPD (%)*	*Acceptable RPD (%)*
EG020T: Total Metals by ICP-MS (QC Lot: 3899943)									
ES2132918-002	Anonymous	EG020A-T: Cadmium	7440-43-9	0.0001	mg/L	<0.0001	<0.0001	0.0	No Limit
		EG020A-T: Arsenic	7440-38-2	0.001	mg/L	<0.001	<0.001	0.0	No Limit
		EG020A-T: Chromium	7440-47-3	0.001	mg/L	<0.001	<0.001	0.0	No Limit
		EG020A-T: Copper	7440-50-8	0.001	mg/L	0.004	0.004	0.0	No Limit
		EG020A-T: Lead	7439-92-1	0.001	mg/L	<0.001	<0.001	0.0	No Limit
		EG020A-T: Nickel	7440-02-0	0.001	mg/L	<0.001	<0.001	0.0	No Limit
		EG020A-T: Zinc	7440-66-6	0.005	mg/L	0.011	0.012	9.9	No Limit
ES2132664-002	Anonymous	EG020A-T: Cadmium	7440-43-9	0.0001	mg/L	<0.0001	<0.0001	0.0	No Limit
		EG020A-T: Arsenic	7440-38-2	0.001	mg/L	0.004	0.004	0.0	No Limit
		EG020A-T: Chromium	7440-47-3	0.001	mg/L	0.035	0.034	0.0	0% - 20%
		EG020A-T: Copper	7440-50-8	0.001	mg/L	0.012	0.013	0.0	0% - 50%
		EG020A-T: Lead	7439-92-1	0.001	mg/L	0.004	0.004	0.0	No Limit
		EG020A-T: Nickel	7440-02-0	0.001	mg/L	0.032	0.032	0.0	0% - 20%
		EG020A-T: Zinc	7440-66-6	0.005	mg/L	0.031	0.030	0.0	No Limit
EG035T: Total Recoverable Mercury by FIMS (QC Lot: 3899878)									
ES2132601-013	QC501_210908	EG035T: Mercury	7439-97-6	0.0001	mg/L	<0.0001	<0.0001	0.0	No Limit
EP080/071: Total Petroleum Hydrocarbons (QC Lot: 3899061)									
ES2132818-001	Anonymous	EP080: C6 - C9 Fraction	----	20	µg/L	<20	<20	0.0	No Limit
ES2132903-001	Anonymous	EP080: C6 - C9 Fraction	----	20	µg/L	80	70	0.0	No Limit
EP080/071: Total Recoverable Hydrocarbons - NEPM 2013 Fractions (QC Lot: 3899061)									
ES2132818-001	Anonymous	EP080: C6 - C10 Fraction	C6_C10	20	µg/L	<20	<20	0.0	No Limit
ES2132903-001	Anonymous	EP080: C6 - C10 Fraction	C6_C10	20	µg/L	80	70	0.0	No Limit
EP080: BTEXN (QC Lot: 3899061)									
ES2132818-001	Anonymous	EP080: Benzene	71-43-2	1	µg/L	<1	<1	0.0	No Limit
		EP080: Toluene	108-88-3	2	µg/L	<2	<2	0.0	No Limit

Sub-Matrix: **WATER**

Laboratory sample ID	Sample ID	Method: Compound	CAS Number	Laboratory Duplicate (DUP) Report					
				LOR	Unit	Original Result	Duplicate Result	RPD (%)	Acceptable RPD (%)
EP080: BTEXN (QC Lot: 3899061) - continued									
ES2132818-001	Anonymous	EP080: Ethylbenzene	100-41-4	2	µg/L	<2	<2	0.0	No Limit
		EP080: meta- & para-Xylene	108-38-3 106-42-3	2	µg/L	<2	<2	0.0	No Limit
		EP080: ortho-Xylene	95-47-6	2	µg/L	<2	<2	0.0	No Limit
		EP080: Naphthalene	91-20-3	5	µg/L	<5	<5	0.0	No Limit
ES2132903-001	Anonymous	EP080: Benzene	71-43-2	1	µg/L	4	3	0.0	No Limit
		EP080: Toluene	108-88-3	2	µg/L	<2	<2	0.0	No Limit
		EP080: Ethylbenzene	100-41-4	2	µg/L	43	39	10.7	0% - 20%
		EP080: meta- & para-Xylene	108-38-3 106-42-3	2	µg/L	<2	<2	0.0	No Limit
		EP080: ortho-Xylene	95-47-6	2	µg/L	<2	<2	0.0	No Limit
		EP080: Naphthalene	91-20-3	5	µg/L	<5	<5	0.0	No Limit

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

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

Sub-Matrix: **SOIL**

				Method Blank (MB) Report	Laboratory Control Spike (LCS) Report			
					Spike	Spike Recovery (%)	Acceptable Limits (%)	
Method: Compound	*CAS Number*	*LOR*	*Unit*	*Result*	*Concentration*	*LCS*	*Low*	*High*
EG005(ED093)T: Total Metals by ICP-AES (QCLot: 3897286)								
EG005T: Arsenic	7440-38-2	5	mg/kg	<5	121.1 mg/kg	103	88.0	113
EG005T: Cadmium	7440-43-9	1	mg/kg	<1	0.74 mg/kg	83.7	70.0	130
EG005T: Chromium	7440-47-3	2	mg/kg	<2	19.6 mg/kg	112	68.0	132
EG005T: Copper	7440-50-8	5	mg/kg	<5	52.9 mg/kg	106	89.0	111
EG005T: Lead	7439-92-1	5	mg/kg	<5	60.8 mg/kg	96.5	82.0	119
EG005T: Nickel	7440-02-0	2	mg/kg	<2	15.3 mg/kg	98.8	80.0	120
EG005T: Zinc	7440-66-6	5	mg/kg	<5	139.3 mg/kg	86.1	66.0	133
EG035T: Total Recoverable Mercury by FIMS (QCLot: 3897285)								
EG035T: Mercury	7439-97-6	0.1	mg/kg	<0.1	0.087 mg/kg	97.1	70.0	125
EP068A: Organochlorine Pesticides (OC) (QCLot: 3892436)								
EP068: alpha-BHC	319-84-6	0.05	mg/kg	<0.05	0.5 mg/kg	89.8	69.0	113
EP068: Hexachlorobenzene (HCB)	118-74-1	0.05	mg/kg	<0.05	0.5 mg/kg	90.4	65.0	117
EP068: beta-BHC	319-85-7	0.05	mg/kg	<0.05	0.5 mg/kg	91.5	67.0	119
EP068: gamma-BHC	58-89-9	0.05	mg/kg	<0.05	0.5 mg/kg	91.2	68.0	116
EP068: delta-BHC	319-86-8	0.05	mg/kg	<0.05	0.5 mg/kg	92.2	65.0	117
EP068: Heptachlor	76-44-8	0.05	mg/kg	<0.05	0.5 mg/kg	92.2	67.0	115
EP068: Aldrin	309-00-2	0.05	mg/kg	<0.05	0.5 mg/kg	91.9	69.0	115
EP068: Heptachlor epoxide	1024-57-3	0.05	mg/kg	<0.05	0.5 mg/kg	88.1	62.0	118
EP068: trans-Chlordane	5103-74-2	0.05	mg/kg	<0.05	0.5 mg/kg	92.5	63.0	117
EP068: alpha-Endosulfan	959-98-8	0.05	mg/kg	<0.05	0.5 mg/kg	94.8	66.0	116
EP068: cis-Chlordane	5103-71-9	0.05	mg/kg	<0.05	0.5 mg/kg	92.3	64.0	116
EP068: Dieldrin	60-57-1	0.05	mg/kg	<0.05	0.5 mg/kg	93.8	66.0	116
EP068: 4.4`-DDE	72-55-9	0.05	mg/kg	<0.05	0.5 mg/kg	91.5	67.0	115
EP068: Endrin	72-20-8	0.05	mg/kg	<0.05	0.5 mg/kg	103	67.0	123
EP068: beta-Endosulfan	33213-65-9	0.05	mg/kg	<0.05	0.5 mg/kg	88.9	69.0	115
EP068: 4.4`-DDD	72-54-8	0.05	mg/kg	<0.05	0.5 mg/kg	95.2	69.0	121
EP068: Endrin aldehyde	7421-93-4	0.05	mg/kg	<0.05	0.5 mg/kg	87.3	56.0	120
EP068: Endosulfan sulfate	1031-07-8	0.05	mg/kg	<0.05	0.5 mg/kg	89.6	62.0	124
EP068: 4.4`-DDT	50-29-3	0.2	mg/kg	<0.2	0.5 mg/kg	88.6	66.0	120
EP068: Endrin ketone	53494-70-5	0.05	mg/kg	<0.05	0.5 mg/kg	91.2	64.0	122
EP068: Methoxychlor	72-43-5	0.2	mg/kg	<0.2	0.5 mg/kg	100.0	54.0	130
EP068B: Organophosphorus Pesticides (OP) (QCLot: 3892436)								
EP068: Dichlorvos	62-73-7	0.05	mg/kg	<0.05	0.5 mg/kg	107	59.0	119
EP068: Demeton-S-methyl	919-86-8	0.05	mg/kg	<0.05	0.5 mg/kg	89.3	62.0	128

Sub-Matrix: **SOIL**

				Method Blank (MB) Report	Laboratory Control Spike (LCS) Report			
					Spike	Spike Recovery (%)	Acceptable Limits (%)	
Method: Compound	CAS Number	LOR	Unit	Result	Concentration	LCS	Low	High
EP068B: Organophosphorus Pesticides (OP) (QCLot: 3892436) - continued								
EP068: Monocrotophos	6923-22-4	0.2	mg/kg	<0.2	0.5 mg/kg	75.7	54.0	126
EP068: Dimethoate	60-51-5	0.05	mg/kg	<0.05	0.5 mg/kg	91.0	67.0	119
EP068: Diazinon	333-41-5	0.05	mg/kg	<0.05	0.5 mg/kg	91.7	70.0	120
EP068: Chlorpyrifos-methyl	5598-13-0	0.05	mg/kg	<0.05	0.5 mg/kg	91.5	72.0	120
EP068: Parathion-methyl	298-00-0	0.2	mg/kg	<0.2	0.5 mg/kg	92.9	68.0	120
EP068: Malathion	121-75-5	0.05	mg/kg	<0.05	0.5 mg/kg	76.6	68.0	122
EP068: Fenthion	55-38-9	0.05	mg/kg	<0.05	0.5 mg/kg	92.7	69.0	117
EP068: Chlorpyrifos	2921-88-2	0.05	mg/kg	<0.05	0.5 mg/kg	91.3	76.0	118
EP068: Parathion	56-38-2	0.2	mg/kg	<0.2	0.5 mg/kg	93.8	64.0	122
EP068: Pirimphos-ethyl	23505-41-1	0.05	mg/kg	<0.05	0.5 mg/kg	95.8	70.0	116
EP068: Chlorfenvinphos	470-90-6	0.05	mg/kg	<0.05	0.5 mg/kg	102	69.0	121
EP068: Bromophos-ethyl	4824-78-6	0.05	mg/kg	<0.05	0.5 mg/kg	90.9	66.0	118
EP068: Fenamiphos	22224-92-6	0.05	mg/kg	<0.05	0.5 mg/kg	81.7	68.0	124
EP068: Prothiofos	34643-46-4	0.05	mg/kg	<0.05	0.5 mg/kg	91.6	62.0	112
EP068: Ethion	563-12-2	0.05	mg/kg	<0.05	0.5 mg/kg	105	68.0	120
EP068: Carbophenothion	786-19-6	0.05	mg/kg	<0.05	0.5 mg/kg	101	65.0	127
EP068: Azinphos Methyl	86-50-0	0.05	mg/kg	<0.05	0.5 mg/kg	83.3	41.0	123
EP075(SIM)B: Polynuclear Aromatic Hydrocarbons (QCLot: 3892435)								
EP075(SIM): Naphthalene	91-20-3	0.5	mg/kg	<0.5	6 mg/kg	93.0	77.0	125
EP075(SIM): Acenaphthylene	208-96-8	0.5	mg/kg	<0.5	6 mg/kg	99.7	72.0	124
EP075(SIM): Acenaphthene	83-32-9	0.5	mg/kg	<0.5	6 mg/kg	101	73.0	127
EP075(SIM): Fluorene	86-73-7	0.5	mg/kg	<0.5	6 mg/kg	103	72.0	126
EP075(SIM): Phenanthrene	85-01-8	0.5	mg/kg	<0.5	6 mg/kg	105	75.0	127
EP075(SIM): Anthracene	120-12-7	0.5	mg/kg	<0.5	6 mg/kg	107	77.0	127
EP075(SIM): Fluoranthene	206-44-0	0.5	mg/kg	<0.5	6 mg/kg	106	73.0	127
EP075(SIM): Pyrene	129-00-0	0.5	mg/kg	<0.5	6 mg/kg	99.2	74.0	128
EP075(SIM): Benz(a)anthracene	56-55-3	0.5	mg/kg	<0.5	6 mg/kg	95.3	69.0	123
EP075(SIM): Chrysene	218-01-9	0.5	mg/kg	<0.5	6 mg/kg	100	75.0	127
EP075(SIM): Benzo(b+j)fluoranthene	205-99-2 205-82-3	0.5	mg/kg	<0.5	6 mg/kg	91.6	68.0	116
EP075(SIM): Benzo(k)fluoranthene	207-08-9	0.5	mg/kg	<0.5	6 mg/kg	106	74.0	126
EP075(SIM): Benzo(a)pyrene	50-32-8	0.5	mg/kg	<0.5	6 mg/kg	97.3	70.0	126
EP075(SIM): Indeno(1.2.3.cd)pyrene	193-39-5	0.5	mg/kg	<0.5	6 mg/kg	97.0	61.0	121
EP075(SIM): Dibenz(a.h)anthracene	53-70-3	0.5	mg/kg	<0.5	6 mg/kg	96.9	62.0	118
EP075(SIM): Benzo(g.h.i)perylene	191-24-2	0.5	mg/kg	<0.5	6 mg/kg	97.7	63.0	121
EP080/071: Total Petroleum Hydrocarbons (QCLot: 3892434)								
EP071: C10 - C14 Fraction	----	50	mg/kg	<50	300 mg/kg	101	75.0	129
EP071: C15 - C28 Fraction	----	100	mg/kg	<100	450 mg/kg	102	77.0	131
EP071: C29 - C36 Fraction	----	100	mg/kg	<100	300 mg/kg	106	71.0	129

Sub-Matrix: **SOIL**

				Method Blank (MB) Report	*Laboratory Control Spike (LCS) Report*			
					Spike	*Spike Recovery (%)*	*Acceptable Limits (%)*	
Method: Compound	*CAS Number*	*LOR*	*Unit*	*Result*	*Concentration*	*LCS*	*Low*	*High*
EP080/071: Total Petroleum Hydrocarbons (QCLot: 3894958)								
EP080: C6 - C9 Fraction	----	10	mg/kg	<10	26 mg/kg	85.0	68.4	128
EP080/071: Total Recoverable Hydrocarbons - NEPM 2013 Fractions (QCLot: 3892434)								
EP071: >C10 - C16 Fraction	----	50	mg/kg	<50	375 mg/kg	103	77.0	125
EP071: >C16 - C34 Fraction	----	100	mg/kg	<100	525 mg/kg	103	74.0	138
EP071: >C34 - C40 Fraction	----	100	mg/kg	<100	225 mg/kg	92.5	63.0	131
EP080/071: Total Recoverable Hydrocarbons - NEPM 2013 Fractions (QCLot: 3894958)								
EP080: C6 - C10 Fraction	C6_C10	10	mg/kg	<10	31 mg/kg	86.6	68.4	128
EP080: BTEXN (QCLot: 3894958)								
EP080: Benzene	71-43-2	0.2	mg/kg	<0.2	1 mg/kg	98.6	62.0	116
EP080: Toluene	108-88-3	0.5	mg/kg	<0.5	1 mg/kg	85.2	67.0	121
EP080: Ethylbenzene	100-41-4	0.5	mg/kg	<0.5	1 mg/kg	87.4	65.0	117
EP080: meta- & para-Xylene	108-38-3 106-42-3	0.5	mg/kg	<0.5	2 mg/kg	85.8	66.0	118
EP080: ortho-Xylene	95-47-6	0.5	mg/kg	<0.5	1 mg/kg	83.9	68.0	120
EP080: Naphthalene	91-20-3	1	mg/kg	<1	1 mg/kg	94.8	63.0	119

Sub-Matrix: **WATER**

				Method Blank (MB) Report	*Laboratory Control Spike (LCS) Report*			
					Spike	*Spike Recovery (%)*	*Acceptable Limits (%)*	
Method: Compound	*CAS Number*	*LOR*	*Unit*	*Result*	*Concentration*	*LCS*	*Low*	*High*
EG020T: Total Metals by ICP-MS (QCLot: 3899943)								
EG020A-T: Arsenic	7440-38-2	0.001	mg/L	<0.001	0.1 mg/L	92.7	82.0	114
EG020A-T: Cadmium	7440-43-9	0.0001	mg/L	<0.0001	0.1 mg/L	89.5	84.0	112
EG020A-T: Chromium	7440-47-3	0.001	mg/L	<0.001	0.1 mg/L	90.2	86.0	116
EG020A-T: Copper	7440-50-8	0.001	mg/L	<0.001	0.1 mg/L	91.0	83.0	118
EG020A-T: Lead	7439-92-1	0.001	mg/L	<0.001	0.1 mg/L	89.5	85.0	115
EG020A-T: Nickel	7440-02-0	0.001	mg/L	<0.001	0.1 mg/L	90.6	84.0	116
EG020A-T: Zinc	7440-66-6	0.005	mg/L	<0.005	0.1 mg/L	95.2	79.0	117
EG035T: Total Recoverable Mercury by FIMS (QCLot: 3899878)								
EG035T: Mercury	7439-97-6	0.0001	mg/L	<0.0001	0.01 mg/L	97.8	77.0	111
EP068A: Organochlorine Pesticides (OC) (QCLot: 3892394)								
EP068: alpha-BHC	319-84-6	0.5	µg/L	<0.5	5 µg/L	80.4	64.9	107
EP068: Hexachlorobenzene (HCB)	118-74-1	0.5	µg/L	<0.5	5 µg/L	80.1	58.3	111
EP068: beta-BHC	319-85-7	0.5	µg/L	<0.5	5 µg/L	83.5	69.0	117
EP068: gamma-BHC	58-89-9	0.5	µg/L	<0.5	5 µg/L	75.0	70.0	112
EP068: delta-BHC	319-86-8	0.5	µg/L	<0.5	5 µg/L	91.7	68.9	110
EP068: Heptachlor	76-44-8	0.5	µg/L	<0.5	5 µg/L	78.0	65.2	108
EP068: Aldrin	309-00-2	0.5	µg/L	<0.5	5 µg/L	82.6	65.8	109
EP068: Heptachlor epoxide	1024-57-3	0.5	µg/L	<0.5	5 µg/L	82.8	67.1	107
EP068: trans-Chlordane	5103-74-2	0.5	µg/L	<0.5	5 µg/L	82.2	64.1	110

Sub-Matrix: **WATER**

				Method Blank (MB) Report	*Laboratory Control Spike (LCS) Report*			
					Spike	*Spike Recovery (%)*	*Acceptable Limits (%)*	
Method: Compound	*CAS Number*	*LOR*	*Unit*	*Result*	*Concentration*	*LCS*	*Low*	*High*
EP068A: Organochlorine Pesticides (OC) (QCLot: 3892394) - continued								
EP068: alpha-Endosulfan	959-98-8	0.5	µg/L	<0.5	5 µg/L	81.8	66.7	112
EP068: cis-Chlordane	5103-71-9	0.5	µg/L	<0.5	5 µg/L	79.4	63.2	111
EP068: Dieldrin	60-57-1	0.5	µg/L	<0.5	5 µg/L	79.3	65.2	113
EP068: 4.4`-DDE	72-55-9	0.5	µg/L	<0.5	5 µg/L	82.1	66.0	112
EP068: Endrin	72-20-8	0.5	µg/L	<0.5	5 µg/L	85.7	65.2	113
EP068: beta-Endosulfan	33213-65-9	0.5	µg/L	<0.5	5 µg/L	96.9	67.3	114
EP068: 4.4`-DDD	72-54-8	0.5	µg/L	<0.5	5 µg/L	85.4	72.0	122
EP068: Endrin aldehyde	7421-93-4	0.5	µg/L	<0.5	5 µg/L	87.1	66.9	109
EP068: Endosulfan sulfate	1031-07-8	0.5	µg/L	<0.5	5 µg/L	80.2	65.2	112
EP068: 4.4`-DDT	50-29-3	2	µg/L	<2.0	5 µg/L	86.3	65.2	112
EP068: Endrin ketone	53494-70-5	0.5	µg/L	<0.5	5 µg/L	89.6	63.8	110
EP068: Methoxychlor	72-43-5	2	µg/L	<2.0	5 µg/L	88.0	61.1	114
EP068B: Organophosphorus Pesticides (OP) (QCLot: 3892394)								
EP068: Dichlorvos	62-73-7	0.5	µg/L	<0.5	5 µg/L	82.8	65.6	114
EP068: Demeton-S-methyl	919-86-8	0.5	µg/L	<0.5	5 µg/L	85.2	63.7	113
EP068: Monocrotophos	6923-22-4	2	µg/L	<2.0	5 µg/L	23.4	19.7	48.0
EP068: Dimethoate	60-51-5	0.5	µg/L	<0.5	5 µg/L	107	69.5	110
EP068: Diazinon	333-41-5	0.5	µg/L	<0.5	5 µg/L	82.1	71.1	110
EP068: Chlorpyrifos-methyl	5598-13-0	0.5	µg/L	<0.5	5 µg/L	81.0	77.0	119
EP068: Parathion-methyl	298-00-0	2	µg/L	<2.0	5 µg/L	86.9	70.0	124
EP068: Malathion	121-75-5	0.5	µg/L	<0.5	5 µg/L	96.4	68.4	116
EP068: Fenthion	55-38-9	0.5	µg/L	<0.5	5 µg/L	84.8	68.6	112
EP068: Chlorpyrifos	2921-88-2	0.5	µg/L	<0.5	5 µg/L	82.7	75.0	119
EP068: Parathion	56-38-2	2	µg/L	<2.0	5 µg/L	87.3	67.0	121
EP068: Pirimphos-ethyl	23505-41-1	0.5	µg/L	<0.5	5 µg/L	85.8	69.0	121
EP068: Chlorfenvinphos	470-90-6	0.5	µg/L	<0.5	5 µg/L	106	71.8	110
EP068: Bromophos-ethyl	4824-78-6	0.5	µg/L	<0.5	5 µg/L	83.7	67.5	112
EP068: Fenamiphos	22224-92-6	0.5	µg/L	<0.5	5 µg/L	106	64.1	116
EP068: Prothiofos	34643-46-4	0.5	µg/L	<0.5	5 µg/L	82.7	67.8	114
EP068: Ethion	563-12-2	0.5	µg/L	<0.5	5 µg/L	85.0	74.0	120
EP068: Carbophenothion	786-19-6	0.5	µg/L	<0.5	5 µg/L	91.4	66.2	114
EP068: Azinphos Methyl	86-50-0	0.5	µg/L	<0.5	5 µg/L	92.8	51.6	128
EP075(SIM)B: Polynuclear Aromatic Hydrocarbons (QCLot: 3892393)								
EP075(SIM): Naphthalene	91-20-3	1	µg/L	<1.0	5 µg/L	71.2	50.0	94.0
EP075(SIM): Acenaphthylene	208-96-8	1	µg/L	<1.0	5 µg/L	72.6	63.6	114
EP075(SIM): Acenaphthene	83-32-9	1	µg/L	<1.0	5 µg/L	79.1	62.2	113
EP075(SIM): Fluorene	86-73-7	1	µg/L	<1.0	5 µg/L	81.8	63.9	115
EP075(SIM): Phenanthrene	85-01-8	1	µg/L	<1.0	5 µg/L	88.5	62.6	116
EP075(SIM): Anthracene	120-12-7	1	µg/L	<1.0	5 µg/L	69.6	64.3	116

Sub-Matrix: **WATER**

				Method Blank (MB) Report	Laboratory Control Spike (LCS) Report			
					Spike	Spike Recovery (%)	Acceptable Limits (%)	
Method: Compound	CAS Number	LOR	Unit	Result	Concentration	LCS	Low	High
EP075(SIM)B: Polynuclear Aromatic Hydrocarbons (QCLot: 3892393) - continued								
EP075(SIM): Fluoranthene	206-44-0	1	µg/L	<1.0	5 µg/L	85.0	63.6	118
EP075(SIM): Pyrene	129-00-0	1	µg/L	<1.0	5 µg/L	85.8	63.1	118
EP075(SIM): Benz(a)anthracene	56-55-3	1	µg/L	<1.0	5 µg/L	83.5	64.1	117
EP075(SIM): Chrysene	218-01-9	1	µg/L	<1.0	5 µg/L	89.4	62.5	116
EP075(SIM): Benzo(b+j)fluoranthene	205-99-2 205-82-3	1	µg/L	<1.0	5 µg/L	97.8	61.7	119
EP075(SIM): Benzo(k)fluoranthene	207-08-9	1	µg/L	<1.0	5 µg/L	94.4	63.0	115
EP075(SIM): Benzo(a)pyrene	50-32-8	0.5	µg/L	<0.5	5 µg/L	87.6	63.3	117
EP075(SIM): Indeno(1.2.3.cd)pyrene	193-39-5	1	µg/L	<1.0	5 µg/L	80.8	59.9	118
EP075(SIM): Dibenz(a.h)anthracene	53-70-3	1	µg/L	<1.0	5 µg/L	73.0	61.2	117
EP075(SIM): Benzo(g.h.i)perylene	191-24-2	1	µg/L	<1.0	5 µg/L	71.8	59.1	118
EP080/071: Total Petroleum Hydrocarbons (QCLot: 3892392)								
EP071: C10 - C14 Fraction	----	50	µg/L	<50	400 µg/L	82.6	55.8	112
EP071: C15 - C28 Fraction	----	100	µg/L	<100	600 µg/L	80.6	71.6	113
EP071: C29 - C36 Fraction	----	50	µg/L	<50	400 µg/L	94.8	56.0	121
EP080/071: Total Petroleum Hydrocarbons (QCLot: 3899061)								
EP080: C6 - C9 Fraction	----	20	µg/L	<20	260 µg/L	78.2	75.0	127
EP080/071: Total Recoverable Hydrocarbons - NEPM 2013 Fractions (QCLot: 3892392)								
EP071: >C10 - C16 Fraction	----	100	µg/L	<100	500 µg/L	81.3	57.9	119
EP071: >C16 - C34 Fraction	----	100	µg/L	<100	700 µg/L	80.4	62.5	110
EP071: >C34 - C40 Fraction	----	100	µg/L	<100	300 µg/L	79.4	61.5	121
EP080/071: Total Recoverable Hydrocarbons - NEPM 2013 Fractions (QCLot: 3899061)								
EP080: C6 - C10 Fraction	C6_C10	20	µg/L	<20	310 µg/L	80.6	75.0	127
EP080: BTEXN (QCLot: 3899061)								
EP080: Benzene	71-43-2	1	µg/L	<1	10 µg/L	83.6	70.0	122
EP080: Toluene	108-88-3	2	µg/L	<2	10 µg/L	94.2	69.0	123
EP080: Ethylbenzene	100-41-4	2	µg/L	<2	10 µg/L	91.9	70.0	120
EP080: meta- & para-Xylene	108-38-3 106-42-3	2	µg/L	<2	10 µg/L	98.0	69.0	121
EP080: ortho-Xylene	95-47-6	2	µg/L	<2	10 µg/L	93.2	72.0	122
EP080: Naphthalene	91-20-3	5	µg/L	<5	10 µg/L	108	70.0	120

Matrix Spike (MS) Report

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

Sub-Matrix: **SOIL**

Matrix Spike (MS) Report		
Spike	SpikeRecovery(%)	Acceptable Limits (%)

Sub-Matrix: **SOIL**

				Matrix Spike (MS) Report			
				Spike	*SpikeRecovery(%)*	*Acceptable Limits (%)*	
Laboratory sample ID	*Sample ID*	*Method: Compound*	*CAS Number*	*Concentration*	*MS*	*Low*	*High*
EG005(ED093)T: Total Metals by ICP-AES (QCLot: 3897286)							
ES2132601-001	SS13_0.05	EG005T: Arsenic	7440-38-2	50 mg/kg	102	70.0	130
		EG005T: Cadmium	7440-43-9	50 mg/kg	92.6	70.0	130
		EG005T: Chromium	7440-47-3	50 mg/kg	93.2	68.0	132
		EG005T: Copper	7440-50-8	250 mg/kg	91.9	70.0	130
		EG005T: Lead	7439-92-1	250 mg/kg	93.6	70.0	130
		EG005T: Nickel	7440-02-0	50 mg/kg	91.5	70.0	130
		EG005T: Zinc	7440-66-6	250 mg/kg	86.9	66.0	133
EG035T: Total Recoverable Mercury by FIMS (QCLot: 3897285)							
ES2132601-001	SS13_0.05	EG035T: Mercury	7439-97-6	5 mg/kg	105	70.0	130
EP068A: Organochlorine Pesticides (OC) (QCLot: 3892436)							
ES2132601-001	SS13_0.05	EP068: gamma-BHC	58-89-9	0.5 mg/kg	92.2	70.0	130
		EP068: Heptachlor	76-44-8	0.5 mg/kg	79.2	70.0	130
		EP068: Aldrin	309-00-2	0.5 mg/kg	95.0	70.0	130
		EP068: Dieldrin	60-57-1	0.5 mg/kg	86.4	70.0	130
		EP068: Endrin	72-20-8	2 mg/kg	82.3	70.0	130
		EP068: 4.4`-DDT	50-29-3	2 mg/kg	77.1	70.0	130
EP068B: Organophosphorus Pesticides (OP) (QCLot: 3892436)							
ES2132601-001	SS13_0.05	EP068: Diazinon	333-41-5	0.5 mg/kg	104	70.0	130
		EP068: Chlorpyrifos-methyl	5598-13-0	0.5 mg/kg	84.2	70.0	130
		EP068: Pirimphos-ethyl	23505-41-1	0.5 mg/kg	90.1	70.0	130
		EP068: Bromophos-ethyl	4824-78-6	0.5 mg/kg	90.0	70.0	130
		EP068: Prothiofos	34643-46-4	0.5 mg/kg	81.4	70.0	130
EP075(SIM)B: Polynuclear Aromatic Hydrocarbons (QCLot: 3892435)							
ES2132601-001	SS13_0.05	EP075(SIM): Acenaphthene	83-32-9	10 mg/kg	96.1	70.0	130
		EP075(SIM): Pyrene	129-00-0	10 mg/kg	105	70.0	130
EP080/071: Total Petroleum Hydrocarbons (QCLot: 3892434)							
ES2132601-001	SS13_0.05	EP071: C10 - C14 Fraction	----	480 mg/kg	111	73.0	137
		EP071: C15 - C28 Fraction	----	3100 mg/kg	106	53.0	131
		EP071: C29 - C36 Fraction	----	2060 mg/kg	110	52.0	132
EP080/071: Total Petroleum Hydrocarbons (QCLot: 3894958)							
ES2132601-001	SS13_0.05	EP080: C6 - C9 Fraction	----	32.5 mg/kg	112	70.0	130
EP080/071: Total Recoverable Hydrocarbons - NEPM 2013 Fractions (QCLot: 3892434)							
ES2132601-001	SS13_0.05	EP071: >C10 - C16 Fraction	----	860 mg/kg	110	73.0	137
		EP071: >C16 - C34 Fraction	----	4320 mg/kg	110	53.0	131
		EP071: >C34 - C40 Fraction	----	890 mg/kg	95.1	52.0	132
EP080/071: Total Recoverable Hydrocarbons - NEPM 2013 Fractions (QCLot: 3894958)							

Sub-Matrix: **SOIL**

				Matrix Spike (MS) Report			
				Spike	SpikeRecovery(%)	Acceptable Limits (%)	
Laboratory sample ID	*Sample ID*	*Method: Compound*	*CAS Number*	*Concentration*	*MS*	*Low*	*High*
EP080/071: Total Recoverable Hydrocarbons - NEPM 2013 Fractions (QCLot: 3894958) - continued							
ES2132601-001	SS13_0.05	EP080: C6 - C10 Fraction	C6_C10	37.5 mg/kg	115	70.0	130
EP080: BTEXN (QCLot: 3894958)							
ES2132601-001	SS13_0.05	EP080: Benzene	71-43-2	2.5 mg/kg	86.0	70.0	130
		EP080: Toluene	108-88-3	2.5 mg/kg	86.3	70.0	130
		EP080: Ethylbenzene	100-41-4	2.5 mg/kg	88.3	70.0	130
		EP080: meta- & para-Xylene	108-38-3 106-42-3	2.5 mg/kg	90.1	70.0	130
		EP080: ortho-Xylene	95-47-6	2.5 mg/kg	88.3	70.0	130
		EP080: Naphthalene	91-20-3	2.5 mg/kg	80.4	70.0	130

Sub-Matrix: **WATER**

				Matrix Spike (MS) Report			
				Spike	SpikeRecovery(%)	Acceptable Limits (%)	
Laboratory sample ID	*Sample ID*	*Method: Compound*	*CAS Number*	*Concentration*	*MS*	*Low*	*High*
EG020T: Total Metals by ICP-MS (QCLot: 3899943)							
ES2132134-012	Anonymous	EG020A-T: Arsenic	7440-38-2	1 mg/L	92.9	70.0	130
		EG020A-T: Cadmium	7440-43-9	0.25 mg/L	90.6	70.0	130
		EG020A-T: Chromium	7440-47-3	1 mg/L	93.4	70.0	130
		EG020A-T: Copper	7440-50-8	1 mg/L	93.8	70.0	130
		EG020A-T: Lead	7439-92-1	1 mg/L	93.2	70.0	130
		EG020A-T: Nickel	7440-02-0	1 mg/L	93.7	70.0	130
		EG020A-T: Zinc	7440-66-6	1 mg/L	92.9	70.0	130
EG035T: Total Recoverable Mercury by FIMS (QCLot: 3899878)							
ES2132664-002	Anonymous	EG035T: Mercury	7439-97-6	0.01 mg/L	90.6	70.0	130
EP080/071: Total Petroleum Hydrocarbons (QCLot: 3899061)							
ES2132818-001	Anonymous	EP080: C6 - C9 Fraction	----	325 µg/L	93.9	70.0	130
EP080/071: Total Recoverable Hydrocarbons - NEPM 2013 Fractions (QCLot: 3899061)							
ES2132818-001	Anonymous	EP080: C6 - C10 Fraction	C6_C10	375 µg/L	93.6	70.0	130
EP080: BTEXN (QCLot: 3899061)							
ES2132818-001	Anonymous	EP080: Benzene	71-43-2	25 µg/L	89.3	70.0	130
		EP080: Toluene	108-88-3	25 µg/L	96.9	70.0	130
		EP080: Ethylbenzene	100-41-4	25 µg/L	99.2	70.0	130
		EP080: meta- & para-Xylene	108-38-3 106-42-3	25 µg/L	97.4	70.0	130
		EP080: ortho-Xylene	95-47-6	25 µg/L	97.9	70.0	130
		EP080: Naphthalene	91-20-3	25 µg/L	91.7	70.0	130

QA/QC Compliance Assessment to assist with Quality Review

Work Order	: **ES2132601**	Page	: 1 of 10
Client	: **Jacobs Arcadis Joint Venture**	Laboratory	: Environmental Division Sydney
Contact	: Amanda Mullen	Telephone	: +61-2-8784 8555
Project	: IA254001	Date Samples Received	: 08-Sep-2021
Site	: ----	Issue Date	: 24-Sep-2021
Sampler	: ----	No. of samples received	: 14
Order number	: ----	No. of samples analysed	: 11

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

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

Summary of Outliers

Outliers : Quality Control Samples

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

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

Outliers : Analysis Holding Time Compliance

- **Analysis Holding Time Outliers exist - please see following pages for full details.**

Outliers : Frequency of Quality Control Samples

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

Outliers : Analysis Holding Time Compliance

Matrix: **SOIL**

Method		*Extraction / Preparation*			*Analysis*		
Container / Client Sample ID(s)		*Date extracted*	*Due for extraction*	**Days overdue**	*Date analysed*	*Due for analysis*	**Days overdue**
MM868: Coliforms & E.coli by MPN using Aquachrom ECC							
Soil Glass Jar - Unpreserved							
SS13_0.05,	QC101_210906	----	----	----	13-Sep-2021	10-Sep-2021	**3**
Soil Glass Jar - Unpreserved							
BH07_0.05,	BH07_0.5	----	----	----	13-Sep-2021	11-Sep-2021	**2**
Soil Glass Jar - Unpreserved							
BH15_0.05,	BH15_2.0	----	----	----	13-Sep-2021	12-Sep-2021	**1**

Outliers : Frequency of Quality Control Samples

Matrix: **WATER**

	Count		Rate (%)		Quality Control Specification
Method	QC	Regular	Actual	Expected	
PAH/Phenols (GC/MS - SIM)	0	2	0.00	10.00	NEPM 2013 B3 & ALS QC Standard
Pesticides by GCMS	0	1	0.00	10.00	NEPM 2013 B3 & ALS QC Standard
TRH - Semivolatile Fraction	0	12	0.00	10.00	NEPM 2013 B3 & ALS QC Standard
PAH/Phenols (GC/MS - SIM)	0	2	0.00	5.00	NEPM 2013 B3 & ALS QC Standard
Pesticides by GCMS	0	1	0.00	5.00	NEPM 2013 B3 & ALS QC Standard
TRH - Semivolatile Fraction	0	12	0.00	5.00	NEPM 2013 B3 & ALS QC Standard

Analysis Holding Time Compliance

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

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

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

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

Matrix: **SOIL**

Evaluation: × = Holding time breach ; ✓ = Within holding time.

Method	***Sample Date***	*Extraction / Preparation*			*Analysis*		
***Container** / Client Sample ID(s)*		***Date extracted***	*Due for extraction*	*Evaluation*	***Date analysed***	*Due for analysis*	*Evaluation*

Matrix: **SOIL** Evaluation: × = Holding time breach ; ✓ = Within holding time.

Method	*Sample Date*	*Extraction / Preparation*			*Analysis*		
Container / Client Sample ID(s)		*Date extracted*	*Due for extraction*	*Evaluation*	*Date analysed*	*Due for analysis*	*Evaluation*
EA055: Moisture Content (Dried @ 105-110°C)							
Soil Glass Jar - Unpreserved (EA055) SS13_0.05, QC101_210906	**06-Sep-2021**	**----**	----	----	**11-Sep-2021**	20-Sep-2021	✓
Soil Glass Jar - Unpreserved (EA055) BH07_0.05, BH07_0.5, SS24_0.05, SS24_0.10, SS26_0.05	**07-Sep-2021**	**----**	----	----	**11-Sep-2021**	21-Sep-2021	✓
Soil Glass Jar - Unpreserved (EA055) BH15_0.05, BH15_2.0	**08-Sep-2021**	**----**	----	----	**11-Sep-2021**	22-Sep-2021	✓
EA200: AS 4964 - 2004 Identification of Asbestos in Soils							
Snap Lock Bag (EA200) SS13_0.05, QC101_210906	**06-Sep-2021**	**----**	----	----	**09-Sep-2021**	05-Mar-2022	✓
Snap Lock Bag (EA200) BH07_0.05, BH07_0.5, SS24_0.05, SS24_0.10, SS26_0.05	**07-Sep-2021**	**----**	----	----	**09-Sep-2021**	06-Mar-2022	✓
Snap Lock Bag (EA200) BH15_0.05	**08-Sep-2021**	**----**	----	----	**09-Sep-2021**	07-Mar-2022	✓
EG005(ED093)T: Total Metals by ICP-AES							
Soil Glass Jar - Unpreserved (EG005T) SS13_0.05, QC101_210906	**06-Sep-2021**	**13-Sep-2021**	05-Mar-2022	✓	**14-Sep-2021**	05-Mar-2022	✓
Soil Glass Jar - Unpreserved (EG005T) BH07_0.05, BH07_0.5, SS24_0.05, SS24_0.10, SS26_0.05	**07-Sep-2021**	**13-Sep-2021**	06-Mar-2022	✓	**14-Sep-2021**	06-Mar-2022	✓
Soil Glass Jar - Unpreserved (EG005T) BH15_0.05, BH15_2.0	**08-Sep-2021**	**13-Sep-2021**	07-Mar-2022	✓	**14-Sep-2021**	07-Mar-2022	✓
EG035T: Total Recoverable Mercury by FIMS							
Soil Glass Jar - Unpreserved (EG035T) SS13_0.05, QC101_210906	**06-Sep-2021**	**13-Sep-2021**	04-Oct-2021	✓	**15-Sep-2021**	04-Oct-2021	✓
Soil Glass Jar - Unpreserved (EG035T) BH07_0.05, BH07_0.5, SS24_0.05, SS24_0.10, SS26_0.05	**07-Sep-2021**	**13-Sep-2021**	05-Oct-2021	✓	**15-Sep-2021**	05-Oct-2021	✓
Soil Glass Jar - Unpreserved (EG035T) BH15_0.05, BH15_2.0	**08-Sep-2021**	**13-Sep-2021**	06-Oct-2021	✓	**15-Sep-2021**	06-Oct-2021	✓

Matrix: **SOIL**

Evaluation: × = Holding time breach ; ✓ = Within holding time.

Method	*Sample Date*	*Extraction / Preparation*			*Analysis*		
Container / Client Sample ID(s)		*Date extracted*	*Due for extraction*	*Evaluation*	*Date analysed*	*Due for analysis*	*Evaluation*
EP068A: Organochlorine Pesticides (OC)							
Soil Glass Jar - Unpreserved (EP068) SS13_0.05, QC101_210906	**06-Sep-2021**	**13-Sep-2021**	20-Sep-2021	✓	**14-Sep-2021**	23-Oct-2021	✓
Soil Glass Jar - Unpreserved (EP068) BH07_0.05, BH07_0.5, SS24_0.05, SS24_0.10, SS26_0.05	**07-Sep-2021**	**13-Sep-2021**	21-Sep-2021	✓	**14-Sep-2021**	23-Oct-2021	✓
Soil Glass Jar - Unpreserved (EP068) BH15_0.05, BH15_2.0	**08-Sep-2021**	**13-Sep-2021**	22-Sep-2021	✓	**14-Sep-2021**	23-Oct-2021	✓
EP068B: Organophosphorus Pesticides (OP)							
Soil Glass Jar - Unpreserved (EP068) SS13_0.05, QC101_210906	**06-Sep-2021**	**13-Sep-2021**	20-Sep-2021	✓	**14-Sep-2021**	23-Oct-2021	✓
Soil Glass Jar - Unpreserved (EP068) BH07_0.05, BH07_0.5, SS24_0.05, SS24_0.10, SS26_0.05	**07-Sep-2021**	**13-Sep-2021**	21-Sep-2021	✓	**14-Sep-2021**	23-Oct-2021	✓
Soil Glass Jar - Unpreserved (EP068) BH15_0.05, BH15_2.0	**08-Sep-2021**	**13-Sep-2021**	22-Sep-2021	✓	**14-Sep-2021**	23-Oct-2021	✓
EP075(SIM)B: Polynuclear Aromatic Hydrocarbons							
Soil Glass Jar - Unpreserved (EP075(SIM)) SS13_0.05, QC101_210906	**06-Sep-2021**	**13-Sep-2021**	20-Sep-2021	✓	**14-Sep-2021**	23-Oct-2021	✓
Soil Glass Jar - Unpreserved (EP075(SIM)) BH07_0.05, BH07_0.5, SS24_0.05, SS24_0.10, SS26_0.05	**07-Sep-2021**	**13-Sep-2021**	21-Sep-2021	✓	**14-Sep-2021**	23-Oct-2021	✓
Soil Glass Jar - Unpreserved (EP075(SIM)) BH15_0.05, BH15_2.0	**08-Sep-2021**	**13-Sep-2021**	22-Sep-2021	✓	**14-Sep-2021**	23-Oct-2021	✓
EP080/071: Total Petroleum Hydrocarbons							
Soil Glass Jar - Unpreserved (EP071) SS13_0.05, QC101_210906	**06-Sep-2021**	**13-Sep-2021**	20-Sep-2021	✓	**13-Sep-2021**	23-Oct-2021	✓
Soil Glass Jar - Unpreserved (EP080) SS13_0.05, QC101_210906	**06-Sep-2021**	**13-Sep-2021**	20-Sep-2021	✓	**15-Sep-2021**	20-Sep-2021	✓
Soil Glass Jar - Unpreserved (EP071) BH07_0.05, BH07_0.5, SS24_0.05, SS24_0.10, SS26_0.05	**07-Sep-2021**	**13-Sep-2021**	21-Sep-2021	✓	**13-Sep-2021**	23-Oct-2021	✓
Soil Glass Jar - Unpreserved (EP080) BH07_0.05, BH07_0.5, SS24_0.05, SS24_0.10, SS26_0.05	**07-Sep-2021**	**13-Sep-2021**	21-Sep-2021	✓	**15-Sep-2021**	21-Sep-2021	✓
Soil Glass Jar - Unpreserved (EP071) BH15_0.05, BH15_2.0	**08-Sep-2021**	**13-Sep-2021**	22-Sep-2021	✓	**13-Sep-2021**	23-Oct-2021	✓
Soil Glass Jar - Unpreserved (EP080) BH15_0.05, BH15_2.0	**08-Sep-2021**	**13-Sep-2021**	22-Sep-2021	✓	**15-Sep-2021**	22-Sep-2021	✓

Matrix: **SOIL**

Evaluation: × = Holding time breach ; ✓ = Within holding time.

Method *Container / Client Sample ID(s)*	*Sample Date*	*Extraction / Preparation*			*Analysis*		
		Date extracted	*Due for extraction*	*Evaluation*	*Date analysed*	*Due for analysis*	*Evaluation*
EP080/071: Total Recoverable Hydrocarbons - NEPM 2013 Fractions							
Soil Glass Jar - Unpreserved (EP071) SS13_0.05, QC101_210906	**06-Sep-2021**	**13-Sep-2021**	20-Sep-2021	✓	**13-Sep-2021**	23-Oct-2021	✓
Soil Glass Jar - Unpreserved (EP080) SS13_0.05, QC101_210906	**06-Sep-2021**	**13-Sep-2021**	20-Sep-2021	✓	**15-Sep-2021**	20-Sep-2021	✓
Soil Glass Jar - Unpreserved (EP071) BH07_0.05, BH07_0.5, SS24_0.05, SS24_0.10, SS26_0.05	**07-Sep-2021**	**13-Sep-2021**	21-Sep-2021	✓	**13-Sep-2021**	23-Oct-2021	✓
Soil Glass Jar - Unpreserved (EP080) BH07_0.05, BH07_0.5, SS24_0.05, SS24_0.10, SS26_0.05	**07-Sep-2021**	**13-Sep-2021**	21-Sep-2021	✓	**15-Sep-2021**	21-Sep-2021	✓
Soil Glass Jar - Unpreserved (EP071) BH15_0.05, BH15_2.0	**08-Sep-2021**	**13-Sep-2021**	22-Sep-2021	✓	**13-Sep-2021**	23-Oct-2021	✓
Soil Glass Jar - Unpreserved (EP080) BH15_0.05, BH15_2.0	**08-Sep-2021**	**13-Sep-2021**	22-Sep-2021	✓	**15-Sep-2021**	22-Sep-2021	✓
EP080: BTEXN							
Soil Glass Jar - Unpreserved (EP080) QC300_210908	**03-Sep-2021**	**13-Sep-2021**	17-Sep-2021	✓	**15-Sep-2021**	17-Sep-2021	✓
Soil Glass Jar - Unpreserved (EP080) SS13_0.05, QC101_210906	**06-Sep-2021**	**13-Sep-2021**	20-Sep-2021	✓	**15-Sep-2021**	20-Sep-2021	✓
Soil Glass Jar - Unpreserved (EP080) BH07_0.05, BH07_0.5, SS24_0.05, SS24_0.10, SS26_0.05	**07-Sep-2021**	**13-Sep-2021**	21-Sep-2021	✓	**15-Sep-2021**	21-Sep-2021	✓
Soil Glass Jar - Unpreserved (EP080) BH15_0.05, BH15_2.0	**08-Sep-2021**	**13-Sep-2021**	22-Sep-2021	✓	**15-Sep-2021**	22-Sep-2021	✓
MM868: Coliforms & E.coli by MPN using Aquachrom ECC							
Soil Glass Jar - Unpreserved (MM868) SS13_0.05, QC101_210906	**06-Sep-2021**	**----**	----	----	**13-Sep-2021**	10-Sep-2021	×
Soil Glass Jar - Unpreserved (MM868) BH07_0.05, BH07_0.5	**07-Sep-2021**	**----**	----	----	**13-Sep-2021**	11-Sep-2021	×
Soil Glass Jar - Unpreserved (MM868) BH15_0.05, BH15_2.0	**08-Sep-2021**	**----**	----	----	**13-Sep-2021**	12-Sep-2021	×

Matrix: **WATER**

Evaluation: × = Holding time breach ; ✓ = Within holding time.

Method *Container / Client Sample ID(s)*	*Sample Date*	*Extraction / Preparation*			*Analysis*		
		Date extracted	*Due for extraction*	*Evaluation*	*Date analysed*	*Due for analysis*	*Evaluation*
EG020T: Total Metals by ICP-MS							
Clear Plastic Bottle - Nitric Acid; Unfiltered (EG020A-T) QC501_210908	**08-Sep-2021**	**14-Sep-2021**	07-Mar-2022	✓	**14-Sep-2021**	07-Mar-2022	✓

Matrix: **WATER**

Evaluation: × = Holding time breach ; ✓ = Within holding time.

Method	***Sample Date***	*Extraction / Preparation*			*Analysis*		
***Container** / Client Sample ID(s)*		***Date extracted***	*Due for extraction*	*Evaluation*	***Date analysed***	*Due for analysis*	*Evaluation*
EG035T: Total Recoverable Mercury by FIMS							
Clear Plastic Bottle - Nitric Acid; Unfiltered (EG035T) QC501_210908	**08-Sep-2021**	**----**	----	----	**14-Sep-2021**	06-Oct-2021	✓
EP068A: Organochlorine Pesticides (OC)							
Amber Glass Bottle - Unpreserved (EP068) QC501_210908	**08-Sep-2021**	**09-Sep-2021**	15-Sep-2021	✓	**10-Sep-2021**	19-Oct-2021	✓
EP068B: Organophosphorus Pesticides (OP)							
Amber Glass Bottle - Unpreserved (EP068) QC501_210908	**08-Sep-2021**	**09-Sep-2021**	15-Sep-2021	✓	**10-Sep-2021**	19-Oct-2021	✓
EP075(SIM)B: Polynuclear Aromatic Hydrocarbons							
Amber Glass Bottle - Unpreserved (EP075(SIM)) QC501_210908	**08-Sep-2021**	**09-Sep-2021**	15-Sep-2021	✓	**10-Sep-2021**	19-Oct-2021	✓
EP080/071: Total Petroleum Hydrocarbons							
Amber Glass Bottle - Unpreserved (EP071) QC501_210908	**08-Sep-2021**	**09-Sep-2021**	15-Sep-2021	✓	**10-Sep-2021**	19-Oct-2021	✓
Amber VOC Vial - Sulfuric Acid (EP080) QC501_210908	**08-Sep-2021**	**14-Sep-2021**	22-Sep-2021	✓	**14-Sep-2021**	22-Sep-2021	✓
EP080/071: Total Recoverable Hydrocarbons - NEPM 2013 Fractions							
Amber Glass Bottle - Unpreserved (EP071) QC501_210908	**08-Sep-2021**	**09-Sep-2021**	15-Sep-2021	✓	**10-Sep-2021**	19-Oct-2021	✓
Amber VOC Vial - Sulfuric Acid (EP080) QC501_210908	**08-Sep-2021**	**14-Sep-2021**	22-Sep-2021	✓	**14-Sep-2021**	22-Sep-2021	✓
EP080: BTEXN							
Amber VOC Vial - Sulfuric Acid (EP080) QC501_210908	**08-Sep-2021**	**14-Sep-2021**	22-Sep-2021	✓	**14-Sep-2021**	22-Sep-2021	✓

Quality Control Parameter Frequency Compliance

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

Matrix: **SOIL**

Evaluation: ✗ = Quality Control frequency not within specification ; ✓ = Quality Control frequency within specification.

		Count		*Rate (%)*			*Quality Control Specification*
Analytical Methods	*Method*	*QC*	*Regular*	***Actual***	***Expected***	*Evaluation*	
Moisture Content	EA055	2	20	**10.00**	**10.00**	✓	NEPM 2013 B3 & ALS QC Standard
PAH/Phenols (SIM)	EP075(SIM)	1	9	**11.11**	**10.00**	✓	NEPM 2013 B3 & ALS QC Standard
Pesticides by GCMS	EP068	1	9	**11.11**	**10.00**	✓	NEPM 2013 B3 & ALS QC Standard
Total Mercury by FIMS	EG035T	2	20	**10.00**	**10.00**	✓	NEPM 2013 B3 & ALS QC Standard
Total Metals by ICP-AES	EG005T	2	20	**10.00**	**10.00**	✓	NEPM 2013 B3 & ALS QC Standard
TRH - Semivolatile Fraction	EP071	1	9	**11.11**	**10.00**	✓	NEPM 2013 B3 & ALS QC Standard
TRH Volatiles/BTEX	EP080	2	20	**10.00**	**10.00**	✓	NEPM 2013 B3 & ALS QC Standard
PAH/Phenols (SIM)	EP075(SIM)	1	9	**11.11**	**5.00**	✓	NEPM 2013 B3 & ALS QC Standard
Pesticides by GCMS	EP068	1	9	**11.11**	**5.00**	✓	NEPM 2013 B3 & ALS QC Standard
Total Mercury by FIMS	EG035T	1	20	**5.00**	**5.00**	✓	NEPM 2013 B3 & ALS QC Standard
Total Metals by ICP-AES	EG005T	1	20	**5.00**	**5.00**	✓	NEPM 2013 B3 & ALS QC Standard
TRH - Semivolatile Fraction	EP071	1	9	**11.11**	**5.00**	✓	NEPM 2013 B3 & ALS QC Standard
TRH Volatiles/BTEX	EP080	1	20	**5.00**	**5.00**	✓	NEPM 2013 B3 & ALS QC Standard
PAH/Phenols (SIM)	EP075(SIM)	1	9	**11.11**	**5.00**	✓	NEPM 2013 B3 & ALS QC Standard
Pesticides by GCMS	EP068	1	9	**11.11**	**5.00**	✓	NEPM 2013 B3 & ALS QC Standard
Total Mercury by FIMS	EG035T	1	20	**5.00**	**5.00**	✓	NEPM 2013 B3 & ALS QC Standard
Total Metals by ICP-AES	EG005T	1	20	**5.00**	**5.00**	✓	NEPM 2013 B3 & ALS QC Standard
TRH - Semivolatile Fraction	EP071	1	9	**11.11**	**5.00**	✓	NEPM 2013 B3 & ALS QC Standard
TRH Volatiles/BTEX	EP080	1	20	**5.00**	**5.00**	✓	NEPM 2013 B3 & ALS QC Standard
PAH/Phenols (SIM)	EP075(SIM)	1	9	**11.11**	**5.00**	✓	NEPM 2013 B3 & ALS QC Standard
Pesticides by GCMS	EP068	1	9	**11.11**	**5.00**	✓	NEPM 2013 B3 & ALS QC Standard
Total Mercury by FIMS	EG035T	1	20	**5.00**	**5.00**	✓	NEPM 2013 B3 & ALS QC Standard
Total Metals by ICP-AES	EG005T	1	20	**5.00**	**5.00**	✓	NEPM 2013 B3 & ALS QC Standard
TRH - Semivolatile Fraction	EP071	1	9	**11.11**	**5.00**	✓	NEPM 2013 B3 & ALS QC Standard
TRH Volatiles/BTEX	EP080	1	20	**5.00**	**5.00**	✓	NEPM 2013 B3 & ALS QC Standard

Matrix: **WATER**

Evaluation: ✗ = Quality Control frequency not within specification ; ✓ = Quality Control frequency within specification.

		Count		*Rate (%)*			*Quality Control Specification*
Analytical Methods	*Method*	*QC*	*Regular*	***Actual***	***Expected***	*Evaluation*	
PAH/Phenols (GC/MS - SIM)	EP075(SIM)	0	2	**0.00**	**10.00**	✗	NEPM 2013 B3 & ALS QC Standard
Pesticides by GCMS	EP068	0	1	**0.00**	**10.00**	✗	NEPM 2013 B3 & ALS QC Standard
Total Mercury by FIMS	EG035T	1	8	**12.50**	**10.00**	✓	NEPM 2013 B3 & ALS QC Standard

Matrix: **WATER**

Evaluation: ✗ = Quality Control frequency not within specification ; ✓ = Quality Control frequency within specification.

Quality Control Sample Type		Count		Rate (%)			Quality Control Specification
Analytical Methods	*Method*	*QC*	*Regular*	***Actual***	***Expected***	*Evaluation*	
Laboratory Duplicates (DUP) - Continued							
Total Metals by ICP-MS - Suite A	EG020A-T	2	10	**20.00**	**10.00**	✓	NEPM 2013 B3 & ALS QC Standard
TRH - Semivolatile Fraction	EP071	0	12	**0.00**	**10.00**	✗	NEPM 2013 B3 & ALS QC Standard
TRH Volatiles/BTEX	EP080	2	20	**10.00**	**10.00**	✓	NEPM 2013 B3 & ALS QC Standard
Laboratory Control Samples (LCS)							
PAH/Phenols (GC/MS - SIM)	EP075(SIM)	1	2	**50.00**	**5.00**	✓	NEPM 2013 B3 & ALS QC Standard
Pesticides by GCMS	EP068	1	1	**100.00**	**5.00**	✓	NEPM 2013 B3 & ALS QC Standard
Total Mercury by FIMS	EG035T	1	8	**12.50**	**5.00**	✓	NEPM 2013 B3 & ALS QC Standard
Total Metals by ICP-MS - Suite A	EG020A-T	1	10	**10.00**	**5.00**	✓	NEPM 2013 B3 & ALS QC Standard
TRH - Semivolatile Fraction	EP071	1	12	**8.33**	**5.00**	✓	NEPM 2013 B3 & ALS QC Standard
TRH Volatiles/BTEX	EP080	1	20	**5.00**	**5.00**	✓	NEPM 2013 B3 & ALS QC Standard
Method Blanks (MB)							
PAH/Phenols (GC/MS - SIM)	EP075(SIM)	1	2	**50.00**	**5.00**	✓	NEPM 2013 B3 & ALS QC Standard
Pesticides by GCMS	EP068	1	1	**100.00**	**5.00**	✓	NEPM 2013 B3 & ALS QC Standard
Total Mercury by FIMS	EG035T	1	8	**12.50**	**5.00**	✓	NEPM 2013 B3 & ALS QC Standard
Total Metals by ICP-MS - Suite A	EG020A-T	1	10	**10.00**	**5.00**	✓	NEPM 2013 B3 & ALS QC Standard
TRH - Semivolatile Fraction	EP071	1	12	**8.33**	**5.00**	✓	NEPM 2013 B3 & ALS QC Standard
TRH Volatiles/BTEX	EP080	1	20	**5.00**	**5.00**	✓	NEPM 2013 B3 & ALS QC Standard
Matrix Spikes (MS)							
PAH/Phenols (GC/MS - SIM)	EP075(SIM)	0	2	**0.00**	**5.00**	✗	NEPM 2013 B3 & ALS QC Standard
Pesticides by GCMS	EP068	0	1	**0.00**	**5.00**	✗	NEPM 2013 B3 & ALS QC Standard
Total Mercury by FIMS	EG035T	1	8	**12.50**	**5.00**	✓	NEPM 2013 B3 & ALS QC Standard
Total Metals by ICP-MS - Suite A	EG020A-T	1	10	**10.00**	**5.00**	✓	NEPM 2013 B3 & ALS QC Standard
TRH - Semivolatile Fraction	EP071	0	12	**0.00**	**5.00**	✗	NEPM 2013 B3 & ALS QC Standard
TRH Volatiles/BTEX	EP080	1	20	**5.00**	**5.00**	✓	NEPM 2013 B3 & ALS QC Standard

Brief Method Summaries

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

Analytical Methods	*Method*	*Matrix*	*Method Descriptions*
Moisture Content	EA055	SOIL	In house: A gravimetric procedure based on weight loss over a 12 hour drying period at 105-110 degrees C. This method is compliant with NEPM Schedule B(3).
Asbestos Identification in Soils	EA200	SOIL	AS 4964 Method for the qualitative identification of asbestos in bulk samples Analysis by Polarised Light Microscopy including dispersion staining
Total Metals by ICP-AES	EG005T	SOIL	In house: Referenced to APHA 3120; USEPA SW 846 - 6010. Metals are determined following an appropriate acid digestion of the soil. The ICPAES technique ionises samples in a plasma, emitting a characteristic spectrum based on metals present. Intensities at selected wavelengths are compared against those of matrix matched standards. This method is compliant with NEPM Schedule B(3)
Total Mercury by FIMS	EG035T	SOIL	In house: Referenced to AS 3550, APHA 3112 Hg - B (Flow-injection (SnCl2) (Cold Vapour generation) AAS) FIM-AAS is an automated flameless atomic absorption technique. Mercury in solids are determined following an appropriate acid digestion. Ionic mercury is reduced online to atomic mercury vapour by SnCl2 which is then purged into a heated quartz cell. Quantification is by comparing absorbance against a calibration curve. This method is compliant with NEPM Schedule B(3)
Pesticides by GCMS	EP068	SOIL	In house: Referenced to USEPA SW 846 - 8270 Extracts are analysed by Capillary GC/MS and quantification is by comparison against an established 5 point calibration curve. This technique is compliant with NEPM Schedule B(3).
TRH - Semivolatile Fraction	EP071	SOIL	In house: Referenced to USEPA SW 846 - 8015 Sample extracts are analysed by Capillary GC/FID and quantified against alkane standards over the range C10 - C40. Compliant with NEPM Schedule B(3).
PAH/Phenols (SIM)	EP075(SIM)	SOIL	In house: Referenced to USEPA SW 846 - 8270. Extracts are analysed by Capillary GC/MS in Selective Ion Mode (SIM) and quantification is by comparison against an established 5 point calibration curve. This method is compliant with NEPM Schedule B(3)
TRH Volatiles/BTEX	EP080	SOIL	In house: Referenced to USEPA SW 846 - 8260. Extracts are analysed by Purge and Trap, Capillary GC/MS. Quantification is by comparison against an established 5 point calibration curve. Compliant with NEPM Schedule B(3) amended.
Coliforms & E.coli in Soils by MPN using Aquachrom ECC	MM868	SOIL	Microbiological analysis subcontracted to ALS Scoresby (NATA Accredited Laboratory No. 992).
Total Metals by ICP-MS - Suite A	EG020A-T	WATER	In house: Referenced to APHA 3125; USEPA SW846 - 6020, ALS QWI-EN/EG020. The ICPMS technique utilizes a highly efficient argon plasma to ionize selected elements. Ions are then passed into a high vacuum mass spectrometer, which separates the analytes based on their distinct mass to charge ratios prior to their measurement by a discrete dynode ion detector.
Total Mercury by FIMS	EG035T	WATER	In house: Referenced to AS 3550, APHA 3112 Hg - B (Flow-injection (SnCl2)(Cold Vapour generation) AAS) FIM-AAS is an automated flameless atomic absorption technique. A bromate/bromide reagent is used to oxidise any organic mercury compounds in the unfiltered sample. The ionic mercury is reduced online to atomic mercury vapour by SnCl2 which is then purged into a heated quartz cell. Quantification is by comparing absorbance against a calibration curve. This method is compliant with NEPM Schedule B(3).

Analytical Methods	*Method*	*Matrix*	*Method Descriptions*
Pesticides by GCMS	EP068	WATER	In house: Referenced to USEPA SW 846 - 8270 Sample extracts are analysed by Capillary GC/MS and quantification is by comparison against an established 5 point calibration curve. This method is compliant with NEPM Schedule B(3)
TRH - Semivolatile Fraction	EP071	WATER	In house: Referenced to USEPA SW 846 - 8015 The sample extract is analysed by Capillary GC/FID and quantification is by comparison against an established 5 point calibration curve of n-Alkane standards. This method is compliant with the QC requirements of NEPM Schedule B(3)
PAH/Phenols (GC/MS - SIM)	EP075(SIM)	WATER	In house: Referenced to USEPA SW 846 - 8270 Sample extracts are analysed by Capillary GC/MS in SIM Mode and quantification is by comparison against an established 5 point calibration curve. This method is compliant with NEPM Schedule B(3)
TRH Volatiles/BTEX	EP080	WATER	In house: Referenced to USEPA SW 846 - 8260 Water samples are directly purged prior to analysis by Capillary GC/MS and quantification is by comparison against an established 5 point calibration curve. Alternatively, a sample is equilibrated in a headspace vial and a portion of the headspace determined by GCMS analysis. This method is compliant with the QC requirements of NEPM Schedule B(3)

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

CHAIN OF CUSTODY

ALS Laboratory: please tick →

☐ADELAIDE 21 Burma Road Pooraka SA 5095
Ph: 08 8359 0890 E: adelaide@alsglobal.com
☐BRISBANE 32 Shand Street Stafford QLD 4053
Ph: 07 3243 7222 E: samples.brisbane@alsglobal.com
☐GLADSTONE 46 Callemondah Drive Clinton QLD 4680
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☐MUDGEE 27 Sydney Road Mudgee NSW 2850
Ph: 02 6372 6735 E: mudgee.mail@alsglobal.com

☐NEWCASTLE 5/585 Maitland Rd Mayfield West NSW 2304
Ph: 02 4014 2500 E: samples.newcastle@alsglobal.com
☐NOWRA 4/13 Geary Place North Nowra NSW 2541
Ph: 024423 2063 E: nowra@alsglobal.com
☐PERTH 10 Hod Way Malaga WA 6090
Ph: 08 9209 7655 E: samples.perth@alsglobal.com

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Ph: 02 8784 8555 E: samples.sydney@alsglobal.com
☐TOWNSVILLE 14-15 Desma Court Bohle QLD 4818
Ph: 07 4796 0600 E: townsville.environmental@alsglobal.com
☐WOLLONGONG 99 Kenny Street Wollongong NSW 2500
Ph: 02 4225 3125 E: portkembla@alsglobal.com

CLIENT: Jacobs Arcadis Joint Venture (JAJV)
OFFICE: Sydney
PROJECT: IA254001
ORDER NUMBER: -
PROJECT MANAGER: Amanda Mullen
CONTACT PH:
SAMPLER: NK
SAMPLER MOBILE: 0421201294
COC emailed to ALS? (YES / [✓ NO])
EDD FORMAT (or default):
Email Reports to (will default to PM if no other addresses are listed): nick.keatley@jacobs.com, amanda.mullen@jacobs.com
Email Invoice to (will default to PM if no other addresses are listed): Nick / Amanda

TURNAROUND REQUIREMENTS : (Standard TAT may be longer for some tests e.g.. Ultra Trace Organics)
☒ Standard TAT (List due date):
☐ Non Standard or urgent TAT (List due date):
ALS QUOTE NO.: -

COC SEQUENCE NUMBER (Circle)
COC: [✓ 1] 2 3 4 5 6 7
OF: 1 [✓ 2] 3 4 5 6 7

RELINQUISHED BY: NK
DATE/TIME: 8/9/21

RECEIVED BY: Juliana 6
DATE/TIME: 8/9/21 3:10pm

RELINQUISHED BY:
DATE/TIME:

RECEIVED BY:
DATE/TIME: 08/9/21/1830

FOR LABORATORY USE ONLY (Circle)
Custody Seal Intact? [✓ Yes] No N/A
[✓ Free ice] / frozen ice bricks present upon receipt? Yes No N/A
Random Sample Temperature on Receipt: 5.4 °C
Other comment:

COMMENTS/SPECIAL HANDLING/STORAGE OR DISPOSAL: also email results to EDMANZ@jacobs.com, jacobs.labresults@esdat.net

ALS USE	SAMPLE DETAILS MATRIX: SOLID (S) WATER (W)			CONTAINER INFORMATION		ANALYSIS REQUIRED including SUITES (NB. Suite Codes must be listed to attract suite price) Where Metals are required, specify Total (unfiltered bottle required) or Dissolved (field filtered bottle required).								Additional Information
LAB ID	SAMPLE ID	DATE / TIME	MATRIX	TYPE & PRESERVATIVE (refer to codes below)	TOTAL CONTAINERS	S-26	S-12	Asbestos p/a	MMB02 (Ecoli & Total Coliforms)				HOLD	Comments on likely contaminant levels, dilutions, or samples requiring specific QC analysis etc.
1	SS13_0.05	6/9/21	S		3	X	X	X	X					
2	QC101_210906	↓				X	X	X	X					Blind Duplicate
-	QC201_210906				↓	X	X	X	X					Send to ~~[illegible]~~ Eurofins
3	BH07_0.05	7/9/21				X	X	X	X					
4	BH07_0.5					X	X	X	X					
5	BH07_0.76				↓								X	
6	SS24_0.05				2	X	X	X						
7	SS24_0.10				2	X	X	X						
8	SS26_0.05	↓			3	X	X	X						
9	BH15-0.05	8/9/21			3	X	X	X	X					
10	BH15_1.0				2								X	
11	BH15_2.0	↓	↓		2	X	X		X					
				TOTAL										

ubcon / Forward Lab / Split WO: QC 201 - 210906/EUROFINS
ab / Analysis: # 1-4, 6-9 ALS Newcastle Asbestos
rganised By / Date:
elinquished By / Date:
onnote / Courier:
O No: ES2132601
ttached By PO / Internal Sheet:

Environmental Division
Sydney
Work Order Reference
ES2132601

Telephone : + 61-2-8784 8555

Container Codes: P = Unpreserved Plastic; N = Nitric Preserved Plastic; ORC = Nitric Preserved ORC; SH = Sodium Hydroxide/Cd Preserved; S = Sodium Hydroxide Preserved Plastic; AG = Amber Glass Unpreserved; AP - Airfreight Unpreserved Plastic
V = VOA Vial HCl Preserved; VB = VOA Vial Sodium Bisulphate Preserved; VS = VOA Vial Sulfuric Preserved; AV = Airfreight Unpreserved Vial SG = Sulfuric Preserved Amber Glass; H = HCl preserved Plastic; HS = HCl preserved Speciation bottle; SP = Sulfuric Preserved Plastic; F = Formaldehyde Preserved Glass;
Z = Zinc Acetate Preserved Bottle; E = EDTA Preserved Bottles; ST = Sterile Bottle; ASS = Plastic Bag for Acid Sulphate Soils; B = Unpreserved Bag.

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CLIENT: Jacobs Arcadis Joint Venture (JAJV)
OFFICE: Sydney
PROJECT: IA254001
ORDER NUMBER: –
PROJECT MANAGER: Amanda Mullen
CONTACT PH:
SAMPLER: NK
SAMPLER MOBILE: 0421201294
COC emailed to ALS? (YES / [✓ NO])
EDD FORMAT (or default):
Email Reports to (will default to PM if no other addresses are listed): As pg 1
Email Invoice to (will default to PM if no other addresses are listed): As pg 1
COMMENTS/SPECIAL HANDLING/STORAGE OR DISPOSAL: As pg 1

TURNAROUND REQUIREMENTS : (Standard TAT may be longer for some tests e.g. Ultra Trace Organics)
☒ Standard TAT (List due date):
☐ Non Standard or urgent TAT (List due date):

ALS QUOTE NO.: –

COC SEQUENCE NUMBER (Circle)
COC: 1 [✓ 2] 3 4 5 6 7
OF: 1 [✓ 2] 3 4 5 6 7

FOR LABORATORY USE ONLY (Circle)
Custody Seal Intact? [✓ Yes] No N/A
[✓ Free] ice / frozen ice bricks present upon receipt? Yes No N/A
Random Sample Temperature on Receipt: °C
Other comment: 5.4

RELINQUISHED BY: NK DATE/TIME: 8/9/21	RECEIVED BY: Juliana G DATE/TIME: 8/9/21 3:10pm	RELINQUISHED BY: DATE/TIME:	RECEIVED BY: Soggy DATE/TIME: 08/9/21 1830

ALS USE	SAMPLE DETAILS MATRIX: SOLID (S) WATER (W)			CONTAINER INFORMATION		ANALYSIS REQUIRED including SUITES (NB. Suite Codes must be listed to attract suite price) Where Metals are required, specify Total (unfiltered bottle required) or Dissolved (field filtered bottle required).								Additional Information
LAB ID	SAMPLE ID	DATE / TIME	MATRIX	TYPE & PRESERVATIVE (refer to codes below)	TOTAL CONTAINERS	S-26	S-12	Asbestos p/a	MM802 (Ecoli & Total coliforms)	~~[illegible]~~	BTEXN		HOLD	Comments on likely contaminant levels, dilutions, or samples requiring specific QC analysis etc.
12	QC300_210908	8/9/21	S		1	X	X				X			Trip blank
13	QC501_210908	↓	W		7	X	X				X			Rinsate
14	BH15_0.5	↓	S		2	X	X	X					X	
					TOTAL									

Water Container Codes: P = Unpreserved Plastic; N = Nitric Preserved Plastic; ORC = Nitric Preserved ORC; SH = Sodium Hydroxide/Cd Preserved; S = Sodium Hydroxide Preserved Plastic; AG = Amber Glass Unpreserved; AP - Airfreight Unpreserved Plastic
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Z = Zinc Acetate Preserved Bottle; E = EDTA Preserved Bottles; ST = Sterile Bottle; ASS = Plastic Bag for Acid Sulphate Soils; B = Unpreserved Bag.

CERTIFICATE OF ANALYSIS

Work Order	: **ES2132942**	Page	: 1 of 8
Client	: **Jacobs Arcadis Joint Venture**	Laboratory	: Environmental Division Sydney
Contact	: Amanda Mullen	Contact	: Customer Services ES
Address	: Level 16 580 George Street Sydney 2000	Address	: 277-289 Woodpark Road Smithfield NSW Australia 2164
Telephone	: ----	Telephone	: +61-2-8784 8555
Project	: IA254001	Date Samples Received	: 10-Sep-2021 15:00
Order number	: ----	Date Analysis Commenced	: 14-Sep-2021
C-O-C number	: ----	Issue Date	: 24-Sep-2021 10:29
Sampler	: Nick Keatley		
Site	: ----		
Quote number	: EN/222		
No. of samples received	: 9		
No. of samples analysed	: 4		

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

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

This Certificate of Analysis contains the following information:

- General Comments
- Analytical Results
- Surrogate Control Limits

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

Signatories

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

Signatories	*Position*	*Accreditation Category*
Edwandy Fadjar	Organic Coordinator	Sydney Organics, Smithfield, NSW
Ivan Taylor	Analyst	Sydney Inorganics, Smithfield, NSW

General Comments

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

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

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

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

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

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

Key : CAS Number = CAS registry number from database maintained by Chemical Abstracts Services. The Chemical Abstracts Service is a division of the American Chemical Society.
LOR = Limit of reporting
^ = This result is computed from individual analyte detections at or above the level of reporting
ø = ALS is not NATA accredited for these tests.
~ = Indicates an estimated value.

- EP075 (SIM): Where reported, Benzo(a)pyrene Toxicity Equivalent Quotient (TEQ) per the NEPM (2013) is the sum total of the concentration of the eight carcinogenic PAHs multiplied by their Toxicity Equivalence Factor (TEF) relative to Benzo(a)pyrene. TEF values are provided in brackets as follows: Benz(a)anthracene (0.1), Chrysene (0.01), Benzo(b+j) & Benzo(k)fluoranthene (0.1), Benzo(a)pyrene (1.0), Indeno(1.2.3.cd)pyrene (0.1), Dibenz(a.h)anthracene (1.0), Benzo(g.h.i)perylene (0.01). Less than LOR results for 'TEQ Zero' are treated as zero.
- Benzo(a)pyrene Toxicity Equivalent Quotient (TEQ) per the NEPM (2013) is the sum total of the concentration of the eight carcinogenic PAHs multiplied by their Toxicity Equivalence Factor (TEF) relative to Benzo(a)pyrene. TEF values are provided in brackets as follows: Benz(a)anthracene (0.1), Chrysene (0.01), Benzo(b+j) & Benzo(k)fluoranthene (0.1), Benzo(a)pyrene (1.0), Indeno(1.2.3.cd)pyrene (0.1), Dibenz(a.h)anthracene (1.0), Benzo(g.h.i)perylene (0.01). Less than LOR results for 'TEQ Zero' are treated as zero, for 'TEQ 1/2LOR' are treated as half the reported LOR, and for 'TEQ LOR' are treated as being equal to the reported LOR. Note: TEQ 1/2LOR and TEQ LOR will calculate as 0.6mg/Kg and 1.2mg/Kg respectively for samples with non-detects for all of the eight TEQ PAHs.
- EP080: Where reported, Total Xylenes is the sum of the reported concentrations of m&p-Xylene and o-Xylene at or above the LOR.
- EP075(SIM): Where reported, Total Cresol is the sum of the reported concentrations of 2-Methylphenol and 3- & 4-Methylphenol at or above the LOR.

Analytical Results

Sub-Matrix: **SOIL** (Matrix: **SOIL**)			*Sample ID*	**BH17-0.05**	**BH17-6.0**	**QC300_210910**	**----**	**----**
			Sampling date / time	09-Sep-2021 00:00	10-Sep-2021 00:00	09-Sep-2021 00:00	----	----
Compound	*CAS Number*	*LOR*	*Unit*	**ES2132942-001**	**ES2132942-006**	**ES2132942-008**	**--------**	**--------**
				Result	Result	Result	----	----
EA055: Moisture Content (Dried @ 105-110°C)								
Moisture Content	----	1.0	%	**15.3**	**12.8**	----	----	----
EG005(ED093)T: Total Metals by ICP-AES								
Arsenic	7440-38-2	5	mg/kg	<5	**6**	----	----	----
Cadmium	7440-43-9	1	mg/kg	<1	<1	----	----	----
Chromium	7440-47-3	2	mg/kg	**6**	**17**	----	----	----
Copper	7440-50-8	5	mg/kg	**6**	**15**	----	----	----
Lead	7439-92-1	5	mg/kg	**6**	**17**	----	----	----
Nickel	7440-02-0	2	mg/kg	**3**	**13**	----	----	----
Zinc	7440-66-6	5	mg/kg	**31**	**75**	----	----	----
EG035T: Total Recoverable Mercury by FIMS								
Mercury	7439-97-6	0.1	mg/kg	<0.1	<0.1	----	----	----
EP075(SIM)B: Polynuclear Aromatic Hydrocarbons								
Naphthalene	91-20-3	0.5	mg/kg	<0.5	<0.5	----	----	----
Acenaphthylene	208-96-8	0.5	mg/kg	<0.5	<0.5	----	----	----
Acenaphthene	83-32-9	0.5	mg/kg	<0.5	<0.5	----	----	----
Fluorene	86-73-7	0.5	mg/kg	<0.5	<0.5	----	----	----
Phenanthrene	85-01-8	0.5	mg/kg	<0.5	<0.5	----	----	----
Anthracene	120-12-7	0.5	mg/kg	<0.5	<0.5	----	----	----
Fluoranthene	206-44-0	0.5	mg/kg	<0.5	<0.5	----	----	----
Pyrene	129-00-0	0.5	mg/kg	<0.5	<0.5	----	----	----
Benz(a)anthracene	56-55-3	0.5	mg/kg	<0.5	<0.5	----	----	----
Chrysene	218-01-9	0.5	mg/kg	<0.5	<0.5	----	----	----
Benzo(b+j)fluoranthene	205-99-2 205-82-3	0.5	mg/kg	<0.5	<0.5	----	----	----
Benzo(k)fluoranthene	207-08-9	0.5	mg/kg	<0.5	<0.5	----	----	----
Benzo(a)pyrene	50-32-8	0.5	mg/kg	<0.5	<0.5	----	----	----
Indeno(1.2.3.cd)pyrene	193-39-5	0.5	mg/kg	<0.5	<0.5	----	----	----
Dibenz(a.h)anthracene	53-70-3	0.5	mg/kg	<0.5	<0.5	----	----	----
Benzo(g.h.i)perylene	191-24-2	0.5	mg/kg	<0.5	<0.5	----	----	----
^ **Sum of polycyclic aromatic hydrocarbons**	----	0.5	mg/kg	<0.5	<0.5	----	----	----
^ **Benzo(a)pyrene TEQ (zero)**	----	0.5	mg/kg	<0.5	<0.5	----	----	----
^ **Benzo(a)pyrene TEQ (half LOR)**	----	0.5	mg/kg	**0.6**	**0.6**	----	----	----
^ **Benzo(a)pyrene TEQ (LOR)**	----	0.5	mg/kg	**1.2**	**1.2**	----	----	----
EP080/071: Total Petroleum Hydrocarbons								
C6 - C9 Fraction	----	10	mg/kg	<10	<10	<10	----	----

Analytical Results

Sub-Matrix: **SOIL** (Matrix: **SOIL**)			*Sample ID*	**BH17-0.05**	**BH17-6.0**	**QC300_210910**	**----**	**----**
			Sampling date / time	09-Sep-2021 00:00	10-Sep-2021 00:00	09-Sep-2021 00:00	----	----
Compound	*CAS Number*	*LOR*	*Unit*	**ES2132942-001**	**ES2132942-006**	**ES2132942-008**	**--------**	**--------**
				Result	Result	Result	----	----
EP080/071: Total Petroleum Hydrocarbons - Continued								
C10 - C14 Fraction	----	50	mg/kg	<50	<50	----	----	----
C15 - C28 Fraction	----	100	mg/kg	<100	<100	----	----	----
C29 - C36 Fraction	----	100	mg/kg	<100	<100	----	----	----
^ **C10 - C36 Fraction (sum)**	----	50	mg/kg	<50	<50	----	----	----
EP080/071: Total Recoverable Hydrocarbons - NEPM 2013 Fractions								
C6 - C10 Fraction	C6_C10	10	mg/kg	<10	<10	<10	----	----
^ **C6 - C10 Fraction minus BTEX (F1)**	C6_C10-BTEX	10	mg/kg	<10	<10	<10	----	----
>C10 - C16 Fraction	----	50	mg/kg	<50	<50	----	----	----
>C16 - C34 Fraction	----	100	mg/kg	<100	<100	----	----	----
>C34 - C40 Fraction	----	100	mg/kg	<100	<100	----	----	----
^ **>C10 - C40 Fraction (sum)**	----	50	mg/kg	<50	<50	----	----	----
^ **>C10 - C16 Fraction minus Naphthalene (F2)**	----	50	mg/kg	<50	<50	----	----	----
EP080: BTEXN								
Benzene	71-43-2	0.2	mg/kg	<0.2	<0.2	<0.2	----	----
Toluene	108-88-3	0.5	mg/kg	<0.5	<0.5	<0.5	----	----
Ethylbenzene	100-41-4	0.5	mg/kg	<0.5	<0.5	<0.5	----	----
meta- & para-Xylene	108-38-3 106-42-3	0.5	mg/kg	<0.5	<0.5	<0.5	----	----
ortho-Xylene	95-47-6	0.5	mg/kg	<0.5	<0.5	<0.5	----	----
^ **Sum of BTEX**	----	0.2	mg/kg	<0.2	<0.2	<0.2	----	----
^ **Total Xylenes**	----	0.5	mg/kg	<0.5	<0.5	<0.5	----	----
Naphthalene	91-20-3	1	mg/kg	<1	<1	<1	----	----
EP075(SIM)S: Phenolic Compound Surrogates								
Phenol-d6	13127-88-3	0.5	%	**93.9**	**88.2**	----	----	----
2-Chlorophenol-D4	93951-73-6	0.5	%	**92.4**	**88.4**	----	----	----
2.4.6-Tribromophenol	118-79-6	0.5	%	**76.9**	**71.1**	----	----	----
EP075(SIM)T: PAH Surrogates								
2-Fluorobiphenyl	321-60-8	0.5	%	**98.8**	**94.2**	----	----	----
Anthracene-d10	1719-06-8	0.5	%	**101**	**97.2**	----	----	----
4-Terphenyl-d14	1718-51-0	0.5	%	**99.7**	**94.6**	----	----	----
EP080S: TPH(V)/BTEX Surrogates								
1.2-Dichloroethane-D4	17060-07-0	0.2	%	**78.9**	**96.6**	**86.4**	----	----
Toluene-D8	2037-26-5	0.2	%	**74.6**	**93.2**	**84.0**	----	----

Analytical Results

Sub-Matrix: **SOIL** (Matrix: **SOIL)**			Sample ID	**BH17-0.05**	**BH17-6.0**	**QC300_210910**	**----**	**----**
			Sampling date / time	09-Sep-2021 00:00	10-Sep-2021 00:00	09-Sep-2021 00:00	----	----
Compound	CAS Number	LOR	Unit	**ES2132942-001**	**ES2132942-006**	**ES2132942-008**	**--------**	**--------**
				Result	Result	Result	----	----
EP080S: TPH(V)/BTEX Surrogates - Continued								
4-Bromofluorobenzene	460-00-4	0.2	%	**77.2**	**97.7**	**85.5**	**----**	**----**

Analytical Results

Sub-Matrix: **WATER** (Matrix: **WATER**)			*Sample ID*	**QC501-210910**	**----**	**----**	**----**	**----**
			Sampling date / time	10-Sep-2021 00:00	----	----	----	----
Compound	*CAS Number*	*LOR*	*Unit*	**ES2132942-009**	**--------**	**--------**	**--------**	**--------**
				Result	----	----	----	----
EG020T: Total Metals by ICP-MS								
Arsenic	7440-38-2	0.001	mg/L	<0.001	----	----	----	----
Cadmium	7440-43-9	0.0001	mg/L	<0.0001	----	----	----	----
Chromium	7440-47-3	0.001	mg/L	<0.001	----	----	----	----
Copper	7440-50-8	0.001	mg/L	<0.001	----	----	----	----
Lead	7439-92-1	0.001	mg/L	<0.001	----	----	----	----
Nickel	7440-02-0	0.001	mg/L	<0.001	----	----	----	----
Zinc	7440-66-6	0.005	mg/L	<0.005	----	----	----	----
EG035T: Total Recoverable Mercury by FIMS								
Mercury	7439-97-6	0.0001	mg/L	<0.0001	----	----	----	----
EP075(SIM)B: Polynuclear Aromatic Hydrocarbons								
Naphthalene	91-20-3	1.0	µg/L	<1.0	----	----	----	----
Acenaphthylene	208-96-8	1.0	µg/L	<1.0	----	----	----	----
Acenaphthene	83-32-9	1.0	µg/L	<1.0	----	----	----	----
Fluorene	86-73-7	1.0	µg/L	<1.0	----	----	----	----
Phenanthrene	85-01-8	1.0	µg/L	<1.0	----	----	----	----
Anthracene	120-12-7	1.0	µg/L	<1.0	----	----	----	----
Fluoranthene	206-44-0	1.0	µg/L	<1.0	----	----	----	----
Pyrene	129-00-0	1.0	µg/L	<1.0	----	----	----	----
Benz(a)anthracene	56-55-3	1.0	µg/L	<1.0	----	----	----	----
Chrysene	218-01-9	1.0	µg/L	<1.0	----	----	----	----
Benzo(b+j)fluoranthene	205-99-2 205-82-3	1.0	µg/L	<1.0	----	----	----	----
Benzo(k)fluoranthene	207-08-9	1.0	µg/L	<1.0	----	----	----	----
Benzo(a)pyrene	50-32-8	0.5	µg/L	<0.5	----	----	----	----
Indeno(1.2.3.cd)pyrene	193-39-5	1.0	µg/L	<1.0	----	----	----	----
Dibenz(a.h)anthracene	53-70-3	1.0	µg/L	<1.0	----	----	----	----
Benzo(g.h.i)perylene	191-24-2	1.0	µg/L	<1.0	----	----	----	----
^ **Sum of polycyclic aromatic hydrocarbons**	----	0.5	µg/L	<0.5	----	----	----	----
^ **Benzo(a)pyrene TEQ (zero)**	----	0.5	µg/L	<0.5	----	----	----	----
EP080/071: Total Petroleum Hydrocarbons								
C6 - C9 Fraction	----	20	µg/L	<20	----	----	----	----
C10 - C14 Fraction	----	50	µg/L	<50	----	----	----	----
C15 - C28 Fraction	----	100	µg/L	<100	----	----	----	----
C29 - C36 Fraction	----	50	µg/L	<50	----	----	----	----
^ **C10 - C36 Fraction (sum)**	----	50	µg/L	<50	----	----	----	----

Analytical Results

Sub-Matrix: **WATER** (Matrix: **WATER**)			Sample ID	**QC501-210910**	----	----	----	----
			Sampling date / time	10-Sep-2021 00:00	----	----	----	----
Compound	CAS Number	LOR	Unit	**ES2132942-009**	--------	--------	--------	--------
				Result	----	----	----	----
EP080/071: Total Recoverable Hydrocarbons - NEPM 2013 Fractions								
C6 - C10 Fraction	C6_C10	20	µg/L	<20	----	----	----	----
^ **C6 - C10 Fraction minus BTEX (F1)**	C6_C10-BTEX	20	µg/L	<20	----	----	----	----
>C10 - C16 Fraction	----	100	µg/L	<100	----	----	----	----
>C16 - C34 Fraction	----	100	µg/L	<100	----	----	----	----
>C34 - C40 Fraction	----	100	µg/L	<100	----	----	----	----
^ **>C10 - C40 Fraction (sum)**	----	100	µg/L	<100	----	----	----	----
^ **>C10 - C16 Fraction minus Naphthalene (F2)**	----	100	µg/L	<100	----	----	----	----
EP080: BTEXN								
Benzene	71-43-2	1	µg/L	<1	----	----	----	----
Toluene	108-88-3	2	µg/L	<2	----	----	----	----
Ethylbenzene	100-41-4	2	µg/L	<2	----	----	----	----
meta- & para-Xylene	108-38-3 106-42-3	2	µg/L	<2	----	----	----	----
ortho-Xylene	95-47-6	2	µg/L	<2	----	----	----	----
^ **Total Xylenes**	----	2	µg/L	<2	----	----	----	----
^ **Sum of BTEX**	----	1	µg/L	<1	----	----	----	----
Naphthalene	91-20-3	5	µg/L	<5	----	----	----	----
EP075(SIM)S: Phenolic Compound Surrogates								
Phenol-d6	13127-88-3	1.0	%	**21.8**	----	----	----	----
2-Chlorophenol-D4	93951-73-6	1.0	%	**56.7**	----	----	----	----
2.4.6-Tribromophenol	118-79-6	1.0	%	**40.2**	----	----	----	----
EP075(SIM)T: PAH Surrogates								
2-Fluorobiphenyl	321-60-8	1.0	%	**77.6**	----	----	----	----
Anthracene-d10	1719-06-8	1.0	%	**73.7**	----	----	----	----
4-Terphenyl-d14	1718-51-0	1.0	%	**85.5**	----	----	----	----
EP080S: TPH(V)/BTEX Surrogates								
1.2-Dichloroethane-D4	17060-07-0	2	%	**105**	----	----	----	----
Toluene-D8	2037-26-5	2	%	**92.2**	----	----	----	----
4-Bromofluorobenzene	460-00-4	2	%	**89.9**	----	----	----	----

Surrogate Control Limits

Sub-Matrix: **SOIL**

Compound	*CAS Number*	*Recovery Limits (%)* Low	*Recovery Limits (%)* High
EP075(SIM)S: Phenolic Compound Surrogates			
Phenol-d6	13127-88-3	63	123
2-Chlorophenol-D4	93951-73-6	66	122
2.4.6-Tribromophenol	118-79-6	40	138
EP075(SIM)T: PAH Surrogates			
2-Fluorobiphenyl	321-60-8	70	122
Anthracene-d10	1719-06-8	66	128
4-Terphenyl-d14	1718-51-0	65	129
EP080S: TPH(V)/BTEX Surrogates			
1.2-Dichloroethane-D4	17060-07-0	73	133
Toluene-D8	2037-26-5	74	132
4-Bromofluorobenzene	460-00-4	72	130

Sub-Matrix: **WATER**

Compound	*CAS Number*	*Recovery Limits (%)* Low	*Recovery Limits (%)* High
EP075(SIM)S: Phenolic Compound Surrogates			
Phenol-d6	13127-88-3	10	44
2-Chlorophenol-D4	93951-73-6	14	94
2.4.6-Tribromophenol	118-79-6	17	125
EP075(SIM)T: PAH Surrogates			
2-Fluorobiphenyl	321-60-8	20	104
Anthracene-d10	1719-06-8	27	113
4-Terphenyl-d14	1718-51-0	32	112
EP080S: TPH(V)/BTEX Surrogates			
1.2-Dichloroethane-D4	17060-07-0	71	137
Toluene-D8	2037-26-5	79	131
4-Bromofluorobenzene	460-00-4	70	128

QUALITY CONTROL REPORT

Work Order	: **ES2132942**	Page	: 1 of 10
Client	: **Jacobs Arcadis Joint Venture**	Laboratory	: Environmental Division Sydney
Contact	: Amanda Mullen	Contact	: Customer Services ES
Address	: Level 16 580 George Street Sydney 2000	Address	: 277-289 Woodpark Road Smithfield NSW Australia 2164
Telephone	: ----	Telephone	: +61-2-8784 8555
Project	: IA254001	Date Samples Received	: 10-Sep-2021
Order number	: ----	Date Analysis Commenced	: 14-Sep-2021
C-O-C number	: ----	Issue Date	: 24-Sep-2021
Sampler	: Nick Keatley		
Site	: ----		
Quote number	: EN/222		
No. of samples received	: 9		
No. of samples analysed	: 4		

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

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

This Quality Control Report contains the following information:

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

Signatories

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

Signatories	*Position*	*Accreditation Category*
Edwandy Fadjar	Organic Coordinator	Sydney Organics, Smithfield, NSW
Ivan Taylor	Analyst	Sydney Inorganics, Smithfield, NSW

General Comments

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

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

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

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

Laboratory Duplicate (DUP) Report

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

Sub-Matrix: **SOIL**

				Laboratory Duplicate (DUP) Report					
Laboratory sample ID	*Sample ID*	*Method: Compound*	*CAS Number*	*LOR*	*Unit*	*Original Result*	*Duplicate Result*	*RPD (%)*	*Acceptable RPD (%)*
EG005(ED093)T: Total Metals by ICP-AES (QC Lot: 3903818)									
ES2133013-018	Anonymous	EG005T: Cadmium	7440-43-9	1	mg/kg	<1	<1	0.0	No Limit
		EG005T: Chromium	7440-47-3	2	mg/kg	7	6	0.0	No Limit
		EG005T: Nickel	7440-02-0	2	mg/kg	43	48	10.1	0% - 20%
		EG005T: Arsenic	7440-38-2	5	mg/kg	<5	<5	0.0	No Limit
		EG005T: Copper	7440-50-8	5	mg/kg	15	18	16.1	No Limit
		EG005T: Lead	7439-92-1	5	mg/kg	14	12	16.0	No Limit
		EG005T: Zinc	7440-66-6	5	mg/kg	9	9	0.0	No Limit
ES2133013-003	Anonymous	EG005T: Cadmium	7440-43-9	1	mg/kg	<1	<1	0.0	No Limit
		EG005T: Chromium	7440-47-3	2	mg/kg	10	10	0.0	No Limit
		EG005T: Nickel	7440-02-0	2	mg/kg	11	7	39.2	No Limit
		EG005T: Arsenic	7440-38-2	5	mg/kg	<5	<5	0.0	No Limit
		EG005T: Copper	7440-50-8	5	mg/kg	14	13	11.4	No Limit
		EG005T: Lead	7439-92-1	5	mg/kg	38	38	0.0	No Limit
		EG005T: Zinc	7440-66-6	5	mg/kg	58	57	3.1	0% - 50%
EA055: Moisture Content (Dried @ 105-110°C) (QC Lot: 3903822)									
ES2133013-001	Anonymous	EA055: Moisture Content	----	0.1	%	6.1	5.2	14.9	No Limit
ES2133013-027	Anonymous	EA055: Moisture Content	----	0.1	%	9.9	9.1	8.4	No Limit
EG035T: Total Recoverable Mercury by FIMS (QC Lot: 3903819)									
ES2133013-018	Anonymous	EG035T: Mercury	7439-97-6	0.1	mg/kg	<0.1	<0.1	0.0	No Limit
ES2133013-003	Anonymous	EG035T: Mercury	7439-97-6	0.1	mg/kg	<0.1	<0.1	0.0	No Limit
EP075(SIM)B: Polynuclear Aromatic Hydrocarbons (QC Lot: 3899302)									
ES2132801-001	Anonymous	EP075(SIM): Naphthalene	91-20-3	0.5	mg/kg	<0.5	<0.5	0.0	No Limit
		EP075(SIM): Acenaphthylene	208-96-8	0.5	mg/kg	<0.5	<0.5	0.0	No Limit

Sub-Matrix: **SOIL**

				Laboratory Duplicate (DUP) Report					
Laboratory sample ID	*Sample ID*	*Method: Compound*	*CAS Number*	*LOR*	*Unit*	*Original Result*	*Duplicate Result*	*RPD (%)*	*Acceptable RPD (%)*
EP075(SIM)B: Polynuclear Aromatic Hydrocarbons (QC Lot: 3899302) - continued									
ES2132801-001	Anonymous	EP075(SIM): Acenaphthene	83-32-9	0.5	mg/kg	<0.5	<0.5	0.0	No Limit
		EP075(SIM): Fluorene	86-73-7	0.5	mg/kg	<0.5	<0.5	0.0	No Limit
		EP075(SIM): Phenanthrene	85-01-8	0.5	mg/kg	<0.5	<0.5	0.0	No Limit
		EP075(SIM): Anthracene	120-12-7	0.5	mg/kg	<0.5	<0.5	0.0	No Limit
		EP075(SIM): Fluoranthene	206-44-0	0.5	mg/kg	<0.5	<0.5	0.0	No Limit
		EP075(SIM): Pyrene	129-00-0	0.5	mg/kg	<0.5	<0.5	0.0	No Limit
		EP075(SIM): Benz(a)anthracene	56-55-3	0.5	mg/kg	<0.5	<0.5	0.0	No Limit
		EP075(SIM): Chrysene	218-01-9	0.5	mg/kg	<0.5	<0.5	0.0	No Limit
		EP075(SIM): Benzo(b+j)fluoranthene	205-99-2 205-82-3	0.5	mg/kg	<0.5	<0.5	0.0	No Limit
		EP075(SIM): Benzo(k)fluoranthene	207-08-9	0.5	mg/kg	<0.5	<0.5	0.0	No Limit
		EP075(SIM): Benzo(a)pyrene	50-32-8	0.5	mg/kg	<0.5	<0.5	0.0	No Limit
		EP075(SIM): Indeno(1.2.3.cd)pyrene	193-39-5	0.5	mg/kg	<0.5	<0.5	0.0	No Limit
		EP075(SIM): Dibenz(a.h)anthracene	53-70-3	0.5	mg/kg	<0.5	<0.5	0.0	No Limit
		EP075(SIM): Benzo(g.h.i)perylene	191-24-2	0.5	mg/kg	<0.5	<0.5	0.0	No Limit
		EP075(SIM): Sum of polycyclic aromatic hydrocarbons	----	0.5	mg/kg	<0.5	<0.5	0.0	No Limit
		EP075(SIM): Benzo(a)pyrene TEQ (zero)	----	0.5	mg/kg	<0.5	<0.5	0.0	No Limit
ES2132944-003	Anonymous	EP075(SIM): Naphthalene	91-20-3	0.5	mg/kg	<0.5	<0.5	0.0	No Limit
		EP075(SIM): Acenaphthylene	208-96-8	0.5	mg/kg	<0.5	<0.5	0.0	No Limit
		EP075(SIM): Acenaphthene	83-32-9	0.5	mg/kg	<0.5	<0.5	0.0	No Limit
		EP075(SIM): Fluorene	86-73-7	0.5	mg/kg	<0.5	<0.5	0.0	No Limit
		EP075(SIM): Phenanthrene	85-01-8	0.5	mg/kg	<0.5	<0.5	0.0	No Limit
		EP075(SIM): Anthracene	120-12-7	0.5	mg/kg	<0.5	<0.5	0.0	No Limit
		EP075(SIM): Fluoranthene	206-44-0	0.5	mg/kg	1.4	1.4	0.0	No Limit
		EP075(SIM): Pyrene	129-00-0	0.5	mg/kg	1.3	1.2	0.0	No Limit
		EP075(SIM): Benz(a)anthracene	56-55-3	0.5	mg/kg	0.6	0.5	0.0	No Limit
		EP075(SIM): Chrysene	218-01-9	0.5	mg/kg	<0.5	<0.5	0.0	No Limit
		EP075(SIM): Benzo(b+j)fluoranthene	205-99-2 205-82-3	0.5	mg/kg	0.8	0.8	0.0	No Limit
		EP075(SIM): Benzo(k)fluoranthene	207-08-9	0.5	mg/kg	<0.5	<0.5	0.0	No Limit
		EP075(SIM): Benzo(a)pyrene	50-32-8	0.5	mg/kg	0.6	0.5	0.0	No Limit
		EP075(SIM): Indeno(1.2.3.cd)pyrene	193-39-5	0.5	mg/kg	<0.5	<0.5	0.0	No Limit
		EP075(SIM): Dibenz(a.h)anthracene	53-70-3	0.5	mg/kg	<0.5	<0.5	0.0	No Limit
		EP075(SIM): Benzo(g.h.i)perylene	191-24-2	0.5	mg/kg	0.6	0.5	0.0	No Limit
		EP075(SIM): Sum of polycyclic aromatic hydrocarbons	----	0.5	mg/kg	5.3	4.9	7.8	0% - 50%
		EP075(SIM): Benzo(a)pyrene TEQ (zero)	----	0.5	mg/kg	0.7	0.6	16.1	No Limit
EP080/071: Total Petroleum Hydrocarbons (QC Lot: 3899301)									
ES2132801-001	Anonymous	EP071: C15 - C28 Fraction	----	100	mg/kg	<100	<100	0.0	No Limit

Sub-Matrix: **SOIL**

				Laboratory Duplicate (DUP) Report					
Laboratory sample ID	*Sample ID*	*Method: Compound*	*CAS Number*	*LOR*	*Unit*	*Original Result*	*Duplicate Result*	*RPD (%)*	*Acceptable RPD (%)*
EP080/071: Total Petroleum Hydrocarbons (QC Lot: 3899301) - continued									
ES2132801-001	Anonymous	EP071: C29 - C36 Fraction	----	100	mg/kg	<100	<100	0.0	No Limit
		EP071: C10 - C14 Fraction	----	50	mg/kg	<50	<50	0.0	No Limit
ES2132944-003	Anonymous	EP071: C15 - C28 Fraction	----	100	mg/kg	<100	<100	0.0	No Limit
		EP071: C29 - C36 Fraction	----	100	mg/kg	<100	<100	0.0	No Limit
		EP071: C10 - C14 Fraction	----	50	mg/kg	<50	<50	0.0	No Limit
EP080/071: Total Petroleum Hydrocarbons (QC Lot: 3900151)									
ES2132942-001	BH17-0.05	EP080: C6 - C9 Fraction	----	10	mg/kg	<10	<10	0.0	No Limit
ES2132895-012	Anonymous	EP080: C6 - C9 Fraction	----	10	mg/kg	<10	<10	0.0	No Limit
EP080/071: Total Recoverable Hydrocarbons - NEPM 2013 Fractions (QC Lot: 3899301)									
ES2132801-001	Anonymous	EP071: >C16 - C34 Fraction	----	100	mg/kg	<100	<100	0.0	No Limit
		EP071: >C34 - C40 Fraction	----	100	mg/kg	<100	<100	0.0	No Limit
		EP071: >C10 - C16 Fraction	----	50	mg/kg	<50	<50	0.0	No Limit
ES2132944-003	Anonymous	EP071: >C16 - C34 Fraction	----	100	mg/kg	<100	<100	0.0	No Limit
		EP071: >C34 - C40 Fraction	----	100	mg/kg	<100	<100	0.0	No Limit
		EP071: >C10 - C16 Fraction	----	50	mg/kg	<50	<50	0.0	No Limit
EP080/071: Total Recoverable Hydrocarbons - NEPM 2013 Fractions (QC Lot: 3900151)									
ES2132942-001	BH17-0.05	EP080: C6 - C10 Fraction	C6_C10	10	mg/kg	<10	<10	0.0	No Limit
ES2132895-012	Anonymous	EP080: C6 - C10 Fraction	C6_C10	10	mg/kg	<10	<10	0.0	No Limit
EP080: BTEXN (QC Lot: 3900151)									
ES2132942-001	BH17-0.05	EP080: Benzene	71-43-2	0.2	mg/kg	<0.2	<0.2	0.0	No Limit
		EP080: Toluene	108-88-3	0.5	mg/kg	<0.5	<0.5	0.0	No Limit
		EP080: Ethylbenzene	100-41-4	0.5	mg/kg	<0.5	<0.5	0.0	No Limit
		EP080: meta- & para-Xylene	108-38-3 106-42-3	0.5	mg/kg	<0.5	<0.5	0.0	No Limit
		EP080: ortho-Xylene	95-47-6	0.5	mg/kg	<0.5	<0.5	0.0	No Limit
		EP080: Naphthalene	91-20-3	1	mg/kg	<1	<1	0.0	No Limit
ES2132895-012	Anonymous	EP080: Benzene	71-43-2	0.2	mg/kg	<0.2	<0.2	0.0	No Limit
		EP080: Toluene	108-88-3	0.5	mg/kg	<0.5	<0.5	0.0	No Limit
		EP080: Ethylbenzene	100-41-4	0.5	mg/kg	<0.5	<0.5	0.0	No Limit
		EP080: meta- & para-Xylene	108-38-3 106-42-3	0.5	mg/kg	<0.5	<0.5	0.0	No Limit
		EP080: ortho-Xylene	95-47-6	0.5	mg/kg	<0.5	<0.5	0.0	No Limit
		EP080: Naphthalene	91-20-3	1	mg/kg	<1	<1	0.0	No Limit

Sub-Matrix: **WATER**

				Laboratory Duplicate (DUP) Report					
Laboratory sample ID	*Sample ID*	*Method: Compound*	*CAS Number*	*LOR*	*Unit*	*Original Result*	*Duplicate Result*	*RPD (%)*	*Acceptable RPD (%)*
EG020T: Total Metals by ICP-MS (QC Lot: 3899943)									
ES2132918-002	Anonymous	EG020A-T: Cadmium	7440-43-9	0.0001	mg/L	<0.0001	<0.0001	0.0	No Limit
		EG020A-T: Arsenic	7440-38-2	0.001	mg/L	<0.001	<0.001	0.0	No Limit
		EG020A-T: Chromium	7440-47-3	0.001	mg/L	<0.001	<0.001	0.0	No Limit

Sub-Matrix: **WATER**

				Laboratory Duplicate (DUP) Report					
Laboratory sample ID	*Sample ID*	*Method: Compound*	*CAS Number*	*LOR*	*Unit*	*Original Result*	*Duplicate Result*	*RPD (%)*	*Acceptable RPD (%)*
EG020T: Total Metals by ICP-MS (QC Lot: 3899943) - continued									
ES2132918-002	Anonymous	EG020A-T: Copper	7440-50-8	0.001	mg/L	0.004	0.004	0.0	No Limit
		EG020A-T: Lead	7439-92-1	0.001	mg/L	<0.001	<0.001	0.0	No Limit
		EG020A-T: Nickel	7440-02-0	0.001	mg/L	<0.001	<0.001	0.0	No Limit
		EG020A-T: Zinc	7440-66-6	0.005	mg/L	0.011	0.012	9.9	No Limit
ES2132664-002	Anonymous	EG020A-T: Cadmium	7440-43-9	0.0001	mg/L	<0.0001	<0.0001	0.0	No Limit
		EG020A-T: Arsenic	7440-38-2	0.001	mg/L	0.004	0.004	0.0	No Limit
		EG020A-T: Chromium	7440-47-3	0.001	mg/L	0.035	0.034	0.0	0% - 20%
		EG020A-T: Copper	7440-50-8	0.001	mg/L	0.012	0.013	0.0	0% - 50%
		EG020A-T: Lead	7439-92-1	0.001	mg/L	0.004	0.004	0.0	No Limit
		EG020A-T: Nickel	7440-02-0	0.001	mg/L	0.032	0.032	0.0	0% - 20%
		EG020A-T: Zinc	7440-66-6	0.005	mg/L	0.031	0.030	0.0	No Limit
EG035T: Total Recoverable Mercury by FIMS (QC Lot: 3899878)									
ES2132601-013	Anonymous	EG035T: Mercury	7439-97-6	0.0001	mg/L	<0.0001	<0.0001	0.0	No Limit
EP080/071: Total Petroleum Hydrocarbons (QC Lot: 3899062)									
ES2132980-001	Anonymous	EP080: C6 - C9 Fraction	----	20	µg/L	<20	<20	0.0	No Limit
ES2132980-009	Anonymous	EP080: C6 - C9 Fraction	----	20	µg/L	1040	1050	0.0	0% - 20%
EP080/071: Total Recoverable Hydrocarbons - NEPM 2013 Fractions (QC Lot: 3899062)									
ES2132980-001	Anonymous	EP080: C6 - C10 Fraction	C6_C10	20	µg/L	<20	<20	0.0	No Limit
ES2132980-009	Anonymous	EP080: C6 - C10 Fraction	C6_C10	20	µg/L	360	360	0.0	0% - 50%
EP080: BTEXN (QC Lot: 3899062)									
ES2132980-001	Anonymous	EP080: Benzene	71-43-2	1	µg/L	<1	<1	0.0	No Limit
		EP080: Toluene	108-88-3	2	µg/L	<2	<2	0.0	No Limit
		EP080: Ethylbenzene	100-41-4	2	µg/L	<2	<2	0.0	No Limit
		EP080: meta- & para-Xylene	108-38-3 106-42-3	2	µg/L	<2	<2	0.0	No Limit
		EP080: ortho-Xylene	95-47-6	2	µg/L	<2	<2	0.0	No Limit
		EP080: Naphthalene	91-20-3	5	µg/L	<5	<5	0.0	No Limit
ES2132980-009	Anonymous	EP080: Benzene	71-43-2	1	µg/L	120	120	0.0	0% - 20%
		EP080: Toluene	108-88-3	2	µg/L	3	3	0.0	No Limit
		EP080: Ethylbenzene	100-41-4	2	µg/L	<2	<2	0.0	No Limit
		EP080: meta- & para-Xylene	108-38-3 106-42-3	2	µg/L	3	3	0.0	No Limit
		EP080: ortho-Xylene	95-47-6	2	µg/L	<2	<2	0.0	No Limit
		EP080: Naphthalene	91-20-3	5	µg/L	<5	<5	0.0	No Limit

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

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

Sub-Matrix: **SOIL**

				Method Blank (MB) Report	*Laboratory Control Spike (LCS) Report*			
					Spike	*Spike Recovery (%)*	*Acceptable Limits (%)*	
Method: Compound	*CAS Number*	*LOR*	*Unit*	*Result*	*Concentration*	*LCS*	*Low*	*High*
EG005(ED093)T: Total Metals by ICP-AES (QCLot: 3903818)								
EG005T: Arsenic	7440-38-2	5	mg/kg	<5	121.1 mg/kg	104	88.0	113
EG005T: Cadmium	7440-43-9	1	mg/kg	<1	0.74 mg/kg	104	70.0	130
EG005T: Chromium	7440-47-3	2	mg/kg	<2	19.6 mg/kg	116	68.0	132
EG005T: Copper	7440-50-8	5	mg/kg	<5	52.9 mg/kg	111	89.0	111
EG005T: Lead	7439-92-1	5	mg/kg	<5	60.8 mg/kg	92.8	82.0	119
EG005T: Nickel	7440-02-0	2	mg/kg	<2	15.3 mg/kg	103	80.0	120
EG005T: Zinc	7440-66-6	5	mg/kg	<5	139.3 mg/kg	97.2	66.0	133
EG035T: Total Recoverable Mercury by FIMS (QCLot: 3903819)								
EG035T: Mercury	7439-97-6	0.1	mg/kg	<0.1	0.087 mg/kg	103	70.0	125
EP075(SIM)B: Polynuclear Aromatic Hydrocarbons (QCLot: 3899302)								
EP075(SIM): Naphthalene	91-20-3	0.5	mg/kg	<0.5	6 mg/kg	90.1	77.0	125
EP075(SIM): Acenaphthylene	208-96-8	0.5	mg/kg	<0.5	6 mg/kg	88.1	72.0	124
EP075(SIM): Acenaphthene	83-32-9	0.5	mg/kg	<0.5	6 mg/kg	91.6	73.0	127
EP075(SIM): Fluorene	86-73-7	0.5	mg/kg	<0.5	6 mg/kg	88.5	72.0	126
EP075(SIM): Phenanthrene	85-01-8	0.5	mg/kg	<0.5	6 mg/kg	90.0	75.0	127
EP075(SIM): Anthracene	120-12-7	0.5	mg/kg	<0.5	6 mg/kg	93.2	77.0	127
EP075(SIM): Fluoranthene	206-44-0	0.5	mg/kg	<0.5	6 mg/kg	93.6	73.0	127
EP075(SIM): Pyrene	129-00-0	0.5	mg/kg	<0.5	6 mg/kg	92.7	74.0	128
EP075(SIM): Benz(a)anthracene	56-55-3	0.5	mg/kg	<0.5	6 mg/kg	84.1	69.0	123
EP075(SIM): Chrysene	218-01-9	0.5	mg/kg	<0.5	6 mg/kg	90.7	75.0	127
EP075(SIM): Benzo(b+j)fluoranthene	205-99-2 205-82-3	0.5	mg/kg	<0.5	6 mg/kg	85.1	68.0	116
EP075(SIM): Benzo(k)fluoranthene	207-08-9	0.5	mg/kg	<0.5	6 mg/kg	92.0	74.0	126
EP075(SIM): Benzo(a)pyrene	50-32-8	0.5	mg/kg	<0.5	6 mg/kg	90.1	70.0	126
EP075(SIM): Indeno(1.2.3.cd)pyrene	193-39-5	0.5	mg/kg	<0.5	6 mg/kg	81.7	61.0	121
EP075(SIM): Dibenz(a.h)anthracene	53-70-3	0.5	mg/kg	<0.5	6 mg/kg	85.3	62.0	118
EP075(SIM): Benzo(g.h.i)perylene	191-24-2	0.5	mg/kg	<0.5	6 mg/kg	84.4	63.0	121
EP080/071: Total Petroleum Hydrocarbons (QCLot: 3899301)								
EP071: C10 - C14 Fraction	----	50	mg/kg	<50	300 mg/kg	107	75.0	129
EP071: C15 - C28 Fraction	----	100	mg/kg	<100	450 mg/kg	101	77.0	131
EP071: C29 - C36 Fraction	----	100	mg/kg	<100	300 mg/kg	104	71.0	129
EP080/071: Total Petroleum Hydrocarbons (QCLot: 3900151)								
EP080: C6 - C9 Fraction	----	10	mg/kg	<10	26 mg/kg	85.7	68.4	128
EP080/071: Total Recoverable Hydrocarbons - NEPM 2013 Fractions (QCLot: 3899301)								

Sub-Matrix: **SOIL**

Method: Compound	CAS Number	LOR	Unit	Method Blank (MB) Report	Laboratory Control Spike (LCS) Report			
				Result	Spike Concentration	Spike Recovery (%) LCS	Acceptable Limits (%) Low	High
EP080/071: Total Recoverable Hydrocarbons - NEPM 2013 Fractions (QCLot: 3899301) - continued								
EP071: >C10 - C16 Fraction	----	50	mg/kg	<50	375 mg/kg	103	77.0	125
EP071: >C16 - C34 Fraction	----	100	mg/kg	<100	525 mg/kg	100	74.0	138
EP071: >C34 - C40 Fraction	----	100	mg/kg	<100	225 mg/kg	102	63.0	131
EP080/071: Total Recoverable Hydrocarbons - NEPM 2013 Fractions (QCLot: 3900151)								
EP080: C6 - C10 Fraction	C6_C10	10	mg/kg	<10	31 mg/kg	85.8	68.4	128
EP080: BTEXN (QCLot: 3900151)								
EP080: Benzene	71-43-2	0.2	mg/kg	<0.2	1 mg/kg	95.1	62.0	116
EP080: Toluene	108-88-3	0.5	mg/kg	<0.5	1 mg/kg	95.8	67.0	121
EP080: Ethylbenzene	100-41-4	0.5	mg/kg	<0.5	1 mg/kg	90.5	65.0	117
EP080: meta- & para-Xylene	108-38-3 106-42-3	0.5	mg/kg	<0.5	2 mg/kg	94.0	66.0	118
EP080: ortho-Xylene	95-47-6	0.5	mg/kg	<0.5	1 mg/kg	92.7	68.0	120
EP080: Naphthalene	91-20-3	1	mg/kg	<1	1 mg/kg	84.1	63.0	119

Sub-Matrix: **WATER**

Method: Compound	CAS Number	LOR	Unit	Method Blank (MB) Report	Laboratory Control Spike (LCS) Report			
				Result	Spike Concentration	Spike Recovery (%) LCS	Acceptable Limits (%) Low	High
EG020T: Total Metals by ICP-MS (QCLot: 3899943)								
EG020A-T: Arsenic	7440-38-2	0.001	mg/L	<0.001	0.1 mg/L	92.7	82.0	114
EG020A-T: Cadmium	7440-43-9	0.0001	mg/L	<0.0001	0.1 mg/L	89.5	84.0	112
EG020A-T: Chromium	7440-47-3	0.001	mg/L	<0.001	0.1 mg/L	90.2	86.0	116
EG020A-T: Copper	7440-50-8	0.001	mg/L	<0.001	0.1 mg/L	91.0	83.0	118
EG020A-T: Lead	7439-92-1	0.001	mg/L	<0.001	0.1 mg/L	89.5	85.0	115
EG020A-T: Nickel	7440-02-0	0.001	mg/L	<0.001	0.1 mg/L	90.6	84.0	116
EG020A-T: Zinc	7440-66-6	0.005	mg/L	<0.005	0.1 mg/L	95.2	79.0	117
EG035T: Total Recoverable Mercury by FIMS (QCLot: 3899878)								
EG035T: Mercury	7439-97-6	0.0001	mg/L	<0.0001	0.01 mg/L	97.8	77.0	111
EP075(SIM)B: Polynuclear Aromatic Hydrocarbons (QCLot: 3899269)								
EP075(SIM): Naphthalene	91-20-3	1	µg/L	<1.0	5 µg/L	72.5	50.0	94.0
EP075(SIM): Acenaphthylene	208-96-8	1	µg/L	<1.0	5 µg/L	85.9	63.6	114
EP075(SIM): Acenaphthene	83-32-9	1	µg/L	<1.0	5 µg/L	79.8	62.2	113
EP075(SIM): Fluorene	86-73-7	1	µg/L	<1.0	5 µg/L	86.5	63.9	115
EP075(SIM): Phenanthrene	85-01-8	1	µg/L	<1.0	5 µg/L	94.1	62.6	116
EP075(SIM): Anthracene	120-12-7	1	µg/L	<1.0	5 µg/L	86.5	64.3	116
EP075(SIM): Fluoranthene	206-44-0	1	µg/L	<1.0	5 µg/L	90.6	63.6	118
EP075(SIM): Pyrene	129-00-0	1	µg/L	<1.0	5 µg/L	90.8	63.1	118
EP075(SIM): Benz(a)anthracene	56-55-3	1	µg/L	<1.0	5 µg/L	88.1	64.1	117
EP075(SIM): Chrysene	218-01-9	1	µg/L	<1.0	5 µg/L	99.5	62.5	116

Sub-Matrix: **WATER**

				Method Blank (MB) Report	Laboratory Control Spike (LCS) Report			
					Spike	Spike Recovery (%)	Acceptable Limits (%)	
Method: Compound	*CAS Number*	*LOR*	*Unit*	*Result*	*Concentration*	*LCS*	*Low*	*High*
EP075(SIM)B: Polynuclear Aromatic Hydrocarbons (QCLot: 3899269) - continued								
EP075(SIM): Benzo(b+j)fluoranthene	205-99-2 205-82-3	1	µg/L	<1.0	5 µg/L	95.3	61.7	119
EP075(SIM): Benzo(k)fluoranthene	207-08-9	1	µg/L	<1.0	5 µg/L	98.1	63.0	115
EP075(SIM): Benzo(a)pyrene	50-32-8	0.5	µg/L	<0.5	5 µg/L	94.7	63.3	117
EP075(SIM): Indeno(1.2.3.cd)pyrene	193-39-5	1	µg/L	<1.0	5 µg/L	97.5	59.9	118
EP075(SIM): Dibenz(a.h)anthracene	53-70-3	1	µg/L	<1.0	5 µg/L	97.2	61.2	117
EP075(SIM): Benzo(g.h.i)perylene	191-24-2	1	µg/L	<1.0	5 µg/L	91.7	59.1	118
EP080/071: Total Petroleum Hydrocarbons (QCLot: 3899062)								
EP080: C6 - C9 Fraction	----	20	µg/L	<20	260 µg/L	76.6	75.0	127
EP080/071: Total Petroleum Hydrocarbons (QCLot: 3899270)								
EP071: C10 - C14 Fraction	----	50	µg/L	<50	400 µg/L	70.0	55.8	112
EP071: C15 - C28 Fraction	----	100	µg/L	<100	600 µg/L	99.4	71.6	113
EP071: C29 - C36 Fraction	----	50	µg/L	<50	400 µg/L	107	56.0	121
EP080/071: Total Recoverable Hydrocarbons - NEPM 2013 Fractions (QCLot: 3899062)								
EP080: C6 - C10 Fraction	C6_C10	20	µg/L	<20	310 µg/L	79.0	75.0	127
EP080/071: Total Recoverable Hydrocarbons - NEPM 2013 Fractions (QCLot: 3899270)								
EP071: >C10 - C16 Fraction	----	100	µg/L	<100	500 µg/L	73.8	57.9	119
EP071: >C16 - C34 Fraction	----	100	µg/L	<100	700 µg/L	87.3	62.5	110
EP071: >C34 - C40 Fraction	----	100	µg/L	<100	300 µg/L	71.3	61.5	121
EP080: BTEXN (QCLot: 3899062)								
EP080: Benzene	71-43-2	1	µg/L	<1	10 µg/L	97.4	70.0	122
EP080: Toluene	108-88-3	2	µg/L	<2	10 µg/L	91.6	69.0	123
EP080: Ethylbenzene	100-41-4	2	µg/L	<2	10 µg/L	87.3	70.0	120
EP080: meta- & para-Xylene	108-38-3 106-42-3	2	µg/L	<2	10 µg/L	85.0	69.0	121
EP080: ortho-Xylene	95-47-6	2	µg/L	<2	10 µg/L	90.0	72.0	122
EP080: Naphthalene	91-20-3	5	µg/L	<5	10 µg/L	89.5	70.0	120

Matrix Spike (MS) Report

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

Sub-Matrix: **SOIL**

				Matrix Spike (MS) Report			
				Spike	SpikeRecovery(%)	Acceptable Limits (%)	
Laboratory sample ID	*Sample ID*	*Method: Compound*	*CAS Number*	*Concentration*	*MS*	*Low*	*High*
EG005(ED093)T: Total Metals by ICP-AES (QCLot: 3903818)							
ES2133013-003	Anonymous	EG005T: Arsenic	7440-38-2	50 mg/kg	103	70.0	130
		EG005T: Cadmium	7440-43-9	50 mg/kg	97.4	70.0	130

Sub-Matrix: **SOIL**

				Matrix Spike (MS) Report			
				Spike	*SpikeRecovery(%)*	*Acceptable Limits (%)*	
Laboratory sample ID	*Sample ID*	*Method: Compound*	*CAS Number*	*Concentration*	*MS*	*Low*	*High*
EG005(ED093)T: Total Metals by ICP-AES (QCLot: 3903818) - continued							
ES2133013-003	Anonymous	EG005T: Chromium	7440-47-3	50 mg/kg	99.7	68.0	132
		EG005T: Copper	7440-50-8	250 mg/kg	104	70.0	130
		EG005T: Lead	7439-92-1	250 mg/kg	91.2	70.0	130
		EG005T: Nickel	7440-02-0	50 mg/kg	88.9	70.0	130
		EG005T: Zinc	7440-66-6	250 mg/kg	97.0	66.0	133
EG035T: Total Recoverable Mercury by FIMS (QCLot: 3903819)							
ES2133013-003	Anonymous	EG035T: Mercury	7439-97-6	5 mg/kg	100	70.0	130
EP075(SIM)B: Polynuclear Aromatic Hydrocarbons (QCLot: 3899302)							
ES2132801-001	Anonymous	EP075(SIM): Acenaphthene	83-32-9	10 mg/kg	89.0	70.0	130
		EP075(SIM): Pyrene	129-00-0	10 mg/kg	98.4	70.0	130
EP080/071: Total Petroleum Hydrocarbons (QCLot: 3899301)							
ES2132801-001	Anonymous	EP071: C10 - C14 Fraction	----	480 mg/kg	114	73.0	137
		EP071: C15 - C28 Fraction	----	3100 mg/kg	115	53.0	131
		EP071: C29 - C36 Fraction	----	2060 mg/kg	122	52.0	132
EP080/071: Total Petroleum Hydrocarbons (QCLot: 3900151)							
ES2132942-001	BH17-0.05	EP080: C6 - C9 Fraction	----	32.5 mg/kg	89.6	70.0	130
EP080/071: Total Recoverable Hydrocarbons - NEPM 2013 Fractions (QCLot: 3899301)							
ES2132801-001	Anonymous	EP071: >C10 - C16 Fraction	----	860 mg/kg	111	73.0	137
		EP071: >C16 - C34 Fraction	----	4320 mg/kg	116	53.0	131
		EP071: >C34 - C40 Fraction	----	890 mg/kg	122	52.0	132
EP080/071: Total Recoverable Hydrocarbons - NEPM 2013 Fractions (QCLot: 3900151)							
ES2132942-001	BH17-0.05	EP080: C6 - C10 Fraction	C6_C10	37.5 mg/kg	87.9	70.0	130
EP080: BTEXN (QCLot: 3900151)							
ES2132942-001	BH17-0.05	EP080: Benzene	71-43-2	2.5 mg/kg	93.5	70.0	130
		EP080: Toluene	108-88-3	2.5 mg/kg	94.4	70.0	130
		EP080: Ethylbenzene	100-41-4	2.5 mg/kg	86.8	70.0	130
		EP080: meta- & para-Xylene	108-38-3 106-42-3	2.5 mg/kg	92.8	70.0	130
		EP080: ortho-Xylene	95-47-6	2.5 mg/kg	93.6	70.0	130
		EP080: Naphthalene	91-20-3	2.5 mg/kg	93.9	70.0	130

Sub-Matrix: **WATER**

				Matrix Spike (MS) Report			
				Spike	*SpikeRecovery(%)*	*Acceptable Limits (%)*	
Laboratory sample ID	*Sample ID*	*Method: Compound*	*CAS Number*	*Concentration*	*MS*	*Low*	*High*
EG020T: Total Metals by ICP-MS (QCLot: 3899943)							
ES2132134-012	Anonymous	EG020A-T: Arsenic	7440-38-2	1 mg/L	92.9	70.0	130
		EG020A-T: Cadmium	7440-43-9	0.25 mg/L	90.6	70.0	130

Sub-Matrix: **WATER**

				Matrix Spike (MS) Report			
				Spike	SpikeRecovery(%)	Acceptable Limits (%)	
Laboratory sample ID	Sample ID	Method: Compound	CAS Number	Concentration	MS	Low	High
EG020T: Total Metals by ICP-MS (QCLot: 3899943) - continued							
ES2132134-012	Anonymous	EG020A-T: Chromium	7440-47-3	1 mg/L	93.4	70.0	130
		EG020A-T: Copper	7440-50-8	1 mg/L	93.8	70.0	130
		EG020A-T: Lead	7439-92-1	1 mg/L	93.2	70.0	130
		EG020A-T: Nickel	7440-02-0	1 mg/L	93.7	70.0	130
		EG020A-T: Zinc	7440-66-6	1 mg/L	92.9	70.0	130
EG035T: Total Recoverable Mercury by FIMS (QCLot: 3899878)							
ES2132664-002	Anonymous	EG035T: Mercury	7439-97-6	0.01 mg/L	90.6	70.0	130
EP080/071: Total Petroleum Hydrocarbons (QCLot: 3899062)							
ES2132980-001	Anonymous	EP080: C6 - C9 Fraction	----	325 µg/L	80.4	70.0	130
EP080/071: Total Recoverable Hydrocarbons - NEPM 2013 Fractions (QCLot: 3899062)							
ES2132980-001	Anonymous	EP080: C6 - C10 Fraction	C6_C10	375 µg/L	81.2	70.0	130
EP080: BTEXN (QCLot: 3899062)							
ES2132980-001	Anonymous	EP080: Benzene	71-43-2	25 µg/L	103	70.0	130
		EP080: Toluene	108-88-3	25 µg/L	96.0	70.0	130
		EP080: Ethylbenzene	100-41-4	25 µg/L	96.2	70.0	130
		EP080: meta- & para-Xylene	108-38-3 106-42-3	25 µg/L	93.9	70.0	130
		EP080: ortho-Xylene	95-47-6	25 µg/L	98.4	70.0	130
		EP080: Naphthalene	91-20-3	25 µg/L	90.6	70.0	130

QA/QC Compliance Assessment to assist with Quality Review

Work Order	: **ES2132942**	Page	: 1 of 8
Client	: **Jacobs Arcadis Joint Venture**	Laboratory	: Environmental Division Sydney
Contact	: Amanda Mullen	Telephone	: +61-2-8784 8555
Project	: IA254001	Date Samples Received	: 10-Sep-2021
Site	: ----	Issue Date	: 24-Sep-2021
Sampler	: Nick Keatley	No. of samples received	: 9
Order number	: ----	No. of samples analysed	: 4

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

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

Summary of Outliers

Outliers : Quality Control Samples

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

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

Outliers : Analysis Holding Time Compliance

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

Outliers : Frequency of Quality Control Samples

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

Outliers : Frequency of Quality Control Samples

Matrix: **WATER**

Method	Count		Rate (%)		Quality Control Specification
	QC	Regular	Actual	Expected	
PAH/Phenols (GC/MS - SIM)	0	9	0.00	10.00	NEPM 2013 B3 & ALS QC Standard
TRH - Semivolatile Fraction	0	9	0.00	10.00	NEPM 2013 B3 & ALS QC Standard
PAH/Phenols (GC/MS - SIM)	0	9	0.00	5.00	NEPM 2013 B3 & ALS QC Standard
TRH - Semivolatile Fraction	0	9	0.00	5.00	NEPM 2013 B3 & ALS QC Standard

Analysis Holding Time Compliance

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

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

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

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

Matrix: **SOIL**

Evaluation: × = Holding time breach ; ✓ = Within holding time.

Method ***Container*** */ Client Sample ID(s)*	***Sample Date***	*Extraction / Preparation*			*Analysis*		
		Date extracted	*Due for extraction*	*Evaluation*	***Date analysed***	*Due for analysis*	*Evaluation*
EA055: Moisture Content (Dried @ 105-110°C)							
Soil Glass Jar - Unpreserved (EA055) BH17-0.05	**09-Sep-2021**	**----**	----	----	**15-Sep-2021**	23-Sep-2021	✓
Soil Glass Jar - Unpreserved (EA055) BH17-6.0	**10-Sep-2021**	**----**	----	----	**15-Sep-2021**	24-Sep-2021	✓
EG005(ED093)T: Total Metals by ICP-AES							
Soil Glass Jar - Unpreserved (EG005T) BH17-0.05	**09-Sep-2021**	**15-Sep-2021**	08-Mar-2022	✓	**16-Sep-2021**	08-Mar-2022	✓
Soil Glass Jar - Unpreserved (EG005T) BH17-6.0	**10-Sep-2021**	**15-Sep-2021**	09-Mar-2022	✓	**16-Sep-2021**	09-Mar-2022	✓
EG035T: Total Recoverable Mercury by FIMS							
Soil Glass Jar - Unpreserved (EG035T) BH17-0.05	**09-Sep-2021**	**15-Sep-2021**	07-Oct-2021	✓	**16-Sep-2021**	07-Oct-2021	✓
Soil Glass Jar - Unpreserved (EG035T) BH17-6.0	**10-Sep-2021**	**15-Sep-2021**	08-Oct-2021	✓	**16-Sep-2021**	08-Oct-2021	✓
EP075(SIM)B: Polynuclear Aromatic Hydrocarbons							
Soil Glass Jar - Unpreserved (EP075(SIM)) BH17-0.05	**09-Sep-2021**	**15-Sep-2021**	23-Sep-2021	✓	**15-Sep-2021**	25-Oct-2021	✓
Soil Glass Jar - Unpreserved (EP075(SIM)) BH17-6.0	**10-Sep-2021**	**15-Sep-2021**	24-Sep-2021	✓	**15-Sep-2021**	25-Oct-2021	✓

Matrix: **SOIL**

Evaluation: × = Holding time breach ; ✓ = Within holding time.

Method	*Sample Date*	*Extraction / Preparation*			*Analysis*		
Container / Client Sample ID(s)		*Date extracted*	*Due for extraction*	*Evaluation*	*Date analysed*	*Due for analysis*	*Evaluation*
EP080/071: Total Petroleum Hydrocarbons							
Soil Glass Jar - Unpreserved (EP080) BH17-0.05, QC300_210910	**09-Sep-2021**	**14-Sep-2021**	23-Sep-2021	✓	**16-Sep-2021**	23-Sep-2021	✓
Soil Glass Jar - Unpreserved (EP071) BH17-0.05	**09-Sep-2021**	**15-Sep-2021**	23-Sep-2021	✓	**15-Sep-2021**	25-Oct-2021	✓
Soil Glass Jar - Unpreserved (EP080) BH17-6.0	**10-Sep-2021**	**14-Sep-2021**	24-Sep-2021	✓	**16-Sep-2021**	24-Sep-2021	✓
Soil Glass Jar - Unpreserved (EP071) BH17-6.0	**10-Sep-2021**	**15-Sep-2021**	24-Sep-2021	✓	**15-Sep-2021**	25-Oct-2021	✓
EP080/071: Total Recoverable Hydrocarbons - NEPM 2013 Fractions							
Soil Glass Jar - Unpreserved (EP080) BH17-0.05, QC300_210910	**09-Sep-2021**	**14-Sep-2021**	23-Sep-2021	✓	**16-Sep-2021**	23-Sep-2021	✓
Soil Glass Jar - Unpreserved (EP071) BH17-0.05	**09-Sep-2021**	**15-Sep-2021**	23-Sep-2021	✓	**15-Sep-2021**	25-Oct-2021	✓
Soil Glass Jar - Unpreserved (EP080) BH17-6.0	**10-Sep-2021**	**14-Sep-2021**	24-Sep-2021	✓	**16-Sep-2021**	24-Sep-2021	✓
Soil Glass Jar - Unpreserved (EP071) BH17-6.0	**10-Sep-2021**	**15-Sep-2021**	24-Sep-2021	✓	**15-Sep-2021**	25-Oct-2021	✓
EP080: BTEXN							
Soil Glass Jar - Unpreserved (EP080) BH17-0.05, QC300_210910	**09-Sep-2021**	**14-Sep-2021**	23-Sep-2021	✓	**16-Sep-2021**	23-Sep-2021	✓
Soil Glass Jar - Unpreserved (EP080) BH17-6.0	**10-Sep-2021**	**14-Sep-2021**	24-Sep-2021	✓	**16-Sep-2021**	24-Sep-2021	✓

Matrix: **WATER**

Evaluation: × = Holding time breach ; ✓ = Within holding time.

Method	*Sample Date*	*Extraction / Preparation*			*Analysis*		
Container / Client Sample ID(s)		*Date extracted*	*Due for extraction*	*Evaluation*	*Date analysed*	*Due for analysis*	*Evaluation*
EG020T: Total Metals by ICP-MS							
Clear Plastic Bottle - Nitric Acid; Unfiltered (EG020A-T) QC501-210910	**10-Sep-2021**	**14-Sep-2021**	09-Mar-2022	✓	**14-Sep-2021**	09-Mar-2022	✓
EG035T: Total Recoverable Mercury by FIMS							
Clear Plastic Bottle - Nitric Acid; Unfiltered (EG035T) QC501-210910	**10-Sep-2021**	**----**	----	----	**14-Sep-2021**	08-Oct-2021	✓
EP075(SIM)B: Polynuclear Aromatic Hydrocarbons							
Amber Glass Bottle - Unpreserved (EP075(SIM)) QC501-210910	**10-Sep-2021**	**14-Sep-2021**	17-Sep-2021	✓	**15-Sep-2021**	24-Oct-2021	✓
EP080/071: Total Petroleum Hydrocarbons							
Amber Glass Bottle - Unpreserved (EP071) QC501-210910	**10-Sep-2021**	**14-Sep-2021**	17-Sep-2021	✓	**15-Sep-2021**	24-Oct-2021	✓
Amber VOC Vial - Sulfuric Acid (EP080) QC501-210910	**10-Sep-2021**	**16-Sep-2021**	24-Sep-2021	✓	**16-Sep-2021**	24-Sep-2021	✓

Matrix: **WATER**

Evaluation: × = Holding time breach ; ✓ = Within holding time.

Method *Container / Client Sample ID(s)*	*Sample Date*	*Extraction / Preparation*			*Analysis*		
		Date extracted	*Due for extraction*	*Evaluation*	*Date analysed*	*Due for analysis*	*Evaluation*
EP080/071: Total Recoverable Hydrocarbons - NEPM 2013 Fractions							
Amber Glass Bottle - Unpreserved (EP071) QC501-210910	**10-Sep-2021**	**14-Sep-2021**	17-Sep-2021	✓	**15-Sep-2021**	24-Oct-2021	✓
Amber VOC Vial - Sulfuric Acid (EP080) QC501-210910	**10-Sep-2021**	**16-Sep-2021**	24-Sep-2021	✓	**16-Sep-2021**	24-Sep-2021	✓
EP080: BTEXN							
Amber VOC Vial - Sulfuric Acid (EP080) QC501-210910	**10-Sep-2021**	**16-Sep-2021**	24-Sep-2021	✓	**16-Sep-2021**	24-Sep-2021	✓

Quality Control Parameter Frequency Compliance

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

Matrix: **SOIL**

Evaluation: ✗ = Quality Control frequency not within specification ; ✓ = Quality Control frequency within specification.

		Count		*Rate (%)*			*Quality Control Specification*
Analytical Methods	*Method*	*QC*	*Regular*	***Actual***	***Expected***	*Evaluation*	
Moisture Content	EA055	2	20	**10.00**	**10.00**	✓	NEPM 2013 B3 & ALS QC Standard
PAH/Phenols (SIM)	EP075(SIM)	2	20	**10.00**	**10.00**	✓	NEPM 2013 B3 & ALS QC Standard
Total Mercury by FIMS	EG035T	2	20	**10.00**	**10.00**	✓	NEPM 2013 B3 & ALS QC Standard
Total Metals by ICP-AES	EG005T	2	20	**10.00**	**10.00**	✓	NEPM 2013 B3 & ALS QC Standard
TRH - Semivolatile Fraction	EP071	2	20	**10.00**	**10.00**	✓	NEPM 2013 B3 & ALS QC Standard
TRH Volatiles/BTEX	EP080	2	20	**10.00**	**10.00**	✓	NEPM 2013 B3 & ALS QC Standard
PAH/Phenols (SIM)	EP075(SIM)	1	20	**5.00**	**5.00**	✓	NEPM 2013 B3 & ALS QC Standard
Total Mercury by FIMS	EG035T	1	20	**5.00**	**5.00**	✓	NEPM 2013 B3 & ALS QC Standard
Total Metals by ICP-AES	EG005T	1	20	**5.00**	**5.00**	✓	NEPM 2013 B3 & ALS QC Standard
TRH - Semivolatile Fraction	EP071	1	20	**5.00**	**5.00**	✓	NEPM 2013 B3 & ALS QC Standard
TRH Volatiles/BTEX	EP080	1	20	**5.00**	**5.00**	✓	NEPM 2013 B3 & ALS QC Standard
PAH/Phenols (SIM)	EP075(SIM)	1	20	**5.00**	**5.00**	✓	NEPM 2013 B3 & ALS QC Standard
Total Mercury by FIMS	EG035T	1	20	**5.00**	**5.00**	✓	NEPM 2013 B3 & ALS QC Standard
Total Metals by ICP-AES	EG005T	1	20	**5.00**	**5.00**	✓	NEPM 2013 B3 & ALS QC Standard
TRH - Semivolatile Fraction	EP071	1	20	**5.00**	**5.00**	✓	NEPM 2013 B3 & ALS QC Standard
TRH Volatiles/BTEX	EP080	1	20	**5.00**	**5.00**	✓	NEPM 2013 B3 & ALS QC Standard
PAH/Phenols (SIM)	EP075(SIM)	1	20	**5.00**	**5.00**	✓	NEPM 2013 B3 & ALS QC Standard
Total Mercury by FIMS	EG035T	1	20	**5.00**	**5.00**	✓	NEPM 2013 B3 & ALS QC Standard
Total Metals by ICP-AES	EG005T	1	20	**5.00**	**5.00**	✓	NEPM 2013 B3 & ALS QC Standard
TRH - Semivolatile Fraction	EP071	1	20	**5.00**	**5.00**	✓	NEPM 2013 B3 & ALS QC Standard
TRH Volatiles/BTEX	EP080	1	20	**5.00**	**5.00**	✓	NEPM 2013 B3 & ALS QC Standard

Matrix: **WATER**

Evaluation: ✗ = Quality Control frequency not within specification ; ✓ = Quality Control frequency within specification.

		Count		*Rate (%)*			*Quality Control Specification*
Analytical Methods	*Method*	*QC*	*Regular*	***Actual***	***Expected***	*Evaluation*	
PAH/Phenols (GC/MS - SIM)	EP075(SIM)	0	9	**0.00**	**10.00**	✗	NEPM 2013 B3 & ALS QC Standard
Total Mercury by FIMS	EG035T	1	8	**12.50**	**10.00**	✓	NEPM 2013 B3 & ALS QC Standard
Total Metals by ICP-MS - Suite A	EG020A-T	2	10	**20.00**	**10.00**	✓	NEPM 2013 B3 & ALS QC Standard
TRH - Semivolatile Fraction	EP071	0	9	**0.00**	**10.00**	✗	NEPM 2013 B3 & ALS QC Standard
TRH Volatiles/BTEX	EP080	2	20	**10.00**	**10.00**	✓	NEPM 2013 B3 & ALS QC Standard
PAH/Phenols (GC/MS - SIM)	EP075(SIM)	1	9	**11.11**	**5.00**	✓	NEPM 2013 B3 & ALS QC Standard

Matrix: **WATER**

Evaluation: ✗ = Quality Control frequency not within specification ; ✓ = Quality Control frequency within specification.

Analytical Methods	*Method*	*Count*		*Rate (%)*			*Quality Control Specification*
		QC	*Regular*	***Actual***	***Expected***	*Evaluation*	
Total Mercury by FIMS	EG035T	1	8	**12.50**	**5.00**	✓	NEPM 2013 B3 & ALS QC Standard
Total Metals by ICP-MS - Suite A	EG020A-T	1	10	**10.00**	**5.00**	✓	NEPM 2013 B3 & ALS QC Standard
TRH - Semivolatile Fraction	EP071	1	9	**11.11**	**5.00**	✓	NEPM 2013 B3 & ALS QC Standard
TRH Volatiles/BTEX	EP080	1	20	**5.00**	**5.00**	✓	NEPM 2013 B3 & ALS QC Standard
PAH/Phenols (GC/MS - SIM)	EP075(SIM)	1	9	**11.11**	**5.00**	✓	NEPM 2013 B3 & ALS QC Standard
Total Mercury by FIMS	EG035T	1	8	**12.50**	**5.00**	✓	NEPM 2013 B3 & ALS QC Standard
Total Metals by ICP-MS - Suite A	EG020A-T	1	10	**10.00**	**5.00**	✓	NEPM 2013 B3 & ALS QC Standard
TRH - Semivolatile Fraction	EP071	1	9	**11.11**	**5.00**	✓	NEPM 2013 B3 & ALS QC Standard
TRH Volatiles/BTEX	EP080	1	20	**5.00**	**5.00**	✓	NEPM 2013 B3 & ALS QC Standard
PAH/Phenols (GC/MS - SIM)	EP075(SIM)	0	9	**0.00**	**5.00**	✗	NEPM 2013 B3 & ALS QC Standard
Total Mercury by FIMS	EG035T	1	8	**12.50**	**5.00**	✓	NEPM 2013 B3 & ALS QC Standard
Total Metals by ICP-MS - Suite A	EG020A-T	1	10	**10.00**	**5.00**	✓	NEPM 2013 B3 & ALS QC Standard
TRH - Semivolatile Fraction	EP071	0	9	**0.00**	**5.00**	✗	NEPM 2013 B3 & ALS QC Standard
TRH Volatiles/BTEX	EP080	1	20	**5.00**	**5.00**	✓	NEPM 2013 B3 & ALS QC Standard

Brief Method Summaries

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

Analytical Methods	*Method*	*Matrix*	*Method Descriptions*
Moisture Content	EA055	SOIL	In house: A gravimetric procedure based on weight loss over a 12 hour drying period at 105-110 degrees C. This method is compliant with NEPM Schedule B(3).
Total Metals by ICP-AES	EG005T	SOIL	In house: Referenced to APHA 3120; USEPA SW 846 - 6010. Metals are determined following an appropriate acid digestion of the soil. The ICPAES technique ionises samples in a plasma, emitting a characteristic spectrum based on metals present. Intensities at selected wavelengths are compared against those of matrix matched standards. This method is compliant with NEPM Schedule B(3)
Total Mercury by FIMS	EG035T	SOIL	In house: Referenced to AS 3550, APHA 3112 Hg - B (Flow-injection (SnCl2) (Cold Vapour generation) AAS) FIM-AAS is an automated flameless atomic absorption technique. Mercury in solids are determined following an appropriate acid digestion. Ionic mercury is reduced online to atomic mercury vapour by SnCl2 which is then purged into a heated quartz cell. Quantification is by comparing absorbance against a calibration curve. This method is compliant with NEPM Schedule B(3)
TRH - Semivolatile Fraction	EP071	SOIL	In house: Referenced to USEPA SW 846 - 8015 Sample extracts are analysed by Capillary GC/FID and quantified against alkane standards over the range C10 - C40. Compliant with NEPM Schedule B(3).
PAH/Phenols (SIM)	EP075(SIM)	SOIL	In house: Referenced to USEPA SW 846 - 8270. Extracts are analysed by Capillary GC/MS in Selective Ion Mode (SIM) and quantification is by comparison against an established 5 point calibration curve. This method is compliant with NEPM Schedule B(3)
TRH Volatiles/BTEX	EP080	SOIL	In house: Referenced to USEPA SW 846 - 8260. Extracts are analysed by Purge and Trap, Capillary GC/MS. Quantification is by comparison against an established 5 point calibration curve. Compliant with NEPM Schedule B(3) amended.
Total Metals by ICP-MS - Suite A	EG020A-T	WATER	In house: Referenced to APHA 3125; USEPA SW846 - 6020, ALS QWI-EN/EG020. The ICPMS technique utilizes a highly efficient argon plasma to ionize selected elements. Ions are then passed into a high vacuum mass spectrometer, which separates the analytes based on their distinct mass to charge ratios prior to their measurement by a discrete dynode ion detector.
Total Mercury by FIMS	EG035T	WATER	In house: Referenced to AS 3550, APHA 3112 Hg - B (Flow-injection (SnCl2)(Cold Vapour generation) AAS) FIM-AAS is an automated flameless atomic absorption technique. A bromate/bromide reagent is used to oxidise any organic mercury compounds in the unfiltered sample. The ionic mercury is reduced online to atomic mercury vapour by SnCl2 which is then purged into a heated quartz cell. Quantification is by comparing absorbance against a calibration curve. This method is compliant with NEPM Schedule B(3).
TRH - Semivolatile Fraction	EP071	WATER	In house: Referenced to USEPA SW 846 - 8015 The sample extract is analysed by Capillary GC/FID and quantification is by comparison against an established 5 point calibration curve of n-Alkane standards. This method is compliant with the QC requirements of NEPM Schedule B(3)
PAH/Phenols (GC/MS - SIM)	EP075(SIM)	WATER	In house: Referenced to USEPA SW 846 - 8270 Sample extracts are analysed by Capillary GC/MS in SIM Mode and quantification is by comparison against an established 5 point calibration curve. This method is compliant with NEPM Schedule B(3)

Analytical Methods	*Method*	*Matrix*	*Method Descriptions*
TRH Volatiles/BTEX	EP080	WATER	In house: Referenced to USEPA SW 846 - 8260 Water samples are directly purged prior to analysis by Capillary GC/MS and quantification is by comparison against an established 5 point calibration curve. Alternatively, a sample is equilibrated in a headspace vial and a portion of the headspace determined by GCMS analysis. This method is compliant with the QC requirements of NEPM Schedule B(3)

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

CHAIN OF CUSTODY

ALS Laboratory: please tick →

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Ph: 02 4225 3125 E: portkembla@alsglobal.com

CLIENT: Jacobs Arcadis Joint Venture (JAJV)
OFFICE: Sydney
PROJECT: IA254001
ORDER NUMBER: –
PROJECT MANAGER: Amanda Mullen
SAMPLER: Nick Keatley

TURNAROUND REQUIREMENTS : (Standard TAT may be longer for some tests e.g.. Ultra Trace Organics)
☒ Standard TAT (List due date):
☐ Non Standard or urgent TAT (List due date):
ALS QUOTE NO.: –
CONTACT PH:
SAMPLER MOBILE: 0421 201294
COC emailed to ALS? (YES / [✓ NO])
EDD FORMAT (or default):
Email Reports to (will default to PM if no other addresses are listed): nick.keatley@jacobs.com amanda.mullen@jacobs.com
Email Invoice to (will default to PM if no other addresses are listed): Nick / Amanda

COC SEQUENCE NUMBER (Circle)
COC: [✓ 1] 2 3 4 5 6 7
OF: [✓ 1] 2 3 4 5 6 7

FOR LABORATORY USE ONLY (Circle)
Custody Seal Intact? [✓ Yes] No N/A
[✓ Free ice] / frozen ice bricks present upon receipt? Yes No N/A
Random Sample Temperature on Receipt: 5.8 °C
Other comment:

RELINQUISHED BY: NK
DATE/TIME: 10/9/21

RECEIVED BY: Juliana G
DATE/TIME: 10/9/21 3:00pm

RELINQUISHED BY:
DATE/TIME:

RECEIVED BY: 5088 / [illegible]
DATE/TIME: 10/9/21 1830

COMMENTS/SPECIAL HANDLING/STORAGE OR DISPOSAL: Also send deliverables to: EDMANZ@jacobs.com, jacobs.labresults@esdat.net

ALS USE	SAMPLE DETAILS MATRIX: SOLID (S) WATER (W)			CONTAINER INFORMATION		ANALYSIS REQUIRED including SUITES (NB. Suite Codes must be listed to attract suite price) Where Metals are required, specify Total (unfiltered bottle required) or Dissolved (field filtered bottle required).								Additional Information
LAB ID	SAMPLE ID	DATE / TIME	MATRIX	TYPE & PRESERVATIVE (refer to codes below)	TOTAL CONTAINERS	S-26	BTEXN						HOLD	Comments on likely contaminant levels, dilutions, or samples requiring specific QC analysis etc.
1	BH17-0.05	9/9/21	S			X								
2	BH17-0.5	↓	↓										X	
3	BH17-1.0	↓	↓										X	
4	BH17-2.5	↓	↓										X	
5	BH17_4.5	10/9/21	↓										X	
6	BH17_6.0	↓	↓			X								
7	BH17_7.0	↓	↓										>	
8	QC300_210910	↓	↓				X							
9	QC501_210910	↓	W			X								
					TOTAL									

Environmental Division
Sydney
Work Order Reference
ES2132942

Telephone : + 61-2-8784 8555

Water Container Codes: P = Unpreserved Plastic; N = Nitric Preserved Plastic; ORC = Nitric Preserved ORC; SH = Sodium Hydroxide/Cd Preserved; S = Sodium Hydroxide Preserved Plastic; AG = Amber Glass Unpreserved; AP - Airfreight Unpreserved Plastic
V = VOA Vial HCl Preserved; VB = VOA Vial Sodium Bisulphate Preserved; VS = VOA Vial Sulfuric Preserved; AV = Airfreight Unpreserved Vial SG = Sulfuric Preserved Amber Glass; H = HCl preserved Plastic; HS = HCl preserved Speciation bottle; SP = Sulfuric Preserved Plastic; F = Formaldehyde Preserved Glass;
Z = Zinc Acetate Preserved Bottle; E = EDTA Preserved Bottles; ST = Sterile Bottle; ASS = Plastic Bag for Acid Sulphate Soils; B = Unpreserved Bag.

Environmental

CERTIFICATE OF ANALYSIS

Work Order : **ES2133844**
Client : **Jacobs Arcadis Joint Venture**
Contact : Amanda Mullen
Address : Level 16 580 George Street
Sydney 2000
Telephone : ----
Project : IA254001
Order number : 1770
C-O-C number : ----
Sampler : Nick Keatley
Site : ----
Quote number : EN/222
No. of samples received : 26
No. of samples analysed : 21

Page : 1 of 25
Laboratory : Environmental Division Sydney
Contact : Customer Services ES
Address : 277-289 Woodpark Road Smithfield NSW Australia 2164
Telephone : +61-2-8784 8555
Date Samples Received : 17-Sep-2021 16:00
Date Analysis Commenced : 20-Sep-2021
Issue Date : 28-Sep-2021 13:57

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

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

This Certificate of Analysis contains the following information:

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

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

Signatories

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

Signatories	*Position*	*Accreditation Category*
Alana Smylie	Asbestos Identifier	Newcastle - Asbestos, Mayfield West, NSW
Ankit Joshi	Inorganic Chemist	Sydney Inorganics, Smithfield, NSW
Edwandy Fadjar	Organic Coordinator	Sydney Organics, Smithfield, NSW
Franco Lentini	LCMS Coordinator	Sydney Inorganics, Smithfield, NSW
Franco Lentini	LCMS Coordinator	Sydney Organics, Smithfield, NSW
Ivan Taylor	Analyst	Sydney Inorganics, Smithfield, NSW
Uma Nagendiram	Subcontracting Coordinator	WRG Subcontracting, Smithfield, NSW

General Comments

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

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

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

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

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

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

Key : CAS Number = CAS registry number from database maintained by Chemical Abstracts Services. The Chemical Abstracts Service is a division of the American Chemical Society.
LOR = Limit of reporting
^ = This result is computed from individual analyte detections at or above the level of reporting
ø = ALS is not NATA accredited for these tests.
~ = Indicates an estimated value.

- EP075 (SIM): Where reported, Benzo(a)pyrene Toxicity Equivalent Quotient (TEQ) per the NEPM (2013) is the sum total of the concentration of the eight carcinogenic PAHs multiplied by their Toxicity Equivalence Factor (TEF) relative to Benzo(a)pyrene. TEF values are provided in brackets as follows: Benz(a)anthracene (0.1), Chrysene (0.01), Benzo(b+j) & Benzo(k)fluoranthene (0.1), Benzo(a)pyrene (1.0), Indeno(1.2.3.cd)pyrene (0.1), Dibenz(a.h)anthracene (1.0), Benzo(g.h.i)perylene (0.01). Less than LOR results for 'TEQ Zero' are treated as zero.
- Benzo(a)pyrene Toxicity Equivalent Quotient (TEQ) per the NEPM (2013) is the sum total of the concentration of the eight carcinogenic PAHs multiplied by their Toxicity Equivalence Factor (TEF) relative to Benzo(a)pyrene. TEF values are provided in brackets as follows: Benz(a)anthracene (0.1), Chrysene (0.01), Benzo(b+j) & Benzo(k)fluoranthene (0.1), Benzo(a)pyrene (1.0), Indeno(1.2.3.cd)pyrene (0.1), Dibenz(a.h)anthracene (1.0), Benzo(g.h.i)perylene (0.01). Less than LOR results for 'TEQ Zero' are treated as zero, for 'TEQ 1/2LOR' are treated as half the reported LOR, and for 'TEQ LOR' are treated as being equal to the reported LOR. Note: TEQ 1/2LOR and TEQ LOR will calculate as 0.6mg/Kg and 1.2mg/Kg respectively for samples with non-detects for all of the eight TEQ PAHs.
- EP080: Where reported, Total Xylenes is the sum of the reported concentrations of m&p-Xylene and o-Xylene at or above the LOR.
- EP068: Where reported, Total Chlordane (sum) is the sum of the reported concentrations of cis-Chlordane and trans-Chlordane at or above the LOR.
- EP068: Where reported, Total OCP is the sum of the reported concentrations of all Organochlorine Pesticides at or above LOR.
- EP075(SIM): Where reported, Total Cresol is the sum of the reported concentrations of 2-Methylphenol and 3- & 4-Methylphenol at or above the LOR.
- MM868 (Coliforms & E. coli in Soils by MPN using Aquachrom ECC) - Analysis is conducted by ALS Scoresby NATA accreditation no. 992, site no. 989.
- EA200 'Am' Amosite (brown asbestos)
- EA200 'Cr' Crocidolite (blue asbestos)
- EA200 'Trace' - Asbestos fibres ("Free Fibres") detected by trace analysis per AS4964. The result can be interpreted that the sample contains detectable 'respirable' asbestos fibres
- EA200: Asbestos Identification Samples were analysed by Polarised Light Microscopy including dispersion staining.
- EA200 Legend
- EA200 'Ch' Chrysotile (white asbestos)
- EA200: 'UMF' Unknown Mineral Fibres. "-" indicates fibres detected may or may not be asbestos fibres. Confirmation by alternative techniques is recommended.
- EA200: For samples larger than 30g, the <2mm fraction may be sub-sampled prior to trace analysis as outlined in ISO23909:2008(E) Sect 6.3.2-2
- EA200: 'Yes' - Asbestos detected by polarised light microscopy including dispersion staining.
- EA200: 'No*' - No asbestos found, at the reporting limit of 0.1g/kg, by polarised light microscopy including dispersion staining. Asbestos material was detected and positively identified at concentrations estimated to be below 0.1g/kg.
- EA200: 'No' - No asbestos found at the reporting limit 0.1g/kg, by polarised light microscopy including dispersion staining.

- EP231: Stable isotope enriched internal standards are added to samples prior to extraction. Target compounds have a direct analogous internal standard with the exception of PFPeS, PFHpA, PFDS, PFTrDA and 10:2 FTS. These compounds use an internal standard that is chemically related and has a retention time close to that of the target compound. The DQO for internal standard response is 50-150% of that established at initial calibration. PFOS is quantified using a certified, traceable standard consisting of linear and branched PFOS isomers. These practices are in line with recommendations in the National Environmental Management Plan for PFAS (Australian HEPA) and also conform to QSM 5.3 (US DoD) requirements.

Analytical Results

Sub-Matrix: **SOIL**
(Matrix: **SOIL**)

			Sample ID	**BH16_0.05**	**BH16_1.5**	**BH13_0.05**	**BH13_0.5**	**SS22_0.05**
			Sampling date / time	13-Sep-2021 00:00	13-Sep-2021 00:00	15-Sep-2021 00:00	15-Sep-2021 00:00	15-Sep-2021 00:00
Compound	*CAS Number*	*LOR*	*Unit*	**ES2133844-001**	**ES2133844-004**	**ES2133844-005**	**ES2133844-006**	**ES2133844-008**
				Result	Result	Result	Result	Result
EA055: Moisture Content (Dried @ 105-110°C)								
Moisture Content	----	1.0	%	**25.7**	**15.0**	**16.8**	**9.6**	**17.1**
EA200: AS 4964 - 2004 Identification of Asbestos in Soils								
Asbestos Detected	1332-21-4	0.1	g/kg	**No**	**No**	**No**	**No**	**No**
Asbestos (Trace)	1332-21-4	5	Fibres	**No**	**No**	**No**	**No**	**No**
Asbestos Type	1332-21-4	-	--	**-**	**-**	**-**	**-**	**-**
Synthetic Mineral Fibre	----	0.1	g/kg	**No**	**No**	**No**	**No**	**No**
Organic Fibre	----	0.1	g/kg	**No**	**No**	**No**	**No**	**No**
Sample weight (dry)	----	0.01	g	**98.8**	**105**	**80.3**	**111**	**95.7**
APPROVED IDENTIFIER:	----	-	--	**A. SMYLIE**	**A. SMYLIE**	**A. SMYLIE**	**A. SMYLIE**	**A. SMYLIE**
EG005(ED093)T: Total Metals by ICP-AES								
Arsenic	7440-38-2	5	mg/kg	<5	**9**	<5	**5**	**7**
Cadmium	7440-43-9	1	mg/kg	<1	<1	<1	<1	<1
Chromium	7440-47-3	2	mg/kg	**5**	**11**	**5**	**12**	**12**
Copper	7440-50-8	5	mg/kg	**12**	**11**	<5	<5	**11**
Lead	7439-92-1	5	mg/kg	**16**	**17**	**9**	**7**	**12**
Nickel	7440-02-0	2	mg/kg	**3**	**3**	**5**	**3**	**11**
Zinc	7440-66-6	5	mg/kg	**13**	**24**	**17**	**8**	**22**
EG035T: Total Recoverable Mercury by FIMS								
Mercury	7439-97-6	0.1	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
EP068A: Organochlorine Pesticides (OC)								
alpha-BHC	319-84-6	0.05	mg/kg	<0.05	<0.05	<0.05	<0.05	<0.05
Hexachlorobenzene (HCB)	118-74-1	0.05	mg/kg	<0.05	<0.05	<0.05	<0.05	<0.05
beta-BHC	319-85-7	0.05	mg/kg	<0.05	<0.05	<0.05	<0.05	<0.05
gamma-BHC	58-89-9	0.05	mg/kg	<0.05	<0.05	<0.05	<0.05	<0.05
delta-BHC	319-86-8	0.05	mg/kg	<0.05	<0.05	<0.05	<0.05	<0.05
Heptachlor	76-44-8	0.05	mg/kg	<0.05	<0.05	<0.05	<0.05	<0.05
Aldrin	309-00-2	0.05	mg/kg	<0.05	<0.05	<0.05	<0.05	<0.05
Heptachlor epoxide	1024-57-3	0.05	mg/kg	<0.05	<0.05	<0.05	<0.05	<0.05
^ **Total Chlordane (sum)**	----	0.05	mg/kg	<0.05	<0.05	<0.05	<0.05	<0.05
trans-Chlordane	5103-74-2	0.05	mg/kg	<0.05	<0.05	<0.05	<0.05	<0.05
alpha-Endosulfan	959-98-8	0.05	mg/kg	<0.05	<0.05	<0.05	<0.05	<0.05
cis-Chlordane	5103-71-9	0.05	mg/kg	<0.05	<0.05	<0.05	<0.05	<0.05
Dieldrin	60-57-1	0.05	mg/kg	<0.05	<0.05	<0.05	<0.05	<0.05
4.4`-DDE	72-55-9	0.05	mg/kg	<0.05	<0.05	<0.05	<0.05	<0.05

Analytical Results

Sub-Matrix: **SOIL**
(Matrix: **SOIL**)

			Sample ID	**BH16_0.05**	**BH16_1.5**	**BH13_0.05**	**BH13_0.5**	**SS22_0.05**
			Sampling date / time	13-Sep-2021 00:00	13-Sep-2021 00:00	15-Sep-2021 00:00	15-Sep-2021 00:00	15-Sep-2021 00:00
Compound	CAS Number	LOR	Unit	**ES2133844-001**	**ES2133844-004**	**ES2133844-005**	**ES2133844-006**	**ES2133844-008**
				Result	Result	Result	Result	Result
EP068A: Organochlorine Pesticides (OC) - Continued								
Endrin	72-20-8	0.05	mg/kg	<0.05	<0.05	<0.05	<0.05	<0.05
beta-Endosulfan	33213-65-9	0.05	mg/kg	<0.05	<0.05	<0.05	<0.05	<0.05
^ **Endosulfan (sum)**	115-29-7	0.05	mg/kg	<0.05	<0.05	<0.05	<0.05	<0.05
4.4`-DDD	72-54-8	0.05	mg/kg	<0.05	<0.05	<0.05	<0.05	<0.05
Endrin aldehyde	7421-93-4	0.05	mg/kg	<0.05	<0.05	<0.05	<0.05	<0.05
Endosulfan sulfate	1031-07-8	0.05	mg/kg	<0.05	<0.05	<0.05	<0.05	<0.05
4.4`-DDT	50-29-3	0.2	mg/kg	<0.2	<0.2	<0.2	<0.2	<0.2
Endrin ketone	53494-70-5	0.05	mg/kg	<0.05	<0.05	<0.05	<0.05	<0.05
Methoxychlor	72-43-5	0.2	mg/kg	<0.2	<0.2	<0.2	<0.2	<0.2
^ **Sum of Aldrin + Dieldrin**	309-00-2/60-57-1	0.05	mg/kg	<0.05	<0.05	<0.05	<0.05	<0.05
^ **Sum of DDD + DDE + DDT**	72-54-8/72-55-9/50-2	0.05	mg/kg	<0.05	<0.05	<0.05	<0.05	<0.05
EP068B: Organophosphorus Pesticides (OP)								
Dichlorvos	62-73-7	0.05	mg/kg	<0.05	<0.05	<0.05	<0.05	<0.05
Demeton-S-methyl	919-86-8	0.05	mg/kg	<0.05	<0.05	<0.05	<0.05	<0.05
Monocrotophos	6923-22-4	0.2	mg/kg	<0.2	<0.2	<0.2	<0.2	<0.2
Dimethoate	60-51-5	0.05	mg/kg	<0.05	<0.05	<0.05	<0.05	<0.05
Diazinon	333-41-5	0.05	mg/kg	<0.05	<0.05	<0.05	<0.05	<0.05
Chlorpyrifos-methyl	5598-13-0	0.05	mg/kg	<0.05	<0.05	<0.05	<0.05	<0.05
Parathion-methyl	298-00-0	0.2	mg/kg	<0.2	<0.2	<0.2	<0.2	<0.2
Malathion	121-75-5	0.05	mg/kg	<0.05	<0.05	<0.05	<0.05	<0.05
Fenthion	55-38-9	0.05	mg/kg	<0.05	<0.05	<0.05	<0.05	<0.05
Chlorpyrifos	2921-88-2	0.05	mg/kg	<0.05	<0.05	<0.05	<0.05	<0.05
Parathion	56-38-2	0.2	mg/kg	<0.2	<0.2	<0.2	<0.2	<0.2
Pirimphos-ethyl	23505-41-1	0.05	mg/kg	<0.05	<0.05	<0.05	<0.05	<0.05
Chlorfenvinphos	470-90-6	0.05	mg/kg	<0.05	<0.05	<0.05	<0.05	<0.05
Bromophos-ethyl	4824-78-6	0.05	mg/kg	<0.05	<0.05	<0.05	<0.05	<0.05
Fenamiphos	22224-92-6	0.05	mg/kg	<0.05	<0.05	<0.05	<0.05	<0.05
Prothiofos	34643-46-4	0.05	mg/kg	<0.05	<0.05	<0.05	<0.05	<0.05
Ethion	563-12-2	0.05	mg/kg	<0.05	<0.05	<0.05	<0.05	<0.05
Carbophenothion	786-19-6	0.05	mg/kg	<0.05	<0.05	<0.05	<0.05	<0.05
Azinphos Methyl	86-50-0	0.05	mg/kg	<0.05	<0.05	<0.05	<0.05	<0.05
EP075(SIM)B: Polynuclear Aromatic Hydrocarbons								
Naphthalene	91-20-3	0.5	mg/kg	<0.5	<0.5	<0.5	<0.5	<0.5
Acenaphthylene	208-96-8	0.5	mg/kg	<0.5	<0.5	<0.5	<0.5	<0.5

Analytical Results

Sub-Matrix: **SOIL** (Matrix: **SOIL**)			Sample ID	**BH16_0.05**	**BH16_1.5**	**BH13_0.05**	**BH13_0.5**	**SS22_0.05**
			Sampling date / time	13-Sep-2021 00:00	13-Sep-2021 00:00	15-Sep-2021 00:00	15-Sep-2021 00:00	15-Sep-2021 00:00
Compound	*CAS Number*	*LOR*	*Unit*	**ES2133844-001**	**ES2133844-004**	**ES2133844-005**	**ES2133844-006**	**ES2133844-008**
				Result	Result	Result	Result	Result
EP075(SIM)B: Polynuclear Aromatic Hydrocarbons - Continued								
Acenaphthene	83-32-9	0.5	mg/kg	<0.5	<0.5	<0.5	<0.5	<0.5
Fluorene	86-73-7	0.5	mg/kg	<0.5	<0.5	<0.5	<0.5	<0.5
Phenanthrene	85-01-8	0.5	mg/kg	<0.5	<0.5	<0.5	<0.5	<0.5
Anthracene	120-12-7	0.5	mg/kg	<0.5	<0.5	<0.5	<0.5	<0.5
Fluoranthene	206-44-0	0.5	mg/kg	<0.5	<0.5	<0.5	<0.5	<0.5
Pyrene	129-00-0	0.5	mg/kg	<0.5	<0.5	<0.5	<0.5	<0.5
Benz(a)anthracene	56-55-3	0.5	mg/kg	<0.5	<0.5	<0.5	<0.5	<0.5
Chrysene	218-01-9	0.5	mg/kg	<0.5	<0.5	<0.5	<0.5	<0.5
Benzo(b+j)fluoranthene	205-99-2 205-82-3	0.5	mg/kg	<0.5	<0.5	<0.5	<0.5	<0.5
Benzo(k)fluoranthene	207-08-9	0.5	mg/kg	<0.5	<0.5	<0.5	<0.5	<0.5
Benzo(a)pyrene	50-32-8	0.5	mg/kg	<0.5	<0.5	<0.5	<0.5	<0.5
Indeno(1.2.3.cd)pyrene	193-39-5	0.5	mg/kg	<0.5	<0.5	<0.5	<0.5	<0.5
Dibenz(a.h)anthracene	53-70-3	0.5	mg/kg	<0.5	<0.5	<0.5	<0.5	<0.5
Benzo(g.h.i)perylene	191-24-2	0.5	mg/kg	<0.5	<0.5	<0.5	<0.5	<0.5
^ **Sum of polycyclic aromatic hydrocarbons**	----	0.5	mg/kg	<0.5	<0.5	<0.5	<0.5	<0.5
^ **Benzo(a)pyrene TEQ (zero)**	----	0.5	mg/kg	<0.5	<0.5	<0.5	<0.5	<0.5
^ **Benzo(a)pyrene TEQ (half LOR)**	----	0.5	mg/kg	**0.6**	**0.6**	**0.6**	**0.6**	**0.6**
^ **Benzo(a)pyrene TEQ (LOR)**	----	0.5	mg/kg	**1.2**	**1.2**	**1.2**	**1.2**	**1.2**
EP080/071: Total Petroleum Hydrocarbons								
C6 - C9 Fraction	----	10	mg/kg	<10	<10	<10	<10	<10
C10 - C14 Fraction	----	50	mg/kg	<50	<50	<50	<50	<50
C15 - C28 Fraction	----	100	mg/kg	<100	<100	<100	<100	<100
C29 - C36 Fraction	----	100	mg/kg	<100	<100	<100	<100	<100
^ **C10 - C36 Fraction (sum)**	----	50	mg/kg	<50	<50	<50	<50	<50
EP080/071: Total Recoverable Hydrocarbons - NEPM 2013 Fractions								
C6 - C10 Fraction	C6_C10	10	mg/kg	<10	<10	<10	<10	<10
^ **C6 - C10 Fraction minus BTEX (F1)**	C6_C10-BTEX	10	mg/kg	<10	<10	<10	<10	<10
>C10 - C16 Fraction	----	50	mg/kg	<50	<50	<50	<50	<50
>C16 - C34 Fraction	----	100	mg/kg	<100	<100	<100	<100	<100
>C34 - C40 Fraction	----	100	mg/kg	<100	<100	<100	<100	<100
^ **>C10 - C40 Fraction (sum)**	----	50	mg/kg	<50	<50	<50	<50	<50
^ **>C10 - C16 Fraction minus Naphthalene (F2)**	----	50	mg/kg	<50	<50	<50	<50	<50

Analytical Results

Sub-Matrix: **SOIL** (Matrix: **SOIL**)			*Sample ID*	**BH16_0.05**	**BH16_1.5**	**BH13_0.05**	**BH13_0.5**	**SS22_0.05**
			Sampling date / time	13-Sep-2021 00:00	13-Sep-2021 00:00	15-Sep-2021 00:00	15-Sep-2021 00:00	15-Sep-2021 00:00
Compound	*CAS Number*	*LOR*	*Unit*	**ES2133844-001**	**ES2133844-004**	**ES2133844-005**	**ES2133844-006**	**ES2133844-008**
				Result	Result	Result	Result	Result
EP080: BTEXN								
Benzene	71-43-2	0.2	mg/kg	<0.2	<0.2	<0.2	<0.2	<0.2
Toluene	108-88-3	0.5	mg/kg	<0.5	<0.5	<0.5	<0.5	<0.5
Ethylbenzene	100-41-4	0.5	mg/kg	<0.5	<0.5	<0.5	<0.5	<0.5
meta- & para-Xylene	108-38-3 106-42-3	0.5	mg/kg	<0.5	<0.5	<0.5	<0.5	<0.5
ortho-Xylene	95-47-6	0.5	mg/kg	<0.5	<0.5	<0.5	<0.5	<0.5
^ **Sum of BTEX**	----	0.2	mg/kg	<0.2	<0.2	<0.2	<0.2	<0.2
^ **Total Xylenes**	----	0.5	mg/kg	<0.5	<0.5	<0.5	<0.5	<0.5
Naphthalene	91-20-3	1	mg/kg	<1	<1	<1	<1	<1
MM868: Coliforms & E.coli by MPN using Aquachrom ECC								
Total Coliforms by MPN	----	10	MPN/g	----	----	**590**	<11	**14000**
EP068S: Organochlorine Pesticide Surrogate								
Dibromo-DDE	21655-73-2	0.05	%	**100**	**95.1**	**83.5**	**94.9**	**112**
EP068T: Organophosphorus Pesticide Surrogate								
DEF	78-48-8	0.05	%	**98.2**	**86.6**	**85.2**	**89.3**	**111**
EP075(SIM)S: Phenolic Compound Surrogates								
Phenol-d6	13127-88-3	0.5	%	**85.0**	**83.9**	**86.5**	**82.6**	**82.6**
2-Chlorophenol-D4	93951-73-6	0.5	%	**85.8**	**85.3**	**87.1**	**83.8**	**81.4**
2.4.6-Tribromophenol	118-79-6	0.5	%	**76.9**	**76.7**	**80.7**	**69.2**	**68.9**
EP075(SIM)T: PAH Surrogates								
2-Fluorobiphenyl	321-60-8	0.5	%	**93.3**	**91.2**	**95.7**	**91.6**	**93.4**
Anthracene-d10	1719-06-8	0.5	%	**91.3**	**90.7**	**93.7**	**92.4**	**92.2**
4-Terphenyl-d14	1718-51-0	0.5	%	**87.9**	**86.4**	**89.1**	**86.5**	**87.0**
EP080S: TPH(V)/BTEX Surrogates								
1.2-Dichloroethane-D4	17060-07-0	0.2	%	**97.9**	**110**	**117**	**115**	**124**
Toluene-D8	2037-26-5	0.2	%	**91.9**	**100**	**92.0**	**110**	**120**
4-Bromofluorobenzene	460-00-4	0.2	%	**80.3**	**80.7**	**89.5**	**90.3**	**101**

Analytical Results

Sub-Matrix: **SOIL** (Matrix: **SOIL**)			*Sample ID*	**BH08_0.05**	**BH08_0.5**	**QC101_210916**	**BH10_0.05**	**BH10_1.0**
			Sampling date / time	16-Sep-2021 00:00	16-Sep-2021 00:00	16-Sep-2021 00:00	16-Sep-2021 00:00	16-Sep-2021 00:00
Compound	*CAS Number*	*LOR*	*Unit*	**ES2133844-009**	**ES2133844-010**	**ES2133844-011**	**ES2133844-013**	**ES2133844-015**
				Result	Result	Result	Result	Result
EA055: Moisture Content (Dried @ 105-110°C)								
Moisture Content	----	1.0	%	**14.5**	**5.4**	**4.9**	**18.5**	**8.6**
EA200: AS 4964 - 2004 Identification of Asbestos in Soils								
Asbestos Detected	1332-21-4	0.1	g/kg	**No**	**No**	----	----	----
Asbestos (Trace)	1332-21-4	5	Fibres	**No**	**No**	----	----	----
Asbestos Type	1332-21-4	-	--	**-**	**-**	----	----	----
Synthetic Mineral Fibre	----	0.1	g/kg	**No**	**No**	----	----	----
Organic Fibre	----	0.1	g/kg	**No**	**No**	----	----	----
Sample weight (dry)	----	0.01	g	**121**	**110**	----	----	----
APPROVED IDENTIFIER:	----	-	--	**A. SMYLIE**	**A. SMYLIE**	----	----	----
EG005(ED093)T: Total Metals by ICP-AES								
Arsenic	7440-38-2	5	mg/kg	<5	<5	<5	<5	<5
Cadmium	7440-43-9	1	mg/kg	<1	<1	<1	<1	<1
Chromium	7440-47-3	2	mg/kg	<2	**2**	<2	**2**	**2**
Copper	7440-50-8	5	mg/kg	<5	<5	<5	<5	<5
Lead	7439-92-1	5	mg/kg	<5	<5	<5	**14**	**7**
Nickel	7440-02-0	2	mg/kg	<2	<2	<2	<2	<2
Zinc	7440-66-6	5	mg/kg	<5	<5	<5	**12**	**14**
EG035T: Total Recoverable Mercury by FIMS								
Mercury	7439-97-6	0.1	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
EK026SF: Total CN by Segmented Flow Analyser								
Total Cyanide	57-12-5	1	mg/kg	----	----	----	<1	<1
EP068A: Organochlorine Pesticides (OC)								
alpha-BHC	319-84-6	0.05	mg/kg	<0.05	<0.05	<0.05	----	----
Hexachlorobenzene (HCB)	118-74-1	0.05	mg/kg	<0.05	<0.05	<0.05	----	----
beta-BHC	319-85-7	0.05	mg/kg	<0.05	<0.05	<0.05	----	----
gamma-BHC	58-89-9	0.05	mg/kg	<0.05	<0.05	<0.05	----	----
delta-BHC	319-86-8	0.05	mg/kg	<0.05	<0.05	<0.05	----	----
Heptachlor	76-44-8	0.05	mg/kg	<0.05	<0.05	<0.05	----	----
Aldrin	309-00-2	0.05	mg/kg	<0.05	<0.05	<0.05	----	----
Heptachlor epoxide	1024-57-3	0.05	mg/kg	<0.05	<0.05	<0.05	----	----
^ **Total Chlordane (sum)**	----	0.05	mg/kg	<0.05	<0.05	<0.05	----	----
trans-Chlordane	5103-74-2	0.05	mg/kg	<0.05	<0.05	<0.05	----	----
alpha-Endosulfan	959-98-8	0.05	mg/kg	<0.05	<0.05	<0.05	----	----
cis-Chlordane	5103-71-9	0.05	mg/kg	<0.05	<0.05	<0.05	----	----

Analytical Results

Sub-Matrix: **SOIL**
(Matrix: **SOIL**)

			Sample ID	**BH08_0.05**	**BH08_0.5**	**QC101_210916**	**BH10_0.05**	**BH10_1.0**
			Sampling date / time	16-Sep-2021 00:00	16-Sep-2021 00:00	16-Sep-2021 00:00	16-Sep-2021 00:00	16-Sep-2021 00:00
Compound	CAS Number	LOR	Unit	**ES2133844-009**	**ES2133844-010**	**ES2133844-011**	**ES2133844-013**	**ES2133844-015**
				Result	Result	Result	Result	Result
EP068A: Organochlorine Pesticides (OC) - Continued								
Dieldrin	60-57-1	0.05	mg/kg	<0.05	<0.05	<0.05	----	----
4.4`-DDE	72-55-9	0.05	mg/kg	<0.05	<0.05	<0.05	----	----
Endrin	72-20-8	0.05	mg/kg	<0.05	<0.05	<0.05	----	----
beta-Endosulfan	33213-65-9	0.05	mg/kg	<0.05	<0.05	<0.05	----	----
^ **Endosulfan (sum)**	115-29-7	0.05	mg/kg	<0.05	<0.05	<0.05	----	----
4.4`-DDD	72-54-8	0.05	mg/kg	<0.05	<0.05	<0.05	----	----
Endrin aldehyde	7421-93-4	0.05	mg/kg	<0.05	<0.05	<0.05	----	----
Endosulfan sulfate	1031-07-8	0.05	mg/kg	<0.05	<0.05	<0.05	----	----
4.4`-DDT	50-29-3	0.2	mg/kg	<0.2	<0.2	<0.2	----	----
Endrin ketone	53494-70-5	0.05	mg/kg	<0.05	<0.05	<0.05	----	----
Methoxychlor	72-43-5	0.2	mg/kg	<0.2	<0.2	<0.2	----	----
^ **Sum of Aldrin + Dieldrin**	309-00-2/60-57-1	0.05	mg/kg	<0.05	<0.05	<0.05	----	----
^ **Sum of DDD + DDE + DDT**	72-54-8/72-55-9/50-2	0.05	mg/kg	<0.05	<0.05	<0.05	----	----
EP068B: Organophosphorus Pesticides (OP)								
Dichlorvos	62-73-7	0.05	mg/kg	<0.05	<0.05	<0.05	----	----
Demeton-S-methyl	919-86-8	0.05	mg/kg	<0.05	<0.05	<0.05	----	----
Monocrotophos	6923-22-4	0.2	mg/kg	<0.2	<0.2	<0.2	----	----
Dimethoate	60-51-5	0.05	mg/kg	<0.05	<0.05	<0.05	----	----
Diazinon	333-41-5	0.05	mg/kg	<0.05	<0.05	<0.05	----	----
Chlorpyrifos-methyl	5598-13-0	0.05	mg/kg	<0.05	<0.05	<0.05	----	----
Parathion-methyl	298-00-0	0.2	mg/kg	<0.2	<0.2	<0.2	----	----
Malathion	121-75-5	0.05	mg/kg	<0.05	<0.05	<0.05	----	----
Fenthion	55-38-9	0.05	mg/kg	<0.05	<0.05	<0.05	----	----
Chlorpyrifos	2921-88-2	0.05	mg/kg	<0.05	<0.05	<0.05	----	----
Parathion	56-38-2	0.2	mg/kg	<0.2	<0.2	<0.2	----	----
Pirimphos-ethyl	23505-41-1	0.05	mg/kg	<0.05	<0.05	<0.05	----	----
Chlorfenvinphos	470-90-6	0.05	mg/kg	<0.05	<0.05	<0.05	----	----
Bromophos-ethyl	4824-78-6	0.05	mg/kg	<0.05	<0.05	<0.05	----	----
Fenamiphos	22224-92-6	0.05	mg/kg	<0.05	<0.05	<0.05	----	----
Prothiofos	34643-46-4	0.05	mg/kg	<0.05	<0.05	<0.05	----	----
Ethion	563-12-2	0.05	mg/kg	<0.05	<0.05	<0.05	----	----
Carbophenothion	786-19-6	0.05	mg/kg	<0.05	<0.05	<0.05	----	----
Azinphos Methyl	86-50-0	0.05	mg/kg	<0.05	<0.05	<0.05	----	----
EP075(SIM)B: Polynuclear Aromatic Hydrocarbons								

Analytical Results

Sub-Matrix: **SOIL** (Matrix: **SOIL)**			*Sample ID*	**BH08_0.05**	**BH08_0.5**	**QC101_210916**	**BH10_0.05**	**BH10_1.0**
			Sampling date / time	16-Sep-2021 00:00	16-Sep-2021 00:00	16-Sep-2021 00:00	16-Sep-2021 00:00	16-Sep-2021 00:00
Compound	*CAS Number*	*LOR*	*Unit*	**ES2133844-009**	**ES2133844-010**	**ES2133844-011**	**ES2133844-013**	**ES2133844-015**
				Result	Result	Result	Result	Result
EP075(SIM)B: Polynuclear Aromatic Hydrocarbons - Continued								
Naphthalene	91-20-3	0.5	mg/kg	<0.5	<0.5	<0.5	----	----
Acenaphthylene	208-96-8	0.5	mg/kg	<0.5	<0.5	<0.5	----	----
Acenaphthene	83-32-9	0.5	mg/kg	<0.5	<0.5	<0.5	----	----
Fluorene	86-73-7	0.5	mg/kg	<0.5	<0.5	<0.5	----	----
Phenanthrene	85-01-8	0.5	mg/kg	<0.5	<0.5	<0.5	----	----
Anthracene	120-12-7	0.5	mg/kg	<0.5	<0.5	<0.5	----	----
Fluoranthene	206-44-0	0.5	mg/kg	<0.5	<0.5	<0.5	----	----
Pyrene	129-00-0	0.5	mg/kg	<0.5	<0.5	<0.5	----	----
Benz(a)anthracene	56-55-3	0.5	mg/kg	<0.5	<0.5	<0.5	----	----
Chrysene	218-01-9	0.5	mg/kg	<0.5	<0.5	<0.5	----	----
Benzo(b+j)fluoranthene	205-99-2 205-82-3	0.5	mg/kg	<0.5	<0.5	<0.5	----	----
Benzo(k)fluoranthene	207-08-9	0.5	mg/kg	<0.5	<0.5	<0.5	----	----
Benzo(a)pyrene	50-32-8	0.5	mg/kg	<0.5	<0.5	<0.5	----	----
Indeno(1.2.3.cd)pyrene	193-39-5	0.5	mg/kg	<0.5	<0.5	<0.5	----	----
Dibenz(a.h)anthracene	53-70-3	0.5	mg/kg	<0.5	<0.5	<0.5	----	----
Benzo(g.h.i)perylene	191-24-2	0.5	mg/kg	<0.5	<0.5	<0.5	----	----
^ **Sum of polycyclic aromatic hydrocarbons**	----	0.5	mg/kg	<0.5	<0.5	<0.5	----	----
^ **Benzo(a)pyrene TEQ (zero)**	----	0.5	mg/kg	<0.5	<0.5	<0.5	----	----
^ **Benzo(a)pyrene TEQ (half LOR)**	----	0.5	mg/kg	**0.6**	**0.6**	**0.6**	----	----
^ **Benzo(a)pyrene TEQ (LOR)**	----	0.5	mg/kg	**1.2**	**1.2**	**1.2**	----	----
EP080/071: Total Petroleum Hydrocarbons								
C6 - C9 Fraction	----	10	mg/kg	<10	<10	<10	----	----
C10 - C14 Fraction	----	50	mg/kg	<50	<50	<50	----	----
C15 - C28 Fraction	----	100	mg/kg	<100	<100	<100	----	----
C29 - C36 Fraction	----	100	mg/kg	<100	<100	<100	----	----
^ **C10 - C36 Fraction (sum)**	----	50	mg/kg	<50	<50	<50	----	----
EP080/071: Total Recoverable Hydrocarbons - NEPM 2013 Fractions								
C6 - C10 Fraction	C6_C10	10	mg/kg	<10	<10	<10	----	----
^ **C6 - C10 Fraction minus BTEX (F1)**	C6_C10-BTEX	10	mg/kg	<10	<10	<10	----	----
>C10 - C16 Fraction	----	50	mg/kg	<50	<50	<50	----	----
>C16 - C34 Fraction	----	100	mg/kg	<100	<100	<100	----	----
>C34 - C40 Fraction	----	100	mg/kg	<100	<100	<100	----	----
^ **>C10 - C40 Fraction (sum)**	----	50	mg/kg	<50	<50	<50	----	----

Analytical Results

Sub-Matrix: **SOIL** (Matrix: **SOIL**)			*Sample ID*	**BH08_0.05**	**BH08_0.5**	**QC101_210916**	**BH10_0.05**	**BH10_1.0**
			Sampling date / time	16-Sep-2021 00:00	16-Sep-2021 00:00	16-Sep-2021 00:00	16-Sep-2021 00:00	16-Sep-2021 00:00
Compound	*CAS Number*	*LOR*	*Unit*	**ES2133844-009**	**ES2133844-010**	**ES2133844-011**	**ES2133844-013**	**ES2133844-015**
				Result	Result	Result	Result	Result
EP080/071: Total Recoverable Hydrocarbons - NEPM 2013 Fractions - Continued								
^ **>C10 - C16 Fraction minus Naphthalene (F2)**	----	50	mg/kg	<50	<50	<50	----	----
EP080: BTEXN								
Benzene	71-43-2	0.2	mg/kg	<0.2	<0.2	<0.2	----	----
Toluene	108-88-3	0.5	mg/kg	<0.5	<0.5	<0.5	----	----
Ethylbenzene	100-41-4	0.5	mg/kg	<0.5	<0.5	<0.5	----	----
meta- & para-Xylene	108-38-3 106-42-3	0.5	mg/kg	<0.5	<0.5	<0.5	----	----
ortho-Xylene	95-47-6	0.5	mg/kg	<0.5	<0.5	<0.5	----	----
^ **Sum of BTEX**	----	0.2	mg/kg	<0.2	<0.2	<0.2	----	----
^ **Total Xylenes**	----	0.5	mg/kg	<0.5	<0.5	<0.5	----	----
Naphthalene	91-20-3	1	mg/kg	<1	<1	<1	----	----
MM868: Coliforms & E.coli by MPN using Aquachrom ECC								
Total Coliforms by MPN	----	10	MPN/g	----	**33**	**11**	----	----
EP068S: Organochlorine Pesticide Surrogate								
Dibromo-DDE	21655-73-2	0.05	%	**95.5**	**118**	**84.0**	----	----
EP068T: Organophosphorus Pesticide Surrogate								
DEF	78-48-8	0.05	%	**93.0**	**101**	**69.2**	----	----
EP075(SIM)S: Phenolic Compound Surrogates								
Phenol-d6	13127-88-3	0.5	%	**87.4**	**84.2**	**85.0**	----	----
2-Chlorophenol-D4	93951-73-6	0.5	%	**88.0**	**85.5**	**86.2**	----	----
2.4.6-Tribromophenol	118-79-6	0.5	%	**76.0**	**68.6**	**68.6**	----	----
EP075(SIM)T: PAH Surrogates								
2-Fluorobiphenyl	321-60-8	0.5	%	**95.0**	**92.7**	**94.1**	----	----
Anthracene-d10	1719-06-8	0.5	%	**95.5**	**92.2**	**94.6**	----	----
4-Terphenyl-d14	1718-51-0	0.5	%	**89.0**	**88.1**	**88.2**	----	----
EP080S: TPH(V)/BTEX Surrogates								
1.2-Dichloroethane-D4	17060-07-0	0.2	%	**121**	**109**	**93.6**	----	----
Toluene-D8	2037-26-5	0.2	%	**130**	**117**	**105**	----	----
4-Bromofluorobenzene	460-00-4	0.2	%	**105**	**113**	**106**	----	----

Analytical Results

Sub-Matrix: **SOIL**
(Matrix: **SOIL**)

			Sample ID	**SS16_0.05**	**SS20_0.05**	**SS29_0.05**	**SS06_0.05**	**SS07_0.05**
			Sampling date / time	17-Sep-2021 00:00	17-Sep-2021 00:00	17-Sep-2021 00:00	17-Sep-2021 00:00	17-Sep-2021 00:00
Compound	*CAS Number*	*LOR*	*Unit*	**ES2133844-016**	**ES2133844-017**	**ES2133844-018**	**ES2133844-019**	**ES2133844-020**
				Result	Result	Result	Result	Result
EA055: Moisture Content (Dried @ 105-110°C)								
Moisture Content	----	1.0	%	**3.7**	**6.4**	**19.6**	**24.1**	**26.2**
EA200: AS 4964 - 2004 Identification of Asbestos in Soils								
Asbestos Detected	1332-21-4	0.1	g/kg	----	----	**No**	**No**	----
Asbestos (Trace)	1332-21-4	5	Fibres	----	----	**No**	**No**	----
Asbestos Type	1332-21-4	-	--	----	----	**-**	**-**	----
Synthetic Mineral Fibre	----	0.1	g/kg	----	----	**No**	**No**	----
Organic Fibre	----	0.1	g/kg	----	----	**No**	**No**	----
Sample weight (dry)	----	0.01	g	----	----	**90.6**	**98.1**	----
APPROVED IDENTIFIER:	----	-	--	----	----	**A. SMYLIE**	**A. SMYLIE**	----
EG005(ED093)T: Total Metals by ICP-AES								
Arsenic	7440-38-2	5	mg/kg	<5	<5	**6**	<5	<5
Cadmium	7440-43-9	1	mg/kg	<1	<1	<1	<1	<1
Chromium	7440-47-3	2	mg/kg	**16**	**8**	**9**	**4**	**6**
Copper	7440-50-8	5	mg/kg	**18**	<5	**15**	<5	**6**
Lead	7439-92-1	5	mg/kg	**22**	**20**	**19**	**10**	**12**
Nickel	7440-02-0	2	mg/kg	**15**	**2**	**3**	<2	<2
Zinc	7440-66-6	5	mg/kg	**75**	**27**	**26**	**15**	**23**
EG035T: Total Recoverable Mercury by FIMS								
Mercury	7439-97-6	0.1	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
EP068A: Organochlorine Pesticides (OC)								
alpha-BHC	319-84-6	0.05	mg/kg	----	----	<0.05	<0.05	----
Hexachlorobenzene (HCB)	118-74-1	0.05	mg/kg	----	----	<0.05	<0.05	----
beta-BHC	319-85-7	0.05	mg/kg	----	----	<0.05	<0.05	----
gamma-BHC	58-89-9	0.05	mg/kg	----	----	<0.05	<0.05	----
delta-BHC	319-86-8	0.05	mg/kg	----	----	<0.05	<0.05	----
Heptachlor	76-44-8	0.05	mg/kg	----	----	<0.05	<0.05	----
Aldrin	309-00-2	0.05	mg/kg	----	----	<0.05	<0.05	----
Heptachlor epoxide	1024-57-3	0.05	mg/kg	----	----	<0.05	<0.05	----
^ **Total Chlordane (sum)**	----	0.05	mg/kg	----	----	<0.05	<0.05	----
trans-Chlordane	5103-74-2	0.05	mg/kg	----	----	<0.05	<0.05	----
alpha-Endosulfan	959-98-8	0.05	mg/kg	----	----	<0.05	<0.05	----
cis-Chlordane	5103-71-9	0.05	mg/kg	----	----	<0.05	<0.05	----
Dieldrin	60-57-1	0.05	mg/kg	----	----	<0.05	<0.05	----
4.4`-DDE	72-55-9	0.05	mg/kg	----	----	<0.05	<0.05	----

Analytical Results

Sub-Matrix: **SOIL**
(Matrix: **SOIL**)

			Sample ID	**SS16_0.05**	**SS20_0.05**	**SS29_0.05**	**SS06_0.05**	**SS07_0.05**
			Sampling date / time	17-Sep-2021 00:00	17-Sep-2021 00:00	17-Sep-2021 00:00	17-Sep-2021 00:00	17-Sep-2021 00:00
Compound	*CAS Number*	*LOR*	*Unit*	**ES2133844-016**	**ES2133844-017**	**ES2133844-018**	**ES2133844-019**	**ES2133844-020**
				Result	Result	Result	Result	Result
EP068A: Organochlorine Pesticides (OC) - Continued								
Endrin	72-20-8	0.05	mg/kg	----	----	<0.05	<0.05	----
beta-Endosulfan	33213-65-9	0.05	mg/kg	----	----	<0.05	<0.05	----
^ **Endosulfan (sum)**	115-29-7	0.05	mg/kg	----	----	<0.05	<0.05	----
4.4`-DDD	72-54-8	0.05	mg/kg	----	----	<0.05	<0.05	----
Endrin aldehyde	7421-93-4	0.05	mg/kg	----	----	<0.05	<0.05	----
Endosulfan sulfate	1031-07-8	0.05	mg/kg	----	----	<0.05	<0.05	----
4.4`-DDT	50-29-3	0.2	mg/kg	----	----	<0.2	<0.2	----
Endrin ketone	53494-70-5	0.05	mg/kg	----	----	<0.05	<0.05	----
Methoxychlor	72-43-5	0.2	mg/kg	----	----	<0.2	<0.2	----
^ **Sum of Aldrin + Dieldrin**	309-00-2/60-57-1	0.05	mg/kg	----	----	<0.05	<0.05	----
^ **Sum of DDD + DDE + DDT**	72-54-8/72-55-9/50-2	0.05	mg/kg	----	----	<0.05	<0.05	----
EP068B: Organophosphorus Pesticides (OP)								
Dichlorvos	62-73-7	0.05	mg/kg	----	----	<0.05	<0.05	----
Demeton-S-methyl	919-86-8	0.05	mg/kg	----	----	<0.05	<0.05	----
Monocrotophos	6923-22-4	0.2	mg/kg	----	----	<0.2	<0.2	----
Dimethoate	60-51-5	0.05	mg/kg	----	----	<0.05	<0.05	----
Diazinon	333-41-5	0.05	mg/kg	----	----	<0.05	<0.05	----
Chlorpyrifos-methyl	5598-13-0	0.05	mg/kg	----	----	<0.05	<0.05	----
Parathion-methyl	298-00-0	0.2	mg/kg	----	----	<0.2	<0.2	----
Malathion	121-75-5	0.05	mg/kg	----	----	<0.05	<0.05	----
Fenthion	55-38-9	0.05	mg/kg	----	----	<0.05	<0.05	----
Chlorpyrifos	2921-88-2	0.05	mg/kg	----	----	<0.05	<0.05	----
Parathion	56-38-2	0.2	mg/kg	----	----	<0.2	<0.2	----
Pirimphos-ethyl	23505-41-1	0.05	mg/kg	----	----	<0.05	<0.05	----
Chlorfenvinphos	470-90-6	0.05	mg/kg	----	----	<0.05	<0.05	----
Bromophos-ethyl	4824-78-6	0.05	mg/kg	----	----	<0.05	<0.05	----
Fenamiphos	22224-92-6	0.05	mg/kg	----	----	<0.05	<0.05	----
Prothiofos	34643-46-4	0.05	mg/kg	----	----	<0.05	<0.05	----
Ethion	563-12-2	0.05	mg/kg	----	----	<0.05	<0.05	----
Carbophenothion	786-19-6	0.05	mg/kg	----	----	<0.05	<0.05	----
Azinphos Methyl	86-50-0	0.05	mg/kg	----	----	<0.05	<0.05	----
EP075(SIM)B: Polynuclear Aromatic Hydrocarbons								
Naphthalene	91-20-3	0.5	mg/kg	<0.5	<0.5	<0.5	<0.5	<0.5
Acenaphthylene	208-96-8	0.5	mg/kg	<0.5	<0.5	<0.5	<0.5	<0.5

Analytical Results

Sub-Matrix: **SOIL**
(Matrix: **SOIL**)

Compound	CAS Number	LOR	Unit	SS16_0.05	SS20_0.05	SS29_0.05	SS06_0.05	SS07_0.05
			Sampling date / time	17-Sep-2021 00:00	17-Sep-2021 00:00	17-Sep-2021 00:00	17-Sep-2021 00:00	17-Sep-2021 00:00
				ES2133844-016	**ES2133844-017**	**ES2133844-018**	**ES2133844-019**	**ES2133844-020**
				Result	Result	Result	Result	Result
EP075(SIM)B: Polynuclear Aromatic Hydrocarbons - Continued								
Acenaphthene	83-32-9	0.5	mg/kg	<0.5	<0.5	<0.5	<0.5	<0.5
Fluorene	86-73-7	0.5	mg/kg	<0.5	<0.5	<0.5	<0.5	<0.5
Phenanthrene	85-01-8	0.5	mg/kg	<0.5	<0.5	<0.5	<0.5	<0.5
Anthracene	120-12-7	0.5	mg/kg	<0.5	<0.5	<0.5	<0.5	<0.5
Fluoranthene	206-44-0	0.5	mg/kg	<0.5	<0.5	<0.5	<0.5	<0.5
Pyrene	129-00-0	0.5	mg/kg	<0.5	<0.5	<0.5	<0.5	<0.5
Benz(a)anthracene	56-55-3	0.5	mg/kg	<0.5	<0.5	<0.5	<0.5	<0.5
Chrysene	218-01-9	0.5	mg/kg	<0.5	<0.5	<0.5	<0.5	<0.5
Benzo(b+j)fluoranthene	205-99-2 205-82-3	0.5	mg/kg	<0.5	<0.5	<0.5	<0.5	<0.5
Benzo(k)fluoranthene	207-08-9	0.5	mg/kg	<0.5	<0.5	<0.5	<0.5	<0.5
Benzo(a)pyrene	50-32-8	0.5	mg/kg	<0.5	<0.5	<0.5	<0.5	<0.5
Indeno(1.2.3.cd)pyrene	193-39-5	0.5	mg/kg	<0.5	<0.5	<0.5	<0.5	<0.5
Dibenz(a.h)anthracene	53-70-3	0.5	mg/kg	<0.5	<0.5	<0.5	<0.5	<0.5
Benzo(g.h.i)perylene	191-24-2	0.5	mg/kg	<0.5	<0.5	<0.5	<0.5	<0.5
^ **Sum of polycyclic aromatic hydrocarbons**	----	0.5	mg/kg	<0.5	<0.5	<0.5	<0.5	<0.5
^ **Benzo(a)pyrene TEQ (zero)**	----	0.5	mg/kg	<0.5	<0.5	<0.5	<0.5	<0.5
^ **Benzo(a)pyrene TEQ (half LOR)**	----	0.5	mg/kg	**0.6**	**0.6**	**0.6**	**0.6**	**0.6**
^ **Benzo(a)pyrene TEQ (LOR)**	----	0.5	mg/kg	**1.2**	**1.2**	**1.2**	**1.2**	**1.2**
EP080/071: Total Petroleum Hydrocarbons								
C6 - C9 Fraction	----	10	mg/kg	<10	<10	<10	<10	<10
C10 - C14 Fraction	----	50	mg/kg	<50	<50	<50	<50	<50
C15 - C28 Fraction	----	100	mg/kg	<100	<100	<100	<100	<100
C29 - C36 Fraction	----	100	mg/kg	<100	<100	<100	<100	<100
^ **C10 - C36 Fraction (sum)**	----	50	mg/kg	<50	<50	<50	<50	<50
EP080/071: Total Recoverable Hydrocarbons - NEPM 2013 Fractions								
C6 - C10 Fraction	C6_C10	10	mg/kg	<10	<10	<10	<10	<10
^ **C6 - C10 Fraction minus BTEX (F1)**	C6_C10-BTEX	10	mg/kg	<10	<10	<10	<10	<10
>C10 - C16 Fraction	----	50	mg/kg	<50	<50	<50	<50	<50
>C16 - C34 Fraction	----	100	mg/kg	<100	<100	<100	<100	<100
>C34 - C40 Fraction	----	100	mg/kg	<100	<100	<100	<100	<100
^ **>C10 - C40 Fraction (sum)**	----	50	mg/kg	<50	<50	<50	<50	<50
^ **>C10 - C16 Fraction minus Naphthalene (F2)**	----	50	mg/kg	<50	<50	<50	<50	<50

Analytical Results

Sub-Matrix: **SOIL** (Matrix: **SOIL**)			*Sample ID*	**SS16_0.05**	**SS20_0.05**	**SS29_0.05**	**SS06_0.05**	**SS07_0.05**
			Sampling date / time	17-Sep-2021 00:00	17-Sep-2021 00:00	17-Sep-2021 00:00	17-Sep-2021 00:00	17-Sep-2021 00:00
Compound	*CAS Number*	*LOR*	*Unit*	**ES2133844-016**	**ES2133844-017**	**ES2133844-018**	**ES2133844-019**	**ES2133844-020**
				Result	Result	Result	Result	Result
EP080: BTEXN								
Benzene	71-43-2	0.2	mg/kg	<0.2	<0.2	<0.2	<0.2	<0.2
Toluene	108-88-3	0.5	mg/kg	<0.5	<0.5	<0.5	<0.5	<0.5
Ethylbenzene	100-41-4	0.5	mg/kg	<0.5	<0.5	<0.5	<0.5	<0.5
meta- & para-Xylene	108-38-3 106-42-3	0.5	mg/kg	<0.5	<0.5	<0.5	<0.5	<0.5
ortho-Xylene	95-47-6	0.5	mg/kg	<0.5	<0.5	<0.5	<0.5	<0.5
^ **Sum of BTEX**	----	0.2	mg/kg	<0.2	<0.2	<0.2	<0.2	<0.2
^ **Total Xylenes**	----	0.5	mg/kg	<0.5	<0.5	<0.5	<0.5	<0.5
Naphthalene	91-20-3	1	mg/kg	<1	<1	<1	<1	<1
EP231A: Perfluoroalkyl Sulfonic Acids								
Perfluorobutane sulfonic acid (PFBS)	375-73-5	0.0002	mg/kg	----	----	----	----	<0.0002
Perfluoropentane sulfonic acid (PFPeS)	2706-91-4	0.0002	mg/kg	----	----	----	----	<0.0002
Perfluorohexane sulfonic acid (PFHxS)	355-46-4	0.0002	mg/kg	----	----	----	----	<0.0002
Perfluoroheptane sulfonic acid (PFHpS)	375-92-8	0.0002	mg/kg	----	----	----	----	<0.0002
Perfluorooctane sulfonic acid (PFOS)	1763-23-1	0.0002	mg/kg	----	----	----	----	**0.0006**
Perfluorodecane sulfonic acid (PFDS)	335-77-3	0.0002	mg/kg	----	----	----	----	<0.0002
EP231B: Perfluoroalkyl Carboxylic Acids								
Perfluorobutanoic acid (PFBA)	375-22-4	0.001	mg/kg	----	----	----	----	<0.001
Perfluoropentanoic acid (PFPeA)	2706-90-3	0.0002	mg/kg	----	----	----	----	<0.0002
Perfluorohexanoic acid (PFHxA)	307-24-4	0.0002	mg/kg	----	----	----	----	<0.0002
Perfluoroheptanoic acid (PFHpA)	375-85-9	0.0002	mg/kg	----	----	----	----	<0.0002
Perfluorooctanoic acid (PFOA)	335-67-1	0.0002	mg/kg	----	----	----	----	<0.0002
Perfluorononanoic acid (PFNA)	375-95-1	0.0002	mg/kg	----	----	----	----	<0.0002
Perfluorodecanoic acid (PFDA)	335-76-2	0.0002	mg/kg	----	----	----	----	<0.0002
Perfluoroundecanoic acid (PFUnDA)	2058-94-8	0.0002	mg/kg	----	----	----	----	<0.0002
Perfluorododecanoic acid (PFDoDA)	307-55-1	0.0002	mg/kg	----	----	----	----	<0.0002
Perfluorotridecanoic acid (PFTrDA)	72629-94-8	0.0002	mg/kg	----	----	----	----	<0.0002

Analytical Results

Sub-Matrix: **SOIL**
(Matrix: **SOIL**)

			Sample ID	**SS16_0.05**	**SS20_0.05**	**SS29_0.05**	**SS06_0.05**	**SS07_0.05**
			Sampling date / time	17-Sep-2021 00:00	17-Sep-2021 00:00	17-Sep-2021 00:00	17-Sep-2021 00:00	17-Sep-2021 00:00
Compound	*CAS Number*	*LOR*	*Unit*	**ES2133844-016**	**ES2133844-017**	**ES2133844-018**	**ES2133844-019**	**ES2133844-020**
				Result	Result	Result	Result	Result
EP231B: Perfluoroalkyl Carboxylic Acids - Continued								
Perfluorotetradecanoic acid (PFTeDA)	376-06-7	0.0005	mg/kg	----	----	----	----	<0.0005
EP231C: Perfluoroalkyl Sulfonamides								
Perfluorooctane sulfonamide (FOSA)	754-91-6	0.0002	mg/kg	----	----	----	----	<0.0002
N-Methyl perfluorooctane sulfonamide (MeFOSA)	31506-32-8	0.0005	mg/kg	----	----	----	----	<0.0005
N-Ethyl perfluorooctane sulfonamide (EtFOSA)	4151-50-2	0.0005	mg/kg	----	----	----	----	<0.0005
N-Methyl perfluorooctane sulfonamidoethanol (MeFOSE)	24448-09-7	0.0005	mg/kg	----	----	----	----	<0.0005
N-Ethyl perfluorooctane sulfonamidoethanol (EtFOSE)	1691-99-2	0.0005	mg/kg	----	----	----	----	<0.0005
N-Methyl perfluorooctane sulfonamidoacetic acid (MeFOSAA)	2355-31-9	0.0002	mg/kg	----	----	----	----	<0.0002
N-Ethyl perfluorooctane sulfonamidoacetic acid (EtFOSAA)	2991-50-6	0.0002	mg/kg	----	----	----	----	<0.0002
EP231D: (n:2) Fluorotelomer Sulfonic Acids								
4:2 Fluorotelomer sulfonic acid (4:2 FTS)	757124-72-4	0.0005	mg/kg	----	----	----	----	<0.0005
6:2 Fluorotelomer sulfonic acid (6:2 FTS)	27619-97-2	0.0005	mg/kg	----	----	----	----	<0.0005
8:2 Fluorotelomer sulfonic acid (8:2 FTS)	39108-34-4	0.0005	mg/kg	----	----	----	----	<0.0005
10:2 Fluorotelomer sulfonic acid (10:2 FTS)	120226-60-0	0.0005	mg/kg	----	----	----	----	<0.0005
EP231P: PFAS Sums								
Sum of PFAS	----	0.0002	mg/kg	----	----	----	----	**0.0006**
Sum of PFHxS and PFOS	355-46-4/1763-23-1	0.0002	mg/kg	----	----	----	----	**0.0006**
Sum of PFAS (WA DER List)	----	0.0002	mg/kg	----	----	----	----	**0.0006**
EP068S: Organochlorine Pesticide Surrogate								
Dibromo-DDE	21655-73-2	0.05	%	----	----	**89.1**	**93.9**	----

Analytical Results

Sub-Matrix: **SOIL** (Matrix: **SOIL**)			Sample ID	**SS16_0.05**	**SS20_0.05**	**SS29_0.05**	**SS06_0.05**	**SS07_0.05**
			Sampling date / time	17-Sep-2021 00:00	17-Sep-2021 00:00	17-Sep-2021 00:00	17-Sep-2021 00:00	17-Sep-2021 00:00
Compound	CAS Number	LOR	Unit	**ES2133844-016**	**ES2133844-017**	**ES2133844-018**	**ES2133844-019**	**ES2133844-020**
				Result	Result	Result	Result	Result
EP068T: Organophosphorus Pesticide Surrogate								
DEF	78-48-8	0.05	%	----	----	**94.6**	**91.5**	----
EP075(SIM)S: Phenolic Compound Surrogates								
Phenol-d6	13127-88-3	0.5	%	**93.8**	**86.8**	**83.3**	**83.0**	**81.1**
2-Chlorophenol-D4	93951-73-6	0.5	%	**91.2**	**87.8**	**83.9**	**83.8**	**82.8**
2.4.6-Tribromophenol	118-79-6	0.5	%	**89.5**	**78.3**	**77.6**	**78.0**	**80.4**
EP075(SIM)T: PAH Surrogates								
2-Fluorobiphenyl	321-60-8	0.5	%	**103**	**98.0**	**91.4**	**90.2**	**90.7**
Anthracene-d10	1719-06-8	0.5	%	**103**	**99.8**	**93.6**	**90.3**	**90.7**
4-Terphenyl-d14	1718-51-0	0.5	%	**98.4**	**96.1**	**86.4**	**86.6**	**85.7**
EP080S: TPH(V)/BTEX Surrogates								
1.2-Dichloroethane-D4	17060-07-0	0.2	%	**112**	**95.4**	**108**	**106**	**105**
Toluene-D8	2037-26-5	0.2	%	**126**	**107**	**121**	**101**	**98.7**
4-Bromofluorobenzene	460-00-4	0.2	%	**87.7**	**84.4**	**85.8**	**75.7**	**82.1**
EP231S: PFAS Surrogate								
13C4-PFOS	----	0.0002	%	----	----	----	----	**94.0**
13C8-PFOA	----	0.0002	%	----	----	----	----	**96.5**

Analytical Results

Sub-Matrix: **SOIL**
(Matrix: **SOIL**)

			Sample ID	**SS08_0.05**	**SS09_0.05**	**QC101_210917**	**QC300_210917**	**----**
			Sampling date / time	17-Sep-2021 00:00	17-Sep-2021 00:00	17-Sep-2021 00:00	17-Sep-2021 00:00	----
Compound	*CAS Number*	*LOR*	*Unit*	**ES2133844-021**	**ES2133844-022**	**ES2133844-023**	**ES2133844-026**	**--------**
				Result	Result	Result	Result	----
EA055: Moisture Content (Dried @ 105-110°C)								
Moisture Content	----	1.0	%	**14.9**	**19.8**	**17.6**	----	----
EG005(ED093)T: Total Metals by ICP-AES								
Arsenic	7440-38-2	5	mg/kg	<5	<5	<5	----	----
Cadmium	7440-43-9	1	mg/kg	<1	<1	<1	----	----
Chromium	7440-47-3	2	mg/kg	**4**	**8**	**7**	----	----
Copper	7440-50-8	5	mg/kg	<5	**6**	**5**	----	----
Lead	7439-92-1	5	mg/kg	<5	**18**	**8**	----	----
Nickel	7440-02-0	2	mg/kg	**2**	**2**	**3**	----	----
Zinc	7440-66-6	5	mg/kg	**31**	**36**	**40**	----	----
EG035T: Total Recoverable Mercury by FIMS								
Mercury	7439-97-6	0.1	mg/kg	<0.1	<0.1	<0.1	----	----
EP075(SIM)B: Polynuclear Aromatic Hydrocarbons								
Naphthalene	91-20-3	0.5	mg/kg	<0.5	<0.5	<0.5	----	----
Acenaphthylene	208-96-8	0.5	mg/kg	<0.5	<0.5	<0.5	----	----
Acenaphthene	83-32-9	0.5	mg/kg	<0.5	<0.5	<0.5	----	----
Fluorene	86-73-7	0.5	mg/kg	<0.5	<0.5	<0.5	----	----
Phenanthrene	85-01-8	0.5	mg/kg	<0.5	<0.5	<0.5	----	----
Anthracene	120-12-7	0.5	mg/kg	<0.5	<0.5	<0.5	----	----
Fluoranthene	206-44-0	0.5	mg/kg	<0.5	<0.5	<0.5	----	----
Pyrene	129-00-0	0.5	mg/kg	<0.5	<0.5	<0.5	----	----
Benz(a)anthracene	56-55-3	0.5	mg/kg	<0.5	<0.5	<0.5	----	----
Chrysene	218-01-9	0.5	mg/kg	<0.5	<0.5	<0.5	----	----
Benzo(b+j)fluoranthene	205-99-2 205-82-3	0.5	mg/kg	<0.5	<0.5	<0.5	----	----
Benzo(k)fluoranthene	207-08-9	0.5	mg/kg	<0.5	<0.5	<0.5	----	----
Benzo(a)pyrene	50-32-8	0.5	mg/kg	<0.5	<0.5	<0.5	----	----
Indeno(1.2.3.cd)pyrene	193-39-5	0.5	mg/kg	<0.5	<0.5	<0.5	----	----
Dibenz(a.h)anthracene	53-70-3	0.5	mg/kg	<0.5	<0.5	<0.5	----	----
Benzo(g.h.i)perylene	191-24-2	0.5	mg/kg	<0.5	<0.5	<0.5	----	----
^ **Sum of polycyclic aromatic hydrocarbons**	----	0.5	mg/kg	<0.5	<0.5	<0.5	----	----
^ **Benzo(a)pyrene TEQ (zero)**	----	0.5	mg/kg	<0.5	<0.5	<0.5	----	----
^ **Benzo(a)pyrene TEQ (half LOR)**	----	0.5	mg/kg	**0.6**	**0.6**	**0.6**	----	----
^ **Benzo(a)pyrene TEQ (LOR)**	----	0.5	mg/kg	**1.2**	**1.2**	**1.2**	----	----
EP080/071: Total Petroleum Hydrocarbons								
C6 - C9 Fraction	----	10	mg/kg	<10	<10	<10	<10	----

Analytical Results

Sub-Matrix: **SOIL** (Matrix: **SOIL**)			*Sample ID*	**SS08_0.05**	**SS09_0.05**	**QC101_210917**	**QC300_210917**	**----**
			Sampling date / time	17-Sep-2021 00:00	17-Sep-2021 00:00	17-Sep-2021 00:00	17-Sep-2021 00:00	----
Compound	*CAS Number*	*LOR*	*Unit*	**ES2133844-021**	**ES2133844-022**	**ES2133844-023**	**ES2133844-026**	**--------**
				Result	Result	Result	Result	----
EP080/071: Total Petroleum Hydrocarbons - Continued								
C10 - C14 Fraction	----	50	mg/kg	<50	<50	<50	----	----
C15 - C28 Fraction	----	100	mg/kg	<100	<100	<100	----	----
C29 - C36 Fraction	----	100	mg/kg	<100	<100	<100	----	----
^ **C10 - C36 Fraction (sum)**	----	50	mg/kg	<50	<50	<50	----	----
EP080/071: Total Recoverable Hydrocarbons - NEPM 2013 Fractions								
C6 - C10 Fraction	C6_C10	10	mg/kg	<10	<10	<10	<10	----
^ **C6 - C10 Fraction minus BTEX (F1)**	C6_C10-BTEX	10	mg/kg	<10	<10	<10	<10	----
>C10 - C16 Fraction	----	50	mg/kg	<50	<50	<50	----	----
>C16 - C34 Fraction	----	100	mg/kg	<100	<100	<100	----	----
>C34 - C40 Fraction	----	100	mg/kg	<100	<100	<100	----	----
^ **>C10 - C40 Fraction (sum)**	----	50	mg/kg	<50	<50	<50	----	----
^ **>C10 - C16 Fraction minus Naphthalene (F2)**	----	50	mg/kg	<50	<50	<50	----	----
EP080: BTEXN								
Benzene	71-43-2	0.2	mg/kg	<0.2	<0.2	<0.2	<0.2	----
Toluene	108-88-3	0.5	mg/kg	<0.5	<0.5	<0.5	<0.5	----
Ethylbenzene	100-41-4	0.5	mg/kg	<0.5	<0.5	<0.5	<0.5	----
meta- & para-Xylene	108-38-3 106-42-3	0.5	mg/kg	<0.5	<0.5	<0.5	<0.5	----
ortho-Xylene	95-47-6	0.5	mg/kg	<0.5	<0.5	<0.5	<0.5	----
^ **Sum of BTEX**	----	0.2	mg/kg	<0.2	<0.2	<0.2	<0.2	----
^ **Total Xylenes**	----	0.5	mg/kg	<0.5	<0.5	<0.5	<0.5	----
Naphthalene	91-20-3	1	mg/kg	<1	<1	<1	<1	----
EP231A: Perfluoroalkyl Sulfonic Acids								
Perfluorobutane sulfonic acid (PFBS)	375-73-5	0.0002	mg/kg	<0.0002	<0.0002	<0.0002	----	----
Perfluoropentane sulfonic acid (PFPeS)	2706-91-4	0.0002	mg/kg	<0.0002	<0.0002	<0.0002	----	----
Perfluorohexane sulfonic acid (PFHxS)	355-46-4	0.0002	mg/kg	<0.0002	<0.0002	<0.0002	----	----
Perfluoroheptane sulfonic acid (PFHpS)	375-92-8	0.0002	mg/kg	<0.0002	<0.0002	<0.0002	----	----
Perfluorooctane sulfonic acid (PFOS)	1763-23-1	0.0002	mg/kg	<0.0002	**0.0003**	<0.0002	----	----

Analytical Results

Sub-Matrix: **SOIL** (Matrix: **SOIL**)			Sample ID	**SS08_0.05**	**SS09_0.05**	**QC101_210917**	**QC300_210917**	**----**
			Sampling date / time	17-Sep-2021 00:00	17-Sep-2021 00:00	17-Sep-2021 00:00	17-Sep-2021 00:00	----
Compound	CAS Number	LOR	Unit	**ES2133844-021**	**ES2133844-022**	**ES2133844-023**	**ES2133844-026**	--------
				Result	Result	Result	Result	----
EP231A: Perfluoroalkyl Sulfonic Acids - Continued								
Perfluorodecane sulfonic acid (PFDS)	335-77-3	0.0002	mg/kg	<0.0002	<0.0002	<0.0002	----	----
EP231B: Perfluoroalkyl Carboxylic Acids								
Perfluorobutanoic acid (PFBA)	375-22-4	0.001	mg/kg	<0.001	<0.001	<0.001	----	----
Perfluoropentanoic acid (PFPeA)	2706-90-3	0.0002	mg/kg	<0.0002	<0.0002	<0.0002	----	----
Perfluorohexanoic acid (PFHxA)	307-24-4	0.0002	mg/kg	<0.0002	<0.0002	<0.0002	----	----
Perfluoroheptanoic acid (PFHpA)	375-85-9	0.0002	mg/kg	<0.0002	<0.0002	<0.0002	----	----
Perfluorooctanoic acid (PFOA)	335-67-1	0.0002	mg/kg	<0.0002	<0.0002	<0.0002	----	----
Perfluorononanoic acid (PFNA)	375-95-1	0.0002	mg/kg	<0.0002	<0.0002	<0.0002	----	----
Perfluorodecanoic acid (PFDA)	335-76-2	0.0002	mg/kg	<0.0002	<0.0002	<0.0002	----	----
Perfluoroundecanoic acid (PFUnDA)	2058-94-8	0.0002	mg/kg	<0.0002	<0.0002	<0.0002	----	----
Perfluorododecanoic acid (PFDoDA)	307-55-1	0.0002	mg/kg	<0.0002	<0.0002	<0.0002	----	----
Perfluorotridecanoic acid (PFTrDA)	72629-94-8	0.0002	mg/kg	<0.0002	<0.0002	<0.0002	----	----
Perfluorotetradecanoic acid (PFTeDA)	376-06-7	0.0005	mg/kg	<0.0005	<0.0005	<0.0005	----	----
EP231C: Perfluoroalkyl Sulfonamides								
Perfluorooctane sulfonamide (FOSA)	754-91-6	0.0002	mg/kg	<0.0002	<0.0002	<0.0002	----	----
N-Methyl perfluorooctane sulfonamide (MeFOSA)	31506-32-8	0.0005	mg/kg	<0.0005	<0.0005	<0.0005	----	----
N-Ethyl perfluorooctane sulfonamide (EtFOSA)	4151-50-2	0.0005	mg/kg	<0.0005	<0.0005	<0.0005	----	----
N-Methyl perfluorooctane sulfonamidoethanol (MeFOSE)	24448-09-7	0.0005	mg/kg	<0.0005	<0.0005	<0.0005	----	----
N-Ethyl perfluorooctane sulfonamidoethanol (EtFOSE)	1691-99-2	0.0005	mg/kg	<0.0005	<0.0005	<0.0005	----	----
N-Methyl perfluorooctane sulfonamidoacetic acid (MeFOSAA)	2355-31-9	0.0002	mg/kg	<0.0002	<0.0002	<0.0002	----	----
N-Ethyl perfluorooctane sulfonamidoacetic acid (EtFOSAA)	2991-50-6	0.0002	mg/kg	<0.0002	<0.0002	<0.0002	----	----
EP231D: (n:2) Fluorotelomer Sulfonic Acids								

Analytical Results

Sub-Matrix: **SOIL** (Matrix: **SOIL**)			*Sample ID*	**SS08_0.05**	**SS09_0.05**	**QC101_210917**	**QC300_210917**	**----**
			Sampling date / time	17-Sep-2021 00:00	17-Sep-2021 00:00	17-Sep-2021 00:00	17-Sep-2021 00:00	----
Compound	*CAS Number*	*LOR*	*Unit*	**ES2133844-021**	**ES2133844-022**	**ES2133844-023**	**ES2133844-026**	**--------**
				Result	Result	Result	Result	----
EP231D: (n:2) Fluorotelomer Sulfonic Acids - Continued								
4:2 Fluorotelomer sulfonic acid (4:2 FTS)	757124-72-4	0.0005	mg/kg	<0.0005	<0.0005	<0.0005	----	----
6:2 Fluorotelomer sulfonic acid (6:2 FTS)	27619-97-2	0.0005	mg/kg	<0.0005	<0.0005	<0.0005	----	----
8:2 Fluorotelomer sulfonic acid (8:2 FTS)	39108-34-4	0.0005	mg/kg	<0.0005	<0.0005	<0.0005	----	----
10:2 Fluorotelomer sulfonic acid (10:2 FTS)	120226-60-0	0.0005	mg/kg	<0.0005	<0.0005	<0.0005	----	----
EP231P: PFAS Sums								
Sum of PFAS	----	0.0002	mg/kg	<0.0002	**0.0003**	<0.0002	----	----
Sum of PFHxS and PFOS	355-46-4/1763-23-1	0.0002	mg/kg	<0.0002	**0.0003**	<0.0002	----	----
Sum of PFAS (WA DER List)	----	0.0002	mg/kg	<0.0002	**0.0003**	<0.0002	----	----
EP075(SIM)S: Phenolic Compound Surrogates								
Phenol-d6	13127-88-3	0.5	%	**84.7**	**82.0**	**86.3**	----	----
2-Chlorophenol-D4	93951-73-6	0.5	%	**85.2**	**82.6**	**87.1**	----	----
2.4.6-Tribromophenol	118-79-6	0.5	%	**76.4**	**77.1**	**77.4**	----	----
EP075(SIM)T: PAH Surrogates								
2-Fluorobiphenyl	321-60-8	0.5	%	**94.3**	**90.0**	**94.8**	----	----
Anthracene-d10	1719-06-8	0.5	%	**93.8**	**91.7**	**95.8**	----	----
4-Terphenyl-d14	1718-51-0	0.5	%	**88.7**	**85.7**	**89.0**	----	----
EP080S: TPH(V)/BTEX Surrogates								
1.2-Dichloroethane-D4	17060-07-0	0.2	%	**80.0**	**98.9**	**116**	**102**	----
Toluene-D8	2037-26-5	0.2	%	**85.4**	**97.1**	**114**	**104**	----
4-Bromofluorobenzene	460-00-4	0.2	%	**76.2**	**79.0**	**94.2**	**87.9**	----
EP231S: PFAS Surrogate								
13C4-PFOS	----	0.0002	%	**112**	**109**	**111**	----	----
13C8-PFOA	----	0.0002	%	**99.0**	**99.5**	**99.0**	----	----

Analytical Results

Sub-Matrix: **WATER** (Matrix: **WATER**)			*Sample ID*	**QC501_210917**	**QC502_210917**	----	----	----
			Sampling date / time	17-Sep-2021 00:00	17-Sep-2021 00:00	----	----	----
Compound	*CAS Number*	*LOR*	*Unit*	**ES2133844-024**	**ES2133844-025**	--------	--------	--------
				Result	Result	----	----	----
EG020T: Total Metals by ICP-MS								
Arsenic	7440-38-2	0.001	mg/L	<0.001	<0.001	----	----	----
Cadmium	7440-43-9	0.0001	mg/L	<0.0001	<0.0001	----	----	----
Chromium	7440-47-3	0.001	mg/L	<0.001	<0.001	----	----	----
Copper	7440-50-8	0.001	mg/L	<0.001	<0.001	----	----	----
Lead	7439-92-1	0.001	mg/L	<0.001	<0.001	----	----	----
Nickel	7440-02-0	0.001	mg/L	<0.001	<0.001	----	----	----
Zinc	7440-66-6	0.005	mg/L	<0.005	<0.005	----	----	----
EG035T: Total Recoverable Mercury by FIMS								
Mercury	7439-97-6	0.0001	mg/L	<0.0001	<0.0001	----	----	----
EP075(SIM)B: Polynuclear Aromatic Hydrocarbons								
Naphthalene	91-20-3	1.0	µg/L	<1.0	<1.0	----	----	----
Acenaphthylene	208-96-8	1.0	µg/L	<1.0	<1.0	----	----	----
Acenaphthene	83-32-9	1.0	µg/L	<1.0	<1.0	----	----	----
Fluorene	86-73-7	1.0	µg/L	<1.0	<1.0	----	----	----
Phenanthrene	85-01-8	1.0	µg/L	<1.0	<1.0	----	----	----
Anthracene	120-12-7	1.0	µg/L	<1.0	<1.0	----	----	----
Fluoranthene	206-44-0	1.0	µg/L	<1.0	<1.0	----	----	----
Pyrene	129-00-0	1.0	µg/L	<1.0	<1.0	----	----	----
Benz(a)anthracene	56-55-3	1.0	µg/L	<1.0	<1.0	----	----	----
Chrysene	218-01-9	1.0	µg/L	<1.0	<1.0	----	----	----
Benzo(b+j)fluoranthene	205-99-2 205-82-3	1.0	µg/L	<1.0	<1.0	----	----	----
Benzo(k)fluoranthene	207-08-9	1.0	µg/L	<1.0	<1.0	----	----	----
Benzo(a)pyrene	50-32-8	0.5	µg/L	<0.5	<0.5	----	----	----
Indeno(1.2.3.cd)pyrene	193-39-5	1.0	µg/L	<1.0	<1.0	----	----	----
Dibenz(a.h)anthracene	53-70-3	1.0	µg/L	<1.0	<1.0	----	----	----
Benzo(g.h.i)perylene	191-24-2	1.0	µg/L	<1.0	<1.0	----	----	----
^ **Sum of polycyclic aromatic hydrocarbons**	----	0.5	µg/L	<0.5	<0.5	----	----	----
^ **Benzo(a)pyrene TEQ (zero)**	----	0.5	µg/L	<0.5	<0.5	----	----	----
EP080/071: Total Petroleum Hydrocarbons								
C6 - C9 Fraction	----	20	µg/L	<20	<20	----	----	----
C10 - C14 Fraction	----	50	µg/L	<50	<50	----	----	----
C15 - C28 Fraction	----	100	µg/L	<100	<100	----	----	----
C29 - C36 Fraction	----	50	µg/L	<50	<50	----	----	----
^ **C10 - C36 Fraction (sum)**	----	50	µg/L	<50	<50	----	----	----

Analytical Results

Sub-Matrix: **WATER** (Matrix: **WATER**)			Sample ID	**QC501_210917**	**QC502_210917**	**----**	**----**	**----**
			Sampling date / time	17-Sep-2021 00:00	17-Sep-2021 00:00	----	----	----
Compound	CAS Number	LOR	Unit	**ES2133844-024**	**ES2133844-025**	--------	--------	--------
				Result	Result	----	----	----
EP080/071: Total Recoverable Hydrocarbons - NEPM 2013 Fractions								
C6 - C10 Fraction	C6_C10	20	µg/L	<20	<20	----	----	----
^ **C6 - C10 Fraction minus BTEX (F1)**	C6_C10-BTEX	20	µg/L	<20	<20	----	----	----
>C10 - C16 Fraction	----	100	µg/L	<100	<100	----	----	----
>C16 - C34 Fraction	----	100	µg/L	<100	<100	----	----	----
>C34 - C40 Fraction	----	100	µg/L	<100	<100	----	----	----
^ **>C10 - C40 Fraction (sum)**	----	100	µg/L	<100	<100	----	----	----
^ **>C10 - C16 Fraction minus Naphthalene (F2)**	----	100	µg/L	<100	<100	----	----	----
EP080: BTEXN								
Benzene	71-43-2	1	µg/L	<1	<1	----	----	----
Toluene	108-88-3	2	µg/L	<2	<2	----	----	----
Ethylbenzene	100-41-4	2	µg/L	<2	<2	----	----	----
meta- & para-Xylene	108-38-3 106-42-3	2	µg/L	<2	<2	----	----	----
ortho-Xylene	95-47-6	2	µg/L	<2	<2	----	----	----
^ **Total Xylenes**	----	2	µg/L	<2	<2	----	----	----
^ **Sum of BTEX**	----	1	µg/L	<1	<1	----	----	----
Naphthalene	91-20-3	5	µg/L	<5	<5	----	----	----
EP075(SIM)S: Phenolic Compound Surrogates								
Phenol-d6	13127-88-3	1.0	%	**19.3**	**18.0**	----	----	----
2-Chlorophenol-D4	93951-73-6	1.0	%	**51.6**	**38.2**	----	----	----
2.4.6-Tribromophenol	118-79-6	1.0	%	**44.2**	**41.9**	----	----	----
EP075(SIM)T: PAH Surrogates								
2-Fluorobiphenyl	321-60-8	1.0	%	**57.8**	**54.4**	----	----	----
Anthracene-d10	1719-06-8	1.0	%	**73.8**	**60.8**	----	----	----
4-Terphenyl-d14	1718-51-0	1.0	%	**93.2**	**80.5**	----	----	----
EP080S: TPH(V)/BTEX Surrogates								
1.2-Dichloroethane-D4	17060-07-0	2	%	**107**	**117**	----	----	----
Toluene-D8	2037-26-5	2	%	**105**	**113**	----	----	----
4-Bromofluorobenzene	460-00-4	2	%	**104**	**116**	----	----	----

Analytical Results

Descriptive Results

Sub-Matrix: **SOIL**

Method: Compound	*Sample ID - Sampling date / time*	*Analytical Results*
EA200: AS 4964 - 2004 Identification of Asbestos in Soils		
EA200: Description	BH16_0.05 - 13-Sep-2021 00:00	Soil sample.
EA200: Description	BH16_1.5 - 13-Sep-2021 00:00	Soil sample.
EA200: Description	BH13_0.05 - 15-Sep-2021 00:00	Soil sample.
EA200: Description	BH13_0.5 - 15-Sep-2021 00:00	Soil sample.
EA200: Description	SS22_0.05 - 15-Sep-2021 00:00	Soil sample.
EA200: Description	BH08_0.05 - 16-Sep-2021 00:00	Soil sample.
EA200: Description	BH08_0.5 - 16-Sep-2021 00:00	Soil sample.
EA200: Description	SS29_0.05 - 17-Sep-2021 00:00	Soil sample.
EA200: Description	SS06_0.05 - 17-Sep-2021 00:00	Soil sample.

Surrogate Control Limits

Sub-Matrix: **SOIL**

Compound	CAS Number	Recovery Limits (%) Low	Recovery Limits (%) High
EP068S: Organochlorine Pesticide Surrogate			
Dibromo-DDE	21655-73-2	49	147
EP068T: Organophosphorus Pesticide Surrogate			
DEF	78-48-8	35	143
EP075(SIM)S: Phenolic Compound Surrogates			
Phenol-d6	13127-88-3	63	123
2-Chlorophenol-D4	93951-73-6	66	122
2.4.6-Tribromophenol	118-79-6	40	138
EP075(SIM)T: PAH Surrogates			
2-Fluorobiphenyl	321-60-8	70	122
Anthracene-d10	1719-06-8	66	128
4-Terphenyl-d14	1718-51-0	65	129
EP080S: TPH(V)/BTEX Surrogates			
1.2-Dichloroethane-D4	17060-07-0	73	133
Toluene-D8	2037-26-5	74	132
4-Bromofluorobenzene	460-00-4	72	130
EP231S: PFAS Surrogate			
13C4-PFOS	----	60	120
13C8-PFOA	----	60	120

Sub-Matrix: **WATER**

Compound	CAS Number	Recovery Limits (%) Low	Recovery Limits (%) High
EP075(SIM)S: Phenolic Compound Surrogates			
Phenol-d6	13127-88-3	10	44
2-Chlorophenol-D4	93951-73-6	14	94
2.4.6-Tribromophenol	118-79-6	17	125
EP075(SIM)T: PAH Surrogates			
2-Fluorobiphenyl	321-60-8	20	104
Anthracene-d10	1719-06-8	27	113
4-Terphenyl-d14	1718-51-0	32	112
EP080S: TPH(V)/BTEX Surrogates			
1.2-Dichloroethane-D4	17060-07-0	71	137
Toluene-D8	2037-26-5	79	131
4-Bromofluorobenzene	460-00-4	70	128

Inter-Laboratory Testing

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

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

ALS Environmental

QUALITY CONTROL REPORT

Work Order : **ES2133844**

Client : **Jacobs Arcadis Joint Venture**
Contact : Amanda Mullen
Address : Level 16 580 George Street
Sydney 2000
Telephone : ----
Project : IA254001
Order number : 1770
C-O-C number : ----
Sampler : Nick Keatley
Site : ----
Quote number : EN/222
No. of samples received : 26
No. of samples analysed : 21

Page : 1 of 18

Laboratory : Environmental Division Sydney
Contact : Customer Services ES
Address : 277-289 Woodpark Road Smithfield NSW Australia 2164
Telephone : +61-2-8784 8555
Date Samples Received : 17-Sep-2021
Date Analysis Commenced : 20-Sep-2021
Issue Date : 28-Sep-2021

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

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

This Quality Control Report contains the following information:

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

Signatories

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

Signatories	*Position*	*Accreditation Category*
Alana Smylie	Asbestos Identifier	Newcastle - Asbestos, Mayfield West, NSW
Ankit Joshi	Inorganic Chemist	Sydney Inorganics, Smithfield, NSW
Edwandy Fadjar	Organic Coordinator	Sydney Organics, Smithfield, NSW
Franco Lentini	LCMS Coordinator	Sydney Inorganics, Smithfield, NSW
Franco Lentini	LCMS Coordinator	Sydney Organics, Smithfield, NSW
Ivan Taylor	Analyst	Sydney Inorganics, Smithfield, NSW
Uma Nagendiram	Subcontracting Coordinator	WRG Subcontracting, Smithfield, NSW

General Comments

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

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

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

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

Laboratory Duplicate (DUP) Report

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

Sub-Matrix**: SOIL**

				Laboratory Duplicate (DUP) Report					
Laboratory sample ID	*Sample ID*	*Method: Compound*	*CAS Number*	*LOR*	*Unit*	*Original Result*	*Duplicate Result*	*RPD (%)*	*Acceptable RPD (%)*
EG005(ED093)T: Total Metals by ICP-AES (QC Lot: 3918141)									
ES2133796-010	Anonymous	EG005T: Cadmium	7440-43-9	1	mg/kg	<1	<1	0.0	No Limit
		EG005T: Chromium	7440-47-3	2	mg/kg	4	6	33.0	No Limit
		EG005T: Nickel	7440-02-0	2	mg/kg	2	2	0.0	No Limit
		EG005T: Arsenic	7440-38-2	5	mg/kg	<5	<5	0.0	No Limit
		EG005T: Copper	7440-50-8	5	mg/kg	<5	<5	0.0	No Limit
		EG005T: Lead	7439-92-1	5	mg/kg	23	25	11.2	No Limit
		EG005T: Zinc	7440-66-6	5	mg/kg	26	26	0.0	No Limit
ES2133796-032	Anonymous	EG005T: Cadmium	7440-43-9	1	mg/kg	1	1	0.0	No Limit
		EG005T: Chromium	7440-47-3	2	mg/kg	169	160	5.1	0% - 20%
		EG005T: Nickel	7440-02-0	2	mg/kg	25	28	9.2	0% - 50%
		EG005T: Arsenic	7440-38-2	5	mg/kg	11	11	0.0	No Limit
		EG005T: Copper	7440-50-8	5	mg/kg	168	168	0.0	0% - 20%
		EG005T: Lead	7439-92-1	5	mg/kg	272	252	7.7	0% - 20%
		EG005T: Zinc	7440-66-6	5	mg/kg	204	206	1.0	0% - 20%
EG005(ED093)T: Total Metals by ICP-AES (QC Lot: 3920087)									
ES2133844-013	BH10_0.05	EG005T: Cadmium	7440-43-9	1	mg/kg	<1	<1	0.0	No Limit
		EG005T: Chromium	7440-47-3	2	mg/kg	2	2	0.0	No Limit
		EG005T: Nickel	7440-02-0	2	mg/kg	<2	<2	0.0	No Limit
		EG005T: Arsenic	7440-38-2	5	mg/kg	<5	<5	0.0	No Limit
		EG005T: Copper	7440-50-8	5	mg/kg	<5	<5	0.0	No Limit
		EG005T: Lead	7439-92-1	5	mg/kg	14	12	8.4	No Limit
		EG005T: Zinc	7440-66-6	5	mg/kg	12	10	16.1	No Limit
ES2133996-001	Anonymous	EG005T: Cadmium	7440-43-9	1	mg/kg	<1	<1	0.0	No Limit
		EG005T: Chromium	7440-47-3	2	mg/kg	2	<2	0.0	No Limit

Sub-Matrix: **SOIL**				Laboratory Duplicate (DUP) Report					
Laboratory sample ID	*Sample ID*	*Method: Compound*	*CAS Number*	*LOR*	*Unit*	*Original Result*	*Duplicate Result*	*RPD (%)*	*Acceptable RPD (%)*
EG005(ED093)T: Total Metals by ICP-AES (QC Lot: 3920087) - continued									
ES2133996-001	Anonymous	EG005T: Nickel	7440-02-0	2	mg/kg	<2	3	53.0	No Limit
		EG005T: Arsenic	7440-38-2	5	mg/kg	<5	<5	0.0	No Limit
		EG005T: Copper	7440-50-8	5	mg/kg	18	16	12.8	No Limit
		EG005T: Lead	7439-92-1	5	mg/kg	38	35	7.9	No Limit
		EG005T: Zinc	7440-66-6	5	mg/kg	41	32	24.2	No Limit
EA055: Moisture Content (Dried @ 105-110°C) (QC Lot: 3918144)									
ES2133796-012	Anonymous	EA055: Moisture Content	----	0.1	%	3.9	4.2	8.2	No Limit
ES2133844-004	BH16_1.5	EA055: Moisture Content	----	0.1	%	15.0	14.3	4.9	0% - 50%
EA055: Moisture Content (Dried @ 105-110°C) (QC Lot: 3919137)									
ES2134259-003	Anonymous	EA055: Moisture Content	----	0.1	%	23.4	23.8	1.9	0% - 20%
EA055: Moisture Content (Dried @ 105-110°C) (QC Lot: 3920094)									
ES2133844-018	SS29_0.05	EA055: Moisture Content	----	0.1	%	19.6	19.7	0.0	0% - 50%
ES2134027-003	Anonymous	EA055: Moisture Content	----	0.1	%	62.7	62.8	0.0	0% - 20%
EG035T: Total Recoverable Mercury by FIMS (QC Lot: 3918142)									
ES2133796-010	Anonymous	EG035T: Mercury	7439-97-6	0.1	mg/kg	<0.1	<0.1	0.0	No Limit
ES2133796-032	Anonymous	EG035T: Mercury	7439-97-6	0.1	mg/kg	0.3	0.3	0.0	No Limit
EG035T: Total Recoverable Mercury by FIMS (QC Lot: 3920088)									
ES2133844-013	BH10_0.05	EG035T: Mercury	7439-97-6	0.1	mg/kg	<0.1	<0.1	0.0	No Limit
ES2133996-001	Anonymous	EG035T: Mercury	7439-97-6	0.1	mg/kg	<0.1	<0.1	0.0	No Limit
EK026SF: Total CN by Segmented Flow Analyser (QC Lot: 3919135)									
ES2133795-001	Anonymous	EK026SF: Total Cyanide	57-12-5	1	mg/kg	<1	<1	0.0	No Limit
ES2133909-011	Anonymous	EK026SF: Total Cyanide	57-12-5	1	mg/kg	<1	<1	0.0	No Limit
EP068A: Organochlorine Pesticides (OC) (QC Lot: 3914739)									
ES2133844-001	BH16_0.05	EP068: alpha-BHC	319-84-6	0.05	mg/kg	<0.05	<0.05	0.0	No Limit
		EP068: Hexachlorobenzene (HCB)	118-74-1	0.05	mg/kg	<0.05	<0.05	0.0	No Limit
		EP068: beta-BHC	319-85-7	0.05	mg/kg	<0.05	<0.05	0.0	No Limit
		EP068: gamma-BHC	58-89-9	0.05	mg/kg	<0.05	<0.05	0.0	No Limit
		EP068: delta-BHC	319-86-8	0.05	mg/kg	<0.05	<0.05	0.0	No Limit
		EP068: Heptachlor	76-44-8	0.05	mg/kg	<0.05	<0.05	0.0	No Limit
		EP068: Aldrin	309-00-2	0.05	mg/kg	<0.05	<0.05	0.0	No Limit
		EP068: Heptachlor epoxide	1024-57-3	0.05	mg/kg	<0.05	<0.05	0.0	No Limit
		EP068: trans-Chlordane	5103-74-2	0.05	mg/kg	<0.05	<0.05	0.0	No Limit
		EP068: alpha-Endosulfan	959-98-8	0.05	mg/kg	<0.05	<0.05	0.0	No Limit
		EP068: cis-Chlordane	5103-71-9	0.05	mg/kg	<0.05	<0.05	0.0	No Limit
		EP068: Dieldrin	60-57-1	0.05	mg/kg	<0.05	<0.05	0.0	No Limit
		EP068: 4.4`-DDE	72-55-9	0.05	mg/kg	<0.05	<0.05	0.0	No Limit
		EP068: Endrin	72-20-8	0.05	mg/kg	<0.05	<0.05	0.0	No Limit
		EP068: beta-Endosulfan	33213-65-9	0.05	mg/kg	<0.05	<0.05	0.0	No Limit
		EP068: 4.4`-DDD	72-54-8	0.05	mg/kg	<0.05	<0.05	0.0	No Limit

Sub-Matrix: **SOIL**

				Laboratory Duplicate (DUP) Report					
Laboratory sample ID	*Sample ID*	*Method: Compound*	*CAS Number*	*LOR*	*Unit*	*Original Result*	*Duplicate Result*	*RPD (%)*	*Acceptable RPD (%)*
EP068A: Organochlorine Pesticides (OC) (QC Lot: 3914739) - continued									
ES2133844-001	BH16_0.05	EP068: Endrin aldehyde	7421-93-4	0.05	mg/kg	<0.05	<0.05	0.0	No Limit
		EP068: Endosulfan sulfate	1031-07-8	0.05	mg/kg	<0.05	<0.05	0.0	No Limit
		EP068: Endrin ketone	53494-70-5	0.05	mg/kg	<0.05	<0.05	0.0	No Limit
		EP068: 4.4`-DDT	50-29-3	0.2	mg/kg	<0.2	<0.2	0.0	No Limit
		EP068: Methoxychlor	72-43-5	0.2	mg/kg	<0.2	<0.2	0.0	No Limit
EP068B: Organophosphorus Pesticides (OP) (QC Lot: 3914739)									
ES2133844-001	BH16_0.05	EP068: Dichlorvos	62-73-7	0.05	mg/kg	<0.05	<0.05	0.0	No Limit
		EP068: Demeton-S-methyl	919-86-8	0.05	mg/kg	<0.05	<0.05	0.0	No Limit
		EP068: Dimethoate	60-51-5	0.05	mg/kg	<0.05	<0.05	0.0	No Limit
		EP068: Diazinon	333-41-5	0.05	mg/kg	<0.05	<0.05	0.0	No Limit
		EP068: Chlorpyrifos-methyl	5598-13-0	0.05	mg/kg	<0.05	<0.05	0.0	No Limit
		EP068: Malathion	121-75-5	0.05	mg/kg	<0.05	<0.05	0.0	No Limit
		EP068: Fenthion	55-38-9	0.05	mg/kg	<0.05	<0.05	0.0	No Limit
		EP068: Chlorpyrifos	2921-88-2	0.05	mg/kg	<0.05	<0.05	0.0	No Limit
		EP068: Pirimphos-ethyl	23505-41-1	0.05	mg/kg	<0.05	<0.05	0.0	No Limit
		EP068: Chlorfenvinphos	470-90-6	0.05	mg/kg	<0.05	<0.05	0.0	No Limit
		EP068: Bromophos-ethyl	4824-78-6	0.05	mg/kg	<0.05	<0.05	0.0	No Limit
		EP068: Fenamiphos	22224-92-6	0.05	mg/kg	<0.05	<0.05	0.0	No Limit
		EP068: Prothiofos	34643-46-4	0.05	mg/kg	<0.05	<0.05	0.0	No Limit
		EP068: Ethion	563-12-2	0.05	mg/kg	<0.05	<0.05	0.0	No Limit
		EP068: Carbophenothion	786-19-6	0.05	mg/kg	<0.05	<0.05	0.0	No Limit
		EP068: Azinphos Methyl	86-50-0	0.05	mg/kg	<0.05	<0.05	0.0	No Limit
		EP068: Monocrotophos	6923-22-4	0.2	mg/kg	<0.2	<0.2	0.0	No Limit
		EP068: Parathion-methyl	298-00-0	0.2	mg/kg	<0.2	<0.2	0.0	No Limit
		EP068: Parathion	56-38-2	0.2	mg/kg	<0.2	<0.2	0.0	No Limit
EP075(SIM)B: Polynuclear Aromatic Hydrocarbons (QC Lot: 3914738)									
ES2133844-018	SS29_0.05	EP075(SIM): Naphthalene	91-20-3	0.5	mg/kg	<0.5	<0.5	0.0	No Limit
		EP075(SIM): Acenaphthylene	208-96-8	0.5	mg/kg	<0.5	<0.5	0.0	No Limit
		EP075(SIM): Acenaphthene	83-32-9	0.5	mg/kg	<0.5	<0.5	0.0	No Limit
		EP075(SIM): Fluorene	86-73-7	0.5	mg/kg	<0.5	<0.5	0.0	No Limit
		EP075(SIM): Phenanthrene	85-01-8	0.5	mg/kg	<0.5	<0.5	0.0	No Limit
		EP075(SIM): Anthracene	120-12-7	0.5	mg/kg	<0.5	<0.5	0.0	No Limit
		EP075(SIM): Fluoranthene	206-44-0	0.5	mg/kg	<0.5	<0.5	0.0	No Limit
		EP075(SIM): Pyrene	129-00-0	0.5	mg/kg	<0.5	<0.5	0.0	No Limit
		EP075(SIM): Benz(a)anthracene	56-55-3	0.5	mg/kg	<0.5	<0.5	0.0	No Limit
		EP075(SIM): Chrysene	218-01-9	0.5	mg/kg	<0.5	<0.5	0.0	No Limit
		EP075(SIM): Benzo(b+j)fluoranthene	205-99-2 205-82-3	0.5	mg/kg	<0.5	<0.5	0.0	No Limit
		EP075(SIM): Benzo(k)fluoranthene	207-08-9	0.5	mg/kg	<0.5	<0.5	0.0	No Limit
		EP075(SIM): Benzo(a)pyrene	50-32-8	0.5	mg/kg	<0.5	<0.5	0.0	No Limit

Sub-Matrix: **SOIL**

				Laboratory Duplicate (DUP) Report					
Laboratory sample ID	*Sample ID*	*Method: Compound*	*CAS Number*	*LOR*	*Unit*	*Original Result*	*Duplicate Result*	*RPD (%)*	*Acceptable RPD (%)*
EP075(SIM)B: Polynuclear Aromatic Hydrocarbons (QC Lot: 3914738) - continued									
ES2133844-018	SS29_0.05	EP075(SIM): Indeno(1.2.3.cd)pyrene	193-39-5	0.5	mg/kg	<0.5	<0.5	0.0	No Limit
		EP075(SIM): Dibenz(a.h)anthracene	53-70-3	0.5	mg/kg	<0.5	<0.5	0.0	No Limit
		EP075(SIM): Benzo(g.h.i)perylene	191-24-2	0.5	mg/kg	<0.5	<0.5	0.0	No Limit
		EP075(SIM): Sum of polycyclic aromatic hydrocarbons	----	0.5	mg/kg	<0.5	<0.5	0.0	No Limit
		EP075(SIM): Benzo(a)pyrene TEQ (zero)	----	0.5	mg/kg	<0.5	<0.5	0.0	No Limit
ES2133844-001	BH16_0.05	EP075(SIM): Naphthalene	91-20-3	0.5	mg/kg	<0.5	<0.5	0.0	No Limit
		EP075(SIM): Acenaphthylene	208-96-8	0.5	mg/kg	<0.5	<0.5	0.0	No Limit
		EP075(SIM): Acenaphthene	83-32-9	0.5	mg/kg	<0.5	<0.5	0.0	No Limit
		EP075(SIM): Fluorene	86-73-7	0.5	mg/kg	<0.5	<0.5	0.0	No Limit
		EP075(SIM): Phenanthrene	85-01-8	0.5	mg/kg	<0.5	<0.5	0.0	No Limit
		EP075(SIM): Anthracene	120-12-7	0.5	mg/kg	<0.5	<0.5	0.0	No Limit
		EP075(SIM): Fluoranthene	206-44-0	0.5	mg/kg	<0.5	<0.5	0.0	No Limit
		EP075(SIM): Pyrene	129-00-0	0.5	mg/kg	<0.5	<0.5	0.0	No Limit
		EP075(SIM): Benz(a)anthracene	56-55-3	0.5	mg/kg	<0.5	<0.5	0.0	No Limit
		EP075(SIM): Chrysene	218-01-9	0.5	mg/kg	<0.5	<0.5	0.0	No Limit
		EP075(SIM): Benzo(b+j)fluoranthene	205-99-2 205-82-3	0.5	mg/kg	<0.5	<0.5	0.0	No Limit
		EP075(SIM): Benzo(k)fluoranthene	207-08-9	0.5	mg/kg	<0.5	<0.5	0.0	No Limit
		EP075(SIM): Benzo(a)pyrene	50-32-8	0.5	mg/kg	<0.5	<0.5	0.0	No Limit
		EP075(SIM): Indeno(1.2.3.cd)pyrene	193-39-5	0.5	mg/kg	<0.5	<0.5	0.0	No Limit
		EP075(SIM): Dibenz(a.h)anthracene	53-70-3	0.5	mg/kg	<0.5	<0.5	0.0	No Limit
		EP075(SIM): Benzo(g.h.i)perylene	191-24-2	0.5	mg/kg	<0.5	<0.5	0.0	No Limit
		EP075(SIM): Sum of polycyclic aromatic hydrocarbons	----	0.5	mg/kg	<0.5	<0.5	0.0	No Limit
		EP075(SIM): Benzo(a)pyrene TEQ (zero)	----	0.5	mg/kg	<0.5	<0.5	0.0	No Limit
EP080/071: Total Petroleum Hydrocarbons (QC Lot: 3914737)									
ES2133844-018	SS29_0.05	EP071: C15 - C28 Fraction	----	100	mg/kg	<100	<100	0.0	No Limit
		EP071: C29 - C36 Fraction	----	100	mg/kg	<100	<100	0.0	No Limit
		EP071: C10 - C14 Fraction	----	50	mg/kg	<50	<50	0.0	No Limit
ES2133844-001	BH16_0.05	EP071: C15 - C28 Fraction	----	100	mg/kg	<100	<100	0.0	No Limit
		EP071: C29 - C36 Fraction	----	100	mg/kg	<100	<100	0.0	No Limit
		EP071: C10 - C14 Fraction	----	50	mg/kg	<50	<50	0.0	No Limit
EP080/071: Total Petroleum Hydrocarbons (QC Lot: 3915436)									
ES2133844-001	BH16_0.05	EP080: C6 - C9 Fraction	----	10	mg/kg	<10	<10	0.0	No Limit
ES2133844-017	SS20_0.05	EP080: C6 - C9 Fraction	----	10	mg/kg	<10	<10	0.0	No Limit
EP080/071: Total Recoverable Hydrocarbons - NEPM 2013 Fractions (QC Lot: 3914737)									
ES2133844-018	SS29_0.05	EP071: >C16 - C34 Fraction	----	100	mg/kg	<100	<100	0.0	No Limit
		EP071: >C34 - C40 Fraction	----	100	mg/kg	<100	<100	0.0	No Limit
		EP071: >C10 - C16 Fraction	----	50	mg/kg	<50	<50	0.0	No Limit

Sub-Matrix: **SOIL**

				Laboratory Duplicate (DUP) Report					
Laboratory sample ID	*Sample ID*	*Method: Compound*	*CAS Number*	*LOR*	*Unit*	*Original Result*	*Duplicate Result*	*RPD (%)*	*Acceptable RPD (%)*
EP080/071: Total Recoverable Hydrocarbons - NEPM 2013 Fractions (QC Lot: 3914737) - continued									
ES2133844-001	BH16_0.05	EP071: >C16 - C34 Fraction	----	100	mg/kg	<100	<100	0.0	No Limit
		EP071: >C34 - C40 Fraction	----	100	mg/kg	<100	<100	0.0	No Limit
		EP071: >C10 - C16 Fraction	----	50	mg/kg	<50	<50	0.0	No Limit
EP080/071: Total Recoverable Hydrocarbons - NEPM 2013 Fractions (QC Lot: 3915436)									
ES2133844-001	BH16_0.05	EP080: C6 - C10 Fraction	C6_C10	10	mg/kg	<10	<10	0.0	No Limit
ES2133844-017	SS20_0.05	EP080: C6 - C10 Fraction	C6_C10	10	mg/kg	<10	<10	0.0	No Limit
EP080: BTEXN (QC Lot: 3915436)									
ES2133844-001	BH16_0.05	EP080: Benzene	71-43-2	0.2	mg/kg	<0.2	<0.2	0.0	No Limit
		EP080: Toluene	108-88-3	0.5	mg/kg	<0.5	<0.5	0.0	No Limit
		EP080: Ethylbenzene	100-41-4	0.5	mg/kg	<0.5	<0.5	0.0	No Limit
		EP080: meta- & para-Xylene	108-38-3 106-42-3	0.5	mg/kg	<0.5	<0.5	0.0	No Limit
		EP080: ortho-Xylene	95-47-6	0.5	mg/kg	<0.5	<0.5	0.0	No Limit
		EP080: Naphthalene	91-20-3	1	mg/kg	<1	<1	0.0	No Limit
ES2133844-017	SS20_0.05	EP080: Benzene	71-43-2	0.2	mg/kg	<0.2	<0.2	0.0	No Limit
		EP080: Toluene	108-88-3	0.5	mg/kg	<0.5	<0.5	0.0	No Limit
		EP080: Ethylbenzene	100-41-4	0.5	mg/kg	<0.5	<0.5	0.0	No Limit
		EP080: meta- & para-Xylene	108-38-3 106-42-3	0.5	mg/kg	<0.5	<0.5	0.0	No Limit
		EP080: ortho-Xylene	95-47-6	0.5	mg/kg	<0.5	<0.5	0.0	No Limit
		EP080: Naphthalene	91-20-3	1	mg/kg	<1	<1	0.0	No Limit
EP231A: Perfluoroalkyl Sulfonic Acids (QC Lot: 3914171)									
EP2110929-001	Anonymous	EP231X: Perfluorobutane sulfonic acid (PFBS)	375-73-5	0.0002	mg/kg	<0.0002	<0.0002	0.0	No Limit
		EP231X: Perfluoropentane sulfonic acid (PFPeS)	2706-91-4	0.0002	mg/kg	<0.0002	<0.0002	0.0	No Limit
		EP231X: Perfluorohexane sulfonic acid (PFHxS)	355-46-4	0.0002	mg/kg	<0.0002	<0.0002	0.0	No Limit
		EP231X: Perfluoroheptane sulfonic acid (PFHpS)	375-92-8	0.0002	mg/kg	<0.0002	<0.0002	0.0	No Limit
		EP231X: Perfluorooctane sulfonic acid (PFOS)	1763-23-1	0.0002	mg/kg	0.0008	0.0009	17.3	No Limit
		EP231X: Perfluorodecane sulfonic acid (PFDS)	335-77-3	0.0002	mg/kg	<0.0002	<0.0002	0.0	No Limit
ES2133334-039	Anonymous	EP231X: Perfluorobutane sulfonic acid (PFBS)	375-73-5	0.0002	mg/kg	<0.0002	<0.0002	0.0	No Limit
		EP231X: Perfluoropentane sulfonic acid (PFPeS)	2706-91-4	0.0002	mg/kg	<0.0002	<0.0002	0.0	No Limit
		EP231X: Perfluorohexane sulfonic acid (PFHxS)	355-46-4	0.0002	mg/kg	0.0002	<0.0002	0.0	No Limit
		EP231X: Perfluoroheptane sulfonic acid (PFHpS)	375-92-8	0.0002	mg/kg	<0.0002	<0.0002	0.0	No Limit
		EP231X: Perfluorooctane sulfonic acid (PFOS)	1763-23-1	0.0002	mg/kg	<0.0002	<0.0002	0.0	No Limit
		EP231X: Perfluorodecane sulfonic acid (PFDS)	335-77-3	0.0002	mg/kg	<0.0002	<0.0002	0.0	No Limit
EP231B: Perfluoroalkyl Carboxylic Acids (QC Lot: 3914171)									
EP2110929-001	Anonymous	EP231X: Perfluoropentanoic acid (PFPeA)	2706-90-3	0.0002	mg/kg	<0.0002	<0.0002	0.0	No Limit
		EP231X: Perfluorohexanoic acid (PFHxA)	307-24-4	0.0002	mg/kg	<0.0002	<0.0002	0.0	No Limit
		EP231X: Perfluoroheptanoic acid (PFHpA)	375-85-9	0.0002	mg/kg	<0.0002	<0.0002	0.0	No Limit
		EP231X: Perfluorooctanoic acid (PFOA)	335-67-1	0.0002	mg/kg	<0.0002	<0.0002	0.0	No Limit
		EP231X: Perfluorononanoic acid (PFNA)	375-95-1	0.0002	mg/kg	<0.0002	<0.0002	0.0	No Limit

Sub-Matrix: **SOIL**

Laboratory sample ID	Sample ID	Method: Compound	CAS Number	Laboratory Duplicate (DUP) Report					
				LOR	Unit	Original Result	Duplicate Result	RPD (%)	Acceptable RPD (%)
EP231B: Perfluoroalkyl Carboxylic Acids (QC Lot: 3914171) - continued									
EP2110929-001	Anonymous	EP231X: Perfluorodecanoic acid (PFDA)	335-76-2	0.0002	mg/kg	<0.0002	<0.0002	0.0	No Limit
		EP231X: Perfluoroundecanoic acid (PFUnDA)	2058-94-8	0.0002	mg/kg	<0.0002	<0.0002	0.0	No Limit
		EP231X: Perfluorododecanoic acid (PFDoDA)	307-55-1	0.0002	mg/kg	<0.0002	<0.0002	0.0	No Limit
		EP231X: Perfluorotridecanoic acid (PFTrDA)	72629-94-8	0.0002	mg/kg	<0.0002	<0.0002	0.0	No Limit
		EP231X: Perfluorotetradecanoic acid (PFTeDA)	376-06-7	0.0005	mg/kg	<0.0005	<0.0005	0.0	No Limit
		EP231X: Perfluorobutanoic acid (PFBA)	375-22-4	0.001	mg/kg	<0.001	<0.001	0.0	No Limit
ES2133334-039	Anonymous	EP231X: Perfluoropentanoic acid (PFPeA)	2706-90-3	0.0002	mg/kg	<0.0002	<0.0002	0.0	No Limit
		EP231X: Perfluorohexanoic acid (PFHxA)	307-24-4	0.0002	mg/kg	<0.0002	<0.0002	0.0	No Limit
		EP231X: Perfluoroheptanoic acid (PFHpA)	375-85-9	0.0002	mg/kg	<0.0002	<0.0002	0.0	No Limit
		EP231X: Perfluorooctanoic acid (PFOA)	335-67-1	0.0002	mg/kg	<0.0002	<0.0002	0.0	No Limit
		EP231X: Perfluorononanoic acid (PFNA)	375-95-1	0.0002	mg/kg	<0.0002	<0.0002	0.0	No Limit
		EP231X: Perfluorodecanoic acid (PFDA)	335-76-2	0.0002	mg/kg	<0.0002	<0.0002	0.0	No Limit
		EP231X: Perfluoroundecanoic acid (PFUnDA)	2058-94-8	0.0002	mg/kg	<0.0002	<0.0002	0.0	No Limit
		EP231X: Perfluorododecanoic acid (PFDoDA)	307-55-1	0.0002	mg/kg	<0.0002	<0.0002	0.0	No Limit
		EP231X: Perfluorotridecanoic acid (PFTrDA)	72629-94-8	0.0002	mg/kg	<0.0002	<0.0002	0.0	No Limit
		EP231X: Perfluorotetradecanoic acid (PFTeDA)	376-06-7	0.0005	mg/kg	<0.0005	<0.0005	0.0	No Limit
		EP231X: Perfluorobutanoic acid (PFBA)	375-22-4	0.001	mg/kg	<0.001	<0.001	0.0	No Limit
EP231C: Perfluoroalkyl Sulfonamides (QC Lot: 3914171)									
EP2110929-001	Anonymous	EP231X: Perfluorooctane sulfonamide (FOSA)	754-91-6	0.0002	mg/kg	<0.0002	<0.0002	0.0	No Limit
		EP231X: N-Methyl perfluorooctane sulfonamidoacetic acid (MeFOSAA)	2355-31-9	0.0002	mg/kg	<0.0002	<0.0002	0.0	No Limit
		EP231X: N-Ethyl perfluorooctane sulfonamidoacetic acid (EtFOSAA)	2991-50-6	0.0002	mg/kg	<0.0002	<0.0002	0.0	No Limit
		EP231X: N-Methyl perfluorooctane sulfonamide (MeFOSA)	31506-32-8	0.0005	mg/kg	<0.0005	<0.0005	0.0	No Limit
		EP231X: N-Ethyl perfluorooctane sulfonamide (EtFOSA)	4151-50-2	0.0005	mg/kg	<0.0005	<0.0005	0.0	No Limit
		EP231X: N-Methyl perfluorooctane sulfonamidoethanol (MeFOSE)	24448-09-7	0.0005	mg/kg	<0.0005	<0.0005	0.0	No Limit
		EP231X: N-Ethyl perfluorooctane sulfonamidoethanol (EtFOSE)	1691-99-2	0.0005	mg/kg	<0.0005	<0.0005	0.0	No Limit
ES2133334-039	Anonymous	EP231X: Perfluorooctane sulfonamide (FOSA)	754-91-6	0.0002	mg/kg	<0.0002	<0.0002	0.0	No Limit
		EP231X: N-Methyl perfluorooctane sulfonamidoacetic acid (MeFOSAA)	2355-31-9	0.0002	mg/kg	<0.0002	<0.0002	0.0	No Limit
		EP231X: N-Ethyl perfluorooctane sulfonamidoacetic acid (EtFOSAA)	2991-50-6	0.0002	mg/kg	<0.0002	<0.0002	0.0	No Limit
		EP231X: N-Methyl perfluorooctane sulfonamide (MeFOSA)	31506-32-8	0.0005	mg/kg	<0.0005	<0.0005	0.0	No Limit
		EP231X: N-Ethyl perfluorooctane sulfonamide (EtFOSA)	4151-50-2	0.0005	mg/kg	<0.0005	<0.0005	0.0	No Limit

Sub-Matrix: **SOIL**

				Laboratory Duplicate (DUP) Report					
Laboratory sample ID	*Sample ID*	*Method: Compound*	*CAS Number*	*LOR*	*Unit*	*Original Result*	*Duplicate Result*	*RPD (%)*	*Acceptable RPD (%)*
EP231C: Perfluoroalkyl Sulfonamides (QC Lot: 3914171) - continued									
ES2133334-039	Anonymous	EP231X: N-Methyl perfluorooctane sulfonamidoethanol (MeFOSE)	24448-09-7	0.0005	mg/kg	<0.0005	<0.0005	0.0	No Limit
		EP231X: N-Ethyl perfluorooctane sulfonamidoethanol (EtFOSE)	1691-99-2	0.0005	mg/kg	<0.0005	<0.0005	0.0	No Limit
EP231D: (n:2) Fluorotelomer Sulfonic Acids (QC Lot: 3914171)									
EP2110929-001	Anonymous	EP231X: 4:2 Fluorotelomer sulfonic acid (4:2 FTS)	757124-72-4	0.0005	mg/kg	<0.0005	<0.0005	0.0	No Limit
		EP231X: 6:2 Fluorotelomer sulfonic acid (6:2 FTS)	27619-97-2	0.0005	mg/kg	<0.0005	<0.0005	0.0	No Limit
		EP231X: 8:2 Fluorotelomer sulfonic acid (8:2 FTS)	39108-34-4	0.0005	mg/kg	<0.0005	<0.0005	0.0	No Limit
		EP231X: 10:2 Fluorotelomer sulfonic acid (10:2 FTS)	120226-60-0	0.0005	mg/kg	<0.0005	<0.0005	0.0	No Limit
ES2133334-039	Anonymous	EP231X: 4:2 Fluorotelomer sulfonic acid (4:2 FTS)	757124-72-4	0.0005	mg/kg	<0.0005	<0.0005	0.0	No Limit
		EP231X: 6:2 Fluorotelomer sulfonic acid (6:2 FTS)	27619-97-2	0.0005	mg/kg	<0.0005	<0.0005	0.0	No Limit
		EP231X: 8:2 Fluorotelomer sulfonic acid (8:2 FTS)	39108-34-4	0.0005	mg/kg	<0.0005	<0.0005	0.0	No Limit
		EP231X: 10:2 Fluorotelomer sulfonic acid (10:2 FTS)	120226-60-0	0.0005	mg/kg	<0.0005	<0.0005	0.0	No Limit

Sub-Matrix: **WATER**

				Laboratory Duplicate (DUP) Report					
Laboratory sample ID	*Sample ID*	*Method: Compound*	*CAS Number*	*LOR*	*Unit*	*Original Result*	*Duplicate Result*	*RPD (%)*	*Acceptable RPD (%)*
EG020T: Total Metals by ICP-MS (QC Lot: 3917623)									
ES2133783-001	Anonymous	EG020A-T: Cadmium	7440-43-9	0.0001	mg/L	<0.0001	<0.0001	0.0	No Limit
		EG020A-T: Arsenic	7440-38-2	0.001	mg/L	<0.001	<0.001	0.0	No Limit
		EG020A-T: Chromium	7440-47-3	0.001	mg/L	0.001	0.002	0.0	No Limit
		EG020A-T: Copper	7440-50-8	0.001	mg/L	0.010	0.010	0.0	No Limit
		EG020A-T: Lead	7439-92-1	0.001	mg/L	0.001	0.001	0.0	No Limit
		EG020A-T: Nickel	7440-02-0	0.001	mg/L	0.003	0.002	0.0	No Limit
		EG020A-T: Zinc	7440-66-6	0.005	mg/L	0.009	0.011	15.4	No Limit
ES2134000-004	Anonymous	EG020A-T: Cadmium	7440-43-9	0.0001	mg/L	<0.0001	<0.0001	0.0	No Limit
		EG020A-T: Arsenic	7440-38-2	0.001	mg/L	<0.001	<0.001	0.0	No Limit
		EG020A-T: Chromium	7440-47-3	0.001	mg/L	<0.001	<0.001	0.0	No Limit
		EG020A-T: Copper	7440-50-8	0.001	mg/L	0.002	0.003	0.0	No Limit
		EG020A-T: Lead	7439-92-1	0.001	mg/L	<0.001	<0.001	0.0	No Limit
		EG020A-T: Nickel	7440-02-0	0.001	mg/L	<0.001	<0.001	0.0	No Limit
		EG020A-T: Zinc	7440-66-6	0.005	mg/L	<0.005	<0.005	0.0	No Limit
EG035T: Total Recoverable Mercury by FIMS (QC Lot: 3917784)									
ES2133844-024	QC501_210917	EG035T: Mercury	7439-97-6	0.0001	mg/L	<0.0001	<0.0001	0.0	No Limit

Sub-Matrix: **WATER**

				Laboratory Duplicate (DUP) Report					
Laboratory sample ID	*Sample ID*	*Method: Compound*	*CAS Number*	*LOR*	*Unit*	*Original Result*	*Duplicate Result*	*RPD (%)*	*Acceptable RPD (%)*
EG035T: Total Recoverable Mercury by FIMS (QC Lot: 3917784) - continued									
ES2134287-001	Anonymous	EG035T: Mercury	7439-97-6	0.0001	mg/L	<0.0001	<0.0001	0.0	No Limit
EP080/071: Total Petroleum Hydrocarbons (QC Lot: 3917254)									
CA2105767-001	Anonymous	EP080: C6 - C9 Fraction	----	20	µg/L	<20	<20	0.0	No Limit
ES2134275-004	Anonymous	EP080: C6 - C9 Fraction	----	20	µg/L	<20	<20	0.0	No Limit
EP080/071: Total Recoverable Hydrocarbons - NEPM 2013 Fractions (QC Lot: 3917254)									
CA2105767-001	Anonymous	EP080: C6 - C10 Fraction	C6_C10	20	µg/L	<20	<20	0.0	No Limit
ES2134275-004	Anonymous	EP080: C6 - C10 Fraction	C6_C10	20	µg/L	<20	<20	0.0	No Limit
EP080: BTEXN (QC Lot: 3917254)									
CA2105767-001	Anonymous	EP080: Benzene	71-43-2	1	µg/L	<1	<1	0.0	No Limit
		EP080: Toluene	108-88-3	2	µg/L	<2	<2	0.0	No Limit
		EP080: Ethylbenzene	100-41-4	2	µg/L	<2	<2	0.0	No Limit
		EP080: meta- & para-Xylene	108-38-3 106-42-3	2	µg/L	<2	<2	0.0	No Limit
		EP080: ortho-Xylene	95-47-6	2	µg/L	<2	<2	0.0	No Limit
		EP080: Naphthalene	91-20-3	5	µg/L	<5	<5	0.0	No Limit
ES2134275-004	Anonymous	EP080: Benzene	71-43-2	1	µg/L	<1	<1	0.0	No Limit
		EP080: Toluene	108-88-3	2	µg/L	<2	<2	0.0	No Limit
		EP080: Ethylbenzene	100-41-4	2	µg/L	<2	<2	0.0	No Limit
		EP080: meta- & para-Xylene	108-38-3 106-42-3	2	µg/L	<2	<2	0.0	No Limit
		EP080: ortho-Xylene	95-47-6	2	µg/L	<2	<2	0.0	No Limit
		EP080: Naphthalene	91-20-3	5	µg/L	<5	<5	0.0	No Limit

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

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

Sub-Matrix: **SOIL**

				Method Blank (MB) Report	Laboratory Control Spike (LCS) Report			
					Spike	Spike Recovery (%)	Acceptable Limits (%)	
Method: Compound	*CAS Number*	*LOR*	*Unit*	*Result*	*Concentration*	*LCS*	*Low*	*High*
EG005(ED093)T: Total Metals by ICP-AES (QCLot: 3918141)								
EG005T: Arsenic	7440-38-2	5	mg/kg	<5	121.1 mg/kg	103	88.0	113
EG005T: Cadmium	7440-43-9	1	mg/kg	<1	0.74 mg/kg	83.6	70.0	130
EG005T: Chromium	7440-47-3	2	mg/kg	<2	19.6 mg/kg	115	68.0	132
EG005T: Copper	7440-50-8	5	mg/kg	<5	52.9 mg/kg	106	89.0	111
EG005T: Lead	7439-92-1	5	mg/kg	<5	60.8 mg/kg	95.3	82.0	119
EG005T: Nickel	7440-02-0	2	mg/kg	<2	15.3 mg/kg	103	80.0	120
EG005T: Zinc	7440-66-6	5	mg/kg	<5	139.3 mg/kg	92.4	66.0	133
EG005(ED093)T: Total Metals by ICP-AES (QCLot: 3920087)								
EG005T: Arsenic	7440-38-2	5	mg/kg	<5	121.1 mg/kg	92.3	88.0	113
EG005T: Cadmium	7440-43-9	1	mg/kg	<1	0.74 mg/kg	82.6	70.0	130
EG005T: Chromium	7440-47-3	2	mg/kg	<2	19.6 mg/kg	107	68.0	132
EG005T: Copper	7440-50-8	5	mg/kg	<5	52.9 mg/kg	98.7	89.0	111
EG005T: Lead	7439-92-1	5	mg/kg	<5	60.8 mg/kg	91.9	82.0	119
EG005T: Nickel	7440-02-0	2	mg/kg	<2	15.3 mg/kg	95.6	80.0	120
EG005T: Zinc	7440-66-6	5	mg/kg	<5	139.3 mg/kg	82.6	66.0	133
EG035T: Total Recoverable Mercury by FIMS (QCLot: 3918142)								
EG035T: Mercury	7439-97-6	0.1	mg/kg	<0.1	0.087 mg/kg	94.4	70.0	125
EG035T: Total Recoverable Mercury by FIMS (QCLot: 3920088)								
EG035T: Mercury	7439-97-6	0.1	mg/kg	<0.1	0.087 mg/kg	95.4	70.0	125
EK026SF: Total CN by Segmented Flow Analyser (QCLot: 3919135)								
EK026SF: Total Cyanide	57-12-5	1	mg/kg	<1	40 mg/kg	123	81.0	129
EP068A: Organochlorine Pesticides (OC) (QCLot: 3914739)								
EP068: alpha-BHC	319-84-6	0.05	mg/kg	<0.05	0.5 mg/kg	98.0	69.0	113
EP068: Hexachlorobenzene (HCB)	118-74-1	0.05	mg/kg	<0.05	0.5 mg/kg	89.4	65.0	117
EP068: beta-BHC	319-85-7	0.05	mg/kg	<0.05	0.5 mg/kg	95.4	67.0	119
EP068: gamma-BHC	58-89-9	0.05	mg/kg	<0.05	0.5 mg/kg	102	68.0	116
EP068: delta-BHC	319-86-8	0.05	mg/kg	<0.05	0.5 mg/kg	91.4	65.0	117
EP068: Heptachlor	76-44-8	0.05	mg/kg	<0.05	0.5 mg/kg	91.0	67.0	115
EP068: Aldrin	309-00-2	0.05	mg/kg	<0.05	0.5 mg/kg	97.2	69.0	115
EP068: Heptachlor epoxide	1024-57-3	0.05	mg/kg	<0.05	0.5 mg/kg	95.9	62.0	118
EP068: trans-Chlordane	5103-74-2	0.05	mg/kg	<0.05	0.5 mg/kg	93.6	63.0	117
EP068: alpha-Endosulfan	959-98-8	0.05	mg/kg	<0.05	0.5 mg/kg	105	66.0	116
EP068: cis-Chlordane	5103-71-9	0.05	mg/kg	<0.05	0.5 mg/kg	90.7	64.0	116
EP068: Dieldrin	60-57-1	0.05	mg/kg	<0.05	0.5 mg/kg	96.0	66.0	116

Sub-Matrix: **SOIL**

				Method Blank (MB) Report	*Laboratory Control Spike (LCS) Report*			
					Spike	*Spike Recovery (%)*	*Acceptable Limits (%)*	
Method: Compound	*CAS Number*	*LOR*	*Unit*	*Result*	*Concentration*	*LCS*	*Low*	*High*
EP068A: Organochlorine Pesticides (OC) (QCLot: 3914739) - continued								
EP068: 4.4`-DDE	72-55-9	0.05	mg/kg	<0.05	0.5 mg/kg	91.0	67.0	115
EP068: Endrin	72-20-8	0.05	mg/kg	<0.05	0.5 mg/kg	80.5	67.0	123
EP068: beta-Endosulfan	33213-65-9	0.05	mg/kg	<0.05	0.5 mg/kg	105	69.0	115
EP068: 4.4`-DDD	72-54-8	0.05	mg/kg	<0.05	0.5 mg/kg	94.4	69.0	121
EP068: Endrin aldehyde	7421-93-4	0.05	mg/kg	<0.05	0.5 mg/kg	96.8	56.0	120
EP068: Endosulfan sulfate	1031-07-8	0.05	mg/kg	<0.05	0.5 mg/kg	104	62.0	124
EP068: 4.4`-DDT	50-29-3	0.2	mg/kg	<0.2	0.5 mg/kg	91.4	66.0	120
EP068: Endrin ketone	53494-70-5	0.05	mg/kg	<0.05	0.5 mg/kg	107	64.0	122
EP068: Methoxychlor	72-43-5	0.2	mg/kg	<0.2	0.5 mg/kg	95.5	54.0	130
EP068B: Organophosphorus Pesticides (OP) (QCLot: 3914739)								
EP068: Dichlorvos	62-73-7	0.05	mg/kg	<0.05	0.5 mg/kg	88.3	59.0	119
EP068: Demeton-S-methyl	919-86-8	0.05	mg/kg	<0.05	0.5 mg/kg	95.2	62.0	128
EP068: Monocrotophos	6923-22-4	0.2	mg/kg	<0.2	0.5 mg/kg	90.2	54.0	126
EP068: Dimethoate	60-51-5	0.05	mg/kg	<0.05	0.5 mg/kg	105	67.0	119
EP068: Diazinon	333-41-5	0.05	mg/kg	<0.05	0.5 mg/kg	104	70.0	120
EP068: Chlorpyrifos-methyl	5598-13-0	0.05	mg/kg	<0.05	0.5 mg/kg	92.6	72.0	120
EP068: Parathion-methyl	298-00-0	0.2	mg/kg	<0.2	0.5 mg/kg	88.5	68.0	120
EP068: Malathion	121-75-5	0.05	mg/kg	<0.05	0.5 mg/kg	93.8	68.0	122
EP068: Fenthion	55-38-9	0.05	mg/kg	<0.05	0.5 mg/kg	99.5	69.0	117
EP068: Chlorpyrifos	2921-88-2	0.05	mg/kg	<0.05	0.5 mg/kg	98.9	76.0	118
EP068: Parathion	56-38-2	0.2	mg/kg	<0.2	0.5 mg/kg	92.9	64.0	122
EP068: Pirimphos-ethyl	23505-41-1	0.05	mg/kg	<0.05	0.5 mg/kg	97.8	70.0	116
EP068: Chlorfenvinphos	470-90-6	0.05	mg/kg	<0.05	0.5 mg/kg	89.8	69.0	121
EP068: Bromophos-ethyl	4824-78-6	0.05	mg/kg	<0.05	0.5 mg/kg	97.5	66.0	118
EP068: Fenamiphos	22224-92-6	0.05	mg/kg	<0.05	0.5 mg/kg	95.6	68.0	124
EP068: Prothiofos	34643-46-4	0.05	mg/kg	<0.05	0.5 mg/kg	99.3	62.0	112
EP068: Ethion	563-12-2	0.05	mg/kg	<0.05	0.5 mg/kg	92.8	68.0	120
EP068: Carbophenothion	786-19-6	0.05	mg/kg	<0.05	0.5 mg/kg	98.0	65.0	127
EP068: Azinphos Methyl	86-50-0	0.05	mg/kg	<0.05	0.5 mg/kg	88.0	41.0	123
EP075(SIM)B: Polynuclear Aromatic Hydrocarbons (QCLot: 3914738)								
EP075(SIM): Naphthalene	91-20-3	0.5	mg/kg	<0.5	6 mg/kg	99.0	77.0	125
EP075(SIM): Acenaphthylene	208-96-8	0.5	mg/kg	<0.5	6 mg/kg	98.3	72.0	124
EP075(SIM): Acenaphthene	83-32-9	0.5	mg/kg	<0.5	6 mg/kg	98.3	73.0	127
EP075(SIM): Fluorene	86-73-7	0.5	mg/kg	<0.5	6 mg/kg	99.8	72.0	126
EP075(SIM): Phenanthrene	85-01-8	0.5	mg/kg	<0.5	6 mg/kg	101	75.0	127
EP075(SIM): Anthracene	120-12-7	0.5	mg/kg	<0.5	6 mg/kg	104	77.0	127
EP075(SIM): Fluoranthene	206-44-0	0.5	mg/kg	<0.5	6 mg/kg	103	73.0	127
EP075(SIM): Pyrene	129-00-0	0.5	mg/kg	<0.5	6 mg/kg	97.5	74.0	128
EP075(SIM): Benz(a)anthracene	56-55-3	0.5	mg/kg	<0.5	6 mg/kg	93.5	69.0	123

Sub-Matrix: **SOIL**

				Method Blank (MB) Report	Laboratory Control Spike (LCS) Report			
					Spike	Spike Recovery (%)	Acceptable Limits (%)	
Method: Compound	*CAS Number*	*LOR*	*Unit*	*Result*	*Concentration*	*LCS*	*Low*	*High*
EP075(SIM)B: Polynuclear Aromatic Hydrocarbons (QCLot: 3914738) - continued								
EP075(SIM): Chrysene	218-01-9	0.5	mg/kg	<0.5	6 mg/kg	96.6	75.0	127
EP075(SIM): Benzo(b+j)fluoranthene	205-99-2 205-82-3	0.5	mg/kg	<0.5	6 mg/kg	89.3	68.0	116
EP075(SIM): Benzo(k)fluoranthene	207-08-9	0.5	mg/kg	<0.5	6 mg/kg	98.6	74.0	126
EP075(SIM): Benzo(a)pyrene	50-32-8	0.5	mg/kg	<0.5	6 mg/kg	95.5	70.0	126
EP075(SIM): Indeno(1.2.3.cd)pyrene	193-39-5	0.5	mg/kg	<0.5	6 mg/kg	76.9	61.0	121
EP075(SIM): Dibenz(a.h)anthracene	53-70-3	0.5	mg/kg	<0.5	6 mg/kg	77.8	62.0	118
EP075(SIM): Benzo(g.h.i)perylene	191-24-2	0.5	mg/kg	<0.5	6 mg/kg	69.7	63.0	121
EP080/071: Total Petroleum Hydrocarbons (QCLot: 3914737)								
EP071: C10 - C14 Fraction	----	50	mg/kg	<50	300 mg/kg	103	75.0	129
EP071: C15 - C28 Fraction	----	100	mg/kg	<100	450 mg/kg	104	77.0	131
EP071: C29 - C36 Fraction	----	100	mg/kg	<100	300 mg/kg	107	71.0	129
EP080/071: Total Petroleum Hydrocarbons (QCLot: 3915436)								
EP080: C6 - C9 Fraction	----	10	mg/kg	<10	26 mg/kg	94.3	68.4	128
EP080/071: Total Recoverable Hydrocarbons - NEPM 2013 Fractions (QCLot: 3914737)								
EP071: >C10 - C16 Fraction	----	50	mg/kg	<50	375 mg/kg	101	77.0	125
EP071: >C16 - C34 Fraction	----	100	mg/kg	<100	525 mg/kg	105	74.0	138
EP071: >C34 - C40 Fraction	----	100	mg/kg	<100	225 mg/kg	104	63.0	131
EP080/071: Total Recoverable Hydrocarbons - NEPM 2013 Fractions (QCLot: 3915436)								
EP080: C6 - C10 Fraction	C6_C10	10	mg/kg	<10	31 mg/kg	94.6	68.4	128
EP080: BTEXN (QCLot: 3915436)								
EP080: Benzene	71-43-2	0.2	mg/kg	<0.2	1 mg/kg	106	62.0	116
EP080: Toluene	108-88-3	0.5	mg/kg	<0.5	1 mg/kg	106	67.0	121
EP080: Ethylbenzene	100-41-4	0.5	mg/kg	<0.5	1 mg/kg	103	65.0	117
EP080: meta- & para-Xylene	108-38-3 106-42-3	0.5	mg/kg	<0.5	2 mg/kg	96.3	66.0	118
EP080: ortho-Xylene	95-47-6	0.5	mg/kg	<0.5	1 mg/kg	97.0	68.0	120
EP080: Naphthalene	91-20-3	1	mg/kg	<1	1 mg/kg	113	63.0	119
EP231A: Perfluoroalkyl Sulfonic Acids (QCLot: 3914171)								
EP231X: Perfluorobutane sulfonic acid (PFBS)	375-73-5	0.0002	mg/kg	<0.0002	0.00125 mg/kg	76.0	72.0	128
EP231X: Perfluoropentane sulfonic acid (PFPeS)	2706-91-4	0.0002	mg/kg	<0.0002	0.00125 mg/kg	89.6	73.0	123
EP231X: Perfluorohexane sulfonic acid (PFHxS)	355-46-4	0.0002	mg/kg	<0.0002	0.00125 mg/kg	78.0	67.0	130
EP231X: Perfluoroheptane sulfonic acid (PFHpS)	375-92-8	0.0002	mg/kg	<0.0002	0.00125 mg/kg	85.2	70.0	132
EP231X: Perfluorooctane sulfonic acid (PFOS)	1763-23-1	0.0002	mg/kg	<0.0002	0.00125 mg/kg	84.0	68.0	136
EP231X: Perfluorodecane sulfonic acid (PFDS)	335-77-3	0.0002	mg/kg	<0.0002	0.00125 mg/kg	89.2	59.0	134
EP231B: Perfluoroalkyl Carboxylic Acids (QCLot: 3914171)								
EP231X: Perfluorobutanoic acid (PFBA)	375-22-4	0.001	mg/kg	<0.001	0.00625 mg/kg	75.0	71.0	135
EP231X: Perfluoropentanoic acid (PFPeA)	2706-90-3	0.0002	mg/kg	<0.0002	0.00125 mg/kg	87.2	69.0	132

Sub-Matrix: **SOIL**

				Method Blank (MB) Report	*Laboratory Control Spike (LCS) Report*			
					Spike	*Spike Recovery (%)*	*Acceptable Limits (%)*	
Method: Compound	***CAS Number***	***LOR***	***Unit***	***Result***	***Concentration***	***LCS***	***Low***	***High***
EP231B: Perfluoroalkyl Carboxylic Acids (QCLot: 3914171) - continued								
EP231X: Perfluorohexanoic acid (PFHxA)	307-24-4	0.0002	mg/kg	<0.0002	0.00125 mg/kg	94.4	70.0	132
EP231X: Perfluoroheptanoic acid (PFHpA)	375-85-9	0.0002	mg/kg	<0.0002	0.00125 mg/kg	87.6	71.0	131
EP231X: Perfluorooctanoic acid (PFOA)	335-67-1	0.0002	mg/kg	<0.0002	0.00125 mg/kg	94.8	69.0	133
EP231X: Perfluorononanoic acid (PFNA)	375-95-1	0.0002	mg/kg	<0.0002	0.00125 mg/kg	95.6	72.0	129
EP231X: Perfluorodecanoic acid (PFDA)	335-76-2	0.0002	mg/kg	<0.0002	0.00125 mg/kg	93.2	69.0	133
EP231X: Perfluoroundecanoic acid (PFUnDA)	2058-94-8	0.0002	mg/kg	<0.0002	0.00125 mg/kg	89.6	64.0	136
EP231X: Perfluorododecanoic acid (PFDoDA)	307-55-1	0.0002	mg/kg	<0.0002	0.00125 mg/kg	80.8	69.0	135
EP231X: Perfluorotridecanoic acid (PFTrDA)	72629-94-8	0.0002	mg/kg	<0.0002	0.00125 mg/kg	72.8	66.0	139
EP231X: Perfluorotetradecanoic acid (PFTeDA)	376-06-7	0.0005	mg/kg	<0.0005	0.00312 mg/kg	87.7	69.0	133
EP231C: Perfluoroalkyl Sulfonamides (QCLot: 3914171)								
EP231X: Perfluorooctane sulfonamide (FOSA)	754-91-6	0.0002	mg/kg	<0.0002	0.00125 mg/kg	96.0	67.0	137
EP231X: N-Methyl perfluorooctane sulfonamide (MeFOSA)	31506-32-8	0.0005	mg/kg	<0.0005	0.00312 mg/kg	88.6	71.6	129
EP231X: N-Ethyl perfluorooctane sulfonamide (EtFOSA)	4151-50-2	0.0005	mg/kg	<0.0005	0.00312 mg/kg	98.9	69.8	131
EP231X: N-Methyl perfluorooctane sulfonamidoethanol (MeFOSE)	24448-09-7	0.0005	mg/kg	<0.0005	0.00312 mg/kg	83.6	68.7	130
EP231X: N-Ethyl perfluorooctane sulfonamidoethanol (EtFOSE)	1691-99-2	0.0005	mg/kg	<0.0005	0.00312 mg/kg	100	65.1	134
EP231X: N-Methyl perfluorooctane sulfonamidoacetic acid (MeFOSAA)	2355-31-9	0.0002	mg/kg	<0.0002	0.00125 mg/kg	104	63.0	144
EP231X: N-Ethyl perfluorooctane sulfonamidoacetic acid (EtFOSAA)	2991-50-6	0.0002	mg/kg	<0.0002	0.00125 mg/kg	82.0	61.0	139
EP231D: (n:2) Fluorotelomer Sulfonic Acids (QCLot: 3914171)								
EP231X: 4:2 Fluorotelomer sulfonic acid (4:2 FTS)	757124-72-4	0.0005	mg/kg	<0.0005	0.00125 mg/kg	88.8	62.0	145
EP231X: 6:2 Fluorotelomer sulfonic acid (6:2 FTS)	27619-97-2	0.0005	mg/kg	<0.0005	0.00125 mg/kg	91.2	64.0	140
EP231X: 8:2 Fluorotelomer sulfonic acid (8:2 FTS)	39108-34-4	0.0005	mg/kg	<0.0005	0.00125 mg/kg	115	65.0	137
EP231X: 10:2 Fluorotelomer sulfonic acid (10:2 FTS)	120226-60-0	0.0005	mg/kg	<0.0005	0.00125 mg/kg	90.4	69.2	143

Sub-Matrix: **WATER**

				Method Blank (MB) Report	*Laboratory Control Spike (LCS) Report*			
					Spike	*Spike Recovery (%)*	*Acceptable Limits (%)*	
Method: Compound	***CAS Number***	***LOR***	***Unit***	***Result***	***Concentration***	***LCS***	***Low***	***High***
EG020T: Total Metals by ICP-MS (QCLot: 3917623)								
EG020A-T: Arsenic	7440-38-2	0.001	mg/L	<0.001	0.1 mg/L	104	82.0	114
EG020A-T: Cadmium	7440-43-9	0.0001	mg/L	<0.0001	0.1 mg/L	101	84.0	112
EG020A-T: Chromium	7440-47-3	0.001	mg/L	<0.001	0.1 mg/L	104	86.0	116
EG020A-T: Copper	7440-50-8	0.001	mg/L	<0.001	0.1 mg/L	101	83.0	118
EG020A-T: Lead	7439-92-1	0.001	mg/L	<0.001	0.1 mg/L	101	85.0	115
EG020A-T: Nickel	7440-02-0	0.001	mg/L	<0.001	0.1 mg/L	102	84.0	116
EG020A-T: Zinc	7440-66-6	0.005	mg/L	<0.005	0.1 mg/L	103	79.0	117
EG035T: Total Recoverable Mercury by FIMS (QCLot: 3917784)								

Sub-Matrix: **WATER**

				Method Blank (MB) Report	Laboratory Control Spike (LCS) Report			
					Spike	Spike Recovery (%)	Acceptable Limits (%)	
Method: Compound	*CAS Number*	*LOR*	*Unit*	*Result*	*Concentration*	*LCS*	*Low*	*High*
EG035T: Total Recoverable Mercury by FIMS (QCLot: 3917784) - continued								
EG035T: Mercury	7439-97-6	0.0001	mg/L	<0.0001	0.01 mg/L	102	77.0	111
EP075(SIM)B: Polynuclear Aromatic Hydrocarbons (QCLot: 3912976)								
EP075(SIM): Naphthalene	91-20-3	1	µg/L	<1.0	5 µg/L	77.6	50.0	94.0
EP075(SIM): Acenaphthylene	208-96-8	1	µg/L	<1.0	5 µg/L	79.5	63.6	114
EP075(SIM): Acenaphthene	83-32-9	1	µg/L	<1.0	5 µg/L	88.4	62.2	113
EP075(SIM): Fluorene	86-73-7	1	µg/L	<1.0	5 µg/L	74.3	63.9	115
EP075(SIM): Phenanthrene	85-01-8	1	µg/L	<1.0	5 µg/L	73.1	62.6	116
EP075(SIM): Anthracene	120-12-7	1	µg/L	<1.0	5 µg/L	69.4	64.3	116
EP075(SIM): Fluoranthene	206-44-0	1	µg/L	<1.0	5 µg/L	88.7	63.6	118
EP075(SIM): Pyrene	129-00-0	1	µg/L	<1.0	5 µg/L	89.5	63.1	118
EP075(SIM): Benz(a)anthracene	56-55-3	1	µg/L	<1.0	5 µg/L	94.5	64.1	117
EP075(SIM): Chrysene	218-01-9	1	µg/L	<1.0	5 µg/L	97.5	62.5	116
EP075(SIM): Benzo(b+j)fluoranthene	205-99-2 205-82-3	1	µg/L	<1.0	5 µg/L	94.4	61.7	119
EP075(SIM): Benzo(k)fluoranthene	207-08-9	1	µg/L	<1.0	5 µg/L	97.0	63.0	115
EP075(SIM): Benzo(a)pyrene	50-32-8	0.5	µg/L	<0.5	5 µg/L	96.0	63.3	117
EP075(SIM): Indeno(1.2.3.cd)pyrene	193-39-5	1	µg/L	<1.0	5 µg/L	86.4	59.9	118
EP075(SIM): Dibenz(a.h)anthracene	53-70-3	1	µg/L	<1.0	5 µg/L	73.7	61.2	117
EP075(SIM): Benzo(g.h.i)perylene	191-24-2	1	µg/L	<1.0	5 µg/L	82.9	59.1	118
EP080/071: Total Petroleum Hydrocarbons (QCLot: 3912975)								
EP071: C10 - C14 Fraction	----	50	µg/L	<50	400 µg/L	79.4	55.8	112
EP071: C15 - C28 Fraction	----	100	µg/L	<100	600 µg/L	92.5	71.6	113
EP071: C29 - C36 Fraction	----	50	µg/L	<50	400 µg/L	94.4	56.0	121
EP080/071: Total Petroleum Hydrocarbons (QCLot: 3917254)								
EP080: C6 - C9 Fraction	----	20	µg/L	<20	260 µg/L	78.7	75.0	127
EP080/071: Total Recoverable Hydrocarbons - NEPM 2013 Fractions (QCLot: 3912975)								
EP071: >C10 - C16 Fraction	----	100	µg/L	<100	500 µg/L	79.6	57.9	119
EP071: >C16 - C34 Fraction	----	100	µg/L	<100	700 µg/L	75.4	62.5	110
EP071: >C34 - C40 Fraction	----	100	µg/L	<100	300 µg/L	88.0	61.5	121
EP080/071: Total Recoverable Hydrocarbons - NEPM 2013 Fractions (QCLot: 3917254)								
EP080: C6 - C10 Fraction	C6_C10	20	µg/L	<20	310 µg/L	80.4	75.0	127
EP080: BTEXN (QCLot: 3917254)								
EP080: Benzene	71-43-2	1	µg/L	<1	10 µg/L	93.9	70.0	122
EP080: Toluene	108-88-3	2	µg/L	<2	10 µg/L	97.2	69.0	123
EP080: Ethylbenzene	100-41-4	2	µg/L	<2	10 µg/L	94.8	70.0	120
EP080: meta- & para-Xylene	108-38-3 106-42-3	2	µg/L	<2	10 µg/L	97.0	69.0	121
EP080: ortho-Xylene	95-47-6	2	µg/L	<2	10 µg/L	99.0	72.0	122

Sub-Matrix: **WATER**

Method: Compound	CAS Number	LOR	Unit	Method Blank (MB) Report	Laboratory Control Spike (LCS) Report			
					Spike	Spike Recovery (%)	Acceptable Limits (%)	
				Result	Concentration	LCS	Low	High
EP080: BTEXN (QCLot: 3917254) - continued								
EP080: Naphthalene	91-20-3	5	µg/L	<5	10 µg/L	102	70.0	120

Matrix Spike (MS) Report

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

Sub-Matrix: **SOIL**

Laboratory sample ID	Sample ID	Method: Compound	CAS Number	Matrix Spike (MS) Report			
				Spike	SpikeRecovery(%)	Acceptable Limits (%)	
				Concentration	MS	Low	High
EG005(ED093)T: Total Metals by ICP-AES (QCLot: 3918141)							
ES2133796-010	Anonymous	EG005T: Arsenic	7440-38-2	50 mg/kg	93.8	70.0	130
		EG005T: Cadmium	7440-43-9	50 mg/kg	94.7	70.0	130
		EG005T: Chromium	7440-47-3	50 mg/kg	94.2	68.0	132
		EG005T: Copper	7440-50-8	250 mg/kg	95.2	70.0	130
		EG005T: Lead	7439-92-1	250 mg/kg	95.8	70.0	130
		EG005T: Nickel	7440-02-0	50 mg/kg	93.3	70.0	130
		EG005T: Zinc	7440-66-6	250 mg/kg	94.5	66.0	133
EG005(ED093)T: Total Metals by ICP-AES (QCLot: 3920087)							
ES2133844-013	BH10_0.05	EG005T: Arsenic	7440-38-2	50 mg/kg	91.6	70.0	130
		EG005T: Cadmium	7440-43-9	50 mg/kg	97.7	70.0	130
		EG005T: Chromium	7440-47-3	50 mg/kg	95.8	68.0	132
		EG005T: Copper	7440-50-8	250 mg/kg	97.0	70.0	130
		EG005T: Lead	7439-92-1	250 mg/kg	96.6	70.0	130
		EG005T: Nickel	7440-02-0	50 mg/kg	96.9	70.0	130
		EG005T: Zinc	7440-66-6	250 mg/kg	94.9	66.0	133
EG035T: Total Recoverable Mercury by FIMS (QCLot: 3918142)							
ES2133796-010	Anonymous	EG035T: Mercury	7439-97-6	5 mg/kg	106	70.0	130
EG035T: Total Recoverable Mercury by FIMS (QCLot: 3920088)							
ES2133844-013	BH10_0.05	EG035T: Mercury	7439-97-6	5 mg/kg	118	70.0	130
EK026SF: Total CN by Segmented Flow Analyser (QCLot: 3919135)							
ES2133909-011	Anonymous	EK026SF: Total Cyanide	57-12-5	40 mg/kg	124	70.0	130
EP068A: Organochlorine Pesticides (OC) (QCLot: 3914739)							
ES2133844-001	BH16_0.05	EP068: gamma-BHC	58-89-9	0.5 mg/kg	91.9	70.0	130
		EP068: Heptachlor	76-44-8	0.5 mg/kg	78.3	70.0	130
		EP068: Aldrin	309-00-2	0.5 mg/kg	81.1	70.0	130
		EP068: Dieldrin	60-57-1	0.5 mg/kg	89.2	70.0	130
		EP068: Endrin	72-20-8	2 mg/kg	104	70.0	130

Sub-Matrix: **SOIL**

				Matrix Spike (MS) Report			
				Spike	SpikeRecovery(%)	Acceptable Limits (%)	
Laboratory sample ID	Sample ID	Method: Compound	CAS Number	Concentration	MS	Low	High
EP068A: Organochlorine Pesticides (OC) (QCLot: 3914739) - continued							
ES2133844-001	BH16_0.05	EP068: 4.4`-DDT	50-29-3	2 mg/kg	85.3	70.0	130
EP068B: Organophosphorus Pesticides (OP) (QCLot: 3914739)							
ES2133844-001	BH16_0.05	EP068: Diazinon	333-41-5	0.5 mg/kg	90.5	70.0	130
		EP068: Chlorpyrifos-methyl	5598-13-0	0.5 mg/kg	85.2	70.0	130
		EP068: Pirimphos-ethyl	23505-41-1	0.5 mg/kg	84.4	70.0	130
		EP068: Bromophos-ethyl	4824-78-6	0.5 mg/kg	84.8	70.0	130
		EP068: Prothiofos	34643-46-4	0.5 mg/kg	77.4	70.0	130
EP075(SIM)B: Polynuclear Aromatic Hydrocarbons (QCLot: 3914738)							
ES2133844-001	BH16_0.05	EP075(SIM): Acenaphthene	83-32-9	10 mg/kg	90.9	70.0	130
		EP075(SIM): Pyrene	129-00-0	10 mg/kg	107	70.0	130
EP080/071: Total Petroleum Hydrocarbons (QCLot: 3914737)							
ES2133844-001	BH16_0.05	EP071: C10 - C14 Fraction	----	480 mg/kg	103	73.0	137
		EP071: C15 - C28 Fraction	----	3100 mg/kg	112	53.0	131
		EP071: C29 - C36 Fraction	----	2060 mg/kg	116	52.0	132
EP080/071: Total Petroleum Hydrocarbons (QCLot: 3915436)							
ES2133844-001	BH16_0.05	EP080: C6 - C9 Fraction	----	32.5 mg/kg	90.7	70.0	130
EP080/071: Total Recoverable Hydrocarbons - NEPM 2013 Fractions (QCLot: 3914737)							
ES2133844-001	BH16_0.05	EP071: >C10 - C16 Fraction	----	860 mg/kg	108	73.0	137
		EP071: >C16 - C34 Fraction	----	4320 mg/kg	112	53.0	131
		EP071: >C34 - C40 Fraction	----	890 mg/kg	123	52.0	132
EP080/071: Total Recoverable Hydrocarbons - NEPM 2013 Fractions (QCLot: 3915436)							
ES2133844-001	BH16_0.05	EP080: C6 - C10 Fraction	C6_C10	37.5 mg/kg	88.8	70.0	130
EP080: BTEXN (QCLot: 3915436)							
ES2133844-001	BH16_0.05	EP080: Benzene	71-43-2	2.5 mg/kg	92.6	70.0	130
		EP080: Toluene	108-88-3	2.5 mg/kg	90.2	70.0	130
		EP080: Ethylbenzene	100-41-4	2.5 mg/kg	87.9	70.0	130
		EP080: meta- & para-Xylene	108-38-3 106-42-3	2.5 mg/kg	84.2	70.0	130
		EP080: ortho-Xylene	95-47-6	2.5 mg/kg	84.9	70.0	130
		EP080: Naphthalene	91-20-3	2.5 mg/kg	78.5	70.0	130
EP231A: Perfluoroalkyl Sulfonic Acids (QCLot: 3914171)							
EP2110929-001	Anonymous	EP231X: Perfluorobutane sulfonic acid (PFBS)	375-73-5	0.00125 mg/kg	74.0	72.0	128
		EP231X: Perfluoropentane sulfonic acid (PFPeS)	2706-91-4	0.00125 mg/kg	86.8	73.0	123
		EP231X: Perfluorohexane sulfonic acid (PFHxS)	355-46-4	0.00125 mg/kg	77.6	67.0	130
		EP231X: Perfluoroheptane sulfonic acid (PFHpS)	375-92-8	0.00125 mg/kg	81.2	70.0	132
		EP231X: Perfluorooctane sulfonic acid (PFOS)	1763-23-1	0.00125 mg/kg	93.2	68.0	136

Sub-Matrix: **SOIL**

				Matrix Spike (MS) Report			
				Spike	SpikeRecovery(%)	Acceptable Limits (%)	
Laboratory sample ID	Sample ID	Method: Compound	CAS Number	Concentration	MS	Low	High
EP231A: Perfluoroalkyl Sulfonic Acids (QCLot: 3914171) - continued							
EP2110929-001	Anonymous	EP231X: Perfluorodecane sulfonic acid (PFDS)	335-77-3	0.00125 mg/kg	82.4	59.0	134
EP231B: Perfluoroalkyl Carboxylic Acids (QCLot: 3914171)							
EP2110929-001	Anonymous	EP231X: Perfluorobutanoic acid (PFBA)	375-22-4	0.00625 mg/kg	78.6	71.0	135
		EP231X: Perfluoropentanoic acid (PFPeA)	2706-90-3	0.00125 mg/kg	90.4	69.0	132
		EP231X: Perfluorohexanoic acid (PFHxA)	307-24-4	0.00125 mg/kg	92.0	70.0	132
		EP231X: Perfluoroheptanoic acid (PFHpA)	375-85-9	0.00125 mg/kg	89.6	71.0	131
		EP231X: Perfluorooctanoic acid (PFOA)	335-67-1	0.00125 mg/kg	93.2	69.0	133
		EP231X: Perfluorononanoic acid (PFNA)	375-95-1	0.00125 mg/kg	94.8	72.0	129
		EP231X: Perfluorodecanoic acid (PFDA)	335-76-2	0.00125 mg/kg	93.6	69.0	133
		EP231X: Perfluoroundecanoic acid (PFUnDA)	2058-94-8	0.00125 mg/kg	94.0	64.0	136
		EP231X: Perfluorododecanoic acid (PFDoDA)	307-55-1	0.00125 mg/kg	81.2	69.0	135
		EP231X: Perfluorotridecanoic acid (PFTrDA)	72629-94-8	0.00125 mg/kg	74.4	66.0	139
		EP231X: Perfluorotetradecanoic acid (PFTeDA)	376-06-7	0.00312 mg/kg	84.6	69.0	133
EP231C: Perfluoroalkyl Sulfonamides (QCLot: 3914171)							
EP2110929-001	Anonymous	EP231X: Perfluorooctane sulfonamide (FOSA)	754-91-6	0.00125 mg/kg	91.6	67.0	137
		EP231X: N-Methyl perfluorooctane sulfonamide (MeFOSA)	31506-32-8	0.00312 mg/kg	93.3	71.6	129
		EP231X: N-Ethyl perfluorooctane sulfonamide (EtFOSA)	4151-50-2	0.00312 mg/kg	93.8	69.8	131
		EP231X: N-Methyl perfluorooctane sulfonamidoethanol (MeFOSE)	24448-09-7	0.00312 mg/kg	80.0	68.7	130
		EP231X: N-Ethyl perfluorooctane sulfonamidoethanol (EtFOSE)	1691-99-2	0.00312 mg/kg	104	65.1	134
		EP231X: N-Methyl perfluorooctane sulfonamidoacetic acid (MeFOSAA)	2355-31-9	0.00125 mg/kg	100	63.0	144
		EP231X: N-Ethyl perfluorooctane sulfonamidoacetic acid (EtFOSAA)	2991-50-6	0.00125 mg/kg	78.4	61.0	139
EP231D: (n:2) Fluorotelomer Sulfonic Acids (QCLot: 3914171)							
EP2110929-001	Anonymous	EP231X: 4:2 Fluorotelomer sulfonic acid (4:2 FTS)	757124-72-4	0.00125 mg/kg	80.0	62.0	145
		EP231X: 6:2 Fluorotelomer sulfonic acid (6:2 FTS)	27619-97-2	0.00125 mg/kg	86.4	64.0	140
		EP231X: 8:2 Fluorotelomer sulfonic acid (8:2 FTS)	39108-34-4	0.00125 mg/kg	98.4	65.0	137
		EP231X: 10:2 Fluorotelomer sulfonic acid (10:2 FTS)	120226-60-0	0.00125 mg/kg	74.8	69.2	143

Sub-Matrix: **WATER**

				Matrix Spike (MS) Report			
				Spike	SpikeRecovery(%)	Acceptable Limits (%)	
Laboratory sample ID	Sample ID	Method: Compound	CAS Number	Concentration	MS	Low	High
EG020T: Total Metals by ICP-MS (QCLot: 3917623)							
ES2133783-006	Anonymous	EG020A-T: Arsenic	7440-38-2	1 mg/L	93.6	70.0	130
		EG020A-T: Cadmium	7440-43-9	0.25 mg/L	95.0	70.0	130
		EG020A-T: Chromium	7440-47-3	1 mg/L	94.5	70.0	130

Sub-Matrix: **WATER**

				Matrix Spike (MS) Report			
				Spike	SpikeRecovery(%)	Acceptable Limits (%)	
Laboratory sample ID	Sample ID	Method: Compound	CAS Number	Concentration	MS	Low	High
EG020T: Total Metals by ICP-MS (QCLot: 3917623) - continued							
ES2133783-006	Anonymous	EG020A-T: Copper	7440-50-8	1 mg/L	93.9	70.0	130
		EG020A-T: Lead	7439-92-1	1 mg/L	92.8	70.0	130
		EG020A-T: Nickel	7440-02-0	1 mg/L	94.5	70.0	130
		EG020A-T: Zinc	7440-66-6	1 mg/L	94.4	70.0	130
EG035T: Total Recoverable Mercury by FIMS (QCLot: 3917784)							
ES2133844-025	QC502_210917	EG035T: Mercury	7439-97-6	0.01 mg/L	93.8	70.0	130
EP080/071: Total Petroleum Hydrocarbons (QCLot: 3917254)							
CA2105767-001	Anonymous	EP080: C6 - C9 Fraction	----	325 µg/L	81.7	70.0	130
EP080/071: Total Recoverable Hydrocarbons - NEPM 2013 Fractions (QCLot: 3917254)							
CA2105767-001	Anonymous	EP080: C6 - C10 Fraction	C6_C10	375 µg/L	83.9	70.0	130
EP080: BTEXN (QCLot: 3917254)							
CA2105767-001	Anonymous	EP080: Benzene	71-43-2	25 µg/L	81.3	70.0	130
		EP080: Toluene	108-88-3	25 µg/L	91.2	70.0	130
		EP080: Ethylbenzene	100-41-4	25 µg/L	95.2	70.0	130
		EP080: meta- & para-Xylene	108-38-3 106-42-3	25 µg/L	93.8	70.0	130
		EP080: ortho-Xylene	95-47-6	25 µg/L	97.5	70.0	130
		EP080: Naphthalene	91-20-3	25 µg/L	97.9	70.0	130

QA/QC Compliance Assessment to assist with Quality Review

Work Order	: **ES2133844**	Page	: 1 of 13
Client	: **Jacobs Arcadis Joint Venture**	Laboratory	: Environmental Division Sydney
Contact	: Amanda Mullen	Telephone	: +61-2-8784 8555
Project	: IA254001	Date Samples Received	: 17-Sep-2021
Site	: ----	Issue Date	: 28-Sep-2021
Sampler	: Nick Keatley	No. of samples received	: 26
Order number	: 1770	No. of samples analysed	: 21

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

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

Summary of Outliers

Outliers : Quality Control Samples

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

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

Outliers : Analysis Holding Time Compliance

- **Analysis Holding Time Outliers exist - please see following pages for full details.**

Outliers : Frequency of Quality Control Samples

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

Outliers : Analysis Holding Time Compliance

Matrix: **SOIL**

Method	*Extraction / Preparation*			*Analysis*		
Container / Client Sample ID(s)	*Date extracted*	*Due for extraction*	***Days overdue***	*Date analysed*	*Due for analysis*	***Days overdue***
MM868: Coliforms & E.coli by MPN using Aquachrom ECC						
Sterile Plastic Jar BH13_0.05, BH13_0.5, SS22_0.05	----	----	----	22-Sep-2021	19-Sep-2021	**3**
Sterile Plastic Jar BH08_0.5, QC101_210916	----	----	----	22-Sep-2021	20-Sep-2021	**2**

Outliers : Frequency of Quality Control Samples

Matrix: **WATER**

	Count		Rate (%)		Quality Control Specification
Method	QC	Regular	Actual	Expected	
PAH/Phenols (GC/MS - SIM)	0	7	0.00	10.00	NEPM 2013 B3 & ALS QC Standard
TRH - Semivolatile Fraction	0	10	0.00	10.00	NEPM 2013 B3 & ALS QC Standard
PAH/Phenols (GC/MS - SIM)	0	7	0.00	5.00	NEPM 2013 B3 & ALS QC Standard
TRH - Semivolatile Fraction	0	10	0.00	5.00	NEPM 2013 B3 & ALS QC Standard

Analysis Holding Time Compliance

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

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

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

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

Matrix: **SOIL**

Evaluation: × = Holding time breach ; ✓ = Within holding time.

Method	***Sample Date***	*Extraction / Preparation*			*Analysis*		
Container */ Client Sample ID(s)*		***Date extracted***	*Due for extraction*	*Evaluation*	***Date analysed***	*Due for analysis*	*Evaluation*

Matrix: **SOIL**

Evaluation: × = Holding time breach ; ✓ = Within holding time.

Method	*Sample Date*	*Extraction / Preparation*			*Analysis*		
Container / Client Sample ID(s)		*Date extracted*	*Due for extraction*	*Evaluation*	*Date analysed*	*Due for analysis*	*Evaluation*
EA055: Moisture Content (Dried @ 105-110°C)							
Soil Glass Jar - Unpreserved (EA055) BH16_0.05, BH16_1.5	**13-Sep-2021**	**----**	----	----	**23-Sep-2021**	27-Sep-2021	✓
Soil Glass Jar - Unpreserved (EA055) BH13_0.05, BH13_0.5, SS22_0.05	**15-Sep-2021**	**----**	----	----	**23-Sep-2021**	29-Sep-2021	✓
Soil Glass Jar - Unpreserved (EA055) BH08_0.05, BH08_0.5, QC101_210916, BH10_0.05, BH10_1.0	**16-Sep-2021**	**----**	----	----	**23-Sep-2021**	30-Sep-2021	✓
Soil Glass Jar - Unpreserved (EA055) SS16_0.05, SS20_0.05, SS29_0.05, SS06_0.05, SS07_0.05, SS08_0.05, SS09_0.05, QC101_210917	**17-Sep-2021**	**----**	----	----	**23-Sep-2021**	01-Oct-2021	✓
EA200: AS 4964 - 2004 Identification of Asbestos in Soils							
Snap Lock Bag - Friable Asbestos/PSD Bag (EA200) BH16_0.05, BH16_1.5	**13-Sep-2021**	**----**	----	----	**20-Sep-2021**	12-Mar-2022	✓
Snap Lock Bag - Friable Asbestos/PSD Bag (EA200) BH13_0.05, BH13_0.5, SS22_0.05	**15-Sep-2021**	**----**	----	----	**20-Sep-2021**	14-Mar-2022	✓
Snap Lock Bag - Friable Asbestos/PSD Bag (EA200) BH08_0.05, BH08_0.5	**16-Sep-2021**	**----**	----	----	**20-Sep-2021**	15-Mar-2022	✓
Snap Lock Bag - Friable Asbestos/PSD Bag (EA200) SS29_0.05, SS06_0.05	**17-Sep-2021**	**----**	----	----	**20-Sep-2021**	16-Mar-2022	✓
EG005(ED093)T: Total Metals by ICP-AES							
Soil Glass Jar - Unpreserved (EG005T) BH16_0.05, BH16_1.5	**13-Sep-2021**	**23-Sep-2021**	12-Mar-2022	✓	**24-Sep-2021**	12-Mar-2022	✓
Soil Glass Jar - Unpreserved (EG005T) BH13_0.05, BH13_0.5, SS22_0.05	**15-Sep-2021**	**23-Sep-2021**	14-Mar-2022	✓	**24-Sep-2021**	14-Mar-2022	✓
Soil Glass Jar - Unpreserved (EG005T) BH08_0.05, BH08_0.5, QC101_210916	**16-Sep-2021**	**23-Sep-2021**	15-Mar-2022	✓	**24-Sep-2021**	15-Mar-2022	✓
Soil Glass Jar - Unpreserved (EG005T) BH10_0.05, BH10_1.0	**16-Sep-2021**	**24-Sep-2021**	15-Mar-2022	✓	**27-Sep-2021**	15-Mar-2022	✓
Soil Glass Jar - Unpreserved (EG005T) SS16_0.05, SS20_0.05, SS29_0.05, SS06_0.05, SS07_0.05, SS08_0.05, SS09_0.05, QC101_210917	**17-Sep-2021**	**24-Sep-2021**	16-Mar-2022	✓	**27-Sep-2021**	16-Mar-2022	✓

Matrix: **SOIL**

Evaluation: × = Holding time breach ; ✓ = Within holding time.

Method *Container / Client Sample ID(s)*	*Sample Date*	*Extraction / Preparation*			*Analysis*		
		Date extracted	*Due for extraction*	*Evaluation*	*Date analysed*	*Due for analysis*	*Evaluation*
EG035T: Total Recoverable Mercury by FIMS							
Soil Glass Jar - Unpreserved (EG035T) BH16_0.05, BH16_1.5	**13-Sep-2021**	**23-Sep-2021**	11-Oct-2021	✓	**24-Sep-2021**	11-Oct-2021	✓
Soil Glass Jar - Unpreserved (EG035T) BH13_0.05, BH13_0.5, SS22_0.05	**15-Sep-2021**	**23-Sep-2021**	13-Oct-2021	✓	**24-Sep-2021**	13-Oct-2021	✓
Soil Glass Jar - Unpreserved (EG035T) BH08_0.05, BH08_0.5, QC101_210916	**16-Sep-2021**	**23-Sep-2021**	14-Oct-2021	✓	**24-Sep-2021**	14-Oct-2021	✓
Soil Glass Jar - Unpreserved (EG035T) BH10_0.05, BH10_1.0	**16-Sep-2021**	**24-Sep-2021**	14-Oct-2021	✓	**27-Sep-2021**	14-Oct-2021	✓
Soil Glass Jar - Unpreserved (EG035T) SS16_0.05, SS20_0.05, SS29_0.05, SS06_0.05, SS07_0.05, SS08_0.05, SS09_0.05, QC101_210917	**17-Sep-2021**	**24-Sep-2021**	15-Oct-2021	✓	**27-Sep-2021**	15-Oct-2021	✓
EK026SF: Total CN by Segmented Flow Analyser							
Soil Glass Jar - Unpreserved (EK026SF) BH10_0.05, BH10_1.0	**16-Sep-2021**	**23-Sep-2021**	30-Sep-2021	✓	**24-Sep-2021**	07-Oct-2021	✓
EP068A: Organochlorine Pesticides (OC)							
Soil Glass Jar - Unpreserved (EP068) BH16_0.05, BH16_1.5	**13-Sep-2021**	**23-Sep-2021**	27-Sep-2021	✓	**27-Sep-2021**	02-Nov-2021	✓
Soil Glass Jar - Unpreserved (EP068) BH13_0.05, BH13_0.5, SS22_0.05	**15-Sep-2021**	**23-Sep-2021**	29-Sep-2021	✓	**27-Sep-2021**	02-Nov-2021	✓
Soil Glass Jar - Unpreserved (EP068) BH08_0.05, BH08_0.5, QC101_210916	**16-Sep-2021**	**23-Sep-2021**	30-Sep-2021	✓	**27-Sep-2021**	02-Nov-2021	✓
Soil Glass Jar - Unpreserved (EP068) SS29_0.05, SS06_0.05	**17-Sep-2021**	**23-Sep-2021**	01-Oct-2021	✓	**27-Sep-2021**	02-Nov-2021	✓
EP068B: Organophosphorus Pesticides (OP)							
Soil Glass Jar - Unpreserved (EP068) BH16_0.05, BH16_1.5	**13-Sep-2021**	**23-Sep-2021**	27-Sep-2021	✓	**27-Sep-2021**	02-Nov-2021	✓
Soil Glass Jar - Unpreserved (EP068) BH13_0.05, BH13_0.5, SS22_0.05	**15-Sep-2021**	**23-Sep-2021**	29-Sep-2021	✓	**27-Sep-2021**	02-Nov-2021	✓
Soil Glass Jar - Unpreserved (EP068) BH08_0.05, BH08_0.5, QC101_210916	**16-Sep-2021**	**23-Sep-2021**	30-Sep-2021	✓	**27-Sep-2021**	02-Nov-2021	✓
Soil Glass Jar - Unpreserved (EP068) SS29_0.05, SS06_0.05	**17-Sep-2021**	**23-Sep-2021**	01-Oct-2021	✓	**27-Sep-2021**	02-Nov-2021	✓

Matrix: **SOIL**

Evaluation: × = Holding time breach ; ✓ = Within holding time.

Method *Container / Client Sample ID(s)*	*Sample Date*	*Extraction / Preparation*			*Analysis*		
		Date extracted	*Due for extraction*	*Evaluation*	*Date analysed*	*Due for analysis*	*Evaluation*
EP075(SIM)B: Polynuclear Aromatic Hydrocarbons							
Soil Glass Jar - Unpreserved (EP075(SIM)) BH16_0.05, BH16_1.5	**13-Sep-2021**	**23-Sep-2021**	27-Sep-2021	✓	**24-Sep-2021**	02-Nov-2021	✓
Soil Glass Jar - Unpreserved (EP075(SIM)) BH13_0.05, BH13_0.5, SS22_0.05	**15-Sep-2021**	**23-Sep-2021**	29-Sep-2021	✓	**24-Sep-2021**	02-Nov-2021	✓
Soil Glass Jar - Unpreserved (EP075(SIM)) BH08_0.05, BH08_0.5, QC101_210916	**16-Sep-2021**	**23-Sep-2021**	30-Sep-2021	✓	**24-Sep-2021**	02-Nov-2021	✓
Soil Glass Jar - Unpreserved (EP075(SIM)) SS16_0.05, SS20_0.05, SS29_0.05, SS06_0.05, SS07_0.05, SS08_0.05, SS09_0.05, QC101_210917	**17-Sep-2021**	**23-Sep-2021**	01-Oct-2021	✓	**24-Sep-2021**	02-Nov-2021	✓
EP080/071: Total Petroleum Hydrocarbons							
Soil Glass Jar - Unpreserved (EP080) BH16_0.05, BH16_1.5	**13-Sep-2021**	**22-Sep-2021**	27-Sep-2021	✓	**24-Sep-2021**	27-Sep-2021	✓
Soil Glass Jar - Unpreserved (EP071) BH16_0.05, BH16_1.5	**13-Sep-2021**	**23-Sep-2021**	27-Sep-2021	✓	**24-Sep-2021**	02-Nov-2021	✓
Soil Glass Jar - Unpreserved (EP080) BH13_0.05, BH13_0.5, SS22_0.05	**15-Sep-2021**	**22-Sep-2021**	29-Sep-2021	✓	**24-Sep-2021**	29-Sep-2021	✓
Soil Glass Jar - Unpreserved (EP071) BH13_0.05, BH13_0.5, SS22_0.05	**15-Sep-2021**	**23-Sep-2021**	29-Sep-2021	✓	**24-Sep-2021**	02-Nov-2021	✓
Soil Glass Jar - Unpreserved (EP080) BH08_0.05, BH08_0.5, QC101_210916	**16-Sep-2021**	**22-Sep-2021**	30-Sep-2021	✓	**24-Sep-2021**	30-Sep-2021	✓
Soil Glass Jar - Unpreserved (EP071) BH08_0.05, BH08_0.5, QC101_210916	**16-Sep-2021**	**23-Sep-2021**	30-Sep-2021	✓	**24-Sep-2021**	02-Nov-2021	✓
Soil Glass Jar - Unpreserved (EP080) SS16_0.05, SS20_0.05, SS29_0.05, SS06_0.05, SS07_0.05, SS08_0.05, SS09_0.05, QC101_210917, QC300_210917	**17-Sep-2021**	**22-Sep-2021**	01-Oct-2021	✓	**24-Sep-2021**	01-Oct-2021	✓
Soil Glass Jar - Unpreserved (EP071) SS16_0.05, SS20_0.05, SS29_0.05, SS06_0.05, SS07_0.05, SS08_0.05, SS09_0.05, QC101_210917	**17-Sep-2021**	**23-Sep-2021**	01-Oct-2021	✓	**24-Sep-2021**	02-Nov-2021	✓

Matrix: **SOIL**

Evaluation: × = Holding time breach ; ✓ = Within holding time.

Method	*Sample Date*	*Extraction / Preparation*			*Analysis*		
Container / Client Sample ID(s)		*Date extracted*	*Due for extraction*	*Evaluation*	*Date analysed*	*Due for analysis*	*Evaluation*
EP080/071: Total Recoverable Hydrocarbons - NEPM 2013 Fractions							
Soil Glass Jar - Unpreserved (EP080) BH16_0.05, BH16_1.5	**13-Sep-2021**	**22-Sep-2021**	27-Sep-2021	✓	**24-Sep-2021**	27-Sep-2021	✓
Soil Glass Jar - Unpreserved (EP071) BH16_0.05, BH16_1.5	**13-Sep-2021**	**23-Sep-2021**	27-Sep-2021	✓	**24-Sep-2021**	02-Nov-2021	✓
Soil Glass Jar - Unpreserved (EP080) BH13_0.05, BH13_0.5, SS22_0.05	**15-Sep-2021**	**22-Sep-2021**	29-Sep-2021	✓	**24-Sep-2021**	29-Sep-2021	✓
Soil Glass Jar - Unpreserved (EP071) BH13_0.05, BH13_0.5, SS22_0.05	**15-Sep-2021**	**23-Sep-2021**	29-Sep-2021	✓	**24-Sep-2021**	02-Nov-2021	✓
Soil Glass Jar - Unpreserved (EP080) BH08_0.05, BH08_0.5, QC101_210916	**16-Sep-2021**	**22-Sep-2021**	30-Sep-2021	✓	**24-Sep-2021**	30-Sep-2021	✓
Soil Glass Jar - Unpreserved (EP071) BH08_0.05, BH08_0.5, QC101_210916	**16-Sep-2021**	**23-Sep-2021**	30-Sep-2021	✓	**24-Sep-2021**	02-Nov-2021	✓
Soil Glass Jar - Unpreserved (EP080) SS16_0.05, SS20_0.05, SS29_0.05, SS06_0.05, SS07_0.05, SS08_0.05, SS09_0.05, QC101_210917, QC300_210917	**17-Sep-2021**	**22-Sep-2021**	01-Oct-2021	✓	**24-Sep-2021**	01-Oct-2021	✓
Soil Glass Jar - Unpreserved (EP071) SS16_0.05, SS20_0.05, SS29_0.05, SS06_0.05, SS07_0.05, SS08_0.05, SS09_0.05, QC101_210917	**17-Sep-2021**	**23-Sep-2021**	01-Oct-2021	✓	**24-Sep-2021**	02-Nov-2021	✓
EP080: BTEXN							
Soil Glass Jar - Unpreserved (EP080) BH16_0.05, BH16_1.5	**13-Sep-2021**	**22-Sep-2021**	27-Sep-2021	✓	**24-Sep-2021**	27-Sep-2021	✓
Soil Glass Jar - Unpreserved (EP080) BH13_0.05, BH13_0.5, SS22_0.05	**15-Sep-2021**	**22-Sep-2021**	29-Sep-2021	✓	**24-Sep-2021**	29-Sep-2021	✓
Soil Glass Jar - Unpreserved (EP080) BH08_0.05, BH08_0.5, QC101_210916	**16-Sep-2021**	**22-Sep-2021**	30-Sep-2021	✓	**24-Sep-2021**	30-Sep-2021	✓
Soil Glass Jar - Unpreserved (EP080) SS16_0.05, SS20_0.05, SS29_0.05, SS06_0.05, SS07_0.05, SS08_0.05, SS09_0.05, QC101_210917, QC300_210917	**17-Sep-2021**	**22-Sep-2021**	01-Oct-2021	✓	**24-Sep-2021**	01-Oct-2021	✓

Matrix: **SOIL**

Evaluation: ✗ = Holding time breach ; ✓ = Within holding time.

Method	*Sample Date*	*Extraction / Preparation*			*Analysis*		
Container / Client Sample ID(s)		*Date extracted*	*Due for extraction*	*Evaluation*	*Date analysed*	*Due for analysis*	*Evaluation*
EP231A: Perfluoroalkyl Sulfonic Acids							
HDPE Soil Jar (EP231X) SS07_0.05, SS08_0.05, SS09_0.05, QC101_210917	**17-Sep-2021**	**22-Sep-2021**	16-Mar-2022	✓	**22-Sep-2021**	01-Nov-2021	✓
EP231B: Perfluoroalkyl Carboxylic Acids							
HDPE Soil Jar (EP231X) SS07_0.05, SS08_0.05, SS09_0.05, QC101_210917	**17-Sep-2021**	**22-Sep-2021**	16-Mar-2022	✓	**22-Sep-2021**	01-Nov-2021	✓
EP231C: Perfluoroalkyl Sulfonamides							
HDPE Soil Jar (EP231X) SS07_0.05, SS08_0.05, SS09_0.05, QC101_210917	**17-Sep-2021**	**22-Sep-2021**	16-Mar-2022	✓	**22-Sep-2021**	01-Nov-2021	✓
EP231D: (n:2) Fluorotelomer Sulfonic Acids							
HDPE Soil Jar (EP231X) SS07_0.05, SS08_0.05, SS09_0.05, QC101_210917	**17-Sep-2021**	**22-Sep-2021**	16-Mar-2022	✓	**22-Sep-2021**	01-Nov-2021	✓
EP231P: PFAS Sums							
HDPE Soil Jar (EP231X) SS07_0.05, SS08_0.05, SS09_0.05, QC101_210917	**17-Sep-2021**	**22-Sep-2021**	16-Mar-2022	✓	**22-Sep-2021**	01-Nov-2021	✓
MM868: Coliforms & E.coli by MPN using Aquachrom ECC							
Sterile Plastic Jar (MM868) BH13_0.05, BH13_0.5, SS22_0.05	**15-Sep-2021**	**----**	----	----	**22-Sep-2021**	19-Sep-2021	✗
Sterile Plastic Jar (MM868) BH08_0.5, QC101_210916	**16-Sep-2021**	**----**	----	----	**22-Sep-2021**	20-Sep-2021	✗

Matrix: **WATER**

Evaluation: ✗ = Holding time breach ; ✓ = Within holding time.

Method	*Sample Date*	*Extraction / Preparation*			*Analysis*		
Container / Client Sample ID(s)		*Date extracted*	*Due for extraction*	*Evaluation*	*Date analysed*	*Due for analysis*	*Evaluation*
EG020T: Total Metals by ICP-MS							
Clear Plastic Bottle - Nitric Acid; Unfiltered (EG020A-T) QC501_210917, QC502_210917	**17-Sep-2021**	**23-Sep-2021**	16-Mar-2022	✓	**23-Sep-2021**	16-Mar-2022	✓
EG035T: Total Recoverable Mercury by FIMS							
Clear Plastic Bottle - Nitric Acid; Unfiltered (EG035T) QC501_210917, QC502_210917	**17-Sep-2021**	**----**	----	----	**23-Sep-2021**	15-Oct-2021	✓
EP075(SIM)B: Polynuclear Aromatic Hydrocarbons							
Amber Glass Bottle - Unpreserved (EP075(SIM)) QC501_210917, QC502_210917	**17-Sep-2021**	**22-Sep-2021**	24-Sep-2021	✓	**23-Sep-2021**	01-Nov-2021	✓

Matrix: **WATER**

Evaluation: × = Holding time breach ; ✓ = Within holding time.

Method		*Sample Date*	*Extraction / Preparation*			*Analysis*		
Container / Client Sample ID(s)			*Date extracted*	*Due for extraction*	*Evaluation*	*Date analysed*	*Due for analysis*	*Evaluation*
EP080/071: Total Petroleum Hydrocarbons								
Amber Glass Bottle - Unpreserved (EP071)								
QC501_210917,	QC502_210917	**17-Sep-2021**	**22-Sep-2021**	24-Sep-2021	✓	**23-Sep-2021**	01-Nov-2021	✓
Amber VOC Vial - Sulfuric Acid (EP080)								
QC501_210917,	QC502_210917	**17-Sep-2021**	**24-Sep-2021**	01-Oct-2021	✓	**24-Sep-2021**	01-Oct-2021	✓
EP080/071: Total Recoverable Hydrocarbons - NEPM 2013 Fractions								
Amber Glass Bottle - Unpreserved (EP071)								
QC501_210917,	QC502_210917	**17-Sep-2021**	**22-Sep-2021**	24-Sep-2021	✓	**23-Sep-2021**	01-Nov-2021	✓
Amber VOC Vial - Sulfuric Acid (EP080)								
QC501_210917,	QC502_210917	**17-Sep-2021**	**24-Sep-2021**	01-Oct-2021	✓	**24-Sep-2021**	01-Oct-2021	✓
EP080: BTEXN								
Amber VOC Vial - Sulfuric Acid (EP080)								
QC501_210917,	QC502_210917	**17-Sep-2021**	**24-Sep-2021**	01-Oct-2021	✓	**24-Sep-2021**	01-Oct-2021	✓

Quality Control Parameter Frequency Compliance

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

Matrix: **SOIL**

Evaluation: ✗ = Quality Control frequency not within specification ; ✓ = Quality Control frequency within specification.

Quality Control Sample Type		Count		Rate (%)			Quality Control Specification
Analytical Methods	*Method*	*QC*	*Regular*	***Actual***	***Expected***	*Evaluation*	
Laboratory Duplicates (DUP)							
Moisture Content	EA055	5	48	**10.42**	**10.00**	✓	NEPM 2013 B3 & ALS QC Standard
PAH/Phenols (SIM)	EP075(SIM)	2	20	**10.00**	**10.00**	✓	NEPM 2013 B3 & ALS QC Standard
Per- and Polyfluoroalkyl Substances (PFAS) by LCMSMS	EP231X	2	19	**10.53**	**10.00**	✓	NEPM 2013 B3 & ALS QC Standard
Pesticides by GCMS	EP068	1	10	**10.00**	**10.00**	✓	NEPM 2013 B3 & ALS QC Standard
Total Cyanide by Segmented Flow Analyser	EK026SF	2	11	**18.18**	**10.00**	✓	NEPM 2013 B3 & ALS QC Standard
Total Mercury by FIMS	EG035T	4	40	**10.00**	**10.00**	✓	NEPM 2013 B3 & ALS QC Standard
Total Metals by ICP-AES	EG005T	4	40	**10.00**	**10.00**	✓	NEPM 2013 B3 & ALS QC Standard
TRH - Semivolatile Fraction	EP071	2	20	**10.00**	**10.00**	✓	NEPM 2013 B3 & ALS QC Standard
TRH Volatiles/BTEX	EP080	2	20	**10.00**	**10.00**	✓	NEPM 2013 B3 & ALS QC Standard
Laboratory Control Samples (LCS)							
PAH/Phenols (SIM)	EP075(SIM)	1	20	**5.00**	**5.00**	✓	NEPM 2013 B3 & ALS QC Standard
Per- and Polyfluoroalkyl Substances (PFAS) by LCMSMS	EP231X	1	19	**5.26**	**5.00**	✓	NEPM 2013 B3 & ALS QC Standard
Pesticides by GCMS	EP068	1	10	**10.00**	**5.00**	✓	NEPM 2013 B3 & ALS QC Standard
Total Cyanide by Segmented Flow Analyser	EK026SF	2	11	**18.18**	**10.00**	✓	NEPM 2013 B3 & ALS QC Standard
Total Mercury by FIMS	EG035T	2	40	**5.00**	**5.00**	✓	NEPM 2013 B3 & ALS QC Standard
Total Metals by ICP-AES	EG005T	2	40	**5.00**	**5.00**	✓	NEPM 2013 B3 & ALS QC Standard
TRH - Semivolatile Fraction	EP071	1	20	**5.00**	**5.00**	✓	NEPM 2013 B3 & ALS QC Standard
TRH Volatiles/BTEX	EP080	1	20	**5.00**	**5.00**	✓	NEPM 2013 B3 & ALS QC Standard
Method Blanks (MB)							
PAH/Phenols (SIM)	EP075(SIM)	1	20	**5.00**	**5.00**	✓	NEPM 2013 B3 & ALS QC Standard
Per- and Polyfluoroalkyl Substances (PFAS) by LCMSMS	EP231X	1	19	**5.26**	**5.00**	✓	NEPM 2013 B3 & ALS QC Standard
Pesticides by GCMS	EP068	1	10	**10.00**	**5.00**	✓	NEPM 2013 B3 & ALS QC Standard
Total Cyanide by Segmented Flow Analyser	EK026SF	1	11	**9.09**	**5.00**	✓	NEPM 2013 B3 & ALS QC Standard
Total Mercury by FIMS	EG035T	2	40	**5.00**	**5.00**	✓	NEPM 2013 B3 & ALS QC Standard
Total Metals by ICP-AES	EG005T	2	40	**5.00**	**5.00**	✓	NEPM 2013 B3 & ALS QC Standard
TRH - Semivolatile Fraction	EP071	1	20	**5.00**	**5.00**	✓	NEPM 2013 B3 & ALS QC Standard
TRH Volatiles/BTEX	EP080	1	20	**5.00**	**5.00**	✓	NEPM 2013 B3 & ALS QC Standard
Matrix Spikes (MS)							
PAH/Phenols (SIM)	EP075(SIM)	1	20	**5.00**	**5.00**	✓	NEPM 2013 B3 & ALS QC Standard
Per- and Polyfluoroalkyl Substances (PFAS) by LCMSMS	EP231X	1	19	**5.26**	**5.00**	✓	NEPM 2013 B3 & ALS QC Standard
Pesticides by GCMS	EP068	1	10	**10.00**	**5.00**	✓	NEPM 2013 B3 & ALS QC Standard
Total Cyanide by Segmented Flow Analyser	EK026SF	1	11	**9.09**	**5.00**	✓	NEPM 2013 B3 & ALS QC Standard
Total Mercury by FIMS	EG035T	2	40	**5.00**	**5.00**	✓	NEPM 2013 B3 & ALS QC Standard
Total Metals by ICP-AES	EG005T	2	40	**5.00**	**5.00**	✓	NEPM 2013 B3 & ALS QC Standard
TRH - Semivolatile Fraction	EP071	1	20	**5.00**	**5.00**	✓	NEPM 2013 B3 & ALS QC Standard
TRH Volatiles/BTEX	EP080	1	20	**5.00**	**5.00**	✓	NEPM 2013 B3 & ALS QC Standard

Matrix: **WATER**

Evaluation: ✗ = Quality Control frequency not within specification ; ✓ = Quality Control frequency within specification.

		Count		Rate (%)			Quality Control Specification
Analytical Methods	*Method*	*QC*	*Regular*	***Actual***	***Expected***	*Evaluation*	
PAH/Phenols (GC/MS - SIM)	EP075(SIM)	0	7	**0.00**	**10.00**	✗	NEPM 2013 B3 & ALS QC Standard
Total Mercury by FIMS	EG035T	2	11	**18.18**	**10.00**	✓	NEPM 2013 B3 & ALS QC Standard
Total Metals by ICP-MS - Suite A	EG020A-T	2	15	**13.33**	**10.00**	✓	NEPM 2013 B3 & ALS QC Standard
TRH - Semivolatile Fraction	EP071	0	10	**0.00**	**10.00**	✗	NEPM 2013 B3 & ALS QC Standard
TRH Volatiles/BTEX	EP080	2	19	**10.53**	**10.00**	✓	NEPM 2013 B3 & ALS QC Standard
PAH/Phenols (GC/MS - SIM)	EP075(SIM)	1	7	**14.29**	**5.00**	✓	NEPM 2013 B3 & ALS QC Standard
Total Mercury by FIMS	EG035T	1	11	**9.09**	**5.00**	✓	NEPM 2013 B3 & ALS QC Standard
Total Metals by ICP-MS - Suite A	EG020A-T	1	15	**6.67**	**5.00**	✓	NEPM 2013 B3 & ALS QC Standard
TRH - Semivolatile Fraction	EP071	1	10	**10.00**	**5.00**	✓	NEPM 2013 B3 & ALS QC Standard
TRH Volatiles/BTEX	EP080	1	19	**5.26**	**5.00**	✓	NEPM 2013 B3 & ALS QC Standard
PAH/Phenols (GC/MS - SIM)	EP075(SIM)	1	7	**14.29**	**5.00**	✓	NEPM 2013 B3 & ALS QC Standard
Total Mercury by FIMS	EG035T	1	11	**9.09**	**5.00**	✓	NEPM 2013 B3 & ALS QC Standard
Total Metals by ICP-MS - Suite A	EG020A-T	1	15	**6.67**	**5.00**	✓	NEPM 2013 B3 & ALS QC Standard
TRH - Semivolatile Fraction	EP071	1	10	**10.00**	**5.00**	✓	NEPM 2013 B3 & ALS QC Standard
TRH Volatiles/BTEX	EP080	1	19	**5.26**	**5.00**	✓	NEPM 2013 B3 & ALS QC Standard
PAH/Phenols (GC/MS - SIM)	EP075(SIM)	0	7	**0.00**	**5.00**	✗	NEPM 2013 B3 & ALS QC Standard
Total Mercury by FIMS	EG035T	1	11	**9.09**	**5.00**	✓	NEPM 2013 B3 & ALS QC Standard
Total Metals by ICP-MS - Suite A	EG020A-T	1	15	**6.67**	**5.00**	✓	NEPM 2013 B3 & ALS QC Standard
TRH - Semivolatile Fraction	EP071	0	10	**0.00**	**5.00**	✗	NEPM 2013 B3 & ALS QC Standard
TRH Volatiles/BTEX	EP080	1	19	**5.26**	**5.00**	✓	NEPM 2013 B3 & ALS QC Standard

Brief Method Summaries

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

Analytical Methods	*Method*	*Matrix*	*Method Descriptions*
Moisture Content	EA055	SOIL	In house: A gravimetric procedure based on weight loss over a 12 hour drying period at 105-110 degrees C. This method is compliant with NEPM Schedule B(3).
Asbestos Identification in Soils	EA200	SOIL	AS 4964 Method for the qualitative identification of asbestos in bulk samples Analysis by Polarised Light Microscopy including dispersion staining
Total Metals by ICP-AES	EG005T	SOIL	In house: Referenced to APHA 3120; USEPA SW 846 - 6010. Metals are determined following an appropriate acid digestion of the soil. The ICPAES technique ionises samples in a plasma, emitting a characteristic spectrum based on metals present. Intensities at selected wavelengths are compared against those of matrix matched standards. This method is compliant with NEPM Schedule B(3)
Total Mercury by FIMS	EG035T	SOIL	In house: Referenced to AS 3550, APHA 3112 Hg - B (Flow-injection (SnCl2) (Cold Vapour generation) AAS) FIM-AAS is an automated flameless atomic absorption technique. Mercury in solids are determined following an appropriate acid digestion. Ionic mercury is reduced online to atomic mercury vapour by SnCl2 which is then purged into a heated quartz cell. Quantification is by comparing absorbance against a calibration curve. This method is compliant with NEPM Schedule B(3)
Total Cyanide by Segmented Flow Analyser	EK026SF	SOIL	In house: Referenced to APHA 4500-CN C / ASTM D7511 / ISO 14403. Caustic leachates of soil samples are introduced into an automated segmented flow analyser. Complex bound cyanide is decomposed in a continuously flowing stream, at a pH of 3.8, by the effect of UV light. A UV-B lamp (312 nm) and a decomposition spiral of borosilicate glass are used to filter out UV light with a wavelength of less than 290 nm thus preventing the conversion of thiocyanate into cyanide. The hydrogen cyanide present at a pH of 3.8 is separated by gas dialysis. The hydrogen cyanide is then determined photometrically, based on the reaction of cyanide with chloramine-T to form cyanogen chloride. This then reacts with 4-pyridine carboxylic acid and 1,3-dimethylbarbituric acid to give a red colour which is measured at 600 nm. This method is compliant with NEPM Schedule B(3).
Pesticides by GCMS	EP068	SOIL	In house: Referenced to USEPA SW 846 - 8270 Extracts are analysed by Capillary GC/MS and quantification is by comparison against an established 5 point calibration curve. This technique is compliant with NEPM Schedule B(3).
TRH - Semivolatile Fraction	EP071	SOIL	In house: Referenced to USEPA SW 846 - 8015 Sample extracts are analysed by Capillary GC/FID and quantified against alkane standards over the range C10 - C40. Compliant with NEPM Schedule B(3).
PAH/Phenols (SIM)	EP075(SIM)	SOIL	In house: Referenced to USEPA SW 846 - 8270. Extracts are analysed by Capillary GC/MS in Selective Ion Mode (SIM) and quantification is by comparison against an established 5 point calibration curve. This method is compliant with NEPM Schedule B(3)
TRH Volatiles/BTEX	EP080	SOIL	In house: Referenced to USEPA SW 846 - 8260. Extracts are analysed by Purge and Trap, Capillary GC/MS. Quantification is by comparison against an established 5 point calibration curve. Compliant with NEPM Schedule B(3) amended.

Analytical Methods	*Method*	*Matrix*	*Method Descriptions*
Per- and Polyfluoroalkyl Substances (PFAS) by LCMSMS	EP231X	SOIL	In-house: Analysis of soils by solvent extraction followed by LC-Electrospray-MS-MS, Negative Mode using MRM using internal standard quantitation. Isotopically labelled analogues of target analytes used as internal standards and surrogates are added to a portion of soil which is then extracted with MTBE and an ion pairing reagent. A portion of extract is exchanged into the analytical solvent mixture, combined with an equal volume reagent water and filtered for analysis. Method procedures and data quality objectives conform to US DoD QSM 5.3, table B-15 requirements.
Coliforms & E.coli in Soils by MPN using Aquachrom ECC	MM868	SOIL	Microbiological analysis subcontracted to ALS Scoresby (NATA Accredited Laboratory No. 992).
Total Metals by ICP-MS - Suite A	EG020A-T	WATER	In house: Referenced to APHA 3125; USEPA SW846 - 6020, ALS QWI-EN/EG020. The ICPMS technique utilizes a highly efficient argon plasma to ionize selected elements. Ions are then passed into a high vacuum mass spectrometer, which separates the analytes based on their distinct mass to charge ratios prior to their measurement by a discrete dynode ion detector.
Total Mercury by FIMS	EG035T	WATER	In house: Referenced to AS 3550, APHA 3112 Hg - B (Flow-injection (SnCl2)(Cold Vapour generation) AAS) FIM-AAS is an automated flameless atomic absorption technique. A bromate/bromide reagent is used to oxidise any organic mercury compounds in the unfiltered sample. The ionic mercury is reduced online to atomic mercury vapour by SnCl2 which is then purged into a heated quartz cell. Quantification is by comparing absorbance against a calibration curve. This method is compliant with NEPM Schedule B(3).
TRH - Semivolatile Fraction	EP071	WATER	In house: Referenced to USEPA SW 846 - 8015 The sample extract is analysed by Capillary GC/FID and quantification is by comparison against an established 5 point calibration curve of n-Alkane standards. This method is compliant with the QC requirements of NEPM Schedule B(3)
PAH/Phenols (GC/MS - SIM)	EP075(SIM)	WATER	In house: Referenced to USEPA SW 846 - 8270 Sample extracts are analysed by Capillary GC/MS in SIM Mode and quantification is by comparison against an established 5 point calibration curve. This method is compliant with NEPM Schedule B(3)
TRH Volatiles/BTEX	EP080	WATER	In house: Referenced to USEPA SW 846 - 8260 Water samples are directly purged prior to analysis by Capillary GC/MS and quantification is by comparison against an established 5 point calibration curve. Alternatively, a sample is equilibrated in a headspace vial and a portion of the headspace determined by GCMS analysis. This method is compliant with the QC requirements of NEPM Schedule B(3)

Preparation Methods	*Method*	*Matrix*	*Method Descriptions*
NaOH leach for CN in Soils	CN-PR	SOIL	In house: APHA 4500 CN. Samples are extracted by end-over-end tumbling with NaOH.
Hot Block Digest for metals in soils sediments and sludges	EN69	SOIL	In house: Referenced to USEPA 200.2. Hot Block Acid Digestion 1.0g of sample is heated with Nitric and Hydrochloric acids, then cooled. Peroxide is added and samples heated and cooled again before being filtered and bulked to volume for analysis. Digest is appropriate for determination of selected metals in sludge, sediments, and soils. This method is compliant with NEPM Schedule B(3).
Methanolic Extraction of Soils for Purge and Trap	ORG16	SOIL	In house: Referenced to USEPA SW 846 - 5030A. 5g of solid is shaken with surrogate and 10mL methanol prior to analysis by Purge and Trap - GC/MS.
Tumbler Extraction of Solids	ORG17	SOIL	In house: Mechanical agitation (tumbler). 10g of sample, Na2SO4 and surrogate are extracted with 30mL 1:1 DCM/Acetone by end over end tumble. The solvent is decanted, dehydrated and concentrated (by KD) to the desired volume for analysis.

Preparation Methods	*Method*	*Matrix*	*Method Descriptions*
QuECheRS Extraction of Solids	ORG71	SOIL	In house: Sequential extractions with Acetonitrile/Methanol by shaking. Extraction efficiency aided by the addition of salts under acidic conditions. Where relevant, interferences from co-extracted organics are removed with dispersive clean-up media (dSPE). The extract is either diluted or concentrated and exchanged into the analytical solvent.
Digestion for Total Recoverable Metals	EN25	WATER	In house: Referenced to USEPA SW846-3005. Method 3005 is a Nitric/Hydrochloric acid digestion procedure used to prepare surface and ground water samples for analysis by ICPAES or ICPMS. This method is compliant with NEPM Schedule B(3)
Separatory Funnel Extraction of Liquids	ORG14	WATER	In house: Referenced to USEPA SW 846 - 3510 100 mL to 1L of sample is transferred to a separatory funnel and serially extracted three times using DCM for each extract. The resultant extracts are combined, dehydrated and concentrated for analysis. This method is compliant with NEPM Schedule B(3) . ALS default excludes sediment which may be resident in the container.
Volatiles Water Preparation	ORG16-W	WATER	A 5 mL aliquot or 5 mL of a diluted sample is added to a 40 mL VOC vial for purging.

ALS

CHAIN OF CUSTODY

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CLIENT: Jacobs Arcadis Joint Venture (JAJV)
OFFICE: Sydney
PROJECT: IA254601
ORDER NUMBER: -
PROJECT MANAGER: Amanda Mullen
CONTACT PH:
SAMPLER: Nick Keatley
SAMPLER MOBILE: 0421201294
COC emailed to ALS? (YES / [✓ NO])
EDD FORMAT (or default):
Email Reports to (will default to PM if no other addresses are listed): nick.keatley@jacobs.com amanda.mullen@jacobs.com
Email Invoice to (will default to PM if no other addresses are listed): " "

TURNAROUND REQUIREMENTS : (Standard TAT may be longer for some tests e.g.. Ultra Trace Organics)
☒ Standard TAT (List due date):
☐ Non Standard or urgent TAT (List due date):

ALS QUOTE NO.: Note: invoicing done through JV contract (not PO)

COC SEQUENCE NUMBER (Circle)
COC: [✓ 1] 2 3 4 5 6 7
OF: 1 2 [✓ 3] 4 5 6 7

RELINQUISHED BY: NK
DATE/TIME: 17/9/21

RECEIVED BY: Juliana G
DATE/TIME: 17/9/21 4:00pm

RELINQUISHED BY:
DATE/TIME:

RECEIVED BY: Sofia/Leo
DATE/TIME: 17/9/21 1830

FOR LABORATORY USE ONLY (Circle)
Custody Seal Intact? [✓ Yes] No N/A
[✓ Free ice] / frozen ice bricks present upon receipt? Yes No N/A
Random Sample Temperature on Receipt: 6.5 °C
Other comment:

COMMENTS/SPECIAL HANDLING/STORAGE OR DISPOSAL: Also email results to EDMANZ@jacobs.com, jacobs.labresults@esdat.net

ALS USE	SAMPLE DETAILS MATRIX: SOLID (S) WATER (W)			CONTAINER INFORMATION		ANALYSIS REQUIRED including SUITES (NB. Suite Codes must be listed to attract suite price) Where Metals are required, specify Total (unfiltered bottle required) or Dissolved (field filtered bottle required).								Additional Information
LAB ID	SAMPLE ID	DATE / TIME	MATRIX	TYPE & PRESERVATIVE (refer to codes below)	TOTAL CONTAINERS	S-26	S-12	EA200	Total Coliforms				HOLD	Comments on likely contaminant levels, dilutions, or samples requiring specific QC analysis etc.
1	BH16_0.05	13/9/21	S			X	X	X						
2	BH16_0.5												X	
3	BH16_1.0	↓											X	
4	BH16_1.5					X	X	X						
5	BH13_0.05	15/9/21				X	X	X	X					
6	BH13_0.5					X	X	X	X					
7	BH13_0.7	↓											X	
8	SS22_0.05					X	X	X	X					
9	BH08_0.05	16/9/21				X	X	X						
10	BH08_0.5					X	X	X	X					
11	QC101_210916	↓				X	X		X					Duplicate
12	QC201_210916		↓			X	X		X					Pls send to eurofins
				TOTAL										

[✓ Subcon] / [✓ Forward Lab] / Split WO
Lab / Analysis: Eurofins QC201
Organised By / Date: Newcastle (1)(5)(6)
Relinquished By / Date: (8)(10)(13)(19)(4)(9)
Connote / Courier:
WO No: ES2133844
Attached By PO / Internal Sheet:

Environmental Division
Sydney
Work Order Reference
ES2133844

Telephone : + 61-2-8784 8555

Water Container Codes: P = Unpreserved Plastic; N = Nitric Preserved Plastic; ORC = Nitric Preserved ORC; SH = Sodium Hydroxide/Cd Preserved; S = Sodium Hydroxide Preserved Plastic; AG = Amber Glass Unpreserved; AP - Airfreight Unpreserved Plastic
V = VOA Vial HCl Preserved; VB = VOA Vial Sodium Bisulphate Preserved; VS = VOA Vial Sulfuric Preserved; AV = Airfreight Unpreserved Vial SG = Sulfuric Preserved Amber Glass; H = HCl preserved Plastic; HS = HCl preserved Speciation bottle; SP = Sulfuric Preserved Plastic; F = Formaldehyde Preserved Glass;
Z = Zinc Acetate Preserved Bottle; E = EDTA Preserved Bottles; ST = Sterile Bottle; ASS = Plastic Bag for Acid Sulphate Soils; B = Unpreserved Bag.

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CLIENT: Jacobs Arcadis Joint Venture
OFFICE: Sydney
PROJECT: IA254001
ORDER NUMBER: -
PROJECT MANAGER: Amanda Mullen
CONTACT PH: [redacted]
SAMPLER: NK
SAMPLER MOBILE: 0421201294
COC emailed to ALS? (YES / NO)
EDD FORMAT (or default):
Email Reports to (will default to PM if no other addresses are listed): As pg 1
Email Invoice to (will default to PM if no other addresses are listed): As pg 1

TURNAROUND REQUIREMENTS : (Standard TAT may be longer for some tests e.g.. Ultra Trace Organics)
☑ Standard TAT (List due date):
☐ Non Standard or urgent TAT (List due date):
ALS QUOTE NO.: -

COC SEQUENCE NUMBER (Circle)
COC: 1 [✓ 2] 3 4 5 6 7
OF: 1 2 [✓ 3] 4 5 6 7

FOR LABORATORY USE ONLY (Circle)
Custody Seal Intact? [✓ Yes] No N/A
Free ice / frozen ice bricks present upon receipt? Yes No N/A
Random Sample Temperature on Receipt: 6.5 °C
Other comment:

RELINQUISHED BY: NK
DATE/TIME: 17/9/21

RECEIVED BY: Jlianc6
DATE/TIME: 17/9/21 4:00pm

RELINQUISHED BY:
DATE/TIME:

RECEIVED BY: SC87 Giles Ags
DATE/TIME: 17/9/21 1830

COMMENTS/SPECIAL HANDLING/STORAGE OR DISPOSAL:

ALS USE	SAMPLE DETAILS MATRIX: SOLID (S) WATER (W)			CONTAINER INFORMATION		ANALYSIS REQUIRED including SUITES (NB. Suite Codes must be listed to attract suite price) Where Metals are required, specify Total (unfiltered bottle required) or Dissolved (field filtered bottle required).								Additional Information
LAB ID	SAMPLE ID	DATE / TIME	MATRIX	TYPE & PRESERVATIVE (refer to codes below)	TOTAL CONTAINERS	S-26	S-12	EA200	Total Coliforms	S-2	Cyanide	PFAS Extended	HOLD	Comments on likely contaminant levels, dilutions, or samples requiring specific QC analysis etc.
13	BH08_1.0	16/9/21	S										X	
14	BH10_0.05	↓	↓							X	X			
15	BH10_0.5	↓	↓										X	
16	BH10_1.0	↓	↓							X	X			
17	SS16_0.05	17/9/21	↓			X								
18	SS20_0.05	↓	↓			X								
19	SS29_0.05	↓	↓			X	X	X						
20	SS06_0.05	↓	↓			X	X	X						
21	SS07_0.05	↓	↓			X						X		
22	SS08_0.05	↓	↓			X						X		
23	SS09_0.05	↓	↓			X						X		
24	QC101_210917	↓	↓			X						X		Duplicate
					TOTAL									

Water Container Codes: P = Unpreserved Plastic; N = Nitric Preserved Plastic; ORC = Nitric Preserved ORC; SH = Sodium Hydroxide/Cd Preserved; S = Sodium Hydroxide Preserved Plastic; AG = Amber Glass Unpreserved; AP - Airfreight Unpreserved Plastic
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Z = Zinc Acetate Preserved Bottle; E = EDTA Preserved Bottles; ST = Sterile Bottle; ASS = Plastic Bag for Acid Sulphate Soils; B = Unpreserved Bag.

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CLIENT: Jacobs Arcadis Joint Venture(JAJV)
OFFICE: Sydney
PROJECT: IA254001
ORDER NUMBER: -
PROJECT MANAGER: Amanda Mullen **CONTACT PH:**
SAMPLER: NK **SAMPLER MOBILE:** 0421201294
COC emailed to ALS? (YES / [✓ NO] **)** **EDD FORMAT (or default):**
Email Reports to (will default to PM if no other addresses are listed): As pg 1
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TURNAROUND REQUIREMENTS : (Standard TAT may be longer for some tests e.g.. Ultra Trace Organics)
☒ Standard TAT **(List due date):**
☐ Non Standard or urgent TAT **(List due date):**

ALS QUOTE NO.: -

COC SEQUENCE NUMBER (Circle)
COC: 1 2 [✓ 3] 4 5 6 7
OF: 1 2 [✓ 3] 4 5 6 7

FOR LABORATORY USE ONLY (Circle)
Custody Seal Intact? [✓ Yes] No N/A
Free ice / frozen ice bricks present upon receipt? Yes No N/A
Random Sample Temperature on Receipt: 6.5 °C
Other comment:

RELINQUISHED BY: NK	**RECEIVED BY:** Juliana G	**RELINQUISHED BY:**	**RECEIVED BY:** Sofia/AY
DATE/TIME: 17/9/21	**DATE/TIME:** 17/9/21 4:00pm	**DATE/TIME:**	**DATE/TIME:** 17/9/21 1230

COMMENTS/SPECIAL HANDLING/STORAGE OR DISPOSAL:

ALS USE	SAMPLE DETAILS MATRIX: SOLID (S) WATER (W)			CONTAINER INFORMATION		ANALYSIS REQUIRED including SUITES (NB. Suite Codes must be listed to attract suite price) Where Metals are required, specify Total (unfiltered bottle required) or Dissolved (field filtered bottle required).								Additional Information
LAB ID	SAMPLE ID	DATE / TIME	MATRIX	TYPE & PRESERVATIVE (refer to codes below)	TOTAL CONTAINERS	S-26, W-26 (Total)	PFAS (Extended)	BTEXN						Comments on likely contaminant levels, dilutions, or samples requiring specific QC analysis etc.
—	QC201_210917	17/9/21	S			X	X							Pls send to eurofins
25	QC501-210917	↓	W			X								Rinsate
26	QC502-210917		W			X								Rinsate
27	QC300_210917		S					X						Trip blank
				TOTAL										

Water Container Codes: P = Unpreserved Plastic; N = Nitric Preserved Plastic; ORC = Nitric Preserved ORC; SH = Sodium Hydroxide/Cd Preserved; S = Sodium Hydroxide Preserved Plastic; AG = Amber Glass Unpreserved; AP - Airfreight Unpreserved Plastic
V = VOA Vial HCl Preserved; VB = VOA Vial Sodium Bisulphate Preserved; VS = VOA Vial Sulfuric Preserved; AV = Airfreight Unpreserved Vial SG = Sulfuric Preserved Amber Glass; H = HCl preserved Plastic; HS = HCl preserved Speciation bottle; SP = Sulfuric Preserved Plastic; F = Formaldehyde Preserved Glass;
Z = Zinc Acetate Preserved Bottle; E = EDTA Preserved Bottles; ST = Sterile Bottle; ASS = Plastic Bag for Acid Sulphate Soils; B = Unpreserved Bag.

CERTIFICATE OF ANALYSIS

Work Order	: **ES2134103**	Page	: 1 of 13
Client	: **Jacobs Arcadis Joint Venture**	Laboratory	: Environmental Division Sydney
Contact	: Amanda Mullen	Contact	: Customer Services ES
Address	: Level 16 580 George Street Sydney 2000	Address	: 277-289 Woodpark Road Smithfield NSW Australia 2164
Telephone	: ----	Telephone	: +61-2-8784 8555
Project	: IA254001	Date Samples Received	: 21-Sep-2021 14:45
Order number	: 1770	Date Analysis Commenced	: 21-Sep-2021
C-O-C number	: ----	Issue Date	: 28-Sep-2021 14:01
Sampler	: NK		
Site	: ----		
Quote number	: EN/222		
No. of samples received	: 10		
No. of samples analysed	: 10		

NATA

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

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

This Certificate of Analysis contains the following information:

- General Comments
- Analytical Results
- Surrogate Control Limits

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

Signatories

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

Signatories	*Position*	*Accreditation Category*
Ankit Joshi	Inorganic Chemist	Sydney Inorganics, Smithfield, NSW
Edwandy Fadjar	Organic Coordinator	Sydney Organics, Smithfield, NSW
Franco Lentini	LCMS Coordinator	Sydney Organics, Smithfield, NSW
Ivan Taylor	Analyst	Sydney Inorganics, Smithfield, NSW
Somlok Chai	Microbiologist	Sydney Microbiology, Smithfield, NSW

General Comments

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

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

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

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

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

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

Key : CAS Number = CAS registry number from database maintained by Chemical Abstracts Services. The Chemical Abstracts Service is a division of the American Chemical Society.
LOR = Limit of reporting
^ = This result is computed from individual analyte detections at or above the level of reporting
ø = ALS is not NATA accredited for these tests.
~ = Indicates an estimated value.

- MF = membrane filtration
- CFU = colony forming unit
- EP075 (SIM): Where reported, Benzo(a)pyrene Toxicity Equivalent Quotient (TEQ) per the NEPM (2013) is the sum total of the concentration of the eight carcinogenic PAHs multiplied by their Toxicity Equivalence Factor (TEF) relative to Benzo(a)pyrene. TEF values are provided in brackets as follows: Benz(a)anthracene (0.1), Chrysene (0.01), Benzo(b+j) & Benzo(k)fluoranthene (0.1), Benzo(a)pyrene (1.0), Indeno(1.2.3.cd)pyrene (0.1), Dibenz(a.h)anthracene (1.0), Benzo(g.h.i)perylene (0.01). Less than LOR results for 'TEQ Zero' are treated as zero.
- EP231X - Per- and Polyfluoroalkyl Substances (PFAS): Samples received in 20ml or 125ml bottles have been tested in accordance with the QSM5.3 compliant, NATA accredited method. 60mL or 250mL bottles have been tested to the legacy QSM 5.1 aligned, NATA accredited method.
- EP068: Where reported, Total Chlordane (sum) is the sum of the reported concentrations of cis-Chlordane and trans-Chlordane at or above the LOR.
- EP080: Where reported, Total Xylenes is the sum of the reported concentrations of m&p-Xylene and o-Xylene at or above the LOR.
- EP075(SIM): Where reported, Total Cresol is the sum of the reported concentrations of 2-Methylphenol and 3- & 4-Methylphenol at or above the LOR.
- Microbiological Comment: In accordance with ALS work instruction QWI-MIC/04, membrane filtration result is reported an approximate (~) when the count of colonies on the filtered membrane is outside the range of 10 - 100cfu.
- Membrane filtration results for MW007 are reported as an estimate (~) due to the growth of bacteria on the filter membrane being counted <10cfu and/or >100cfu and due to the presence of many non-target organism colonies that may have inhibited the growth of the target organisms on the filter membrane. It may be informative to record this fact.
- MW007 is ALS's internal code and is equivalent to AS4276.5.
- EP231: Stable isotope enriched internal standards are added to samples prior to extraction. Target compounds have a direct analogous internal standard with the exception of PFPeS, PFHpA, PFDS, PFTrDA and 10:2 FTS. These compounds use an internal standard that is chemically related and has a retention time close to that of the target compound. The DQO for internal standard response is 50-150% of that established at initial calibration. PFOS is quantified using a certified, traceable standard consisting of linear and branched PFOS isomers. These practices are in line with recommendations in the National Environmental Management Plan for PFAS (Australian HEPA) and also conform to QSM 5.3 (US DoD) requirements.

Analytical Results

Sub-Matrix: **WATER** (Matrix: **WATER**)			*Sample ID*	**GW01**	**GW05**	**GW07**	**GW03**	**GW02**
			Sampling date / time	20-Sep-2021 00:00	20-Sep-2021 00:00	20-Sep-2021 00:00	20-Sep-2021 00:00	21-Sep-2021 00:00
Compound	*CAS Number*	*LOR*	*Unit*	**ES2134103-001**	**ES2134103-002**	**ES2134103-003**	**ES2134103-004**	**ES2134103-005**
				Result	Result	Result	Result	Result
EG020F: Dissolved Metals by ICP-MS								
Arsenic	7440-38-2	0.001	mg/L	<0.001	<0.001	<0.001	<0.001	<0.001
Cadmium	7440-43-9	0.0001	mg/L	**0.0002**	**0.0001**	<0.0001	**0.0003**	<0.0001
Chromium	7440-47-3	0.001	mg/L	<0.001	<0.001	<0.001	<0.001	<0.001
Copper	7440-50-8	0.001	mg/L	<0.001	**0.004**	<0.001	<0.001	<0.001
Lead	7439-92-1	0.001	mg/L	<0.001	<0.001	<0.001	<0.001	<0.001
Nickel	7440-02-0	0.001	mg/L	**0.009**	**0.006**	**0.008**	**0.083**	**0.019**
Zinc	7440-66-6	0.005	mg/L	**0.029**	**0.008**	**0.033**	**0.229**	**0.057**
EG035F: Dissolved Mercury by FIMS								
Mercury	7439-97-6	0.0001	mg/L	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001
EK026SF: Total CN by Segmented Flow Analyser								
Total Cyanide	57-12-5	0.004	mg/L	----	<0.004	----	----	----
EK055G: Ammonia as N by Discrete Analyser								
Ammonia as N	7664-41-7	0.01	mg/L	----	----	----	**0.04**	----
EK057G: Nitrite as N by Discrete Analyser								
Nitrite as N	14797-65-0	0.01	mg/L	----	----	----	<0.01	----
EK058G: Nitrate as N by Discrete Analyser								
Nitrate as N	14797-55-8	0.01	mg/L	----	----	----	**0.03**	----
EK059G: Nitrite plus Nitrate as N (NOx) by Discrete Analyser								
Nitrite + Nitrate as N	----	0.01	mg/L	----	----	----	**0.03**	----
EK061G: Total Kjeldahl Nitrogen By Discrete Analyser								
Total Kjeldahl Nitrogen as N	----	0.1	mg/L	----	----	----	**0.4**	----
EK062G: Total Nitrogen as N (TKN + NOx) by Discrete Analyser								
^ **Total Nitrogen as N**	----	0.1	mg/L	----	----	----	**0.4**	----
EK067G: Total Phosphorus as P by Discrete Analyser								
Total Phosphorus as P	----	0.01	mg/L	----	----	----	**0.17**	----
EP010: Formaldehyde								
Formaldehyde	50-00-0	0.1	mg/L	----	----	----	**2.6**	----
EP068A: Organochlorine Pesticides (OC)								
alpha-BHC	319-84-6	0.5	µg/L	----	----	----	----	<0.5
Hexachlorobenzene (HCB)	118-74-1	0.5	µg/L	----	----	----	----	<0.5
beta-BHC	319-85-7	0.5	µg/L	----	----	----	----	<0.5
gamma-BHC	58-89-9	0.5	µg/L	----	----	----	----	<0.5
delta-BHC	319-86-8	0.5	µg/L	----	----	----	----	<0.5

Analytical Results

Sub-Matrix: **WATER** (Matrix: **WATER**)			*Sample ID*	**GW01**	**GW05**	**GW07**	**GW03**	**GW02**
			Sampling date / time	20-Sep-2021 00:00	20-Sep-2021 00:00	20-Sep-2021 00:00	20-Sep-2021 00:00	21-Sep-2021 00:00
Compound	*CAS Number*	*LOR*	*Unit*	**ES2134103-001**	**ES2134103-002**	**ES2134103-003**	**ES2134103-004**	**ES2134103-005**
				Result	Result	Result	Result	Result
EP068A: Organochlorine Pesticides (OC) - Continued								
Heptachlor	76-44-8	0.5	µg/L	----	----	----	----	<0.5
Aldrin	309-00-2	0.5	µg/L	----	----	----	----	<0.5
Heptachlor epoxide	1024-57-3	0.5	µg/L	----	----	----	----	<0.5
trans-Chlordane	5103-74-2	0.5	µg/L	----	----	----	----	<0.5
alpha-Endosulfan	959-98-8	0.5	µg/L	----	----	----	----	<0.5
cis-Chlordane	5103-71-9	0.5	µg/L	----	----	----	----	<0.5
Dieldrin	60-57-1	0.5	µg/L	----	----	----	----	<0.5
4.4`-DDE	72-55-9	0.5	µg/L	----	----	----	----	<0.5
Endrin	72-20-8	0.5	µg/L	----	----	----	----	<0.5
beta-Endosulfan	33213-65-9	0.5	µg/L	----	----	----	----	<0.5
4.4`-DDD	72-54-8	0.5	µg/L	----	----	----	----	<0.5
Endrin aldehyde	7421-93-4	0.5	µg/L	----	----	----	----	<0.5
Endosulfan sulfate	1031-07-8	0.5	µg/L	----	----	----	----	<0.5
4.4`-DDT	50-29-3	2.0	µg/L	----	----	----	----	<2.0
Endrin ketone	53494-70-5	0.5	µg/L	----	----	----	----	<0.5
Methoxychlor	72-43-5	2.0	µg/L	----	----	----	----	<2.0
^ **Total Chlordane (sum)**	----	0.5	µg/L	----	----	----	----	<0.5
^ **Sum of DDD + DDE + DDT**	72-54-8/72-55-9/50-2	0.5	µg/L	----	----	----	----	<0.5
^ **Sum of Aldrin + Dieldrin**	309-00-2/60-57-1	0.5	µg/L	----	----	----	----	<0.5
EP068B: Organophosphorus Pesticides (OP)								
Dichlorvos	62-73-7	0.5	µg/L	----	----	----	----	<0.5
Demeton-S-methyl	919-86-8	0.5	µg/L	----	----	----	----	<0.5
Monocrotophos	6923-22-4	2.0	µg/L	----	----	----	----	<2.0
Dimethoate	60-51-5	0.5	µg/L	----	----	----	----	<0.5
Diazinon	333-41-5	0.5	µg/L	----	----	----	----	<0.5
Chlorpyrifos-methyl	5598-13-0	0.5	µg/L	----	----	----	----	<0.5
Parathion-methyl	298-00-0	2.0	µg/L	----	----	----	----	<2.0
Malathion	121-75-5	0.5	µg/L	----	----	----	----	<0.5
Fenthion	55-38-9	0.5	µg/L	----	----	----	----	<0.5
Chlorpyrifos	2921-88-2	0.5	µg/L	----	----	----	----	<0.5
Parathion	56-38-2	2.0	µg/L	----	----	----	----	<2.0
Pirimphos-ethyl	23505-41-1	0.5	µg/L	----	----	----	----	<0.5
Chlorfenvinphos	470-90-6	0.5	µg/L	----	----	----	----	<0.5
Bromophos-ethyl	4824-78-6	0.5	µg/L	----	----	----	----	<0.5

Analytical Results

Sub-Matrix: **WATER** (Matrix: **WATER**)			*Sample ID*	**GW01**	**GW05**	**GW07**	**GW03**	**GW02**
			Sampling date / time	20-Sep-2021 00:00	20-Sep-2021 00:00	20-Sep-2021 00:00	20-Sep-2021 00:00	21-Sep-2021 00:00
Compound	*CAS Number*	*LOR*	*Unit*	**ES2134103-001**	**ES2134103-002**	**ES2134103-003**	**ES2134103-004**	**ES2134103-005**
				Result	Result	Result	Result	Result
EP068B: Organophosphorus Pesticides (OP) - Continued								
Fenamiphos	22224-92-6	0.5	µg/L	----	----	----	----	<0.5
Prothiofos	34643-46-4	0.5	µg/L	----	----	----	----	<0.5
Ethion	563-12-2	0.5	µg/L	----	----	----	----	<0.5
Carbophenothion	786-19-6	0.5	µg/L	----	----	----	----	<0.5
Azinphos Methyl	86-50-0	0.5	µg/L	----	----	----	----	<0.5
EP075(SIM)B: Polynuclear Aromatic Hydrocarbons								
Naphthalene	91-20-3	1.0	µg/L	<1.0	----	<1.0	----	<1.0
Acenaphthylene	208-96-8	1.0	µg/L	<1.0	----	<1.0	----	<1.0
Acenaphthene	83-32-9	1.0	µg/L	<1.0	----	<1.0	----	<1.0
Fluorene	86-73-7	1.0	µg/L	<1.0	----	<1.0	----	<1.0
Phenanthrene	85-01-8	1.0	µg/L	<1.0	----	<1.0	----	<1.0
Anthracene	120-12-7	1.0	µg/L	<1.0	----	<1.0	----	<1.0
Fluoranthene	206-44-0	1.0	µg/L	<1.0	----	<1.0	----	<1.0
Pyrene	129-00-0	1.0	µg/L	<1.0	----	<1.0	----	<1.0
Benz(a)anthracene	56-55-3	1.0	µg/L	<1.0	----	<1.0	----	<1.0
Chrysene	218-01-9	1.0	µg/L	<1.0	----	<1.0	----	<1.0
Benzo(b+j)fluoranthene	205-99-2 205-82-3	1.0	µg/L	<1.0	----	<1.0	----	<1.0
Benzo(k)fluoranthene	207-08-9	1.0	µg/L	<1.0	----	<1.0	----	<1.0
Benzo(a)pyrene	50-32-8	0.5	µg/L	<0.5	----	<0.5	----	<0.5
Indeno(1.2.3.cd)pyrene	193-39-5	1.0	µg/L	<1.0	----	<1.0	----	<1.0
Dibenz(a.h)anthracene	53-70-3	1.0	µg/L	<1.0	----	<1.0	----	<1.0
Benzo(g.h.i)perylene	191-24-2	1.0	µg/L	<1.0	----	<1.0	----	<1.0
^ **Sum of polycyclic aromatic hydrocarbons**	----	0.5	µg/L	<0.5	----	<0.5	----	<0.5
^ **Benzo(a)pyrene TEQ (zero)**	----	0.5	µg/L	<0.5	----	<0.5	----	<0.5
EP080/071: Total Petroleum Hydrocarbons								
C6 - C9 Fraction	----	20	µg/L	<20	----	<20	----	<20
C10 - C14 Fraction	----	50	µg/L	**1120**	----	<50	----	<50
C15 - C28 Fraction	----	100	µg/L	**240**	----	<100	----	<100
C29 - C36 Fraction	----	50	µg/L	<50	----	<50	----	<50
^ **C10 - C36 Fraction (sum)**	----	50	µg/L	**1360**	----	<50	----	<50
EP080/071: Total Recoverable Hydrocarbons - NEPM 2013 Fractions								
C6 - C10 Fraction	C6_C10	20	µg/L	<20	----	<20	----	<20
^ **C6 - C10 Fraction minus BTEX (F1)**	C6_C10-BTEX	20	µg/L	<20	----	<20	----	<20

Analytical Results

Sub-Matrix: **WATER** (Matrix: **WATER**)			*Sample ID*	**GW01**	**GW05**	**GW07**	**GW03**	**GW02**
			Sampling date / time	20-Sep-2021 00:00	20-Sep-2021 00:00	20-Sep-2021 00:00	20-Sep-2021 00:00	21-Sep-2021 00:00
Compound	*CAS Number*	*LOR*	*Unit*	**ES2134103-001**	**ES2134103-002**	**ES2134103-003**	**ES2134103-004**	**ES2134103-005**
				Result	Result	Result	Result	Result
EP080/071: Total Recoverable Hydrocarbons - NEPM 2013 Fractions - Continued								
>C10 - C16 Fraction	----	100	µg/L	**1120**	----	<100	----	<100
>C16 - C34 Fraction	----	100	µg/L	**260**	----	<100	----	<100
>C34 - C40 Fraction	----	100	µg/L	<100	----	<100	----	<100
^ **>C10 - C40 Fraction (sum)**	----	100	µg/L	**1380**	----	<100	----	<100
^ **>C10 - C16 Fraction minus Naphthalene (F2)**	----	100	µg/L	**1120**	----	<100	----	<100
EP080: BTEXN								
Benzene	71-43-2	1	µg/L	<1	----	<1	----	<1
Toluene	108-88-3	2	µg/L	<2	----	<2	----	<2
Ethylbenzene	100-41-4	2	µg/L	<2	----	<2	----	<2
meta- & para-Xylene	108-38-3 106-42-3	2	µg/L	<2	----	<2	----	<2
ortho-Xylene	95-47-6	2	µg/L	<2	----	<2	----	<2
^ **Total Xylenes**	----	2	µg/L	<2	----	<2	----	<2
^ **Sum of BTEX**	----	1	µg/L	<1	----	<1	----	<1
Naphthalene	91-20-3	5	µg/L	<5	----	<5	----	<5
MW007: Coliforms by MF								
Coliforms	----	1	CFU/100mL	----	----	----	----	**~100**
EP068S: Organochlorine Pesticide Surrogate								
Dibromo-DDE	21655-73-2	0.5	%	----	----	----	----	**76.4**
EP068T: Organophosphorus Pesticide Surrogate								
DEF	78-48-8	0.5	%	----	----	----	----	**70.8**
EP075(SIM)S: Phenolic Compound Surrogates								
Phenol-d6	13127-88-3	1.0	%	**18.3**	----	**20.7**	----	**20.7**
2-Chlorophenol-D4	93951-73-6	1.0	%	**48.8**	----	**52.0**	----	**51.6**
2.4.6-Tribromophenol	118-79-6	1.0	%	**67.2**	----	**61.2**	----	**51.3**
EP075(SIM)T: PAH Surrogates								
2-Fluorobiphenyl	321-60-8	1.0	%	**67.7**	----	**71.3**	----	**64.3**
Anthracene-d10	1719-06-8	1.0	%	**62.6**	----	**67.7**	----	**69.3**
4-Terphenyl-d14	1718-51-0	1.0	%	**84.6**	----	**82.5**	----	**91.5**
EP080S: TPH(V)/BTEX Surrogates								
1.2-Dichloroethane-D4	17060-07-0	2	%	**117**	----	**113**	----	**115**
Toluene-D8	2037-26-5	2	%	**108**	----	**107**	----	**105**
4-Bromofluorobenzene	460-00-4	2	%	**108**	----	**105**	----	**106**

Analytical Results

Sub-Matrix: **WATER** (Matrix: **WATER**)			*Sample ID*	**GW06**	**QC101_210921** **Duplicate**	**QC501_210921** **Rinsate**	**QC300_210921** **Trip Blank**	**QC501_210917** **Rinsate**
			Sampling date / time	21-Sep-2021 00:00	21-Sep-2021 00:00	21-Sep-2021 00:00	10-Sep-2021 00:00	17-Sep-2021 00:00
Compound	*CAS Number*	*LOR*	*Unit*	**ES2134103-006**	**ES2134103-007**	**ES2134103-008**	**ES2134103-009**	**ES2134103-010**
				Result	Result	Result	Result	Result
EG020F: Dissolved Metals by ICP-MS								
Arsenic	7440-38-2	0.001	mg/L	<0.001	<0.001	<0.001	----	----
Cadmium	7440-43-9	0.0001	mg/L	<0.0001	<0.0001	<0.0001	----	----
Chromium	7440-47-3	0.001	mg/L	<0.001	<0.001	<0.001	----	----
Copper	7440-50-8	0.001	mg/L	<0.001	<0.001	<0.001	----	----
Lead	7439-92-1	0.001	mg/L	<0.001	<0.001	<0.001	----	----
Nickel	7440-02-0	0.001	mg/L	**0.002**	**0.021**	<0.001	----	----
Zinc	7440-66-6	0.005	mg/L	<0.005	**0.053**	<0.005	----	----
EG035F: Dissolved Mercury by FIMS								
Mercury	7439-97-6	0.0001	mg/L	<0.0001	<0.0001	<0.0001	----	----
EP068A: Organochlorine Pesticides (OC)								
alpha-BHC	319-84-6	0.5	µg/L	<0.5	<0.5	----	----	----
Hexachlorobenzene (HCB)	118-74-1	0.5	µg/L	<0.5	<0.5	----	----	----
beta-BHC	319-85-7	0.5	µg/L	<0.5	<0.5	----	----	----
gamma-BHC	58-89-9	0.5	µg/L	<0.5	<0.5	----	----	----
delta-BHC	319-86-8	0.5	µg/L	<0.5	<0.5	----	----	----
Heptachlor	76-44-8	0.5	µg/L	<0.5	<0.5	----	----	----
Aldrin	309-00-2	0.5	µg/L	<0.5	<0.5	----	----	----
Heptachlor epoxide	1024-57-3	0.5	µg/L	<0.5	<0.5	----	----	----
trans-Chlordane	5103-74-2	0.5	µg/L	<0.5	<0.5	----	----	----
alpha-Endosulfan	959-98-8	0.5	µg/L	<0.5	<0.5	----	----	----
cis-Chlordane	5103-71-9	0.5	µg/L	<0.5	<0.5	----	----	----
Dieldrin	60-57-1	0.5	µg/L	<0.5	<0.5	----	----	----
4.4`-DDE	72-55-9	0.5	µg/L	<0.5	<0.5	----	----	----
Endrin	72-20-8	0.5	µg/L	<0.5	<0.5	----	----	----
beta-Endosulfan	33213-65-9	0.5	µg/L	<0.5	<0.5	----	----	----
4.4`-DDD	72-54-8	0.5	µg/L	<0.5	<0.5	----	----	----
Endrin aldehyde	7421-93-4	0.5	µg/L	<0.5	<0.5	----	----	----
Endosulfan sulfate	1031-07-8	0.5	µg/L	<0.5	<0.5	----	----	----
4.4`-DDT	50-29-3	2.0	µg/L	<2.0	<2.0	----	----	----
Endrin ketone	53494-70-5	0.5	µg/L	<0.5	<0.5	----	----	----
Methoxychlor	72-43-5	2.0	µg/L	<2.0	<2.0	----	----	----
^ **Total Chlordane (sum)**	----	0.5	µg/L	<0.5	<0.5	----	----	----
^ **Sum of DDD + DDE + DDT**	72-54-8/72-55-9/50-2	0.5	µg/L	<0.5	<0.5	----	----	----

Analytical Results

Sub-Matrix: **WATER** (Matrix: **WATER**)			*Sample ID*	**GW06**	**QC101_210921 Duplicate**	**QC501_210921 Rinsate**	**QC300_210921 Trip Blank**	**QC501_210917 Rinsate**
			Sampling date / time	21-Sep-2021 00:00	21-Sep-2021 00:00	21-Sep-2021 00:00	10-Sep-2021 00:00	17-Sep-2021 00:00
Compound	*CAS Number*	*LOR*	*Unit*	**ES2134103-006**	**ES2134103-007**	**ES2134103-008**	**ES2134103-009**	**ES2134103-010**
				Result	Result	Result	Result	Result
EP068A: Organochlorine Pesticides (OC) - Continued								
^ **Sum of Aldrin + Dieldrin**	309-00-2/60-57-1	0.5	µg/L	<0.5	<0.5	----	----	----
EP068B: Organophosphorus Pesticides (OP)								
Dichlorvos	62-73-7	0.5	µg/L	<0.5	<0.5	----	----	----
Demeton-S-methyl	919-86-8	0.5	µg/L	<0.5	<0.5	----	----	----
Monocrotophos	6923-22-4	2.0	µg/L	<2.0	<2.0	----	----	----
Dimethoate	60-51-5	0.5	µg/L	<0.5	<0.5	----	----	----
Diazinon	333-41-5	0.5	µg/L	<0.5	<0.5	----	----	----
Chlorpyrifos-methyl	5598-13-0	0.5	µg/L	<0.5	<0.5	----	----	----
Parathion-methyl	298-00-0	2.0	µg/L	<2.0	<2.0	----	----	----
Malathion	121-75-5	0.5	µg/L	<0.5	<0.5	----	----	----
Fenthion	55-38-9	0.5	µg/L	<0.5	<0.5	----	----	----
Chlorpyrifos	2921-88-2	0.5	µg/L	<0.5	<0.5	----	----	----
Parathion	56-38-2	2.0	µg/L	<2.0	<2.0	----	----	----
Pirimphos-ethyl	23505-41-1	0.5	µg/L	<0.5	<0.5	----	----	----
Chlorfenvinphos	470-90-6	0.5	µg/L	<0.5	<0.5	----	----	----
Bromophos-ethyl	4824-78-6	0.5	µg/L	<0.5	<0.5	----	----	----
Fenamiphos	22224-92-6	0.5	µg/L	<0.5	<0.5	----	----	----
Prothiofos	34643-46-4	0.5	µg/L	<0.5	<0.5	----	----	----
Ethion	563-12-2	0.5	µg/L	<0.5	<0.5	----	----	----
Carbophenothion	786-19-6	0.5	µg/L	<0.5	<0.5	----	----	----
Azinphos Methyl	86-50-0	0.5	µg/L	<0.5	<0.5	----	----	----
EP075(SIM)B: Polynuclear Aromatic Hydrocarbons								
Naphthalene	91-20-3	1.0	µg/L	<1.0	<1.0	<1.0	----	----
Acenaphthylene	208-96-8	1.0	µg/L	<1.0	<1.0	<1.0	----	----
Acenaphthene	83-32-9	1.0	µg/L	<1.0	<1.0	<1.0	----	----
Fluorene	86-73-7	1.0	µg/L	<1.0	<1.0	<1.0	----	----
Phenanthrene	85-01-8	1.0	µg/L	<1.0	<1.0	<1.0	----	----
Anthracene	120-12-7	1.0	µg/L	<1.0	<1.0	<1.0	----	----
Fluoranthene	206-44-0	1.0	µg/L	<1.0	<1.0	<1.0	----	----
Pyrene	129-00-0	1.0	µg/L	<1.0	<1.0	<1.0	----	----
Benz(a)anthracene	56-55-3	1.0	µg/L	<1.0	<1.0	<1.0	----	----
Chrysene	218-01-9	1.0	µg/L	<1.0	<1.0	<1.0	----	----
Benzo(b+j)fluoranthene	205-99-2 205-82-3	1.0	µg/L	<1.0	<1.0	<1.0	----	----
Benzo(k)fluoranthene	207-08-9	1.0	µg/L	<1.0	<1.0	<1.0	----	----

Analytical Results

Sub-Matrix: **WATER** (Matrix: **WATER**)			*Sample ID*	**GW06**	**QC101_210921** **Duplicate**	**QC501_210921** **Rinsate**	**QC300_210921** **Trip Blank**	**QC501_210917** **Rinsate**
			Sampling date / time	21-Sep-2021 00:00	21-Sep-2021 00:00	21-Sep-2021 00:00	10-Sep-2021 00:00	17-Sep-2021 00:00
Compound	*CAS Number*	*LOR*	*Unit*	**ES2134103-006**	**ES2134103-007**	**ES2134103-008**	**ES2134103-009**	**ES2134103-010**
				Result	Result	Result	Result	Result
EP075(SIM)B: Polynuclear Aromatic Hydrocarbons - Continued								
Benzo(a)pyrene	50-32-8	0.5	µg/L	<0.5	<0.5	<0.5	----	----
Indeno(1.2.3.cd)pyrene	193-39-5	1.0	µg/L	<1.0	<1.0	<1.0	----	----
Dibenz(a.h)anthracene	53-70-3	1.0	µg/L	<1.0	<1.0	<1.0	----	----
Benzo(g.h.i)perylene	191-24-2	1.0	µg/L	<1.0	<1.0	<1.0	----	----
^ **Sum of polycyclic aromatic hydrocarbons**	----	0.5	µg/L	<0.5	<0.5	<0.5	----	----
^ **Benzo(a)pyrene TEQ (zero)**	----	0.5	µg/L	<0.5	<0.5	<0.5	----	----
EP080/071: Total Petroleum Hydrocarbons								
C6 - C9 Fraction	----	20	µg/L	<20	<20	<20	<20	----
C10 - C14 Fraction	----	50	µg/L	<50	<50	<50	----	----
C15 - C28 Fraction	----	100	µg/L	<100	<100	<100	----	----
C29 - C36 Fraction	----	50	µg/L	<50	<50	<50	----	----
^ **C10 - C36 Fraction (sum)**	----	50	µg/L	<50	<50	<50	----	----
EP080/071: Total Recoverable Hydrocarbons - NEPM 2013 Fractions								
C6 - C10 Fraction	C6_C10	20	µg/L	<20	<20	<20	<20	----
^ **C6 - C10 Fraction minus BTEX (F1)**	C6_C10-BTEX	20	µg/L	<20	<20	<20	<20	----
>C10 - C16 Fraction	----	100	µg/L	<100	<100	<100	----	----
>C16 - C34 Fraction	----	100	µg/L	<100	<100	<100	----	----
>C34 - C40 Fraction	----	100	µg/L	<100	<100	<100	----	----
^ **>C10 - C40 Fraction (sum)**	----	100	µg/L	<100	<100	<100	----	----
^ **>C10 - C16 Fraction minus Naphthalene (F2)**	----	100	µg/L	<100	<100	<100	----	----
EP080: BTEXN								
Benzene	71-43-2	1	µg/L	<1	<1	<1	<1	----
Toluene	108-88-3	2	µg/L	<2	<2	<2	<2	----
Ethylbenzene	100-41-4	2	µg/L	<2	<2	<2	<2	----
meta- & para-Xylene	108-38-3 106-42-3	2	µg/L	<2	<2	<2	<2	----
ortho-Xylene	95-47-6	2	µg/L	<2	<2	<2	<2	----
^ **Total Xylenes**	----	2	µg/L	<2	<2	<2	<2	----
^ **Sum of BTEX**	----	1	µg/L	<1	<1	<1	<1	----
Naphthalene	91-20-3	5	µg/L	<5	<5	<5	<5	----
EP231A: Perfluoroalkyl Sulfonic Acids								
Perfluorobutane sulfonic acid (PFBS)	375-73-5	0.02	µg/L	----	----	----	----	<0.02

Analytical Results

Sub-Matrix: **WATER** (Matrix: **WATER**)			*Sample ID*	**GW06**	**QC101_210921 Duplicate**	**QC501_210921 Rinsate**	**QC300_210921 Trip Blank**	**QC501_210917 Rinsate**
			Sampling date / time	21-Sep-2021 00:00	21-Sep-2021 00:00	21-Sep-2021 00:00	10-Sep-2021 00:00	17-Sep-2021 00:00
Compound	*CAS Number*	*LOR*	*Unit*	**ES2134103-006**	**ES2134103-007**	**ES2134103-008**	**ES2134103-009**	**ES2134103-010**
				Result	Result	Result	Result	Result
EP231A: Perfluoroalkyl Sulfonic Acids - Continued								
Perfluoropentane sulfonic acid (PFPeS)	2706-91-4	0.02	µg/L	----	----	----	----	<0.02
Perfluorohexane sulfonic acid (PFHxS)	355-46-4	0.02	µg/L	----	----	----	----	<0.02
Perfluoroheptane sulfonic acid (PFHpS)	375-92-8	0.02	µg/L	----	----	----	----	<0.02
Perfluorooctane sulfonic acid (PFOS)	1763-23-1	0.01	µg/L	----	----	----	----	<0.01
Perfluorodecane sulfonic acid (PFDS)	335-77-3	0.02	µg/L	----	----	----	----	<0.02
EP231B: Perfluoroalkyl Carboxylic Acids								
Perfluorobutanoic acid (PFBA)	375-22-4	0.1	µg/L	----	----	----	----	<0.1
Perfluoropentanoic acid (PFPeA)	2706-90-3	0.02	µg/L	----	----	----	----	<0.02
Perfluorohexanoic acid (PFHxA)	307-24-4	0.02	µg/L	----	----	----	----	<0.02
Perfluoroheptanoic acid (PFHpA)	375-85-9	0.02	µg/L	----	----	----	----	<0.02
Perfluorooctanoic acid (PFOA)	335-67-1	0.01	µg/L	----	----	----	----	<0.01
Perfluorononanoic acid (PFNA)	375-95-1	0.02	µg/L	----	----	----	----	<0.02
Perfluorodecanoic acid (PFDA)	335-76-2	0.02	µg/L	----	----	----	----	<0.02
Perfluoroundecanoic acid (PFUnDA)	2058-94-8	0.02	µg/L	----	----	----	----	<0.02
Perfluorododecanoic acid (PFDoDA)	307-55-1	0.02	µg/L	----	----	----	----	<0.02
Perfluorotridecanoic acid (PFTrDA)	72629-94-8	0.02	µg/L	----	----	----	----	<0.02
Perfluorotetradecanoic acid (PFTeDA)	376-06-7	0.05	µg/L	----	----	----	----	<0.05
EP231C: Perfluoroalkyl Sulfonamides								
Perfluorooctane sulfonamide (FOSA)	754-91-6	0.02	µg/L	----	----	----	----	<0.02
N-Methyl perfluorooctane sulfonamide (MeFOSA)	31506-32-8	0.05	µg/L	----	----	----	----	<0.05
N-Ethyl perfluorooctane sulfonamide (EtFOSA)	4151-50-2	0.05	µg/L	----	----	----	----	<0.05
N-Methyl perfluorooctane sulfonamidoethanol (MeFOSE)	24448-09-7	0.05	µg/L	----	----	----	----	<0.05

Analytical Results

Sub-Matrix: **WATER** (Matrix: **WATER**)			*Sample ID*	**GW06**	**QC101_210921** **Duplicate**	**QC501_210921** **Rinsate**	**QC300_210921** **Trip Blank**	**QC501_210917** **Rinsate**
			Sampling date / time	21-Sep-2021 00:00	21-Sep-2021 00:00	21-Sep-2021 00:00	10-Sep-2021 00:00	17-Sep-2021 00:00
Compound	*CAS Number*	*LOR*	*Unit*	**ES2134103-006**	**ES2134103-007**	**ES2134103-008**	**ES2134103-009**	**ES2134103-010**
				Result	Result	Result	Result	Result
EP231C: Perfluoroalkyl Sulfonamides - Continued								
N-Ethyl perfluorooctane sulfonamidoethanol (EtFOSE)	1691-99-2	0.05	µg/L	----	----	----	----	<0.05
N-Methyl perfluorooctane sulfonamidoacetic acid (MeFOSAA)	2355-31-9	0.02	µg/L	----	----	----	----	<0.02
N-Ethyl perfluorooctane sulfonamidoacetic acid (EtFOSAA)	2991-50-6	0.02	µg/L	----	----	----	----	<0.02
EP231D: (n:2) Fluorotelomer Sulfonic Acids								
4:2 Fluorotelomer sulfonic acid (4:2 FTS)	757124-72-4	0.05	µg/L	----	----	----	----	<0.05
6:2 Fluorotelomer sulfonic acid (6:2 FTS)	27619-97-2	0.05	µg/L	----	----	----	----	<0.05
8:2 Fluorotelomer sulfonic acid (8:2 FTS)	39108-34-4	0.05	µg/L	----	----	----	----	<0.05
10:2 Fluorotelomer sulfonic acid (10:2 FTS)	120226-60-0	0.05	µg/L	----	----	----	----	<0.05
EP231P: PFAS Sums								
Sum of PFAS	----	0.01	µg/L	----	----	----	----	<0.01
Sum of PFHxS and PFOS	355-46-4/1763-23-1	0.01	µg/L	----	----	----	----	<0.01
Sum of PFAS (WA DER List)	----	0.01	µg/L	----	----	----	----	<0.01
MW007: Coliforms by MF								
Coliforms	----	1	CFU/100mL	**~100**	**~200**	----	----	----
EP068S: Organochlorine Pesticide Surrogate								
Dibromo-DDE	21655-73-2	0.5	%	**68.1**	**75.4**	----	----	----
EP068T: Organophosphorus Pesticide Surrogate								
DEF	78-48-8	0.5	%	**64.4**	**67.4**	----	----	----
EP075(SIM)S: Phenolic Compound Surrogates								
Phenol-d6	13127-88-3	1.0	%	**19.5**	**22.2**	**22.4**	----	----
2-Chlorophenol-D4	93951-73-6	1.0	%	**49.7**	**54.4**	**57.4**	----	----
2.4.6-Tribromophenol	118-79-6	1.0	%	**46.1**	**44.9**	**47.9**	----	----
EP075(SIM)T: PAH Surrogates								
2-Fluorobiphenyl	321-60-8	1.0	%	**59.2**	**68.3**	**73.0**	----	----

Analytical Results

Sub-Matrix: **WATER**
(Matrix: **WATER)**

			Sample ID	**GW06**	**QC101_210921 Duplicate**	**QC501_210921 Rinsate**	**QC300_210921 Trip Blank**	**QC501_210917 Rinsate**
			Sampling date / time	21-Sep-2021 00:00	21-Sep-2021 00:00	21-Sep-2021 00:00	10-Sep-2021 00:00	17-Sep-2021 00:00
Compound	*CAS Number*	*LOR*	*Unit*	**ES2134103-006**	**ES2134103-007**	**ES2134103-008**	**ES2134103-009**	**ES2134103-010**
				Result	Result	Result	Result	Result
EP075(SIM)T: PAH Surrogates - Continued								
Anthracene-d10	1719-06-8	1.0	%	**72.7**	**72.7**	**78.7**	----	----
4-Terphenyl-d14	1718-51-0	1.0	%	**82.4**	**86.8**	**95.4**	----	----
EP080S: TPH(V)/BTEX Surrogates								
1.2-Dichloroethane-D4	17060-07-0	2	%	**114**	**113**	**116**	**115**	----
Toluene-D8	2037-26-5	2	%	**102**	**102**	**102**	**104**	----
4-Bromofluorobenzene	460-00-4	2	%	**104**	**103**	**103**	**103**	----
EP231S: PFAS Surrogate								
13C4-PFOS	----	0.02	%	----	----	----	----	**98.7**
13C8-PFOA	----	0.02	%	----	----	----	----	**98.2**

Surrogate Control Limits

Sub-Matrix: **WATER**

Compound	CAS Number	Recovery Limits (%)	
		Low	High
EP068S: Organochlorine Pesticide Surrogate			
Dibromo-DDE	21655-73-2	67	111
EP068T: Organophosphorus Pesticide Surrogate			
DEF	78-48-8	67	111
EP075(SIM)S: Phenolic Compound Surrogates			
Phenol-d6	13127-88-3	10	44
2-Chlorophenol-D4	93951-73-6	14	94
2.4.6-Tribromophenol	118-79-6	17	125
EP075(SIM)T: PAH Surrogates			
2-Fluorobiphenyl	321-60-8	20	104
Anthracene-d10	1719-06-8	27	113
4-Terphenyl-d14	1718-51-0	32	112
EP080S: TPH(V)/BTEX Surrogates			
1.2-Dichloroethane-D4	17060-07-0	71	137
Toluene-D8	2037-26-5	79	131
4-Bromofluorobenzene	460-00-4	70	128
EP231S: PFAS Surrogate			
13C4-PFOS	----	60	120
13C8-PFOA	----	60	120

QUALITY CONTROL REPORT

Work Order	: **ES2134103**	Page	: 1 of 9
Client	: **Jacobs Arcadis Joint Venture**	Laboratory	: Environmental Division Sydney
Contact	: Amanda Mullen	Contact	: Customer Services ES
Address	: Level 16 580 George Street Sydney 2000	Address	: 277-289 Woodpark Road Smithfield NSW Australia 2164
Telephone	: ----	Telephone	: +61-2-8784 8555
Project	: IA254001	Date Samples Received	: 21-Sep-2021
Order number	: 1770	Date Analysis Commenced	: 21-Sep-2021
C-O-C number	: ----	Issue Date	: 28-Sep-2021
Sampler	: NK		
Site	: ----		
Quote number	: EN/222		
No. of samples received	: 10		
No. of samples analysed	: 10		

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

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

This Quality Control Report contains the following information:

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

Signatories

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

Signatories	*Position*	*Accreditation Category*
Ankit Joshi	Inorganic Chemist	Sydney Inorganics, Smithfield, NSW
Edwandy Fadjar	Organic Coordinator	Sydney Organics, Smithfield, NSW
Franco Lentini	LCMS Coordinator	Sydney Organics, Smithfield, NSW
Ivan Taylor	Analyst	Sydney Inorganics, Smithfield, NSW
Somlok Chai	Microbiologist	Sydney Microbiology, Smithfield, NSW

General Comments

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

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

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

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

Laboratory Duplicate (DUP) Report

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

Sub-Matrix: **WATER**

				Laboratory Duplicate (DUP) Report					
Laboratory sample ID	*Sample ID*	*Method: Compound*	*CAS Number*	*LOR*	*Unit*	*Original Result*	*Duplicate Result*	*RPD (%)*	*Acceptable RPD (%)*
EG020F: Dissolved Metals by ICP-MS (QC Lot: 3919217)									
WN2110865-001	Anonymous	EG020A-F: Cadmium	7440-43-9	0.0001	mg/L	0.0003	0.0003	0.0	No Limit
		EG020A-F: Arsenic	7440-38-2	0.001	mg/L	0.024	0.025	0.0	0% - 20%
		EG020A-F: Chromium	7440-47-3	0.001	mg/L	0.004	0.004	0.0	No Limit
		EG020A-F: Copper	7440-50-8	0.001	mg/L	0.001	0.002	0.0	No Limit
		EG020A-F: Lead	7439-92-1	0.001	mg/L	<0.001	<0.001	0.0	No Limit
		EG020A-F: Nickel	7440-02-0	0.001	mg/L	0.012	0.012	0.0	0% - 50%
		EG020A-F: Zinc	7440-66-6	0.005	mg/L	0.008	0.007	0.0	No Limit
WN2110865-011	Anonymous	EG020A-F: Cadmium	7440-43-9	0.0001	mg/L	<0.0001	<0.0001	0.0	No Limit
		EG020A-F: Arsenic	7440-38-2	0.001	mg/L	<0.001	<0.001	0.0	No Limit
		EG020A-F: Chromium	7440-47-3	0.001	mg/L	<0.001	<0.001	0.0	No Limit
		EG020A-F: Copper	7440-50-8	0.001	mg/L	0.001	0.001	0.0	No Limit
		EG020A-F: Lead	7439-92-1	0.001	mg/L	<0.001	<0.001	0.0	No Limit
		EG020A-F: Nickel	7440-02-0	0.001	mg/L	0.004	0.003	0.0	No Limit
		EG020A-F: Zinc	7440-66-6	0.005	mg/L	<0.005	<0.005	0.0	No Limit
EG035F: Dissolved Mercury by FIMS (QC Lot: 3919218)									
ES2134103-002	GW05	EG035F: Mercury	7439-97-6	0.0001	mg/L	<0.0001	<0.0001	0.0	No Limit
WN2110865-002	Anonymous	EG035F: Mercury	7439-97-6	0.0001	mg/L	<0.0001	<0.0001	0.0	No Limit
EK026SF: Total CN by Segmented Flow Analyser (QC Lot: 3915320)									
ES2134001-001	Anonymous	EK026SF: Total Cyanide	57-12-5	0.004	mg/L	<0.004	<0.004	0.0	No Limit
WN2110790-004	Anonymous	EK026SF: Total Cyanide	57-12-5	0.004	mg/L	<0.004	<0.004	0.0	No Limit
EK055G: Ammonia as N by Discrete Analyser (QC Lot: 3919142)									
ES2132713-001	Anonymous	EK055G: Ammonia as N	7664-41-7	0.01	mg/L	0.02	0.01	0.0	No Limit
ES2134268-005	Anonymous	EK055G: Ammonia as N	7664-41-7	0.01	mg/L	0.30	0.30	0.0	0% - 20%

Sub-Matrix: **WATER**

				Laboratory Duplicate (DUP) Report					
Laboratory sample ID	*Sample ID*	*Method: Compound*	*CAS Number*	*LOR*	*Unit*	*Original Result*	*Duplicate Result*	*RPD (%)*	*Acceptable RPD (%)*
EK057G: Nitrite as N by Discrete Analyser (QC Lot: 3914952)									
EW2103926-003	Anonymous	EK057G: Nitrite as N	14797-65-0	0.01	mg/L	<0.01	<0.01	0.0	No Limit
ES2134095-001	Anonymous	EK057G: Nitrite as N	14797-65-0	0.01	mg/L	0.05	0.05	0.0	No Limit
EK059G: Nitrite plus Nitrate as N (NOx) by Discrete Analyser (QC Lot: 3919143)									
ES2132713-001	Anonymous	EK059G: Nitrite + Nitrate as N	----	0.01	mg/L	0.03	0.03	0.0	No Limit
ES2134268-005	Anonymous	EK059G: Nitrite + Nitrate as N	----	0.01	mg/L	0.02	0.02	0.0	No Limit
EK061G: Total Kjeldahl Nitrogen By Discrete Analyser (QC Lot: 3919147)									
ES2134103-004	GW03	EK061G: Total Kjeldahl Nitrogen as N	----	0.1	mg/L	0.4	0.4	0.0	No Limit
ES2133991-001	Anonymous	EK061G: Total Kjeldahl Nitrogen as N	----	0.1	mg/L	26.9	27.5	2.4	0% - 20%
EK067G: Total Phosphorus as P by Discrete Analyser (QC Lot: 3919146)									
ES2134103-004	GW03	EK067G: Total Phosphorus as P	----	0.01	mg/L	0.17	0.17	0.0	0% - 50%
ES2133991-001	Anonymous	EK067G: Total Phosphorus as P	----	0.01	mg/L	5.43	5.54	1.9	0% - 20%
EP010: Formaldehyde (QC Lot: 3914972)									
ES2134103-004	GW03	EP010: Formaldehyde	50-00-0	0.1	mg/L	2.6	2.6	0.0	0% - 20%
EP080/071: Total Petroleum Hydrocarbons (QC Lot: 3917246)									
ES2134103-001	GW01	EP080: C6 - C9 Fraction	----	20	µg/L	<20	<20	0.0	No Limit
ES2134103-005	GW02	EP080: C6 - C9 Fraction	----	20	µg/L	<20	<20	0.0	No Limit
EP080/071: Total Recoverable Hydrocarbons - NEPM 2013 Fractions (QC Lot: 3917246)									
ES2134103-001	GW01	EP080: C6 - C10 Fraction	C6_C10	20	µg/L	<20	<20	0.0	No Limit
ES2134103-005	GW02	EP080: C6 - C10 Fraction	C6_C10	20	µg/L	<20	<20	0.0	No Limit
EP080: BTEXN (QC Lot: 3917246)									
ES2134103-001	GW01	EP080: Benzene	71-43-2	1	µg/L	<1	<1	0.0	No Limit
		EP080: Toluene	108-88-3	2	µg/L	<2	<2	0.0	No Limit
		EP080: Ethylbenzene	100-41-4	2	µg/L	<2	<2	0.0	No Limit
		EP080: meta- & para-Xylene	108-38-3 106-42-3	2	µg/L	<2	<2	0.0	No Limit
		EP080: ortho-Xylene	95-47-6	2	µg/L	<2	<2	0.0	No Limit
		EP080: Naphthalene	91-20-3	5	µg/L	<5	<5	0.0	No Limit
ES2134103-005	GW02	EP080: Benzene	71-43-2	1	µg/L	<1	<1	0.0	No Limit
		EP080: Toluene	108-88-3	2	µg/L	<2	<2	0.0	No Limit
		EP080: Ethylbenzene	100-41-4	2	µg/L	<2	<2	0.0	No Limit
		EP080: meta- & para-Xylene	108-38-3 106-42-3	2	µg/L	<2	<2	0.0	No Limit
		EP080: ortho-Xylene	95-47-6	2	µg/L	<2	<2	0.0	No Limit
		EP080: Naphthalene	91-20-3	5	µg/L	<5	<5	0.0	No Limit

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

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

Sub-Matrix: **WATER**

				Method Blank (MB) Report	Laboratory Control Spike (LCS) Report			
					Spike	Spike Recovery (%)	Acceptable Limits (%)	
Method: Compound	*CAS Number*	*LOR*	*Unit*	*Result*	*Concentration*	*LCS*	*Low*	*High*
EG020F: Dissolved Metals by ICP-MS (QCLot: 3919217)								
EG020A-F: Arsenic	7440-38-2	0.001	mg/L	<0.001	0.1 mg/L	93.7	85.0	114
EG020A-F: Cadmium	7440-43-9	0.0001	mg/L	<0.0001	0.1 mg/L	93.0	84.0	110
EG020A-F: Chromium	7440-47-3	0.001	mg/L	<0.001	0.1 mg/L	91.1	85.0	111
EG020A-F: Copper	7440-50-8	0.001	mg/L	<0.001	0.1 mg/L	91.2	81.0	111
EG020A-F: Lead	7439-92-1	0.001	mg/L	<0.001	0.1 mg/L	92.1	83.0	111
EG020A-F: Nickel	7440-02-0	0.001	mg/L	<0.001	0.1 mg/L	91.7	82.0	112
EG020A-F: Zinc	7440-66-6	0.005	mg/L	<0.005	0.1 mg/L	95.0	81.0	117
EG035F: Dissolved Mercury by FIMS (QCLot: 3919218)								
EG035F: Mercury	7439-97-6	0.0001	mg/L	<0.0001	0.01 mg/L	98.8	83.0	105
EK026SF: Total CN by Segmented Flow Analyser (QCLot: 3915320)								
EK026SF: Total Cyanide	57-12-5	0.004	mg/L	<0.004	0.2 mg/L	117	73.0	133
EK055G: Ammonia as N by Discrete Analyser (QCLot: 3919142)								
EK055G: Ammonia as N	7664-41-7	0.01	mg/L	<0.01	1 mg/L	104	90.0	114
EK057G: Nitrite as N by Discrete Analyser (QCLot: 3914952)								
EK057G: Nitrite as N	14797-65-0	0.01	mg/L	<0.01	0.5 mg/L	105	82.0	114
EK059G: Nitrite plus Nitrate as N (NOx) by Discrete Analyser (QCLot: 3919143)								
EK059G: Nitrite + Nitrate as N	----	0.01	mg/L	<0.01	0.5 mg/L	104	91.0	113
EK061G: Total Kjeldahl Nitrogen By Discrete Analyser (QCLot: 3919147)								
EK061G: Total Kjeldahl Nitrogen as N	----	0.1	mg/L	<0.1	10 mg/L	92.3	69.0	101
				<0.1	1 mg/L	95.4	70.0	118
				<0.1	5 mg/L	93.4	70.0	130
EK067G: Total Phosphorus as P by Discrete Analyser (QCLot: 3919146)								
EK067G: Total Phosphorus as P	----	0.01	mg/L	<0.01	4.42 mg/L	99.3	71.0	101
				<0.01	0.442 mg/L	98.3	72.0	108
				<0.01	1 mg/L	101	70.0	130
EP010: Formaldehyde (QCLot: 3914972)								
EP010: Formaldehyde	50-00-0	0.1	mg/L	<0.1	2 mg/L	99.5	83.0	111
EP068A: Organochlorine Pesticides (OC) (QCLot: 3915464)								
EP068: alpha-BHC	319-84-6	0.5	µg/L	<0.5	5 µg/L	99.4	64.9	107
EP068: Hexachlorobenzene (HCB)	118-74-1	0.5	µg/L	<0.5	5 µg/L	96.2	58.3	111
EP068: beta-BHC	319-85-7	0.5	µg/L	<0.5	5 µg/L	81.3	69.0	117
EP068: gamma-BHC	58-89-9	0.5	µg/L	<0.5	5 µg/L	90.5	70.0	112
EP068: delta-BHC	319-86-8	0.5	µg/L	<0.5	5 µg/L	106	68.9	110

Sub-Matrix: **WATER**

				Method Blank (MB) Report	*Laboratory Control Spike (LCS) Report*			
					Spike	*Spike Recovery (%)*	*Acceptable Limits (%)*	
Method: Compound	*CAS Number*	*LOR*	*Unit*	*Result*	*Concentration*	*LCS*	*Low*	*High*
EP068A: Organochlorine Pesticides (OC) (QCLot: 3915464) - continued								
EP068: Heptachlor	76-44-8	0.5	µg/L	<0.5	5 µg/L	100	65.2	108
EP068: Aldrin	309-00-2	0.5	µg/L	<0.5	5 µg/L	102	65.8	109
EP068: Heptachlor epoxide	1024-57-3	0.5	µg/L	<0.5	5 µg/L	107	67.1	107
EP068: trans-Chlordane	5103-74-2	0.5	µg/L	<0.5	5 µg/L	107	64.1	110
EP068: alpha-Endosulfan	959-98-8	0.5	µg/L	<0.5	5 µg/L	104	66.7	112
EP068: cis-Chlordane	5103-71-9	0.5	µg/L	<0.5	5 µg/L	104	63.2	111
EP068: Dieldrin	60-57-1	0.5	µg/L	<0.5	5 µg/L	105	65.2	113
EP068: 4.4`-DDE	72-55-9	0.5	µg/L	<0.5	5 µg/L	102	66.0	112
EP068: Endrin	72-20-8	0.5	µg/L	<0.5	5 µg/L	105	65.2	113
EP068: beta-Endosulfan	33213-65-9	0.5	µg/L	<0.5	5 µg/L	100	67.3	114
EP068: 4.4`-DDD	72-54-8	0.5	µg/L	<0.5	5 µg/L	103	72.0	122
EP068: Endrin aldehyde	7421-93-4	0.5	µg/L	<0.5	5 µg/L	101	66.9	109
EP068: Endosulfan sulfate	1031-07-8	0.5	µg/L	<0.5	5 µg/L	97.0	65.2	112
EP068: 4.4`-DDT	50-29-3	2	µg/L	<2.0	5 µg/L	91.4	65.2	112
EP068: Endrin ketone	53494-70-5	0.5	µg/L	<0.5	5 µg/L	102	63.8	110
EP068: Methoxychlor	72-43-5	2	µg/L	<2.0	5 µg/L	97.9	61.1	114
EP068B: Organophosphorus Pesticides (OP) (QCLot: 3915464)								
EP068: Dichlorvos	62-73-7	0.5	µg/L	<0.5	5 µg/L	89.0	65.6	114
EP068: Demeton-S-methyl	919-86-8	0.5	µg/L	<0.5	5 µg/L	90.7	63.7	113
EP068: Monocrotophos	6923-22-4	2	µg/L	<2.0	5 µg/L	26.2	19.7	48.0
EP068: Dimethoate	60-51-5	0.5	µg/L	<0.5	5 µg/L	89.8	69.5	110
EP068: Diazinon	333-41-5	0.5	µg/L	<0.5	5 µg/L	107	71.1	110
EP068: Chlorpyrifos-methyl	5598-13-0	0.5	µg/L	<0.5	5 µg/L	100	77.0	119
EP068: Parathion-methyl	298-00-0	2	µg/L	<2.0	5 µg/L	97.1	70.0	124
EP068: Malathion	121-75-5	0.5	µg/L	<0.5	5 µg/L	98.2	68.4	116
EP068: Fenthion	55-38-9	0.5	µg/L	<0.5	5 µg/L	96.8	68.6	112
EP068: Chlorpyrifos	2921-88-2	0.5	µg/L	<0.5	5 µg/L	101	75.0	119
EP068: Parathion	56-38-2	2	µg/L	<2.0	5 µg/L	101	67.0	121
EP068: Pirimphos-ethyl	23505-41-1	0.5	µg/L	<0.5	5 µg/L	103	69.0	121
EP068: Chlorfenvinphos	470-90-6	0.5	µg/L	<0.5	5 µg/L	103	71.8	110
EP068: Bromophos-ethyl	4824-78-6	0.5	µg/L	<0.5	5 µg/L	94.8	67.5	112
EP068: Fenamiphos	22224-92-6	0.5	µg/L	<0.5	5 µg/L	105	64.1	116
EP068: Prothiofos	34643-46-4	0.5	µg/L	<0.5	5 µg/L	96.5	67.8	114
EP068: Ethion	563-12-2	0.5	µg/L	<0.5	5 µg/L	95.3	74.0	120
EP068: Carbophenothion	786-19-6	0.5	µg/L	<0.5	5 µg/L	92.1	66.2	114
EP068: Azinphos Methyl	86-50-0	0.5	µg/L	<0.5	5 µg/L	95.9	51.6	128
EP075(SIM)B: Polynuclear Aromatic Hydrocarbons (QCLot: 3915465)								
EP075(SIM): Naphthalene	91-20-3	1	µg/L	<1.0	5 µg/L	68.1	50.0	94.0
EP075(SIM): Acenaphthylene	208-96-8	1	µg/L	<1.0	5 µg/L	77.9	63.6	114

Sub-Matrix: **WATER**

				Method Blank (MB) Report	Laboratory Control Spike (LCS) Report			
					Spike	Spike Recovery (%)	Acceptable Limits (%)	
Method: Compound	CAS Number	LOR	Unit	Result	Concentration	LCS	Low	High
EP075(SIM)B: Polynuclear Aromatic Hydrocarbons (QCLot: 3915465) - continued								
EP075(SIM): Acenaphthene	83-32-9	1	µg/L	<1.0	5 µg/L	77.8	62.2	113
EP075(SIM): Fluorene	86-73-7	1	µg/L	<1.0	5 µg/L	75.8	63.9	115
EP075(SIM): Phenanthrene	85-01-8	1	µg/L	<1.0	5 µg/L	77.4	62.6	116
EP075(SIM): Anthracene	120-12-7	1	µg/L	<1.0	5 µg/L	70.6	64.3	116
EP075(SIM): Fluoranthene	206-44-0	1	µg/L	<1.0	5 µg/L	71.4	63.6	118
EP075(SIM): Pyrene	129-00-0	1	µg/L	<1.0	5 µg/L	70.1	63.1	118
EP075(SIM): Benz(a)anthracene	56-55-3	1	µg/L	<1.0	5 µg/L	72.5	64.1	117
EP075(SIM): Chrysene	218-01-9	1	µg/L	<1.0	5 µg/L	83.3	62.5	116
EP075(SIM): Benzo(b+j)fluoranthene	205-99-2 205-82-3	1	µg/L	<1.0	5 µg/L	75.8	61.7	119
EP075(SIM): Benzo(k)fluoranthene	207-08-9	1	µg/L	<1.0	5 µg/L	76.3	63.0	115
EP075(SIM): Benzo(a)pyrene	50-32-8	0.5	µg/L	<0.5	5 µg/L	81.5	63.3	117
EP075(SIM): Indeno(1.2.3.cd)pyrene	193-39-5	1	µg/L	<1.0	5 µg/L	84.6	59.9	118
EP075(SIM): Dibenz(a.h)anthracene	53-70-3	1	µg/L	<1.0	5 µg/L	78.8	61.2	117
EP075(SIM): Benzo(g.h.i)perylene	191-24-2	1	µg/L	<1.0	5 µg/L	81.7	59.1	118
EP080/071: Total Petroleum Hydrocarbons (QCLot: 3915463)								
EP071: C10 - C14 Fraction	----	50	µg/L	<50	400 µg/L	71.9	55.8	112
EP071: C15 - C28 Fraction	----	100	µg/L	<100	600 µg/L	75.9	71.6	113
EP071: C29 - C36 Fraction	----	50	µg/L	<50	400 µg/L	92.8	56.0	121
EP080/071: Total Petroleum Hydrocarbons (QCLot: 3917246)								
EP080: C6 - C9 Fraction	----	20	µg/L	<20	260 µg/L	78.6	75.0	127
EP080/071: Total Recoverable Hydrocarbons - NEPM 2013 Fractions (QCLot: 3915463)								
EP071: >C10 - C16 Fraction	----	100	µg/L	<100	500 µg/L	84.6	57.9	119
EP071: >C16 - C34 Fraction	----	100	µg/L	<100	700 µg/L	84.2	62.5	110
EP071: >C34 - C40 Fraction	----	100	µg/L	<100	300 µg/L	78.0	61.5	121
EP080/071: Total Recoverable Hydrocarbons - NEPM 2013 Fractions (QCLot: 3917246)								
EP080: C6 - C10 Fraction	C6_C10	20	µg/L	<20	310 µg/L	83.3	75.0	127
EP080: BTEXN (QCLot: 3917246)								
EP080: Benzene	71-43-2	1	µg/L	<1	10 µg/L	93.1	70.0	122
EP080: Toluene	108-88-3	2	µg/L	<2	10 µg/L	100	69.0	123
EP080: Ethylbenzene	100-41-4	2	µg/L	<2	10 µg/L	99.6	70.0	120
EP080: meta- & para-Xylene	108-38-3 106-42-3	2	µg/L	<2	10 µg/L	98.8	69.0	121
EP080: ortho-Xylene	95-47-6	2	µg/L	<2	10 µg/L	105	72.0	122
EP080: Naphthalene	91-20-3	5	µg/L	<5	10 µg/L	118	70.0	120
EP231A: Perfluoroalkyl Sulfonic Acids (QCLot: 3919482)								
EP231X: Perfluorobutane sulfonic acid (PFBS)	375-73-5	0.02	µg/L	<0.02	0.25 µg/L	79.8	72.0	130
EP231X: Perfluoropentane sulfonic acid (PFPeS)	2706-91-4	0.02	µg/L	<0.02	0.25 µg/L	86.4	71.0	127

Sub-Matrix: **WATER**

				Method Blank (MB) Report	Laboratory Control Spike (LCS) Report			
					Spike	Spike Recovery (%)	Acceptable Limits (%)	
Method: Compound	CAS Number	LOR	Unit	Result	Concentration	LCS	Low	High
EP231A: Perfluoroalkyl Sulfonic Acids (QCLot: 3919482) - continued								
EP231X: Perfluorohexane sulfonic acid (PFHxS)	355-46-4	0.02	µg/L	<0.02	0.25 µg/L	78.6	68.0	131
EP231X: Perfluoroheptane sulfonic acid (PFHpS)	375-92-8	0.02	µg/L	<0.02	0.25 µg/L	85.0	69.0	134
EP231X: Perfluorooctane sulfonic acid (PFOS)	1763-23-1	0.01	µg/L	<0.01	0.25 µg/L	92.8	65.0	140
EP231X: Perfluorodecane sulfonic acid (PFDS)	335-77-3	0.02	µg/L	<0.02	0.25 µg/L	81.4	53.0	142
EP231B: Perfluoroalkyl Carboxylic Acids (QCLot: 3919482)								
EP231X: Perfluorobutanoic acid (PFBA)	375-22-4	0.1	µg/L	<0.1	1.25 µg/L	91.0	73.0	129
EP231X: Perfluoropentanoic acid (PFPeA)	2706-90-3	0.02	µg/L	<0.02	0.25 µg/L	95.4	72.0	129
EP231X: Perfluorohexanoic acid (PFHxA)	307-24-4	0.02	µg/L	<0.02	0.25 µg/L	94.2	72.0	129
EP231X: Perfluoroheptanoic acid (PFHpA)	375-85-9	0.02	µg/L	<0.02	0.25 µg/L	90.2	72.0	130
EP231X: Perfluorooctanoic acid (PFOA)	335-67-1	0.01	µg/L	<0.01	0.25 µg/L	104	71.0	133
EP231X: Perfluorononanoic acid (PFNA)	375-95-1	0.02	µg/L	<0.02	0.25 µg/L	97.0	69.0	130
EP231X: Perfluorodecanoic acid (PFDA)	335-76-2	0.02	µg/L	<0.02	0.25 µg/L	96.4	71.0	129
EP231X: Perfluoroundecanoic acid (PFUnDA)	2058-94-8	0.02	µg/L	<0.02	0.25 µg/L	92.4	69.0	133
EP231X: Perfluorododecanoic acid (PFDoDA)	307-55-1	0.02	µg/L	<0.02	0.25 µg/L	91.6	72.0	134
EP231X: Perfluorotridecanoic acid (PFTrDA)	72629-94-8	0.02	µg/L	<0.02	0.25 µg/L	91.2	65.0	144
EP231X: Perfluorotetradecanoic acid (PFTeDA)	376-06-7	0.05	µg/L	<0.05	0.625 µg/L	96.4	71.0	132
EP231C: Perfluoroalkyl Sulfonamides (QCLot: 3919482)								
EP231X: Perfluorooctane sulfonamide (FOSA)	754-91-6	0.02	µg/L	<0.02	0.25 µg/L	86.4	67.0	137
EP231X: N-Methyl perfluorooctane sulfonamide (MeFOSA)	31506-32-8	0.05	µg/L	<0.05	0.625 µg/L	99.9	68.0	141
EP231X: N-Ethyl perfluorooctane sulfonamide (EtFOSA)	4151-50-2	0.05	µg/L	<0.05	0.625 µg/L	115	62.6	147
EP231X: N-Methyl perfluorooctane sulfonamidoethanol (MeFOSE)	24448-09-7	0.05	µg/L	<0.05	0.625 µg/L	95.4	66.0	145
EP231X: N-Ethyl perfluorooctane sulfonamidoethanol (EtFOSE)	1691-99-2	0.05	µg/L	<0.05	0.625 µg/L	73.0	57.6	145
EP231X: N-Methyl perfluorooctane sulfonamidoacetic acid (MeFOSAA)	2355-31-9	0.02	µg/L	<0.02	0.25 µg/L	97.8	65.0	136
EP231X: N-Ethyl perfluorooctane sulfonamidoacetic acid (EtFOSAA)	2991-50-6	0.02	µg/L	<0.02	0.25 µg/L	88.4	61.0	135
EP231D: (n:2) Fluorotelomer Sulfonic Acids (QCLot: 3919482)								
EP231X: 4:2 Fluorotelomer sulfonic acid (4:2 FTS)	757124-72-4	0.05	µg/L	<0.05	0.25 µg/L	96.8	63.0	143
EP231X: 6:2 Fluorotelomer sulfonic acid (6:2 FTS)	27619-97-2	0.05	µg/L	<0.05	0.25 µg/L	95.0	64.0	140
EP231X: 8:2 Fluorotelomer sulfonic acid (8:2 FTS)	39108-34-4	0.05	µg/L	<0.05	0.25 µg/L	104	67.0	138
EP231X: 10:2 Fluorotelomer sulfonic acid (10:2 FTS)	120226-60-0	0.05	µg/L	<0.05	0.25 µg/L	111	71.4	144

Matrix Spike (MS) Report

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

Sub-Matrix: **WATER**

Matrix Spike (MS) Report

Sub-Matrix: **WATER**

Laboratory sample ID	Sample ID	Method: Compound	CAS Number	Matrix Spike (MS) Report Spike Concentration	SpikeRecovery(%) MS	Acceptable Limits (%) Low	High
EG020F: Dissolved Metals by ICP-MS (QCLot: 3919217)							
ES2134103-003	GW07	EG020A-F: Arsenic	7440-38-2	1 mg/L	96.5	70.0	130
		EG020A-F: Cadmium	7440-43-9	0.25 mg/L	97.1	70.0	130
		EG020A-F: Chromium	7440-47-3	1 mg/L	95.6	70.0	130
		EG020A-F: Copper	7440-50-8	1 mg/L	96.7	70.0	130
		EG020A-F: Lead	7439-92-1	1 mg/L	94.4	70.0	130
		EG020A-F: Nickel	7440-02-0	1 mg/L	93.3	70.0	130
		EG020A-F: Zinc	7440-66-6	1 mg/L	96.8	70.0	130
EG035F: Dissolved Mercury by FIMS (QCLot: 3919218)							
ES2134103-001	GW01	EG035F: Mercury	7439-97-6	0.01 mg/L	84.6	70.0	130
EK026SF: Total CN by Segmented Flow Analyser (QCLot: 3915320)							
ES2134001-001	Anonymous	EK026SF: Total Cyanide	57-12-5	0.2 mg/L	112	70.0	130
EK055G: Ammonia as N by Discrete Analyser (QCLot: 3919142)							
ES2132713-001	Anonymous	EK055G: Ammonia as N	7664-41-7	1 mg/L	91.8	70.0	130
EK057G: Nitrite as N by Discrete Analyser (QCLot: 3914952)							
ES2134095-001	Anonymous	EK057G: Nitrite as N	14797-65-0	0.5 mg/L	105	70.0	130
EK059G: Nitrite plus Nitrate as N (NOx) by Discrete Analyser (QCLot: 3919143)							
ES2132713-001	Anonymous	EK059G: Nitrite + Nitrate as N	----	0.5 mg/L	117	70.0	130
EK061G: Total Kjeldahl Nitrogen By Discrete Analyser (QCLot: 3919147)							
ES2133991-002	Anonymous	EK061G: Total Kjeldahl Nitrogen as N	----	50 mg/L	130	70.0	130
EK067G: Total Phosphorus as P by Discrete Analyser (QCLot: 3919146)							
ES2133991-002	Anonymous	EK067G: Total Phosphorus as P	----	10 mg/L	120	70.0	130
EP010: Formaldehyde (QCLot: 3914972)							
ES2134103-004	GW03	EP010: Formaldehyde	50-00-0	2.5 mg/L	113	70.0	130
EP080/071: Total Petroleum Hydrocarbons (QCLot: 3917246)							
ES2134103-001	GW01	EP080: C6 - C9 Fraction	----	325 µg/L	70.2	70.0	130
EP080/071: Total Recoverable Hydrocarbons - NEPM 2013 Fractions (QCLot: 3917246)							
ES2134103-001	GW01	EP080: C6 - C10 Fraction	C6_C10	375 µg/L	73.9	70.0	130
EP080: BTEXN (QCLot: 3917246)							
ES2134103-001	GW01	EP080: Benzene	71-43-2	25 µg/L	100	70.0	130
		EP080: Toluene	108-88-3	25 µg/L	77.6	70.0	130
		EP080: Ethylbenzene	100-41-4	25 µg/L	77.2	70.0	130
		EP080: meta- & para-Xylene	108-38-3 106-42-3	25 µg/L	76.6	70.0	130
		EP080: ortho-Xylene	95-47-6	25 µg/L	80.0	70.0	130
		EP080: Naphthalene	91-20-3	25 µg/L	70.1	70.0	130

QA/QC Compliance Assessment to assist with Quality Review

Work Order	: **ES2134103**	Page	: 1 of 9
Client	: **Jacobs Arcadis Joint Venture**	Laboratory	: Environmental Division Sydney
Contact	: Amanda Mullen	Telephone	: +61-2-8784 8555
Project	: IA254001	Date Samples Received	: 21-Sep-2021
Site	: ----	Issue Date	: 28-Sep-2021
Sampler	: NK	No. of samples received	: 10
Order number	: 1770	No. of samples analysed	: 10

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

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

Summary of Outliers

Outliers : Quality Control Samples

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

- **NO Method Blank value outliers occur.**
- **NO Duplicate outliers occur.**
- **NO Laboratory Control outliers occur.**
- **NO Matrix Spike outliers occur.**
- **Surrogate recovery outliers exist for all regular sample matrices - please see following pages for full details.**

Outliers : Analysis Holding Time Compliance

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

Outliers : Frequency of Quality Control Samples

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

Regular Sample Surrogates

Sub-Matrix: **WATER**

Compound Group Name	Laboratory Sample ID	Client Sample ID	**Analyte**	CAS Number	Data	Limits	**Comment**
Samples Submitted							
EP068T: Organophosphorus Pesticide Surrogate	ES2134103-006	GW06	**DEF**	78-48-8	64.4 %	66.5-111 %	**Recovery less than lower data quality objective**

Outliers : Frequency of Quality Control Samples

Matrix: **WATER**

Method	Count		Rate (%)		Quality Control Specification
	QC	Regular	Actual	Expected	
PAH/Phenols (GC/MS - SIM)	0	7	0.00	10.00	NEPM 2013 B3 & ALS QC Standard
Per- and Polyfluoroalkyl Substances (PFAS) by LCMSMS	0	19	0.00	10.00	NEPM 2013 B3 & ALS QC Standard
Pesticides by GCMS	0	6	0.00	10.00	NEPM 2013 B3 & ALS QC Standard
TRH - Semivolatile Fraction	0	9	0.00	10.00	NEPM 2013 B3 & ALS QC Standard
PAH/Phenols (GC/MS - SIM)	0	7	0.00	5.00	NEPM 2013 B3 & ALS QC Standard
Per- and Polyfluoroalkyl Substances (PFAS) by LCMSMS	0	19	0.00	5.00	NEPM 2013 B3 & ALS QC Standard
Pesticides by GCMS	0	6	0.00	5.00	NEPM 2013 B3 & ALS QC Standard
TRH - Semivolatile Fraction	0	9	0.00	5.00	NEPM 2013 B3 & ALS QC Standard

Analysis Holding Time Compliance

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

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

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

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

Matrix: **WATER**

Evaluation: × = Holding time breach ; ✓ = Within holding time.

Method ***Container*** */ Client Sample ID(s)*	***Sample Date***	*Extraction / Preparation*			*Analysis*		
		Date extracted	*Due for extraction*	*Evaluation*	***Date analysed***	*Due for analysis*	*Evaluation*
EG020F: Dissolved Metals by ICP-MS							
Clear Plastic Bottle - Nitric Acid; Filtered (EG020A-F) GW01, GW05, GW07, GW03	**20-Sep-2021**	**----**	----	----	**23-Sep-2021**	19-Mar-2022	✓
Clear Plastic Bottle - Nitric Acid; Filtered (EG020A-F) GW02, GW06, QC101_210921 - Duplicate, QC501_210921 - Rinsate	**21-Sep-2021**	**----**	----	----	**23-Sep-2021**	20-Mar-2022	✓

Matrix: **WATER**

Evaluation: × = Holding time breach ; ✓ = Within holding time.

Method	*Sample Date*	*Extraction / Preparation*			*Analysis*		
Container / Client Sample ID(s)		*Date extracted*	*Due for extraction*	*Evaluation*	*Date analysed*	*Due for analysis*	*Evaluation*
EG035F: Dissolved Mercury by FIMS							
Clear Plastic Bottle - Nitric Acid; Filtered (EG035F) GW01, GW05, GW07, GW03	**20-Sep-2021**	----	----	----	**24-Sep-2021**	18-Oct-2021	✓
Clear Plastic Bottle - Nitric Acid; Filtered (EG035F) GW02, GW06, QC101_210921 - Duplicate, QC501_210921 - Rinsate	**21-Sep-2021**	----	----	----	**24-Sep-2021**	19-Oct-2021	✓
EK026SF: Total CN by Segmented Flow Analyser							
Opaque plastic bottle - NaOH (EK026SF) GW05	**20-Sep-2021**	----	----	----	**22-Sep-2021**	04-Oct-2021	✓
EK055G: Ammonia as N by Discrete Analyser							
Clear Plastic Bottle - Sulfuric Acid (EK055G) GW03	**20-Sep-2021**	----	----	----	**23-Sep-2021**	18-Oct-2021	✓
EK057G: Nitrite as N by Discrete Analyser							
Clear Plastic Bottle - Natural (EK057G) GW03	**20-Sep-2021**	----	----	----	**21-Sep-2021**	22-Sep-2021	✓
EK059G: Nitrite plus Nitrate as N (NOx) by Discrete Analyser							
Clear Plastic Bottle - Sulfuric Acid (EK059G) GW03	**20-Sep-2021**	----	----	----	**23-Sep-2021**	18-Oct-2021	✓
EK061G: Total Kjeldahl Nitrogen By Discrete Analyser							
Clear Plastic Bottle - Sulfuric Acid (EK061G) GW03	**20-Sep-2021**	**23-Sep-2021**	18-Oct-2021	✓	**23-Sep-2021**	18-Oct-2021	✓
EK067G: Total Phosphorus as P by Discrete Analyser							
Clear Plastic Bottle - Sulfuric Acid (EK067G) GW03	**20-Sep-2021**	**23-Sep-2021**	18-Oct-2021	✓	**23-Sep-2021**	18-Oct-2021	✓
EP010: Formaldehyde							
Clear Plastic Bottle - Natural (EP010) GW03	**20-Sep-2021**	----	----	----	**21-Sep-2021**	22-Sep-2021	✓
EP068A: Organochlorine Pesticides (OC)							
Amber Glass Bottle - Unpreserved (EP068) GW02, GW06, QC101_210921 - Duplicate	**21-Sep-2021**	**23-Sep-2021**	28-Sep-2021	✓	**24-Sep-2021**	02-Nov-2021	✓
EP068B: Organophosphorus Pesticides (OP)							
Amber Glass Bottle - Unpreserved (EP068) GW02, GW06, QC101_210921 - Duplicate	**21-Sep-2021**	**23-Sep-2021**	28-Sep-2021	✓	**24-Sep-2021**	02-Nov-2021	✓
EP075(SIM)B: Polynuclear Aromatic Hydrocarbons							
Amber Glass Bottle - Unpreserved (EP075(SIM)) GW01, GW07	**20-Sep-2021**	**23-Sep-2021**	27-Sep-2021	✓	**24-Sep-2021**	02-Nov-2021	✓
Amber Glass Bottle - Unpreserved (EP075(SIM)) GW02, GW06, QC101_210921 - Duplicate, QC501_210921 - Rinsate	**21-Sep-2021**	**23-Sep-2021**	28-Sep-2021	✓	**24-Sep-2021**	02-Nov-2021	✓

Matrix: **WATER**

Evaluation: × = Holding time breach ; ✓ = Within holding time.

Method	*Sample Date*	*Extraction / Preparation*			*Analysis*		
Container / Client Sample ID(s)		*Date extracted*	*Due for extraction*	*Evaluation*	*Date analysed*	*Due for analysis*	*Evaluation*
EP080/071: Total Petroleum Hydrocarbons							
Amber Glass Bottle - Unpreserved (EP071) GW01, GW07	**20-Sep-2021**	**23-Sep-2021**	27-Sep-2021	✓	**24-Sep-2021**	02-Nov-2021	✓
Amber Glass Bottle - Unpreserved (EP071) GW02, GW06, QC101_210921 - Duplicate, QC501_210921 - Rinsate	**21-Sep-2021**	**23-Sep-2021**	28-Sep-2021	✓	**24-Sep-2021**	02-Nov-2021	✓
Amber VOC Vial - Sulfuric Acid (EP080) QC300_210921 - Trip Blank	**10-Sep-2021**	**23-Sep-2021**	24-Sep-2021	✓	**23-Sep-2021**	24-Sep-2021	✓
Amber VOC Vial - Sulfuric Acid (EP080) GW01, GW07	**20-Sep-2021**	**23-Sep-2021**	04-Oct-2021	✓	**23-Sep-2021**	04-Oct-2021	✓
Amber VOC Vial - Sulfuric Acid (EP080) GW02, GW06, QC101_210921 - Duplicate, QC501_210921 - Rinsate	**21-Sep-2021**	**23-Sep-2021**	05-Oct-2021	✓	**23-Sep-2021**	05-Oct-2021	✓
EP080/071: Total Recoverable Hydrocarbons - NEPM 2013 Fractions							
Amber Glass Bottle - Unpreserved (EP071) GW01, GW07	**20-Sep-2021**	**23-Sep-2021**	27-Sep-2021	✓	**24-Sep-2021**	02-Nov-2021	✓
Amber Glass Bottle - Unpreserved (EP071) GW02, GW06, QC101_210921 - Duplicate, QC501_210921 - Rinsate	**21-Sep-2021**	**23-Sep-2021**	28-Sep-2021	✓	**24-Sep-2021**	02-Nov-2021	✓
Amber VOC Vial - Sulfuric Acid (EP080) QC300_210921 - Trip Blank	**10-Sep-2021**	**23-Sep-2021**	24-Sep-2021	✓	**23-Sep-2021**	24-Sep-2021	✓
Amber VOC Vial - Sulfuric Acid (EP080) GW01, GW07	**20-Sep-2021**	**23-Sep-2021**	04-Oct-2021	✓	**23-Sep-2021**	04-Oct-2021	✓
Amber VOC Vial - Sulfuric Acid (EP080) GW02, GW06, QC101_210921 - Duplicate, QC501_210921 - Rinsate	**21-Sep-2021**	**23-Sep-2021**	05-Oct-2021	✓	**23-Sep-2021**	05-Oct-2021	✓
EP080: BTEXN							
Amber VOC Vial - Sulfuric Acid (EP080) QC300_210921 - Trip Blank	**10-Sep-2021**	**23-Sep-2021**	24-Sep-2021	✓	**23-Sep-2021**	24-Sep-2021	✓
Amber VOC Vial - Sulfuric Acid (EP080) GW01, GW07	**20-Sep-2021**	**23-Sep-2021**	04-Oct-2021	✓	**23-Sep-2021**	04-Oct-2021	✓
Amber VOC Vial - Sulfuric Acid (EP080) GW02, GW06, QC101_210921 - Duplicate, QC501_210921 - Rinsate	**21-Sep-2021**	**23-Sep-2021**	05-Oct-2021	✓	**23-Sep-2021**	05-Oct-2021	✓
EP231A: Perfluoroalkyl Sulfonic Acids							
HDPE (no PTFE) (EP231X) QC501_210917 - Rinsate	**17-Sep-2021**	**24-Sep-2021**	16-Mar-2022	✓	**24-Sep-2021**	16-Mar-2022	✓
EP231B: Perfluoroalkyl Carboxylic Acids							
HDPE (no PTFE) (EP231X) QC501_210917 - Rinsate	**17-Sep-2021**	**24-Sep-2021**	16-Mar-2022	✓	**24-Sep-2021**	16-Mar-2022	✓
EP231C: Perfluoroalkyl Sulfonamides							
HDPE (no PTFE) (EP231X) QC501_210917 - Rinsate	**17-Sep-2021**	**24-Sep-2021**	16-Mar-2022	✓	**24-Sep-2021**	16-Mar-2022	✓

Matrix: **WATER**

Evaluation: × = Holding time breach ; ✓ = Within holding time.

Method *Container / Client Sample ID(s)*	*Sample Date*	*Extraction / Preparation*			*Analysis*		
		Date extracted	*Due for extraction*	*Evaluation*	*Date analysed*	*Due for analysis*	*Evaluation*
EP231D: (n:2) Fluorotelomer Sulfonic Acids							
HDPE (no PTFE) (EP231X)							
QC501_210917 - Rinsate	**17-Sep-2021**	**24-Sep-2021**	16-Mar-2022	✓	**24-Sep-2021**	16-Mar-2022	✓
EP231P: PFAS Sums							
HDPE (no PTFE) (EP231X)							
QC501_210917 - Rinsate	**17-Sep-2021**	**24-Sep-2021**	16-Mar-2022	✓	**24-Sep-2021**	16-Mar-2022	✓
MW007: Coliforms by MF							
Sterile Plastic Bottle - Sodium Thiosulfate (MW007)							
GW02, GW06, QC101_210921 - Duplicate	**21-Sep-2021**	**----**	----	----	**22-Sep-2021**	22-Sep-2021	✓

Quality Control Parameter Frequency Compliance

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

Matrix: **WATER**

Evaluation: ✗ = Quality Control frequency not within specification ; ✓ = Quality Control frequency within specification.

Quality Control Sample Type		Count		Rate (%)			Quality Control Specification
Analytical Methods	*Method*	*QC*	*Regular*	***Actual***	***Expected***	*Evaluation*	
Laboratory Duplicates (DUP)							
Ammonia as N by Discrete analyser	EK055G	2	20	**10.00**	**10.00**	✓	NEPM 2013 B3 & ALS QC Standard
Dissolved Mercury by FIMS	EG035F	2	20	**10.00**	**10.00**	✓	NEPM 2013 B3 & ALS QC Standard
Dissolved Metals by ICP-MS - Suite A	EG020A-F	2	20	**10.00**	**10.00**	✓	NEPM 2013 B3 & ALS QC Standard
Formaldehyde	EP010	1	1	**100.00**	**10.00**	✓	NEPM 2013 B3 & ALS QC Standard
Nitrite and Nitrate as N (NOx) by Discrete Analyser	EK059G	2	20	**10.00**	**10.00**	✓	NEPM 2013 B3 & ALS QC Standard
Nitrite as N by Discrete Analyser	EK057G	2	19	**10.53**	**10.00**	✓	NEPM 2013 B3 & ALS QC Standard
PAH/Phenols (GC/MS - SIM)	EP075(SIM)	0	7	**0.00**	**10.00**	✗	NEPM 2013 B3 & ALS QC Standard
Per- and Polyfluoroalkyl Substances (PFAS) by LCMSMS	EP231X	0	19	**0.00**	**10.00**	✗	NEPM 2013 B3 & ALS QC Standard
Pesticides by GCMS	EP068	0	6	**0.00**	**10.00**	✗	NEPM 2013 B3 & ALS QC Standard
Total Cyanide by Segmented Flow Analyser	EK026SF	2	20	**10.00**	**10.00**	✓	NEPM 2013 B3 & ALS QC Standard
Total Kjeldahl Nitrogen as N By Discrete Analyser	EK061G	2	20	**10.00**	**10.00**	✓	NEPM 2013 B3 & ALS QC Standard
Total Phosphorus as P By Discrete Analyser	EK067G	2	20	**10.00**	**10.00**	✓	NEPM 2013 B3 & ALS QC Standard
TRH - Semivolatile Fraction	EP071	0	9	**0.00**	**10.00**	✗	NEPM 2013 B3 & ALS QC Standard
TRH Volatiles/BTEX	EP080	2	20	**10.00**	**10.00**	✓	NEPM 2013 B3 & ALS QC Standard
Laboratory Control Samples (LCS)							
Ammonia as N by Discrete analyser	EK055G	1	20	**5.00**	**5.00**	✓	NEPM 2013 B3 & ALS QC Standard
Dissolved Mercury by FIMS	EG035F	1	20	**5.00**	**5.00**	✓	NEPM 2013 B3 & ALS QC Standard
Dissolved Metals by ICP-MS - Suite A	EG020A-F	1	20	**5.00**	**5.00**	✓	NEPM 2013 B3 & ALS QC Standard
Formaldehyde	EP010	1	1	**100.00**	**5.00**	✓	NEPM 2013 B3 & ALS QC Standard
Nitrite and Nitrate as N (NOx) by Discrete Analyser	EK059G	1	20	**5.00**	**5.00**	✓	NEPM 2013 B3 & ALS QC Standard
Nitrite as N by Discrete Analyser	EK057G	1	19	**5.26**	**5.00**	✓	NEPM 2013 B3 & ALS QC Standard
PAH/Phenols (GC/MS - SIM)	EP075(SIM)	1	7	**14.29**	**5.00**	✓	NEPM 2013 B3 & ALS QC Standard
Per- and Polyfluoroalkyl Substances (PFAS) by LCMSMS	EP231X	1	19	**5.26**	**5.00**	✓	NEPM 2013 B3 & ALS QC Standard
Pesticides by GCMS	EP068	1	6	**16.67**	**5.00**	✓	NEPM 2013 B3 & ALS QC Standard
Total Cyanide by Segmented Flow Analyser	EK026SF	2	20	**10.00**	**10.00**	✓	NEPM 2013 B3 & ALS QC Standard
Total Kjeldahl Nitrogen as N By Discrete Analyser	EK061G	3	20	**15.00**	**15.00**	✓	NEPM 2013 B3 & ALS QC Standard
Total Phosphorus as P By Discrete Analyser	EK067G	3	20	**15.00**	**15.00**	✓	NEPM 2013 B3 & ALS QC Standard
TRH - Semivolatile Fraction	EP071	1	9	**11.11**	**5.00**	✓	NEPM 2013 B3 & ALS QC Standard
TRH Volatiles/BTEX	EP080	1	20	**5.00**	**5.00**	✓	NEPM 2013 B3 & ALS QC Standard
Method Blanks (MB)							
Ammonia as N by Discrete analyser	EK055G	1	20	**5.00**	**5.00**	✓	NEPM 2013 B3 & ALS QC Standard
Dissolved Mercury by FIMS	EG035F	1	20	**5.00**	**5.00**	✓	NEPM 2013 B3 & ALS QC Standard
Dissolved Metals by ICP-MS - Suite A	EG020A-F	1	20	**5.00**	**5.00**	✓	NEPM 2013 B3 & ALS QC Standard
Formaldehyde	EP010	1	1	**100.00**	**5.00**	✓	NEPM 2013 B3 & ALS QC Standard
Nitrite and Nitrate as N (NOx) by Discrete Analyser	EK059G	1	20	**5.00**	**5.00**	✓	NEPM 2013 B3 & ALS QC Standard
Nitrite as N by Discrete Analyser	EK057G	1	19	**5.26**	**5.00**	✓	NEPM 2013 B3 & ALS QC Standard

Matrix: **WATER**

Evaluation: ✗ = Quality Control frequency not within specification ; ✓ = Quality Control frequency within specification.

		Count		Rate (%)			Quality Control Specification
Analytical Methods	*Method*	*QC*	*Regular*	***Actual***	***Expected***	*Evaluation*	
PAH/Phenols (GC/MS - SIM)	EP075(SIM)	1	7	**14.29**	**5.00**	✓	NEPM 2013 B3 & ALS QC Standard
Per- and Polyfluoroalkyl Substances (PFAS) by LCMSMS	EP231X	1	19	**5.26**	**5.00**	✓	NEPM 2013 B3 & ALS QC Standard
Pesticides by GCMS	EP068	1	6	**16.67**	**5.00**	✓	NEPM 2013 B3 & ALS QC Standard
Total Cyanide by Segmented Flow Analyser	EK026SF	1	20	**5.00**	**5.00**	✓	NEPM 2013 B3 & ALS QC Standard
Total Kjeldahl Nitrogen as N By Discrete Analyser	EK061G	1	20	**5.00**	**5.00**	✓	NEPM 2013 B3 & ALS QC Standard
Total Phosphorus as P By Discrete Analyser	EK067G	1	20	**5.00**	**5.00**	✓	NEPM 2013 B3 & ALS QC Standard
TRH - Semivolatile Fraction	EP071	1	9	**11.11**	**5.00**	✓	NEPM 2013 B3 & ALS QC Standard
TRH Volatiles/BTEX	EP080	1	20	**5.00**	**5.00**	✓	NEPM 2013 B3 & ALS QC Standard
Ammonia as N by Discrete analyser	EK055G	1	20	**5.00**	**5.00**	✓	NEPM 2013 B3 & ALS QC Standard
Dissolved Mercury by FIMS	EG035F	1	20	**5.00**	**5.00**	✓	NEPM 2013 B3 & ALS QC Standard
Dissolved Metals by ICP-MS - Suite A	EG020A-F	1	20	**5.00**	**5.00**	✓	NEPM 2013 B3 & ALS QC Standard
Formaldehyde	EP010	1	1	**100.00**	**5.00**	✓	NEPM 2013 B3 & ALS QC Standard
Nitrite and Nitrate as N (NOx) by Discrete Analyser	EK059G	1	20	**5.00**	**5.00**	✓	NEPM 2013 B3 & ALS QC Standard
Nitrite as N by Discrete Analyser	EK057G	1	19	**5.26**	**5.00**	✓	NEPM 2013 B3 & ALS QC Standard
PAH/Phenols (GC/MS - SIM)	EP075(SIM)	0	7	**0.00**	**5.00**	✗	NEPM 2013 B3 & ALS QC Standard
Per- and Polyfluoroalkyl Substances (PFAS) by LCMSMS	EP231X	0	19	**0.00**	**5.00**	✗	NEPM 2013 B3 & ALS QC Standard
Pesticides by GCMS	EP068	0	6	**0.00**	**5.00**	✗	NEPM 2013 B3 & ALS QC Standard
Total Cyanide by Segmented Flow Analyser	EK026SF	1	20	**5.00**	**5.00**	✓	NEPM 2013 B3 & ALS QC Standard
Total Kjeldahl Nitrogen as N By Discrete Analyser	EK061G	1	20	**5.00**	**5.00**	✓	NEPM 2013 B3 & ALS QC Standard
Total Phosphorus as P By Discrete Analyser	EK067G	1	20	**5.00**	**5.00**	✓	NEPM 2013 B3 & ALS QC Standard
TRH - Semivolatile Fraction	EP071	0	9	**0.00**	**5.00**	✗	NEPM 2013 B3 & ALS QC Standard
TRH Volatiles/BTEX	EP080	1	20	**5.00**	**5.00**	✓	NEPM 2013 B3 & ALS QC Standard

Brief Method Summaries

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

Analytical Methods	Method	Matrix	Method Descriptions
Dissolved Metals by ICP-MS - Suite A	EG020A-F	WATER	In house: Referenced to APHA 3125; USEPA SW846 - 6020, ALS QWI-EN/EG020. Samples are 0.45µm filtered prior to analysis. The ICPMS technique utilizes a highly efficient argon plasma to ionize selected elements. Ions are then passed into a high vacuum mass spectrometer, which separates the analytes based on their distinct mass to charge ratios prior to their measurement by a discrete dynode ion detector.
Dissolved Mercury by FIMS	EG035F	WATER	In house: Referenced to AS 3550, APHA 3112 Hg - B (Flow-injection (SnCl2)(Cold Vapour generation) AAS) Samples are 0.45µm filtered prior to analysis. FIM-AAS is an automated flameless atomic absorption technique. A bromate/bromide reagent is used to oxidise any organic mercury compounds in the filtered sample. The ionic mercury is reduced online to atomic mercury vapour by SnCl2 which is then purged into a heated quartz cell. Quantification is by comparing absorbance against a calibration curve. This method is compliant with NEPM Schedule B(3).
Total Cyanide by Segmented Flow Analyser	EK026SF	WATER	In house: Referenced to APHA 4500-CN C&O / ASTM D7511 / ISO 14403. Sodium hydroxide preserved samples are introduced into an automated segmented flow analyser. Complex bound cyanide is decomposed in a continuously flowing stream, at a pH of 3.8, by the effect of UV light. A UV-B lamp (312 nm) and a decomposition spiral of borosilicate glass are used to filter out UV light with a wavelength of less than 290 nm thus preventing the conversion of thiocyanate into cyanide. The hydrogen cyanide present at a pH of 3.8 is separated by gas dialysis. The hydrogen cyanide is then determined photometrically, based on the reaction of cyanide with chloramine-T to form cyanogen chloride. This then reacts with 4-pyridine carboxylic acid and 1,3-dimethylbarbituric acid to give a red colour which is measured at 600 nm. This method is compliant with NEPM Schedule B(3)
Ammonia as N by Discrete analyser	EK055G	WATER	In house: Referenced to APHA 4500-NH3 G Ammonia is determined by direct colorimetry by Discrete Analyser. This method is compliant with NEPM Schedule B(3)
Nitrite as N by Discrete Analyser	EK057G	WATER	In house: Referenced to APHA 4500-NO2- B. Nitrite is determined by direct colourimetry by Discrete Analyser. This method is compliant with NEPM Schedule B(3)
Nitrate as N by Discrete Analyser	EK058G	WATER	In house: Referenced to APHA 4500-NO3- F. Nitrate is reduced to nitrite by way of a chemical reduction followed by quantification by Discrete Analyser. Nitrite is determined seperately by direct colourimetry and result for Nitrate calculated as the difference between the two results. This method is compliant with NEPM Schedule B(3)
Nitrite and Nitrate as N (NOx) by Discrete Analyser	EK059G	WATER	In house: Referenced to APHA 4500-NO3- F. Combined oxidised Nitrogen (NO2+NO3) is determined by Chemical Reduction and direct colourimetry by Discrete Analyser. This method is compliant with NEPM Schedule B(3)
Total Kjeldahl Nitrogen as N By Discrete Analyser	EK061G	WATER	In house: Referenced to APHA 4500-Norg D (In house). An aliquot of sample is digested using a high temperature Kjeldahl digestion to convert nitrogenous compounds to ammonia. Ammonia is determined colorimetrically by discrete analyser. This method is compliant with NEPM Schedule B(3)
Total Nitrogen as N (TKN + Nox) By Discrete Analyser	EK062G	WATER	In house: Referenced to APHA 4500-Norg / 4500-NO3-. This method is compliant with NEPM Schedule B(3)

Analytical Methods	*Method*	*Matrix*	*Method Descriptions*
Total Phosphorus as P By Discrete Analyser	EK067G	WATER	In house: Referenced to APHA 4500-P H, Jirka et al, Zhang et al. This procedure involves sulphuric acid digestion of a sample aliquot to break phosphorus down to orthophosphate. The orthophosphate reacts with ammonium molybdate and antimony potassium tartrate to form a complex which is then reduced and its concentration measured at 880nm using discrete analyser. This method is compliant with NEPM Schedule B(3)
Formaldehyde	EP010	WATER	In house: Referenced to ASTM D 6303-98. s
Pesticides by GCMS	EP068	WATER	In house: Referenced to USEPA SW 846 - 8270 Sample extracts are analysed by Capillary GC/MS and quantification is by comparison against an established 5 point calibration curve. This method is compliant with NEPM Schedule B(3)
TRH - Semivolatile Fraction	EP071	WATER	In house: Referenced to USEPA SW 846 - 8015 The sample extract is analysed by Capillary GC/FID and quantification is by comparison against an established 5 point calibration curve of n-Alkane standards. This method is compliant with the QC requirements of NEPM Schedule B(3)
PAH/Phenols (GC/MS - SIM)	EP075(SIM)	WATER	In house: Referenced to USEPA SW 846 - 8270 Sample extracts are analysed by Capillary GC/MS in SIM Mode and quantification is by comparison against an established 5 point calibration curve. This method is compliant with NEPM Schedule B(3)
TRH Volatiles/BTEX	EP080	WATER	In house: Referenced to USEPA SW 846 - 8260 Water samples are directly purged prior to analysis by Capillary GC/MS and quantification is by comparison against an established 5 point calibration curve. Alternatively, a sample is equilibrated in a headspace vial and a portion of the headspace determined by GCMS analysis. This method is compliant with the QC requirements of NEPM Schedule B(3)
Per- and Polyfluoroalkyl Substances (PFAS) by LCMSMS	EP231X	WATER	In-house: Analysis of fresh and saline waters by Solid Phase Extraction (SPE) followed by LC-Electrospray-MS-MS, Negative Mode using MRM and internal standard quantitation. Isotopically labelled analogues of target analytes used as internal standards and surrogates are added to the sample container. The entire contents are transferred to a solid phase extraction (SPE) cartridge. The sample container is successively rinsed with aliquots of the elution solvent. The eluted extract is combined with an equal volume of reagent water and a portion is filtered for analysis. Method procedures and data quality objectives conform to US DoD QSM 5.3, table B-15 requirements.
Coliforms by Membrane Filtration	MW007	WATER	AS 4276.5

Preparation Methods	*Method*	*Matrix*	*Method Descriptions*
TKN/TP Digestion	EK061/EK067	WATER	In house: Referenced to APHA 4500 Norg - D; APHA 4500 P - H. This method is compliant with NEPM Schedule B(3)
Separatory Funnel Extraction of Liquids	ORG14	WATER	In house: Referenced to USEPA SW 846 - 3510 100 mL to 1L of sample is transferred to a separatory funnel and serially extracted three times using DCM for each extract. The resultant extracts are combined, dehydrated and concentrated for analysis. This method is compliant with NEPM Schedule B(3) . ALS default excludes sediment which may be resident in the container.
Volatiles Water Preparation	ORG16-W	WATER	A 5 mL aliquot or 5 mL of a diluted sample is added to a 40 mL VOC vial for purging.
Solid Phase Extraction (SPE) for PFAS in water	ORG72	WATER	In-house: Isotopically labelled analogues of target analytes used as internal standards and surrogates are added to the sample container. The entire contents are transferred to a solid phase extraction (SPE) cartridge. The sample container is successively rinsed with aliquots of the elution solvent. The eluted extract is combined with an equal volume of reagent water and a portion is filtered for analysis. Method procedures conform to US DoD QSM 5.3, table B-15 requirements.

CHAIN OF CUSTODY

ALS Laboratory: please tick ->

☐ADELAIDE 21 Burma Road Pooraka SA 5095 Ph: 08 8359 0890 E: adelaide@alsglobal.com
☐BRISBANE 32 Shand Street Stafford QLD 4053 Ph: 07 3243 7222 E: samples.brisbane@alsglobal.com
☐GLADSTONE 46 Callemondah Drive Clinton QLD 4680 Ph: 07 7471 5600 E: gladstone@alsglobal.com
☐MACKAY 78 Harbour Road Mackay QLD 4740 Ph: 07 4944 0177 E: mackay@alsglobal.com
☐MELBOURNE 2-4 Westall Road Springvale VIC 3171 Ph: 03 8549 9600 E: samples.melbourne@alsglobal.com
☐MUDGEE 27 Sydney Road Mudgee NSW 2850 Ph: 02 6372 6735 E: mudgee.mail@alsglobal.com
☐NEWCASTLE 5/585 Maitland Rd Mayfield West NSW 2304 Ph: 02 4014 2500 E: samples.newcastle@alsglobal.com
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☐PERTH 10 Hod Way Malaga WA 6090 Ph: 08 9209 7655 E: samples.perth@alsglobal.com
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☐TOWNSVILLE 14-15 Desma Court Bohle QLD 4818 Ph: 07 4796 0600 E: townsville.environmental@alsglobal.com
☐WOLLONGONG 99 Kenny Street Wollongong NSW 2500 Ph: 02 4225 3125 E: portkembla@alsglobal.com

URGENT

CLIENT: Jacobs Arcadis Joint Venture (JAJV)
OFFICE: Sydney
PROJECT: IA254001
ORDER NUMBER: -
PROJECT MANAGER: Amanda Mullen
CONTACT PH: -
SAMPLER: NK
SAMPLER MOBILE: 0421201294
COC emailed to ALS? (YES / [✓ NO])
EDD FORMAT (or default):
Email Reports to (will default to PM if no other addresses are listed): nick.keatley@jacobs.com amanda.mullen@jacobs.com
Email Invoice to (will default to PM if no other addresses are listed): Nick/Amanda.
COMMENTS/SPECIAL HANDLING/STORAGE OR DISPOSAL: Also email results to EDMANZ@jacobs.com, jacobs.labresults@esdat.net

TURNAROUND REQUIREMENTS : (Standard TAT may be longer for some tests e.g.. Ultra Trace Organics)
☒ Standard TAT (List due date):
☐ Non Standard or urgent TAT (List due date):
ALS QUOTE NO.:

COC SEQUENCE NUMBER (Circle)
COC: [✓ 1] 2 3 4 5 6 7
OF: [✓ 1] 2 3 4 5 6 7

RELINQUISHED BY:	RECEIVED BY:	RELINQUISHED BY:	RECEIVED BY:
NK	Juliana G		
DATE/TIME: 21/9/21	DATE/TIME: 21/9/21 2:45 pm	DATE/TIME:	DATE/TIME: 21/9/21 1810

FOR LABORATORY USE ONLY (Circle)
Custody Seal Intact? Yes No [✓ N/A]
Free ice / frozen ice bricks present upon receipt? Yes No N/A
Random Sample Temperature on Receipt: 4.5 °C
Other comment:

ALS USE	SAMPLE DETAILS MATRIX: SOLID (S) WATER (W)			CONTAINER INFORMATION		ANALYSIS REQUIRED including SUITES (NB. Suite Codes must be listed to attract suite price) Where Metals are required, specify Total (unfiltered bottle required) or Dissolved (field filtered bottle required).									Additional Information
LAB ID	SAMPLE ID	DATE / TIME	MATRIX	TYPE & PRESERVATIVE (refer to codes below)	TOTAL CONTAINERS	W-26	W-2	W-12	NT-8	Cyanide	Total Coliforms	Formaldehyde	BTEX	[illegible]	
1	GW01	20/9/21	W			X									
2	GW05	↓	↓				X			X					
3	GW07					X									
4	GW03						X		X			X			
5	GW02	21/9/21				X		X			X				
6	GW06	↓				X		X			X				
7	QC101_210921					X		X			X				Duplicate
-	QC201_210921					X		X			X				Send to eurofins
8	QC501_210921					X									Rinsate (total metals)
9	QC300_210921												X		Trip Blank
10	QC501_210917	~~20~~/9/21 17												X	Rinsate.

Subcon / Forward Lab / Split WO
Lab / Analysis: Eurofins -> QC201_210921
Organised By / Date:
Relinquished By / Date:
Connote / Courier:
WO No:
Attached By PO / Internal Sheet:

Environmental Division
Sydney
Work Order Reference
ES2134103

Telephone : + 61-2-8784 8555

Water Container Codes: P = Unpreserved Plastic; N = Nitric Preserved Plastic; ORC = Nitric Preserved ORC; SH = Sodium Hydroxide/Cd Preserved; S = Sodium Hydroxide Preserved Plastic; AG = Amber Glass Unpreserved; AP - Airfreight Unpreserved Plastic
V = VOA Vial HCl Preserved; VB = VOA Vial Sodium Bisulphate Preserved; VS = VOA Vial Sulfuric Preserved; AV = Airfreight Unpreserved Vial SG = Sulfuric Preserved Amber Glass; H = HCl preserved Plastic; HS = HCl preserved Speciation bottle; SP = Sulfuric Preserved Plastic; F = Formaldehyde Preserved Glass;
Z = Zinc Acetate Preserved Bottle; E = EDTA Preserved Bottles; ST = Sterile Bottle; ASS = Plastic Bag for Acid Sulphate Soils; B = Unpreserved Bag.

CERTIFICATE OF ANALYSIS

Work Order	: **ES2134640**	Page	: 1 of 2
Client	: **Jacobs Arcadis Joint Venture**	Laboratory	: Environmental Division Sydney
Contact	: Amanda Mullen	Contact	: Customer Services ES
Address	: Level 16 580 George Street Sydney 2000	Address	: 277-289 Woodpark Road Smithfield NSW Australia 2164
Telephone	: ----	Telephone	: +61-2-8784 8555
Project	: IA254001	Date Samples Received	: 24-Sep-2021 10:21
Order number	: 1770	Date Analysis Commenced	: 27-Sep-2021
C-O-C number	: ----	Issue Date	: 30-Sep-2021 11:42
Sampler	: ----		
Site	: ----		
Quote number	: EN/222		
No. of samples received	: 2		
No. of samples analysed	: 2		

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

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

This Certificate of Analysis contains the following information:

- General Comments
- Analytical Results

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

Signatories

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

Signatories	*Position*	*Accreditation Category*
Ankit Joshi	Inorganic Chemist	Sydney Inorganics, Smithfield, NSW

General Comments

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

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

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

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

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

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

Key : CAS Number = CAS registry number from database maintained by Chemical Abstracts Services. The Chemical Abstracts Service is a division of the American Chemical Society.
LOR = Limit of reporting
^ = This result is computed from individual analyte detections at or above the level of reporting
ø = ALS is not NATA accredited for these tests.
~ = Indicates an estimated value.

Analytical Results

Sub-Matrix: **SOIL** (Matrix: **SOIL**)			Sample ID	**BH11_0.05**	**BH11_0.5**	**----**	**----**	**----**
			Sampling date / time	02-Sep-2021 00:00	02-Sep-2021 00:00	----	----	----
Compound	CAS Number	LOR	Unit	**ES2134640-001**	**ES2134640-002**	**--------**	**--------**	**--------**
				Result	Result	----	----	----
EA055: Moisture Content (Dried @ 105-110°C)								
Moisture Content	----	0.1	%	**10.7**	**8.2**	----	----	----
EK026SF: Total CN by Segmented Flow Analyser								
Total Cyanide	57-12-5	1	mg/kg	<1	<1	----	----	----

Environmental

QUALITY CONTROL REPORT

Work Order	: **ES2134640**	Page	: 1 of 3
Client	: **Jacobs Arcadis Joint Venture**	Laboratory	: Environmental Division Sydney
Contact	: Amanda Mullen	Contact	: Customer Services ES
Address	: Level 16 580 George Street Sydney 2000	Address	: 277-289 Woodpark Road Smithfield NSW Australia 2164
Telephone	: ----	Telephone	: +61-2-8784 8555
Project	: IA254001	Date Samples Received	: 24-Sep-2021
Order number	: 1770	Date Analysis Commenced	: 27-Sep-2021
C-O-C number	: ----	Issue Date	: 30-Sep-2021
Sampler	: ----		
Site	: ----		
Quote number	: EN/222		
No. of samples received	: 2		
No. of samples analysed	: 2		

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

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

This Quality Control Report contains the following information:

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

Signatories

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

Signatories	*Position*	*Accreditation Category*
Ankit Joshi	Inorganic Chemist	Sydney Inorganics, Smithfield, NSW

General Comments

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

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

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

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

Laboratory Duplicate (DUP) Report

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

Sub-Matrix: **SOIL**

				Laboratory Duplicate (DUP) Report					
Laboratory sample ID	*Sample ID*	*Method: Compound*	*CAS Number*	*LOR*	*Unit*	*Original Result*	*Duplicate Result*	*RPD (%)*	*Acceptable RPD (%)*
EA055: Moisture Content (Dried @ 105-110°C) (QC Lot: 3923580)									
ES2134640-001	BH11_0.05	EA055: Moisture Content	----	0.1	%	10.7	10.5	2.0	0% - 20%
EK026SF: Total CN by Segmented Flow Analyser (QC Lot: 3924401)									
ES2133714-001	Anonymous	EK026SF: Total Cyanide	57-12-5	1	mg/kg	<1	<1	0.0	No Limit
ES2134307-002	Anonymous	EK026SF: Total Cyanide	57-12-5	1	mg/kg	<1	<1	0.0	No Limit

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

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

Sub-Matrix: **SOIL**

				Method Blank (MB) Report	Laboratory Control Spike (LCS) Report			
					Spike	Spike Recovery (%)	Acceptable Limits (%)	
Method: Compound	CAS Number	LOR	Unit	Result	Concentration	LCS	Low	High
EK026SF: Total CN by Segmented Flow Analyser (QCLot: 3924401)								
EK026SF: Total Cyanide	57-12-5	1	mg/kg	<1	40 mg/kg	122	81.0	129

Matrix Spike (MS) Report

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

Sub-Matrix: **SOIL**

				Matrix Spike (MS) Report			
				Spike	SpikeRecovery(%)	Acceptable Limits (%)	
Laboratory sample ID	Sample ID	Method: Compound	CAS Number	Concentration	MS	Low	High
EK026SF: Total CN by Segmented Flow Analyser (QCLot: 3924401)							
ES2133714-001	Anonymous	EK026SF: Total Cyanide	57-12-5	40 mg/kg	118	70.0	130

Environmental

QA/QC Compliance Assessment to assist with Quality Review

Work Order	: **ES2134640**	Page	: 1 of 4
Client	: **Jacobs Arcadis Joint Venture**	Laboratory	: Environmental Division Sydney
Contact	: Amanda Mullen	Telephone	: +61-2-8784 8555
Project	: IA254001	Date Samples Received	: 24-Sep-2021
Site	: ----	Issue Date	: 30-Sep-2021
Sampler	: ----	No. of samples received	: 2
Order number	: 1770	No. of samples analysed	: 2

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

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

Summary of Outliers

Outliers : Quality Control Samples

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

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

Outliers : Analysis Holding Time Compliance

- **Analysis Holding Time Outliers exist - please see following pages for full details.**

Outliers : Frequency of Quality Control Samples

- **NO Quality Control Sample Frequency Outliers exist.**

Outliers : Analysis Holding Time Compliance

Matrix: **SOIL**

Method	*Extraction / Preparation*			*Analysis*		
Container / Client Sample ID(s)	*Date extracted*	*Due for extraction*	**Days overdue**	*Date analysed*	*Due for analysis*	**Days overdue**
EA055: Moisture Content (Dried @ 105-110°C)						
Soil Glass Jar - Unpreserved						
BH11_0.05, BH11_0.5	----	----	----	27-Sep-2021	16-Sep-2021	**11**
EK026SF: Total CN by Segmented Flow Analyser						
Soil Glass Jar - Unpreserved						
BH11_0.05, BH11_0.5	27-Sep-2021	16-Sep-2021	**11**	----	----	----

Analysis Holding Time Compliance

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

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

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

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

Matrix: **SOIL**

Evaluation: ✘ = Holding time breach ; ✓ = Within holding time.

Method	***Sample Date***	*Extraction / Preparation*			*Analysis*		
Container / Client Sample ID(s)		***Date extracted***	*Due for extraction*	*Evaluation*	***Date analysed***	*Due for analysis*	*Evaluation*
EA055: Moisture Content (Dried @ 105-110°C)							
Soil Glass Jar - Unpreserved (EA055)							
BH11_0.05, BH11_0.5	**02-Sep-2021**	**----**	----	----	**27-Sep-2021**	16-Sep-2021	✘
EK026SF: Total CN by Segmented Flow Analyser							
Soil Glass Jar - Unpreserved (EK026SF)							
BH11_0.05, BH11_0.5	**02-Sep-2021**	**27-Sep-2021**	16-Sep-2021	✘	**28-Sep-2021**	11-Oct-2021	✓

Quality Control Parameter Frequency Compliance

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

Matrix: **SOIL**

Evaluation: × = Quality Control frequency not within specification ; ✓ = Quality Control frequency within specification.

		Count		Rate (%)			Quality Control Specification
Analytical Methods	*Method*	*QC*	*Regular*	***Actual***	***Expected***	*Evaluation*	
Moisture Content	EA055	1	4	**25.00**	**10.00**	✓	NEPM 2013 B3 & ALS QC Standard
Total Cyanide by Segmented Flow Analyser	EK026SF	2	18	**11.11**	**10.00**	✓	NEPM 2013 B3 & ALS QC Standard
Total Cyanide by Segmented Flow Analyser	EK026SF	2	18	**11.11**	**10.00**	✓	NEPM 2013 B3 & ALS QC Standard
Total Cyanide by Segmented Flow Analyser	EK026SF	1	18	**5.56**	**5.00**	✓	NEPM 2013 B3 & ALS QC Standard
Total Cyanide by Segmented Flow Analyser	EK026SF	1	18	**5.56**	**5.00**	✓	NEPM 2013 B3 & ALS QC Standard

Brief Method Summaries

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

Analytical Methods	*Method*	*Matrix*	*Method Descriptions*
Moisture Content	EA055	SOIL	In house: A gravimetric procedure based on weight loss over a 12 hour drying period at 105-110 degrees C. This method is compliant with NEPM Schedule B(3).
Total Cyanide by Segmented Flow Analyser	EK026SF	SOIL	In house: Referenced to APHA 4500-CN C / ASTM D7511 / ISO 14403. Caustic leachates of soil samples are introduced into an automated segmented flow analyser. Complex bound cyanide is decomposed in a continuously flowing stream, at a pH of 3.8, by the effect of UV light. A UV-B lamp (312 nm) and a decomposition spiral of borosilicate glass are used to filter out UV light with a wavelength of less than 290 nm thus preventing the conversion of thiocyanate into cyanide. The hydrogen cyanide present at a pH of 3.8 is separated by gas dialysis. The hydrogen cyanide is then determined photometrically, based on the reaction of cyanide with chloramine-T to form cyanogen chloride. This then reacts with 4-pyridine carboxylic acid and 1,3-dimethylbarbituric acid to give a red colour which is measured at 600 nm. This method is compliant with NEPM Schedule B(3).

Preparation Methods	*Method*	*Matrix*	*Method Descriptions*
NaOH leach for CN in Soils	CN-PR	SOIL	In house: APHA 4500 CN. Samples are extracted by end-over-end tumbling with NaOH.

Vishal
24/09/2021
1021

Vishal Patel

From: Tyler Anderson
Sent: Friday, 24 September 2021 10:21 AM
To: rebatches.sydney
Subject: FW: [EXTERNAL] - ES2132166 - Additional Sample Analysis

Hi team,

Can you please organise the following rebatch:

- ①BH11_0.05 (ID: ES2132166-035) – Total Cyanide 0209
- ②BH11_0.5 (ID: ES2132166-036) – Total Cyanide S- 1033-1035

Kind regards,

Tyler Anderson

Client Services Coordinator, Environmental
Sydney

Please note that I am working remotely and can be contacted directly on (02) 8784 8501.

T +61 2 8784 8555 F +61 2 8784 8500
D +61 2 8784 8501
tyler.anderson@alsglobal.com
277-289 Woodpark Road
Smithfield NSW 2164 AUSTRALIA

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Environmental Division
Sydney
Work Order Reference
ES2134640

Telephone : + 61-2-8784 8555

From: Keatley, Nick <Nick.Keatley@jacobs.com>
Sent: Thursday, 23 September 2021 9:58 AM
To: Tyler Anderson <tyler.anderson@alsglobal.com>
Cc: Mullen, Amanda <Amanda.Mullen@jacobs.com>
Subject: [EXTERNAL] - ES2132166 - Additional Sample Analysis

CAUTION: This email originated from outside of ALS. Do not click links or open attachments unless you recognize the sender and are sure content is relevant to you.

Hi Tyler,

I am hoping to perform additional analysis on the soil samples listed below that were previously submitted as part of work order ES2132166:

- BH11_0.05 (ID: ES2132166-035) – Total Cyanide
- BH11_0.5 (ID: ES2132166-036) – Total Cyanide

Please contact me if there are any issues with this request.

Regards,

Nick Keatley | Jacobs | Graduate Environmental Scientist |
Contaminated Land Assessment and Remediation Eastern |
M:+61 421 201 294 | nick.keatley@jacobs.com

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Reinventing tomorrow.

CERTIFICATE OF ANALYSIS

Work Order	: **ES2135804**	Page	: 1 of 6
Client	: **Jacobs Arcadis Joint Venture**	Laboratory	: Environmental Division Sydney
Contact	: Amanda Mullen	Contact	: Customer Services ES
Address	: Level 16 580 George Street Sydney 2000	Address	: 277-289 Woodpark Road Smithfield NSW Australia 2164
Telephone	: ----	Telephone	: +61-2-8784 8555
Project	: IA254001	Date Samples Received	: 21-Sep-2021 18:10
Order number	: 1770	Date Analysis Commenced	: 07-Oct-2021
C-O-C number	: ----	Issue Date	: 14-Oct-2021 13:28
Sampler	: ----		
Site	: ----		
Quote number	: EN/222		
No. of samples received	: 4		
No. of samples analysed	: 4		

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

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

This Certificate of Analysis contains the following information:

- General Comments
- Analytical Results
- Surrogate Control Limits

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

Signatories

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

Signatories	*Position*	*Accreditation Category*
Aleksandar Vujkovic	Laboratory Technician	Newcastle - Inorganics, Mayfield West, NSW
Ankit Joshi	Inorganic Chemist	Sydney Inorganics, Smithfield, NSW
Dian Dao	Senior Chemist - Inorganics	Sydney Inorganics, Smithfield, NSW
Franco Lentini	LCMS Coordinator	Sydney Organics, Smithfield, NSW
Ivan Taylor	Analyst	Sydney Inorganics, Smithfield, NSW

General Comments

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

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

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

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

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

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

Key : CAS Number = CAS registry number from database maintained by Chemical Abstracts Services. The Chemical Abstracts Service is a division of the American Chemical Society.
LOR = Limit of reporting
^ = This result is computed from individual analyte detections at or above the level of reporting
ø = ALS is not NATA accredited for these tests.
~ = Indicates an estimated value.

- EP231X - Per- and Polyfluoroalkyl Substances (PFAS): Samples received in 20ml or 125ml bottles have been tested in accordance with the QSM5.3 compliant, NATA accredited method. 60mL or 250mL bottles have been tested to the legacy QSM 5.1 aligned, NATA accredited method.
- ED007 and ED008: When Exchangeable Al is reported from these methods, it should be noted that Rayment & Lyons (2011) suggests Exchange Acidity by 1M KCl - Method 15G1 (ED005) is a more suitable method for the determination of exchange acidity (H+ + Al3+).
- EP231: Stable isotope enriched internal standards are added to samples prior to extraction. Target compounds have a direct analogous internal standard with the exception of PFPeS, PFHpA, PFDS, PFTrDA and 10:2 FTS. These compounds use an internal standard that is chemically related and has a retention time close to that of the target compound. The DQO for internal standard response is 50-150% of that established at initial calibration. PFOS is quantified using a certified, traceable standard consisting of linear and branched PFOS isomers. These practices are in line with recommendations in the National Environmental Management Plan for PFAS (Australian HEPA) and also conform to QSM 5.3 (US DoD) requirements.
- EN33: Where leachable PFAS analysis is requested, centrifugation rather than pressure filtration is used as the default approach for removal of particulates, in line with AS 4439.3.

Analytical Results

Sub-Matrix: **SOIL** (Matrix: **SOIL**)			*Sample ID*	**WC_S01**	**WC_S02**	**BH16_1.5**	**BH08_1.0**	**----**
			Sampling date / time	20-Sep-2021 00:00	20-Sep-2021 00:00	13-Sep-2021 00:00	16-Sep-2021 00:00	----
Compound	*CAS Number*	*LOR*	*Unit*	**ES2135804-001**	**ES2135804-002**	**ES2135804-003**	**ES2135804-004**	**--------**
				Result	Result	Result	Result	----
EA002: pH 1:5 (Soils)								
pH Value	----	0.1	pH Unit	**----**	**----**	**5.2**	**5.9**	**----**
EA150: Soil Classification based on Particle Size								
Clay (<2 µm)	----	1	%	**----**	**----**	**42**	**5**	**----**
EA152: Soil Particle Density								
Soil Particle Density (Clay/Silt/Sand)	----	0.01	g/cm3	**----**	**----**	**2.58**	**2.50**	**----**
ED007: Exchangeable Cations								
Exchangeable Calcium	----	0.1	meq/100g	**----**	**----**	<0.1	**2.8**	**----**
Exchangeable Magnesium	----	0.1	meq/100g	**----**	**----**	**1.0**	**2.9**	**----**
Exchangeable Potassium	----	0.1	meq/100g	**----**	**----**	**0.1**	<0.1	**----**
Exchangeable Sodium	----	0.1	meq/100g	**----**	**----**	**0.2**	**0.2**	**----**
Cation Exchange Capacity	----	0.1	meq/100g	**----**	**----**	**2.0**	**6.0**	**----**
Exchangeable Sodium Percent	----	0.1	%	**----**	**----**	**12.1**	**4.2**	**----**
EN33: TCLP Leach - Inorganics/PFAS (Plastic Vessel)								
Initial pH	----	0.1	pH Unit	**6.9**	**10.7**	**----**	**----**	**----**
After HCl pH	----	0.1	pH Unit	**1.6**	**2.0**	**----**	**----**	**----**
Extraction Fluid Number	----	1	-	**1**	**1**	**----**	**----**	**----**
Final pH	----	0.1	pH Unit	**4.9**	**5.6**	**----**	**----**	**----**

Analytical Results

Sub-Matrix: **TCLP LEACHATE** (Matrix: **WATER**)			*Sample ID*	**WC_S01**	**WC_S02**	**----**	**----**	**----**
			Sampling date / time	20-Sep-2021 00:00	20-Sep-2021 00:00	----	----	----
Compound	*CAS Number*	*LOR*	*Unit*	**ES2135804-001**	**ES2135804-002**	**--------**	**--------**	**--------**
				Result	Result	----	----	----
EP231A: Perfluoroalkyl Sulfonic Acids								
Perfluorobutane sulfonic acid (PFBS)	375-73-5	0.02	µg/L	<0.02	<0.02	----	----	----
Perfluoropentane sulfonic acid (PFPeS)	2706-91-4	0.02	µg/L	<0.02	<0.02	----	----	----
Perfluorohexane sulfonic acid (PFHxS)	355-46-4	0.02	µg/L	<0.02	<0.02	----	----	----
Perfluoroheptane sulfonic acid (PFHpS)	375-92-8	0.02	µg/L	<0.02	<0.02	----	----	----
Perfluorooctane sulfonic acid (PFOS)	1763-23-1	0.01	µg/L	<0.01	<0.01	----	----	----
Perfluorodecane sulfonic acid (PFDS)	335-77-3	0.02	µg/L	<0.02	<0.02	----	----	----
EP231B: Perfluoroalkyl Carboxylic Acids								
Perfluorobutanoic acid (PFBA)	375-22-4	0.1	µg/L	<0.1	<0.1	----	----	----
Perfluoropentanoic acid (PFPeA)	2706-90-3	0.02	µg/L	<0.02	<0.02	----	----	----
Perfluorohexanoic acid (PFHxA)	307-24-4	0.02	µg/L	<0.02	<0.02	----	----	----
Perfluoroheptanoic acid (PFHpA)	375-85-9	0.02	µg/L	<0.02	<0.02	----	----	----
Perfluorooctanoic acid (PFOA)	335-67-1	0.01	µg/L	<0.01	<0.01	----	----	----
Perfluorononanoic acid (PFNA)	375-95-1	0.02	µg/L	<0.02	<0.02	----	----	----
Perfluorodecanoic acid (PFDA)	335-76-2	0.02	µg/L	<0.02	<0.02	----	----	----
Perfluoroundecanoic acid (PFUnDA)	2058-94-8	0.02	µg/L	<0.02	<0.02	----	----	----
Perfluorododecanoic acid (PFDoDA)	307-55-1	0.02	µg/L	<0.02	<0.02	----	----	----
Perfluorotridecanoic acid (PFTrDA)	72629-94-8	0.02	µg/L	<0.02	<0.02	----	----	----
Perfluorotetradecanoic acid (PFTeDA)	376-06-7	0.05	µg/L	<0.05	<0.05	----	----	----
EP231C: Perfluoroalkyl Sulfonamides								
Perfluorooctane sulfonamide (FOSA)	754-91-6	0.02	µg/L	<0.02	<0.02	----	----	----
N-Methyl perfluorooctane sulfonamide (MeFOSA)	31506-32-8	0.05	µg/L	<0.05	<0.05	----	----	----
N-Ethyl perfluorooctane sulfonamide (EtFOSA)	4151-50-2	0.05	µg/L	<0.05	<0.05	----	----	----

Analytical Results

Sub-Matrix: **TCLP LEACHATE** (Matrix: **WATER**)			*Sample ID*	**WC_S01**	**WC_S02**	**----**	**----**	**----**
			Sampling date / time	20-Sep-2021 00:00	20-Sep-2021 00:00	----	----	----
Compound	*CAS Number*	*LOR*	*Unit*	**ES2135804-001**	**ES2135804-002**	--------	--------	--------
				Result	Result	----	----	----
EP231C: Perfluoroalkyl Sulfonamides - Continued								
N-Methyl perfluorooctane sulfonamidoethanol (MeFOSE)	24448-09-7	0.05	µg/L	<0.05	<0.05	----	----	----
N-Ethyl perfluorooctane sulfonamidoethanol (EtFOSE)	1691-99-2	0.05	µg/L	<0.05	<0.05	----	----	----
N-Methyl perfluorooctane sulfonamidoacetic acid (MeFOSAA)	2355-31-9	0.02	µg/L	<0.02	<0.02	----	----	----
N-Ethyl perfluorooctane sulfonamidoacetic acid (EtFOSAA)	2991-50-6	0.02	µg/L	<0.02	<0.02	----	----	----
EP231D: (n:2) Fluorotelomer Sulfonic Acids								
4:2 Fluorotelomer sulfonic acid (4:2 FTS)	757124-72-4	0.05	µg/L	<0.05	<0.05	----	----	----
6:2 Fluorotelomer sulfonic acid (6:2 FTS)	27619-97-2	0.05	µg/L	<0.05	<0.05	----	----	----
8:2 Fluorotelomer sulfonic acid (8:2 FTS)	39108-34-4	0.05	µg/L	<0.05	<0.05	----	----	----
10:2 Fluorotelomer sulfonic acid (10:2 FTS)	120226-60-0	0.05	µg/L	<0.05	<0.05	----	----	----
EP231P: PFAS Sums								
Sum of PFAS	----	0.01	µg/L	<0.01	<0.01	----	----	----
Sum of PFHxS and PFOS	355-46-4/1763-23-1	0.01	µg/L	<0.01	<0.01	----	----	----
Sum of PFAS (WA DER List)	----	0.01	µg/L	<0.01	<0.01	----	----	----
EP231S: PFAS Surrogate								
13C4-PFOS	----	0.02	%	**109**	**113**	----	----	----
13C8-PFOA	----	0.02	%	**110**	**106**	----	----	----

Surrogate Control Limits

Sub-Matrix: **TCLP LEACHATE**

Compound	CAS Number	Recovery Limits (%) Low	Recovery Limits (%) High
EP231S: PFAS Surrogate			
13C4-PFOS	----	60	120
13C8-PFOA	----	60	120

Inter-Laboratory Testing

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

(SOIL) EA150: Soil Classification based on Particle Size

(SOIL) EA152: Soil Particle Density

Environmental

QUALITY CONTROL REPORT

Work Order : **ES2135804**

Client : **Jacobs Arcadis Joint Venture**

Contact : Amanda Mullen

Address : Level 16 580 George Street
Sydney 2000

Telephone : ----

Project : IA254001

Order number : 1770

C-O-C number : ----

Sampler : ----

Site : ----

Quote number : EN/222

No. of samples received : 4

No. of samples analysed : 4

Page : 1 of 4

Laboratory : Environmental Division Sydney

Contact : Customer Services ES

Address : 277-289 Woodpark Road Smithfield NSW Australia 2164

Telephone : +61-2-8784 8555

Date Samples Received : 21-Sep-2021

Date Analysis Commenced : 07-Oct-2021

Issue Date : 14-Oct-2021

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

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

This Quality Control Report contains the following information:

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

Signatories

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

Signatories	*Position*	*Accreditation Category*
Aleksandar Vujkovic	Laboratory Technician	Newcastle - Inorganics, Mayfield West, NSW
Ankit Joshi	Inorganic Chemist	Sydney Inorganics, Smithfield, NSW
Dian Dao	Senior Chemist - Inorganics	Sydney Inorganics, Smithfield, NSW
Franco Lentini	LCMS Coordinator	Sydney Organics, Smithfield, NSW
Ivan Taylor	Analyst	Sydney Inorganics, Smithfield, NSW

General Comments

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

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

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

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

Laboratory Duplicate (DUP) Report

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

Sub-Matrix: **SOIL**

				Laboratory Duplicate (DUP) Report					
Laboratory sample ID	*Sample ID*	*Method: Compound*	*CAS Number*	*LOR*	*Unit*	*Original Result*	*Duplicate Result*	*RPD (%)*	*Acceptable RPD (%)*
EA002: pH 1:5 (Soils) (QC Lot: 3948339)									
ES2136160-005	Anonymous	EA002: pH Value	----	0.1	pH Unit	5.4	5.3	2.4	0% - 20%
ES2135825-001	Anonymous	EA002: pH Value	----	0.1	pH Unit	8.2	8.2	0.0	0% - 20%
ED007: Exchangeable Cations (QC Lot: 3953246)									
ES2135804-003	BH16_1.5	ED007: Exchangeable Sodium Percent	----	0.1	%	12.1	12.3	2.0	0% - 20%
		ED007: Exchangeable Calcium	----	0.1	meq/100g	<0.1	<0.1	0.0	No Limit
		ED007: Exchangeable Magnesium	----	0.1	meq/100g	1.0	1.0	0.0	No Limit
		ED007: Exchangeable Potassium	----	0.1	meq/100g	0.1	0.1	0.0	No Limit
		ED007: Exchangeable Sodium	----	0.1	meq/100g	0.2	0.2	0.0	No Limit
		ED007: Cation Exchange Capacity	----	0.1	meq/100g	2.0	2.1	0.0	0% - 20%

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

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

Sub-Matrix: **SOIL**

				Method Blank (MB) Report	Laboratory Control Spike (LCS) Report			
					Spike	Spike Recovery (%)	Acceptable Limits (%)	
Method: Compound	*CAS Number*	*LOR*	*Unit*	*Result*	*Concentration*	*LCS*	*Low*	*High*
ED007: Exchangeable Cations (QCLot: 3953246)								
ED007: Exchangeable Calcium	----	0.1	meq/100g	<0.1	1 meq/100g	101	75.8	120
ED007: Exchangeable Magnesium	----	0.1	meq/100g	<0.1	1.67 meq/100g	98.8	74.9	115
ED007: Exchangeable Potassium	----	0.1	meq/100g	<0.1	0.51 meq/100g	104	80.0	120
ED007: Exchangeable Sodium	----	0.1	meq/100g	<0.1	0.87 meq/100g	106	80.0	120
ED007: Cation Exchange Capacity	----	0.1	meq/100g	<0.1	----	----	----	----
ED007: Exchangeable Sodium Percent	----	0.1	%	<0.1	----	----	----	----

Sub-Matrix: **WATER**

				Method Blank (MB) Report	Laboratory Control Spike (LCS) Report			
					Spike	Spike Recovery (%)	Acceptable Limits (%)	
Method: Compound	*CAS Number*	*LOR*	*Unit*	*Result*	*Concentration*	*LCS*	*Low*	*High*
EP231A: Perfluoroalkyl Sulfonic Acids (QCLot: 3945825)								
EP231X: Perfluorobutane sulfonic acid (PFBS)	375-73-5	0.02	µg/L	<0.02	0.25 µg/L	77.6	72.0	130
EP231X: Perfluoropentane sulfonic acid (PFPeS)	2706-91-4	0.02	µg/L	<0.02	0.25 µg/L	91.8	71.0	127
EP231X: Perfluorohexane sulfonic acid (PFHxS)	355-46-4	0.02	µg/L	<0.02	0.25 µg/L	82.0	68.0	131
EP231X: Perfluoroheptane sulfonic acid (PFHpS)	375-92-8	0.02	µg/L	<0.02	0.25 µg/L	89.6	69.0	134
EP231X: Perfluorooctane sulfonic acid (PFOS)	1763-23-1	0.01	µg/L	<0.01	0.25 µg/L	85.6	65.0	140
EP231X: Perfluorodecane sulfonic acid (PFDS)	335-77-3	0.02	µg/L	<0.02	0.25 µg/L	84.6	53.0	142
EP231B: Perfluoroalkyl Carboxylic Acids (QCLot: 3945825)								
EP231X: Perfluorobutanoic acid (PFBA)	375-22-4	0.1	µg/L	<0.1	1.25 µg/L	88.0	73.0	129
EP231X: Perfluoropentanoic acid (PFPeA)	2706-90-3	0.02	µg/L	<0.02	0.25 µg/L	89.2	72.0	129
EP231X: Perfluorohexanoic acid (PFHxA)	307-24-4	0.02	µg/L	<0.02	0.25 µg/L	88.8	72.0	129
EP231X: Perfluoroheptanoic acid (PFHpA)	375-85-9	0.02	µg/L	<0.02	0.25 µg/L	89.6	72.0	130
EP231X: Perfluorooctanoic acid (PFOA)	335-67-1	0.01	µg/L	<0.01	0.25 µg/L	95.8	71.0	133
EP231X: Perfluorononanoic acid (PFNA)	375-95-1	0.02	µg/L	<0.02	0.25 µg/L	85.2	69.0	130
EP231X: Perfluorodecanoic acid (PFDA)	335-76-2	0.02	µg/L	<0.02	0.25 µg/L	82.6	71.0	129
EP231X: Perfluoroundecanoic acid (PFUnDA)	2058-94-8	0.02	µg/L	<0.02	0.25 µg/L	82.6	69.0	133
EP231X: Perfluorododecanoic acid (PFDoDA)	307-55-1	0.02	µg/L	<0.02	0.25 µg/L	97.0	72.0	134
EP231X: Perfluorotridecanoic acid (PFTrDA)	72629-94-8	0.02	µg/L	<0.02	0.25 µg/L	81.4	65.0	144
EP231X: Perfluorotetradecanoic acid (PFTeDA)	376-06-7	0.05	µg/L	<0.05	0.625 µg/L	103	71.0	132
EP231C: Perfluoroalkyl Sulfonamides (QCLot: 3945825)								
EP231X: Perfluorooctane sulfonamide (FOSA)	754-91-6	0.02	µg/L	<0.02	0.25 µg/L	87.8	67.0	137
EP231X: N-Methyl perfluorooctane sulfonamide (MeFOSA)	31506-32-8	0.05	µg/L	<0.05	0.625 µg/L	81.9	68.0	141
EP231X: N-Ethyl perfluorooctane sulfonamide (EtFOSA)	4151-50-2	0.05	µg/L	<0.05	0.625 µg/L	86.7	62.6	147
EP231X: N-Methyl perfluorooctane sulfonamidoethanol (MeFOSE)	24448-09-7	0.05	µg/L	<0.05	0.625 µg/L	89.9	66.0	145

Sub-Matrix: **WATER**

				Method Blank (MB) Report	Laboratory Control Spike (LCS) Report			
					Spike	Spike Recovery (%)	Acceptable Limits (%)	
Method: Compound	CAS Number	LOR	Unit	Result	Concentration	LCS	Low	High
EP231C: Perfluoroalkyl Sulfonamides (QCLot: 3945825) - continued								
EP231X: N-Ethyl perfluorooctane sulfonamidoethanol (EtFOSE)	1691-99-2	0.05	µg/L	<0.05	0.625 µg/L	80.1	57.6	145
EP231X: N-Methyl perfluorooctane sulfonamidoacetic acid (MeFOSAA)	2355-31-9	0.02	µg/L	<0.02	0.25 µg/L	101	65.0	136
EP231X: N-Ethyl perfluorooctane sulfonamidoacetic acid (EtFOSAA)	2991-50-6	0.02	µg/L	<0.02	0.25 µg/L	87.2	61.0	135
EP231D: (n:2) Fluorotelomer Sulfonic Acids (QCLot: 3945825)								
EP231X: 4:2 Fluorotelomer sulfonic acid (4:2 FTS)	757124-72-4	0.05	µg/L	<0.05	0.25 µg/L	83.0	63.0	143
EP231X: 6:2 Fluorotelomer sulfonic acid (6:2 FTS)	27619-97-2	0.05	µg/L	<0.05	0.25 µg/L	94.8	64.0	140
EP231X: 8:2 Fluorotelomer sulfonic acid (8:2 FTS)	39108-34-4	0.05	µg/L	<0.05	0.25 µg/L	117	67.0	138
EP231X: 10:2 Fluorotelomer sulfonic acid (10:2 FTS)	120226-60-0	0.05	µg/L	<0.05	0.25 µg/L	108	71.4	144

Matrix Spike (MS) Report

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

- **No Matrix Spike (MS) or Matrix Spike Duplicate (MSD) Results are required to be reported.**

Environmental

QA/QC Compliance Assessment to assist with Quality Review

Work Order : **ES2135804**

Client : **Jacobs Arcadis Joint Venture**
Contact : Amanda Mullen
Project : IA254001
Site : ----
Sampler : ----
Order number : 1770

Page : 1 of 5

Laboratory : Environmental Division Sydney
Telephone : +61-2-8784 8555
Date Samples Received : 21-Sep-2021
Issue Date : 14-Oct-2021
No. of samples received : 4
No. of samples analysed : 4

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

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

Summary of Outliers

Outliers : Quality Control Samples

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

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

Outliers : Analysis Holding Time Compliance

- **Analysis Holding Time Outliers exist - please see following pages for full details.**

Outliers : Frequency of Quality Control Samples

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

Outliers : Analysis Holding Time Compliance

Matrix: **SOIL**

Method	Extraction / Preparation			Analysis		
Container / Client Sample ID(s)	Date extracted	Due for extraction	**Days overdue**	Date analysed	Due for analysis	**Days overdue**
EA002: pH 1:5 (Soils)						
Soil Glass Jar - Unpreserved BH16_1.5	11-Oct-2021	20-Sep-2021	**21**	12-Oct-2021	11-Oct-2021	**1**
Soil Glass Jar - Unpreserved BH08_1.0	11-Oct-2021	23-Sep-2021	**18**	12-Oct-2021	11-Oct-2021	**1**
ED007: Exchangeable Cations						
Soil Glass Jar - Unpreserved BH16_1.5	13-Oct-2021	11-Oct-2021	**2**	13-Oct-2021	11-Oct-2021	**2**

Outliers : Frequency of Quality Control Samples

Matrix: **WATER**

	Count		Rate (%)		Quality Control Specification
Method	QC	Regular	Actual	Expected	
Laboratory Duplicates (DUP)					
Per- and Polyfluoroalkyl Substances (PFAS) by LCMSMS	0	10	0.00	10.00	NEPM 2013 B3 & ALS QC Standard
Matrix Spikes (MS)					
Per- and Polyfluoroalkyl Substances (PFAS) by LCMSMS	0	10	0.00	5.00	NEPM 2013 B3 & ALS QC Standard

Analysis Holding Time Compliance

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

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

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

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

Matrix: **SOIL**

Evaluation: ✗ = Holding time breach ; ✓ = Within holding time.

Method	**Sample Date**	Extraction / Preparation			Analysis		
Container / Client Sample ID(s)		**Date extracted**	Due for extraction	Evaluation	**Date analysed**	Due for analysis	Evaluation
EA002: pH 1:5 (Soils)							
Soil Glass Jar - Unpreserved (EA002) BH16_1.5	**13-Sep-2021**	**11-Oct-2021**	20-Sep-2021	✗	**12-Oct-2021**	11-Oct-2021	✗
Soil Glass Jar - Unpreserved (EA002) BH08_1.0	**16-Sep-2021**	**11-Oct-2021**	23-Sep-2021	✗	**12-Oct-2021**	11-Oct-2021	✗
EA150: Soil Classification based on Particle Size							
Snap Lock Bag (EA150H) BH16_1.5	**13-Sep-2021**	**----**	----	----	**13-Oct-2021**	12-Mar-2022	✓
Snap Lock Bag (EA150H) BH08_1.0	**16-Sep-2021**	**----**	----	----	**13-Oct-2021**	15-Mar-2022	✓

Matrix: **SOIL**

Evaluation: ✗ = Holding time breach ; ✓ = Within holding time.

Method	***Sample Date***	*Extraction / Preparation*			*Analysis*		
***Container** / Client Sample ID(s)*		***Date extracted***	*Due for extraction*	*Evaluation*	***Date analysed***	*Due for analysis*	*Evaluation*
EA152: Soil Particle Density							
Snap Lock Bag (EA152) BH16_1.5	**13-Sep-2021**	**----**	----	----	**13-Oct-2021**	12-Mar-2022	✓
Snap Lock Bag (EA152) BH08_1.0	**16-Sep-2021**	**----**	----	----	**13-Oct-2021**	15-Mar-2022	✓
ED007: Exchangeable Cations							
Soil Glass Jar - Unpreserved (ED007) BH16_1.5	**13-Sep-2021**	**13-Oct-2021**	11-Oct-2021	✗	**13-Oct-2021**	11-Oct-2021	✗
Soil Glass Jar - Unpreserved (ED007) BH08_1.0	**16-Sep-2021**	**13-Oct-2021**	14-Oct-2021	✓	**13-Oct-2021**	14-Oct-2021	✓
EN33: TCLP Leach - Inorganics/PFAS (Plastic Vessel)							
Non-Volatile Leach: 180 day HT (e.g. PFAS, metals ex.Hg) (EN33a-P) WC_S01, WC_S02	**20-Sep-2021**	**07-Oct-2021**	19-Mar-2022	✓	**----**	----	----

Matrix: **WATER**

Evaluation: ✗ = Holding time breach ; ✓ = Within holding time.

Method	***Sample Date***	*Extraction / Preparation*			*Analysis*		
***Container** / Client Sample ID(s)*		***Date extracted***	*Due for extraction*	*Evaluation*	***Date analysed***	*Due for analysis*	*Evaluation*
EP231A: Perfluoroalkyl Sulfonic Acids							
HDPE (no PTFE) (EP231X) WC_S01, WC_S02	**07-Oct-2021**	**11-Oct-2021**	05-Apr-2022	✓	**11-Oct-2021**	05-Apr-2022	✓
EP231B: Perfluoroalkyl Carboxylic Acids							
HDPE (no PTFE) (EP231X) WC_S01, WC_S02	**07-Oct-2021**	**11-Oct-2021**	05-Apr-2022	✓	**11-Oct-2021**	05-Apr-2022	✓
EP231C: Perfluoroalkyl Sulfonamides							
HDPE (no PTFE) (EP231X) WC_S01, WC_S02	**07-Oct-2021**	**11-Oct-2021**	05-Apr-2022	✓	**11-Oct-2021**	05-Apr-2022	✓
EP231D: (n:2) Fluorotelomer Sulfonic Acids							
HDPE (no PTFE) (EP231X) WC_S01, WC_S02	**07-Oct-2021**	**11-Oct-2021**	05-Apr-2022	✓	**11-Oct-2021**	05-Apr-2022	✓
EP231P: PFAS Sums							
HDPE (no PTFE) (EP231X) WC_S01, WC_S02	**07-Oct-2021**	**11-Oct-2021**	05-Apr-2022	✓	**11-Oct-2021**	05-Apr-2022	✓

Quality Control Parameter Frequency Compliance

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

Matrix: **SOIL**

Evaluation: ✘ = Quality Control frequency not within specification ; ✓ = Quality Control frequency within specification.

		Count		*Rate (%)*			*Quality Control Specification*
Analytical Methods	*Method*	*QC*	*Regular*	***Actual***	***Expected***	*Evaluation*	
Exchangeable Cations	ED007	1	2	**50.00**	**10.00**	✓	NEPM 2013 B3 & ALS QC Standard
pH (1:5)	EA002	2	20	**10.00**	**10.00**	✓	NEPM 2013 B3 & ALS QC Standard
Exchangeable Cations	ED007	1	2	**50.00**	**5.00**	✓	NEPM 2013 B3 & ALS QC Standard
Exchangeable Cations	ED007	1	2	**50.00**	**5.00**	✓	NEPM 2013 B3 & ALS QC Standard

Matrix: **WATER**

Evaluation: ✘ = Quality Control frequency not within specification ; ✓ = Quality Control frequency within specification.

		Count		*Rate (%)*			*Quality Control Specification*
Analytical Methods	*Method*	*QC*	*Regular*	***Actual***	***Expected***	*Evaluation*	
Per- and Polyfluoroalkyl Substances (PFAS) by LCMSMS	EP231X	0	10	**0.00**	**10.00**	✘	NEPM 2013 B3 & ALS QC Standard
Per- and Polyfluoroalkyl Substances (PFAS) by LCMSMS	EP231X	1	10	**10.00**	**5.00**	✓	NEPM 2013 B3 & ALS QC Standard
Per- and Polyfluoroalkyl Substances (PFAS) by LCMSMS	EP231X	1	10	**10.00**	**5.00**	✓	NEPM 2013 B3 & ALS QC Standard
Per- and Polyfluoroalkyl Substances (PFAS) by LCMSMS	EP231X	0	10	**0.00**	**5.00**	✘	NEPM 2013 B3 & ALS QC Standard

Brief Method Summaries

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

Analytical Methods	*Method*	*Matrix*	*Method Descriptions*
pH (1:5)	EA002	SOIL	In house: Referenced to Rayment and Lyons 4A1 and APHA 4500H+. pH is determined on soil samples after a 1:5 soil/water leach. This method is compliant with NEPM Schedule B(3).
Particle Size Analysis by Hydrometer	EA150H	SOIL	Particle Size Analysis by Hydrometer according to AS1289.3.6.3
Soil Particle Density	EA152	SOIL	Soil Particle Density by AS 1289.3.5.1: Methods of testing soils for engineering purposes - Soil classification tests - Determination of the soil particle density of a soil - Standard method
Exchangeable Cations	ED007	SOIL	In house: Referenced to Rayment & Lyons Method 15A1. Cations are exchanged from the sample by contact with Ammonium Chloride. They are then quantitated in the final solution by ICPAES and reported as meq/100g of original soil. This method is compliant with NEPM Schedule B(3).
Per- and Polyfluoroalkyl Substances (PFAS) by LCMSMS	EP231X	SOIL	In-house: Analysis of fresh and saline waters by Solid Phase Extraction (SPE) followed by LC-Electrospray-MS-MS, Negative Mode using MRM and internal standard quantitation. Isotopically labelled analogues of target analytes used as internal standards and surrogates are added to the sample container. The entire contents are transferred to a solid phase extraction (SPE) cartridge. The sample container is successively rinsed with aliquots of the elution solvent. The eluted extract is combined with an equal volume of reagent water and a portion is filtered for analysis. Method procedures and data quality objectives conform to US DoD QSM 5.3, table B-15 requirements.

Preparation Methods	*Method*	*Matrix*	*Method Descriptions*
Exchangeable Cations Preparation Method	ED007PR	SOIL	In house: Referenced to Rayment & Lyons method 15A1. A 1M NH4Cl extraction by end over end tumbling at a ratio of 1:20. There is no pretreatment for soluble salts. Extracts can be run by ICP for cations.
TCLP for Non & Semivolatile Analytes - Plastic Leaching Vessel	EN33a-P	SOIL	In house QWI-EN/33 referenced to USEPA SW846-1311: The TCLP procedure is designed to determine the mobility of both organic and inorganic analytes present in wastes. The standard TCLP leach is for non-volatile and Semivolatile test parameters.
1:5 solid / water leach for soluble analytes	EN34	SOIL	10 g of soil is mixed with 50 mL of reagent grade water and tumbled end over end for 1 hour. Water soluble salts are leached from the soil by the continuous suspension. Samples are settled and the water filtered off for analysis.
Solid Phase Extraction (SPE) for PFAS in water	ORG72	SOIL	In-house: Isotopically labelled analogues of target analytes used as internal standards and surrogates are added to the sample container. The entire contents are transferred to a solid phase extraction (SPE) cartridge. The sample container is successively rinsed with aliquots of the elution solvent. The eluted extract is combined with an equal volume of reagent water and a portion is filtered for analysis. Method procedures conform to US DoD QSM 5.3, table B-15 requirements.

Vishal
1/10/2021
1517

Vishal Patel

From: Tyler Anderson
Sent: Friday, 1 October 2021 3:17 PM
To: rebatches.sydney
Subject: FW: [EXTERNAL] - Additional Sample Analysis - ES2134094 and ES2133844

Hi team,

Can you please organise the below rebatch?

- ES2134094:
  - PFAS TCLP analysis of ① WC_S01 and ② WC_S02   # 1 & 2   S-1355
- ES2133844:
  - pH, CEC and %clay analysis of ③ BH16_1.5 and ④ BH08_1.0   # 4 ,12   S 1292 · 1289 , S-1339

Kind regards,

Tyler Anderson

Client Services Coordinator, Environmental
Sydney

Please note that I am working remotely and can be contacted directly on (02) 8784 8501.

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tyler.anderson@alsglobal.com
277-289 Woodpark Road
Smithfield NSW 2164 AUSTRALIA

[✓ bcon] / Forward Lab / Split WO
b / Analysis: clay content - Newcastle
ganised By / Date:
nquished By / Date:
note / Courier:
No:
ched By PO / Internal Sheet:

Environmental Division
Sydney
Work Order Reference
ES2135804

Telephone : + 61-2-8784 8555

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From: Keatley, Nick <Nick.Keatley@jacobs.com>
Sent: Friday, 1 October 2021 2:25 PM
To: Tyler Anderson <tyler.anderson@alsglobal.com>
Cc: Mullen, Amanda <Amanda.Mullen@jacobs.com>
Subject: [EXTERNAL] - Additional Sample Analysis - ES2134094 and ES2133844

CAUTION: This email originated from outside of ALS. Do not click links or open attachments unless you recognize the sender and are sure content is relevant to you.

Hi Tyler,

Can I please request the following additional sample analysis for samples from work orders ES2134094 and ES2133844:

- ES2134094:
  - PFAS TCLP analysis of WC_S01 and WC_S02
- ES2133844:
  - pH, CEC and %clay analysis of BH16_1.5 and BH08_1.0

Please advise if there are any issues with this request.

Regards,

Nick Keatley | Jacobs | Graduate Environmental Scientist |
Contaminated Land Assessment and Remediation Eastern |
M:+61 421 201 294 | nick.keatley@jacobs.com

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CERTIFICATE OF ANALYSIS 276682

Client Details

Client	Jacobs Group (Australia) Pty Ltd
Attention	Amanda Mullen
Address	Level 7, 177 Pacific Highway, North Sydney, NSW, 2060

Sample Details

Your Reference	**IA254001**
Number of Samples	30 Soil, 2 Water
Date samples received	27/08/2021
Date completed instructions received	27/08/2021

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.

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

Report Details

Date results requested by	03/09/2021
Date of Issue	03/09/2021

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

Results Approved By
Dragana Tomas, Senior Chemist
Hannah Nguyen, Metals Supervisor
Jaimie Loa-Kum-Cheung, Senior Chemist
Josh Williams, LC Supervisor
Lucy Zhu, Asbestos Supervisor
Manju Dewendrage, Prep Team Leader
Steven Luong, Organics Supervisor

Authorised By

Nancy Zhang, Laboratory Manager

vTRH(C6-C10)/BTEXN in Soil						
Our Reference		276682-1	276682-2	276682-3	276682-4	276682-5
Your Reference	UNITS	SS01_0.05	SS02_0.05	SS03a_0.10	SS04_0.05	SS05_0.05
Depth		0.05	0.05	0.10	0.05	0.05
Date Sampled		24/08/2021	24/08/2021	24/08/2021	24/08/2021	26/08/2021
Type of sample		Soil	Soil	Soil	Soil	Soil
Date extracted	-	30/08/2021	30/08/2021	30/08/2021	30/08/2021	30/08/2021
Date analysed	-	31/08/2021	31/08/2021	31/08/2021	31/08/2021	31/08/2021
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	%	102	81	95	93	84

vTRH(C6-C10)/BTEXN in Soil						
Our Reference		276682-6	276682-7	276682-8	276682-9	276682-10
Your Reference	UNITS	SS10_0.05	SS11_0.05	SS12_0.05	SS14_0.05	SS15_0.05
Depth		0.05	0.05	0.05	0.05	0.05
Date Sampled		25/08/2021	24/08/2021	24/08/2021	24/08/2021	26/08/2021
Type of sample		Soil	Soil	Soil	Soil	Soil
Date extracted	-	30/08/2021	30/08/2021	30/08/2021	30/08/2021	30/08/2021
Date analysed	-	31/08/2021	31/08/2021	31/08/2021	31/08/2021	31/08/2021
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	%	97	78	91	92	68

vTRH(C6-C10)/BTEXN in Soil						
Our Reference		276682-11	276682-12	276682-13	276682-14	276682-15
Your Reference	UNITS	SS17a_0.10	SS18_0.05	SS23_0.05	SS25_0.10	SS27_0.05
Depth		0.10	0.05	0.05	0.10	0.05
Date Sampled		25/08/2021	24/08/2021	24/08/2021	24/08/2021	27/08/2021
Type of sample		Soil	Soil	Soil	Soil	Soil
Date extracted	-	30/08/2021	30/08/2021	30/08/2021	30/08/2021	30/08/2021
Date analysed	-	31/08/2021	31/08/2021	31/08/2021	31/08/2021	31/08/2021
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	%	79	103	109	86	71

vTRH(C6-C10)/BTEXN in Soil						
Our Reference		276682-16	276682-17	276682-18	276682-20	276682-22
Your Reference	UNITS	SS28_0.05	BH02_0.05	BH02_0.5	BH03_0.05	BH03_0.9
Depth		0.05	0.05	0.5	0.05	0.9
Date Sampled		27/08/2021	26/08/2021	26/08/2021	26/08/2021	26/08/2021
Type of sample		Soil	Soil	Soil	Soil	Soil
Date extracted	-	30/08/2021	30/08/2021	30/08/2021	30/08/2021	30/08/2021
Date analysed	-	31/08/2021	31/08/2021	31/08/2021	31/08/2021	31/08/2021
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	%	84	95	85	78	98

vTRH(C6-C10)/BTEXN in Soil						
Our Reference		276682-24	276682-26	276682-27	276682-28	276682-29
Your Reference	UNITS	BH14_0.5	BH14_1.5	QC101_210826	QC300_210825	QC400_210825
Depth		0.5	1.5	-	-	-
Date Sampled		26/08/2021	26/08/2021	26/08/2021	25/08/2021	25/08/2021
Type of sample		Soil	Soil	Soil	Soil	Soil
Date extracted	-	30/08/2021	30/08/2021	30/08/2021	30/08/2021	30/08/2021
Date analysed	-	31/08/2021	31/08/2021	31/08/2021	31/08/2021	31/08/2021
TRH C_6 - C_9	mg/kg	<25	<25	<25	[NA]	[NA]
TRH C_6 - C_{10}	mg/kg	<25	<25	<25	[NA]	[NA]
vTPH C_6 - C_{10} less BTEX (F1)	mg/kg	<25	<25	<25	[NA]	[NA]
Benzene	mg/kg	<0.2	<0.2	<0.2	<0.2	122%
Toluene	mg/kg	<0.5	<0.5	<0.5	<0.5	119%
Ethylbenzene	mg/kg	<1	<1	<1	<1	124%
m+p-xylene	mg/kg	<2	<2	<2	<2	124%
o-Xylene	mg/kg	<1	<1	<1	<1	123%
naphthalene	mg/kg	<1	<1	<1	<1	[NT]
Total +ve Xylenes	mg/kg	<3	<3	<3	<3	[NT]
Surrogate aaa-Trifluorotoluene	%	62	91	74	109	122

vTRH(C6-C10)/BTEXN in Soil		
Our Reference		276682-32
Your Reference	UNITS	SS03b_0.10
Depth		0.10
Date Sampled		27/08/2021
Type of sample		Soil
Date extracted	-	30/08/2021
Date analysed	-	31/08/2021
TRH C_6 - C_9	mg/kg	<25
TRH C_6 - C_{10}	mg/kg	<25
vTPH C_6 - C_{10} less BTEX (F1)	mg/kg	<25
Benzene	mg/kg	<0.2
Toluene	mg/kg	<0.5
Ethylbenzene	mg/kg	<1
m+p-xylene	mg/kg	<2
o-Xylene	mg/kg	<1
naphthalene	mg/kg	<1
Total +ve Xylenes	mg/kg	<3
Surrogate aaa-Trifluorotoluene	%	99

svTRH (C10-C40) in Soil						
Our Reference		276682-1	276682-2	276682-3	276682-4	276682-5
Your Reference	UNITS	SS01_0.05	SS02_0.05	SS03a_0.10	SS04_0.05	SS05_0.05
Depth		0.05	0.05	0.10	0.05	0.05
Date Sampled		24/08/2021	24/08/2021	24/08/2021	24/08/2021	26/08/2021
Type of sample		Soil	Soil	Soil	Soil	Soil
Date extracted	-	30/08/2021	30/08/2021	30/08/2021	30/08/2021	30/08/2021
Date analysed	-	31/08/2021	31/08/2021	01/09/2021	31/08/2021	31/08/2021
TRH C_{10} - C_{14}	mg/kg	<50	<50	<50	<50	<50
TRH C_{15} - C_{28}	mg/kg	<100	<100	130	<100	<100
TRH C_{29} - C_{36}	mg/kg	140	<100	380	<100	<100
Total +ve TRH (C10-C36)	mg/kg	140	<50	510	<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	170	<100	400	<100	130
TRH >C_{34} -C_{40}	mg/kg	110	<100	500	<100	<100
Total +ve TRH (>C10-C40)	mg/kg	280	<50	900	<50	130
Surrogate o-Terphenyl	%	91	83	117	94	82

svTRH (C10-C40) in Soil						
Our Reference		276682-6	276682-7	276682-8	276682-9	276682-10
Your Reference	UNITS	SS10_0.05	SS11_0.05	SS12_0.05	SS14_0.05	SS15_0.05
Depth		0.05	0.05	0.05	0.05	0.05
Date Sampled		25/08/2021	24/08/2021	24/08/2021	24/08/2021	26/08/2021
Type of sample		Soil	Soil	Soil	Soil	Soil
Date extracted	-	30/08/2021	30/08/2021	30/08/2021	30/08/2021	30/08/2021
Date analysed	-	31/08/2021	31/08/2021	31/08/2021	31/08/2021	31/08/2021
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	130	<100	<100
Total +ve TRH (C10-C36)	mg/kg	<50	<50	130	<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	110	<100	160	<100	130
TRH >C_{34} -C_{40}	mg/kg	<100	<100	<100	<100	<100
Total +ve TRH (>C10-C40)	mg/kg	110	<50	160	<50	130
Surrogate o-Terphenyl	%	103	106	100	100	86

svTRH (C10-C40) in Soil						
Our Reference		276682-11	276682-12	276682-13	276682-14	276682-15
Your Reference	UNITS	SS17a_0.10	SS18_0.05	SS23_0.05	SS25_0.10	SS27_0.05
Depth		0.10	0.05	0.05	0.10	0.05
Date Sampled		25/08/2021	24/08/2021	24/08/2021	24/08/2021	27/08/2021
Type of sample		Soil	Soil	Soil	Soil	Soil
Date extracted	-	30/08/2021	30/08/2021	30/08/2021	30/08/2021	30/08/2021
Date analysed	-	31/08/2021	01/09/2021	01/09/2021	01/09/2021	01/09/2021
TRH C_{10} - C_{14}	mg/kg	<50	<50	<50	<50	<50
TRH C_{15} - C_{28}	mg/kg	<100	<100	<100	190	170
TRH C_{29} - C_{36}	mg/kg	150	<100	<100	250	480
Total +ve TRH (C10-C36)	mg/kg	150	<50	<50	440	650
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	160	<100	110	360	490
TRH >C_{34} -C_{40}	mg/kg	180	<100	<100	160	320
Total +ve TRH (>C10-C40)	mg/kg	340	<50	110	520	810
Surrogate o-Terphenyl	%	97	95	103	120	109

svTRH (C10-C40) in Soil						
Our Reference		276682-16	276682-17	276682-18	276682-20	276682-22
Your Reference	UNITS	SS28_0.05	BH02_0.05	BH02_0.5	BH03_0.05	BH03_0.9
Depth		0.05	0.05	0.5	0.05	0.9
Date Sampled		27/08/2021	26/08/2021	26/08/2021	26/08/2021	26/08/2021
Type of sample		Soil	Soil	Soil	Soil	Soil
Date extracted	-	30/08/2021	30/08/2021	30/08/2021	30/08/2021	30/08/2021
Date analysed	-	01/09/2021	01/09/2021	01/09/2021	01/09/2021	01/09/2021
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	%	104	100	101	90	98

svTRH (C10-C40) in Soil					
Our Reference		276682-24	276682-26	276682-27	276682-32
Your Reference	UNITS	BH14_0.5	BH14_1.5	QC101_210826	SS03b_0.10
Depth		0.5	1.5	-	0.10
Date Sampled		26/08/2021	26/08/2021	26/08/2021	27/08/2021
Type of sample		Soil	Soil	Soil	Soil
Date extracted	-	30/08/2021	30/08/2021	30/08/2021	30/08/2021
Date analysed	-	01/09/2021	01/09/2021	01/09/2021	01/09/2021
TRH C_{10} - C_{14}	mg/kg	<50	<50	<50	<50
TRH C_{15} - C_{28}	mg/kg	100	<100	<100	<100
TRH C_{29} - C_{36}	mg/kg	<100	<100	150	<100
Total +ve TRH (C10-C36)	mg/kg	100	<50	150	<50
TRH >C_{10} -C_{16}	mg/kg	<50	<50	<50	<50
TRH >C_{10} - C_{16} less Naphthalene (F2)	mg/kg	<50	<50	<50	<50
TRH >C_{16} -C_{34}	mg/kg	150	<100	180	<100
TRH >C_{34} -C_{40}	mg/kg	<100	<100	110	<100
Total +ve TRH (>C10-C40)	mg/kg	150	<50	290	<50
Surrogate o-Terphenyl	%	83	81	96	101

PAHs in Soil						
Our Reference		276682-1	276682-2	276682-3	276682-4	276682-5
Your Reference	UNITS	SS01_0.05	SS02_0.05	SS03a_0.10	SS04_0.05	SS05_0.05
Depth		0.05	0.05	0.10	0.05	0.05
Date Sampled		24/08/2021	24/08/2021	24/08/2021	24/08/2021	26/08/2021
Type of sample		Soil	Soil	Soil	Soil	Soil
Date extracted	-	30/08/2021	30/08/2021	30/08/2021	30/08/2021	30/08/2021
Date analysed	-	30/08/2021	30/08/2021	01/09/2021	30/08/2021	01/09/2021
Naphthalene	mg/kg	<0.1	<0.1	0.1	<0.1	<0.1
Acenaphthylene	mg/kg	<0.1	<0.1	0.4	<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	0.2	<0.1	0.2
Anthracene	mg/kg	<0.1	<0.1	0.2	<0.1	<0.1
Fluoranthene	mg/kg	0.2	<0.1	0.2	<0.1	0.5
Pyrene	mg/kg	0.2	<0.1	0.3	<0.1	0.6
Benzo(a)anthracene	mg/kg	<0.1	<0.1	0.2	<0.1	0.6
Chrysene	mg/kg	<0.1	<0.1	0.2	<0.1	0.5
Benzo(b,j+k)fluoranthene	mg/kg	0.3	<0.2	0.4	<0.2	0.3
Benzo(a)pyrene	mg/kg	0.1	<0.05	0.4	<0.05	0.4
Indeno(1,2,3-c,d)pyrene	mg/kg	<0.1	<0.1	0.3	<0.1	0.2
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	0.3	<0.1	0.2
Total +ve PAH's	mg/kg	0.84	<0.05	3.1	<0.05	3.2
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	0.6
Surrogate p-Terphenyl-d14	%	95	92	98	91	99

PAHs in Soil						
Our Reference		276682-6	276682-7	276682-8	276682-9	276682-10
Your Reference	UNITS	SS10_0.05	SS11_0.05	SS12_0.05	SS14_0.05	SS15_0.05
Depth		0.05	0.05	0.05	0.05	0.05
Date Sampled		25/08/2021	24/08/2021	24/08/2021	24/08/2021	26/08/2021
Type of sample		Soil	Soil	Soil	Soil	Soil
Date extracted	-	30/08/2021	30/08/2021	30/08/2021	30/08/2021	30/08/2021
Date analysed	-	01/09/2021	01/09/2021	30/08/2021	30/08/2021	01/09/2021
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	0.2	<0.1	<0.1
Anthracene	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Fluoranthene	mg/kg	0.2	<0.1	0.5	<0.1	0.1
Pyrene	mg/kg	0.3	<0.1	0.5	<0.1	<0.1
Benzo(a)anthracene	mg/kg	0.2	<0.1	0.2	<0.1	<0.1
Chrysene	mg/kg	0.2	<0.1	0.2	<0.1	<0.1
Benzo(b,j+k)fluoranthene	mg/kg	<0.2	<0.2	0.6	<0.2	<0.2
Benzo(a)pyrene	mg/kg	0.2	<0.05	0.3	0.05	<0.05
Indeno(1,2,3-c,d)pyrene	mg/kg	<0.1	<0.1	0.2	<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	0.3	<0.1	<0.1
Total +ve PAH's	mg/kg	1.2	<0.05	3.2	0.05	0.1
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	%	79	111	96	96	96

PAHs in Soil						
Our Reference		276682-11	276682-12	276682-13	276682-14	276682-15
Your Reference	UNITS	SS17a_0.10	SS18_0.05	SS23_0.05	SS25_0.10	SS27_0.05
Depth		0.10	0.05	0.05	0.10	0.05
Date Sampled		25/08/2021	24/08/2021	24/08/2021	24/08/2021	27/08/2021
Type of sample		Soil	Soil	Soil	Soil	Soil
Date extracted	-	30/08/2021	30/08/2021	30/08/2021	30/08/2021	30/08/2021
Date analysed	-	01/09/2021	30/08/2021	30/08/2021	01/09/2021	30/08/2021
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	0.3	<0.1
Anthracene	mg/kg	<0.1	<0.1	<0.1	0.1	<0.1
Fluoranthene	mg/kg	<0.1	<0.1	<0.1	0.5	<0.1
Pyrene	mg/kg	<0.1	<0.1	<0.1	0.4	<0.1
Benzo(a)anthracene	mg/kg	<0.1	<0.1	<0.1	0.3	<0.1
Chrysene	mg/kg	<0.1	<0.1	<0.1	0.2	<0.1
Benzo(b,j+k)fluoranthene	mg/kg	<0.2	<0.2	<0.2	0.3	<0.2
Benzo(a)pyrene	mg/kg	<0.05	<0.05	<0.05	0.2	<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	2.5	<0.05
Benzo(a)pyrene TEQ calc (zero)	mg/kg	<0.5	<0.5	<0.5	<0.5	<0.5
Benzo(a)pyrene TEQ calc(half)	mg/kg	<0.5	<0.5	<0.5	<0.5	<0.5
Benzo(a)pyrene TEQ calc(PQL)	mg/kg	<0.5	<0.5	<0.5	<0.5	<0.5
Surrogate p-Terphenyl-d14	%	103	95	96	111	93

PAHs in Soil						
Our Reference	UNITS	276682-16	276682-17	276682-18	276682-20	276682-22
Your Reference		SS28_0.05	BH02_0.05	BH02_0.5	BH03_0.05	BH03_0.9
Depth		0.05	0.05	0.5	0.05	0.9
Date Sampled		27/08/2021	26/08/2021	26/08/2021	26/08/2021	26/08/2021
Type of sample		Soil	Soil	Soil	Soil	Soil
Date extracted	-	30/08/2021	30/08/2021	30/08/2021	30/08/2021	30/08/2021
Date analysed	-	01/09/2021	30/08/2021	30/08/2021	30/08/2021	01/09/2021
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	0.3	<0.2	<0.2	<0.2	<0.2
Benzo(a)pyrene	mg/kg	0.08	<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	0.74	<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	%	109	99	100	100	108

PAHs in Soil					
Our Reference		276682-24	276682-26	276682-27	276682-32
Your Reference	UNITS	BH14_0.5	BH14_1.5	QC101_210826	SS03b_0.10
Depth		0.5	1.5	-	0.10
Date Sampled		26/08/2021	26/08/2021	26/08/2021	27/08/2021
Type of sample		Soil	Soil	Soil	Soil
Date extracted	-	01/09/2021	30/08/2021	30/08/2021	30/08/2021
Date analysed	-	01/09/2021	31/08/2021	31/08/2021	31/08/2021
Naphthalene	mg/kg	<0.1	<0.1	<0.1	<0.1
Acenaphthylene	mg/kg	<0.1	<0.1	<0.1	<0.1
Acenaphthene	mg/kg	<0.1	<0.1	<0.1	<0.1
Fluorene	mg/kg	<0.1	<0.1	<0.1	<0.1
Phenanthrene	mg/kg	0.6	<0.1	<0.1	0.2
Anthracene	mg/kg	0.2	<0.1	<0.1	<0.1
Fluoranthene	mg/kg	0.9	<0.1	<0.1	<0.1
Pyrene	mg/kg	0.9	<0.1	<0.1	<0.1
Benzo(a)anthracene	mg/kg	0.4	<0.1	<0.1	<0.1
Chrysene	mg/kg	0.4	<0.1	<0.1	<0.1
Benzo(b,j+k)fluoranthene	mg/kg	0.6	<0.2	<0.2	<0.2
Benzo(a)pyrene	mg/kg	0.4	<0.05	<0.05	<0.05
Indeno(1,2,3-c,d)pyrene	mg/kg	0.1	<0.1	<0.1	<0.1
Dibenzo(a,h)anthracene	mg/kg	<0.1	<0.1	<0.1	<0.1
Benzo(g,h,i)perylene	mg/kg	0.1	<0.1	<0.1	<0.1
Total +ve PAH's	mg/kg	4.7	<0.05	<0.05	0.2
Benzo(a)pyrene TEQ calc (zero)	mg/kg	<0.5	<0.5	<0.5	<0.5
Benzo(a)pyrene TEQ calc(half)	mg/kg	0.5	<0.5	<0.5	<0.5
Benzo(a)pyrene TEQ calc(PQL)	mg/kg	0.6	<0.5	<0.5	<0.5
Surrogate p-Terphenyl-d14	%	84	94	100	91

Organochlorine Pesticides in soil						
Our Reference		276682-3	276682-5	276682-7	276682-10	276682-11
Your Reference	UNITS	SS03a_0.10	SS05_0.05	SS11_0.05	SS15_0.05	SS17a_0.10
Depth		0.10	0.05	0.05	0.05	0.10
Date Sampled		24/08/2021	26/08/2021	24/08/2021	26/08/2021	25/08/2021
Type of sample		Soil	Soil	Soil	Soil	Soil
Date extracted	-	30/08/2021	30/08/2021	30/08/2021	30/08/2021	30/08/2021
Date analysed	-	01/09/2021	30/08/2021	01/09/2021	01/09/2021	01/09/2021
alpha-BHC	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
HCB	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
beta-BHC	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
gamma-BHC	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Heptachlor	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
delta-BHC	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Aldrin	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Heptachlor Epoxide	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
gamma-Chlordane	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
alpha-chlordane	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Endosulfan I	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
pp-DDE	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Dieldrin	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Endrin	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Endosulfan II	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
pp-DDD	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Endrin Aldehyde	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
pp-DDT	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Endosulfan Sulphate	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Methoxychlor	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Total +ve DDT+DDD+DDE	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Surrogate TCMX	%	92	111	100	89	95

Organochlorine Pesticides in soil						
Our Reference		276682-14	276682-16	276682-24	276682-26	276682-32
Your Reference	UNITS	SS25_0.10	SS28_0.05	BH14_0.5	BH14_1.5	SS03b_0.10
Depth		0.10	0.05	0.5	1.5	0.10
Date Sampled		24/08/2021	27/08/2021	26/08/2021	26/08/2021	27/08/2021
Type of sample		Soil	Soil	Soil	Soil	Soil
Date extracted	-	30/08/2021	30/08/2021	01/09/2021	30/08/2021	30/08/2021
Date analysed	-	01/09/2021	01/09/2021	01/09/2021	31/08/2021	31/08/2021
alpha-BHC	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
HCB	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
beta-BHC	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
gamma-BHC	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Heptachlor	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
delta-BHC	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Aldrin	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Heptachlor Epoxide	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
gamma-Chlordane	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
alpha-chlordane	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Endosulfan I	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
pp-DDE	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Dieldrin	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Endrin	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Endosulfan II	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
pp-DDD	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Endrin Aldehyde	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
pp-DDT	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Endosulfan Sulphate	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Methoxychlor	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Total +ve DDT+DDD+DDE	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Surrogate TCMX	%	102	101	84	84	99

Organophosphorus Pesticides in Soil						
Our Reference		276682-3	276682-5	276682-7	276682-10	276682-11
Your Reference	UNITS	SS03a_0.10	SS05_0.05	SS11_0.05	SS15_0.05	SS17a_0.10
Depth		0.10	0.05	0.05	0.05	0.10
Date Sampled		24/08/2021	26/08/2021	24/08/2021	26/08/2021	25/08/2021
Type of sample		Soil	Soil	Soil	Soil	Soil
Date extracted	-	30/08/2021	30/08/2021	30/08/2021	30/08/2021	30/08/2021
Date analysed	-	01/09/2021	30/08/2021	01/09/2021	01/09/2021	01/09/2021
Dichlorvos	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Dimethoate	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Diazinon	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Chlorpyriphos-methyl	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Ronnel	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Fenitrothion	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Malathion	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Chlorpyriphos	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Parathion	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Bromophos-ethyl	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Ethion	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Azinphos-methyl (Guthion)	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Surrogate TCMX	%	92	111	100	89	95

Organophosphorus Pesticides in Soil						
Our Reference		276682-14	276682-16	276682-24	276682-26	276682-32
Your Reference	UNITS	SS25_0.10	SS28_0.05	BH14_0.5	BH14_1.5	SS03b_0.10
Depth		0.10	0.05	0.5	1.5	0.10
Date Sampled		24/08/2021	27/08/2021	26/08/2021	26/08/2021	27/08/2021
Type of sample		Soil	Soil	Soil	Soil	Soil
Date extracted	-	30/08/2021	30/08/2021	01/09/2021	30/08/2021	30/08/2021
Date analysed	-	01/09/2021	01/09/2021	01/09/2021	31/08/2021	31/08/2021
Dichlorvos	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Dimethoate	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Diazinon	mg/kg	0.1	<0.1	<0.1	<0.1	<0.1
Chlorpyriphos-methyl	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Ronnel	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Fenitrothion	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Malathion	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Chlorpyriphos	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Parathion	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Bromophos-ethyl	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Ethion	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Azinphos-methyl (Guthion)	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Surrogate TCMX	%	102	101	84	84	99

Acid Extractable metals in soil						
Our Reference		276682-1	276682-2	276682-3	276682-4	276682-5
Your Reference	UNITS	SS01_0.05	SS02_0.05	SS03a_0.10	SS04_0.05	SS05_0.05
Depth		0.05	0.05	0.10	0.05	0.05
Date Sampled		24/08/2021	24/08/2021	24/08/2021	24/08/2021	26/08/2021
Type of sample		Soil	Soil	Soil	Soil	Soil
Date prepared	-	30/08/2021	30/08/2021	30/08/2021	30/08/2021	30/08/2021
Date analysed	-	30/08/2021	30/08/2021	30/08/2021	30/08/2021	30/08/2021
Arsenic	mg/kg	<4	<4	<4	<4	13
Cadmium	mg/kg	<0.4	0.5	<0.4	0.6	<0.4
Chromium	mg/kg	6	2	17	3	16
Copper	mg/kg	7	7	14	8	21
Lead	mg/kg	17	36	11	72	48
Mercury	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Nickel	mg/kg	4	2	24	2	10
Zinc	mg/kg	56	68	110	71	94

Acid Extractable metals in soil						
Our Reference		276682-6	276682-7	276682-8	276682-9	276682-10
Your Reference	UNITS	SS10_0.05	SS11_0.05	SS12_0.05	SS14_0.05	SS15_0.05
Depth		0.05	0.05	0.05	0.05	0.05
Date Sampled		25/08/2021	24/08/2021	24/08/2021	24/08/2021	26/08/2021
Type of sample		Soil	Soil	Soil	Soil	Soil
Date prepared	-	30/08/2021	30/08/2021	30/08/2021	30/08/2021	30/08/2021
Date analysed	-	30/08/2021	30/08/2021	30/08/2021	30/08/2021	30/08/2021
Arsenic	mg/kg	4	<4	<4	5	<4
Cadmium	mg/kg	<0.4	<0.4	<0.4	<0.4	<0.4
Chromium	mg/kg	12	20	12	14	4
Copper	mg/kg	6	17	13	10	12
Lead	mg/kg	15	18	18	20	25
Mercury	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Nickel	mg/kg	3	3	10	5	2
Zinc	mg/kg	15	22	45	39	69

Acid Extractable metals in soil						
Our Reference		276682-11	276682-12	276682-13	276682-14	276682-15
Your Reference	UNITS	SS17a_0.10	SS18_0.05	SS23_0.05	SS25_0.10	SS27_0.05
Depth		0.10	0.05	0.05	0.10	0.05
Date Sampled		25/08/2021	24/08/2021	24/08/2021	24/08/2021	27/08/2021
Type of sample		Soil	Soil	Soil	Soil	Soil
Date prepared	-	30/08/2021	30/08/2021	30/08/2021	30/08/2021	30/08/2021
Date analysed	-	30/08/2021	30/08/2021	30/08/2021	30/08/2021	30/08/2021
Arsenic	mg/kg	6	<4	6	10	<4
Cadmium	mg/kg	<0.4	<0.4	<0.4	<0.4	<0.4
Chromium	mg/kg	7	1	10	16	22
Copper	mg/kg	20	3	13	17	26
Lead	mg/kg	20	8	17	20	16
Mercury	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Nickel	mg/kg	6	1	9	13	28
Zinc	mg/kg	38	49	45	54	140

Acid Extractable metals in soil						
Our Reference		276682-16	276682-17	276682-18	276682-20	276682-22
Your Reference	UNITS	SS28_0.05	BH02_0.05	BH02_0.5	BH03_0.05	BH03_0.9
Depth		0.05	0.05	0.5	0.05	0.9
Date Sampled		27/08/2021	26/08/2021	26/08/2021	26/08/2021	26/08/2021
Type of sample		Soil	Soil	Soil	Soil	Soil
Date prepared	-	30/08/2021	30/08/2021	30/08/2021	30/08/2021	30/08/2021
Date analysed	-	30/08/2021	30/08/2021	30/08/2021	30/08/2021	30/08/2021
Arsenic	mg/kg	<4	5	5	11	17
Cadmium	mg/kg	<0.4	<0.4	<0.4	<0.4	<0.4
Chromium	mg/kg	9	17	16	15	16
Copper	mg/kg	12	18	19	22	22
Lead	mg/kg	5	15	16	63	26
Mercury	mg/kg	<0.1	<0.1	<0.1	0.1	<0.1
Nickel	mg/kg	10	15	10	11	9
Zinc	mg/kg	23	62	59	140	62

Acid Extractable metals in soil						
Our Reference		276682-24	276682-26	276682-27	276682-32	276682-33
Your Reference	UNITS	BH14_0.5	BH14_1.5	QC101_210826	SS03b_0.10	SS25_0.10 - [TRIPLICATE]
Depth		0.5	1.5	-	0.10	0.10
Date Sampled		26/08/2021	26/08/2021	26/08/2021	27/08/2021	24/08/2021
Type of sample		Soil	Soil	Soil	Soil	Soil
Date prepared	-	30/08/2021	30/08/2021	30/08/2021	30/08/2021	30/08/2021
Date analysed	-	30/08/2021	30/08/2021	30/08/2021	30/08/2021	30/08/2021
Arsenic	mg/kg	8	7	11	5	5
Cadmium	mg/kg	<0.4	<0.4	<0.4	<0.4	<0.4
Chromium	mg/kg	11	19	15	12	9
Copper	mg/kg	20	8	23	11	10
Lead	mg/kg	24	14	58	17	18
Mercury	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Nickel	mg/kg	21	12	10	17	8

Acid Extractable metals in soil			
Our Reference		276682-34	276682-35
Your Reference	UNITS	SS17a_0.10 - [TRIPLICATE]	SS01_0.05 - [TRIPLICATE]
Depth		0.10	0.05
Date Sampled		25/08/2021	24/08/2021
Type of sample		Soil	Soil
Date prepared	-	30/08/2021	30/08/2021
Date analysed	-	30/08/2021	30/08/2021
Arsenic	mg/kg	8	<4
Cadmium	mg/kg	<0.4	<0.4
Chromium	mg/kg	10	10
Copper	mg/kg	27	14
Lead	mg/kg	26	17
Mercury	mg/kg	<0.1	<0.1
Nickel	mg/kg	7	9
Zinc	mg/kg	39	53

Moisture						
Our Reference		276682-1	276682-2	276682-3	276682-4	276682-5
Your Reference	UNITS	SS01_0.05	SS02_0.05	SS03a_0.10	SS04_0.05	SS05_0.05
Depth		0.05	0.05	0.10	0.05	0.05
Date Sampled		24/08/2021	24/08/2021	24/08/2021	24/08/2021	26/08/2021
Type of sample		Soil	Soil	Soil	Soil	Soil
Date prepared	-	27/08/2021	27/08/2021	27/08/2021	27/08/2021	27/08/2021
Date analysed	-	30/08/2021	30/08/2021	30/08/2021	30/08/2021	30/08/2021
Moisture	%	13	11	6.4	11	29

Moisture						
Our Reference		276682-6	276682-7	276682-8	276682-9	276682-10
Your Reference	UNITS	SS10_0.05	SS11_0.05	SS12_0.05	SS14_0.05	SS15_0.05
Depth		0.05	0.05	0.05	0.05	0.05
Date Sampled		25/08/2021	24/08/2021	24/08/2021	24/08/2021	26/08/2021
Type of sample		Soil	Soil	Soil	Soil	Soil
Date prepared	-	27/08/2021	27/08/2021	27/08/2021	27/08/2021	27/08/2021
Date analysed	-	30/08/2021	30/08/2021	30/08/2021	30/08/2021	30/08/2021
Moisture	%	16	22	17	20	23

Moisture						
Our Reference		276682-11	276682-12	276682-13	276682-14	276682-15
Your Reference	UNITS	SS17a_0.10	SS18_0.05	SS23_0.05	SS25_0.10	SS27_0.05
Depth		0.10	0.05	0.05	0.10	0.05
Date Sampled		25/08/2021	24/08/2021	24/08/2021	24/08/2021	27/08/2021
Type of sample		Soil	Soil	Soil	Soil	Soil
Date prepared	-	27/08/2021	27/08/2021	27/08/2021	27/08/2021	27/08/2021
Date analysed	-	30/08/2021	30/08/2021	30/08/2021	30/08/2021	30/08/2021
Moisture	%	15	9.7	23	49	18

Moisture						
Our Reference		276682-16	276682-17	276682-18	276682-20	276682-22
Your Reference	UNITS	SS28_0.05	BH02_0.05	BH02_0.5	BH03_0.05	BH03_0.9
Depth		0.05	0.05	0.5	0.05	0.9
Date Sampled		27/08/2021	26/08/2021	26/08/2021	26/08/2021	26/08/2021
Type of sample		Soil	Soil	Soil	Soil	Soil
Date prepared	-	27/08/2021	27/08/2021	27/08/2021	27/08/2021	27/08/2021
Date analysed	-	30/08/2021	30/08/2021	30/08/2021	30/08/2021	30/08/2021
Moisture	%	2.7	14	9.4	19	13

Moisture					
Our Reference		276682-24	276682-26	276682-27	276682-32
Your Reference	UNITS	BH14_0.5	BH14_1.5	QC101_210826	SS03b_0.10
Depth		0.5	1.5	-	0.10
Date Sampled		26/08/2021	26/08/2021	26/08/2021	27/08/2021
Type of sample		Soil	Soil	Soil	Soil
Date prepared	-	27/08/2021	27/08/2021	27/08/2021	27/08/2021
Date analysed	-	30/08/2021	30/08/2021	30/08/2021	30/08/2021
Moisture	%	20	19	20	11

Asbestos ID - soils						
Our Reference		276682-3	276682-5	276682-7	276682-10	276682-11
Your Reference	UNITS	SS03a_0.10	SS05_0.05	SS11_0.05	SS15_0.05	SS17a_0.10
Depth		0.10	0.05	0.05	0.05	0.10
Date Sampled		24/08/2021	26/08/2021	24/08/2021	26/08/2021	25/08/2021
Type of sample		Soil	Soil	Soil	Soil	Soil
Date analysed	-	02/09/2021	02/09/2021	02/09/2021	02/09/2021	02/09/2021
Sample mass tested	g	Approx. 55g	Approx. 25g	Approx. 20g	Approx. 40g	Approx. 40g
Sample Description	-	Brown coarse-grained soil & rocks	Brown coarse-grained soil & rocks	Brown coarse-grained soil & rocks	Brown coarse-grained soil & rocks	Brown coarse-grained soil & rocks
Asbestos ID in soil	-	No asbestos detected at reporting limit of 0.1g/kg Organic fibres detected	No asbestos detected at reporting limit of 0.1g/kg Organic fibres detected	No asbestos detected at reporting limit of 0.1g/kg Organic fibres detected	No asbestos detected at reporting limit of 0.1g/kg Organic fibres detected	No asbestos detected at reporting limit of 0.1g/kg Organic fibres detected
Trace Analysis	-	No asbestos detected	No asbestos detected	No asbestos detected	No asbestos detected	No asbestos detected

Asbestos ID - soils						
Our Reference		276682-14	276682-16	276682-24	276682-26	276682-32
Your Reference	UNITS	SS25_0.10	SS28_0.05	BH14_0.5	BH14_1.5	SS03b_0.10
Depth		0.10	0.05	0.5	1.5	0.10
Date Sampled		24/08/2021	27/08/2021	26/08/2021	26/08/2021	27/08/2021
Type of sample		Soil	Soil	Soil	Soil	Soil
Date analysed	-	02/09/2021	02/09/2021	02/09/2021	02/09/2021	02/09/2021
Sample mass tested	g	Approx. 35g	Approx. 50g	Approx. 50g	Approx. 40g	Approx. 40g
Sample Description	-	Brown coarse-grained soil & rocks	Brown coarse-grained soil & rocks	Brown coarse-grained soil & rocks	Brown coarse-grained soil & rocks	Brown coarse-grained soil & rocks
Asbestos ID in soil	-	No asbestos detected at reporting limit of 0.1g/kg Organic fibres detected	No asbestos detected at reporting limit of 0.1g/kg Organic fibres detected	No asbestos detected at reporting limit of 0.1g/kg Organic fibres detected	No asbestos detected at reporting limit of 0.1g/kg Organic fibres detected	No asbestos detected at reporting limit of 0.1g/kg Organic fibres detected
Trace Analysis	-	No asbestos detected	No asbestos detected	No asbestos detected	No asbestos detected	No asbestos detected

PFAS in Soils Extended		
Our Reference		276682-6
Your Reference	UNITS	SS10_0.05
Depth		0.05
Date Sampled		25/08/2021
Type of sample		Soil
Date prepared	-	30/08/2021
Date analysed	-	30/08/2021
Perfluorobutanesulfonic acid	µg/kg	<0.1
Perfluoropentanesulfonic acid	µg/kg	<0.1
Perfluorohexanesulfonic acid - PFHxS	µg/kg	<0.1
Perfluoroheptanesulfonic acid	µg/kg	<0.1
Perfluorooctanesulfonic acid PFOS	µg/kg	<0.1
Perfluorodecanesulfonic acid	µg/kg	<0.2
Perfluorobutanoic acid	µg/kg	<0.2
Perfluoropentanoic acid	µg/kg	<0.2
Perfluorohexanoic acid	µg/kg	<0.1
Perfluoroheptanoic acid	µg/kg	<0.1
Perfluorooctanoic acid PFOA	µg/kg	<0.1
Perfluorononanoic acid	µg/kg	<0.1
Perfluorodecanoic acid	µg/kg	<0.5
Perfluoroundecanoic acid	µg/kg	<0.5
Perfluorododecanoic acid	µg/kg	<0.5
Perfluorotridecanoic acid	µg/kg	<0.5
Perfluorotetradecanoic acid	µg/kg	<5
4:2 FTS	µg/kg	<0.1
6:2 FTS	µg/kg	<0.1
8:2 FTS	µg/kg	<0.2
10:2 FTS	µg/kg	<0.2
Perfluorooctane sulfonamide	µg/kg	<1
N-Methyl perfluorooctane sulfonamide	µg/kg	<1
N-Ethyl perfluorooctanesulfon amide	µg/kg	<1
N-Me perfluorooctanesulfonamid oethanol	µg/kg	<1
N-Et perfluorooctanesulfonamid oethanol	µg/kg	<5
MePerfluorooctanesulf- amid oacetic acid	µg/kg	<0.2
EtPerfluorooctanesulf amid oacetic acid	µg/kg	<0.2
Surrogate $^{13}C_8$ *PFOS*	%	102
Surrogate $^{13}C_2$ *PFOA*	%	99
Extracted ISTD $^{13}C_3$ *PFBS*	%	87
Extracted ISTD $^{18}O_2$ *PFHxS*	%	93
Extracted ISTD $^{13}C_4$ *PFOS*	%	90

PFAS in Soils Extended		
Our Reference		276682-6
Your Reference	UNITS	SS10_0.05
Depth		0.05
Date Sampled		25/08/2021
Type of sample		Soil
Extracted ISTD $^{13}C_4$ *PFBA*	%	89
Extracted ISTD $^{13}C_3$ *PFPeA*	%	88
Extracted ISTD $^{13}C_2$ *PFHxA*	%	97
Extracted ISTD $^{13}C_4$ *PFHpA*	%	93
Extracted ISTD $^{13}C_4$ *PFOA*	%	94
Extracted ISTD $^{13}C_5$ *PFNA*	%	92
Extracted ISTD $^{13}C_2$ *PFDA*	%	98
Extracted ISTD $^{13}C_2$ *PFUnDA*	%	78
Extracted ISTD $^{13}C_2$ *PFDoDA*	%	98
Extracted ISTD $^{13}C_2$ *PFTeDA*	%	98
Extracted ISTD $^{13}C_2$ *4:2FTS*	%	94
Extracted ISTD $^{13}C_2$ *6:2FTS*	%	101
Extracted ISTD $^{13}C_2$ *8:2FTS*	%	113
Extracted ISTD $^{13}C_8$ *FOSA*	%	91
Extracted ISTD d_3 *N MeFOSA*	%	89
Extracted ISTD d_5 *N EtFOSA*	%	88
Extracted ISTD d_7 *N MeFOSE*	%	83
Extracted ISTD d_9 *N EtFOSE*	%	79
Extracted ISTD d_3 *N MeFOSAA*	%	97
Extracted ISTD d_5 *N EtFOSAA*	%	98
Total Positive PFHxS & PFOS	µg/kg	<0.1
Total Positive PFOS & PFOA	µg/kg	<0.1
Total Positive PFAS	µg/kg	<0.1

vTRH(C6-C10)/BTEXN in Water			
Our Reference		276682-30	276682-31
Your Reference	UNITS	QC501_210826	QC501_210827
Depth		-	-
Date Sampled		26/08/2021	27/08/2021
Type of sample		Water	Water
Date extracted	-	27/08/2021	27/08/2021
Date analysed	-	27/08/2021	27/08/2021
TRH C_6 - C_9	µg/L	<10	<10
TRH C_6 - C_{10}	µg/L	<10	<10
TRH C_6 - C_{10} less BTEX (F1)	µg/L	<10	<10
Benzene	µg/L	<1	<1
Toluene	µg/L	<1	<1
Ethylbenzene	µg/L	<1	<1
m+p-xylene	µg/L	<2	<2
o-xylene	µg/L	<1	<1
Naphthalene	µg/L	<1	<1
Surrogate Dibromofluoromethane	%	99	99
Surrogate toluene-d8	%	97	96
Surrogate 4-BFB	%	100	100

svTRH (C10-C40) in Water			
Our Reference		276682-30	276682-31
Your Reference	UNITS	QC501_210826	QC501_210827
Depth		-	-
Date Sampled		26/08/2021	27/08/2021
Type of sample		Water	Water
Date extracted	-	30/08/2021	30/08/2021
Date analysed	-	30/08/2021	30/08/2021
TRH C_{10} - C_{14}	µg/L	<50	<50
TRH C_{15} - C_{28}	µg/L	<100	<100
TRH C_{29} - C_{36}	µg/L	<100	<100
Total +ve TRH (C10-C36)	µg/L	<50	<50
TRH >C_{10} - C_{16}	µg/L	<50	<50
TRH >C_{10} - C_{16} less Naphthalene (F2)	µg/L	<50	<50
TRH >C_{16} - C_{34}	µg/L	<100	<100
TRH >C_{34} - C_{40}	µg/L	<100	<100
Total +ve TRH (>C10-C40)	µg/L	<50	<50
Surrogate o-Terphenyl	%	78	82

PAHs in Water			
Our Reference		276682-30	276682-31
Your Reference	UNITS	QC501_210826	QC501_210827
Depth		-	-
Date Sampled		26/08/2021	27/08/2021
Type of sample		Water	Water
Date extracted	-	30/08/2021	30/08/2021
Date analysed	-	30/08/2021	30/08/2021
Naphthalene	µg/L	<1	<1
Acenaphthylene	µg/L	<1	<1
Acenaphthene	µg/L	<1	<1
Fluorene	µg/L	<1	<1
Phenanthrene	µg/L	<1	<1
Anthracene	µg/L	<1	<1
Fluoranthene	µg/L	<1	<1
Pyrene	µg/L	<1	<1
Benzo(a)anthracene	µg/L	<1	<1
Chrysene	µg/L	<1	<1
Benzo(b,j+k)fluoranthene	µg/L	<2	<2
Benzo(a)pyrene	µg/L	<1	<1
Indeno(1,2,3-c,d)pyrene	µg/L	<1	<1
Dibenzo(a,h)anthracene	µg/L	<1	<1
Benzo(g,h,i)perylene	µg/L	<1	<1
Benzo(a)pyrene TEQ	µg/L	<5	<5
Total +ve PAH's	µg/L	NIL (+)VE	NIL (+)VE
Surrogate p-Terphenyl-d14	%	91	95

Organochlorine Pesticides in Water			
Our Reference		276682-30	276682-31
Your Reference	UNITS	QC501_210826	QC501_210827
Depth		-	-
Date Sampled		26/08/2021	27/08/2021
Type of sample		Water	Water
Date extracted	-	30/08/2021	30/08/2021
Date analysed	-	30/08/2021	30/08/2021
alpha-BHC	µg/L	<0.2	<0.2
HCB	µg/L	<0.2	<0.2
beta-BHC	µg/L	<0.2	<0.2
gamma-BHC	µg/L	<0.2	<0.2
Heptachlor	µg/L	<0.2	<0.2
delta-BHC	µg/L	<0.2	<0.2
Aldrin	µg/L	<0.2	<0.2
Heptachlor Epoxide	µg/L	<0.2	<0.2
gamma-Chlordane	µg/L	<0.2	<0.2
alpha-Chlordane	µg/L	<0.2	<0.2
Endosulfan I	µg/L	<0.2	<0.2
pp-DDE	µg/L	<0.2	<0.2
Dieldrin	µg/L	<0.2	<0.2
Endrin	µg/L	<0.2	<0.2
Endosulfan II	µg/L	<0.2	<0.2
pp-DDD	µg/L	<0.2	<0.2
Endrin Aldehyde	µg/L	<0.2	<0.2
pp-DDT	µg/L	<0.2	<0.2
Endosulfan Sulphate	µg/L	<0.2	<0.2
Methoxychlor	µg/L	<0.2	<0.2
Surrogate TCMX	%	86	89

OP Pesticides in Water			
Our Reference		276682-30	276682-31
Your Reference	UNITS	QC501_210826	QC501_210827
Depth		-	-
Date Sampled		26/08/2021	27/08/2021
Type of sample		Water	Water
Date extracted	-	30/08/2021	30/08/2021
Date analysed	-	30/08/2021	30/08/2021
Dichlorvos	µg/L	<0.2	<0.2
Dimethoate	µg/L	<0.2	<0.2
Diazinon	µg/L	<0.2	<0.2
Chlorpyriphos-methyl	µg/L	<0.2	<0.2
Ronnel	µg/L	<0.2	<0.2
Fenitrothion	µg/L	<0.2	<0.2
Malathion	µg/L	<0.2	<0.2
Chlorpyriphos	µg/L	<0.2	<0.2
Parathion	µg/L	<0.2	<0.2
Bromophos ethyl	µg/L	<0.2	<0.2
Ethion	µg/L	<0.2	<0.2
Azinphos-methyl (Guthion)	µg/L	<0.2	<0.2
Surrogate TCMX	%	86	89

Metals in Water - Dissolved			
Our Reference		276682-30	276682-31
Your Reference	UNITS	QC501_210826	QC501_210827
Depth		-	-
Date Sampled		26/08/2021	27/08/2021
Type of sample		Water	Water
Date digested	-	30/08/2021	30/08/2021
Date analysed	-	30/08/2021	30/08/2021
Arsenic - Dissolved	mg/L	<0.05	<0.05
Cadmium - Dissolved	mg/L	<0.01	<0.01
Chromium - Dissolved	mg/L	<0.01	<0.01
Copper - Dissolved	mg/L	<0.01	<0.01
Lead - Dissolved	mg/L	<0.03	<0.03
Mercury - Dissolved	mg/L	<0.0005	<0.0005
Nickel - Dissolved	mg/L	<0.02	<0.02
Zinc - Dissolved	mg/L	<0.02	<0.02

Method ID	Methodology Summary
ASB-001	Asbestos ID - Qualitative identification of asbestos in bulk samples using Polarised Light Microscopy and Dispersion Staining Techniques including Synthetic Mineral Fibre and Organic Fibre as per Australian Standard 4964-2004.
Inorg-008	Moisture content determined by heating at 105+/-5 °C for a minimum of 12 hours.
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	Determination of VOCs sampled onto coconut shell charcoal sorbent tubes, that can be desorbed using carbon disulphide, and analysed by GC-MS.
Org-022/025	Soil samples are extracted with Dichloromethane/Acetone and waters with Dichloromethane and analysed by GC-MS/GC-MSMS.
Org-022/025	Soil samples are extracted with dichloromethane/acetone and waters with dichloromethane and analysed by GC-MS/GC-MSMS. Note, the Total +ve reported DDD+DDE+DDT PQL is reflective of the lowest individual PQL and is therefore simply a sum of the positive individually report DDD+DDE+DDT.
Org-022/025	Soil samples are extracted with Dichloromethane/Acetone and waters with Dichloromethane and analysed by GC-MS/GC-MSMS. Benzo(a)pyrene TEQ as per NEPM B1 Guideline on Investigation Levels for Soil and Groundwater - 2013.

Method ID	Methodology Summary
Org-022/025	Soil samples are extracted with Dichloromethane/Acetone and waters with Dichloromethane and analysed by GC-MS and/or GC-MS/MS. Benzo(a)pyrene TEQ as per NEPM B1 Guideline on Investigation Levels for Soil and Groundwater - 2013. For soil results:- 1. 'EQ PQL'values are assuming all contributing PAHs reported as <PQL are actually at the PQL. This is the most conservative approach and can give false positive TEQs given that PAHs that contribute to the TEQ calculation may not be present. 2. 'EQ zero'values are assuming all contributing PAHs reported as <PQL are zero. This is the least conservative approach and is more susceptible to false negative TEQs when PAHs that contribute to the TEQ calculation are present but below PQL. 3. 'EQ half PQL'values are assuming all contributing PAHs reported as <PQL are half the stipulated PQL. Hence a mid-point between the most and least conservative approaches above. Note, the Total +ve PAHs PQL is reflective of the lowest individual PQL and is therefore "Total +ve PAHs" is simply a sum of the positive individual PAHs.
Org-023	Water samples are analysed directly 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.
Org-023	Soil samples are extracted with methanol and spiked into water prior to analysing by purge and trap GC-MS. Water samples are analysed directly by purge and trap GC-MS. F1 = (C6-C10)-BTEX as per NEPM B1 Guideline on Investigation Levels for Soil and Groundwater.
Org-023	Soil samples are extracted with methanol and spiked into water prior to analysing by purge and trap GC-MS. Water samples are analysed directly by purge and trap GC-MS. F1 = (C6-C10)-BTEX as per NEPM B1 Guideline on Investigation Levels for Soil and Groundwater. Note, the Total +ve Xylene PQL is reflective of the lowest individual PQL and is therefore "Total +ve Xylenes" is simply a sum of the positive individual Xylenes.
Org-029	Soil samples are extracted with basified Methanol. Waters and soil extracts are directly injected and/or concentrated/extracted using SPE. TCLPs/ASLP leachates are centrifuged, the supernatant is then analysed (including amendment with solvent) - as per the option in AS4439.3. Analysis is undertaken with LC-MS/MS. PFAS results include the sum of branched and linear isomers where applicable. Please note that PFAS results are corrected for Extracted Internal Standards (QSM 5.3 Table B-15 terminology), which are mass labelled analytes added prior to sample preparation to assess matrix effects and verify processing of the sample. PFAS analytes without a commercially available mass labelled analogue are corrected vs a closely eluting mass labelled PFAS compound. Surrogates are also reported, in this context they are mass labelled PFAS compounds added prior to extraction but are used as monitoring compounds only (not used for result correction). Envicarb (or similar) is used discretionally to remove interfering matrix components. Please contact the laboratory if estimates of Measurement Uncertainty are required as per WA DER.

QUALITY CONTROL: vTRH(C6-C10)/BTEXN in Soil					Duplicate				Spike Recovery %	
Test Description	Units	PQL	Method	Blank	#	Base	Dup.	RPD	LCS-2	276682-7
Date extracted	-			30/08/2021	3	30/08/2021	30/08/2021		30/08/2021	30/08/2021
Date analysed	-			31/08/2021	3	31/08/2021	31/08/2021		31/08/2021	31/08/2021
TRH C_6 - C_9	mg/kg	25	Org-023	<25	3	<25	<25	0	118	99
TRH C_6 - C_{10}	mg/kg	25	Org-023	<25	3	<25	<25	0	118	99
Benzene	mg/kg	0.2	Org-023	<0.2	3	<0.2	<0.2	0	115	96
Toluene	mg/kg	0.5	Org-023	<0.5	3	<0.5	<0.5	0	121	102
Ethylbenzene	mg/kg	1	Org-023	<1	3	<1	<1	0	117	97
m+p-xylene	mg/kg	2	Org-023	<2	3	<2	<2	0	118	99
o-Xylene	mg/kg	1	Org-023	<1	3	<1	<1	0	122	103
naphthalene	mg/kg	1	Org-023	<1	3	<1	<1	0	[NT]	[NT]
Surrogate aaa-Trifluorotoluene	%		Org-023	102	3	95	104	9	106	96

QUALITY CONTROL: vTRH(C6-C10)/BTEXN in Soil					Duplicate				Spike Recovery %	
Test Description	Units	PQL	Method	Blank	#	Base	Dup.	RPD	LCS-3	276682-16
Date extracted	-			[NT]	11	30/08/2021	30/08/2021		30/08/2021	30/08/2021
Date analysed	-			[NT]	11	31/08/2021	31/08/2021		31/08/2021	31/08/2021
TRH C_6 - C_9	mg/kg	25	Org-023	[NT]	11	<25	<25	0	94	84
TRH C_6 - C_{10}	mg/kg	25	Org-023	[NT]	11	<25	<25	0	94	84
Benzene	mg/kg	0.2	Org-023	[NT]	11	<0.2	<0.2	0	100	77
Toluene	mg/kg	0.5	Org-023	[NT]	11	<0.5	<0.5	0	104	85
Ethylbenzene	mg/kg	1	Org-023	[NT]	11	<1	<1	0	89	84
m+p-xylene	mg/kg	2	Org-023	[NT]	11	<2	<2	0	90	87
o-Xylene	mg/kg	1	Org-023	[NT]	11	<1	<1	0	92	89
naphthalene	mg/kg	1	Org-023	[NT]	11	<1	<1	0	[NT]	[NT]
Surrogate aaa-Trifluorotoluene	%		Org-023	[NT]	11	79	91	14	99	86

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]	14	30/08/2021	30/08/2021		[NT]	[NT]
Date analysed	-			[NT]	14	31/08/2021	31/08/2021		[NT]	[NT]
TRH C_6 - C_9	mg/kg	25	Org-023	[NT]	14	<25	<25	0	[NT]	[NT]
TRH C_6 - C_{10}	mg/kg	25	Org-023	[NT]	14	<25	<25	0	[NT]	[NT]
Benzene	mg/kg	0.2	Org-023	[NT]	14	<0.2	<0.2	0	[NT]	[NT]
Toluene	mg/kg	0.5	Org-023	[NT]	14	<0.5	<0.5	0	[NT]	[NT]
Ethylbenzene	mg/kg	1	Org-023	[NT]	14	<1	<1	0	[NT]	[NT]
m+p-xylene	mg/kg	2	Org-023	[NT]	14	<2	<2	0	[NT]	[NT]
o-Xylene	mg/kg	1	Org-023	[NT]	14	<1	<1	0	[NT]	[NT]
naphthalene	mg/kg	1	Org-023	[NT]	14	<1	<1	0	[NT]	[NT]
Surrogate aaa-Trifluorotoluene	%		Org-023	[NT]	14	86	88	2	[NT]	[NT]

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]	32	30/08/2021	30/08/2021		[NT]	[NT]
Date analysed	-			[NT]	32	31/08/2021	31/08/2021		[NT]	[NT]
TRH C_6 - C_9	mg/kg	25	Org-023	[NT]	32	<25	<25	0	[NT]	[NT]
TRH C_6 - C_{10}	mg/kg	25	Org-023	[NT]	32	<25	<25	0	[NT]	[NT]
Benzene	mg/kg	0.2	Org-023	[NT]	32	<0.2	<0.2	0	[NT]	[NT]
Toluene	mg/kg	0.5	Org-023	[NT]	32	<0.5	<0.5	0	[NT]	[NT]
Ethylbenzene	mg/kg	1	Org-023	[NT]	32	<1	<1	0	[NT]	[NT]
m+p-xylene	mg/kg	2	Org-023	[NT]	32	<2	<2	0	[NT]	[NT]
o-Xylene	mg/kg	1	Org-023	[NT]	32	<1	<1	0	[NT]	[NT]
naphthalene	mg/kg	1	Org-023	[NT]	32	<1	<1	0	[NT]	[NT]
Surrogate aaa-Trifluorotoluene	%		Org-023	[NT]	32	99	98	1	[NT]	[NT]

Client Reference: IA254001

QUALITY CONTROL: svTRH (C10-C40) in Soil					Duplicate				Spike Recovery %	
Test Description	Units	PQL	Method	Blank	#	Base	Dup.	RPD	LCS-2	276682-7
Date extracted	-			30/08/2021	3	30/08/2021	30/08/2021		30/08/2021	30/08/2021
Date analysed	-			31/08/2021	3	01/09/2021	01/09/2021		31/08/2021	31/08/2021
TRH C_{10} - C_{14}	mg/kg	50	Org-020	<50	3	<50	<50	0	118	115
TRH C_{15} - C_{28}	mg/kg	100	Org-020	<100	3	130	<100	26	110	108
TRH C_{29} - C_{36}	mg/kg	100	Org-020	<100	3	380	450	17	122	116
TRH $>C_{10}$ -C_{16}	mg/kg	50	Org-020	<50	3	<50	<50	0	118	115
TRH $>C_{16}$ -C_{34}	mg/kg	100	Org-020	<100	3	400	340	16	110	108
TRH $>C_{34}$ -C_{40}	mg/kg	100	Org-020	<100	3	500	700	33	122	116
Surrogate o-Terphenyl	%		Org-020	107	3	117	85	32	101	106

QUALITY CONTROL: svTRH (C10-C40) in Soil					Duplicate				Spike Recovery %	
Test Description	Units	PQL	Method	Blank	#	Base	Dup.	RPD	LCS-3	276682-16
Date extracted	-			[NT]	11	30/08/2021	30/08/2021		30/08/2021	30/08/2021
Date analysed	-			[NT]	11	31/08/2021	31/08/2021		01/09/2021	01/09/2021
TRH C_{10} - C_{14}	mg/kg	50	Org-020	[NT]	11	<50	<50	0	125	119
TRH C_{15} - C_{28}	mg/kg	100	Org-020	[NT]	11	<100	<100	0	130	123
TRH C_{29} - C_{36}	mg/kg	100	Org-020	[NT]	11	150	<100	40	102	103
TRH $>C_{10}$ -C_{16}	mg/kg	50	Org-020	[NT]	11	<50	<50	0	125	119
TRH $>C_{16}$ -C_{34}	mg/kg	100	Org-020	[NT]	11	160	<100	46	130	123
TRH $>C_{34}$ -C_{40}	mg/kg	100	Org-020	[NT]	11	180	110	48	102	103
Surrogate o-Terphenyl	%		Org-020	[NT]	11	97	98	1	100	90

QUALITY CONTROL: svTRH (C10-C40) in Soil					Duplicate				Spike Recovery %	
Test Description	Units	PQL	Method	Blank	#	Base	Dup.	RPD	[NT]	[NT]
Date extracted	-			[NT]	14	30/08/2021	30/08/2021		[NT]	[NT]
Date analysed	-			[NT]	14	01/09/2021	01/09/2021		[NT]	[NT]
TRH C_{10} - C_{14}	mg/kg	50	Org-020	[NT]	14	<50	<50	0	[NT]	[NT]
TRH C_{15} - C_{28}	mg/kg	100	Org-020	[NT]	14	190	220	15	[NT]	[NT]
TRH C_{29} - C_{36}	mg/kg	100	Org-020	[NT]	14	250	300	18	[NT]	[NT]
TRH $>C_{10}$ -C_{16}	mg/kg	50	Org-020	[NT]	14	<50	<50	0	[NT]	[NT]
TRH $>C_{16}$ -C_{34}	mg/kg	100	Org-020	[NT]	14	360	440	20	[NT]	[NT]
TRH $>C_{34}$ -C_{40}	mg/kg	100	Org-020	[NT]	14	160	170	6	[NT]	[NT]
Surrogate o-Terphenyl	%		Org-020	[NT]	14	120	114	5	[NT]	[NT]

QUALITY CONTROL: svTRH (C10-C40) in Soil					Duplicate				Spike Recovery %	
Test Description	Units	PQL	Method	Blank	#	Base	Dup.	RPD	[NT]	[NT]
Date extracted	-			[NT]	32	30/08/2021	30/08/2021		[NT]	[NT]
Date analysed	-			[NT]	32	01/09/2021	01/09/2021		[NT]	[NT]
TRH C_{10} - C_{14}	mg/kg	50	Org-020	[NT]	32	<50	<50	0	[NT]	[NT]
TRH C_{15} - C_{28}	mg/kg	100	Org-020	[NT]	32	<100	<100	0	[NT]	[NT]
TRH C_{29} - C_{36}	mg/kg	100	Org-020	[NT]	32	<100	<100	0	[NT]	[NT]
TRH $>C_{10}$ -C_{16}	mg/kg	50	Org-020	[NT]	32	<50	<50	0	[NT]	[NT]
TRH $>C_{16}$ -C_{34}	mg/kg	100	Org-020	[NT]	32	<100	<100	0	[NT]	[NT]
TRH $>C_{34}$ -C_{40}	mg/kg	100	Org-020	[NT]	32	<100	<100	0	[NT]	[NT]
Surrogate o-Terphenyl	%		Org-020	[NT]	32	101	105	4	[NT]	[NT]

QUALITY CONTROL: PAHs in Soil					Duplicate				Spike Recovery %	
Test Description	Units	PQL	Method	Blank	#	Base	Dup.	RPD	LCS-2	276682-7
Date extracted	-			30/08/2021	3	30/08/2021	30/08/2021		30/08/2021	30/08/2021
Date analysed	-			31/08/2021	3	01/09/2021	01/09/2021		31/08/2021	31/08/2021
Naphthalene	mg/kg	0.1	Org-022/025	<0.1	3	0.1	0.1	0	110	114
Acenaphthylene	mg/kg	0.1	Org-022/025	<0.1	3	0.4	0.5	22	[NT]	[NT]
Acenaphthene	mg/kg	0.1	Org-022/025	<0.1	3	<0.1	<0.1	0	96	101
Fluorene	mg/kg	0.1	Org-022/025	<0.1	3	<0.1	0.1	0	112	114
Phenanthrene	mg/kg	0.1	Org-022/025	<0.1	3	0.2	0.5	86	123	133
Anthracene	mg/kg	0.1	Org-022/025	<0.1	3	0.2	0.3	40	[NT]	[NT]
Fluoranthene	mg/kg	0.1	Org-022/025	<0.1	3	0.2	0.3	40	105	116
Pyrene	mg/kg	0.1	Org-022/025	<0.1	3	0.3	0.7	80	111	120
Benzo(a)anthracene	mg/kg	0.1	Org-022/025	<0.1	3	0.2	0.3	40	[NT]	[NT]
Chrysene	mg/kg	0.1	Org-022/025	<0.1	3	0.2	0.4	67	100	90
Benzo(b,j+k)fluoranthene	mg/kg	0.2	Org-022/025	<0.2	3	0.4	0.6	40	[NT]	[NT]
Benzo(a)pyrene	mg/kg	0.05	Org-022/025	<0.05	3	0.4	0.5	22	107	133
Indeno(1,2,3-c,d)pyrene	mg/kg	0.1	Org-022/025	<0.1	3	0.3	0.3	0	[NT]	[NT]
Dibenzo(a,h)anthracene	mg/kg	0.1	Org-022/025	<0.1	3	<0.1	<0.1	0	[NT]	[NT]
Benzo(g,h,i)perylene	mg/kg	0.1	Org-022/025	<0.1	3	0.3	0.4	29	[NT]	[NT]
Surrogate p-Terphenyl-d14	%		Org-022/025	101	3	98	101	3	98	101

QUALITY CONTROL: PAHs in Soil					Duplicate				Spike Recovery %	
Test Description	Units	PQL	Method	Blank	#	Base	Dup.	RPD	LCS-3	276682-16
Date extracted	-			[NT]	11	30/08/2021	30/08/2021		30/08/2021	30/08/2021
Date analysed	-			[NT]	11	01/09/2021	01/09/2021		30/08/2021	01/09/2021
Naphthalene	mg/kg	0.1	Org-022/025	[NT]	11	<0.1	<0.1	0	112	114
Acenaphthylene	mg/kg	0.1	Org-022/025	[NT]	11	<0.1	<0.1	0	[NT]	[NT]
Acenaphthene	mg/kg	0.1	Org-022/025	[NT]	11	<0.1	<0.1	0	97	101
Fluorene	mg/kg	0.1	Org-022/025	[NT]	11	<0.1	<0.1	0	111	114
Phenanthrene	mg/kg	0.1	Org-022/025	[NT]	11	<0.1	<0.1	0	122	131
Anthracene	mg/kg	0.1	Org-022/025	[NT]	11	<0.1	<0.1	0	[NT]	[NT]
Fluoranthene	mg/kg	0.1	Org-022/025	[NT]	11	<0.1	<0.1	0	111	114
Pyrene	mg/kg	0.1	Org-022/025	[NT]	11	<0.1	<0.1	0	113	116
Benzo(a)anthracene	mg/kg	0.1	Org-022/025	[NT]	11	<0.1	<0.1	0	[NT]	[NT]
Chrysene	mg/kg	0.1	Org-022/025	[NT]	11	<0.1	<0.1	0	88	90
Benzo(b,j+k)fluoranthene	mg/kg	0.2	Org-022/025	[NT]	11	<0.2	<0.2	0	[NT]	[NT]
Benzo(a)pyrene	mg/kg	0.05	Org-022/025	[NT]	11	<0.05	<0.05	0	105	136
Indeno(1,2,3-c,d)pyrene	mg/kg	0.1	Org-022/025	[NT]	11	<0.1	<0.1	0	[NT]	[NT]
Dibenzo(a,h)anthracene	mg/kg	0.1	Org-022/025	[NT]	11	<0.1	<0.1	0	[NT]	[NT]
Benzo(g,h,i)perylene	mg/kg	0.1	Org-022/025	[NT]	11	<0.1	<0.1	0	[NT]	[NT]
Surrogate p-Terphenyl-d14	%		Org-022/025	[NT]	11	103	102	1	100	106

QUALITY CONTROL: PAHs in Soil					Duplicate				Spike Recovery %	
Test Description	Units	PQL	Method	Blank	#	Base	Dup.	RPD	[NT]	[NT]
Date extracted	-			[NT]	14	30/08/2021	30/08/2021		[NT]	[NT]
Date analysed	-			[NT]	14	01/09/2021	01/09/2021		[NT]	[NT]
Naphthalene	mg/kg	0.1	Org-022/025	[NT]	14	<0.1	<0.1	0	[NT]	[NT]
Acenaphthylene	mg/kg	0.1	Org-022/025	[NT]	14	<0.1	<0.1	0	[NT]	[NT]
Acenaphthene	mg/kg	0.1	Org-022/025	[NT]	14	<0.1	<0.1	0	[NT]	[NT]
Fluorene	mg/kg	0.1	Org-022/025	[NT]	14	<0.1	<0.1	0	[NT]	[NT]
Phenanthrene	mg/kg	0.1	Org-022/025	[NT]	14	0.3	0.2	40	[NT]	[NT]
Anthracene	mg/kg	0.1	Org-022/025	[NT]	14	0.1	0.1	0	[NT]	[NT]
Fluoranthene	mg/kg	0.1	Org-022/025	[NT]	14	0.5	0.3	50	[NT]	[NT]
Pyrene	mg/kg	0.1	Org-022/025	[NT]	14	0.4	0.3	29	[NT]	[NT]
Benzo(a)anthracene	mg/kg	0.1	Org-022/025	[NT]	14	0.3	0.2	40	[NT]	[NT]
Chrysene	mg/kg	0.1	Org-022/025	[NT]	14	0.2	0.2	0	[NT]	[NT]
Benzo(b,j+k)fluoranthene	mg/kg	0.2	Org-022/025	[NT]	14	0.3	0.3	0	[NT]	[NT]
Benzo(a)pyrene	mg/kg	0.05	Org-022/025	[NT]	14	0.2	0.2	0	[NT]	[NT]
Indeno(1,2,3-c,d)pyrene	mg/kg	0.1	Org-022/025	[NT]	14	0.1	<0.1	0	[NT]	[NT]
Dibenzo(a,h)anthracene	mg/kg	0.1	Org-022/025	[NT]	14	<0.1	<0.1	0	[NT]	[NT]
Benzo(g,h,i)perylene	mg/kg	0.1	Org-022/025	[NT]	14	<0.1	<0.1	0	[NT]	[NT]
Surrogate p-Terphenyl-d14	%		Org-022/025	[NT]	14	111	111	0	[NT]	[NT]

QUALITY CONTROL: PAHs in Soil					Duplicate				Spike Recovery %	
Test Description	Units	PQL	Method	Blank	#	Base	Dup.	RPD	[NT]	[NT]
Date extracted	-			[NT]	32	30/08/2021	30/08/2021		[NT]	[NT]
Date analysed	-			[NT]	32	31/08/2021	31/08/2021		[NT]	[NT]
Naphthalene	mg/kg	0.1	Org-022/025	[NT]	32	<0.1	<0.1	0	[NT]	[NT]
Acenaphthylene	mg/kg	0.1	Org-022/025	[NT]	32	<0.1	<0.1	0	[NT]	[NT]
Acenaphthene	mg/kg	0.1	Org-022/025	[NT]	32	<0.1	<0.1	0	[NT]	[NT]
Fluorene	mg/kg	0.1	Org-022/025	[NT]	32	<0.1	<0.1	0	[NT]	[NT]
Phenanthrene	mg/kg	0.1	Org-022/025	[NT]	32	0.2	0.1	67	[NT]	[NT]
Anthracene	mg/kg	0.1	Org-022/025	[NT]	32	<0.1	<0.1	0	[NT]	[NT]
Fluoranthene	mg/kg	0.1	Org-022/025	[NT]	32	<0.1	<0.1	0	[NT]	[NT]
Pyrene	mg/kg	0.1	Org-022/025	[NT]	32	<0.1	<0.1	0	[NT]	[NT]
Benzo(a)anthracene	mg/kg	0.1	Org-022/025	[NT]	32	<0.1	<0.1	0	[NT]	[NT]
Chrysene	mg/kg	0.1	Org-022/025	[NT]	32	<0.1	<0.1	0	[NT]	[NT]
Benzo(b,j+k)fluoranthene	mg/kg	0.2	Org-022/025	[NT]	32	<0.2	<0.2	0	[NT]	[NT]
Benzo(a)pyrene	mg/kg	0.05	Org-022/025	[NT]	32	<0.05	<0.05	0	[NT]	[NT]
Indeno(1,2,3-c,d)pyrene	mg/kg	0.1	Org-022/025	[NT]	32	<0.1	<0.1	0	[NT]	[NT]
Dibenzo(a,h)anthracene	mg/kg	0.1	Org-022/025	[NT]	32	<0.1	<0.1	0	[NT]	[NT]
Benzo(g,h,i)perylene	mg/kg	0.1	Org-022/025	[NT]	32	<0.1	<0.1	0	[NT]	[NT]
Surrogate p-Terphenyl-d14	%		Org-022/025	[NT]	32	91	95	4	[NT]	[NT]

QUALITY CONTROL: Organochlorine Pesticides in soil						Duplicate			Spike Recovery %	
Test Description	Units	PQL	Method	Blank	#	Base	Dup.	RPD	LCS-2	276682-7
Date extracted	-			30/08/2021	3	30/08/2021	30/08/2021		30/08/2021	30/08/2021
Date analysed	-			31/08/2021	3	01/09/2021	01/09/2021		31/08/2021	31/08/2021
alpha-BHC	mg/kg	0.1	Org-022/025	<0.1	3	<0.1	<0.1	0	110	113
HCB	mg/kg	0.1	Org-022/025	<0.1	3	<0.1	<0.1	0	[NT]	[NT]
beta-BHC	mg/kg	0.1	Org-022/025	<0.1	3	<0.1	<0.1	0	115	94
gamma-BHC	mg/kg	0.1	Org-022/025	<0.1	3	<0.1	<0.1	0	[NT]	[NT]
Heptachlor	mg/kg	0.1	Org-022/025	<0.1	3	<0.1	<0.1	0	111	85
delta-BHC	mg/kg	0.1	Org-022/025	<0.1	3	<0.1	<0.1	0	[NT]	[NT]
Aldrin	mg/kg	0.1	Org-022/025	<0.1	3	<0.1	<0.1	0	114	121
Heptachlor Epoxide	mg/kg	0.1	Org-022/025	<0.1	3	<0.1	<0.1	0	110	119
gamma-Chlordane	mg/kg	0.1	Org-022/025	<0.1	3	<0.1	<0.1	0	[NT]	[NT]
alpha-chlordane	mg/kg	0.1	Org-022/025	<0.1	3	<0.1	<0.1	0	[NT]	[NT]
Endosulfan I	mg/kg	0.1	Org-022/025	<0.1	3	<0.1	<0.1	0	[NT]	[NT]
pp-DDE	mg/kg	0.1	Org-022/025	<0.1	3	<0.1	<0.1	0	113	123
Dieldrin	mg/kg	0.1	Org-022/025	<0.1	3	<0.1	<0.1	0	105	123
Endrin	mg/kg	0.1	Org-022/025	<0.1	3	<0.1	<0.1	0	100	134
Endosulfan II	mg/kg	0.1	Org-022/025	<0.1	3	<0.1	<0.1	0	[NT]	[NT]
pp-DDD	mg/kg	0.1	Org-022/025	<0.1	3	<0.1	<0.1	0	110	115
Endrin Aldehyde	mg/kg	0.1	Org-022/025	<0.1	3	<0.1	<0.1	0	[NT]	[NT]
pp-DDT	mg/kg	0.1	Org-022/025	<0.1	3	<0.1	<0.1	0	[NT]	[NT]
Endosulfan Sulphate	mg/kg	0.1	Org-022/025	<0.1	3	<0.1	<0.1	0	109	109
Methoxychlor	mg/kg	0.1	Org-022/025	<0.1	3	<0.1	<0.1	0	[NT]	[NT]
Surrogate TCMX	%		Org-022/025	98	3	92	92	0	95	96

QUALITY CONTROL: Organochlorine Pesticides in soil					Duplicate				Spike Recovery %	
Test Description	Units	PQL	Method	Blank	#	Base	Dup.	RPD	[NT]	276682-16
Date extracted	-			[NT]	11	30/08/2021	30/08/2021		[NT]	30/08/2021
Date analysed	-			[NT]	11	01/09/2021	01/09/2021		[NT]	01/09/2021
alpha-BHC	mg/kg	0.1	Org-022/025	[NT]	11	<0.1	<0.1	0	[NT]	113
HCB	mg/kg	0.1	Org-022/025	[NT]	11	<0.1	<0.1	0	[NT]	[NT]
beta-BHC	mg/kg	0.1	Org-022/025	[NT]	11	<0.1	<0.1	0	[NT]	94
gamma-BHC	mg/kg	0.1	Org-022/025	[NT]	11	<0.1	<0.1	0	[NT]	[NT]
Heptachlor	mg/kg	0.1	Org-022/025	[NT]	11	<0.1	<0.1	0	[NT]	85
delta-BHC	mg/kg	0.1	Org-022/025	[NT]	11	<0.1	<0.1	0	[NT]	[NT]
Aldrin	mg/kg	0.1	Org-022/025	[NT]	11	<0.1	<0.1	0	[NT]	119
Heptachlor Epoxide	mg/kg	0.1	Org-022/025	[NT]	11	<0.1	<0.1	0	[NT]	118
gamma-Chlordane	mg/kg	0.1	Org-022/025	[NT]	11	<0.1	<0.1	0	[NT]	[NT]
alpha-chlordane	mg/kg	0.1	Org-022/025	[NT]	11	<0.1	<0.1	0	[NT]	[NT]
Endosulfan I	mg/kg	0.1	Org-022/025	[NT]	11	<0.1	<0.1	0	[NT]	[NT]
pp-DDE	mg/kg	0.1	Org-022/025	[NT]	11	<0.1	<0.1	0	[NT]	123
Dieldrin	mg/kg	0.1	Org-022/025	[NT]	11	<0.1	<0.1	0	[NT]	119
Endrin	mg/kg	0.1	Org-022/025	[NT]	11	<0.1	<0.1	0	[NT]	139
Endosulfan II	mg/kg	0.1	Org-022/025	[NT]	11	<0.1	<0.1	0	[NT]	[NT]
pp-DDD	mg/kg	0.1	Org-022/025	[NT]	11	<0.1	<0.1	0	[NT]	114
Endrin Aldehyde	mg/kg	0.1	Org-022/025	[NT]	11	<0.1	<0.1	0	[NT]	[NT]
pp-DDT	mg/kg	0.1	Org-022/025	[NT]	11	<0.1	<0.1	0	[NT]	[NT]
Endosulfan Sulphate	mg/kg	0.1	Org-022/025	[NT]	11	<0.1	<0.1	0	[NT]	105
Methoxychlor	mg/kg	0.1	Org-022/025	[NT]	11	<0.1	<0.1	0	[NT]	[NT]
Surrogate TCMX	%		Org-022/025	[NT]	11	95	95	0	[NT]	100

QUALITY CONTROL: Organochlorine Pesticides in soil					Duplicate				Spike Recovery %	
Test Description	Units	PQL	Method	Blank	#	Base	Dup.	RPD	[NT]	[NT]
Date extracted	-			[NT]	14	30/08/2021	30/08/2021		[NT]	[NT]
Date analysed	-			[NT]	14	01/09/2021	01/09/2021		[NT]	[NT]
alpha-BHC	mg/kg	0.1	Org-022/025	[NT]	14	<0.1	<0.1	0	[NT]	[NT]
HCB	mg/kg	0.1	Org-022/025	[NT]	14	<0.1	<0.1	0	[NT]	[NT]
beta-BHC	mg/kg	0.1	Org-022/025	[NT]	14	<0.1	<0.1	0	[NT]	[NT]
gamma-BHC	mg/kg	0.1	Org-022/025	[NT]	14	<0.1	<0.1	0	[NT]	[NT]
Heptachlor	mg/kg	0.1	Org-022/025	[NT]	14	<0.1	<0.1	0	[NT]	[NT]
delta-BHC	mg/kg	0.1	Org-022/025	[NT]	14	<0.1	<0.1	0	[NT]	[NT]
Aldrin	mg/kg	0.1	Org-022/025	[NT]	14	<0.1	<0.1	0	[NT]	[NT]
Heptachlor Epoxide	mg/kg	0.1	Org-022/025	[NT]	14	<0.1	<0.1	0	[NT]	[NT]
gamma-Chlordane	mg/kg	0.1	Org-022/025	[NT]	14	<0.1	<0.1	0	[NT]	[NT]
alpha-chlordane	mg/kg	0.1	Org-022/025	[NT]	14	<0.1	<0.1	0	[NT]	[NT]
Endosulfan I	mg/kg	0.1	Org-022/025	[NT]	14	<0.1	<0.1	0	[NT]	[NT]
pp-DDE	mg/kg	0.1	Org-022/025	[NT]	14	<0.1	<0.1	0	[NT]	[NT]
Dieldrin	mg/kg	0.1	Org-022/025	[NT]	14	<0.1	<0.1	0	[NT]	[NT]
Endrin	mg/kg	0.1	Org-022/025	[NT]	14	<0.1	<0.1	0	[NT]	[NT]
Endosulfan II	mg/kg	0.1	Org-022/025	[NT]	14	<0.1	<0.1	0	[NT]	[NT]
pp-DDD	mg/kg	0.1	Org-022/025	[NT]	14	<0.1	<0.1	0	[NT]	[NT]
Endrin Aldehyde	mg/kg	0.1	Org-022/025	[NT]	14	<0.1	<0.1	0	[NT]	[NT]
pp-DDT	mg/kg	0.1	Org-022/025	[NT]	14	<0.1	<0.1	0	[NT]	[NT]
Endosulfan Sulphate	mg/kg	0.1	Org-022/025	[NT]	14	<0.1	<0.1	0	[NT]	[NT]
Methoxychlor	mg/kg	0.1	Org-022/025	[NT]	14	<0.1	<0.1	0	[NT]	[NT]
Surrogate TCMX	%		Org-022/025	[NT]	14	102	103	1	[NT]	[NT]

QUALITY CONTROL: Organochlorine Pesticides in soil					Duplicate				Spike Recovery %	
Test Description	Units	PQL	Method	Blank	#	Base	Dup.	RPD	[NT]	[NT]
Date extracted	-			[NT]	32	30/08/2021	30/08/2021		[NT]	[NT]
Date analysed	-			[NT]	32	31/08/2021	31/08/2021		[NT]	[NT]
alpha-BHC	mg/kg	0.1	Org-022/025	[NT]	32	<0.1	<0.1	0	[NT]	[NT]
HCB	mg/kg	0.1	Org-022/025	[NT]	32	<0.1	<0.1	0	[NT]	[NT]
beta-BHC	mg/kg	0.1	Org-022/025	[NT]	32	<0.1	<0.1	0	[NT]	[NT]
gamma-BHC	mg/kg	0.1	Org-022/025	[NT]	32	<0.1	<0.1	0	[NT]	[NT]
Heptachlor	mg/kg	0.1	Org-022/025	[NT]	32	<0.1	<0.1	0	[NT]	[NT]
delta-BHC	mg/kg	0.1	Org-022/025	[NT]	32	<0.1	<0.1	0	[NT]	[NT]
Aldrin	mg/kg	0.1	Org-022/025	[NT]	32	<0.1	<0.1	0	[NT]	[NT]
Heptachlor Epoxide	mg/kg	0.1	Org-022/025	[NT]	32	<0.1	<0.1	0	[NT]	[NT]
gamma-Chlordane	mg/kg	0.1	Org-022/025	[NT]	32	<0.1	<0.1	0	[NT]	[NT]
alpha-chlordane	mg/kg	0.1	Org-022/025	[NT]	32	<0.1	<0.1	0	[NT]	[NT]
Endosulfan I	mg/kg	0.1	Org-022/025	[NT]	32	<0.1	<0.1	0	[NT]	[NT]
pp-DDE	mg/kg	0.1	Org-022/025	[NT]	32	<0.1	<0.1	0	[NT]	[NT]
Dieldrin	mg/kg	0.1	Org-022/025	[NT]	32	<0.1	<0.1	0	[NT]	[NT]
Endrin	mg/kg	0.1	Org-022/025	[NT]	32	<0.1	<0.1	0	[NT]	[NT]
Endosulfan II	mg/kg	0.1	Org-022/025	[NT]	32	<0.1	<0.1	0	[NT]	[NT]
pp-DDD	mg/kg	0.1	Org-022/025	[NT]	32	<0.1	<0.1	0	[NT]	[NT]
Endrin Aldehyde	mg/kg	0.1	Org-022/025	[NT]	32	<0.1	<0.1	0	[NT]	[NT]
pp-DDT	mg/kg	0.1	Org-022/025	[NT]	32	<0.1	<0.1	0	[NT]	[NT]
Endosulfan Sulphate	mg/kg	0.1	Org-022/025	[NT]	32	<0.1	<0.1	0	[NT]	[NT]
Methoxychlor	mg/kg	0.1	Org-022/025	[NT]	32	<0.1	<0.1	0	[NT]	[NT]
Surrogate TCMX	%		Org-022/025	[NT]	32	99	100	1	[NT]	[NT]

QUALITY CONTROL: Organophosphorus Pesticides in Soil					Duplicate				Spike Recovery %	
Test Description	Units	PQL	Method	Blank	#	Base	Dup.	RPD	LCS-2	276682-7
Date extracted	-			30/08/2021	3	30/08/2021	30/08/2021		30/08/2021	30/08/2021
Date analysed	-			31/08/2021	3	01/09/2021	01/09/2021		31/08/2021	31/08/2021
Dichlorvos	mg/kg	0.1	Org-022/025	<0.1	3	<0.1	<0.1	0	96	94
Dimethoate	mg/kg	0.1	Org-022/025	<0.1	3	<0.1	<0.1	0	[NT]	[NT]
Diazinon	mg/kg	0.1	Org-022/025	<0.1	3	<0.1	<0.1	0	[NT]	[NT]
Chlorpyriphos-methyl	mg/kg	0.1	Org-022/025	<0.1	3	<0.1	<0.1	0	[NT]	[NT]
Ronnel	mg/kg	0.1	Org-022/025	<0.1	3	<0.1	<0.1	0	104	126
Fenitrothion	mg/kg	0.1	Org-022/025	<0.1	3	<0.1	<0.1	0	93	108
Malathion	mg/kg	0.1	Org-022/025	<0.1	3	<0.1	<0.1	0	108	[NT]
Chlorpyriphos	mg/kg	0.1	Org-022/025	<0.1	3	<0.1	<0.1	0	118	136
Parathion	mg/kg	0.1	Org-022/025	<0.1	3	<0.1	<0.1	0	92	120
Bromophos-ethyl	mg/kg	0.1	Org-022	<0.1	3	<0.1	<0.1	0	[NT]	[NT]
Ethion	mg/kg	0.1	Org-022/025	<0.1	3	<0.1	<0.1	0	95	131
Azinphos-methyl (Guthion)	mg/kg	0.1	Org-022/025	<0.1	3	<0.1	<0.1	0	[NT]	[NT]
Surrogate TCMX	%		Org-022/025	98	3	92	92	0	95	96

QUALITY CONTROL: Organophosphorus Pesticides in Soil					Duplicate				Spike Recovery %	
Test Description	Units	PQL	Method	Blank	#	Base	Dup.	RPD	[NT]	276682-16
Date extracted	-			[NT]	11	30/08/2021	30/08/2021		[NT]	30/08/2021
Date analysed	-			[NT]	11	01/09/2021	01/09/2021		[NT]	01/09/2021
Dichlorvos	mg/kg	0.1	Org-022/025	[NT]	11	<0.1	<0.1	0	[NT]	98
Dimethoate	mg/kg	0.1	Org-022/025	[NT]	11	<0.1	<0.1	0	[NT]	[NT]
Diazinon	mg/kg	0.1	Org-022/025	[NT]	11	<0.1	<0.1	0	[NT]	[NT]
Chlorpyriphos-methyl	mg/kg	0.1	Org-022/025	[NT]	11	<0.1	<0.1	0	[NT]	[NT]
Ronnel	mg/kg	0.1	Org-022/025	[NT]	11	<0.1	<0.1	0	[NT]	123
Fenitrothion	mg/kg	0.1	Org-022/025	[NT]	11	<0.1	<0.1	0	[NT]	111
Malathion	mg/kg	0.1	Org-022/025	[NT]	11	<0.1	<0.1	0	[NT]	[NT]
Chlorpyriphos	mg/kg	0.1	Org-022/025	[NT]	11	<0.1	<0.1	0	[NT]	134
Parathion	mg/kg	0.1	Org-022/025	[NT]	11	<0.1	<0.1	0	[NT]	114
Bromophos-ethyl	mg/kg	0.1	Org-022	[NT]	11	<0.1	<0.1	0	[NT]	[NT]
Ethion	mg/kg	0.1	Org-022/025	[NT]	11	<0.1	<0.1	0	[NT]	131
Azinphos-methyl (Guthion)	mg/kg	0.1	Org-022/025	[NT]	11	<0.1	<0.1	0	[NT]	[NT]
Surrogate TCMX	%		Org-022/025	[NT]	11	95	95	0	[NT]	100

QUALITY CONTROL: Organophosphorus Pesticides in Soil					Duplicate				Spike Recovery %	
Test Description	Units	PQL	Method	Blank	#	Base	Dup.	RPD	[NT]	[NT]
Date extracted	-			[NT]	14	30/08/2021	30/08/2021		[NT]	[NT]
Date analysed	-			[NT]	14	01/09/2021	01/09/2021		[NT]	[NT]
Dichlorvos	mg/kg	0.1	Org-022/025	[NT]	14	<0.1	<0.1	0	[NT]	[NT]
Dimethoate	mg/kg	0.1	Org-022/025	[NT]	14	<0.1	<0.1	0	[NT]	[NT]
Diazinon	mg/kg	0.1	Org-022/025	[NT]	14	0.1	<0.1	0	[NT]	[NT]
Chlorpyriphos-methyl	mg/kg	0.1	Org-022/025	[NT]	14	<0.1	<0.1	0	[NT]	[NT]
Ronnel	mg/kg	0.1	Org-022/025	[NT]	14	<0.1	<0.1	0	[NT]	[NT]
Fenitrothion	mg/kg	0.1	Org-022/025	[NT]	14	<0.1	<0.1	0	[NT]	[NT]
Malathion	mg/kg	0.1	Org-022/025	[NT]	14	<0.1	<0.1	0	[NT]	[NT]
Chlorpyriphos	mg/kg	0.1	Org-022/025	[NT]	14	<0.1	<0.1	0	[NT]	[NT]
Parathion	mg/kg	0.1	Org-022/025	[NT]	14	<0.1	<0.1	0	[NT]	[NT]
Bromophos-ethyl	mg/kg	0.1	Org-022	[NT]	14	<0.1	<0.1	0	[NT]	[NT]
Ethion	mg/kg	0.1	Org-022/025	[NT]	14	<0.1	<0.1	0	[NT]	[NT]
Azinphos-methyl (Guthion)	mg/kg	0.1	Org-022/025	[NT]	14	<0.1	<0.1	0	[NT]	[NT]
Surrogate TCMX	%		Org-022/025	[NT]	14	102	103	1	[NT]	[NT]

QUALITY CONTROL: Organophosphorus Pesticides in Soil					Duplicate				Spike Recovery %	
Test Description	Units	PQL	Method	Blank	#	Base	Dup.	RPD	[NT]	[NT]
Date extracted	-			[NT]	32	30/08/2021	30/08/2021		[NT]	[NT]
Date analysed	-			[NT]	32	31/08/2021	31/08/2021		[NT]	[NT]
Dichlorvos	mg/kg	0.1	Org-022/025	[NT]	32	<0.1	<0.1	0	[NT]	[NT]
Dimethoate	mg/kg	0.1	Org-022/025	[NT]	32	<0.1	<0.1	0	[NT]	[NT]
Diazinon	mg/kg	0.1	Org-022/025	[NT]	32	<0.1	<0.1	0	[NT]	[NT]
Chlorpyriphos-methyl	mg/kg	0.1	Org-022/025	[NT]	32	<0.1	<0.1	0	[NT]	[NT]
Ronnel	mg/kg	0.1	Org-022/025	[NT]	32	<0.1	<0.1	0	[NT]	[NT]
Fenitrothion	mg/kg	0.1	Org-022/025	[NT]	32	<0.1	<0.1	0	[NT]	[NT]
Malathion	mg/kg	0.1	Org-022/025	[NT]	32	<0.1	<0.1	0	[NT]	[NT]
Chlorpyriphos	mg/kg	0.1	Org-022/025	[NT]	32	<0.1	<0.1	0	[NT]	[NT]
Parathion	mg/kg	0.1	Org-022/025	[NT]	32	<0.1	<0.1	0	[NT]	[NT]
Bromophos-ethyl	mg/kg	0.1	Org-022	[NT]	32	<0.1	<0.1	0	[NT]	[NT]
Ethion	mg/kg	0.1	Org-022/025	[NT]	32	<0.1	<0.1	0	[NT]	[NT]
Azinphos-methyl (Guthion)	mg/kg	0.1	Org-022/025	[NT]	32	<0.1	<0.1	0	[NT]	[NT]
Surrogate TCMX	%		Org-022/025	[NT]	32	99	100	1	[NT]	[NT]

QUALITY CONTROL: Acid Extractable metals in soil					Duplicate				Spike Recovery %	
Test Description	Units	PQL	Method	Blank	#	Base	Dup.	RPD	LCS-2	276682-2
Date prepared	-			30/08/2021	1	30/08/2021	30/08/2021		30/08/2021	30/08/2021
Date analysed	-			30/08/2021	1	30/08/2021	30/08/2021		30/08/2021	30/08/2021
Arsenic	mg/kg	4	Metals-020	<4	1	<4	<4	0	109	103
Cadmium	mg/kg	0.4	Metals-020	<0.4	1	<0.4	<0.4	0	107	93
Chromium	mg/kg	1	Metals-020	<1	1	6	11	59	111	101
Copper	mg/kg	1	Metals-020	<1	1	7	11	44	111	109
Lead	mg/kg	1	Metals-020	<1	1	17	18	6	112	101
Mercury	mg/kg	0.1	Metals-021	<0.1	1	<0.1	<0.1	0	103	121
Nickel	mg/kg	1	Metals-020	<1	1	4	7	55	112	99
Zinc	mg/kg	1	Metals-020	<1	1	56	54	4	108	82

QUALITY CONTROL: Acid Extractable metals in soil					Duplicate				Spike Recovery %	
Test Description	Units	PQL	Method	Blank	#	Base	Dup.	RPD	LCS-3	276682-7
Date prepared	-			[NT]	3	30/08/2021	30/08/2021		30/08/2021	30/08/2021
Date analysed	-			[NT]	3	30/08/2021	30/08/2021		30/08/2021	30/08/2021
Arsenic	mg/kg	4	Metals-020	[NT]	3	<4	<4	0	98	94
Cadmium	mg/kg	0.4	Metals-020	[NT]	3	<0.4	<0.4	0	103	99
Chromium	mg/kg	1	Metals-020	[NT]	3	17	14	19	117	90
Copper	mg/kg	1	Metals-020	[NT]	3	14	13	7	109	97
Lead	mg/kg	1	Metals-020	[NT]	3	11	11	0	100	94
Mercury	mg/kg	0.1	Metals-021	[NT]	3	<0.1	<0.1	0	116	90
Nickel	mg/kg	1	Metals-020	[NT]	3	24	18	29	116	96
Zinc	mg/kg	1	Metals-020	[NT]	3	110	92	18	111	94

QUALITY CONTROL: Acid Extractable metals in soil					Duplicate				Spike Recovery %	
Test Description	Units	PQL	Method	Blank	#	Base	Dup.	RPD	[NT]	276682-16
Date prepared	-			[NT]	11	30/08/2021	30/08/2021		[NT]	30/08/2021
Date analysed	-			[NT]	11	30/08/2021	30/08/2021		[NT]	30/08/2021
Arsenic	mg/kg	4	Metals-020	[NT]	11	6	7	15	[NT]	86
Cadmium	mg/kg	0.4	Metals-020	[NT]	11	<0.4	<0.4	0	[NT]	96
Chromium	mg/kg	1	Metals-020	[NT]	11	7	7	0	[NT]	80
Copper	mg/kg	1	Metals-020	[NT]	11	20	27	30	[NT]	75
Lead	mg/kg	1	Metals-020	[NT]	11	20	31	43	[NT]	89
Mercury	mg/kg	0.1	Metals-021	[NT]	11	<0.1	<0.1	0	[NT]	100
Nickel	mg/kg	1	Metals-020	[NT]	11	6	7	15	[NT]	75
Zinc	mg/kg	1	Metals-020	[NT]	11	38	40	5	[NT]	70

QUALITY CONTROL: Acid Extractable metals in soil					Duplicate				Spike Recovery %	
Test Description	Units	PQL	Method	Blank	#	Base	Dup.	RPD	[NT]	[NT]
Date prepared	-			[NT]	14	30/08/2021	30/08/2021		[NT]	[NT]
Date analysed	-			[NT]	14	30/08/2021	30/08/2021		[NT]	[NT]
Arsenic	mg/kg	4	Metals-020	[NT]	14	10	5	67	[NT]	[NT]
Cadmium	mg/kg	0.4	Metals-020	[NT]	14	<0.4	<0.4	0	[NT]	[NT]
Chromium	mg/kg	1	Metals-020	[NT]	14	16	9	56	[NT]	[NT]
Copper	mg/kg	1	Metals-020	[NT]	14	17	11	43	[NT]	[NT]
Lead	mg/kg	1	Metals-020	[NT]	14	20	17	16	[NT]	[NT]
Mercury	mg/kg	0.1	Metals-021	[NT]	14	<0.1	<0.1	0	[NT]	[NT]
Nickel	mg/kg	1	Metals-020	[NT]	14	13	8	48	[NT]	[NT]
Zinc	mg/kg	1	Metals-020	[NT]	14	54	29	60	[NT]	[NT]

QUALITY CONTROL: Acid Extractable metals in soil					Duplicate				Spike Recovery %	
Test Description	Units	PQL	Method	Blank	#	Base	Dup.	RPD	[NT]	[NT]
Date prepared	-			[NT]	32	30/08/2021	30/08/2021		[NT]	[NT]
Date analysed	-			[NT]	32	30/08/2021	30/08/2021		[NT]	[NT]
Arsenic	mg/kg	4	Metals-020	[NT]	32	5	<4	22	[NT]	[NT]
Cadmium	mg/kg	0.4	Metals-020	[NT]	32	<0.4	<0.4	0	[NT]	[NT]
Chromium	mg/kg	1	Metals-020	[NT]	32	12	9	29	[NT]	[NT]
Copper	mg/kg	1	Metals-020	[NT]	32	11	8	32	[NT]	[NT]
Lead	mg/kg	1	Metals-020	[NT]	32	17	14	19	[NT]	[NT]
Mercury	mg/kg	0.1	Metals-021	[NT]	32	<0.1	<0.1	0	[NT]	[NT]
Nickel	mg/kg	1	Metals-020	[NT]	32	17	16	6	[NT]	[NT]
Zinc	mg/kg	1	Metals-020	[NT]	32	58	44	27	[NT]	[NT]

QUALITY CONTROL: PFAS in Soils Extended					Duplicate				Spike Recovery %	
Test Description	Units	PQL	Method	Blank	#	Base	Dup.	RPD	LCS-2	[NT]
Date prepared	-			30/08/2021	[NT]	[NT]	[NT]	[NT]	30/08/2021	[NT]
Date analysed	-			30/08/2021	[NT]	[NT]	[NT]	[NT]	30/08/2021	[NT]
Perfluorobutanesulfonic acid	µg/kg	0.1	Org-029	<0.1	[NT]	[NT]	[NT]	[NT]	99	[NT]
Perfluoropentanesulfonic acid	µg/kg	0.1	Org-029	<0.1	[NT]	[NT]	[NT]	[NT]	96	[NT]
Perfluorohexanesulfonic acid - PFHxS	µg/kg	0.1	Org-029	<0.1	[NT]	[NT]	[NT]	[NT]	97	[NT]
Perfluoroheptanesulfonic acid	µg/kg	0.1	Org-029	<0.1	[NT]	[NT]	[NT]	[NT]	99	[NT]
Perfluorooctanesulfonic acid PFOS	µg/kg	0.1	Org-029	<0.1	[NT]	[NT]	[NT]	[NT]	98	[NT]
Perfluorodecanesulfonic acid	µg/kg	0.2	Org-029	<0.2	[NT]	[NT]	[NT]	[NT]	102	[NT]
Perfluorobutanoic acid	µg/kg	0.2	Org-029	<0.2	[NT]	[NT]	[NT]	[NT]	99	[NT]
Perfluoropentanoic acid	µg/kg	0.2	Org-029	<0.2	[NT]	[NT]	[NT]	[NT]	103	[NT]
Perfluorohexanoic acid	µg/kg	0.1	Org-029	<0.1	[NT]	[NT]	[NT]	[NT]	103	[NT]
Perfluoroheptanoic acid	µg/kg	0.1	Org-029	<0.1	[NT]	[NT]	[NT]	[NT]	95	[NT]
Perfluorooctanoic acid PFOA	µg/kg	0.1	Org-029	<0.1	[NT]	[NT]	[NT]	[NT]	105	[NT]
Perfluorononanoic acid	µg/kg	0.1	Org-029	<0.1	[NT]	[NT]	[NT]	[NT]	98	[NT]
Perfluorodecanoic acid	µg/kg	0.5	Org-029	<0.5	[NT]	[NT]	[NT]	[NT]	103	[NT]
Perfluoroundecanoic acid	µg/kg	0.5	Org-029	<0.5	[NT]	[NT]	[NT]	[NT]	110	[NT]
Perfluorododecanoic acid	µg/kg	0.5	Org-029	<0.5	[NT]	[NT]	[NT]	[NT]	113	[NT]
Perfluorotridecanoic acid	µg/kg	0.5	Org-029	<0.5	[NT]	[NT]	[NT]	[NT]	122	[NT]
Perfluorotetradecanoic acid	µg/kg	5	Org-029	<5	[NT]	[NT]	[NT]	[NT]	107	[NT]
4:2 FTS	µg/kg	0.1	Org-029	<0.1	[NT]	[NT]	[NT]	[NT]	102	[NT]
6:2 FTS	µg/kg	0.1	Org-029	<0.1	[NT]	[NT]	[NT]	[NT]	103	[NT]
8:2 FTS	µg/kg	0.2	Org-029	<0.2	[NT]	[NT]	[NT]	[NT]	91	[NT]
10:2 FTS	µg/kg	0.2	Org-029	<0.2	[NT]	[NT]	[NT]	[NT]	103	[NT]
Perfluorooctane sulfonamide	µg/kg	1	Org-029	<1	[NT]	[NT]	[NT]	[NT]	102	[NT]
N-Methyl perfluorooctane sulfonamide	µg/kg	1	Org-029	<1	[NT]	[NT]	[NT]	[NT]	104	[NT]
N-Ethyl perfluorooctanesulfon amide	µg/kg	1	Org-029	<1	[NT]	[NT]	[NT]	[NT]	95	[NT]
N-Me perfluorooctanesulfonamid oethanol	µg/kg	1	Org-029	<1	[NT]	[NT]	[NT]	[NT]	113	[NT]
N-Et perfluorooctanesulfonamid oethanol	µg/kg	5	Org-029	<5	[NT]	[NT]	[NT]	[NT]	111	[NT]
MePerfluorooctanesulf- amid oacetic acid	µg/kg	0.2	Org-029	<0.2	[NT]	[NT]	[NT]	[NT]	102	[NT]
EtPerfluorooctanesulf amid oacetic acid	µg/kg	0.2	Org-029	<0.2	[NT]	[NT]	[NT]	[NT]	94	[NT]
Surrogate $^{13}C_8$ *PFOS*	%		Org-029	101	[NT]	[NT]	[NT]	[NT]	99	[NT]
Surrogate $^{13}C_2$ *PFOA*	%		Org-029	98	[NT]	[NT]	[NT]	[NT]	101	[NT]

QUALITY CONTROL: PFAS in Soils Extended					Duplicate				Spike Recovery %	
Test Description	Units	PQL	Method	Blank	#	Base	Dup.	RPD	LCS-2	[NT]
Extracted ISTD $^{13}C_3$ *PFBS*	%		Org-029	97	[NT]	[NT]	[NT]	[NT]	98	[NT]
Extracted ISTD $^{18}O_2$ *PFHxS*	%		Org-029	100	[NT]	[NT]	[NT]	[NT]	104	[NT]
Extracted ISTD $^{13}C_4$ *PFOS*	%		Org-029	101	[NT]	[NT]	[NT]	[NT]	102	[NT]
Extracted ISTD $^{13}C_4$ *PFBA*	%		Org-029	102	[NT]	[NT]	[NT]	[NT]	101	[NT]
Extracted ISTD $^{13}C_3$ *PFPeA*	%		Org-029	100	[NT]	[NT]	[NT]	[NT]	99	[NT]
Extracted ISTD $^{13}C_2$ *PFHxA*	%		Org-029	105	[NT]	[NT]	[NT]	[NT]	104	[NT]
Extracted ISTD $^{13}C_4$ *PFHpA*	%		Org-029	107	[NT]	[NT]	[NT]	[NT]	103	[NT]
Extracted ISTD $^{13}C_4$ *PFOA*	%		Org-029	106	[NT]	[NT]	[NT]	[NT]	101	[NT]
Extracted ISTD $^{13}C_5$ *PFNA*	%		Org-029	101	[NT]	[NT]	[NT]	[NT]	98	[NT]
Extracted ISTD $^{13}C_2$ *PFDA*	%		Org-029	90	[NT]	[NT]	[NT]	[NT]	96	[NT]
Extracted ISTD $^{13}C_2$ *PFUnDA*	%		Org-029	114	[NT]	[NT]	[NT]	[NT]	102	[NT]
Extracted ISTD $^{13}C_2$ *PFDoDA*	%		Org-029	119	[NT]	[NT]	[NT]	[NT]	98	[NT]
Extracted ISTD $^{13}C_2$ *PFTeDA*	%		Org-029	107	[NT]	[NT]	[NT]	[NT]	95	[NT]
Extracted ISTD $^{13}C_2$ *4:2FTS*	%		Org-029	106	[NT]	[NT]	[NT]	[NT]	109	[NT]
Extracted ISTD $^{13}C_2$ *6:2FTS*	%		Org-029	112	[NT]	[NT]	[NT]	[NT]	103	[NT]
Extracted ISTD $^{13}C_2$ *8:2FTS*	%		Org-029	115	[NT]	[NT]	[NT]	[NT]	104	[NT]
Extracted ISTD $^{13}C_8$ *FOSA*	%		Org-029	110	[NT]	[NT]	[NT]	[NT]	105	[NT]
Extracted ISTD d_3 *N MeFOSA*	%		Org-029	104	[NT]	[NT]	[NT]	[NT]	104	[NT]
Extracted ISTD d_5 *N EtFOSA*	%		Org-029	109	[NT]	[NT]	[NT]	[NT]	109	[NT]
Extracted ISTD d_7 *N MeFOSE*	%		Org-029	106	[NT]	[NT]	[NT]	[NT]	103	[NT]

QUALITY CONTROL: PFAS in Soils Extended					Duplicate				Spike Recovery %	
Test Description	Units	PQL	Method	Blank	#	Base	Dup.	RPD	LCS-2	[NT]
Extracted ISTD d_9 *N EtFOSE*	%		Org-029	103	[NT]	[NT]	[NT]	[NT]	95	[NT]
Extracted ISTD d_3 *N MeFOSAA*	%		Org-029	147	[NT]	[NT]	[NT]	[NT]	100	[NT]
Extracted ISTD d_5 *N EtFOSAA*	%		Org-029	112	[NT]	[NT]	[NT]	[NT]	114	[NT]

QUALITY CONTROL: vTRH(C6-C10)/BTEXN in Water					Duplicate				Spike Recovery %	
Test Description	Units	PQL	Method	Blank	#	Base	Dup.	RPD	LCS-W2	[NT]
Date extracted	-			27/08/2021	[NT]	[NT]	[NT]	[NT]	27/08/2021	[NT]
Date analysed	-			27/08/2021	[NT]	[NT]	[NT]	[NT]	27/08/2021	[NT]
TRH C_6 - C_9	µg/L	10	Org-023	<10	[NT]	[NT]	[NT]	[NT]	110	[NT]
TRH C_6 - C_{10}	µg/L	10	Org-023	<10	[NT]	[NT]	[NT]	[NT]	110	[NT]
Benzene	µg/L	1	Org-023	<1	[NT]	[NT]	[NT]	[NT]	104	[NT]
Toluene	µg/L	1	Org-023	<1	[NT]	[NT]	[NT]	[NT]	106	[NT]
Ethylbenzene	µg/L	1	Org-023	<1	[NT]	[NT]	[NT]	[NT]	112	[NT]
m+p-xylene	µg/L	2	Org-023	<2	[NT]	[NT]	[NT]	[NT]	115	[NT]
o-xylene	µg/L	1	Org-023	<1	[NT]	[NT]	[NT]	[NT]	110	[NT]
Naphthalene	µg/L	1	Org-023	<1	[NT]	[NT]	[NT]	[NT]	[NT]	[NT]
Surrogate Dibromofluoromethane	%		Org-023	98	[NT]	[NT]	[NT]	[NT]	100	[NT]
Surrogate toluene-d8	%		Org-023	97	[NT]	[NT]	[NT]	[NT]	100	[NT]
Surrogate 4-BFB	%		Org-023	102	[NT]	[NT]	[NT]	[NT]	101	[NT]

QUALITY CONTROL: svTRH (C10-C40) in Water					Duplicate				Spike Recovery %	
Test Description	Units	PQL	Method	Blank	#	Base	Dup.	RPD	LCS-W2	[NT]
Date extracted	-			30/08/2021	30	30/08/2021	30/08/2021		30/08/2021	[NT]
Date analysed	-			30/08/2021	30	30/08/2021	30/08/2021		30/08/2021	[NT]
TRH C_{10} - C_{14}	µg/L	50	Org-020	<50	30	<50	<50	0	82	[NT]
TRH C_{15} - C_{28}	µg/L	100	Org-020	<100	30	<100	<100	0	75	[NT]
TRH C_{29} - C_{36}	µg/L	100	Org-020	<100	30	<100	<100	0	96	[NT]
TRH >C_{10} - C_{16}	µg/L	50	Org-020	<50	30	<50	<50	0	82	[NT]
TRH >C_{16} - C_{34}	µg/L	100	Org-020	<100	30	<100	<100	0	75	[NT]
TRH >C_{34} - C_{40}	µg/L	100	Org-020	<100	30	<100	<100	0	96	[NT]
Surrogate o-Terphenyl	%		Org-020	90	30	78	77	1	92	[NT]

QUALITY CONTROL: PAHs in Water						Duplicate			Spike Recovery %	
Test Description	Units	PQL	Method	Blank	#	Base	Dup.	RPD	LCS-W1	276682-31
Date extracted	-			30/08/2021	30	30/08/2021	30/08/2021		30/08/2021	30/08/2021
Date analysed	-			30/08/2021	30	30/08/2021	30/08/2021		30/08/2021	30/08/2021
Naphthalene	µg/L	1	Org-022/025	<1	30	<1	<1	0	96	100
Acenaphthylene	µg/L	1	Org-022/025	<1	30	<1	<1	0	[NT]	[NT]
Acenaphthene	µg/L	1	Org-022/025	<1	30	<1	<1	0	87	90
Fluorene	µg/L	1	Org-022/025	<1	30	<1	<1	0	100	102
Phenanthrene	µg/L	1	Org-022/025	<1	30	<1	<1	0	120	128
Anthracene	µg/L	1	Org-022/025	<1	30	<1	<1	0	[NT]	[NT]
Fluoranthene	µg/L	1	Org-022/025	<1	30	<1	<1	0	98	105
Pyrene	µg/L	1	Org-022/025	<1	30	<1	<1	0	102	109
Benzo(a)anthracene	µg/L	1	Org-022/025	<1	30	<1	<1	0	[NT]	[NT]
Chrysene	µg/L	1	Org-022/025	<1	30	<1	<1	0	108	84
Benzo(b,j+k)fluoranthene	µg/L	2	Org-022/025	<2	30	<2	<2	0	[NT]	[NT]
Benzo(a)pyrene	µg/L	1	Org-022/025	<1	30	<1	<1	0	85	95
Indeno(1,2,3-c,d)pyrene	µg/L	1	Org-022/025	<1	30	<1	<1	0	[NT]	[NT]
Dibenzo(a,h)anthracene	µg/L	1	Org-022/025	<1	30	<1	<1	0	[NT]	[NT]
Benzo(g,h,i)perylene	µg/L	1	Org-022/025	<1	30	<1	<1	0	[NT]	[NT]
Surrogate p-Terphenyl-d14	%		Org-022/025	85	30	91	93	2	92	90

QUALITY CONTROL: Organochlorine Pesticides in Water						Duplicate			Spike Recovery %	
Test Description	Units	PQL	Method	Blank	#	Base	Dup.	RPD	LCS-W1	276682-31
Date extracted	-			30/08/2021	30	30/08/2021	30/08/2021		30/08/2021	30/08/2021
Date analysed	-			30/08/2021	30	30/08/2021	30/08/2021		30/08/2021	30/08/2021
alpha-BHC	µg/L	0.2	Org-022/025	<0.2	30	<0.2	<0.2	0	103	105
HCB	µg/L	0.2	Org-022/025	<0.2	30	<0.2	<0.2	0	[NT]	[NT]
beta-BHC	µg/L	0.2	Org-022/025	<0.2	30	<0.2	<0.2	0	100	106
gamma-BHC	µg/L	0.2	Org-022/025	<0.2	30	<0.2	<0.2	0	[NT]	[NT]
Heptachlor	µg/L	0.2	Org-022/025	<0.2	30	<0.2	<0.2	0	100	108
delta-BHC	µg/L	0.2	Org-022/025	<0.2	30	<0.2	<0.2	0	[NT]	[NT]
Aldrin	µg/L	0.2	Org-022/025	<0.2	30	<0.2	<0.2	0	109	116
Heptachlor Epoxide	µg/L	0.2	Org-022/025	<0.2	30	<0.2	<0.2	0	110	117
gamma-Chlordane	µg/L	0.2	Org-022/025	<0.2	30	<0.2	<0.2	0	[NT]	[NT]
alpha-Chlordane	µg/L	0.2	Org-022/025	<0.2	30	<0.2	<0.2	0	[NT]	[NT]
Endosulfan I	µg/L	0.2	Org-022/025	<0.2	30	<0.2	<0.2	0	[NT]	[NT]
pp-DDE	µg/L	0.2	Org-022/025	<0.2	30	<0.2	<0.2	0	109	102
Dieldrin	µg/L	0.2	Org-022/025	<0.2	30	<0.2	<0.2	0	106	112
Endrin	µg/L	0.2	Org-022/025	<0.2	30	<0.2	<0.2	0	88	111
Endosulfan II	µg/L	0.2	Org-022/025	<0.2	30	<0.2	<0.2	0	[NT]	[NT]
pp-DDD	µg/L	0.2	Org-022/025	<0.2	30	<0.2	<0.2	0	95	104
Endrin Aldehyde	µg/L	0.2	Org-022/025	<0.2	30	<0.2	<0.2	0	[NT]	[NT]
pp-DDT	µg/L	0.2	Org-022/025	<0.2	30	<0.2	<0.2	0	[NT]	[NT]
Endosulfan Sulphate	µg/L	0.2	Org-022/025	<0.2	30	<0.2	<0.2	0	104	115
Methoxychlor	µg/L	0.2	Org-022/025	<0.2	30	<0.2	<0.2	0	[NT]	[NT]
Surrogate TCMX	%		Org-022/025	85	30	86	88	2	91	84

QUALITY CONTROL: OP Pesticides in Water					Duplicate				Spike Recovery %	
Test Description	Units	PQL	Method	Blank	#	Base	Dup.	RPD	LCS-W1	276682-31
Date extracted	-			30/08/2021	30	30/08/2021	30/08/2021		30/08/2021	30/08/2021
Date analysed	-			30/08/2021	30	30/08/2021	30/08/2021		30/08/2021	30/08/2021
Dichlorvos	µg/L	0.2	Org-022/025	<0.2	30	<0.2	<0.2	0	104	112
Dimethoate	µg/L	0.2	Org-022/025	<0.2	30	<0.2	<0.2	0	[NT]	[NT]
Diazinon	µg/L	0.2	Org-022/025	<0.2	30	<0.2	<0.2	0	[NT]	[NT]
Chlorpyriphos-methyl	µg/L	0.2	Org-022/025	<0.2	30	<0.2	<0.2	0	[NT]	[NT]
Ronnel	µg/L	0.2	Org-022/025	<0.2	30	<0.2	<0.2	0	111	120
Fenitrothion	µg/L	0.2	Org-022/025	<0.2	30	<0.2	<0.2	0	116	80
Malathion	µg/L	0.2	Org-022/025	<0.2	30	<0.2	<0.2	0	108	131
Chlorpyriphos	µg/L	0.2	Org-022/025	<0.2	30	<0.2	<0.2	0	112	121
Parathion	µg/L	0.2	Org-022/025	<0.2	30	<0.2	<0.2	0	87	96
Bromophos ethyl	µg/L	0.2	Org-022/025	<0.2	30	<0.2	<0.2	0	[NT]	[NT]
Ethion	µg/L	0.2	Org-022/025	<0.2	30	<0.2	<0.2	0	90	102
Azinphos-methyl (Guthion)	µg/L	0.2	Org-022/025	<0.2	30	<0.2	<0.2	0	[NT]	[NT]
Surrogate TCMX	%		Org-022/025	85	30	86	88	2	91	84

QUALITY CONTROL: Metals in Water - Dissolved					Duplicate				Spike Recovery %	
Test Description	Units	PQL	Method	Blank	#	Base	Dup.	RPD	LCS-W2	[NT]
Date digested	-			30/08/2021	[NT]	[NT]	[NT]	[NT]	30/08/2021	[NT]
Date analysed	-			30/08/2021	[NT]	[NT]	[NT]	[NT]	30/08/2021	[NT]
Arsenic - Dissolved	mg/L	0.05	Metals-020	<0.05	[NT]	[NT]	[NT]	[NT]	102	[NT]
Cadmium - Dissolved	mg/L	0.01	Metals-020	<0.01	[NT]	[NT]	[NT]	[NT]	96	[NT]
Chromium - Dissolved	mg/L	0.01	Metals-020	<0.01	[NT]	[NT]	[NT]	[NT]	97	[NT]
Copper - Dissolved	mg/L	0.01	Metals-020	<0.01	[NT]	[NT]	[NT]	[NT]	101	[NT]
Lead - Dissolved	mg/L	0.03	Metals-020	<0.03	[NT]	[NT]	[NT]	[NT]	99	[NT]
Mercury - Dissolved	mg/L	0.0005	Metals-021	<0.0005	[NT]	[NT]	[NT]	[NT]	114	[NT]
Nickel - Dissolved	mg/L	0.02	Metals-020	<0.02	[NT]	[NT]	[NT]	[NT]	101	[NT]
Zinc - Dissolved	mg/L	0.02	Metals-020	<0.02	[NT]	[NT]	[NT]	[NT]	103	[NT]

Result Definitions

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

Quality Control Definitions

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

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

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

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

Laboratory Acceptance Criteria

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

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

Spikes for Physical and Aggregate Tests are not applicable.

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

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

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

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

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

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

Measurement Uncertainty estimates are available for most tests upon request.

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

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

Report Comments

PAHs in Soil - The RPD for duplicate results is accepted due to the non homogenous nature of samples 276682-3,3d,14,14d

TRH Soil C10-C40 NEPM - # Percent recovery for the surrogate/matrix spike is not possible to report as the high concentration of analytes in sample/s 276682-16 have caused interference.

Acid Extractable Metals in Soil:
- The laboratory RPD acceptance criteria has been exceeded for 276682-14 for Cu, Cr, Ni and Zn. Therefore a triplicate result has been issued as laboratory sample number 276682-33.
- The laboratory RPD acceptance criteria has been exceeded for 276682-11 for Pb. Therefore a triplicate result has been issued as laboratory sample number 276682-34.
- The laboratory RPD acceptance criteria has been exceeded for 276682-1 for Cr and Ni. Therefore a triplicate result has been issued as laboratory sample number 276682-35.

Asbestos: Excessive sample volumes were provided for asbestos analysis.
A portion of the supplied samples were sub-sampled according to Envirolab
procedures.
We cannot guarantee that these sub-samples are indicative of the entire sample.
Envirolab recommends supplying 40-50g (50mL) of sample in its own
container as per AS4964-2004.
Note: Samples 276682-3,7,10,11,12,16,24,26,32 were sub-sampled from bags provided by the client.

Asbestos: A portion of the supplied sample was sub-sampled for asbestos
analysis according to Envirolab procedures.
We cannot guarantee that this sub-sample is indicative of the entire sample.
Envirolab recommends supplying 40-50g of sample in its own container.
Note: Sample 276682-5 was sub-sampled from a jar provided by the client.

CHAIN OF CUSTODY - Client

1 of 3

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Sampler: KYLE MCLEAN
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Client Project Name / Number / Site etc (ie report title): 1A254001
PO No.:
Envirolab Quote No. :
Date results required:
Or choose: [✓ standard] / same day / 1 day / 2 day / 3 day
Note: Inform lab in advance if urgent turnaround is required - surcharges apply
Additional report format: [✓ esdat] / equis /
Lab Comments:

Sample information					Tests Required															Comments
Envirolab Sample ID	Client Sample ID or information	Depth	Date sampled	Type of sample	Heavy Metals (8)	TRH	BTEX	PAH	OCP/OPP	Asbestos	Microbiological (Total Coliform)	PFAS (Ext.)								Provide as much information about the sample as you can
1	SS01_0.05	0.05	24/8	Soil.		X	X	X												
2	SS02_0.05	0.05	↓	↓		X	X	X												
3	SS03a_0.10	0.10			X	X	X	X	X	X										
4	SS04_0.05	0.05				X	X	X												
5	SS05_0.05	0.05	26/8		X	X	X	X	X	X	X									
6	SS10_0.05.	0.05	25/8		X	X	X	X				X								
7.	SS11_0.05	0.05	24/8		X	X	X	X	X	X										← Microbiological-Hold
8	SS12_0.05.	0.05	↓			X	X	X												
9	SS14_0.05	0.05				X	X	X												
10	SS15_0.05.	0.05	26/8		X	X	X	X	X	X	X									
11	SS17a_0.10	0.10	25/8		X	X	X	X	X	X										
12	SS18_0.05	0.05	24/8			X	X	X												
13	SS23_0.05	0.05.	24/8			X	X	X												

Relinquished by (Company): JACOBS
Print Name: KYLE MCLEAN
Date & Time: 27.8.21 12:30
Signature:

Received by (Company): ELS SYD.
Print Name: Christine
Date & Time: 27/08/21 1255
Signature:

Lab Use Only
Job number: 276682
Cooling: [✓ Ice] / Ice pack / None
Temperature: 8°C
Security seal: Intact / Broken / None
TAT Req - SAME day / 1 / 2 / 3 / 4 / STD

Form 302_V002

Issue date: 27 April 2017

CHAIN OF CUSTODY - Client

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Ph: 08 8967 1201 / darwin@envirolab.com.au

Client: TfNSW
Contact Person: KYLE MCLEAN
Project Mgr: AMANDA MULLEN
Sampler: KYLE MCLEAN
Address: Level 7, 177 Pacific Hwy, North Sydney.
Phone: **Mob:** 0402536796
Email: kyle.mclean@jacobs.com. amanda.mullen@jacobs.com

Client Project Name / Number / Site etc (ie report title): IA254001
PO No.:
Envirolab Quote No. :
Date results required:
Or choose: [✓ standard] / same day / 1 day / 2 day / 3 day
Note: Inform lab in advance if urgent turnaround is required - surcharges apply
Additional report format: esdat / equis /
Lab Comments:

Sample information					Tests Required															Comments
Envirolab Sample ID	**Client Sample ID or information**	**Depth**	**Date sampled**	**Type of sample**	Heavy Metals (8)	TRH	BTEX	PAH.	OCP/OPP	Asbestos	Microbiological	PFAS (Ext)								**Provide as much information about the sample as you can**
	~~SS24a-0.10~~	~~0.10~~	~~27/8~~	~~Soil~~	~~X~~	~~X~~	~~X~~	~~X~~	~~X~~	~~X~~										
14.	SS25_0.10	0.10	24/8		X	X	X	X	X	X										
15	SS27_0.05	0.05	27/8			X	X	X												
16	SS28_0.05	0.05	27/8		X	X	X	X	X	X										
	~~SS24b_0.10~~	~~0.10~~	~~27/8~~		~~X~~	~~X~~	~~X~~	~~X~~	~~X~~	~~X~~										
17	BH02_0.05	0.05	26/8		X	X	X	X												
18	BH02_0.5	0.5			X	X	X	X												
19	BH02_1.0	1.0																		
20	BH03_0.05	0.05			X	X	X	X												
21	BH03_0.5.	0.5																		
22	BH03_0.9	0.9			X	X	X	X												
23	BH14_0.05	0.05																		
24	BH14_0.5	0.5.			X	X	X	X	X	X	X									

Relinquished by (Company): JACOBS
Print Name: KYLE MCLEAN
Date & Time: 27.8.21 @ 12:30
Signature:

Received by (Company): ELS SYD
Print Name: Christine
Date & Time: 27/08/21 1255
Signature:

Lab Use Only
Job number: 276682
Cooling: [✓ Ice] / Ice pack / None
Temperature: 30.
Security seal: Intact / Broken /None
TAT Req - SAME day / 1 / 2 / 3 / 4 / STD

CHAIN OF CUSTODY - Client

3 of 3

ENVIROLAB GROUP - National phone number 1300 424 344

Sydney Lab - Envirolab Services
12 Ashley St, Chatswood, NSW 2067
Ph: 02 9910 6200 / sydney@envirolab.com.au ✓

Perth Lab - MPL Laboratories
16-18 Hayden Crt Myaree, WA 6154
Ph: 08 9317 2505 / lab@mpl.com.au

Melbourne Lab - Envirolab Services
1A Dalmore Drive Scoresby VIC 3179
Ph: 03 9763 2500 / melbourne@envirolab.com.au

Adelaide Office - Envirolab Services
7a The Parade, Norwood, SA 5067
Ph: 08 7087 6800 / adelaide@envirolab.com.au

Brisbane Office - Envirolab Services
20a, 10-20 Depot St, Banyo, QLD 4014
Ph: 07 3266 9532 / brisbane@envirolab.com.au

Darwin Office - Envirolab Services
Unit 7, 17 Willes Rd, Berrimah, NT 0820
Ph: 08 8967 1201 / darwin@envirolab.com.au

Client: TfNSW
Contact Person: KYLE MCLEAN
Project Mgr: AMANDA MULLEN
Sampler: KYLE MCLEAN
Address: Level 7, 177 Pacific Hwy, North Sydney, NSW
Phone: **Mob:** 0402 536 796
Email: kyle.mclean@jacobs.com
amanda.mullen@jacobs.com.

Client Project Name / Number / Site etc (ie report title): 1A254001
PO No.:
Envirolab Quote No. :
Date results required:
Or choose: [✓ standard] / same day / 1 day / 2 day / 3 day
Note: Inform lab in advance if urgent turnaround is required - surcharges apply
Additional report format: [✓ esdat] / equis /
Lab Comments:

Sample information					Tests Required															Comments
Envirolab Sample ID	**Client Sample ID or information**	**Depth**	**Date sampled**	**Type of sample**	Heavy Metals (6)	TRH	BTEX	PAH	OCP/OPP	Asbestos	Microbiological (Total Coliforms)	PFAS (Ext)								**Provide as much information about the sample as you can**
25	BH14-1.0	26/8	1.0	Soil																
26	BH14-1.5.	26/8	1.5.		X	X	X	X	X	X	X									
27	QC101-210826	26/8	–		X	X	X	X												Blind Duplicate
–	QC201-210826	26/8	–		X	X	X	X												Send to ALS
28	QC300-210825	25/8	–				X													Trip blank
29	QC400-210825	25/8	–	Soil			X													Trip Spike
30	QC501-210826	26/8	–	Water	X	X	X	X	X		X									Rinsate
31	QC501-210827	27/8	–	Water	X	X	X	X	X		X									Rinsate
32	SS036_~~21082~~ 0.10	27/8	0.10	Soil	X	X	X	X	X	X										

Relinquished by (Company): KYLE MCLEAN
Print Name: JACOBS
Date & Time: 27.8.21 @ 12:30
Signature:

Received by (Company): ELS SYD
Print Name: Christina
Date & Time: 27/08/21 1255
Signature:

Lab Use Only
Job number: 276682
Cooling: [✓ Ice] / Ice pack / None
Temperature: 5°
Security seal: Intact / Broken / None
TAT Req - SAME day / 1 / 2 / 3 / 4 / STD

Form 302_V002

Issue date: 27 April 2017

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

CERTIFICATE OF ANALYSIS 277534

Client Details

Client	Jacobs Group (Australia) Pty Ltd
Attention	Kyle Mclean, Amanda Mullen
Address	Level 7, 177 Pacific Highway, North Sydney, NSW, 2060

Sample Details

Your Reference	**IA254001**
Number of Samples	21 Soil, 1 Water
Date samples received	01/09/2021
Date completed instructions received	01/09/2021

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.

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

Report Details

Date results requested by	09/09/2021
Date of Issue	10/09/2021

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

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

Results Approved By
Greta Petzold, Senior Report Coordinator

Authorised By

Nancy Zhang, Laboratory Manager

Micro testing in soil					
Our Reference		277534-2	277534-4	277534-10	277534-11
Your Reference	UNITS	BH09_0.50	BH09_2.0	BH04_0.50	BH04_1.0
Depth		0.50	2.0	0.50	1.0
Date Sampled		30/08/2021	30/08/2021	31/08/2021	31/08/2021
Type of sample		Soil	Soil	Soil	Soil
Date of testing	-	01/09/2021	01/09/2021	01/09/2021	01/09/2021
Total Coliforms in soil	MPN/100g	<200	160,000	<200	<200

Microbiologocal Testing		
Our Reference		277534-22
Your Reference	UNITS	QC501_210831
Depth		-
Date Sampled		31/08/2021
Type of sample		Water
Date of testing	-	01/09/2021
Total Coliforms	cfu/100mL	<1

Method ID	Methodology Summary
Ext-008	Subcontracted to Sonic Food & Water Testing. NATA Accreditation No. 4034.

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.

Report Comments

Total Coliforms in water & soil analysed by Sonic Food & Water Testing. Report No. W2119974, W2119979 & W2119980

The time between collection and the commencement of testing should not exceed 24 hours. Samples tested outside this time may have their results compromised

Pg 1of 2

CHAIN OF CUSTODY - Client

ENVIROLAB GROUP - National phone number 1300 424 344

Sydney Lab - Envirolab Services
12 Ashley St, Chatswood, NSW 2067
Ph: 02 9910 6200 / sydney@envirolab.com.au

Perth Lab - MPL Laboratories
16-18 Hayden Crt Myaree, WA 6154
Ph: 08 9317 2505 / lab@mpl.com.au

Melbourne Lab - Envirolab Services
1A Dalmore Drive Scoresby VIC 3179
Ph: 03 9763 2500 / melbourne@envirolab.com.au

Adelaide Office - Envirolab Services
7a The Parade, Norwood, SA 5067
Ph: 08 7087 6800 / adelaide@envirolab.com.au

Brisbane Office - Envirolab Services
20a, 10-20 Depot St, Banyo, QLD 4014
Ph: 07 3266 9532 / brisbane@envirolab.com.au

Darwin Office - Envirolab Services
Unit 7, 17 Willes Rd, Berrimah, NT 0820
Ph: 08 8967 1201 / darwin@envirolab.com.au

Client: [redacted] Jacobs [redacted] (JAJV)
Contact Person: Kyle Mclean / Nick Keatley
Project Mgr: Amanda Mullen.
Sampler: Kyle Mclean.
Address: Level 7, 177 Pacific Hwy, North Sydney.
[redacted]
Phone: **Mob:** [redacted]
Email: Kyle.mclean@jacobs.com 0402 536 796
Nick.Keatley@jacobs.com , jacobs.labresults@esdat.net
Amanda.Mullen@jacobs.com , EDMANZ@jacobs.com

Client Project Name / Number / Site etc (ie report title): IA254001
PO No.:
Envirolab Quote No. :
Date results required:
Or choose: [✓ standard] / same day / 1 day / 2 day / 3 day
Note: Inform lab in advance if urgent turnaround is required - surcharges apply
Additional report format: esdat / equis /
Lab Comments: [redacted] All samples sent to Sonic for TC Analysis

Sample information | **Tests Required** | **Comments**

Envirolab Sample ID	Client Sample ID or information	Depth	Date sampled	Type of sample	[redacted]	[redacted]	Total Coliforms	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]							Hold	Provide as much information about the sample as you can
1.	BH09 - 0.05	0.05	30/8/21	Soil															X	Sample for T.C.
2.	BH09 - 0.50	0.50			[redacted]	[redacted]	X													dropped off
3	BH09 - 1.0	1.0																	X	@ Sonic in
4	BH09 - 2.0	2.0			[redacted]	[redacted]	X													Lithgow directly.
5	BH09 - 3.0	3.0																	X	
6	BH09 - 4.0	4.0																	X	
7	BH09 - 5.0	5.0																	X	
8	BH09 - 6.0	6.0																	X	
	~~SS/76 - 0.00~~	~~0.10~~			X			X	X	X	X	X								
9	BH04 - 0.05	0.05	31/8/21																	see sonic
10	BH04 - 0.50	0.50																		~~te~~ for which
11	BH04 - 1.0	1.0																		samples were
12	BH04 - 2.0	2.0																		analysed

only TC

Relinquished by (Company): KYLE MCLEAN
Print Name: JACOBS (JAJV)
Date & Time:
Signature:

Received by (Company):
Print Name:
Date & Time: 01/09/2021.
Signature:

Lab Use Only
Job number: 277534
Cooling: Ice / Ice pack / None
Temperature:
Security seal: Intact / Broken / None
TAT Req - SAME day / 1 / 2 / 3 / 4 / STD

Form 302_V002

Issue date: 27 April 2017

Pg 2 of 2

CHAIN OF CUSTODY - Client

ENVIROLAB GROUP - National phone number 1300 424 344

Client: ~~[illegible]~~ Jacobs (JAJV)
Contact Person: KYLE MCLEAN / NICK KEATLEY
Project Mgr: AMANDA MULLEN (FIELD MANAGER)
Sampler: KYLE MCLEAN
Address: Level 7, 177 Pacific Hwy, North Sydney
Phone:
Mob: ~~0402 536 776~~
Email: kyle.mclean@jacobs.com 0402 536796
nick.keatley@jacobs.com, jacobs.labresults@esdat.net
amanda.mullen@jacobs.com, EDMANZ@jacobs.com.

Client Project Name / Number / Site etc (ie report title): IA254001
PO No.:
Envirolab Quote No. :
Date results required:
Or choose: [✓ standard] same day / 1 day / 2 day / 3 day
Note: Inform lab in advance if urgent turnaround is required - surcharges apply
Additional report format: esdat / equis /
Lab Comments:

Sydney Lab - Envirolab Services
12 Ashley St, Chatswood, NSW 2067
Ph: 02 9910 6200 / sydney@envirolab.com.au

Perth Lab - MPL Laboratories
16-18 Hayden Crt Myaree, WA 6154
Ph: 08 9317 2505 / lab@mpl.com.au

Melbourne Lab - Envirolab Services
1A Dalmore Drive Scoresby VIC 3179
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Ph: 07 3266 9532 / brisbane@envirolab.com.au

Darwin Office - Envirolab Services
Unit 7, 17 Willes Rd, Berrimah, NT 0820
Ph: 08 8967 1201 / darwin@envirolab.com.au

Sample Information					Tests Required															Comments
Envirolab Sample ID	Client Sample ID or information	Depth	Date sampled	Type of sample	[illegible]	[illegible]	Total Coliforms	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]						Hold	Provide as much information about the sample as you can
13	BH04-3.0	3.0	31/8/21	Soil																see sonic ~~for~~ samples that were analysed TC only
14	BH04_4.0	4.0																		
15	BH04-5.0	5.0																		
16	BH04_6.0	6.0																		
17	BH04-7.0	7.0																		
18	BH04_8.0	8.0																		
19	BH04_9.0	9.0																		
20	BH04-10.0	10.0																		
21	BH04_11.0	11.0																		
22	QC501_210831	—		Water	~~[illegible]~~	~~[illegible]~~	X	~~[illegible]~~	~~[illegible]~~	~~[illegible]~~	~~[illegible]~~									Rinsate
	~~BH05_0.05~~	~~0.05~~																		
	~~BH05_0.5~~	~~0.5~~																		
	~~BH05_1.0~~	~~1.0~~																		

Relinquished by (Company): JACOBS (JAJV)
Print Name: /
Date & Time: 3/9/21 @
Signature:

Received by (Company):
Print Name:
Date & Time:
Signature:

Lab Use Only
Job number: 277534.
Cooling: Ice / Ice pack / None
Temperature:
Security seal: Intact / Broken /None
TAT Req - SAME day / 1 / 2 / 3 / 4 / STD

Form 302_V002

Issue date: 27 April 2017

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	Jacobs Group (Australia) Pty Ltd
Attention	Kyle Mclean, Amanda Mullen

Sample Login Details

Your reference	IA254001
Envirolab Reference	277534
Date Sample Received	01/09/2021
Date Instructions Received	01/09/2021
Date Results Expected to be Reported	09/09/2021

Sample Condition

Samples received in appropriate condition for analysis	Yes
No. of Samples Provided	21 Soil, 1 Water
Turnaround Time Requested	Standard
Temperature on Receipt (°C)	
Cooling Method	
Sampling Date Provided	YES

Comments

samples received by Sonic

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:

Sample ID	Micro testing in soil	Microbiologocal Testing	On Hold
BH09_0.05-0.05			✓
BH09_0.50-0.50	✓		
BH09_1.0-1.0			✓
BH09_2.0-2.0	✓		
BH09_3.0-3.0			✓
BH09_4.0-4.0			✓
BH09_5.0-5.0			✓
BH09_6.0-6.0			✓
BH04_0.05-0.05			✓
BH04_0.50-0.50	✓		
BH04_1.0-1.0	✓		
BH04_2.0-2.0			✓
BH04_3.0-3.0			✓
BH04_4.0-4.0			✓
BH04_5.0-5.0			✓
BH04_6.0-6.0			✓
BH04_7.0-7.0			✓
BH04_8.0-8.0			✓
BH04_9.0-9.0			✓
BH04_10.0-10.0			✓
BH04_11.0-11.0			✓
QC501_210831		✓	

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

Additional Info

Sample storage - Waters are routinely disposed of approximately 1 month and soils approximately 2 months from receipt.

Requests for longer term sample storage must be received in writing.

Please contact the laboratory immediately if observed settled sediment present in water samples is to be included in the extraction and/or analysis (exceptions include certain Physical Tests (pH/EC/BOD/COD/Apparent Colour etc.), Solids testing, Total Recoverable metals and PFAS analysis where solids are included by default.

TAT for Micro is dependent on incubation. This varies from 3 to 6 days.

eurofins | Environment Testing

Certificate of Analysis

Jacobs Group (Australia) P/L NSW
Level 7, 177 Pacific Highway
North Sydney
NSW 2065

Attention: **Kyle McLean**

Report **820973-S**
Project name
Project ID IA254001
Received Date Aug 30, 2021

Client Sample ID			**QC201_210826**
Sample Matrix			**Soil**
Eurofins Sample No.			**S21-Au58558**
Date Sampled			**Aug 26, 2021**
Test/Reference	LOR	Unit	
Total Recoverable Hydrocarbons			
TRH C6-C9	20	mg/kg	< 20
TRH C10-C14	20	mg/kg	< 20
TRH C15-C28	50	mg/kg	< 50
TRH C29-C36	50	mg/kg	120
TRH C10-C36 (Total)	50	mg/kg	120
Naphthalene^{N02}	0.5	mg/kg	< 0.5
TRH C6-C10	20	mg/kg	< 20
TRH C6-C10 less BTEX (F1)^{N04}	20	mg/kg	< 20
TRH >C10-C16	50	mg/kg	< 50
TRH >C10-C16 less Naphthalene (F2)^{N01}	50	mg/kg	< 50
TRH >C16-C34	100	mg/kg	140
TRH >C34-C40	100	mg/kg	< 100
TRH >C10-C40 (total)*	100	mg/kg	140
BTEX			
Benzene	0.1	mg/kg	< 0.1
Toluene	0.1	mg/kg	< 0.1
Ethylbenzene	0.1	mg/kg	< 0.1
m&p-Xylenes	0.2	mg/kg	< 0.2
o-Xylene	0.1	mg/kg	< 0.1
Xylenes - Total*	0.3	mg/kg	< 0.3
4-Bromofluorobenzene (surr.)	1	%	106
Polycyclic Aromatic Hydrocarbons			
Benzo(a)pyrene TEQ (lower bound) *	0.5	mg/kg	< 0.5
Benzo(a)pyrene TEQ (medium bound) *	0.5	mg/kg	0.6
Benzo(a)pyrene TEQ (upper bound) *	0.5	mg/kg	1.2
Acenaphthene	0.5	mg/kg	< 0.5
Acenaphthylene	0.5	mg/kg	< 0.5
Anthracene	0.5	mg/kg	< 0.5
Benz(a)anthracene	0.5	mg/kg	< 0.5
Benzo(a)pyrene	0.5	mg/kg	< 0.5
Benzo(b&j)fluoranthene^{N07}	0.5	mg/kg	< 0.5
Benzo(g.h.i)perylene	0.5	mg/kg	< 0.5
Benzo(k)fluoranthene	0.5	mg/kg	< 0.5
Chrysene	0.5	mg/kg	< 0.5
Dibenz(a.h)anthracene	0.5	mg/kg	< 0.5

Client Sample ID			**QC201_210826**
Sample Matrix			**Soil**
Eurofins Sample No.			**S21-Au58558**
Date Sampled			**Aug 26, 2021**
Test/Reference	LOR	Unit	
Polycyclic Aromatic Hydrocarbons			
Fluoranthene	0.5	mg/kg	< 0.5
Fluorene	0.5	mg/kg	< 0.5
Indeno(1.2.3-cd)pyrene	0.5	mg/kg	< 0.5
Naphthalene	0.5	mg/kg	< 0.5
Phenanthrene	0.5	mg/kg	< 0.5
Pyrene	0.5	mg/kg	< 0.5
Total PAH*	0.5	mg/kg	< 0.5
2-Fluorobiphenyl (surr.)	1	%	89
p-Terphenyl-d14 (surr.)	1	%	85
Heavy Metals			
Arsenic	2	mg/kg	
Cadmium	0.4	mg/kg	
Chromium	5	mg/kg	
Copper	5	mg/kg	
Lead	5	mg/kg	
Mercury	0.1	mg/kg	
Nickel	5	mg/kg	
Zinc	5	mg/kg	
% Moisture	1	%	17

Sample History

Where samples are submitted/analysed over several days, the last date of extraction is reported.

If the date and time of sampling are not provided, the Laboratory will not be responsible for compromised results should testing be performed outside the recommended holding time.

Description	Testing Site	Extracted	Holding Time
Total Recoverable Hydrocarbons - 1999 NEPM Fractions - Method: LTM-ORG-2010 TRH C6-C40	Sydney	Sep 02, 2021	14 Days
Total Recoverable Hydrocarbons - 2013 NEPM Fractions - Method: LTM-ORG-2010 TRH C6-C40	Sydney	Sep 02, 2021	14 Days
Total Recoverable Hydrocarbons - 2013 NEPM Fractions - Method: LTM-ORG-2010 TRH C6-C40	Sydney	Sep 02, 2021	14 Days
BTEX - Method: LTM-ORG-2010 TRH C6-C40	Sydney	Sep 02, 2021	14 Days
Polycyclic Aromatic Hydrocarbons - Method: LTM-ORG-2130 PAH and Phenols in Soil and Water	Sydney	Sep 02, 2021	14 Days
Metals M8 - Method: LTM-MET-3040 Metals in Waters, Soils & Sediments by ICP-MS	Sydney	Sep 02, 2021	180 Days
% Moisture - Method: LTM-GEN-7080 Moisture	Sydney	Sep 01, 2021	14 Days

Company Name:	Jacobs Group (Australia) P/L NSW	**Order No.:**		**Received:**	Aug 30, 2021 2:48 PM
Address:	Level 7, 177 Pacific Highway North Sydney NSW 2065	**Report #:**	820973	**Due:**	Sep 6, 2021
		Phone:	02 9928 2100	**Priority:**	5 Day
		Fax:	02 9928 2504	**Contact Name:**	Kyle McLean
Project Name:					
Project ID:	IA254001				

Eurofins Analytical Services Manager : Andrew Black

Sample Det						Moisture Set	Eurofins Suite B7
Melbourne Laboratory - NATA Site # 1254							
Sydney Laboratory - NATA Site # 18217						X	X
Brisbane Laboratory - NATA Site # 20794							
Perth Laboratory - NATA Site # 23736							
Mayfield Laboratory - NATA Site # 25079							
External Laboratory							
No	**Sample ID**	**Sample Date**	**Sampling Time**	**Matrix**	**LAB ID**		
1	QC201_210826	Aug 26, 2021		Soil	S21-Au58558	X	X
Test Counts						1	1

Internal Quality Control Review and Glossary

General

1. Laboratory QC results for Method Blanks, Duplicates, Matrix Spikes, and Laboratory Control Samples follows guidelines delineated in the National Environment Protection (Assessment of Site Contamination) Measure 1999, as amended May 2013 and are included in this QC report where applicable. Additional QC data may be available on request.
2. All soil/sediment/solid results are reported on a dry basis, unless otherwise stated.
3. All biota/food results are reported on a wet weight basis on the edible portion, unless otherwise stated.
4. Actual LORs are matrix dependant. Quoted LORs may be raised where sample extracts are diluted due to interferences.
5. Results are uncorrected for matrix spikes or surrogate recoveries except for PFAS compounds.
6. SVOC analysis on waters are performed on homogenised, unfiltered samples, unless noted otherwise.
7. Samples were analysed on an 'as received' basis.
8. Information identified on this report with blue colour, indicates data provided by customer, that may have an impact on the results.
9. This report replaces any interim results previously issued.

Holding Times

Please refer to 'Sample Preservation and Container Guide' for holding times (QS3001).

For samples received on the last day of holding time, notification of testing requirements should have been received at least 6 hours prior to sample receipt deadlines as stated on the SRA.

If the Laboratory did not receive the information in the required timeframe, and regardless of any other integrity issues, suitably qualified results may still be reported.

Holding times apply from the date of sampling, therefore compliance to these may be outside the laboratory's control.

For VOCs containing vinyl chloride, styrene and 2-chloroethyl vinyl ether the holding time is 7 days however for all other VOCs such as BTEX or C6-10 TRH then the holding time is 14 days.

****NOTE:** pH duplicates are reported as a range NOT as RPD

Units

mg/kg: milligrams per kilogram
ppm: Parts per million
org/100mL: Organisms per 100 millilitres
mg/L: milligrams per litre
ppb: Parts per billion
NTU: Nephelometric Turbidity Units
ug/L: micrograms per litre
%: Percentage
MPN/100mL: Most Probable Number of organisms per 100 millilitres

Terms

Dry	Where a moisture has been determined on a solid sample the result is expressed on a dry basis.
LOR	Limit of Reporting.
SPIKE	Addition of the analyte to the sample and reported as percentage recovery.
RPD	Relative Percent Difference between two Duplicate pieces of analysis.
LCS	Laboratory Control Sample - reported as percent recovery.
CRM	Certified Reference Material - reported as percent recovery.
Method Blank	In the case of solid samples these are performed on laboratory certified clean sands and in the case of water samples these are performed on de-ionised water.
Surr - Surrogate	The addition of a like compound to the analyte target and reported as percentage recovery.
Duplicate	A second piece of analysis from the same sample and reported in the same units as the result to show comparison.
USEPA	United States Environmental Protection Agency
APHA	American Public Health Association
TCLP	Toxicity Characteristic Leaching Procedure
COC	Chain of Custody
SRA	Sample Receipt Advice
QSM	US Department of Defense Quality Systems Manual Version 5.3
CP	Client Parent - QC was performed on samples pertaining to this report
NCP	Non-Client Parent - QC performed on samples not pertaining to this report, QC is representative of the sequence or batch that client samples were analysed within.
TEQ	Toxic Equivalency Quotient

QC - Acceptance Criteria

RPD Duplicates: Global RPD Duplicates Acceptance Criteria is 30% however the following acceptance guidelines are equally applicable:

Results <10 times the LOR : No Limit

Results between 10-20 times the LOR : RPD must lie between 0-50%

Results >20 times the LOR : RPD must lie between 0-30%

Surrogate Recoveries: Recoveries must lie between 20-130% Phenols & 50-150% PFASs

PFAS field samples that contain surrogate recoveries in excess of the QC limit designated in QSM 5.3 where no positive PFAS results have been reported have been reviewed and no data was affected.

WA DWER (n=10): PFBA, PFPeA, PFHxA, PFHpA, PFOA, PFBS, PFHxS, PFOS, 6:2 FTSA, 8:2 FTSA

QC Data General Comments

1. Where a result is reported as a less than (<), higher than the nominated LOR, this is due to either matrix interference, extract dilution required due to interferences or contaminant levels within the sample, high moisture content or insufficient sample provided.
2. Duplicate data shown within this report that states the word "BATCH" is a Batch Duplicate from outside of your sample batch, but within the laboratory sample batch at a 1:10 ratio. The Parent and Duplicate data shown is not data from your samples.
3. Organochlorine Pesticide analysis - where reporting LCS data, Toxaphene & Chlordane are not added to the LCS.
4. Organochlorine Pesticide analysis - where reporting Spike data, Toxaphene is not added to the Spike.
5. Total Recoverable Hydrocarbons - where reporting Spike & LCS data, a single spike of commercial Hydrocarbon products in the range of C12-C30 is added and it's Total Recovery is reported in the C10-C14 cell of the Report.
6. pH and Free Chlorine analysed in the laboratory - Analysis on this test must begin within 30 minutes of sampling.Therefore laboratory analysis is unlikely to be completed within holding time. Analysis will begin as soon as possible after sample receipt.
7. Recovery Data (Spikes & Surrogates) - where chromatographic interference does not allow the determination of Recovery the term "INT" appears against that analyte.
8. Polychlorinated Biphenyls are spiked only using Aroclor 1260 in Matrix Spikes and LCS.
9. For Matrix Spikes and LCS results a dash " -" in the report means that the specific analyte was not added to the QC sample.
10. Duplicate RPDs are calculated from raw analytical data thus it is possible to have two sets of data.

Quality Control Results

Test	Units	Result 1			Acceptance Limits	Pass Limits	Qualifying Code
Method Blank							
Total Recoverable Hydrocarbons							
TRH C6-C9	mg/kg	< 20			20	Pass	
TRH C10-C14	mg/kg	< 20			20	Pass	
TRH C15-C28	mg/kg	< 50			50	Pass	
TRH C29-C36	mg/kg	< 50			50	Pass	
Naphthalene	mg/kg	< 0.5			0.5	Pass	
TRH C6-C10	mg/kg	< 20			20	Pass	
TRH >C10-C16	mg/kg	< 50			50	Pass	
TRH >C16-C34	mg/kg	< 100			100	Pass	
TRH >C34-C40	mg/kg	< 100			100	Pass	
Method Blank							
BTEX							
Benzene	mg/kg	< 0.1			0.1	Pass	
Toluene	mg/kg	< 0.1			0.1	Pass	
Ethylbenzene	mg/kg	< 0.1			0.1	Pass	
m&p-Xylenes	mg/kg	< 0.2			0.2	Pass	
o-Xylene	mg/kg	< 0.1			0.1	Pass	
Xylenes - Total*	mg/kg	< 0.3			0.3	Pass	
Method Blank							
Polycyclic Aromatic Hydrocarbons							
Acenaphthene	mg/kg	< 0.5			0.5	Pass	
Acenaphthylene	mg/kg	< 0.5			0.5	Pass	
Anthracene	mg/kg	< 0.5			0.5	Pass	
Benz(a)anthracene	mg/kg	< 0.5			0.5	Pass	
Benzo(a)pyrene	mg/kg	< 0.5			0.5	Pass	
Benzo(b&j)fluoranthene	mg/kg	< 0.5			0.5	Pass	
Benzo(g.h.i)perylene	mg/kg	< 0.5			0.5	Pass	
Benzo(k)fluoranthene	mg/kg	< 0.5			0.5	Pass	
Chrysene	mg/kg	< 0.5			0.5	Pass	
Dibenz(a.h)anthracene	mg/kg	< 0.5			0.5	Pass	
Fluoranthene	mg/kg	< 0.5			0.5	Pass	
Fluorene	mg/kg	< 0.5			0.5	Pass	
Indeno(1.2.3-cd)pyrene	mg/kg	< 0.5			0.5	Pass	
Naphthalene	mg/kg	< 0.5			0.5	Pass	
Phenanthrene	mg/kg	< 0.5			0.5	Pass	
Pyrene	mg/kg	< 0.5			0.5	Pass	
LCS - % Recovery							
Total Recoverable Hydrocarbons							
TRH C6-C9	%	105			70-130	Pass	
TRH C10-C14	%	70			70-130	Pass	
Naphthalene	%	110			70-130	Pass	
TRH C6-C10	%	106			70-130	Pass	
TRH >C10-C16	%	91			70-130	Pass	
LCS - % Recovery							
BTEX							
Benzene	%	99			70-130	Pass	
Toluene	%	102			70-130	Pass	
Ethylbenzene	%	105			70-130	Pass	
m&p-Xylenes	%	107			70-130	Pass	
o-Xylene	%	107			70-130	Pass	
Xylenes - Total*	%	107			70-130	Pass	

Test	Units	Result 1			Acceptance Limits	Pass Limits	Qualifying Code
LCS - % Recovery							
Polycyclic Aromatic Hydrocarbons							
Acenaphthene	%	107			70-130	Pass	
Acenaphthylene	%	110			70-130	Pass	
Anthracene	%	111			70-130	Pass	
Benz(a)anthracene	%	125			70-130	Pass	
Benzo(a)pyrene	%	108			70-130	Pass	
Benzo(b&j)fluoranthene	%	107			70-130	Pass	
Benzo(g.h.i)perylene	%	93			70-130	Pass	
Benzo(k)fluoranthene	%	91			70-130	Pass	
Chrysene	%	109			70-130	Pass	
Dibenz(a.h)anthracene	%	122			70-130	Pass	
Fluoranthene	%	112			70-130	Pass	
Fluorene	%	115			70-130	Pass	
Indeno(1.2.3-cd)pyrene	%	112			70-130	Pass	
Naphthalene	%	112			70-130	Pass	
Phenanthrene	%	113			70-130	Pass	
Pyrene	%	113			70-130	Pass	

Test	Lab Sample ID	QA Source	Units	Result 1			Acceptance Limits	Pass Limits	Qualifying Code
Spike - % Recovery									
Total Recoverable Hydrocarbons				Result 1					
TRH C6-C9	S21-Se03442	NCP	%	85			70-130	Pass	
TRH C10-C14	S21-Au53076	NCP	%	71			70-130	Pass	
Naphthalene	S21-Se03442	NCP	%	99			70-130	Pass	
TRH C6-C10	S21-Se03442	NCP	%	88			70-130	Pass	
TRH >C10-C16	S21-Se00633	NCP	%	71			70-130	Pass	
Spike - % Recovery									
BTEX				Result 1					
Benzene	S21-Se03442	NCP	%	82			70-130	Pass	
Toluene	S21-Se03442	NCP	%	89			70-130	Pass	
Ethylbenzene	S21-Se03442	NCP	%	91			70-130	Pass	
m&p-Xylenes	S21-Se03442	NCP	%	91			70-130	Pass	
o-Xylene	S21-Se03442	NCP	%	92			70-130	Pass	
Xylenes - Total*	S21-Se03442	NCP	%	92			70-130	Pass	
Spike - % Recovery									
Polycyclic Aromatic Hydrocarbons				Result 1					
Acenaphthene	S21-Se00684	NCP	%	117			70-130	Pass	
Acenaphthylene	S21-Se00684	NCP	%	113			70-130	Pass	
Anthracene	S21-Se00684	NCP	%	116			70-130	Pass	
Benz(a)anthracene	S21-Se00684	NCP	%	126			70-130	Pass	
Benzo(a)pyrene	S21-Se00684	NCP	%	120			70-130	Pass	
Benzo(b&j)fluoranthene	S21-Se00684	NCP	%	111			70-130	Pass	
Benzo(g.h.i)perylene	S21-Se00684	NCP	%	102			70-130	Pass	
Benzo(k)fluoranthene	S21-Se00684	NCP	%	107			70-130	Pass	
Chrysene	S21-Se00684	NCP	%	110			70-130	Pass	
Dibenz(a.h)anthracene	S21-Se00684	NCP	%	123			70-130	Pass	
Fluoranthene	S21-Se00684	NCP	%	115			70-130	Pass	
Fluorene	S21-Se00684	NCP	%	121			70-130	Pass	
Indeno(1.2.3-cd)pyrene	S21-Se00684	NCP	%	117			70-130	Pass	
Naphthalene	S21-Se00684	NCP	%	115			70-130	Pass	
Phenanthrene	S21-Se00684	NCP	%	115			70-130	Pass	
Pyrene	S21-Se00684	NCP	%	115			70-130	Pass	

Test	Lab Sample ID	QA Source	Units	Result 1			Acceptance Limits	Pass Limits	Qualifying Code
Duplicate									
Total Recoverable Hydrocarbons				Result 1	Result 2	RPD			
TRH C6-C9	S21-Se02136	NCP	mg/kg	< 20	< 20	<1	30%	Pass	
TRH C10-C14	S21-Au58278	NCP	mg/kg	< 20	< 20	<1	30%	Pass	
TRH C15-C28	S21-Au58278	NCP	mg/kg	51	64	23	30%	Pass	
TRH C29-C36	S21-Au58278	NCP	mg/kg	120	150	23	30%	Pass	
Naphthalene	S21-Se02136	NCP	mg/kg	< 0.5	< 0.5	<1	30%	Pass	
TRH C6-C10	S21-Se02136	NCP	mg/kg	< 20	< 20	<1	30%	Pass	
TRH >C10-C16	S21-Au58278	NCP	mg/kg	< 50	< 50	<1	30%	Pass	
TRH >C16-C34	S21-Au58278	NCP	mg/kg	150	190	23	30%	Pass	
TRH >C34-C40	S21-Au58278	NCP	mg/kg	< 100	< 100	<1	30%	Pass	
Duplicate									
BTEX				Result 1	Result 2	RPD			
Benzene	S21-Se02136	NCP	mg/kg	< 0.1	< 0.1	<1	30%	Pass	
Toluene	S21-Se02136	NCP	mg/kg	< 0.1	< 0.1	<1	30%	Pass	
Ethylbenzene	S21-Se02136	NCP	mg/kg	< 0.1	< 0.1	<1	30%	Pass	
m&p-Xylenes	S21-Se02136	NCP	mg/kg	< 0.2	< 0.2	<1	30%	Pass	
o-Xylene	S21-Se02136	NCP	mg/kg	< 0.1	< 0.1	<1	30%	Pass	
Xylenes - Total*	S21-Se02136	NCP	mg/kg	< 0.3	< 0.3	<1	30%	Pass	
Duplicate									
Polycyclic Aromatic Hydrocarbons				Result 1	Result 2	RPD			
Acenaphthene	S21-Au58558	CP	mg/kg	< 0.5	< 0.5	<1	30%	Pass	
Acenaphthylene	S21-Au58558	CP	mg/kg	< 0.5	< 0.5	<1	30%	Pass	
Anthracene	S21-Au58558	CP	mg/kg	< 0.5	< 0.5	<1	30%	Pass	
Benz(a)anthracene	S21-Au58558	CP	mg/kg	< 0.5	< 0.5	<1	30%	Pass	
Benzo(a)pyrene	S21-Au58558	CP	mg/kg	< 0.5	< 0.5	<1	30%	Pass	
Benzo(b&j)fluoranthene	S21-Au58558	CP	mg/kg	< 0.5	< 0.5	<1	30%	Pass	
Benzo(g.h.i)perylene	S21-Au58558	CP	mg/kg	< 0.5	< 0.5	<1	30%	Pass	
Benzo(k)fluoranthene	S21-Au58558	CP	mg/kg	< 0.5	< 0.5	<1	30%	Pass	
Chrysene	S21-Au58558	CP	mg/kg	< 0.5	< 0.5	<1	30%	Pass	
Dibenz(a.h)anthracene	S21-Au58558	CP	mg/kg	< 0.5	< 0.5	<1	30%	Pass	
Fluoranthene	S21-Au58558	CP	mg/kg	< 0.5	< 0.5	<1	30%	Pass	
Fluorene	S21-Au58558	CP	mg/kg	< 0.5	< 0.5	<1	30%	Pass	
Indeno(1.2.3-cd)pyrene	S21-Au58558	CP	mg/kg	< 0.5	< 0.5	<1	30%	Pass	
Naphthalene	S21-Au58558	CP	mg/kg	< 0.5	< 0.5	<1	30%	Pass	
Phenanthrene	S21-Au58558	CP	mg/kg	< 0.5	< 0.5	<1	30%	Pass	
Pyrene	S21-Au58558	CP	mg/kg	< 0.5	< 0.5	<1	30%	Pass	
Duplicate									
				Result 1	Result 2	RPD			
% Moisture	S21-Au58555	NCP	%	7.2	8.8	21	30%	Pass	

Comments

Sample Integrity

Custody Seals Intact (if used)	N/A
Attempt to Chill was evident	Yes
Sample correctly preserved	Yes
Appropriate sample containers have been used	Yes
Sample containers for volatile analysis received with minimal headspace	Yes
Samples received within HoldingTime	Yes
Some samples have been subcontracted	No

Qualifier Codes/Comments

Code	Description
N01	F2 is determined by arithmetically subtracting the "naphthalene" value from the ">C10-C16" value. The naphthalene value used in this calculation is obtained from volatiles (Purge & Trap analysis).
N02	Where we have reported both volatile (P&T GCMS) and semivolatile (GCMS) naphthalene data, results may not be identical. Provided correct sample handling protocols have been followed, any observed differences in results are likely to be due to procedural differences within each methodology. Results determined by both techniques have passed all QAQC acceptance criteria, and are entirely technically valid.
N04	F1 is determined by arithmetically subtracting the "Total BTEX" value from the "C6-C10" value. The "Total BTEX" value is obtained by summing the concentrations of BTEX analytes. The "C6-C10" value is obtained by quantitating against a standard of mixed aromatic/aliphatic analytes.
N07	Please note:- These two PAH isomers closely co-elute using the most contemporary analytical methods and both the reported concentration (and the TEQ) apply specifically to the total of the two co-eluting PAHs

Authorised by:

Andrew Sullivan	Senior Analyst-Organic (NSW)
John Nguyen	Senior Analyst-Metal (NSW)
Roopesh Rangarajan	Senior Analyst-Volatile (NSW)

Glenn Jackson
General Manager

- Indicates Not Requested

* Indicates NATA accreditation does not cover the performance of this service

Measurement uncertainty of test data is available on request or please click here.

CHAIN OF CUSTODY - Client

3 of 3

ENVIROLAB GROUP - National phone number 1300 424 344

Client: TfNSW
Contact Person: KYLE MCLEAN
Project Mgr: AMANDA MULLEN
Sampler: KYLE MCLEAN
Address: Level 7, 177 Pacific Hwy, North Sydney, NSW
Phone:
Mob: 0402 536 796
Email: kyle.mclean@jacobs.com
amanda.mullen@jacobs.com.

Client Project Name / Number / Site etc (ie report title): IA254001
PO No.:
Envirolab Quote No. :
Date results required:
Or choose: [✓ **standard**] / **same day / 1 day / 2 day / 3 day**
Note: Inform lab in advance if urgent turnaround is required - surcharges apply
Additional report format: [✓ **esdat**] / **equis /**
Lab Comments:

Sydney Lab - Envirolab Services
12 Ashley St, Chatswood, NSW 2067
Ph: 02 9910 6200 / sydney@envirolab.com.au

Perth Lab - MPL Laboratories
16-18 Hayden Crt Myaree, WA 6154
Ph: 08 9317 2505 / lab@mpl.com.au

Melbourne Lab - Envirolab Services
1A Dalmore Drive Scoresby VIC 3179
Ph: 03 9763 2500 / melbourne@envirolab.com.au

Adelaide Office - Envirolab Services
7a The Parade, Norwood, SA 5067
Ph: 08 7087 6800 / adelaide@envirolab.com.au

Brisbane Office - Envirolab Services
20a, 10-20 Depot St, Banyo, QLD 4014
Ph: 07 3266 9532 / brisbane@envirolab.com.au

Darwin Office - Envirolab Services
Unit 7, 17 Willes Rd, Berrimah, NT 0820
Ph: 08 8967 1201 / darwin@envirolab.com.au

✓

Sample information					Tests Required															Comments
Envirolab Sample ID	**Client Sample ID or information**	**Depth**	**Date sampled**	**Type of sample**	Heavy Metals (8).	TRH	BTEX	PAH	OCP/OPP	Asbestos	Microbiological (Total Coliforms)	PFAS.(Ecol)								**Provide as much information about the sample as you can**
25	BH14_1.0	26/8	1.0	Soil																
26	BH14_1.5.	26/8	1.5.		X	X	X	X	X	X	X									
27	QC101-210826	26/8	—		X	X	X	X												Blind Duplicate
—	QC201_210826	26/8	—		X	X	X	X												Send to ~~ALS~~ Mgt
28	QC300_210825	25/8	—				X													Trip blank
29	QC400-210825	25/8	—	Soil			X													Trip Spike
30	QC501-210826	26/8	—	Water	X	X	X	X	X		X									Rinsate
31	QC501_210827	27/8	—	Water	X	X	X	X	X		X									Rinsate
32.	SS036_~~210827~~ 0.10	27/8	0.10	Soil	X	X	X	X	X	X										

Relinquished by EIS Shaney
Cmullenthe 30/8/21 1030.

Relinquished by (Company): KYLE MCLEAN
Print Name: JACOBS
Date & Time: 27.8.21 @ 12:30
Signature:

Received by (Company): ELS SYD
Print Name: Christina
Date & Time: 27/08/21 1255
Signature:

Lab Use Only
Job number: 276682.
Temperature: 5°.
Cooling: [✓ Ice] / Ice pack / None
Security seal: Intact / Broken /None
TAT Req - SAME day / 1 / 2 / 3 / 4 / STD

Form 302_V002

Issue date: 27 April 2017

Gran Eln 3018 2:48 #820973

Certificate of Analysis

Jacobs Group (Australia) P/L NSW
Level 7, 177 Pacific Highway
North Sydney
NSW 2065

NATA Accredited
Accreditation Number 1261
Site Number 1254

Accredited for compliance with ISO/IEC 17025 – Testing
NATA is a signatory to the ILAC Mutual Recognition Arrangement for the mutual recognition of the equivalence of testing, medical testing, calibration, inspection, proficiency testing scheme providers and reference materials producers reports and certificates.

Attention: **Amanda Mullen**

Report **822697-S**
Project name IA254001
Project ID IA254001
Received Date Sep 06, 2021

Client Sample ID **Sample Matrix** **Eurofins Sample No.** **Date Sampled** Test/Reference	LOR	Unit	**QC201_210901** **Soil** **M21-Se13067** **Sep 01, 2021**
Formaldehyde (free)	10	mg/kg	< 10
% Moisture	1	%	24

Sample History

Where samples are submitted/analysed over several days, the last date of extraction is reported.

If the date and time of sampling are not provided, the Laboratory will not be responsible for compromised results should testing be performed outside the recommended holding time.

Description	Testing Site	Extracted	Holding Time
Formaldehyde (free)	Melbourne	Sep 08, 2021	14 Days
- Method: Melbourne Water HMSO(HCHO free)			
% Moisture	Melbourne	Sep 07, 2021	14 Days
- Method: LTM-GEN-7080 Moisture			

Company Name: Jacobs Group (Australia) P/L NSW
Address: Level 7, 177 Pacific Highway
North Sydney
NSW 2065

Project Name: IA254001
Project ID: IA254001

Order No.:
Report #: 822697
Phone: 02 9928 2100
Fax: 02 9928 2504

Received: Sep 6, 2021 5:19 PM
Due: Sep 13, 2021
Priority: 5 Day
Contact Name: Amanda Mullen

Eurofins Analytical Services Manager : Andrew Black

Sample Detail						Formaldehyde (free)	Moisture Set
Melbourne Laboratory - NATA # 1261 Site # 1254						X	X
Sydney Laboratory - NATA # 1261 Site # 18217							
Brisbane Laboratory - NATA # 1261 Site # 20794							
Mayfield Laboratory - NATA # 1261 Site # 25079							
Perth Laboratory - NATA # 2377 Site # 2370							
External Laboratory							
No	**Sample ID**	**Sample Date**	**Sampling Time**	**Matrix**	**LAB ID**		
1	QC201_210901	Sep 01, 2021		Soil	M21-Se13067	X	X
Test Counts						1	1

Internal Quality Control Review and Glossary

General

1. Laboratory QC results for Method Blanks, Duplicates, Matrix Spikes, and Laboratory Control Samples follows guidelines delineated in the National Environment Protection (Assessment of Site Contamination) Measure 1999, as amended May 2013 and are included in this QC report where applicable. Additional QC data may be available on request.
2. All soil/sediment/solid results are reported on a dry basis, unless otherwise stated.
3. All biota/food results are reported on a wet weight basis on the edible portion, unless otherwise stated.
4. Actual LORs are matrix dependant. Quoted LORs may be raised where sample extracts are diluted due to interferences.
5. Results are uncorrected for matrix spikes or surrogate recoveries except for PFAS compounds.
6. SVOC analysis on waters are performed on homogenised, unfiltered samples, unless noted otherwise.
7. Samples were analysed on an 'as received' basis.
8. Information identified on this report with blue colour, indicates data provided by customer, that may have an impact on the results.
9. This report replaces any interim results previously issued.

Holding Times

Please refer to 'Sample Preservation and Container Guide' for holding times (QS3001).

For samples received on the last day of holding time, notification of testing requirements should have been received at least 6 hours prior to sample receipt deadlines as stated on the SRA.

If the Laboratory did not receive the information in the required timeframe, and regardless of any other integrity issues, suitably qualified results may still be reported.

Holding times apply from the date of sampling, therefore compliance to these may be outside the laboratory's control.

For VOCs containing vinyl chloride, styrene and 2-chloroethyl vinyl ether the holding time is 7 days however for all other VOCs such as BTEX or C6-10 TRH then the holding time is 14 days.

NOTE: pH duplicates are reported as a range NOT as RPD

Units

mg/kg: milligrams per kilogram
ppm: Parts per million
org/100mL: Organisms per 100 millilitres
mg/L: milligrams per litre
ppb: Parts per billion
NTU: Nephelometric Turbidity Units
ug/L: micrograms per litre
%: Percentage
MPN/100mL: Most Probable Number of organisms per 100 millilitres

Terms

Dry	Where a moisture has been determined on a solid sample the result is expressed on a dry basis.
LOR	Limit of Reporting.
SPIKE	Addition of the analyte to the sample and reported as percentage recovery.
RPD	Relative Percent Difference between two Duplicate pieces of analysis.
LCS	Laboratory Control Sample - reported as percent recovery.
CRM	Certified Reference Material - reported as percent recovery.
Method Blank	In the case of solid samples these are performed on laboratory certified clean sands and in the case of water samples these are performed on de-ionised water.
Surr - Surrogate	The addition of a like compound to the analyte target and reported as percentage recovery.
Duplicate	A second piece of analysis from the same sample and reported in the same units as the result to show comparison.
USEPA	United States Environmental Protection Agency
APHA	American Public Health Association
TCLP	Toxicity Characteristic Leaching Procedure
COC	Chain of Custody
SRA	Sample Receipt Advice
QSM	US Department of Defense Quality Systems Manual Version 5.3
CP	Client Parent - QC was performed on samples pertaining to this report
NCP	Non-Client Parent - QC performed on samples not pertaining to this report, QC is representative of the sequence or batch that client samples were analysed within.
TEQ	Toxic Equivalency Quotient

QC - Acceptance Criteria

RPD Duplicates: Global RPD Duplicates Acceptance Criteria is 30% however the following acceptance guidelines are equally applicable:

Results <10 times the LOR : No Limit

Results between 10-20 times the LOR : RPD must lie between 0-50%

Results >20 times the LOR : RPD must lie between 0-30%

Surrogate Recoveries: Recoveries must lie between 20-130% Phenols & 50-150% PFASs

PFAS field samples that contain surrogate recoveries in excess of the QC limit designated in QSM 5.3 where no positive PFAS results have been reported have been reviewed and no data was affected.

WA DWER (n=10): PFBA, PFPeA, PFHxA, PFHpA, PFOA, PFBS, PFHxS, PFOS, 6:2 FTSA, 8:2 FTSA

QC Data General Comments

1. Where a result is reported as a less than (<), higher than the nominated LOR, this is due to either matrix interference, extract dilution required due to interferences or contaminant levels within the sample, high moisture content or insufficient sample provided.
2. Duplicate data shown within this report that states the word "BATCH" is a Batch Duplicate from outside of your sample batch, but within the laboratory sample batch at a 1:10 ratio. The Parent and Duplicate data shown is not data from your samples.
3. Organochlorine Pesticide analysis - where reporting LCS data, Toxaphene & Chlordane are not added to the LCS.
4. Organochlorine Pesticide analysis - where reporting Spike data, Toxaphene is not added to the Spike.
5. Total Recoverable Hydrocarbons - where reporting Spike & LCS data, a single spike of commercial Hydrocarbon products in the range of C12-C30 is added and it's Total Recovery is reported in the C10-C14 cell of the Report.
6. pH and Free Chlorine analysed in the laboratory - Analysis on this test must begin within 30 minutes of sampling.Therefore laboratory analysis is unlikely to be completed within holding time. Analysis will begin as soon as possible after sample receipt.
7. Recovery Data (Spikes & Surrogates) - where chromatographic interference does not allow the determination of Recovery the term "INT" appears against that analyte.
8. Polychlorinated Biphenyls are spiked only using Aroclor 1260 in Matrix Spikes and LCS.
9. For Matrix Spikes and LCS results a dash " -" in the report means that the specific analyte was not added to the QC sample.
10. Duplicate RPDs are calculated from raw analytical data thus it is possible to have two sets of data.

Quality Control Results

Test	Lab Sample ID	QA Source	Units	Result 1			Acceptance Limits	Pass Limits	Qualifying Code
Duplicate									
				Result 1	Result 2	RPD			
% Moisture	M21-Se13286	NCP	%	11	9.9	9.0	30%	Pass	

Comments

Sample Integrity

Custody Seals Intact (if used)	N/A
Attempt to Chill was evident	Yes
Sample correctly preserved	Yes
Appropriate sample containers have been used	Yes
Sample containers for volatile analysis received with minimal headspace	Yes
Samples received within HoldingTime	Yes
Some samples have been subcontracted	No

Authorised by:

Ursula Long	Analytical Services Manager
Scott Beddoes	Senior Analyst-Inorganic (VIC)

Glenn Jackson
General Manager

Final Report – this report replaces any previously issued Report

- Indicates Not Requested

* Indicates NATA accreditation does not cover the performance of this service

Measurement uncertainty of test data is available on request or please click here.

MR 6/9/21 5:41PM 10.5°C

CHAIN OF CUSTODY

ALS Laboratory: please tick →

CLIENT: Jacobs Arcadis Joint Venture (JAJV)
OFFICE: Sydney
PROJECT: IA254001
ORDER NUMBER:
PROJECT MANAGER: Amanda Mullen
CONTACT PH: 0421201294
SAMPLER: Nick Keatley/Kyle McLean
SAMPLER MOBILE: 0421201294
COC emailed to ALS? (YES / [✓ NO])
EDD FORMAT (or default):
Email Reports to (will default to PM if no other addresses are listed): nick.keatley@jacobs.com, amanda.mullen@jacobs.com
Email Invoice to (will default to PM if no other addresses are listed): Nick / Amanda
COMMENTS/SPECIAL HANDLING/STORAGE OR DISPOSAL: [redacted] - ninsafe & TB from [redacted] / envirolab

TURNAROUND REQUIREMENTS : (Standard TAT may be longer for some tests e.g.. Ultra Trace Organics)
☒ Standard TAT (List due date):
☐ Non Standard or urgent TAT (List due date):
ALS QUOTE NO.:

COC SEQUENCE NUMBER (Circle)
COC: [✓ 1] 2 3 4 5 6 7
OF: 1 2 3 [✓ 4] 5 6 7

FOR LABORATORY USE ONLY (Circle)
Custody Seal Intact? [✓ Yes] No N/A
Free ice / frozen ice bricks present upon receipt? Yes No N/A
Random Sample Temperature on Receipt. °C
Other comment: 4.5

RELINQUISHED BY: NK
DATE/TIME: 3/9/21 5pm

RECEIVED BY: Juliana G T=4.5°C
DATE/TIME: 3/9/21 5:19

RELINQUISHED BY:
DATE/TIME:

RECEIVED BY: Soffia AS
DATE/TIME: 03/9/21 18:20

ALS USE LAB ID	SAMPLE DETAILS MATRIX: SOLID (S) WATER (W) SAMPLE ID	DATE / TIME	MATRIX	CONTAINER INFORMATION TYPE & PRESERVATIVE (refer to codes below)	TOTAL CONTAINERS	[redacted]	~~[illegible]~~ NT-11S	S-11	S-2 (Dissolved M)	S-26 (Dissolved M)	Asbestos (P/A)		Hold	Additional Information Comments on likely contaminant levels, dilutions, or samples requiring specific QC analysis etc.
1	BH09_0.05	30/8/21	Soil		1								X	
2	BH09_0.5	↓	↓		↓		X		X					
3	BH09_1.0												X	
4	BH09_2.0						X		X					
5	BH09_3.0												X	
6	BH09_4.0												X	
7	BH09_5.0												X	
8	BH09_6.0												X	
9	SS176_0.10	↓			2			X		X	X			
10	BH04_0.05	31/8/21			↓								X	
11	BH04_~~00~~0.5	↓											X	
12	BH04_1.0		↓		↓								X	
					16									

Subcon / Forward Lab / Split WO
Lab / Analysis:
Organised By / Date: 6/9/21 →
Relinquished By / Date:
Connote / Courier:
WO No.:
Attached By PO / Internal Sheet

822697

Water Container Codes: P = Unpreserved Plastic; N = Nitric Preserved Plastic; ORC = Nitric Preserved ORC; SH = Sodium Hydroxide/Cd Preserved; S = Sodium Hydroxide Preserved Plastic; AG = Amber Glass Unpreserved; AP - Airfreight Unpreserved Plastic
V = VOA Vial HCl Preserved; VB = VOA Vial Sodium Bisulphate Preserved; VS = VOA Vial Sulfuric Preserved; AV = Airfreight Unpreserved Vial SG = Sulfuric Preserved Amber Glass; H = HCl preserved Plastic; HS = HCl preserved Speciation bottle; SP = Sulfuric Preserved Plastic;
Z = Zinc Acetate Preserved Bottle; E = EDTA Preserved Bottles; ST = Sterile Bottle; ASS = Plastic Bag for Acid Sulphate Soils; B = Unpreserved Bag

Environmental Division
Sydney
Work Order Reference
ES2132166

Telephone : + 61-2-8784 8555

CHAIN OF CUSTODY

ALS Laboratory:
please tick →

TOWNSVILLE 14-15 Desma Court Bohle QLD 4818
Ph: 07 4796 0600 E: townsville.environmental@alsglobal.com

CLIENT: Jacobs Arcadis Joint Venture (JAJV)
OFFICE: Sydney
PROJECT: IA254001
ORDER NUMBER: –
PROJECT MANAGER: Amanda Mullen
CONTACT PH:
SAMPLER: NK/KM
SAMPLER MOBILE: 0421201294
COC emailed to ALS? (YES / NO)
EDD FORMAT (or default):
Email Reports to (will default to PM if no other addresses are listed): As pg 1
Email Invoice to (will default to PM if no other addresses are listed): As pg 1

TURNAROUND REQUIREMENTS : (Standard TAT may be longer for some tests e.g.. Ultra Trace Organics)
☒ Standard TAT (List due date):
☐ Non Standard or urgent TAT (List due date):
ALS QUOTE NO.: –

COC SEQUENCE NUMBER (Circle)
COC: 1 [✓ 2] 3 4 5 6 7
OF: 1 2 3 [✓ 4] 5 6 7

FOR LABORATORY USE ONLY (Circle)
Custody Seal Intact? [✓ Yes] No N/A
[✓ Free ice] / frozen ice bricks present upon receipt? Yes No N/A
Random Sample Temperature on Receipt: 4.5 °C
Other comment

RELINQUISHED BY: NK
DATE/TIME: 3/9/21 - 5pm

RECEIVED BY: JulianaG T=4.5°C
DATE/TIME: 3/9/21 5:19pm

RELINQUISHED BY:
DATE/TIME:

RECEIVED BY: AJ
DATE/TIME: 03/9/21 183

COMMENTS/SPECIAL HANDLING/STORAGE OR DISPOSAL:

ALS USE	SAMPLE DETAILS MATRIX: SOLID (S) WATER (W)			CONTAINER INFORMATION		ANALYSIS REQUIRED including SUITES (NB. Suite Codes must be listed to attract suite price) Where Metals are required, specify Total (unfiltered bottle required) or Dissolved (field filtered bottle required).								Additional Information
LAB ID	SAMPLE ID	DATE / TIME	MATRIX	TYPE & PRESERVATIVE (refer to codes below)	TOTAL CONTAINERS	NT-11S	S-11	S-2(Dissolved)	S-26(Dissolved)	Asbestos (p/a)	Formaldehyde	Total Coliforms	Hold	Comments on likely contaminant levels, dilutions, or samples requiring specific QC analysis etc.
13	BH04_2.0	31/8/21	S		2	X	X			X		X		
14	BH04-3.0				↓								X	
15	BH04_4.0					X	X			X		X		
16	BH04_5.0				1								X	
17	BH04_6.0												X	
18	BH04_7.0												X	
19	BH04_8.0												X	
20	BH04_9.0												X	
21	BH04_10.0												X	822697
22	BH04_11.0		↓		↓								X	
23	QC501_210831		W		7	X	X		X	X		X		use equivalent water suite (total M) (rinsate)
24	BH05_0.05	1/8/21	S		1	X		X			X			
					21									

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V = VOA Vial HCl Preserved; VB = VOA Vial Sodium Bisulphate Preserved; VS = VOA Vial Sulfuric Preserved; AV = Airfreight Unpreserved Vial SG = Sulfuric Preserved Amber Glass; H = HCl preserved Plastic; HS = HCl preserved Speciation bottle; SP = Sulfuric Preserved Plastic; F = Formaldehyde Preserved Glass;
Z = Zinc Acetate Preserved Bottle; E = EDTA Preserved Bottles; ST = Sterile Bottle; ASS = Plastic Bag for Acid Sulphate Soils; B = Unpreserved Bag

CHAIN OF CUSTODY

ALS Laboratory:
please tick →

CLIENT: Jacobs Arcadis Joint Venture
OFFICE: Sydney
PROJECT: IA254001
ORDER NUMBER: –
PROJECT MANAGER: Amanda Mullen
CONTACT PH:
SAMPLER: NK/KM
SAMPLER MOBILE: 0421201294
COC emailed to ALS? (YES / NO)
EDD FORMAT (or default):
Email Reports to (will default to PM if no other addresses are listed): As page 1
Email Invoice to (will default to PM if no other addresses are listed): As page 1

TURNAROUND REQUIREMENTS : (Standard TAT may be longer for some tests e.g.. Ultra Trace Organics)
☒ Standard TAT (List due date):
☐ Non Standard or urgent TAT (List due date):
ALS QUOTE NO.: ~

COC SEQUENCE NUMBER (Circle)
COC: 1 2 [✓ 3] 4 5 6 7
OF: 1 2 3 [✓ 4] 5 6 7

FOR LABORATORY USE ONLY (Circle)
Custody Seal Intact? [✓ Yes] No N/A
Free ice / frozen ice bricks present upon receipt? Yes No N/A
Random Sample Temperature on Receipt 4.5 °C
Other comment

RELINQUISHED BY: NK
DATE/TIME: 3/9/21 5pm

RECEIVED BY: Juliana G
DATE/TIME: 3/9/21 5:19pm

RELINQUISHED BY:
DATE/TIME:

RECEIVED BY: [illegible]
DATE/TIME: 03/9/21 1830

COMMENTS/SPECIAL HANDLING/STORAGE OR DISPOSAL:

ALS USE	SAMPLE DETAILS MATRIX: SOLID (S) WATER (W)			CONTAINER INFORMATION		ANALYSIS REQUIRED including SUITES (NB. Suite Codes must be listed to attract suite price) Where Metals are required, specify Total (unfiltered bottle required) or Dissolved (field filtered bottle required).								Additional Information
LAB ID	SAMPLE ID	DATE / TIME	MATRIX	TYPE & PRESERVATIVE (refer to codes below)	TOTAL CONTAINERS	S-2(dissolved)	NT-11S	Formaldehyde					Hold	Comments on likely contaminant levels, dilutions, or samples requiring specific QC analysis etc.
25	BH05_1.0	1/9/21	S	[illegible]	1								X	
26	BH05_2.0												X	
27	BH05_3.0												X	
28	BH05_4.0												X	
29	BH05_5.0					X	X	X						
30	BH05_6.0												X	
31	BH05_7.0												X	
32	BH05_8.0				↓								X	
33	QC101_210901				#1	X	X	X						
34	QC201_210901	↓			1	X	X	X						send to eurofins
35	BH11_0.05	2/9/21			↓	X		X						
36	BH11_0.5	↓	↓		↓	X		X						822697

Water Container Codes: P = Unpreserved Plastic; N = Nitric Preserved Plastic; ORC = Nitric Preserved ORC; SH = Sodium Hydroxide/Cd Preserved; S = Sodium Hydroxide Preserved Plastic; AG = Amber Glass Unpreserved; AP - Airfreight Unpreserved Plastic
V = VOA Vial HCl Preserved; VB = VOA Vial Sodium Bisulphate Preserved; VS = VOA Vial Sulfuric Preserved; AV = Airfreight Unpreserved Vial SG = Sulfuric Preserved Amber Glass; H = HCl preserved Plastic; HS = HCl preserved Speciation bottle; SP = Sulfuric Preserved Plastic; F = Formaldehyde Preserved Glass;
Z = Zinc Acetate Preserved Bottle; E = EDTA Preserved Bottles; ST = Sterile Bottle; ASS = Plastic Bag for Acid Sulphate Soils; B = Unpreserved Bag

CHAIN OF CUSTODY

ALS Laboratory: please tick →

CLIENT: Jacobs Arcadis Joint Venture
OFFICE: Sydney
PROJECT: IA254001
ORDER NUMBER: -
PROJECT MANAGER: Amanda Mullen
SAMPLER: NK/KM
COC emailed to ALS? (YES / NO)
Email Reports to (will default to PM if no other addresses are listed): as pg 1
Email Invoice to (will default to PM if no other addresses are listed): as pg 1

TURNAROUND REQUIREMENTS : (Standard TAT may be longer for some tests e.g.. Ultra Trace Organics)
☒ Standard TAT (List due date):
☐ Non Standard or urgent TAT (List due date):
ALS QUOTE NO.:
COC SEQUENCE NUMBER (Circle)
COC: 1 2 3 [✓ 4] 5 6 7
OF: 1 2 3 [✓ 4] 5 6 7
CONTACT PH:
SAMPLER MOBILE: 0421201291
EDD FORMAT (or default):

FOR LABORATORY USE ONLY (Circle)
Custody Seal Intact? [✓ Yes] No N/A
Free-ice / frozen ice bricks present upon receipt? Yes No N/A
Random Sample Temperature on Receipt: °C
Other comment: U-S

RELINQUISHED BY:	RECEIVED BY:	RELINQUISHED BY:	RECEIVED BY:
NK	JulianaG		SOD
DATE/TIME: 3/9/21-5pm	DATE/TIME: 3/9/21 5:19pm	DATE/TIME:	DATE/TIME: 03/9/21 1830

COMMENTS/SPECIAL HANDLING/STORAGE OR DISPOSAL:

ALS USE	SAMPLE DETAILS MATRIX: SOLID (S) WATER (W)			CONTAINER INFORMATION		ANALYSIS REQUIRED including SUITES (NB. Suite Codes must be listed to attract suite price) Where Metals are required, specify Total (unfiltered bottle required) or Dissolved (field filtered bottle required).								Additional Information
LAB ID	SAMPLE ID	DATE / TIME	MATRIX	TYPE & PRESERVATIVE (refer to codes below)	TOTAL CONTAINERS	S-2 (dissolved)	NT-11S	Formaldehyde	S-11	S-2	Asbestos P/A	Total Coliforms	Hold	Comments on likely contaminant levels, dilutions, or samples requiring specific QC analysis etc.
37	BH11_1.0	2/9/21	S										X	
38	BH11_1.65	↓	S ↓										X	
39	BH06_0.05						X		X	X	X	X		
40	BH06_0.5												X	
41	BH06_0.82						X		X	X	X	X		
42	TB													trip blank
				TOTAL										822691

Water Container Codes: P = Unpreserved Plastic; N = Nitric Preserved Plastic; ORC = Nitric Preserved ORC; SH = Sodium Hydroxide/Cd Preserved; S = Sodium Hydroxide Preserved Plastic; AG = Amber Glass Unpreserved; AP - Airfreight Unpreserved Plastic
V = VOA Vial HCl Preserved; VB = VOA Vial Sodium Bisulphate Preserved; VS = VOA Vial Sulfuric Preserved; AV = Airfreight Unpreserved Vial SG = Sulfuric Preserved Amber Glass; H = HCl preserved Plastic; HS = HCl preserved Speciation bottle; SP = Sulfuric Preserved Plastic; F = Formaldehyde Preserved Glass;
Z = Zinc Acetate Preserved Bottle; E = EDTA Preserved Bottles; ST = Sterile Bottle; ASS = Plastic Bag for Acid Sulphate Soils; B = Unpreserved Bag

Certificate of Analysis

Jacobs Group (Australia) P/L NSW
Level 7, 177 Pacific Highway
North Sydney
NSW 2065

NATA Accredited
Accreditation Number 1261
Site Number 18217

Accredited for compliance with ISO/IEC 17025 – Testing
NATA is a signatory to the ILAC Mutual Recognition Arrangement for the mutual recognition of the equivalence of testing, medical testing, calibration, inspection, proficiency testing scheme providers and reference materials producers reports and certificates.

Attention: **Amanda Mullen**

Report **824081-S**
Project name
Project ID IA254001
Received Date Sep 09, 2021

Client Sample ID			**QC201_210906**
Sample Matrix			**Soil**
Eurofins Sample No.			**S21-Se25052**
Date Sampled			**Sep 06, 2021**
Test/Reference	LOR	Unit	
Total Recoverable Hydrocarbons			
TRH C6-C9	20	mg/kg	< 20
TRH C10-C14	20	mg/kg	< 20
TRH C15-C28	50	mg/kg	< 50
TRH C29-C36	50	mg/kg	< 50
TRH C10-C36 (Total)	50	mg/kg	< 50
Naphthalene[N02]	0.5	mg/kg	< 0.5
TRH C6-C10	20	mg/kg	< 20
TRH C6-C10 less BTEX (F1)[N04]	20	mg/kg	< 20
TRH >C10-C16	50	mg/kg	< 50
TRH >C10-C16 less Naphthalene (F2)[N01]	50	mg/kg	< 50
TRH >C16-C34	100	mg/kg	< 100
TRH >C34-C40	100	mg/kg	< 100
TRH >C10-C40 (total)*	100	mg/kg	< 100
BTEX			
Benzene	0.1	mg/kg	< 0.1
Toluene	0.1	mg/kg	< 0.1
Ethylbenzene	0.1	mg/kg	< 0.1
m&p-Xylenes	0.2	mg/kg	< 0.2
o-Xylene	0.1	mg/kg	< 0.1
Xylenes - Total*	0.3	mg/kg	< 0.3
4-Bromofluorobenzene (surr.)	1	%	110
Polycyclic Aromatic Hydrocarbons			
Benzo(a)pyrene TEQ (lower bound) *	0.5	mg/kg	< 0.5
Benzo(a)pyrene TEQ (medium bound) *	0.5	mg/kg	0.6
Benzo(a)pyrene TEQ (upper bound) *	0.5	mg/kg	1.2
Acenaphthene	0.5	mg/kg	< 0.5
Acenaphthylene	0.5	mg/kg	< 0.5
Anthracene	0.5	mg/kg	< 0.5
Benz(a)anthracene	0.5	mg/kg	< 0.5
Benzo(a)pyrene	0.5	mg/kg	< 0.5
Benzo(b&j)fluoranthene[N07]	0.5	mg/kg	< 0.5
Benzo(g.h.i)perylene	0.5	mg/kg	< 0.5
Benzo(k)fluoranthene	0.5	mg/kg	< 0.5
Chrysene	0.5	mg/kg	< 0.5
Dibenz(a.h)anthracene	0.5	mg/kg	< 0.5

Client Sample ID			**QC201_210906**
Sample Matrix			**Soil**
Eurofins Sample No.			**S21-Se25052**
Date Sampled			**Sep 06, 2021**
Test/Reference	LOR	Unit	
Polycyclic Aromatic Hydrocarbons			
Fluoranthene	0.5	mg/kg	< 0.5
Fluorene	0.5	mg/kg	< 0.5
Indeno(1.2.3-cd)pyrene	0.5	mg/kg	< 0.5
Naphthalene	0.5	mg/kg	< 0.5
Phenanthrene	0.5	mg/kg	< 0.5
Pyrene	0.5	mg/kg	< 0.5
Total PAH*	0.5	mg/kg	< 0.5
2-Fluorobiphenyl (surr.)	1	%	88
p-Terphenyl-d14 (surr.)	1	%	104
Organochlorine Pesticides			
Chlordanes - Total	0.1	mg/kg	< 0.1
4.4'-DDD	0.05	mg/kg	< 0.05
4.4'-DDE	0.05	mg/kg	< 0.05
4.4'-DDT	0.05	mg/kg	< 0.05
a-HCH	0.05	mg/kg	< 0.05
Aldrin	0.05	mg/kg	< 0.05
b-HCH	0.05	mg/kg	< 0.05
d-HCH	0.05	mg/kg	< 0.05
Dieldrin	0.05	mg/kg	< 0.05
Endosulfan I	0.05	mg/kg	< 0.05
Endosulfan II	0.05	mg/kg	< 0.05
Endosulfan sulphate	0.05	mg/kg	< 0.05
Endrin	0.05	mg/kg	< 0.05
Endrin aldehyde	0.05	mg/kg	< 0.05
Endrin ketone	0.05	mg/kg	< 0.05
g-HCH (Lindane)	0.05	mg/kg	< 0.05
Heptachlor	0.05	mg/kg	< 0.05
Heptachlor epoxide	0.05	mg/kg	< 0.05
Hexachlorobenzene	0.05	mg/kg	< 0.05
Methoxychlor	0.05	mg/kg	< 0.05
Toxaphene	0.5	mg/kg	< 0.5
Aldrin and Dieldrin (Total)*	0.05	mg/kg	< 0.05
DDT + DDE + DDD (Total)*	0.05	mg/kg	< 0.05
Vic EPA IWRG 621 OCP (Total)*	0.1	mg/kg	< 0.1
Vic EPA IWRG 621 Other OCP (Total)*	0.1	mg/kg	< 0.1
Dibutylchlorendate (surr.)	1	%	119
Tetrachloro-m-xylene (surr.)	1	%	93
Organophosphorus Pesticides			
Azinphos-methyl	0.2	mg/kg	< 0.2
Bolstar	0.2	mg/kg	< 0.2
Chlorfenvinphos	0.2	mg/kg	< 0.2
Chlorpyrifos	0.2	mg/kg	< 0.2
Chlorpyrifos-methyl	0.2	mg/kg	< 0.2
Coumaphos	2	mg/kg	< 2
Demeton-S	0.2	mg/kg	< 0.2
Demeton-O	0.2	mg/kg	< 0.2
Diazinon	0.2	mg/kg	< 0.2
Dichlorvos	0.2	mg/kg	< 0.2
Dimethoate	0.2	mg/kg	< 0.2

Client Sample ID			**QC201_210906**
Sample Matrix			**Soil**
Eurofins Sample No.			**S21-Se25052**
Date Sampled			**Sep 06, 2021**
Test/Reference	LOR	Unit	
Organophosphorus Pesticides			
Disulfoton	0.2	mg/kg	< 0.2
EPN	0.2	mg/kg	< 0.2
Ethion	0.2	mg/kg	< 0.2
Ethoprop	0.2	mg/kg	< 0.2
Ethyl parathion	0.2	mg/kg	< 0.2
Fenitrothion	0.2	mg/kg	< 0.2
Fensulfothion	0.2	mg/kg	< 0.2
Fenthion	0.2	mg/kg	< 0.2
Malathion	0.2	mg/kg	< 0.2
Merphos	0.2	mg/kg	< 0.2
Methyl parathion	0.2	mg/kg	< 0.2
Mevinphos	0.2	mg/kg	< 0.2
Monocrotophos	2	mg/kg	< 2
Naled	0.2	mg/kg	< 0.2
Omethoate	2	mg/kg	< 2
Phorate	0.2	mg/kg	< 0.2
Pirimiphos-methyl	0.2	mg/kg	< 0.2
Pyrazophos	0.2	mg/kg	< 0.2
Ronnel	0.2	mg/kg	< 0.2
Terbufos	0.2	mg/kg	< 0.2
Tetrachlorvinphos	0.2	mg/kg	< 0.2
Tokuthion	0.2	mg/kg	< 0.2
Trichloronate	0.2	mg/kg	< 0.2
Triphenylphosphate (surr.)	1	%	114
Heavy Metals			
Arsenic	2	mg/kg	2.3
Cadmium	0.4	mg/kg	< 0.4
Chromium	5	mg/kg	7.0
Copper	5	mg/kg	< 5
Lead	5	mg/kg	5.7
Mercury	0.1	mg/kg	< 0.1
Nickel	5	mg/kg	< 5
Zinc	5	mg/kg	< 5
% Moisture	1	%	16

Sample History

Where samples are submitted/analysed over several days, the last date of extraction is reported.

If the date and time of sampling are not provided, the Laboratory will not be responsible for compromised results should testing be performed outside the recommended holding time.

Description	Testing Site	Extracted	Holding Time
Total Recoverable Hydrocarbons - 1999 NEPM Fractions	Sydney	Sep 14, 2021	14 Days
- Method: LTM-ORG-2010 TRH C6-C40			
Total Recoverable Hydrocarbons - 2013 NEPM Fractions	Sydney	Sep 14, 2021	14 Days
- Method: LTM-ORG-2010 TRH C6-C40			
Total Recoverable Hydrocarbons - 2013 NEPM Fractions	Sydney	Sep 14, 2021	14 Days
- Method: LTM-ORG-2010 TRH C6-C40			
BTEX	Sydney	Sep 14, 2021	14 Days
- Method: LTM-ORG-2010 TRH C6-C40			
Polycyclic Aromatic Hydrocarbons	Sydney	Sep 14, 2021	14 Days
- Method: LTM-ORG-2130 PAH and Phenols in Soil and Water			
Metals M8	Sydney	Sep 14, 2021	180 Days
- Method: LTM-MET-3040 Metals in Waters, Soils & Sediments by ICP-MS			
Organochlorine Pesticides	Sydney	Sep 14, 2021	14 Days
- Method: LTM-ORG-2220 OCP & PCB in Soil and Water			
Organophosphorus Pesticides	Sydney	Sep 14, 2021	14 Days
- Method: LTM-ORG-2200 Organophosphorus Pesticides by GC-MS			
% Moisture	Sydney	Sep 13, 2021	14 Days
- Method: LTM-GEN-7080 Moisture			

Company Name: Jacobs Group (Australia) P/L NSW
Address: Level 7, 177 Pacific Highway
North Sydney
NSW 2065

Project Name:
Project ID: IA254001

Order No.:
Report #: 824081
Phone: 02 9928 2100
Fax: 02 9928 2504

Received: Sep 9, 2021 5:54 PM
Due: Sep 16, 2021
Priority: 5 Day
Contact Name: Amanda Mullen

Eurofins Analytical Services Manager : Andrew Black

Sample Detail						Suite B14: OCP/OPP	Moisture Set	Eurofins Suite B7
Melbourne Laboratory - NATA # 1261 Site # 1254								
Sydney Laboratory - NATA # 1261 Site # 18217						X	X	X
Brisbane Laboratory - NATA # 1261 Site # 20794								
Mayfield Laboratory - NATA # 1261 Site # 25079								
Perth Laboratory - NATA # 2377 Site # 2370								
External Laboratory								
No	**Sample ID**	**Sample Date**	**Sampling Time**	**Matrix**	**LAB ID**			
1	QC201_210906	Sep 06, 2021		Soil	S21-Se25052	X	X	X
Test Counts						1	1	1

Internal Quality Control Review and Glossary

General

1. Laboratory QC results for Method Blanks, Duplicates, Matrix Spikes, and Laboratory Control Samples follows guidelines delineated in the National Environment Protection (Assessment of Site Contamination) Measure 1999, as amended May 2013 and are included in this QC report where applicable. Additional QC data may be available on request.
2. All soil/sediment/solid results are reported on a dry basis, unless otherwise stated.
3. All biota/food results are reported on a wet weight basis on the edible portion, unless otherwise stated.
4. Actual LORs are matrix dependant. Quoted LORs may be raised where sample extracts are diluted due to interferences.
5. Results are uncorrected for matrix spikes or surrogate recoveries except for PFAS compounds.
6. SVOC analysis on waters are performed on homogenised, unfiltered samples, unless noted otherwise.
7. Samples were analysed on an 'as received' basis.
8. Information identified on this report with blue colour, indicates data provided by customer, that may have an impact on the results.
9. This report replaces any interim results previously issued.

Holding Times

Please refer to 'Sample Preservation and Container Guide' for holding times (QS3001).

For samples received on the last day of holding time, notification of testing requirements should have been received at least 6 hours prior to sample receipt deadlines as stated on the SRA.

If the Laboratory did not receive the information in the required timeframe, and regardless of any other integrity issues, suitably qualified results may still be reported.

Holding times apply from the date of sampling, therefore compliance to these may be outside the laboratory's control.

For VOCs containing vinyl chloride, styrene and 2-chloroethyl vinyl ether the holding time is 7 days however for all other VOCs such as BTEX or C6-10 TRH then the holding time is 14 days.

****NOTE:** pH duplicates are reported as a range NOT as RPD

Units

mg/kg: milligrams per kilogram	**mg/L:** milligrams per litre	**ug/L:** micrograms per litre
ppm: Parts per million	**ppb:** Parts per billion	**%:** Percentage
org/100mL: Organisms per 100 millilitres	**NTU:** Nephelometric Turbidity Units	**MPN/100mL:** Most Probable Number of organisms per 100 millilitres

Terms

Dry	Where a moisture has been determined on a solid sample the result is expressed on a dry basis.
LOR	Limit of Reporting.
SPIKE	Addition of the analyte to the sample and reported as percentage recovery.
RPD	Relative Percent Difference between two Duplicate pieces of analysis.
LCS	Laboratory Control Sample - reported as percent recovery.
CRM	Certified Reference Material - reported as percent recovery.
Method Blank	In the case of solid samples these are performed on laboratory certified clean sands and in the case of water samples these are performed on de-ionised water.
Surr - Surrogate	The addition of a like compound to the analyte target and reported as percentage recovery.
Duplicate	A second piece of analysis from the same sample and reported in the same units as the result to show comparison.
USEPA	United States Environmental Protection Agency
APHA	American Public Health Association
TCLP	Toxicity Characteristic Leaching Procedure
COC	Chain of Custody
SRA	Sample Receipt Advice
QSM	US Department of Defense Quality Systems Manual Version 5.3
CP	Client Parent - QC was performed on samples pertaining to this report
NCP	Non-Client Parent - QC performed on samples not pertaining to this report, QC is representative of the sequence or batch that client samples were analysed within.
TEQ	Toxic Equivalency Quotient

QC - Acceptance Criteria

RPD Duplicates: Global RPD Duplicates Acceptance Criteria is 30% however the following acceptance guidelines are equally applicable:

Results <10 times the LOR : No Limit

Results between 10-20 times the LOR : RPD must lie between 0-50%

Results >20 times the LOR : RPD must lie between 0-30%

Surrogate Recoveries: Recoveries must lie between 20-130% Phenols & 50-150% PFASs

PFAS field samples that contain surrogate recoveries in excess of the QC limit designated in QSM 5.3 where no positive PFAS results have been reported have been reviewed and no data was affected.

WA DWER (n=10): PFBA, PFPeA, PFHxA, PFHpA, PFOA, PFBS, PFHxS, PFOS, 6:2 FTSA, 8:2 FTSA

QC Data General Comments

1. Where a result is reported as a less than (<), higher than the nominated LOR, this is due to either matrix interference, extract dilution required due to interferences or contaminant levels within the sample, high moisture content or insufficient sample provided.
2. Duplicate data shown within this report that states the word "BATCH" is a Batch Duplicate from outside of your sample batch, but within the laboratory sample batch at a 1:10 ratio. The Parent and Duplicate data shown is not data from your samples.
3. Organochlorine Pesticide analysis - where reporting LCS data, Toxaphene & Chlordane are not added to the LCS.
4. Organochlorine Pesticide analysis - where reporting Spike data, Toxaphene is not added to the Spike.
5. Total Recoverable Hydrocarbons - where reporting Spike & LCS data, a single spike of commercial Hydrocarbon products in the range of C12-C30 is added and it's Total Recovery is reported in the C10-C14 cell of the Report.
6. pH and Free Chlorine analysed in the laboratory - Analysis on this test must begin within 30 minutes of sampling.Therefore laboratory analysis is unlikely to be completed within holding time. Analysis will begin as soon as possible after sample receipt.
7. Recovery Data (Spikes & Surrogates) - where chromatographic interference does not allow the determination of Recovery the term "INT" appears against that analyte.
8. Polychlorinated Biphenyls are spiked only using Aroclor 1260 in Matrix Spikes and LCS.
9. For Matrix Spikes and LCS results a dash " -" in the report means that the specific analyte was not added to the QC sample.
10. Duplicate RPDs are calculated from raw analytical data thus it is possible to have two sets of data.

Quality Control Results

Test	Units	Result 1			Acceptance Limits	Pass Limits	Qualifying Code
Method Blank							
Total Recoverable Hydrocarbons							
TRH C6-C9	mg/kg	< 20			20	Pass	
TRH C10-C14	mg/kg	< 20			20	Pass	
TRH C15-C28	mg/kg	< 50			50	Pass	
TRH C29-C36	mg/kg	< 50			50	Pass	
Naphthalene	mg/kg	< 0.5			0.5	Pass	
TRH C6-C10	mg/kg	< 20			20	Pass	
TRH >C10-C16	mg/kg	< 50			50	Pass	
TRH >C16-C34	mg/kg	< 100			100	Pass	
TRH >C34-C40	mg/kg	< 100			100	Pass	
Method Blank							
BTEX							
Benzene	mg/kg	< 0.1			0.1	Pass	
Toluene	mg/kg	< 0.1			0.1	Pass	
Ethylbenzene	mg/kg	< 0.1			0.1	Pass	
m&p-Xylenes	mg/kg	< 0.2			0.2	Pass	
o-Xylene	mg/kg	< 0.1			0.1	Pass	
Xylenes - Total*	mg/kg	< 0.3			0.3	Pass	
Method Blank							
Polycyclic Aromatic Hydrocarbons							
Acenaphthene	mg/kg	< 0.5			0.5	Pass	
Acenaphthylene	mg/kg	< 0.5			0.5	Pass	
Anthracene	mg/kg	< 0.5			0.5	Pass	
Benz(a)anthracene	mg/kg	< 0.5			0.5	Pass	
Benzo(a)pyrene	mg/kg	< 0.5			0.5	Pass	
Benzo(b&j)fluoranthene	mg/kg	< 0.5			0.5	Pass	
Benzo(g.h.i)perylene	mg/kg	< 0.5			0.5	Pass	
Benzo(k)fluoranthene	mg/kg	< 0.5			0.5	Pass	
Chrysene	mg/kg	< 0.5			0.5	Pass	
Dibenz(a.h)anthracene	mg/kg	< 0.5			0.5	Pass	
Fluoranthene	mg/kg	< 0.5			0.5	Pass	
Fluorene	mg/kg	< 0.5			0.5	Pass	
Indeno(1.2.3-cd)pyrene	mg/kg	< 0.5			0.5	Pass	
Naphthalene	mg/kg	< 0.5			0.5	Pass	
Phenanthrene	mg/kg	< 0.5			0.5	Pass	
Pyrene	mg/kg	< 0.5			0.5	Pass	
Method Blank							
Organochlorine Pesticides							
Chlordanes - Total	mg/kg	< 0.1			0.1	Pass	
4.4'-DDD	mg/kg	< 0.05			0.05	Pass	
4.4'-DDE	mg/kg	< 0.05			0.05	Pass	
4.4'-DDT	mg/kg	< 0.05			0.05	Pass	
a-HCH	mg/kg	< 0.05			0.05	Pass	
Aldrin	mg/kg	< 0.05			0.05	Pass	
b-HCH	mg/kg	< 0.05			0.05	Pass	
d-HCH	mg/kg	< 0.05			0.05	Pass	
Dieldrin	mg/kg	< 0.05			0.05	Pass	
Endosulfan I	mg/kg	< 0.05			0.05	Pass	
Endosulfan II	mg/kg	< 0.05			0.05	Pass	
Endosulfan sulphate	mg/kg	< 0.05			0.05	Pass	
Endrin	mg/kg	< 0.05			0.05	Pass	

Test	Units	Result 1			Acceptance Limits	Pass Limits	Qualifying Code
Endrin aldehyde	mg/kg	< 0.05			0.05	Pass	
Endrin ketone	mg/kg	< 0.05			0.05	Pass	
g-HCH (Lindane)	mg/kg	< 0.05			0.05	Pass	
Heptachlor	mg/kg	< 0.05			0.05	Pass	
Heptachlor epoxide	mg/kg	< 0.05			0.05	Pass	
Hexachlorobenzene	mg/kg	< 0.05			0.05	Pass	
Methoxychlor	mg/kg	< 0.05			0.05	Pass	
Toxaphene	mg/kg	< 0.5			0.5	Pass	
Method Blank							
Organophosphorus Pesticides							
Azinphos-methyl	mg/kg	< 0.2			0.2	Pass	
Bolstar	mg/kg	< 0.2			0.2	Pass	
Chlorfenvinphos	mg/kg	< 0.2			0.2	Pass	
Chlorpyrifos	mg/kg	< 0.2			0.2	Pass	
Chlorpyrifos-methyl	mg/kg	< 0.2			0.2	Pass	
Coumaphos	mg/kg	< 2			2	Pass	
Demeton-S	mg/kg	< 0.2			0.2	Pass	
Demeton-O	mg/kg	< 0.2			0.2	Pass	
Diazinon	mg/kg	< 0.2			0.2	Pass	
Dichlorvos	mg/kg	< 0.2			0.2	Pass	
Dimethoate	mg/kg	< 0.2			0.2	Pass	
Disulfoton	mg/kg	< 0.2			0.2	Pass	
EPN	mg/kg	< 0.2			0.2	Pass	
Ethion	mg/kg	< 0.2			0.2	Pass	
Ethoprop	mg/kg	< 0.2			0.2	Pass	
Ethyl parathion	mg/kg	< 0.2			0.2	Pass	
Fenitrothion	mg/kg	< 0.2			0.2	Pass	
Fensulfothion	mg/kg	< 0.2			0.2	Pass	
Fenthion	mg/kg	< 0.2			0.2	Pass	
Malathion	mg/kg	< 0.2			0.2	Pass	
Merphos	mg/kg	< 0.2			0.2	Pass	
Methyl parathion	mg/kg	< 0.2			0.2	Pass	
Mevinphos	mg/kg	< 0.2			0.2	Pass	
Monocrotophos	mg/kg	< 2			2	Pass	
Naled	mg/kg	< 0.2			0.2	Pass	
Omethoate	mg/kg	< 2			2	Pass	
Phorate	mg/kg	< 0.2			0.2	Pass	
Pirimiphos-methyl	mg/kg	< 0.2			0.2	Pass	
Pyrazophos	mg/kg	< 0.2			0.2	Pass	
Ronnel	mg/kg	< 0.2			0.2	Pass	
Terbufos	mg/kg	< 0.2			0.2	Pass	
Tetrachlorvinphos	mg/kg	< 0.2			0.2	Pass	
Tokuthion	mg/kg	< 0.2			0.2	Pass	
Trichloronate	mg/kg	< 0.2			0.2	Pass	
Method Blank							
Heavy Metals							
Arsenic	mg/kg	< 2			2	Pass	
Cadmium	mg/kg	< 0.4			0.4	Pass	
Chromium	mg/kg	< 5			5	Pass	
Copper	mg/kg	< 5			5	Pass	
Lead	mg/kg	< 5			5	Pass	
Mercury	mg/kg	< 0.1			0.1	Pass	
Nickel	mg/kg	< 5			5	Pass	
Zinc	mg/kg	< 5			5	Pass	

Test	Units	Result 1			Acceptance Limits	Pass Limits	Qualifying Code
LCS - % Recovery							
Total Recoverable Hydrocarbons							
TRH C6-C9	%	93			70-130	Pass	
TRH C10-C14	%	113			70-130	Pass	
Naphthalene	%	121			70-130	Pass	
TRH C6-C10	%	89			70-130	Pass	
TRH >C10-C16	%	109			70-130	Pass	
LCS - % Recovery							
BTEX							
Benzene	%	109			70-130	Pass	
Toluene	%	101			70-130	Pass	
Ethylbenzene	%	96			70-130	Pass	
m&p-Xylenes	%	101			70-130	Pass	
o-Xylene	%	98			70-130	Pass	
Xylenes - Total*	%	100			70-130	Pass	
LCS - % Recovery							
Polycyclic Aromatic Hydrocarbons							
Acenaphthene	%	103			70-130	Pass	
Acenaphthylene	%	102			70-130	Pass	
Anthracene	%	108			70-130	Pass	
Benz(a)anthracene	%	93			70-130	Pass	
Benzo(a)pyrene	%	107			70-130	Pass	
Benzo(b&j)fluoranthene	%	100			70-130	Pass	
Benzo(g.h.i)perylene	%	113			70-130	Pass	
Benzo(k)fluoranthene	%	88			70-130	Pass	
Chrysene	%	97			70-130	Pass	
Dibenz(a.h)anthracene	%	127			70-130	Pass	
Fluoranthene	%	103			70-130	Pass	
Fluorene	%	111			70-130	Pass	
Indeno(1.2.3-cd)pyrene	%	117			70-130	Pass	
Naphthalene	%	101			70-130	Pass	
Phenanthrene	%	99			70-130	Pass	
Pyrene	%	101			70-130	Pass	
LCS - % Recovery							
Organochlorine Pesticides							
Chlordanes - Total	%	81			70-130	Pass	
4.4'-DDD	%	77			70-130	Pass	
4.4'-DDE	%	78			70-130	Pass	
4.4'-DDT	%	95			70-130	Pass	
a-HCH	%	77			70-130	Pass	
Aldrin	%	80			70-130	Pass	
b-HCH	%	75			70-130	Pass	
d-HCH	%	73			70-130	Pass	
Dieldrin	%	79			70-130	Pass	
Endosulfan I	%	78			70-130	Pass	
Endosulfan II	%	78			70-130	Pass	
Endosulfan sulphate	%	73			70-130	Pass	
Endrin	%	102			70-130	Pass	
Endrin aldehyde	%	71			70-130	Pass	
Endrin ketone	%	71			70-130	Pass	
g-HCH (Lindane)	%	74			70-130	Pass	
Heptachlor	%	88			70-130	Pass	
Heptachlor epoxide	%	83			70-130	Pass	
Hexachlorobenzene	%	79			70-130	Pass	

Test	Units	Result 1			Acceptance Limits	Pass Limits	Qualifying Code
Methoxychlor	%	80			70-130	Pass	
LCS - % Recovery							
Organophosphorus Pesticides							
Diazinon	%	79			70-130	Pass	
Dimethoate	%	81			70-130	Pass	
Ethion	%	109			70-130	Pass	
Fenitrothion	%	96			70-130	Pass	
Methyl parathion	%	111			70-130	Pass	
Mevinphos	%	86			70-130	Pass	
LCS - % Recovery							
Heavy Metals							
Arsenic	%	98			80-120	Pass	
Cadmium	%	100			80-120	Pass	
Chromium	%	96			80-120	Pass	
Copper	%	96			80-120	Pass	
Lead	%	91			80-120	Pass	
Mercury	%	101			80-120	Pass	
Nickel	%	97			80-120	Pass	
Zinc	%	90			80-120	Pass	

Test	Lab Sample ID	QA Source	Units	Result 1			Acceptance Limits	Pass Limits	Qualifying Code
Spike - % Recovery									
Total Recoverable Hydrocarbons				Result 1					
TRH C6-C9	S21-Se19599	NCP	%	75			70-130	Pass	
TRH C10-C14	S21-Se23626	NCP	%	95			70-130	Pass	
Naphthalene	S21-Se19599	NCP	%	114			70-130	Pass	
TRH C6-C10	S21-Se19599	NCP	%	74			70-130	Pass	
TRH >C10-C16	S21-Se23626	NCP	%	90			70-130	Pass	
Spike - % Recovery									
BTEX				Result 1					
Benzene	S21-Se19599	NCP	%	90			70-130	Pass	
Toluene	S21-Se19599	NCP	%	88			70-130	Pass	
Ethylbenzene	S21-Se19599	NCP	%	85			70-130	Pass	
m&p-Xylenes	S21-Se19599	NCP	%	87			70-130	Pass	
o-Xylene	S21-Se19599	NCP	%	87			70-130	Pass	
Xylenes - Total*	S21-Se19599	NCP	%	87			70-130	Pass	
Spike - % Recovery									
Polycyclic Aromatic Hydrocarbons				Result 1					
Acenaphthene	S21-Se23688	NCP	%	109			70-130	Pass	
Acenaphthylene	S21-Se23688	NCP	%	107			70-130	Pass	
Anthracene	S21-Se23688	NCP	%	112			70-130	Pass	
Benz(a)anthracene	S21-Se23688	NCP	%	98			70-130	Pass	
Benzo(a)pyrene	S21-Se23688	NCP	%	114			70-130	Pass	
Benzo(b&j)fluoranthene	S21-Se23688	NCP	%	103			70-130	Pass	
Benzo(g.h.i)perylene	S21-Se23688	NCP	%	108			70-130	Pass	
Benzo(k)fluoranthene	S21-Se23688	NCP	%	95			70-130	Pass	
Chrysene	S21-Se23688	NCP	%	101			70-130	Pass	
Dibenz(a.h)anthracene	S21-Se23688	NCP	%	126			70-130	Pass	
Fluoranthene	S21-Se23688	NCP	%	106			70-130	Pass	
Fluorene	S21-Se23688	NCP	%	119			70-130	Pass	
Indeno(1.2.3-cd)pyrene	S21-Se23688	NCP	%	115			70-130	Pass	
Naphthalene	S21-Se23688	NCP	%	108			70-130	Pass	
Phenanthrene	S21-Se23688	NCP	%	102			70-130	Pass	
Pyrene	S21-Se23688	NCP	%	105			70-130	Pass	
Spike - % Recovery									

Test	Lab Sample ID	QA Source	Units	Result 1			Acceptance Limits	Pass Limits	Qualifying Code
Organochlorine Pesticides				Result 1					
Chlordanes - Total	S21-Se23688	NCP	%	93			70-130	Pass	
4.4'-DDD	S21-Se23688	NCP	%	91			70-130	Pass	
4.4'-DDE	S21-Se23688	NCP	%	91			70-130	Pass	
4.4'-DDT	S21-Se23688	NCP	%	107			70-130	Pass	
a-HCH	S21-Se23688	NCP	%	89			70-130	Pass	
Aldrin	S21-Se23688	NCP	%	91			70-130	Pass	
b-HCH	S21-Se23688	NCP	%	87			70-130	Pass	
d-HCH	S21-Se23688	NCP	%	84			70-130	Pass	
Dieldrin	S21-Se23688	NCP	%	87			70-130	Pass	
Endosulfan I	S21-Se23688	NCP	%	93			70-130	Pass	
Endosulfan II	S21-Se23688	NCP	%	90			70-130	Pass	
Endosulfan sulphate	S21-Se23688	NCP	%	83			70-130	Pass	
Endrin	S21-Se23688	NCP	%	110			70-130	Pass	
Endrin ketone	S21-Se23688	NCP	%	82			70-130	Pass	
g-HCH (Lindane)	S21-Se23688	NCP	%	87			70-130	Pass	
Heptachlor	S21-Se23688	NCP	%	98			70-130	Pass	
Heptachlor epoxide	S21-Se23688	NCP	%	95			70-130	Pass	
Hexachlorobenzene	S21-Se23688	NCP	%	90			70-130	Pass	
Methoxychlor	S21-Se23688	NCP	%	89			70-130	Pass	
Spike - % Recovery									
Organophosphorus Pesticides				Result 1					
Diazinon	S21-Se14086	NCP	%	85			70-130	Pass	
Spike - % Recovery									
Heavy Metals				Result 1					
Arsenic	S21-Se19079	NCP	%	85			75-125	Pass	
Cadmium	S21-Se19079	NCP	%	99			75-125	Pass	
Chromium	S21-Se19079	NCP	%	88			75-125	Pass	
Copper	S21-Se19079	NCP	%	93			75-125	Pass	
Lead	S21-Se19079	NCP	%	92			75-125	Pass	
Mercury	S21-Se19079	NCP	%	117			75-125	Pass	
Nickel	S21-Se19079	NCP	%	93			75-125	Pass	
Zinc	S21-Se19079	NCP	%	101			75-125	Pass	
Test	**Lab Sample ID**	**QA Source**	**Units**	**Result 1**			**Acceptance Limits**	**Pass Limits**	**Qualifying Code**
Duplicate									
Total Recoverable Hydrocarbons				Result 1	Result 2	RPD			
TRH C6-C9	S21-Se25052	CP	mg/kg	< 20	< 20	<1	30%	Pass	
TRH C10-C14	S21-Se25052	CP	mg/kg	< 20	< 20	<1	30%	Pass	
TRH C15-C28	S21-Se25052	CP	mg/kg	< 50	< 50	<1	30%	Pass	
TRH C29-C36	S21-Se25052	CP	mg/kg	< 50	< 50	<1	30%	Pass	
Naphthalene	S21-Se25052	CP	mg/kg	< 0.5	< 0.5	<1	30%	Pass	
TRH C6-C10	S21-Se25052	CP	mg/kg	< 20	< 20	<1	30%	Pass	
TRH >C10-C16	S21-Se25052	CP	mg/kg	< 50	< 50	<1	30%	Pass	
TRH >C16-C34	S21-Se25052	CP	mg/kg	< 100	< 100	<1	30%	Pass	
TRH >C34-C40	S21-Se25052	CP	mg/kg	< 100	< 100	<1	30%	Pass	
Duplicate									
BTEX				Result 1	Result 2	RPD			
Benzene	S21-Se25052	CP	mg/kg	< 0.1	< 0.1	<1	30%	Pass	
Toluene	S21-Se25052	CP	mg/kg	< 0.1	< 0.1	<1	30%	Pass	
Ethylbenzene	S21-Se25052	CP	mg/kg	< 0.1	< 0.1	<1	30%	Pass	
m&p-Xylenes	S21-Se25052	CP	mg/kg	< 0.2	< 0.2	<1	30%	Pass	
o-Xylene	S21-Se25052	CP	mg/kg	< 0.1	< 0.1	<1	30%	Pass	
Xylenes - Total*	S21-Se25052	CP	mg/kg	< 0.3	< 0.3	<1	30%	Pass	

Duplicate									
Polycyclic Aromatic Hydrocarbons				Result 1	Result 2	RPD			
Acenaphthene	S21-Se25052	CP	mg/kg	< 0.5	< 0.5	<1	30%	Pass	
Acenaphthylene	S21-Se25052	CP	mg/kg	< 0.5	< 0.5	<1	30%	Pass	
Anthracene	S21-Se25052	CP	mg/kg	< 0.5	< 0.5	<1	30%	Pass	
Benz(a)anthracene	S21-Se25052	CP	mg/kg	< 0.5	< 0.5	<1	30%	Pass	
Benzo(a)pyrene	S21-Se25052	CP	mg/kg	< 0.5	< 0.5	<1	30%	Pass	
Benzo(b&j)fluoranthene	S21-Se25052	CP	mg/kg	< 0.5	< 0.5	<1	30%	Pass	
Benzo(g.h.i)perylene	S21-Se25052	CP	mg/kg	< 0.5	< 0.5	<1	30%	Pass	
Benzo(k)fluoranthene	S21-Se25052	CP	mg/kg	< 0.5	< 0.5	<1	30%	Pass	
Chrysene	S21-Se25052	CP	mg/kg	< 0.5	< 0.5	<1	30%	Pass	
Dibenz(a.h)anthracene	S21-Se25052	CP	mg/kg	< 0.5	< 0.5	<1	30%	Pass	
Fluoranthene	S21-Se25052	CP	mg/kg	< 0.5	< 0.5	<1	30%	Pass	
Fluorene	S21-Se25052	CP	mg/kg	< 0.5	< 0.5	<1	30%	Pass	
Indeno(1.2.3-cd)pyrene	S21-Se25052	CP	mg/kg	< 0.5	< 0.5	<1	30%	Pass	
Naphthalene	S21-Se25052	CP	mg/kg	< 0.5	< 0.5	<1	30%	Pass	
Phenanthrene	S21-Se25052	CP	mg/kg	< 0.5	< 0.5	<1	30%	Pass	
Pyrene	S21-Se25052	CP	mg/kg	< 0.5	< 0.5	<1	30%	Pass	
Duplicate									
Organochlorine Pesticides				Result 1	Result 2	RPD			
Chlordanes - Total	S21-Se25052	CP	mg/kg	< 0.1	< 0.1	<1	30%	Pass	
4.4'-DDD	S21-Se25052	CP	mg/kg	< 0.05	< 0.05	<1	30%	Pass	
4.4'-DDE	S21-Se25052	CP	mg/kg	< 0.05	< 0.05	<1	30%	Pass	
4.4'-DDT	S21-Se25052	CP	mg/kg	< 0.05	< 0.05	<1	30%	Pass	
a-HCH	S21-Se25052	CP	mg/kg	< 0.05	< 0.05	<1	30%	Pass	
Aldrin	S21-Se25052	CP	mg/kg	< 0.05	< 0.05	<1	30%	Pass	
b-HCH	S21-Se25052	CP	mg/kg	< 0.05	< 0.05	<1	30%	Pass	
d-HCH	S21-Se25052	CP	mg/kg	< 0.05	< 0.05	<1	30%	Pass	
Dieldrin	S21-Se25052	CP	mg/kg	< 0.05	< 0.05	<1	30%	Pass	
Endosulfan I	S21-Se25052	CP	mg/kg	< 0.05	< 0.05	<1	30%	Pass	
Endosulfan II	S21-Se25052	CP	mg/kg	< 0.05	< 0.05	<1	30%	Pass	
Endosulfan sulphate	S21-Se25052	CP	mg/kg	< 0.05	< 0.05	<1	30%	Pass	
Endrin	S21-Se25052	CP	mg/kg	< 0.05	< 0.05	<1	30%	Pass	
Endrin aldehyde	S21-Se25052	CP	mg/kg	< 0.05	< 0.05	<1	30%	Pass	
Endrin ketone	S21-Se25052	CP	mg/kg	< 0.05	< 0.05	<1	30%	Pass	
g-HCH (Lindane)	S21-Se25052	CP	mg/kg	< 0.05	< 0.05	<1	30%	Pass	
Heptachlor	S21-Se25052	CP	mg/kg	< 0.05	< 0.05	<1	30%	Pass	
Heptachlor epoxide	S21-Se25052	CP	mg/kg	< 0.05	< 0.05	<1	30%	Pass	
Hexachlorobenzene	S21-Se25052	CP	mg/kg	< 0.05	< 0.05	<1	30%	Pass	
Methoxychlor	S21-Se25052	CP	mg/kg	< 0.05	< 0.05	<1	30%	Pass	
Toxaphene	S21-Se25052	CP	mg/kg	< 0.5	< 0.5	<1	30%	Pass	
Duplicate									
Organophosphorus Pesticides				Result 1	Result 2	RPD			
Azinphos-methyl	S21-Se25052	CP	mg/kg	< 0.2	< 0.2	<1	30%	Pass	
Bolstar	S21-Se25052	CP	mg/kg	< 0.2	< 0.2	<1	30%	Pass	
Chlorfenvinphos	S21-Se25052	CP	mg/kg	< 0.2	< 0.2	<1	30%	Pass	
Chlorpyrifos	S21-Se25052	CP	mg/kg	< 0.2	< 0.2	<1	30%	Pass	
Chlorpyrifos-methyl	S21-Se25052	CP	mg/kg	< 0.2	< 0.2	<1	30%	Pass	
Coumaphos	S21-Se25052	CP	mg/kg	< 2	< 2	<1	30%	Pass	
Demeton-S	S21-Se25052	CP	mg/kg	< 0.2	< 0.2	<1	30%	Pass	
Demeton-O	S21-Se25052	CP	mg/kg	< 0.2	< 0.2	<1	30%	Pass	
Diazinon	S21-Se25052	CP	mg/kg	< 0.2	< 0.2	<1	30%	Pass	
Dichlorvos	S21-Se25052	CP	mg/kg	< 0.2	< 0.2	<1	30%	Pass	
Dimethoate	S21-Se25052	CP	mg/kg	< 0.2	< 0.2	<1	30%	Pass	
Disulfoton	S21-Se25052	CP	mg/kg	< 0.2	< 0.2	<1	30%	Pass	
EPN	S21-Se25052	CP	mg/kg	< 0.2	< 0.2	<1	30%	Pass	

Duplicate									
Organophosphorus Pesticides				Result 1	Result 2	RPD			
Ethion	S21-Se25052	CP	mg/kg	< 0.2	< 0.2	<1	30%	Pass	
Ethoprop	S21-Se25052	CP	mg/kg	< 0.2	< 0.2	<1	30%	Pass	
Ethyl parathion	S21-Se25052	CP	mg/kg	< 0.2	< 0.2	<1	30%	Pass	
Fenitrothion	S21-Se25052	CP	mg/kg	< 0.2	< 0.2	<1	30%	Pass	
Fensulfothion	S21-Se25052	CP	mg/kg	< 0.2	< 0.2	<1	30%	Pass	
Fenthion	S21-Se25052	CP	mg/kg	< 0.2	< 0.2	<1	30%	Pass	
Malathion	S21-Se25052	CP	mg/kg	< 0.2	< 0.2	<1	30%	Pass	
Merphos	S21-Se25052	CP	mg/kg	< 0.2	< 0.2	<1	30%	Pass	
Methyl parathion	S21-Se25052	CP	mg/kg	< 0.2	< 0.2	<1	30%	Pass	
Mevinphos	S21-Se25052	CP	mg/kg	< 0.2	< 0.2	<1	30%	Pass	
Monocrotophos	S21-Se25052	CP	mg/kg	< 2	< 2	<1	30%	Pass	
Naled	S21-Se25052	CP	mg/kg	< 0.2	< 0.2	<1	30%	Pass	
Omethoate	S21-Se25052	CP	mg/kg	< 2	< 2	<1	30%	Pass	
Phorate	S21-Se25052	CP	mg/kg	< 0.2	< 0.2	<1	30%	Pass	
Pirimiphos-methyl	S21-Se25052	CP	mg/kg	< 0.2	< 0.2	<1	30%	Pass	
Pyrazophos	S21-Se25052	CP	mg/kg	< 0.2	< 0.2	<1	30%	Pass	
Ronnel	S21-Se25052	CP	mg/kg	< 0.2	< 0.2	<1	30%	Pass	
Terbufos	S21-Se25052	CP	mg/kg	< 0.2	< 0.2	<1	30%	Pass	
Tetrachlorvinphos	S21-Se25052	CP	mg/kg	< 0.2	< 0.2	<1	30%	Pass	
Tokuthion	S21-Se25052	CP	mg/kg	< 0.2	< 0.2	<1	30%	Pass	
Trichloronate	S21-Se25052	CP	mg/kg	< 0.2	< 0.2	<1	30%	Pass	
Duplicate									
Heavy Metals				Result 1	Result 2	RPD			
Arsenic	S21-Se19198	NCP	mg/kg	4.2	3.4	22	30%	Pass	
Cadmium	S21-Se19198	NCP	mg/kg	< 0.4	< 0.4	<1	30%	Pass	
Chromium	S21-Se19198	NCP	mg/kg	15	16	8.0	30%	Pass	
Copper	S21-Se19198	NCP	mg/kg	18	26	35	30%	Fail	Q15
Lead	S21-Se19198	NCP	mg/kg	18	11	52	30%	Fail	Q15
Mercury	S21-Se19198	NCP	mg/kg	< 0.1	< 0.1	<1	30%	Pass	
Nickel	S21-Se19198	NCP	mg/kg	11	11	1.0	30%	Pass	
Zinc	S21-Se19198	NCP	mg/kg	63	38	49	30%	Fail	Q15
Duplicate									
				Result 1	Result 2	RPD			
% Moisture	S21-Se25052	CP	%	16	16	1.0	30%	Pass	

Comments

Sample Integrity

Custody Seals Intact (if used)	N/A
Attempt to Chill was evident	Yes
Sample correctly preserved	Yes
Appropriate sample containers have been used	Yes
Sample containers for volatile analysis received with minimal headspace	Yes
Samples received within HoldingTime	Yes
Some samples have been subcontracted	No

Qualifier Codes/Comments

Code	Description
N01	F2 is determined by arithmetically subtracting the "naphthalene" value from the ">C10-C16" value. The naphthalene value used in this calculation is obtained from volatiles (Purge & Trap analysis).
N02	Where we have reported both volatile (P&T GCMS) and semivolatile (GCMS) naphthalene data, results may not be identical. Provided correct sample handling protocols have been followed, any observed differences in results are likely to be due to procedural differences within each methodology. Results determined by both techniques have passed all QAQC acceptance criteria, and are entirely technically valid.
N04	F1 is determined by arithmetically subtracting the "Total BTEX" value from the "C6-C10" value. The "Total BTEX" value is obtained by summing the concentrations of BTEX analytes. The "C6-C10" value is obtained by quantitating against a standard of mixed aromatic/aliphatic analytes.
N07	Please note:- These two PAH isomers closely co-elute using the most contemporary analytical methods and both the reported concentration (and the TEQ) apply specifically to the total of the two co-eluting PAHs
Q15	The RPD reported passes Eurofins Environment Testing's QC - Acceptance Criteria as defined in the Internal Quality Control Review and Glossary page of this report.

Authorised by:

Emma Beesley	Analytical Services Manager
Andrew Sullivan	Senior Analyst-Organic (NSW)
John Nguyen	Senior Analyst-Metal (NSW)
Roopesh Rangarajan	Senior Analyst-Volatile (NSW)

Glenn Jackson
General Manager

Final Report – this report replaces any previously issued Report

- Indicates Not Requested

* Indicates NATA accreditation does not cover the performance of this service

Measurement uncertainty of test data is available on request or please click here.

Eurofins shall not be liable for loss, cost, damages or expenses incurred by the client, or any other person or company, resulting from the use of any information or interpretation given in this report. In no case shall Eurofins be liable for consequential damages including, but not limited to, lost profits, damages for failure to meet deadlines and lost production arising from this report. This document shall not be reproduced except in full and relates only to the items tested. Unless indicated otherwise, the tests were performed on the samples as received.

824081

CHAIN OF CUSTODY

ALS Laboratory:
please tick →

ADELAIDE 21 Burma Road Pooraka SA 5095
Ph: 08 8359 0890 E: adelaide@alsglobal.com

07 7471

QLD 4818

CLIENT: Jacobs Arcadis Joint Venture (JAJV)
OFFICE: Sydney
PROJECT: IA254001
ORDER NUMBER: –
PROJECT MANAGER: Amanda Mullen CONTACT PH:
SAMPLER: NK SAMPLER MOBILE: 0421201294
COC emailed to ALS? (YES / [✓ NO])
EDD FORMAT (or default):
Email Reports to (will default to PM if no other addresses are listed): nick.Reatley@jacobs.com, amanda.mullen@jacobs.com
Email Invoice to (will default to PM if no other addresses are listed): Nick / Amanda

TURNAROUND REQUIREMENTS : (Standard TAT may be longer for some tests e.g.. Ultra Trace Organics)
☒ Standard TAT (List due date):
☐ Non Standard or urgent TAT (List due date):

ALS QUOTE NO.: – ~~[illegible]~~

COC SEQUENCE NUMBER (Circle)
COC: [✓ 1] 2 3 4 5 6 7
OF: 1 [✓ 2] 3 4 5 6 7

FOR LABORATORY USE ONLY (Circle)
Custody Seal Intact? [✓ Yes] No N/A
[✓ Free ice] / frozen ice bricks present upon receipt? Yes No N/A
Random Sample Temperature on Receipt 5.4 °C
Other comment:

RELINQUISHED BY:	RECEIVED BY:	RELINQUISHED BY:	RECEIVED BY:
NK	Juliana G	RPhillips @Eurofins	[illegible]
DATE/TIME: 8/9/21	DATE/TIME: 8/9/21 3:10pm	DATE/TIME: 9/9/21 5:55pm	DATE/TIME: 08/9/21/1830

COMMENTS/SPECIAL HANDLING/STORAGE OR DISPOSAL: also email results to EDMANZ@jacobs.com, jacobs.labresults@esdat.net

ALS USE	SAMPLE DETAILS MATRIX: SOLID (S) WATER (W)			CONTAINER INFORMATION		ANALYSIS REQUIRED including SUITES (NB. Suite Codes must be listed to attract suite price) Where Metals are required, specify Total (unfiltered bottle required) or Dissolved (field filtered bottle required).								Additional Information
LAB ID	SAMPLE ID	DATE / TIME	MATRIX	TYPE & PRESERVATIVE (refer to codes below)	TOTAL CONTAINERS	S-26	S-12	Asbestos p/a	MMB02 (Ecoli & Total Coliforms)	~~[illegible]~~			HOLD	Comments on likely contaminant levels, dilutions, or samples requiring specific QC analysis etc.
1	SS13_0.05	6/9/21	S		3	X	X	X	X					
2	QC101_210906	↓	↓		↓	X	X	X	X					Blind Duplicate
-	QC201_210906	↓				X	X	X	~~X~~					Send to ~~[illegible]~~ Eurofins
3	BH07_0.05	7/9/21				X	X	X	X					
4	BH07_0.5	↓				X	X	X	X					
5	BH07_0.76				↓								X	
6	SS24_0.05				2	X	X	X						
7	SS24_0.10				2	X	X	X						
8	SS26_0.05	↓			3	X	X	X						
9	BH15_0.05	8/9/21			3	X	X	X	X					
10	BH15_1.0	↓			2								X	
11	BH15_2.0	↓	↓		2	X	X		X					

QC 201-210906 to Eurofins

Subcon / Forward Lab / Split WO: to
Lab / Analysis: 6-9 AS Newcastle Asbestos
Organised By / Date:
Relinquished By / Date:
Connote / Courier:
WO No: ES2132601
Attached By PO / Internal Sheet:

Environmental Division
Sydney
Work Order Reference
ES2132601

Telephone : + 61-2-8784 8555

tainer Codes: P = Unpreserved Plastic; N = Nitric Preserved Plastic; ORC = Nitric Preserved ORC; SH = Sodium Hydroxide/Cd Preserved; S = Sodium Hydroxide Preserved Plastic; AG = Amber Glass Unpreserved; AP - Airfreight Unpreserved Plastic
Vial HCl Preserved; VB = VOA Vial Sodium Bisulphate Preserved; VS = VOA Vial Sulfuric Preserved; AV = Airfreight Unpreserved Vial SG = Sulfuric Preserved Amber Glass; H = HCl preserved Plastic; HS = HCl preserved Speciation bottle; SP = Sulfuric Preserved Plastic; F = Formaldehyde Preserved Glass;
Z = Zinc Acetate Preserved Bottle; E = EDTA Preserved Bottles; ST = Sterile Bottle; ASS = Plastic Bag for Acid Sulphate Soils; B = Unpreserved Bag

★ 824081

CHAIN OF CUSTODY

ALS Laboratory: please tick →

CLIENT: Jacobs Arcadis Joint Venture (JAJV)
OFFICE: Sydney
PROJECT: IA254001
ORDER NUMBER: –
PROJECT MANAGER: Amanda Mullen
CONTACT PH:
SAMPLER: NK
SAMPLER MOBILE: 0421201294
COC emailed to ALS? (YES / [✓ NO])
EDD FORMAT (or default):
Email Reports to (will default to PM if no other addresses are listed): As pg 1
Email Invoice to (will default to PM if no other addresses are listed): As pg 1
COMMENTS/SPECIAL HANDLING/STORAGE OR DISPOSAL: As pg 1

TURNAROUND REQUIREMENTS : (Standard TAT may be longer for some tests e.g., Ultra Trace Organics)
☒ Standard TAT (List due date):
☐ Non Standard or urgent TAT (List due date):
ALS QUOTE NO.: –

COC SEQUENCE NUMBER (Circle)
COC: 1 [✓ 2] 3 4 5 6 7
OF: 1 [✓ 2] 3 4 5 6 7

FOR LABORATORY USE ONLY (Circle)
Custody Seal Intact? [✓ Yes] No N/A
Free ice / frozen ice bricks present upon receipt? Yes No N/A
Random Sample Temperature on Receipt: 5.4 °C
Other comment:

RELINQUISHED BY:	RECEIVED BY:	RELINQUISHED BY:	RECEIVED BY:
NK	Juliana G	RPhillips @Eurofins	
DATE/TIME: 8/9/21	DATE/TIME: 8/9/21 3:10pm	DATE/TIME: 9/9/21 5:55pm	DATE/TIME: 08/9/21 1830

ALS USE	SAMPLE DETAILS MATRIX: SOLID (S) WATER (W)			CONTAINER INFORMATION		ANALYSIS REQUIRED including SUITES (NB. Suite Codes must be listed to attract suite price) Where Metals are required, specify Total (unfiltered bottle required) or Dissolved (field filtered bottle required).								Additional Information
LAB ID	SAMPLE ID	DATE / TIME	MATRIX	TYPE & PRESERVATIVE (refer to codes below)	TOTAL CONTAINERS	S-26	S-12	Asbestos p/9	M.M802 (E.coli & Total coliforms)	[illegible]	BTEXN		HOLD	Comments on likely contaminant levels, dilutions, or samples requiring specific QC analysis etc.
12	QC300_210908	8/9/21	S		1	X	X				X			Trip blank
13	QC501_210908	↓	W		7	X	X				X			Rinsate
14	BH15-0.5	↓	S		2	X	X	X					X	

Water Container Codes: P = Unpreserved Plastic; N = Nitric Preserved Plastic; ORC = Nitric Preserved ORC; SH = Sodium Hydroxide/Cd Preserved; S = Sodium Hydroxide Preserved Plastic; AG = Amber Glass Unpreserved; AP - Airfreight Unpreserved Plastic
V = VOA Vial HCl Preserved; VB = VOA Vial Sodium Bisulphate Preserved; VS = VOA Vial Sulfuric Preserved; AV = Airfreight Unpreserved Vial SG = Sulfuric Preserved Amber Glass; H = HCl preserved Plastic; HS = HCl preserved Speciation bottle; SP = Sulfuric Preserved Plastic; F = Formaldehyde Preserved Glass;
Z = Zinc Acetate Preserved Bottle; E = EDTA Preserved Bottles; ST = Sterile Bottle; ASS = Plastic Bag for Acid Sulphate Soils; B = Unpreserved Bag

NATA Accredited
Accreditation Number 1261
Site Number 1254

Accredited for compliance with ISO/IEC 17025 – Testing
NATA is a signatory to the ILAC Mutual Recognition Arrangement for the mutual recognition of the equivalence of testing, medical testing, calibration, inspection, proficiency testing scheme providers and reference materials producers reports and certificates.

Jacobs Group (Australia) P/L NSW
Level 7, 177 Pacific Highway
North Sydney
NSW 2065

Attention: **Nick Keatley**

Report **824119-S**
Project name IA254001
Project ID IA254001
Received Date Sep 13, 2021

Client Sample ID **Sample Matrix** **Eurofins Sample No.** **Date Sampled** Test/Reference	LOR	Unit	**QC201_210901** **Soil** **M21-Se25295** **Sep 01, 2021**
Nitrate & Nitrite (as N)	5	mg/kg	< 5
Total Kjeldahl Nitrogen (as N)	10	mg/kg	1500
Total Nitrogen (as N)*	10	mg/kg	1500
Phosphorus	5	mg/kg	180
% Moisture	1	%	24
Heavy Metals			
Arsenic	2	mg/kg	6.1
Cadmium	0.4	mg/kg	< 0.4
Chromium	5	mg/kg	25
Copper	5	mg/kg	< 5
Lead	5	mg/kg	15
Mercury	0.1	mg/kg	< 0.1
Nickel	5	mg/kg	< 5
Zinc	5	mg/kg	13

Sample History

Where samples are submitted/analysed over several days, the last date of extraction is reported.

If the date and time of sampling are not provided, the Laboratory will not be responsible for compromised results should testing be performed outside the recommended holding time.

Description	Testing Site	Extracted	Holding Time
Total Nitrogen Set (as N)			
Nitrate & Nitrite (as N)	Melbourne	Sep 13, 2021	28 Days
- Method: LTM-INO-4120 Analysis of NOx NO2 NH3 by FIA			
Total Kjeldahl Nitrogen (as N)	Melbourne	Sep 13, 2021	28 Days
- Method: APHA 4500-Norg B,D Total Kjeldahl Nitrogen by FIA			
Phosphorus	Melbourne	Sep 13, 2021	180 Days
- Method: LTM-MET-3010 Alkali Metals Sulfur Silicon and Phosphorus by ICP-AES			
Metals M8	Melbourne	Sep 13, 2021	180 Days
- Method:			
% Moisture	Melbourne	Sep 13, 2021	14 Days
- Method: LTM-GEN-7080 Moisture			

Company Name: Jacobs Group (Australia) P/L NSW
Address: Level 7, 177 Pacific Highway
North Sydney
NSW 2065

Project Name: IA254001
Project ID: IA254001

Order No.:
Report #: 824119
Phone: 02 9928 2100
Fax: 02 9928 2504

Received: Sep 13, 2021 1:48 PM
Due: Sep 20, 2021
Priority: 5 Day
Contact Name: Nick Keatley

Eurofins Analytical Services Manager : Andrew Black

Sample Detail						Phosphorus	Metals M8	Total Nitrogen Set (as N)	Moisture Set
Melbourne Laboratory - NATA # 1261 Site # 1254						X	X	X	X
Sydney Laboratory - NATA # 1261 Site # 18217									
Brisbane Laboratory - NATA # 1261 Site # 20794									
Mayfield Laboratory - NATA # 1261 Site # 25079									
Perth Laboratory - NATA # 2377 Site # 2370									
External Laboratory									
No	**Sample ID**	**Sample Date**	**Sampling Time**	**Matrix**	**LAB ID**				
1	QC201_210901	Sep 01, 2021		Soil	M21-Se25295	X	X	X	X
Test Counts						1	1	1	1

Internal Quality Control Review and Glossary

General

1. Laboratory QC results for Method Blanks, Duplicates, Matrix Spikes, and Laboratory Control Samples follows guidelines delineated in the National Environment Protection (Assessment of Site Contamination) Measure 1999, as amended May 2013 and are included in this QC report where applicable. Additional QC data may be available on request.
2. All soil/sediment/solid results are reported on a dry basis, unless otherwise stated.
3. All biota/food results are reported on a wet weight basis on the edible portion, unless otherwise stated.
4. Actual LORs are matrix dependant. Quoted LORs may be raised where sample extracts are diluted due to interferences.
5. Results are uncorrected for matrix spikes or surrogate recoveries except for PFAS compounds.
6. SVOC analysis on waters are performed on homogenised, unfiltered samples, unless noted otherwise.
7. Samples were analysed on an 'as received' basis.
8. Information identified on this report with blue colour, indicates data provided by customer, that may have an impact on the results.
9. This report replaces any interim results previously issued.

Holding Times

Please refer to 'Sample Preservation and Container Guide' for holding times (QS3001).

For samples received on the last day of holding time, notification of testing requirements should have been received at least 6 hours prior to sample receipt deadlines as stated on the SRA.

If the Laboratory did not receive the information in the required timeframe, and regardless of any other integrity issues, suitably qualified results may still be reported.

Holding times apply from the date of sampling, therefore compliance to these may be outside the laboratory's control.

For VOCs containing vinyl chloride, styrene and 2-chloroethyl vinyl ether the holding time is 7 days however for all other VOCs such as BTEX or C6-10 TRH then the holding time is 14 days.

****NOTE:** pH duplicates are reported as a range NOT as RPD

Units

mg/kg: milligrams per kilogram
ppm: Parts per million
org/100mL: Organisms per 100 millilitres
mg/L: milligrams per litre
ppb: Parts per billion
NTU: Nephelometric Turbidity Units
ug/L: micrograms per litre
%: Percentage
MPN/100mL: Most Probable Number of organisms per 100 millilitres

Terms

Dry	Where a moisture has been determined on a solid sample the result is expressed on a dry basis.
LOR	Limit of Reporting.
SPIKE	Addition of the analyte to the sample and reported as percentage recovery.
RPD	Relative Percent Difference between two Duplicate pieces of analysis.
LCS	Laboratory Control Sample - reported as percent recovery.
CRM	Certified Reference Material - reported as percent recovery.
Method Blank	In the case of solid samples these are performed on laboratory certified clean sands and in the case of water samples these are performed on de-ionised water.
Surr - Surrogate	The addition of a like compound to the analyte target and reported as percentage recovery.
Duplicate	A second piece of analysis from the same sample and reported in the same units as the result to show comparison.
USEPA	United States Environmental Protection Agency
APHA	American Public Health Association
TCLP	Toxicity Characteristic Leaching Procedure
COC	Chain of Custody
SRA	Sample Receipt Advice
QSM	US Department of Defense Quality Systems Manual Version 5.3
CP	Client Parent - QC was performed on samples pertaining to this report
NCP	Non-Client Parent - QC performed on samples not pertaining to this report, QC is representative of the sequence or batch that client samples were analysed within.
TEQ	Toxic Equivalency Quotient

QC - Acceptance Criteria

RPD Duplicates: Global RPD Duplicates Acceptance Criteria is 30% however the following acceptance guidelines are equally applicable:

Results <10 times the LOR : No Limit

Results between 10-20 times the LOR : RPD must lie between 0-50%

Results >20 times the LOR : RPD must lie between 0-30%

Surrogate Recoveries: Recoveries must lie between 20-130% Phenols & 50-150% PFASs

PFAS field samples that contain surrogate recoveries in excess of the QC limit designated in QSM 5.3 where no positive PFAS results have been reported have been reviewed and no data was affected.

WA DWER (n=10): PFBA, PFPeA, PFHxA, PFHpA, PFOA, PFBS, PFHxS, PFOS, 6:2 FTSA, 8:2 FTSA

QC Data General Comments

1. Where a result is reported as a less than (<), higher than the nominated LOR, this is due to either matrix interference, extract dilution required due to interferences or contaminant levels within the sample, high moisture content or insufficient sample provided.
2. Duplicate data shown within this report that states the word "BATCH" is a Batch Duplicate from outside of your sample batch, but within the laboratory sample batch at a 1:10 ratio. The Parent and Duplicate data shown is not data from your samples.
3. Organochlorine Pesticide analysis - where reporting LCS data, Toxaphene & Chlordane are not added to the LCS.
4. Organochlorine Pesticide analysis - where reporting Spike data, Toxaphene is not added to the Spike.
5. Total Recoverable Hydrocarbons - where reporting Spike & LCS data, a single spike of commercial Hydrocarbon products in the range of C12-C30 is added and it's Total Recovery is reported in the C10-C14 cell of the Report.
6. pH and Free Chlorine analysed in the laboratory - Analysis on this test must begin within 30 minutes of sampling.Therefore laboratory analysis is unlikely to be completed within holding time. Analysis will begin as soon as possible after sample receipt.
7. Recovery Data (Spikes & Surrogates) - where chromatographic interference does not allow the determination of Recovery the term "INT" appears against that analyte.
8. Polychlorinated Biphenyls are spiked only using Aroclor 1260 in Matrix Spikes and LCS.
9. For Matrix Spikes and LCS results a dash " -" in the report means that the specific analyte was not added to the QC sample.
10. Duplicate RPDs are calculated from raw analytical data thus it is possible to have two sets of data.

Quality Control Results

Test	Units	Result 1			Acceptance Limits	Pass Limits	Qualifying Code
Method Blank							
Phosphorus	mg/kg	< 5			5	Pass	
Method Blank							
Heavy Metals							
Arsenic	mg/kg	< 2			2	Pass	
Cadmium	mg/kg	< 0.4			0.4	Pass	
Chromium	mg/kg	< 5			5	Pass	
Copper	mg/kg	< 5			5	Pass	
Lead	mg/kg	< 5			5	Pass	
Mercury	mg/kg	< 0.1			0.1	Pass	
Nickel	mg/kg	< 5			5	Pass	
Zinc	mg/kg	< 5			5	Pass	
LCS - % Recovery							
Heavy Metals							
Arsenic	%	94			80-120	Pass	
Cadmium	%	119			80-120	Pass	
Chromium	%	96			80-120	Pass	
Copper	%	93			80-120	Pass	
Lead	%	92			80-120	Pass	
Mercury	%	113			80-120	Pass	
Nickel	%	94			80-120	Pass	
Zinc	%	93			80-120	Pass	

Test	Lab Sample ID	QA Source	Units	Result 1			Acceptance Limits	Pass Limits	Qualifying Code
Spike - % Recovery									
Heavy Metals				Result 1					
Arsenic	M21-Se26456	NCP	%	139			75-125	Fail	Q08
Cadmium	M21-Se26456	NCP	%	124			75-125	Pass	
Chromium	M21-Se26456	NCP	%	88			75-125	Pass	
Copper	M21-Se26456	NCP	%	108			75-125	Pass	
Lead	M21-Se26456	NCP	%	111			75-125	Pass	
Mercury	M21-Se26456	NCP	%	117			75-125	Pass	
Nickel	M21-Se26456	NCP	%	85			75-125	Pass	
Zinc	M21-Se26456	NCP	%	382			75-125	Fail	Q08

Test	Lab Sample ID	QA Source	Units	Result 1			Acceptance Limits	Pass Limits	Qualifying Code
Duplicate									
				Result 1	Result 2	RPD			
Nitrate & Nitrite (as N)	M21-Se20981	NCP	mg/kg	34	34	<1	30%	Pass	
% Moisture	M21-Se25242	NCP	%	14	14	1.0	30%	Pass	
Duplicate									
Heavy Metals				Result 1	Result 2	RPD			
Arsenic	M21-Se26455	NCP	mg/kg	9.8	11	12	30%	Pass	
Cadmium	M21-Se26455	NCP	mg/kg	0.6	0.6	5.0	30%	Pass	
Chromium	M21-Se26455	NCP	mg/kg	120	120	3.0	30%	Pass	
Copper	M21-Se26455	NCP	mg/kg	64	66	4.0	30%	Pass	
Lead	M21-Se26455	NCP	mg/kg	79	120	38	30%	Fail	Q02
Mercury	M21-Se26455	NCP	mg/kg	0.1	0.2	11	30%	Pass	
Nickel	M21-Se26455	NCP	mg/kg	150	190	21	30%	Pass	
Zinc	M21-Se26455	NCP	mg/kg	130	130	1.0	30%	Pass	

Comments

Sample Integrity

Custody Seals Intact (if used)	N/A
Attempt to Chill was evident	Yes
Sample correctly preserved	Yes
Appropriate sample containers have been used	Yes
Sample containers for volatile analysis received with minimal headspace	Yes
Samples received within HoldingTime	Yes
Some samples have been subcontracted	No

Qualifier Codes/Comments

Code	Description
Q02	The duplicate %RPD is outside the recommended acceptance criteria. Further analysis indicates sample heterogeneity as the cause
Q08	The matrix spike recovery is outside of the recommended acceptance criteria. An acceptable recovery was obtained for the laboratory control sample indicating a sample matrix interference.

Authorised by:

Emma Beesley	Analytical Services Manager
Emily Rosenberg	Senior Analyst-Metal (VIC)
Scott Beddoes	Senior Analyst-Inorganic (VIC)

Glenn Jackson
General Manager

Final Report – this report replaces any previously issued Report

- Indicates Not Requested

* Indicates NATA accreditation does not cover the performance of this service

Measurement uncertainty of test data is available on request or please click here.

Eurofins shall not be liable for loss, cost, damages or expenses incurred by the client, or any other person or company, resulting from the use of any information or interpretation given in this report. In no case shall Eurofins be liable for consequential damages including, but not limited to, lost profits, damages for failure to meet deadlines and lost production arising from this report. This document shall not be reproduced except in full and relates only to the items tested. Unless indicated otherwise, the tests were performed on the samples as received.

FW: [EXTERNAL] Eurofins Test Results, Invoice - Report 822697 : Site IA254001 (IA254001)

Ursula Long <UrsulaLong@eurofins.com>
Mon 13/09/2021 2:37 PM

To: #AU_CAU001_EnviroSampleVic <EnviroSampleVic@eurofins.com>; Enviro Sample Vic Transit <EnviroSampleVicTransit@eurofins.com>; Catherine Wilson <CatherineWilson@eurofins.com>

5 day additional please

824119
~~822697~~
G/6 E7
13/9/21

Kind regards,

Ursula Long
Analytical Services Manager

Eurofins | Environment Testing
Unit F3, Parkview Building
16 Mars Road
LANE COVE WEST NSW 2066
AUSTRALIA
Mobile: +61 428 845 495
Email : UrsulaLong@eurofins.com
Website: www.eurofins.com.au/environmental-testing

For sample receipt enquiries (eg. SRAs, changes to analysis) please contact EnvirosampleNSW@eurofins.com or 02 9900 8421 (7am – 12am).
For despatch enquiries (eg. courier bookings, bottle orders) please contact AU04_Despatch_SYD@eurofins.com or 0488 400 929 (8am – 4pm).

From: Keatley, Nick <Nick.Keatley@jacobs.com>
Sent: Monday, 13 September 2021 1:48 PM
To: Ursula Long <UrsulaLong@eurofins.com>
Cc: Mullen, Amanda <Amanda.Mullen@jacobs.com>
Subject: Re: [EXTERNAL] Eurofins Test Results, Invoice - Report 822697 : Site IA254001 (IA254001)

EXTERNAL EMAIL*

Hi Ursula,
Thanks for this.

I am not sure why this wasn't communicated by ALS, but this sample should have also been analysed for the following:

Se13067-S00264-FD202.

- 8 Heavy Metals (As, Cd, Cr, Cu, Ni, Pb, Zn, Hg)
- Total Nitrogen, TKN, NOx, Total Phosporus

If possible could you also complete this analysis on the sample?

Let me know if there are any issues with this.

Thanks,
Nick Keatley
Jacobs
0421201294

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Certificate of Analysis

NATA Accredited
Accreditation Number 1261
Site Number 18217

Accredited for compliance with ISO/IEC 17025–Testing NATA is a signatory to the ILAC Mutual Recognition Arrangement for the mutual recognition of the equivalence of testing, medical testing, calibration, inspection, proficiency testing scheme providers and reference materials producers reports and certificates.

Jacobs Group (Australia) P/L NSW
Level 7, 177 Pacific Highway
North Sydney
NSW 2065

Attention: Amanda Mullen
Report 826682-AID
Project Name IA254001
Project ID IA254001
Received Date Sep 22, 2021
Date Reported Sep 23, 2021

Methodology:

Asbestos Fibre Identification	Conducted in accordance with the Australian Standard AS 4964 – 2004: Method for the Qualitative Identification of Asbestos in Bulk Samples and in-house Method LTM-ASB-8020 by polarised light microscopy (PLM) and dispersion staining (DS) techniques. *NOTE: Positive Trace Analysis results indicate the sample contains detectable respirable fibres.*
Unknown Mineral Fibres	Mineral fibres of unknown type, as determined by PLM with DS, may require another analytical technique, such as Electron Microscopy, to confirm unequivocal identity. *NOTE: While Actinolite, Anthophyllite and Tremolite asbestos may be detected by PLM with DS, due to variability in the optical properties of these materials, AS4964 requires that these are reported as UMF unless confirmed by an independent technique.*
Subsampling Soil Samples	The whole sample submitted is first dried and then passed through a 10mm sieve followed by a 2mm sieve. All fibrous matter greater than 10mm, greater than 2mm as well as the material passing through the 2mm sieve are retained and analysed for the presence of asbestos. If the sub 2mm fraction is greater than approximately 30 to 60g then a sub-sampling routine based on ISO 3082:2009(E) is employed. *NOTE: Depending on the nature and size of the soil sample, the sub-2 mm residue material may need to be sub-sampled for trace analysis, in accordance with AS 4964-2004.*
Bonded asbestos-containing material (ACM)	The material is first examined and any fibres isolated for identification by PLM and DS. Where required, interfering matrices may be removed by disintegration using a range of heat, chemical or physical treatments, possibly in combination.The resultant material is then further examined in accordance with AS 4964 - 2004. *NOTE: Even after disintegration it may be difficult to detect the presence of asbestos in some asbestos-containing bulk materials using PLM and DS. This is due to the low grade or small length or diameter of the asbestos fibres present in the material, or to the fact that very fine fibres have been distributed intimately throughout the materials. Vinyl/asbestos floor tiles, some asbestos-containing sealants and mastics, asbestos-containing epoxy resins and some ore samples are examples of these types of material, which are difficult to analyse.*
Limit of Reporting	The performance limitation of the AS 4964 (2004) method for non-homogeneous samples is around 0.1 g/kg (equivalent to 0.01% (w/w)). Where no asbestos is found by PLM and DS, including Trace Analysis, this is considered to be at the nominal reporting limit of 0.01% (w/w). The NEPM screening level of 0.001% (w/w) is intended as an on-site determination, not a laboratory Limit of Reporting (LOR), per se. Examination of a large sample size (e.g. 500 mL) may improve the likelihood of detecting asbestos, particularly AF, to aid assessment against the NEPM criteria. Gravimetric determinations to this level of accuracy are outside of AS 4964 and hence NATA Accreditation does not cover the performance of this service (non-NATA results shown with an asterisk). *NOTE: NATA News March 2014, p.7, states in relation to AS 4964: "This is a qualitative method with a nominal reporting limit of 0.01 % " and that currently in Australia "there is no validated method available for the quantification of asbestos".This report is consistent with the analytical procedures and reporting recommendations in the NEPM and the WA DoH.*

Project Name	IA254001
Project ID	IA254001
Date Sampled	Sep 06, 2021
Report	826682-AID

Client Sample ID	Eurofins Sample No.	Date Sampled	Sample Description	Result
QC201_210906	21-Se45699	Sep 06, 2021	Approximate Sample 115g Sample consisted of: Brown coarse-grained soil, plant reisude and rocks	No asbestos detected at the reporting limit of 0.01% w/w. Organic fibre detected. No trace asbestos detected.

Sample History

Where samples are submitted/analysed over several days, the last date of extraction is reported.

If the date and time of sampling are not provided, the Laboratory will not be responsible for compromised results should testing be performed outside the recommended holding time.

Description	Testing Site	Extracted	Holding Time
Asbestos - LTM-ASB-8020	Sydney	Sep 22, 2021	Indefinite

Company Name: Jacobs Group (Australia) P/L NSW
Address: Level 7, 177 Pacific Highway
North Sydney
NSW 2065

Project Name: IA254001
Project ID: IA254001

Order No.:
Report #: 826682
Phone: 02 9928 2100
Fax: 02 9928 2504

Received: Sep 22, 2021 2:10 PM
Due: Sep 23, 2021
Priority: Overnight
Contact Name: Amanda Mullen

Eurofins Analytical Services Manager : Andrew Black

Sample Detail						Asbestos - AS4964
Melbourne Laboratory - NATA # 1261 Site # 1254						
Sydney Laboratory - NATA # 1261 Site # 18217						X
Brisbane Laboratory - NATA # 1261 Site # 20794						
Mayfield Laboratory - NATA # 1261 Site # 25079						
Perth Laboratory - NATA # 2377 Site # 2370						
External Laboratory						
No	**Sample ID**	**Sample Date**	**Sampling Time**	**Matrix**	**LAB ID**	
1	QC201_210906	Sep 06, 2021		Soil	S21-Se45699	X
Test Counts						1

Internal Quality Control Review and Glossary

General

1. QC data may be available on request.
2. All soil results are reported on a dry basis, unless otherwise stated.
3. Samples were analysed on an 'as received' basis.
4. Information identified on this report with blue colour, indicates data provided by customer, that may have an impact on the results.
5. This report replaces any interim results previously issued.

Holding Times

Please refer to 'Sample Preservation and Container Guide' for holding times (QS3001).

For samples received on the last day of holding time, notification of testing requirements should have been received at least 6 hours prior to sample receipt deadlines as stated on the Sample Receipt Advice.

If the Laboratory did not receive the information in the required timeframe, and regardless of any other integrity issues, suitably qualified results may still be reported.

Holding times apply from the date of sampling, therefore compliance to these may be outside the laboratory's control.

Units

% w/w: weight for weight basis	grams per kilogram
Filter loading:	fibres/100 graticule areas
Reported Concentration:	fibres/mL
Flowrate:	L/min

Terms

Dry	Sample is dried by heating prior to analysis
LOR	Limit of Reporting
COC	Chain of Custody
SRA	Sample Receipt Advice
ISO	International Standards Organisation
AS	Australian Standards
WA DOH	Reference document for the NEPM. Government of Western Australia, Guidelines for the Assessment, Remediation and Management of Asbestos-Contaminated Sites in Western Australia (2009), including supporting document Recommended Procedures for Laboratory Analysis of Asbestos in Soil (2011)
NEPM	National Environment Protection (Assessment of Site Contamination) Measure, 2013 (as amended)
ACM	Asbestos Containing Materials. Asbestos contained within a non-asbestos matrix, typically presented in bonded and/or sound condition. For the purposes of the NEPM, ACM is generally restricted to those materials that do not pass a 7mm x 7mm sieve.
AF	Asbestos Fines. Asbestos containing materials, including friable, weathered and bonded materials, able to pass a 7mm x 7mm sieve. Considered under the NEPM as equivalent to “non-bonded / friable”.
FA	Fibrous Asbestos. Asbestos containing materials in a friable and/or severely weathered condition. For the purposes of the NEPM, FA is generally restricted to those materials that do not pass a 7mm x 7mm sieve.
Friable	Asbestos-containing materials of any size that may be broken or crumbled by hand pressure. For the purposes of the NEPM, this includes both AF and FA. It is outside of the laboratory’s remit to assess degree of friability.
Trace Analysis	Analytical procedure used to detect the presence of respirable fibres in the matrix.

Comments

Sample Integrity

Custody Seals Intact (if used)	N/A
Attempt to Chill was evident	N/A
Sample correctly preserved	Yes
Appropriate sample containers have been used	Yes
Sample containers for volatile analysis received with minimal headspace	Yes
Samples received within HoldingTime	Yes
Some samples have been subcontracted	No

Qualifier Codes/Comments

Code	Description
N/A	Not applicable

Asbestos Counter/Identifier:

Chamath JHM Annakkage	Senior Analyst-Asbestos (NSW)

Authorised by:

Laxman Dias	Senior Analyst-Asbestos (NSW)

Glenn Jackson
General Manager

Final Report – this report replaces any previously issued Report

- Indicates Not Requested

* Indicates NATA accreditation does not cover the performance of this service

Measurement uncertainty of test data is available on request or please click here.

Grace Tuckwell

From:	#AU04_Enviro_Sample_NSW
Subject:	FW: Urgent Additional asbestos | FW: [EXTERNAL] Eurofins Test Results, Invoice - Report 824081 : Site IA254001
Importance:	High

From: Keatley, Nick <Nick.Keatley@jacobs.com>
Sent: Wednesday, 22 September 2021 2:10 PM
To: #AU04_Enviro_Sample_NSW <EnviroSampleNSW@eurofins.com>; Andrew Black <AndrewBlack@eurofins.com>
Cc: Mullen, Amanda <Amanda.Mullen@jacobs.com>; Emma Beesley <EmmaBeesley@eurofins.com>
Subject: RE: [EXTERNAL] Eurofins Test Results, Invoice - Report 824081 : Site IA254001

EXTERNAL EMAIL*

Hi,

I have just had a chance to review this and have noticed that the asbestos P/A and total coliforms analysis has not been performed for the triplicate sample as requested in the COC.

Can you please advise why this was not performed?

Regards,

Nick Keatley | Jacobs | Graduate Environmental Scientist |
Contaminated Land Assessment and Remediation Eastern |
M:+61 421 201 294 | nick.keatley@jacobs.com

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Reinventing tomorrow.

From: EmmaBeesley@eurofins.com <EmmaBeesley@eurofins.com>
Sent: Friday, 17 September 2021 4:48 PM
To: Mullen, Amanda <Amanda.Mullen@jacobs.com>
Cc: Keatley, Nick <Nick.Keatley@jacobs.com>
Subject: [EXTERNAL] Eurofins Test Results, Invoice - Report 824081 : Site IA254001

Hi Amanda,

Please find attached results and invoice for your project in the subject header.

Kind Regards,

Emma Beesley
Analytical Services Manager Assistant
Eurofins | Environment Testing

7/7 Friesian Close,
Sandgate, NSW, 2304
Australia

Email: EmmaBeesley@eurofins.com
Website: eurofins.com.au
Mobile: 0429 195 949

Please note my work hours are 2pm-10pm Mon-Fri
For enquiries outside my work hours please contact another member of our ASM team for assistance
For sample receipt enquiries (eg. SRAs, changes to analysis) please contact EnvirosampleNSW@eurofins.com or 02 9900 8421 (7am – 9pm).
For despatch enquiries (eg. courier bookings, bottle orders) please contact AU04_Despatch_SYD@eurofins.com or 0488 400 929 (8am – 4pm).

EnviroNote 1117 - Urban Runoff Mortality Syndrome 6-PPD quinone & HMMM
EnviroNote 1115 - Eurofins SYDNEY Laboratory is now NATA accredited for PFAS

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Certificate of Analysis

Jacobs Group (Australia) P/L NSW
Level 7, 177 Pacific Highway
North Sydney
NSW 2065

NATA Accredited
Accreditation Number 1261
Site Number 18217

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Attention:	**Amanda Mullen**
Report	**826760-S**
Project name	IA254001
Received Date	Sep 20, 2021

Client Sample ID			[G01]**QC201_210916**
Sample Matrix			**Soil**
Eurofins Sample No.			**S21-Se46185**
Date Sampled			**Sep 16, 2021**
Test/Reference	LOR	Unit	
Total Recoverable Hydrocarbons			
TRH C6-C9	20	mg/kg	< 20
TRH C10-C14	20	mg/kg	< 20
TRH C15-C28	50	mg/kg	72
TRH C29-C36	50	mg/kg	73
TRH C10-C36 (Total)	50	mg/kg	145
Naphthalene[N02]	0.5	mg/kg	< 0.5
TRH C6-C10	20	mg/kg	< 20
TRH C6-C10 less BTEX (F1)[N04]	20	mg/kg	< 20
TRH >C10-C16	50	mg/kg	< 50
TRH >C10-C16 less Naphthalene (F2)[N01]	50	mg/kg	< 50
TRH >C16-C34	100	mg/kg	120
TRH >C34-C40	100	mg/kg	< 100
TRH >C10-C40 (total)*	100	mg/kg	120
BTEX			
Benzene	0.1	mg/kg	< 0.1
Toluene	0.1	mg/kg	< 0.1
Ethylbenzene	0.1	mg/kg	< 0.1
m&p-Xylenes	0.2	mg/kg	< 0.2
o-Xylene	0.1	mg/kg	< 0.1
Xylenes - Total*	0.3	mg/kg	< 0.3
4-Bromofluorobenzene (surr.)	1	%	67
Polycyclic Aromatic Hydrocarbons			
Benzo(a)pyrene TEQ (lower bound) *	0.5	mg/kg	< 0.5
Benzo(a)pyrene TEQ (medium bound) *	0.5	mg/kg	0.6
Benzo(a)pyrene TEQ (upper bound) *	0.5	mg/kg	1.2
Acenaphthene	0.5	mg/kg	< 0.5
Acenaphthylene	0.5	mg/kg	< 0.5
Anthracene	0.5	mg/kg	< 0.5
Benz(a)anthracene	0.5	mg/kg	< 0.5
Benzo(a)pyrene	0.5	mg/kg	< 0.5
Benzo(b&j)fluoranthene[N07]	0.5	mg/kg	< 0.5
Benzo(g.h.i)perylene	0.5	mg/kg	< 0.5
Benzo(k)fluoranthene	0.5	mg/kg	< 0.5
Chrysene	0.5	mg/kg	< 0.5
Dibenz(a.h)anthracene	0.5	mg/kg	< 0.5
Fluoranthene	0.5	mg/kg	< 0.5

Client Sample ID			^{G01}**QC201_210916**
Sample Matrix			**Soil**
Eurofins Sample No.			**S21-Se46185**
Date Sampled			**Sep 16, 2021**
Test/Reference	LOR	Unit	
Polycyclic Aromatic Hydrocarbons			
Fluorene	0.5	mg/kg	< 0.5
Indeno(1.2.3-cd)pyrene	0.5	mg/kg	< 0.5
Naphthalene	0.5	mg/kg	< 0.5
Phenanthrene	0.5	mg/kg	< 0.5
Pyrene	0.5	mg/kg	< 0.5
Total PAH*	0.5	mg/kg	< 0.5
2-Fluorobiphenyl (surr.)	1	%	77
p-Terphenyl-d14 (surr.)	1	%	72
Organochlorine Pesticides			
Chlordanes - Total	0.1	mg/kg	< 1
4.4'-DDD	0.05	mg/kg	< 0.5
4.4'-DDE	0.05	mg/kg	< 0.5
4.4'-DDT	0.05	mg/kg	< 0.5
a-HCH	0.05	mg/kg	< 0.5
Aldrin	0.05	mg/kg	< 0.5
b-HCH	0.05	mg/kg	< 0.5
d-HCH	0.05	mg/kg	< 0.5
Dieldrin	0.05	mg/kg	< 0.5
Endosulfan I	0.05	mg/kg	< 0.5
Endosulfan II	0.05	mg/kg	< 0.5
Endosulfan sulphate	0.05	mg/kg	< 0.5
Endrin	0.05	mg/kg	< 0.5
Endrin aldehyde	0.05	mg/kg	< 0.5
Endrin ketone	0.05	mg/kg	< 0.5
g-HCH (Lindane)	0.05	mg/kg	< 0.5
Heptachlor	0.05	mg/kg	< 0.5
Heptachlor epoxide	0.05	mg/kg	< 0.5
Hexachlorobenzene	0.05	mg/kg	< 0.5
Methoxychlor	0.05	mg/kg	< 0.5
Toxaphene	0.5	mg/kg	< 10
Aldrin and Dieldrin (Total)*	0.05	mg/kg	< 0.5
DDT + DDE + DDD (Total)*	0.05	mg/kg	< 0.5
Vic EPA IWRG 621 OCP (Total)*	0.1	mg/kg	< 1
Vic EPA IWRG 621 Other OCP (Total)*	0.1	mg/kg	< 1
Dibutylchlorendate (surr.)	1	%	^{Q09}INT
Tetrachloro-m-xylene (surr.)	1	%	70
Organophosphorus Pesticides			
Azinphos-methyl	0.2	mg/kg	< 0.5
Bolstar	0.2	mg/kg	< 0.5
Chlorfenvinphos	0.2	mg/kg	< 0.5
Chlorpyrifos	0.2	mg/kg	< 0.5
Chlorpyrifos-methyl	0.2	mg/kg	< 0.5
Coumaphos	2	mg/kg	< 5
Demeton-S	0.2	mg/kg	< 0.5
Demeton-O	0.2	mg/kg	< 0.5
Diazinon	0.2	mg/kg	< 0.5
Dichlorvos	0.2	mg/kg	< 0.5
Dimethoate	0.2	mg/kg	< 0.5
Disulfoton	0.2	mg/kg	< 0.5

Client Sample ID			[G01]**QC201_210916**
Sample Matrix			**Soil**
Eurofins Sample No.			**S21-Se46185**
Date Sampled			**Sep 16, 2021**
Test/Reference	LOR	Unit	
Organophosphorus Pesticides			
EPN	0.2	mg/kg	< 0.5
Ethion	0.2	mg/kg	< 0.5
Ethoprop	0.2	mg/kg	< 0.5
Ethyl parathion	0.2	mg/kg	< 0.5
Fenitrothion	0.2	mg/kg	< 0.5
Fensulfothion	0.2	mg/kg	< 0.5
Fenthion	0.2	mg/kg	< 0.5
Malathion	0.2	mg/kg	< 0.5
Merphos	0.2	mg/kg	< 0.5
Methyl parathion	0.2	mg/kg	< 0.5
Mevinphos	0.2	mg/kg	< 0.5
Monocrotophos	2	mg/kg	< 5
Naled	0.2	mg/kg	< 0.5
Omethoate	2	mg/kg	< 5
Phorate	0.2	mg/kg	< 0.5
Pirimiphos-methyl	0.2	mg/kg	< 0.5
Pyrazophos	0.2	mg/kg	< 0.5
Ronnel	0.2	mg/kg	< 0.5
Terbufos	0.2	mg/kg	< 0.5
Tetrachlorvinphos	0.2	mg/kg	< 0.5
Tokuthion	0.2	mg/kg	< 0.5
Trichloronate	0.2	mg/kg	< 0.5
Triphenylphosphate (surr.)	1	%	[Q09]INT
Heavy Metals			
Arsenic	2	mg/kg	< 2
Cadmium	0.4	mg/kg	< 0.4
Chromium	5	mg/kg	9.1
Copper	5	mg/kg	5.6
Lead	5	mg/kg	7.5
Mercury	0.1	mg/kg	< 0.1
Nickel	5	mg/kg	< 5
Zinc	5	mg/kg	35
% Moisture	1	%	47
Pathogens			
Total Coliforms (MPN)	1	MPN/g	see attached

Sample History

Where samples are submitted/analysed over several days, the last date of extraction is reported.

If the date and time of sampling are not provided, the Laboratory will not be responsible for compromised results should testing be performed outside the recommended holding time.

Description	Testing Site	Extracted	Holding Time
Total Recoverable Hydrocarbons - 1999 NEPM Fractions - Method: LTM-ORG-2010 TRH C6-C40	Sydney	Sep 24, 2021	14 Days
Total Recoverable Hydrocarbons - 2013 NEPM Fractions - Method: LTM-ORG-2010 TRH C6-C40	Sydney	Sep 24, 2021	14 Days
Total Recoverable Hydrocarbons - 2013 NEPM Fractions - Method: LTM-ORG-2010 TRH C6-C40	Sydney	Sep 24, 2021	14 Days
BTEX - Method: LTM-ORG-2010 TRH C6-C40	Sydney	Sep 24, 2021	14 Days
Polycyclic Aromatic Hydrocarbons - Method: LTM-ORG-2130 PAH and Phenols in Soil and Water	Sydney	Sep 24, 2021	14 Days
Metals M8 - Method: LTM-MET-3040 Metals in Waters, Soils & Sediments by ICP-MS	Sydney	Sep 24, 2021	28 Days
Organochlorine Pesticides - Method: LTM-ORG-2220 OCP & PCB in Soil and Water	Sydney	Sep 24, 2021	14 Days
Organophosphorus Pesticides - Method: LTM-ORG-2200 Organophosphorus Pesticides by GC-MS	Sydney	Sep 24, 2021	14 Days
% Moisture - Method: LTM-GEN-7080 Moisture	Sydney	Sep 23, 2021	14 Days
Total Coliforms (MPN) - Method: LTM-MIC-6621 E Coli and Total Coliforms by MPN	WaterTestingVic	Sep 23, 2021	72 Hours

Company Name: Jacobs Group (Australia) P/L NSW
Address: Level 7, 177 Pacific Highway
North Sydney
NSW 2065

Project Name: IA254001

Order No.:
Report #: 826760
Phone: 02 9928 2100
Fax: 02 9928 2504

Received: Sep 20, 2021 6:45 PM
Due: Sep 27, 2021
Priority: 5 Day
Contact Name: Amanda Mullen

Eurofins Analytical Services Manager : Andrew Black

Sample Detail						Total Coliforms (MPN)	Suite B14: OCP/OPP	Moisture Set	Eurofins Suite B7
Melbourne Laboratory - NATA # 1261 Site # 1254									
Sydney Laboratory - NATA # 1261 Site # 18217							X	X	X
Brisbane Laboratory - NATA # 1261 Site # 20794									
Mayfield Laboratory - NATA # 1261 Site # 25079									
Perth Laboratory - NATA # 2377 Site # 2370									
External Laboratory						X			
No	**Sample ID**	**Sample Date**	**Sampling Time**	**Matrix**	**LAB ID**				
1	QC201_210916	Sep 16, 2021		Soil	S21-Se46185	X	X	X	X
Test Counts						1	1	1	1

Internal Quality Control Review and Glossary

General

1. Laboratory QC results for Method Blanks, Duplicates, Matrix Spikes, and Laboratory Control Samples follows guidelines delineated in the National Environment Protection (Assessment of Site Contamination) Measure 1999, as amended May 2013 and are included in this QC report where applicable. Additional QC data may be available on request.
2. All soil/sediment/solid results are reported on a dry basis, unless otherwise stated.
3. All biota/food results are reported on a wet weight basis on the edible portion, unless otherwise stated.
4. Actual LORs are matrix dependant. Quoted LORs may be raised where sample extracts are diluted due to interferences.
5. Results are uncorrected for matrix spikes or surrogate recoveries except for PFAS compounds.
6. SVOC analysis on waters are performed on homogenised, unfiltered samples, unless noted otherwise.
7. Samples were analysed on an 'as received' basis.
8. Information identified on this report with blue colour, indicates data provided by customer, that may have an impact on the results.
9. This report replaces any interim results previously issued.

Holding Times

Please refer to 'Sample Preservation and Container Guide' for holding times (QS3001).

For samples received on the last day of holding time, notification of testing requirements should have been received at least 6 hours prior to sample receipt deadlines as stated on the SRA.

If the Laboratory did not receive the information in the required timeframe, and regardless of any other integrity issues, suitably qualified results may still be reported.

Holding times apply from the date of sampling, therefore compliance to these may be outside the laboratory's control.

For VOCs containing vinyl chloride, styrene and 2-chloroethyl vinyl ether the holding time is 7 days however for all other VOCs such as BTEX or C6-10 TRH then the holding time is 14 days.

****NOTE:** pH duplicates are reported as a range NOT as RPD

Units

mg/kg: milligrams per kilogram
ppm: Parts per million
org/100mL: Organisms per 100 millilitres
mg/L: milligrams per litre
ppb: Parts per billion
NTU: Nephelometric Turbidity Units
ug/L: micrograms per litre
%: Percentage
MPN/100mL: Most Probable Number of organisms per 100 millilitres

Terms

Dry	Where a moisture has been determined on a solid sample the result is expressed on a dry basis.
LOR	Limit of Reporting.
SPIKE	Addition of the analyte to the sample and reported as percentage recovery.
RPD	Relative Percent Difference between two Duplicate pieces of analysis.
LCS	Laboratory Control Sample - reported as percent recovery.
CRM	Certified Reference Material - reported as percent recovery.
Method Blank	In the case of solid samples these are performed on laboratory certified clean sands and in the case of water samples these are performed on de-ionised water.
Surr - Surrogate	The addition of a like compound to the analyte target and reported as percentage recovery.
Duplicate	A second piece of analysis from the same sample and reported in the same units as the result to show comparison.
USEPA	United States Environmental Protection Agency
APHA	American Public Health Association
TCLP	Toxicity Characteristic Leaching Procedure
COC	Chain of Custody
SRA	Sample Receipt Advice
QSM	US Department of Defense Quality Systems Manual Version 5.3
CP	Client Parent - QC was performed on samples pertaining to this report
NCP	Non-Client Parent - QC performed on samples not pertaining to this report, QC is representative of the sequence or batch that client samples were analysed within.
TEQ	Toxic Equivalency Quotient

QC - Acceptance Criteria

RPD Duplicates: Global RPD Duplicates Acceptance Criteria is 30% however the following acceptance guidelines are equally applicable:

Results <10 times the LOR : No Limit

Results between 10-20 times the LOR : RPD must lie between 0-50%

Results >20 times the LOR : RPD must lie between 0-30%

Surrogate Recoveries: Recoveries must lie between 20-130% Phenols & 50-150% PFASs

PFAS field samples that contain surrogate recoveries in excess of the QC limit designated in QSM 5.3 where no positive PFAS results have been reported have been reviewed and no data was affected.

WA DWER (n=10): PFBA, PFPeA, PFHxA, PFHpA, PFOA, PFBS, PFHxS, PFOS, 6:2 FTSA, 8:2 FTSA

QC Data General Comments

1. Where a result is reported as a less than (<), higher than the nominated LOR, this is due to either matrix interference, extract dilution required due to interferences or contaminant levels within the sample, high moisture content or insufficient sample provided.
2. Duplicate data shown within this report that states the word "BATCH" is a Batch Duplicate from outside of your sample batch, but within the laboratory sample batch at a 1:10 ratio. The Parent and Duplicate data shown is not data from your samples.
3. Organochlorine Pesticide analysis - where reporting LCS data, Toxaphene & Chlordane are not added to the LCS.
4. Organochlorine Pesticide analysis - where reporting Spike data, Toxaphene is not added to the Spike.
5. Total Recoverable Hydrocarbons - where reporting Spike & LCS data, a single spike of commercial Hydrocarbon products in the range of C12-C30 is added and it's Total Recovery is reported in the C10-C14 cell of the Report.
6. pH and Free Chlorine analysed in the laboratory - Analysis on this test must begin within 30 minutes of sampling.Therefore laboratory analysis is unlikely to be completed within holding time. Analysis will begin as soon as possible after sample receipt.
7. Recovery Data (Spikes & Surrogates) - where chromatographic interference does not allow the determination of Recovery the term "INT" appears against that analyte.
8. Polychlorinated Biphenyls are spiked only using Aroclor 1260 in Matrix Spikes and LCS.
9. For Matrix Spikes and LCS results a dash " -" in the report means that the specific analyte was not added to the QC sample.
10. Duplicate RPDs are calculated from raw analytical data thus it is possible to have two sets of data.

Quality Control Results

Test	Units	Result 1			Acceptance Limits	Pass Limits	Qualifying Code
Method Blank							
Total Recoverable Hydrocarbons							
TRH C6-C9	mg/kg	< 20			20	Pass	
TRH C10-C14	mg/kg	< 20			20	Pass	
TRH C15-C28	mg/kg	< 50			50	Pass	
TRH C29-C36	mg/kg	< 50			50	Pass	
Naphthalene	mg/kg	< 0.5			0.5	Pass	
TRH C6-C10	mg/kg	< 20			20	Pass	
TRH >C10-C16	mg/kg	< 50			50	Pass	
TRH >C16-C34	mg/kg	< 100			100	Pass	
TRH >C34-C40	mg/kg	< 100			100	Pass	
Method Blank							
BTEX							
Benzene	mg/kg	< 0.1			0.1	Pass	
Toluene	mg/kg	< 0.1			0.1	Pass	
Ethylbenzene	mg/kg	< 0.1			0.1	Pass	
m&p-Xylenes	mg/kg	< 0.2			0.2	Pass	
o-Xylene	mg/kg	< 0.1			0.1	Pass	
Xylenes - Total*	mg/kg	< 0.3			0.3	Pass	
Method Blank							
Polycyclic Aromatic Hydrocarbons							
Acenaphthene	mg/kg	< 0.5			0.5	Pass	
Acenaphthylene	mg/kg	< 0.5			0.5	Pass	
Anthracene	mg/kg	< 0.5			0.5	Pass	
Benz(a)anthracene	mg/kg	< 0.5			0.5	Pass	
Benzo(a)pyrene	mg/kg	< 0.5			0.5	Pass	
Benzo(b&j)fluoranthene	mg/kg	< 0.5			0.5	Pass	
Benzo(g.h.i)perylene	mg/kg	< 0.5			0.5	Pass	
Benzo(k)fluoranthene	mg/kg	< 0.5			0.5	Pass	
Chrysene	mg/kg	< 0.5			0.5	Pass	
Dibenz(a.h)anthracene	mg/kg	< 0.5			0.5	Pass	
Fluoranthene	mg/kg	< 0.5			0.5	Pass	
Fluorene	mg/kg	< 0.5			0.5	Pass	
Indeno(1.2.3-cd)pyrene	mg/kg	< 0.5			0.5	Pass	
Naphthalene	mg/kg	< 0.5			0.5	Pass	
Phenanthrene	mg/kg	< 0.5			0.5	Pass	
Pyrene	mg/kg	< 0.5			0.5	Pass	
Method Blank							
Organochlorine Pesticides							
Chlordanes - Total	mg/kg	< 0.1			0.1	Pass	
4.4'-DDD	mg/kg	< 0.05			0.05	Pass	
4.4'-DDE	mg/kg	< 0.05			0.05	Pass	
4.4'-DDT	mg/kg	< 0.05			0.05	Pass	
a-HCH	mg/kg	< 0.05			0.05	Pass	
Aldrin	mg/kg	< 0.05			0.05	Pass	
b-HCH	mg/kg	< 0.05			0.05	Pass	
d-HCH	mg/kg	< 0.05			0.05	Pass	
Dieldrin	mg/kg	< 0.05			0.05	Pass	
Endosulfan I	mg/kg	< 0.05			0.05	Pass	
Endosulfan II	mg/kg	< 0.05			0.05	Pass	
Endosulfan sulphate	mg/kg	< 0.05			0.05	Pass	
Endrin	mg/kg	< 0.05			0.05	Pass	

Test	Units	Result 1			Acceptance Limits	Pass Limits	Qualifying Code
Endrin aldehyde	mg/kg	< 0.05			0.05	Pass	
Endrin ketone	mg/kg	< 0.05			0.05	Pass	
g-HCH (Lindane)	mg/kg	< 0.05			0.05	Pass	
Heptachlor	mg/kg	< 0.05			0.05	Pass	
Heptachlor epoxide	mg/kg	< 0.05			0.05	Pass	
Hexachlorobenzene	mg/kg	< 0.05			0.05	Pass	
Methoxychlor	mg/kg	< 0.05			0.05	Pass	
Toxaphene	mg/kg	< 0.5			0.5	Pass	
Method Blank							
Organophosphorus Pesticides							
Azinphos-methyl	mg/kg	< 0.2			0.2	Pass	
Bolstar	mg/kg	< 0.2			0.2	Pass	
Chlorfenvinphos	mg/kg	< 0.2			0.2	Pass	
Chlorpyrifos	mg/kg	< 0.2			0.2	Pass	
Chlorpyrifos-methyl	mg/kg	< 0.2			0.2	Pass	
Coumaphos	mg/kg	< 2			2	Pass	
Demeton-S	mg/kg	< 0.2			0.2	Pass	
Demeton-O	mg/kg	< 0.2			0.2	Pass	
Diazinon	mg/kg	< 0.2			0.2	Pass	
Dichlorvos	mg/kg	< 0.2			0.2	Pass	
Dimethoate	mg/kg	< 0.2			0.2	Pass	
Disulfoton	mg/kg	< 0.2			0.2	Pass	
EPN	mg/kg	< 0.2			0.2	Pass	
Ethion	mg/kg	< 0.2			0.2	Pass	
Ethoprop	mg/kg	< 0.2			0.2	Pass	
Ethyl parathion	mg/kg	< 0.2			0.2	Pass	
Fenitrothion	mg/kg	< 0.2			0.2	Pass	
Fensulfothion	mg/kg	< 0.2			0.2	Pass	
Fenthion	mg/kg	< 0.2			0.2	Pass	
Malathion	mg/kg	< 0.2			0.2	Pass	
Merphos	mg/kg	< 0.2			0.2	Pass	
Methyl parathion	mg/kg	< 0.2			0.2	Pass	
Mevinphos	mg/kg	< 0.2			0.2	Pass	
Monocrotophos	mg/kg	< 2			2	Pass	
Naled	mg/kg	< 0.2			0.2	Pass	
Omethoate	mg/kg	< 2			2	Pass	
Phorate	mg/kg	< 0.2			0.2	Pass	
Pirimiphos-methyl	mg/kg	< 0.2			0.2	Pass	
Pyrazophos	mg/kg	< 0.2			0.2	Pass	
Ronnel	mg/kg	< 0.2			0.2	Pass	
Terbufos	mg/kg	< 0.2			0.2	Pass	
Tetrachlorvinphos	mg/kg	< 0.2			0.2	Pass	
Tokuthion	mg/kg	< 0.2			0.2	Pass	
Trichloronate	mg/kg	< 0.2			0.2	Pass	
Method Blank							
Heavy Metals							
Arsenic	mg/kg	< 2			2	Pass	
Cadmium	mg/kg	< 0.4			0.4	Pass	
Chromium	mg/kg	< 5			5	Pass	
Copper	mg/kg	< 5			5	Pass	
Lead	mg/kg	< 5			5	Pass	
Mercury	mg/kg	< 0.1			0.1	Pass	
Nickel	mg/kg	< 5			5	Pass	
LCS - % Recovery							

Test	Units	Result 1			Acceptance Limits	Pass Limits	Qualifying Code
Total Recoverable Hydrocarbons							
TRH C6-C9	%	94			70-130	Pass	
TRH C10-C14	%	105			70-130	Pass	
Naphthalene	%	83			70-130	Pass	
TRH C6-C10	%	92			70-130	Pass	
TRH >C10-C16	%	103			70-130	Pass	
LCS - % Recovery							
BTEX							
Benzene	%	110			70-130	Pass	
Toluene	%	105			70-130	Pass	
Ethylbenzene	%	102			70-130	Pass	
m&p-Xylenes	%	99			70-130	Pass	
o-Xylene	%	94			70-130	Pass	
Xylenes - Total*	%	97			70-130	Pass	
LCS - % Recovery							
Polycyclic Aromatic Hydrocarbons							
Acenaphthene	%	84			70-130	Pass	
Acenaphthylene	%	106			70-130	Pass	
Anthracene	%	94			70-130	Pass	
Benz(a)anthracene	%	99			70-130	Pass	
Benzo(a)pyrene	%	101			70-130	Pass	
Benzo(b&j)fluoranthene	%	90			70-130	Pass	
Benzo(g.h.i)perylene	%	100			70-130	Pass	
Benzo(k)fluoranthene	%	95			70-130	Pass	
Chrysene	%	93			70-130	Pass	
Dibenz(a.h)anthracene	%	102			70-130	Pass	
Fluoranthene	%	97			70-130	Pass	
Fluorene	%	95			70-130	Pass	
Indeno(1.2.3-cd)pyrene	%	105			70-130	Pass	
Naphthalene	%	95			70-130	Pass	
Phenanthrene	%	91			70-130	Pass	
Pyrene	%	97			70-130	Pass	
LCS - % Recovery							
Organochlorine Pesticides							
Chlordanes - Total	%	76			70-130	Pass	
4.4'-DDD	%	81			70-130	Pass	
4.4'-DDE	%	70			70-130	Pass	
4.4'-DDT	%	121			70-130	Pass	
a-HCH	%	79			70-130	Pass	
Aldrin	%	72			70-130	Pass	
b-HCH	%	81			70-130	Pass	
d-HCH	%	71			70-130	Pass	
Dieldrin	%	80			70-130	Pass	
Endosulfan I	%	78			70-130	Pass	
Endosulfan II	%	83			70-130	Pass	
Endosulfan sulphate	%	98			70-130	Pass	
Endrin	%	109			70-130	Pass	
Endrin aldehyde	%	73			70-130	Pass	
Endrin ketone	%	109			70-130	Pass	
g-HCH (Lindane)	%	72			70-130	Pass	
Heptachlor	%	112			70-130	Pass	
Heptachlor epoxide	%	91			70-130	Pass	
Hexachlorobenzene	%	85			70-130	Pass	
Methoxychlor	%	129			70-130	Pass	

Test	Units	Result 1			Acceptance Limits	Pass Limits	Qualifying Code
LCS - % Recovery							
Organophosphorus Pesticides							
Diazinon	%	111			70-130	Pass	
Dimethoate	%	121			70-130	Pass	
Fenitrothion	%	114			70-130	Pass	
Mevinphos	%	110			70-130	Pass	
LCS - % Recovery							
Heavy Metals							
Arsenic	%	94			80-120	Pass	
Cadmium	%	100			80-120	Pass	
Chromium	%	114			80-120	Pass	
Copper	%	105			80-120	Pass	
Lead	%	118			80-120	Pass	
Mercury	%	99			80-120	Pass	
Nickel	%	104			80-120	Pass	
Zinc	%	99			80-120	Pass	

Test	Lab Sample ID	QA Source	Units	Result 1			Acceptance Limits	Pass Limits	Qualifying Code
Spike - % Recovery									
Total Recoverable Hydrocarbons				Result 1					
TRH C6-C9	N21-Se41672	NCP	%	95			70-130	Pass	
TRH C10-C14	S21-Se48095	NCP	%	94			70-130	Pass	
Naphthalene	N21-Se41672	NCP	%	81			70-130	Pass	
TRH C6-C10	N21-Se41672	NCP	%	95			70-130	Pass	
TRH >C10-C16	S21-Se48095	NCP	%	86			70-130	Pass	
Spike - % Recovery									
BTEX				Result 1					
Benzene	N21-Se41672	NCP	%	109			70-130	Pass	
Toluene	N21-Se41672	NCP	%	105			70-130	Pass	
Ethylbenzene	N21-Se41672	NCP	%	102			70-130	Pass	
m&p-Xylenes	N21-Se41672	NCP	%	100			70-130	Pass	
o-Xylene	N21-Se41672	NCP	%	101			70-130	Pass	
Xylenes - Total*	N21-Se41672	NCP	%	100			70-130	Pass	
Spike - % Recovery									
Polycyclic Aromatic Hydrocarbons				Result 1					
Acenaphthene	W21-Se48050	NCP	%	79			70-130	Pass	
Acenaphthylene	W21-Se48050	NCP	%	99			70-130	Pass	
Anthracene	W21-Se48050	NCP	%	83			70-130	Pass	
Benz(a)anthracene	W21-Se48050	NCP	%	90			70-130	Pass	
Benzo(a)pyrene	W21-Se48050	NCP	%	90			70-130	Pass	
Benzo(b&j)fluoranthene	W21-Se48050	NCP	%	80			70-130	Pass	
Benzo(g.h.i)perylene	W21-Se48050	NCP	%	84			70-130	Pass	
Benzo(k)fluoranthene	W21-Se48050	NCP	%	82			70-130	Pass	
Chrysene	W21-Se48050	NCP	%	84			70-130	Pass	
Dibenz(a.h)anthracene	W21-Se48050	NCP	%	93			70-130	Pass	
Fluoranthene	W21-Se48050	NCP	%	91			70-130	Pass	
Fluorene	W21-Se48050	NCP	%	87			70-130	Pass	
Indeno(1.2.3-cd)pyrene	W21-Se48050	NCP	%	94			70-130	Pass	
Naphthalene	W21-Se48050	NCP	%	87			70-130	Pass	
Phenanthrene	W21-Se48050	NCP	%	83			70-130	Pass	
Pyrene	W21-Se48050	NCP	%	92			70-130	Pass	
Spike - % Recovery									
Organochlorine Pesticides				Result 1					
Chlordanes - Total	W21-Se48050	NCP	%	71			70-130	Pass	
4.4'-DDD	W21-Se48050	NCP	%	79			70-130	Pass	

Test	Lab Sample ID	QA Source	Units	Result 1			Acceptance Limits	Pass Limits	Qualifying Code
4.4'-DDE	S21-Se38484	NCP	%	97			70-130	Pass	
4.4'-DDT	W21-Se48050	NCP	%	115			70-130	Pass	
a-HCH	W21-Se48050	NCP	%	73			70-130	Pass	
Aldrin	S21-Se38484	NCP	%	98			70-130	Pass	
b-HCH	W21-Se48050	NCP	%	72			70-130	Pass	
d-HCH	S21-Se38484	NCP	%	96			70-130	Pass	
Dieldrin	W21-Se48050	NCP	%	75			70-130	Pass	
Endosulfan I	W21-Se48050	NCP	%	70			70-130	Pass	
Endosulfan II	W21-Se48050	NCP	%	76			70-130	Pass	
Endosulfan sulphate	W21-Se48050	NCP	%	93			70-130	Pass	
Endrin	W21-Se48050	NCP	%	125			70-130	Pass	
Endrin ketone	W21-Se48050	NCP	%	104			70-130	Pass	
g-HCH (Lindane)	S21-Se38484	NCP	%	93			70-130	Pass	
Heptachlor	W21-Se48050	NCP	%	103			70-130	Pass	
Heptachlor epoxide	W21-Se48050	NCP	%	84			70-130	Pass	
Hexachlorobenzene	S21-Se38484	NCP	%	83			70-130	Pass	
Methoxychlor	W21-Se48050	NCP	%	118			70-130	Pass	
Spike - % Recovery									
Organophosphorus Pesticides				Result 1					
Diazinon	S21-Se38484	NCP	%	121			70-130	Pass	
Dimethoate	S21-Se38484	NCP	%	127			70-130	Pass	
Fenitrothion	S21-Se38484	NCP	%	126			70-130	Pass	
Methyl parathion	S21-Se37727	NCP	%	127			70-130	Pass	
Mevinphos	S21-Se37727	NCP	%	116			70-130	Pass	
Spike - % Recovery									
Heavy Metals				Result 1					
Arsenic	S21-Se43798	NCP	%	83			75-125	Pass	
Cadmium	S21-Se40579	NCP	%	82			75-125	Pass	
Chromium	S21-Se40579	NCP	%	87			75-125	Pass	
Copper	S21-Se40579	NCP	%	86			75-125	Pass	
Lead	S21-Se40579	NCP	%	83			75-125	Pass	
Mercury	S21-Se40579	NCP	%	77			75-125	Pass	
Nickel	S21-Se40579	NCP	%	94			75-125	Pass	
Zinc	S21-Se43798	NCP	%	98			75-125	Pass	
Test	**Lab Sample ID**	**QA Source**	**Units**	**Result 1**			**Acceptance Limits**	**Pass Limits**	**Qualifying Code**
Duplicate									
Total Recoverable Hydrocarbons				Result 1	Result 2	RPD			
TRH C6-C9	S21-Se45837	NCP	mg/kg	< 20	< 20	<1	30%	Pass	
TRH C10-C14	N21-Se44636	NCP	mg/kg	< 20	< 20	<1	30%	Pass	
TRH C15-C28	N21-Se44636	NCP	mg/kg	< 50	< 50	<1	30%	Pass	
TRH C29-C36	N21-Se44636	NCP	mg/kg	< 50	62	75	30%	Fail	Q15
Naphthalene	S21-Se45837	NCP	mg/kg	< 0.5	< 0.5	<1	30%	Pass	
TRH C6-C10	S21-Se45837	NCP	mg/kg	< 20	< 20	<1	30%	Pass	
TRH >C10-C16	N21-Se44636	NCP	mg/kg	< 50	< 50	<1	30%	Pass	
TRH >C16-C34	N21-Se44636	NCP	mg/kg	< 100	< 100	<1	30%	Pass	
TRH >C34-C40	N21-Se44636	NCP	mg/kg	< 100	< 100	<1	30%	Pass	
Duplicate									
BTEX				Result 1	Result 2	RPD			
Benzene	S21-Se45837	NCP	mg/kg	< 0.1	< 0.1	<1	30%	Pass	
Toluene	S21-Se45837	NCP	mg/kg	< 0.1	< 0.1	<1	30%	Pass	
Ethylbenzene	S21-Se45837	NCP	mg/kg	< 0.1	< 0.1	<1	30%	Pass	
m&p-Xylenes	S21-Se45837	NCP	mg/kg	< 0.2	< 0.2	<1	30%	Pass	
o-Xylene	S21-Se45837	NCP	mg/kg	< 0.1	< 0.1	<1	30%	Pass	
Xylenes - Total*	S21-Se45837	NCP	mg/kg	< 0.3	< 0.3	<1	30%	Pass	

Duplicate									
Polycyclic Aromatic Hydrocarbons				Result 1	Result 2	RPD			
Acenaphthene	S21-Se46385	NCP	mg/kg	< 0.5	< 0.5	<1	30%	Pass	
Acenaphthylene	S21-Se46385	NCP	mg/kg	< 0.5	< 0.5	<1	30%	Pass	
Anthracene	S21-Se46385	NCP	mg/kg	< 0.5	< 0.5	<1	30%	Pass	
Benz(a)anthracene	S21-Se46385	NCP	mg/kg	< 0.5	< 0.5	<1	30%	Pass	
Benzo(a)pyrene	S21-Se46385	NCP	mg/kg	< 0.5	< 0.5	<1	30%	Pass	
Benzo(b&j)fluoranthene	S21-Se46385	NCP	mg/kg	< 0.5	< 0.5	<1	30%	Pass	
Benzo(g.h.i)perylene	S21-Se46385	NCP	mg/kg	< 0.5	< 0.5	<1	30%	Pass	
Benzo(k)fluoranthene	S21-Se46385	NCP	mg/kg	< 0.5	< 0.5	<1	30%	Pass	
Chrysene	S21-Se46385	NCP	mg/kg	< 0.5	< 0.5	<1	30%	Pass	
Dibenz(a.h)anthracene	S21-Se46385	NCP	mg/kg	< 0.5	< 0.5	<1	30%	Pass	
Fluoranthene	S21-Se46385	NCP	mg/kg	< 0.5	< 0.5	<1	30%	Pass	
Fluorene	S21-Se46385	NCP	mg/kg	< 0.5	< 0.5	<1	30%	Pass	
Indeno(1.2.3-cd)pyrene	S21-Se46385	NCP	mg/kg	< 0.5	< 0.5	<1	30%	Pass	
Naphthalene	S21-Se46385	NCP	mg/kg	< 0.5	< 0.5	<1	30%	Pass	
Phenanthrene	S21-Se46385	NCP	mg/kg	< 0.5	< 0.5	<1	30%	Pass	
Pyrene	S21-Se46385	NCP	mg/kg	< 0.5	< 0.5	<1	30%	Pass	
Duplicate									
Organochlorine Pesticides				Result 1	Result 2	RPD			
Chlordanes - Total	S21-Se46385	NCP	mg/kg	< 0.1	< 0.1	<1	30%	Pass	
4.4'-DDD	S21-Se46385	NCP	mg/kg	< 0.05	< 0.05	<1	30%	Pass	
4.4'-DDE	S21-Se46385	NCP	mg/kg	< 0.05	< 0.05	<1	30%	Pass	
4.4'-DDT	S21-Se46385	NCP	mg/kg	< 0.05	< 0.05	<1	30%	Pass	
a-HCH	S21-Se46385	NCP	mg/kg	< 0.05	< 0.05	<1	30%	Pass	
Aldrin	S21-Se46385	NCP	mg/kg	< 0.05	< 0.05	<1	30%	Pass	
b-HCH	S21-Se46385	NCP	mg/kg	< 0.05	< 0.05	<1	30%	Pass	
d-HCH	S21-Se46385	NCP	mg/kg	< 0.05	< 0.05	<1	30%	Pass	
Dieldrin	S21-Se46385	NCP	mg/kg	< 0.05	< 0.05	<1	30%	Pass	
Endosulfan I	S21-Se46385	NCP	mg/kg	< 0.05	< 0.05	<1	30%	Pass	
Endosulfan II	S21-Se46385	NCP	mg/kg	< 0.05	< 0.05	<1	30%	Pass	
Endosulfan sulphate	S21-Se46385	NCP	mg/kg	< 0.05	< 0.05	<1	30%	Pass	
Endrin	S21-Se46385	NCP	mg/kg	< 0.05	< 0.05	<1	30%	Pass	
Endrin aldehyde	S21-Se46385	NCP	mg/kg	< 0.05	< 0.05	<1	30%	Pass	
Endrin ketone	S21-Se46385	NCP	mg/kg	< 0.05	< 0.05	<1	30%	Pass	
g-HCH (Lindane)	S21-Se46385	NCP	mg/kg	< 0.05	< 0.05	<1	30%	Pass	
Heptachlor	S21-Se46385	NCP	mg/kg	< 0.05	< 0.05	<1	30%	Pass	
Heptachlor epoxide	S21-Se46385	NCP	mg/kg	< 0.05	< 0.05	<1	30%	Pass	
Hexachlorobenzene	S21-Se46385	NCP	mg/kg	< 0.05	< 0.05	<1	30%	Pass	
Methoxychlor	S21-Se46385	NCP	mg/kg	< 0.05	< 0.05	<1	30%	Pass	
Toxaphene	S21-Se46385	NCP	mg/kg	< 0.5	< 0.5	<1	30%	Pass	
Duplicate									
Organophosphorus Pesticides				Result 1	Result 2	RPD			
Azinphos-methyl	S21-Se46385	NCP	mg/kg	< 0.2	< 0.2	<1	30%	Pass	
Bolstar	S21-Se46385	NCP	mg/kg	< 0.2	< 0.2	<1	30%	Pass	
Chlorfenvinphos	S21-Se46385	NCP	mg/kg	< 0.2	< 0.2	<1	30%	Pass	
Chlorpyrifos	S21-Se46385	NCP	mg/kg	< 0.2	< 0.2	<1	30%	Pass	
Chlorpyrifos-methyl	S21-Se46385	NCP	mg/kg	< 0.2	< 0.2	<1	30%	Pass	
Coumaphos	S21-Se46385	NCP	mg/kg	< 2	< 2	<1	30%	Pass	
Demeton-S	S21-Se46385	NCP	mg/kg	< 0.2	< 0.2	<1	30%	Pass	
Demeton-O	S21-Se46385	NCP	mg/kg	< 0.2	< 0.2	<1	30%	Pass	
Diazinon	S21-Se46385	NCP	mg/kg	< 0.2	< 0.2	<1	30%	Pass	
Dichlorvos	S21-Se46385	NCP	mg/kg	< 0.2	< 0.2	<1	30%	Pass	
Dimethoate	S21-Se46385	NCP	mg/kg	< 0.2	< 0.2	<1	30%	Pass	
Disulfoton	S21-Se46385	NCP	mg/kg	< 0.2	< 0.2	<1	30%	Pass	
EPN	S21-Se46385	NCP	mg/kg	< 0.2	< 0.2	<1	30%	Pass	

Duplicate									
Organophosphorus Pesticides				Result 1	Result 2	RPD			
Ethion	S21-Se46385	NCP	mg/kg	< 0.2	< 0.2	<1	30%	Pass	
Ethoprop	S21-Se46385	NCP	mg/kg	< 0.2	< 0.2	<1	30%	Pass	
Ethyl parathion	S21-Se46385	NCP	mg/kg	< 0.2	< 0.2	<1	30%	Pass	
Fenitrothion	S21-Se46385	NCP	mg/kg	< 0.2	< 0.2	<1	30%	Pass	
Fensulfothion	S21-Se46385	NCP	mg/kg	< 0.2	< 0.2	<1	30%	Pass	
Fenthion	S21-Se46385	NCP	mg/kg	< 0.2	< 0.2	<1	30%	Pass	
Malathion	S21-Se46385	NCP	mg/kg	< 0.2	< 0.2	<1	30%	Pass	
Merphos	S21-Se46385	NCP	mg/kg	< 0.2	< 0.2	<1	30%	Pass	
Methyl parathion	S21-Se46385	NCP	mg/kg	< 0.2	< 0.2	<1	30%	Pass	
Mevinphos	S21-Se46385	NCP	mg/kg	< 0.2	< 0.2	<1	30%	Pass	
Monocrotophos	S21-Se46385	NCP	mg/kg	< 2	< 2	<1	30%	Pass	
Naled	S21-Se46385	NCP	mg/kg	< 0.2	< 0.2	<1	30%	Pass	
Omethoate	S21-Se46385	NCP	mg/kg	< 2	< 2	<1	30%	Pass	
Phorate	S21-Se46385	NCP	mg/kg	< 0.2	< 0.2	<1	30%	Pass	
Pirimiphos-methyl	S21-Se46385	NCP	mg/kg	< 0.2	< 0.2	<1	30%	Pass	
Pyrazophos	S21-Se46385	NCP	mg/kg	< 0.2	< 0.2	<1	30%	Pass	
Ronnel	S21-Se46385	NCP	mg/kg	< 0.2	< 0.2	<1	30%	Pass	
Terbufos	S21-Se46385	NCP	mg/kg	< 0.2	< 0.2	<1	30%	Pass	
Tetrachlorvinphos	S21-Se46385	NCP	mg/kg	< 0.2	< 0.2	<1	30%	Pass	
Tokuthion	S21-Se46385	NCP	mg/kg	< 0.2	< 0.2	<1	30%	Pass	
Trichloronate	S21-Se46385	NCP	mg/kg	< 0.2	< 0.2	<1	30%	Pass	
Duplicate									
Heavy Metals				Result 1	Result 2	RPD			
Arsenic	B21-Se38788	NCP	mg/kg	3.2	3.3	5.0	30%	Pass	
Cadmium	B21-Se38788	NCP	mg/kg	< 0.4	< 0.4	<1	30%	Pass	
Chromium	B21-Se38788	NCP	mg/kg	29	40	33	30%	Fail	Q15
Copper	B21-Se38788	NCP	mg/kg	19	30	42	30%	Fail	Q15
Lead	B21-Se38788	NCP	mg/kg	< 5	< 5	<1	30%	Pass	
Mercury	B21-Se38788	NCP	mg/kg	< 0.1	< 0.1	<1	30%	Pass	
Nickel	B21-Se38788	NCP	mg/kg	38	57	39	30%	Fail	Q15
Zinc	B21-Se38788	NCP	mg/kg	35	47	30	30%	Pass	
Duplicate									
				Result 1	Result 2	RPD			
% Moisture	S21-Se46351	NCP	%	25	24	3.0	30%	Pass	

Comments

Total Coliforms analysed by Eurofins ARL Group, report reference 21-17590-R00.

Sample Integrity

Custody Seals Intact (if used)	N/A
Attempt to Chill was evident	Yes
Sample correctly preserved	Yes
Appropriate sample containers have been used	Yes
Sample containers for volatile analysis received with minimal headspace	Yes
Samples received within HoldingTime	Yes
Some samples have been subcontracted	No

Qualifier Codes/Comments

Code	Description
G01	The LORs have been raised due to matrix interference
N01	F2 is determined by arithmetically subtracting the "naphthalene" value from the ">C10-C16" value. The naphthalene value used in this calculation is obtained from volatiles (Purge & Trap analysis).
N02	Where we have reported both volatile (P&T GCMS) and semivolatile (GCMS) naphthalene data, results may not be identical. Provided correct sample handling protocols have been followed, any observed differences in results are likely to be due to procedural differences within each methodology. Results determined by both techniques have passed all QAQC acceptance criteria, and are entirely technically valid.
N04	F1 is determined by arithmetically subtracting the "Total BTEX" value from the "C6-C10" value. The "Total BTEX" value is obtained by summing the concentrations of BTEX analytes. The "C6-C10" value is obtained by quantitating against a standard of mixed aromatic/aliphatic analytes.
N07	Please note:- These two PAH isomers closely co-elute using the most contemporary analytical methods and both the reported concentration (and the TEQ) apply specifically to the total of the two co-eluting PAHs
Q09	The Surrogate recovery is outside of the recommended acceptance criteria due to matrix interference. Acceptance criteria were met for all other QC
Q15	The RPD reported passes Eurofins Environment Testing's QC - Acceptance Criteria as defined in the Internal Quality Control Review and Glossary page of this report.

Authorised by:

Emma Beesley	Analytical Services Manager
Andrew Sullivan	Senior Analyst-Organic (NSW)
John Nguyen	Senior Analyst-Metal (NSW)
Roopesh Rangarajan	Senior Analyst-Volatile (NSW)

Glenn Jackson
General Manager

Final Report – this report replaces any previously issued Report

- Indicates Not Requested

* Indicates NATA accreditation does not cover the performance of this service

Measurement uncertainty of test data is available on request or please click here.

LABORATORY REPORT

ADDRESS: **Eurofins Environment Testing Australia Pty Ltd**
6 Monterey Road
Dandenong South VIC 3175

ATTENTION: Andrew Black

DATE RECEIVED: 24/09/2021

YOUR REFERENCE: 826760

PURCHASE ORDER: 21-434-1368-826760

APPROVALS:

Lolita Kusnandar
Microbiologist

REPORT COMMENTS:

This report is issued by Eurofins ARL Pty Ltd. The report shall not be reproduced except in full without written approval from the laboratory.

Samples are analysed on an as received basis unless otherwise noted.

^ Please note that these samples were analysed outside of the recommended holding period. This should be taken into consideration when interpreting these results, as they may not be truly representative of the sample composition at the time of collection.

METHOD REFERENCES:

Method ID	Method Description
AS 4276.21 (PM 4.2c)	MPN of Coliforms and E.coli by Colilert

LABORATORY REPORT

Water Microbiology		**Sample No**	**21-17590-1**
		Sample Description	21-Se46185 QC201_210916
		Sample Date	16/09/2021
ANALYTE	**LOR**	**Units**	**Result**
Date Tested	N/A	N/A	24/09/2021
Total Coliforms MPN*	1	MPN/g	9.1

Result Definitions

LOR Limit of Reporting [NT] Not Tested [ND] Not Detected at indicated Limit of Reporting

* Denotes test conducted by in-house methodology.

[1]pH and Free Chlorine analysed in the laboratory - Analysis on this test must begin within 30 minutes of sampling. Therefore laboratory analysis is unlikely to be completed within holding time. Analysis will begin as soon as possible after sample receipt.

FOR MICROBIOLOGICAL TESTING - The results relate only to the sample tested and may not be representative of a lot, batch or other samples and may not necessarily justify the acceptance or rejection of a lot or batch, a product recall or support legal proceedings. Tests are not routinely performed as duplicates unless specifically requested. Changes occur in the bacterial content of biological samples. Samples should be examined as soon as possible after collection, preferably within 6 hrs and must be stored at 4 degrees Celsius or below. Samples tested after 24 hrs cannot be regarded as satisfactory because of temperature abuse and variations.

CHAIN OF CUSTODY

ALS Laboratory: please tick →

☐ADELAIDE 21 Burma Road Pooraka SA 5095 Ph: 08 8359 0890 E: adelaide@alsglobal.com
☐BRISBANE 32 Shand Street Stafford QLD 4053 Ph: 07 3243 7222 E: samples.brisbane@alsglobal.com
☐GLADSTONE 46 Callemondah Drive Clinton QLD 4680 Ph: 07 7471 5600 E: gladstone@alsglobal.com
☐MACKAY 78 Harbour Road Mackay QLD 4740 Ph: 07 4944 0177 E: mackay@alsglobal.com
☐MELBOURNE 2-4 Westall Road Springvale VIC 3171 Ph: 03 8549 9600 E: samples.melbourne@alsglobal.com
☐MUDGEE 27 Sydney Road Mudgee NSW 2850 Ph: 02 6372 6735 E: mudgee.mail@alsglobal.com
☐NEWCASTLE 5/585 Maitland Rd Mayfield West NSW 2304 Ph: 02 4014 2500 E: samples.newcastle@alsglobal.com
☐NOWRA 4/13 Geary Place North Nowra NSW 2541 Ph: 024423 2063 E: nowra@alsglobal.com
☐PERTH 10 Hod Way Malaga WA 6090 Ph: 08 9209 7655 E: samples.perth@alsglobal.com
☑SYDNEY 277-289 Woodpark Road Smithfield NSW 2164 Ph: 02 8784 8555 E: samples.sydney@alsglobal.com
☐TOWNSVILLE 14-15 Desma Court Bohle QLD 4818 Ph: 07 4796 0600 E: townsville.environmental@alsglobal.com
☐WOLLONGONG 99 Kenny Street Wollongong NSW 2500 Ph: 02 4225 3125 E: portkembla@alsglobal.com

CLIENT: Jacobs Arcadis Joint Venture (JAJV)
OFFICE: Sydney
PROJECT: IA254601
ORDER NUMBER: –
PROJECT MANAGER: Amanda Mullen
CONTACT PH:
SAMPLER: Nick Keatley
SAMPLER MOBILE: 0421201294
COC emailed to ALS? (YES / [✓ NO])
EDD FORMAT (or default):
Email Reports to (will default to PM if no other addresses are listed): nick.keatley@jacobs.com amanda.mullen@jacobs.com
Email Invoice to (will default to PM if no other addresses are listed): " "

TURNAROUND REQUIREMENTS : (Standard TAT may be longer for some tests e.g.. Ultra Trace Organics)
☒ Standard TAT (List due date):
☐ Non Standard or urgent TAT (List due date):

ALS QUOTE NO.: Note: invoicing done through JV contract (not PO)

COC SEQUENCE NUMBER (Circle)
COC: [✓ 1] 2 3 4 5 6 7
OF: 1 2 [✓ 3] 4 5 6 7

FOR LABORATORY USE ONLY (Circle)
Custody Seal intact? [✓ Yes] No N/A
Free ice / frozen ice bricks present upon receipt? Yes No N/A
Random Sample Temperature on Receipt: 6.5 °C
Other comment:

RELINQUISHED BY:	RECEIVED BY:	RELINQUISHED BY:	RECEIVED BY:
NK	Juliana G	M.H #826760	[illegible]
DATE/TIME: 17/9/21	DATE/TIME: 17/9/21 4:00pm	DATE/TIME: 20/9/21	DATE/TIME: 17/9/21 1830

COMMENTS/SPECIAL HANDLING/STORAGE OR DISPOSAL: Also email results to EDMANZ@jacobs.com, jacobs.labresults@esdat.net

ALS USE	SAMPLE DETAILS MATRIX: SOLID (S) WATER (W)			CONTAINER INFORMATION		ANALYSIS REQUIRED including SUITES (NB. Suite Codes must be listed to attract suite price) Where Metals are required, specify Total (unfiltered bottle required) or Dissolved (field filtered bottle required).								Additional Information
LAB ID	SAMPLE ID	DATE / TIME	MATRIX	TYPE & PRESERVATIVE (refer to codes below)	TOTAL CONTAINERS	S-26	S-12	EA200	Total Coliforms				HOLD	Comments on likely contaminant levels, dilutions, or samples requiring specific QC analysis etc.
1	BH16_0.05	13/9/21	S			X	X	X	~~X~~					
2	BH16_0.5	↓	↓										X	
3	BH16_1.0	↓	↓										X	
4	BH16_1.5	↓	↓			X	X	X	~~X~~					
5	BH13_0.05	15/9/21	↓			X	X	X	X					
6	BH13_0.5	↓	↓			X	X	X	X					
7	BH13_0.7	↓	↓										X	
8	SS22_0.05	↓	↓			X	X	X	X					
9	BH08_0.05	16/9/21	↓			X	X	X						
10	BH08_0.5	↓	↓			X	X	X	X					
11	QC101_210916	↓	↓			X	X		X					Duplicate
12	QC202_210916	↓	↓			X	X		X					Pls send to eurofins
					TOTAL									

Subcon / Forward Lab / Split WO:
Lab / Analysis: Eurofins. QC201
Organised By / Date: Newcastle
Relinquished By / Date: 8, 10, 13, 19
Connote / Courier: Scoresby 5-6, 8, 10-12
WO No: ES2133844
Attached By PO / Internal Sheet:

Environmental Division
Sydney
Work Order Reference
ES2133844

Telephone : + 61-2-8784 8555

Water Container Codes: P = Unpreserved Plastic; N = Nitric Preserved Plastic; ORC = Nitric Preserved ORC; SH = Sodium Hydroxide/Cd Preserved; S = Sodium Hydroxide Preserved Plastic; AG = Amber Glass Unpreserved; AP - Airfreight Unpreserved Plastic
V = VOA Vial HCl Preserved; VB = VOA Vial Sodium Bisulphate Preserved; VS = VOA Vial Sulfuric Preserved; AV = Airfreight Unpreserved Vial SG = Sulfuric Preserved Amber Glass; H = HCl preserved Plastic; HS = HCl preserved Speciation bottle; SP = Sulfuric Preserved Plastic; F = Formaldehyde Preserved Glass;
Z = Zinc Acetate Preserved Bottle; E = EDTA Preserved Bottles; ST = Sterile Bottle; ASS = Plastic Bag for Acid Sulphate Soils; B = Unpreserved Bag.

Certificate of Analysis

NATA Accredited
Accreditation Number 1261
Site Number 18217

Accredited for compliance with ISO/IEC 17025 – Testing
NATA is a signatory to the ILAC Mutual Recognition Arrangement for the mutual recognition of the equivalence of testing, medical testing, calibration, inspection, proficiency testing scheme providers and reference materials producers reports and certificates.

Jacobs Group (Australia) P/L NSW
Level 7, 177 Pacific Highway
North Sydney
NSW 2065

Attention: **Amanda Mullen**

Report **826833-W**
Project name IA254001
Received Date Sep 22, 2021

Client Sample ID **Sample Matrix** **Eurofins Sample No.** **Date Sampled** Test/Reference	LOR	Unit	**QC201_210921** **Water** **S21-Se46881** **Sep 21, 2021**
Total Recoverable Hydrocarbons			
TRH C6-C9	0.02	mg/L	< 0.02
TRH C10-C14	0.05	mg/L	< 0.05
TRH C15-C28	0.1	mg/L	< 0.1
TRH C29-C36	0.1	mg/L	< 0.1
TRH C10-C36 (Total)	0.1	mg/L	< 0.1
Naphthalene[N02]	0.01	mg/L	< 0.01
TRH C6-C10	0.02	mg/L	< 0.02
TRH C6-C10 less BTEX (F1)[N04]	0.02	mg/L	< 0.02
TRH >C10-C16	0.05	mg/L	< 0.05
TRH >C10-C16 less Naphthalene (F2)[N01]	0.05	mg/L	< 0.05
TRH >C16-C34	0.1	mg/L	< 0.1
TRH >C34-C40	0.1	mg/L	< 0.1
TRH >C10-C40 (total)*	0.1	mg/L	< 0.1
BTEX			
Benzene	0.001	mg/L	< 0.001
Toluene	0.001	mg/L	< 0.001
Ethylbenzene	0.001	mg/L	< 0.001
m&p-Xylenes	0.002	mg/L	< 0.002
o-Xylene	0.001	mg/L	< 0.001
Xylenes - Total*	0.003	mg/L	< 0.003
4-Bromofluorobenzene (surr.)	1	%	88
Polycyclic Aromatic Hydrocarbons			
Acenaphthene	0.001	mg/L	< 0.001
Acenaphthylene	0.001	mg/L	< 0.001
Anthracene	0.001	mg/L	< 0.001
Benz(a)anthracene	0.001	mg/L	< 0.001
Benzo(a)pyrene	0.001	mg/L	< 0.001
Benzo(b&j)fluoranthene[N07]	0.001	mg/L	< 0.001
Benzo(g.h.i)perylene	0.001	mg/L	< 0.001
Benzo(k)fluoranthene	0.001	mg/L	< 0.001
Chrysene	0.001	mg/L	< 0.001
Dibenz(a.h)anthracene	0.001	mg/L	< 0.001
Fluoranthene	0.001	mg/L	< 0.001
Fluorene	0.001	mg/L	< 0.001
Indeno(1.2.3-cd)pyrene	0.001	mg/L	< 0.001
Naphthalene	0.001	mg/L	< 0.001

Client Sample ID			**QC201_210921**
Sample Matrix			**Water**
Eurofins Sample No.			**S21-Se46881**
Date Sampled			**Sep 21, 2021**
Test/Reference	LOR	Unit	
Polycyclic Aromatic Hydrocarbons			
Phenanthrene	0.001	mg/L	< 0.001
Pyrene	0.001	mg/L	< 0.001
Total PAH*	0.001	mg/L	< 0.001
2-Fluorobiphenyl (surr.)	1	%	117
p-Terphenyl-d14 (surr.)	1	%	[Q09]INT
Organochlorine Pesticides			
Chlordanes - Total	0.002	mg/L	< 0.002
4.4'-DDD	0.0002	mg/L	< 0.0002
4.4'-DDE	0.0002	mg/L	< 0.0002
4.4'-DDT	0.0002	mg/L	< 0.0002
a-HCH	0.0002	mg/L	< 0.0002
Aldrin	0.0002	mg/L	< 0.0002
b-HCH	0.0002	mg/L	< 0.0002
d-HCH	0.0002	mg/L	< 0.0002
Dieldrin	0.0002	mg/L	< 0.0002
Endosulfan I	0.0002	mg/L	< 0.0002
Endosulfan II	0.0002	mg/L	< 0.0002
Endosulfan sulphate	0.0002	mg/L	< 0.0002
Endrin	0.0002	mg/L	< 0.0002
Endrin aldehyde	0.0002	mg/L	< 0.0002
Endrin ketone	0.0002	mg/L	< 0.0002
g-HCH (Lindane)	0.0002	mg/L	< 0.0002
Heptachlor	0.0002	mg/L	< 0.0002
Heptachlor epoxide	0.0002	mg/L	< 0.0002
Hexachlorobenzene	0.0002	mg/L	< 0.0002
Methoxychlor	0.0002	mg/L	< 0.0002
Toxaphene	0.005	mg/L	< 0.005
Aldrin and Dieldrin (Total)*	0.0002	mg/L	< 0.0002
DDT + DDE + DDD (Total)*	0.0002	mg/L	< 0.0002
Vic EPA IWRG 621 OCP (Total)*	0.002	mg/L	< 0.002
Vic EPA IWRG 621 Other OCP (Total)*	0.002	mg/L	< 0.002
Dibutylchlorendate (surr.)	1	%	[Q09]INT
Tetrachloro-m-xylene (surr.)	1	%	[Q09]INT
Organophosphorus Pesticides			
Azinphos-methyl	0.002	mg/L	< 0.002
Bolstar	0.002	mg/L	< 0.002
Chlorfenvinphos	0.02	mg/L	< 0.02
Chlorpyrifos	0.002	mg/L	< 0.002
Chlorpyrifos-methyl	0.002	mg/L	< 0.002
Coumaphos	0.02	mg/L	< 0.02
Demeton-S	0.002	mg/L	< 0.002
Demeton-O	0.002	mg/L	< 0.002
Diazinon	0.002	mg/L	< 0.002
Dichlorvos	0.002	mg/L	< 0.002
Dimethoate	0.002	mg/L	< 0.002
Disulfoton	0.002	mg/L	< 0.002
EPN	0.002	mg/L	< 0.002
Ethion	0.002	mg/L	< 0.002
Ethoprop	0.002	mg/L	< 0.002

Client Sample ID **Sample Matrix** **Eurofins Sample No.** **Date Sampled** Test/Reference	LOR	Unit	**QC201_210921** **Water** **S21-Se46881** **Sep 21, 2021**
Organophosphorus Pesticides			
Ethyl parathion	0.002	mg/L	< 0.002
Fenitrothion	0.002	mg/L	< 0.002
Fensulfothion	0.002	mg/L	< 0.002
Fenthion	0.002	mg/L	< 0.002
Malathion	0.002	mg/L	< 0.002
Merphos	0.002	mg/L	< 0.002
Methyl parathion	0.002	mg/L	< 0.002
Mevinphos	0.002	mg/L	< 0.002
Monocrotophos	0.002	mg/L	< 0.002
Naled	0.002	mg/L	< 0.002
Omethoate	0.02	mg/L	< 0.02
Phorate	0.002	mg/L	< 0.002
Pirimiphos-methyl	0.02	mg/L	< 0.02
Pyrazophos	0.002	mg/L	< 0.002
Ronnel	0.002	mg/L	< 0.002
Terbufos	0.002	mg/L	< 0.002
Tetrachlorvinphos	0.002	mg/L	< 0.002
Tokuthion	0.002	mg/L	< 0.002
Trichloronate	0.002	mg/L	< 0.002
Triphenylphosphate (surr.)	1	%	Q09INT
Heavy Metals			
Arsenic (filtered)	0.001	mg/L	0.002
Cadmium (filtered)	0.0002	mg/L	< 0.0002
Chromium (filtered)	0.001	mg/L	< 0.001
Copper (filtered)	0.001	mg/L	< 0.001
Lead (filtered)	0.001	mg/L	< 0.001
Mercury (filtered)	0.0001	mg/L	< 0.0001
Nickel (filtered)	0.001	mg/L	0.017
Zinc (filtered)	0.005	mg/L	0.048
Pathogens			
Total Coliforms (MPN)	1	MPN/100mL	see attached

Sample History

Where samples are submitted/analysed over several days, the last date of extraction is reported.

If the date and time of sampling are not provided, the Laboratory will not be responsible for compromised results should testing be performed outside the recommended holding time.

Description	Testing Site	Extracted	Holding Time
Total Recoverable Hydrocarbons - 1999 NEPM Fractions	Sydney	Sep 23, 2021	7 Days
- Method: LTM-ORG-2010 TRH C6-C40			
Total Recoverable Hydrocarbons - 2013 NEPM Fractions	Sydney	Sep 23, 2021	7 Days
- Method: LTM-ORG-2010 TRH C6-C40			
Total Recoverable Hydrocarbons - 2013 NEPM Fractions	Sydney	Sep 23, 2021	7 Days
- Method: LTM-ORG-2010 TRH C6-C40			
BTEX	Sydney	Sep 23, 2021	14 Days
- Method: LTM-ORG-2010 TRH C6-C40			
Polycyclic Aromatic Hydrocarbons	Sydney	Sep 23, 2021	7 Days
- Method: LTM-ORG-2130 PAH and Phenols in Soil and Water			
Metals M8 filtered	Sydney	Sep 23, 2021	28 Days
- Method: LTM-MET-3040 Metals in Waters, Soils & Sediments by ICP-MS			
Organochlorine Pesticides	Sydney	Sep 23, 2021	7 Days
- Method: LTM-ORG-2220 OCP & PCB in Soil and Water			
Organophosphorus Pesticides	Sydney	Sep 23, 2021	7 Days
- Method: LTM-ORG-2200 Organophosphorus Pesticides by GC-MS			
Total Coliforms (MPN)	WaterTestingVic	Sep 23, 2021	24 Hours
- Method: LTM-MIC-6621 E Coli and Total Coliforms by MPN			

Company Name: Jacobs Group (Australia) P/L NSW
Address: Level 7, 177 Pacific Highway
North Sydney
NSW 2065

Project Name: IA254001

Order No.:
Report #: 826833
Phone: 02 9928 2100
Fax: 02 9928 2504

Received: Sep 22, 2021 4:17 PM
Due: Sep 29, 2021
Priority: 5 Day
Contact Name: Amanda Mullen

Eurofins Analytical Services Manager : Andrew Black

Sample Detail						Total Coliforms (MPN)	Suite B14: OCP/OPP	Eurofins Suite B7 (filtered metals)
Melbourne Laboratory - NATA # 1261 Site # 1254								
Sydney Laboratory - NATA # 1261 Site # 18217							X	X
Brisbane Laboratory - NATA # 1261 Site # 20794								
Mayfield Laboratory - NATA # 1261 Site # 25079								
Perth Laboratory - NATA # 2377 Site # 2370								
External Laboratory						X		
No	**Sample ID**	**Sample Date**	**Sampling Time**	**Matrix**	**LAB ID**			
1	QC201_210921	Sep 21, 2021		Water	S21-Se46881	X	X	X
Test Counts						1	1	1

Internal Quality Control Review and Glossary

General

1. Laboratory QC results for Method Blanks, Duplicates, Matrix Spikes, and Laboratory Control Samples follows guidelines delineated in the National Environment Protection (Assessment of Site Contamination) Measure 1999, as amended May 2013 and are included in this QC report where applicable. Additional QC data may be available on request.
2. All soil/sediment/solid results are reported on a dry basis, unless otherwise stated.
3. All biota/food results are reported on a wet weight basis on the edible portion, unless otherwise stated.
4. Actual LORs are matrix dependant. Quoted LORs may be raised where sample extracts are diluted due to interferences.
5. Results are uncorrected for matrix spikes or surrogate recoveries except for PFAS compounds.
6. SVOC analysis on waters are performed on homogenised, unfiltered samples, unless noted otherwise.
7. Samples were analysed on an 'as received' basis.
8. Information identified on this report with blue colour, indicates data provided by customer, that may have an impact on the results.
9. This report replaces any interim results previously issued.

Holding Times

Please refer to 'Sample Preservation and Container Guide' for holding times (QS3001).

For samples received on the last day of holding time, notification of testing requirements should have been received at least 6 hours prior to sample receipt deadlines as stated on the SRA.

If the Laboratory did not receive the information in the required timeframe, and regardless of any other integrity issues, suitably qualified results may still be reported.

Holding times apply from the date of sampling, therefore compliance to these may be outside the laboratory's control.

For VOCs containing vinyl chloride, styrene and 2-chloroethyl vinyl ether the holding time is 7 days however for all other VOCs such as BTEX or C6-10 TRH then the holding time is 14 days.

****NOTE:** pH duplicates are reported as a range NOT as RPD

Units

mg/kg: milligrams per kilogram
ppm: Parts per million
org/100mL: Organisms per 100 millilitres

mg/L: milligrams per litre
ppb: Parts per billion
NTU: Nephelometric Turbidity Units

ug/L: micrograms per litre
%: Percentage
MPN/100mL: Most Probable Number of organisms per 100 millilitres

Terms

Dry	Where a moisture has been determined on a solid sample the result is expressed on a dry basis.
LOR	Limit of Reporting.
SPIKE	Addition of the analyte to the sample and reported as percentage recovery.
RPD	Relative Percent Difference between two Duplicate pieces of analysis.
LCS	Laboratory Control Sample - reported as percent recovery.
CRM	Certified Reference Material - reported as percent recovery.
Method Blank	In the case of solid samples these are performed on laboratory certified clean sands and in the case of water samples these are performed on de-ionised water.
Surr - Surrogate	The addition of a like compound to the analyte target and reported as percentage recovery.
Duplicate	A second piece of analysis from the same sample and reported in the same units as the result to show comparison.
USEPA	United States Environmental Protection Agency
APHA	American Public Health Association
TCLP	Toxicity Characteristic Leaching Procedure
COC	Chain of Custody
SRA	Sample Receipt Advice
QSM	US Department of Defense Quality Systems Manual Version 5.3
CP	Client Parent - QC was performed on samples pertaining to this report
NCP	Non-Client Parent - QC performed on samples not pertaining to this report, QC is representative of the sequence or batch that client samples were analysed within.
TEQ	Toxic Equivalency Quotient

QC - Acceptance Criteria

RPD Duplicates: Global RPD Duplicates Acceptance Criteria is 30% however the following acceptance guidelines are equally applicable:

Results <10 times the LOR : No Limit

Results between 10-20 times the LOR : RPD must lie between 0-50%

Results >20 times the LOR : RPD must lie between 0-30%

Surrogate Recoveries: Recoveries must lie between 20-130% Phenols & 50-150% PFASs

PFAS field samples that contain surrogate recoveries in excess of the QC limit designated in QSM 5.3 where no positive PFAS results have been reported have been reviewed and no data was affected.

WA DWER (n=10): PFBA, PFPeA, PFHxA, PFHpA, PFOA, PFBS, PFHxS, PFOS, 6:2 FTSA, 8:2 FTSA

QC Data General Comments

1. Where a result is reported as a less than (<), higher than the nominated LOR, this is due to either matrix interference, extract dilution required due to interferences or contaminant levels within the sample, high moisture content or insufficient sample provided.
2. Duplicate data shown within this report that states the word "BATCH" is a Batch Duplicate from outside of your sample batch, but within the laboratory sample batch at a 1:10 ratio. The Parent and Duplicate data shown is not data from your samples.
3. Organochlorine Pesticide analysis - where reporting LCS data, Toxaphene & Chlordane are not added to the LCS.
4. Organochlorine Pesticide analysis - where reporting Spike data, Toxaphene is not added to the Spike.
5. Total Recoverable Hydrocarbons - where reporting Spike & LCS data, a single spike of commercial Hydrocarbon products in the range of C12-C30 is added and it's Total Recovery is reported in the C10-C14 cell of the Report.
6. pH and Free Chlorine analysed in the laboratory - Analysis on this test must begin within 30 minutes of sampling.Therefore laboratory analysis is unlikely to be completed within holding time. Analysis will begin as soon as possible after sample receipt.
7. Recovery Data (Spikes & Surrogates) - where chromatographic interference does not allow the determination of Recovery the term "INT" appears against that analyte.
8. Polychlorinated Biphenyls are spiked only using Aroclor 1260 in Matrix Spikes and LCS.
9. For Matrix Spikes and LCS results a dash " -" in the report means that the specific analyte was not added to the QC sample.
10. Duplicate RPDs are calculated from raw analytical data thus it is possible to have two sets of data.

Quality Control Results

Test	Units	Result 1			Acceptance Limits	Pass Limits	Qualifying Code
Method Blank							
Total Recoverable Hydrocarbons							
TRH C6-C9	mg/L	< 0.02			0.02	Pass	
TRH C10-C14	mg/L	< 0.05			0.05	Pass	
TRH C15-C28	mg/L	< 0.1			0.1	Pass	
TRH C29-C36	mg/L	< 0.1			0.1	Pass	
Naphthalene	mg/L	< 0.01			0.01	Pass	
TRH C6-C10	mg/L	< 0.02			0.02	Pass	
TRH >C10-C16	mg/L	< 0.05			0.05	Pass	
TRH >C16-C34	mg/L	< 0.1			0.1	Pass	
TRH >C34-C40	mg/L	< 0.1			0.1	Pass	
Method Blank							
BTEX							
Benzene	mg/L	< 0.001			0.001	Pass	
Toluene	mg/L	< 0.001			0.001	Pass	
Ethylbenzene	mg/L	< 0.001			0.001	Pass	
m&p-Xylenes	mg/L	< 0.002			0.002	Pass	
o-Xylene	mg/L	< 0.001			0.001	Pass	
Xylenes - Total*	mg/L	< 0.003			0.003	Pass	
Method Blank							
Polycyclic Aromatic Hydrocarbons							
Acenaphthene	mg/L	< 0.001			0.001	Pass	
Acenaphthylene	mg/L	< 0.001			0.001	Pass	
Anthracene	mg/L	< 0.001			0.001	Pass	
Benz(a)anthracene	mg/L	< 0.001			0.001	Pass	
Benzo(a)pyrene	mg/L	< 0.001			0.001	Pass	
Benzo(b&j)fluoranthene	mg/L	< 0.001			0.001	Pass	
Benzo(g.h.i)perylene	mg/L	< 0.001			0.001	Pass	
Benzo(k)fluoranthene	mg/L	< 0.001			0.001	Pass	
Chrysene	mg/L	< 0.001			0.001	Pass	
Dibenz(a.h)anthracene	mg/L	< 0.001			0.001	Pass	
Fluoranthene	mg/L	< 0.001			0.001	Pass	
Fluorene	mg/L	< 0.001			0.001	Pass	
Indeno(1.2.3-cd)pyrene	mg/L	< 0.001			0.001	Pass	
Naphthalene	mg/L	< 0.001			0.001	Pass	
Phenanthrene	mg/L	< 0.001			0.001	Pass	
Pyrene	mg/L	< 0.001			0.001	Pass	
Method Blank							
Organochlorine Pesticides							
Chlordanes - Total	mg/L	< 0.002			0.002	Pass	
4.4'-DDD	mg/L	< 0.0002			0.0002	Pass	
4.4'-DDE	mg/L	< 0.0002			0.0002	Pass	
4.4'-DDT	mg/L	< 0.0002			0.0002	Pass	
a-HCH	mg/L	< 0.0002			0.0002	Pass	
Aldrin	mg/L	< 0.0002			0.0002	Pass	
b-HCH	mg/L	< 0.0002			0.0002	Pass	
d-HCH	mg/L	< 0.0002			0.0002	Pass	
Dieldrin	mg/L	< 0.0002			0.0002	Pass	
Endosulfan I	mg/L	< 0.0002			0.0002	Pass	
Endosulfan II	mg/L	< 0.0002			0.0002	Pass	
Endosulfan sulphate	mg/L	< 0.0002			0.0002	Pass	
Endrin	mg/L	< 0.0002			0.0002	Pass	

Test	Units	Result 1			Acceptance Limits	Pass Limits	Qualifying Code
Endrin aldehyde	mg/L	< 0.0002			0.0002	Pass	
Endrin ketone	mg/L	< 0.0002			0.0002	Pass	
g-HCH (Lindane)	mg/L	< 0.0002			0.0002	Pass	
Heptachlor	mg/L	< 0.0002			0.0002	Pass	
Heptachlor epoxide	mg/L	< 0.0002			0.0002	Pass	
Hexachlorobenzene	mg/L	< 0.0002			0.0002	Pass	
Methoxychlor	mg/L	< 0.0002			0.0002	Pass	
Toxaphene	mg/L	< 0.005			0.005	Pass	
Method Blank							
Organophosphorus Pesticides							
Azinphos-methyl	mg/L	< 0.002			0.002	Pass	
Bolstar	mg/L	< 0.002			0.002	Pass	
Chlorfenvinphos	mg/L	< 0.02			0.02	Pass	
Chlorpyrifos	mg/L	< 0.002			0.002	Pass	
Chlorpyrifos-methyl	mg/L	< 0.002			0.002	Pass	
Coumaphos	mg/L	< 0.02			0.02	Pass	
Demeton-S	mg/L	< 0.002			0.002	Pass	
Demeton-O	mg/L	< 0.002			0.002	Pass	
Diazinon	mg/L	< 0.002			0.002	Pass	
Dichlorvos	mg/L	< 0.002			0.002	Pass	
Dimethoate	mg/L	< 0.002			0.002	Pass	
Disulfoton	mg/L	< 0.002			0.002	Pass	
EPN	mg/L	< 0.002			0.002	Pass	
Ethion	mg/L	< 0.002			0.002	Pass	
Ethoprop	mg/L	< 0.002			0.002	Pass	
Ethyl parathion	mg/L	< 0.002			0.002	Pass	
Fenitrothion	mg/L	< 0.002			0.002	Pass	
Fensulfothion	mg/L	< 0.002			0.002	Pass	
Fenthion	mg/L	< 0.002			0.002	Pass	
Malathion	mg/L	< 0.002			0.002	Pass	
Merphos	mg/L	< 0.002			0.002	Pass	
Methyl parathion	mg/L	< 0.002			0.002	Pass	
Mevinphos	mg/L	< 0.002			0.002	Pass	
Monocrotophos	mg/L	< 0.002			0.002	Pass	
Naled	mg/L	< 0.002			0.002	Pass	
Omethoate	mg/L	< 0.02			0.02	Pass	
Phorate	mg/L	< 0.002			0.002	Pass	
Pirimiphos-methyl	mg/L	< 0.02			0.02	Pass	
Pyrazophos	mg/L	< 0.002			0.002	Pass	
Ronnel	mg/L	< 0.002			0.002	Pass	
Terbufos	mg/L	< 0.002			0.002	Pass	
Tetrachlorvinphos	mg/L	< 0.002			0.002	Pass	
Tokuthion	mg/L	< 0.002			0.002	Pass	
Trichloronate	mg/L	< 0.002			0.002	Pass	
Method Blank							
Heavy Metals							
Arsenic (filtered)	mg/L	< 0.001			0.001	Pass	
Cadmium (filtered)	mg/L	< 0.0002			0.0002	Pass	
Chromium (filtered)	mg/L	< 0.001			0.001	Pass	
Copper (filtered)	mg/L	< 0.001			0.001	Pass	
Lead (filtered)	mg/L	< 0.001			0.001	Pass	
Mercury (filtered)	mg/L	< 0.0001			0.0001	Pass	
Nickel (filtered)	mg/L	< 0.001			0.001	Pass	
Zinc (filtered)	mg/L	< 0.005			0.005	Pass	

Test	Units	Result 1			Acceptance Limits	Pass Limits	Qualifying Code
LCS - % Recovery							
Total Recoverable Hydrocarbons							
TRH C6-C9	%	71			70-130	Pass	
TRH C10-C14	%	80			70-130	Pass	
Naphthalene	%	92			70-130	Pass	
TRH C6-C10	%	71			70-130	Pass	
TRH >C10-C16	%	79			70-130	Pass	
LCS - % Recovery							
BTEX							
Benzene	%	74			70-130	Pass	
Toluene	%	78			70-130	Pass	
Ethylbenzene	%	81			70-130	Pass	
m&p-Xylenes	%	81			70-130	Pass	
o-Xylene	%	82			70-130	Pass	
Xylenes - Total*	%	81			70-130	Pass	
LCS - % Recovery							
Polycyclic Aromatic Hydrocarbons							
Acenaphthene	%	79			70-130	Pass	
Acenaphthylene	%	90			70-130	Pass	
Anthracene	%	88			70-130	Pass	
Benz(a)anthracene	%	92			70-130	Pass	
Benzo(a)pyrene	%	95			70-130	Pass	
Benzo(b&j)fluoranthene	%	89			70-130	Pass	
Benzo(g.h.i)perylene	%	95			70-130	Pass	
Benzo(k)fluoranthene	%	96			70-130	Pass	
Chrysene	%	87			70-130	Pass	
Dibenz(a.h)anthracene	%	89			70-130	Pass	
Fluoranthene	%	88			70-130	Pass	
Fluorene	%	84			70-130	Pass	
Indeno(1.2.3-cd)pyrene	%	90			70-130	Pass	
Naphthalene	%	75			70-130	Pass	
Phenanthrene	%	88			70-130	Pass	
Pyrene	%	89			70-130	Pass	
LCS - % Recovery							
Organochlorine Pesticides							
Chlordanes - Total	%	82			70-130	Pass	
4.4'-DDD	%	96			70-130	Pass	
4.4'-DDE	%	79			70-130	Pass	
a-HCH	%	80			70-130	Pass	
Aldrin	%	76			70-130	Pass	
b-HCH	%	86			70-130	Pass	
d-HCH	%	90			70-130	Pass	
Dieldrin	%	87			70-130	Pass	
Endosulfan I	%	86			70-130	Pass	
Endosulfan II	%	87			70-130	Pass	
Endosulfan sulphate	%	96			70-130	Pass	
Endrin aldehyde	%	110			70-130	Pass	
Endrin ketone	%	109			70-130	Pass	
g-HCH (Lindane)	%	88			70-130	Pass	
Heptachlor	%	123			70-130	Pass	
Heptachlor epoxide	%	92			70-130	Pass	
Hexachlorobenzene	%	72			70-130	Pass	
Methoxychlor	%	104			70-130	Pass	
LCS - % Recovery							

Test			Units	Result 1			Acceptance Limits	Pass Limits	Qualifying Code
Organophosphorus Pesticides									
Dimethoate			%	89			70-130	Pass	
Ethion			%	118			70-130	Pass	
Fenitrothion			%	126			70-130	Pass	
Mevinphos			%	102			70-130	Pass	
LCS - % Recovery									
Heavy Metals									
Arsenic (filtered)			%	102			80-120	Pass	
Cadmium (filtered)			%	98			80-120	Pass	
Chromium (filtered)			%	95			80-120	Pass	
Copper (filtered)			%	90			80-120	Pass	
Lead (filtered)			%	95			80-120	Pass	
Mercury (filtered)			%	104			80-120	Pass	
Nickel (filtered)			%	93			80-120	Pass	
Zinc (filtered)			%	94			80-120	Pass	
Test	**Lab Sample ID**	**QA Source**	**Units**	**Result 1**			**Acceptance Limits**	**Pass Limits**	**Qualifying Code**
Spike - % Recovery									
Total Recoverable Hydrocarbons				Result 1					
TRH C6-C9	S21-Se51230	NCP	%	99			70-130	Pass	
TRH C10-C14	S21-Se45212	NCP	%	82			70-130	Pass	
Naphthalene	S21-Se51230	NCP	%	106			70-130	Pass	
TRH C6-C10	S21-Se51230	NCP	%	102			70-130	Pass	
TRH >C10-C16	S21-Se45212	NCP	%	89			70-130	Pass	
Spike - % Recovery									
BTEX				Result 1					
Benzene	S21-Se51230	NCP	%	94			70-130	Pass	
Toluene	S21-Se51230	NCP	%	98			70-130	Pass	
Ethylbenzene	S21-Se51230	NCP	%	99			70-130	Pass	
m&p-Xylenes	S21-Se51230	NCP	%	100			70-130	Pass	
o-Xylene	S21-Se51230	NCP	%	101			70-130	Pass	
Xylenes - Total*	S21-Se51230	NCP	%	101			70-130	Pass	
Spike - % Recovery									
Polycyclic Aromatic Hydrocarbons				Result 1					
Acenaphthene	N21-Se37262	NCP	%	76			70-130	Pass	
Acenaphthylene	N21-Se37262	NCP	%	85			70-130	Pass	
Anthracene	N21-Se37262	NCP	%	87			70-130	Pass	
Benz(a)anthracene	N21-Se37262	NCP	%	97			70-130	Pass	
Benzo(a)pyrene	N21-Se37262	NCP	%	99			70-130	Pass	
Benzo(b&j)fluoranthene	N21-Se37262	NCP	%	99			70-130	Pass	
Benzo(g.h.i)perylene	N21-Se37262	NCP	%	107			70-130	Pass	
Benzo(k)fluoranthene	N21-Se37262	NCP	%	96			70-130	Pass	
Chrysene	N21-Se37262	NCP	%	93			70-130	Pass	
Dibenz(a.h)anthracene	N21-Se37262	NCP	%	103			70-130	Pass	
Fluoranthene	N21-Se37262	NCP	%	94			70-130	Pass	
Fluorene	N21-Se37262	NCP	%	81			70-130	Pass	
Indeno(1.2.3-cd)pyrene	N21-Se37262	NCP	%	103			70-130	Pass	
Naphthalene	S21-Se47159	NCP	%	117			70-130	Pass	
Phenanthrene	N21-Se37262	NCP	%	90			70-130	Pass	
Pyrene	N21-Se37262	NCP	%	95			70-130	Pass	
Spike - % Recovery									
Organochlorine Pesticides				Result 1					
Chlordanes - Total	N21-Se37262	NCP	%	168			70-130	Fail	Q08
4.4'-DDD	N21-Se37262	NCP	%	97			70-130	Pass	
4.4'-DDE	N21-Se37262	NCP	%	81			70-130	Pass	

Test	Lab Sample ID	QA Source	Units	Result 1			Acceptance Limits	Pass Limits	Qualifying Code
a-HCH	N21-Se37262	NCP	%	76			70-130	Pass	
Aldrin	N21-Se37262	NCP	%	75			70-130	Pass	
b-HCH	N21-Se37262	NCP	%	85			70-130	Pass	
d-HCH	N21-Se37262	NCP	%	88			70-130	Pass	
Dieldrin	N21-Se37262	NCP	%	89			70-130	Pass	
Endosulfan I	N21-Se37262	NCP	%	88			70-130	Pass	
Endosulfan II	N21-Se37262	NCP	%	89			70-130	Pass	
Endosulfan sulphate	N21-Se37262	NCP	%	96			70-130	Pass	
Endrin aldehyde	N21-Se37262	NCP	%	101			70-130	Pass	
Endrin ketone	N21-Se37262	NCP	%	109			70-130	Pass	
g-HCH (Lindane)	N21-Se37262	NCP	%	84			70-130	Pass	
Heptachlor	N21-Se37262	NCP	%	119			70-130	Pass	
Heptachlor epoxide	N21-Se37262	NCP	%	95			70-130	Pass	
Methoxychlor	N21-Se37262	NCP	%	105			70-130	Pass	
Spike - % Recovery									
Organophosphorus Pesticides				Result 1					
Dimethoate	N21-Se37262	NCP	%	91			70-130	Pass	
Ethion	N21-Se37262	NCP	%	125			70-130	Pass	
Fenitrothion	N21-Se37262	NCP	%	125			70-130	Pass	
Mevinphos	N21-Se37262	NCP	%	100			70-130	Pass	
Spike - % Recovery									
Heavy Metals				Result 1					
Arsenic (filtered)	S21-Se46881	CP	%	108			75-125	Pass	
Cadmium (filtered)	S21-Se46881	CP	%	90			75-125	Pass	
Chromium (filtered)	S21-Se46881	CP	%	81			75-125	Pass	
Lead (filtered)	S21-Se46881	CP	%	80			75-125	Pass	
Mercury (filtered)	S21-Se46881	CP	%	90			75-125	Pass	
Test	**Lab Sample ID**	**QA Source**	**Units**	**Result 1**			**Acceptance Limits**	**Pass Limits**	**Qualifying Code**
Duplicate									
Total Recoverable Hydrocarbons				Result 1	Result 2	RPD			
TRH C6-C9	S21-Se44506	NCP	mg/L	< 0.02	< 0.02	<1	30%	Pass	
TRH C10-C14	S21-Se45482	NCP	mg/L	< 0.05	< 0.05	<1	30%	Pass	
TRH C15-C28	S21-Se45482	NCP	mg/L	< 0.1	< 0.1	<1	30%	Pass	
TRH C29-C36	S21-Se45482	NCP	mg/L	< 0.1	< 0.1	<1	30%	Pass	
Naphthalene	S21-Se44506	NCP	mg/L	< 0.01	< 0.01	<1	30%	Pass	
TRH C6-C10	S21-Se44506	NCP	mg/L	< 0.02	< 0.02	<1	30%	Pass	
TRH >C10-C16	S21-Se45482	NCP	mg/L	< 0.05	< 0.05	<1	30%	Pass	
TRH >C16-C34	S21-Se45482	NCP	mg/L	< 0.1	< 0.1	<1	30%	Pass	
TRH >C34-C40	S21-Se45482	NCP	mg/L	< 0.1	< 0.1	<1	30%	Pass	
Duplicate									
BTEX				Result 1	Result 2	RPD			
Benzene	S21-Se44506	NCP	mg/L	< 0.001	< 0.001	<1	30%	Pass	
Toluene	S21-Se44506	NCP	mg/L	< 0.001	< 0.001	<1	30%	Pass	
Ethylbenzene	S21-Se44506	NCP	mg/L	< 0.001	< 0.001	<1	30%	Pass	
m&p-Xylenes	S21-Se44506	NCP	mg/L	< 0.002	< 0.002	<1	30%	Pass	
o-Xylene	S21-Se44506	NCP	mg/L	< 0.001	< 0.001	<1	30%	Pass	
Xylenes - Total*	S21-Se44506	NCP	mg/L	< 0.003	< 0.003	<1	30%	Pass	
Duplicate									
Polycyclic Aromatic Hydrocarbons				Result 1	Result 2	RPD			
Acenaphthene	S21-Se45482	NCP	mg/L	< 0.001	< 0.001	<1	30%	Pass	
Acenaphthylene	S21-Se45482	NCP	mg/L	< 0.001	< 0.001	<1	30%	Pass	
Anthracene	S21-Se45482	NCP	mg/L	< 0.001	< 0.001	<1	30%	Pass	
Benz(a)anthracene	S21-Se45482	NCP	mg/L	< 0.001	< 0.001	<1	30%	Pass	
Benzo(a)pyrene	S21-Se45482	NCP	mg/L	< 0.001	< 0.001	<1	30%	Pass	

Duplicate									
Polycyclic Aromatic Hydrocarbons				Result 1	Result 2	RPD			
Benzo(b&j)fluoranthene	S21-Se45482	NCP	mg/L	< 0.001	< 0.001	<1	30%	Pass	
Benzo(g.h.i)perylene	S21-Se45482	NCP	mg/L	< 0.001	< 0.001	<1	30%	Pass	
Benzo(k)fluoranthene	S21-Se45482	NCP	mg/L	< 0.001	< 0.001	<1	30%	Pass	
Chrysene	S21-Se45482	NCP	mg/L	< 0.001	< 0.001	<1	30%	Pass	
Dibenz(a.h)anthracene	S21-Se45482	NCP	mg/L	< 0.001	< 0.001	<1	30%	Pass	
Fluoranthene	S21-Se45482	NCP	mg/L	< 0.001	< 0.001	<1	30%	Pass	
Fluorene	S21-Se45482	NCP	mg/L	< 0.001	< 0.001	<1	30%	Pass	
Indeno(1.2.3-cd)pyrene	S21-Se45482	NCP	mg/L	< 0.001	< 0.001	<1	30%	Pass	
Naphthalene	S21-Se45482	NCP	mg/L	< 0.001	< 0.001	<1	30%	Pass	
Phenanthrene	S21-Se45482	NCP	mg/L	< 0.001	< 0.001	<1	30%	Pass	
Pyrene	S21-Se45482	NCP	mg/L	< 0.001	< 0.001	<1	30%	Pass	
Duplicate									
Organochlorine Pesticides				Result 1	Result 2	RPD			
Chlordanes - Total	S21-Se45482	NCP	mg/L	< 0.002	< 0.002	<1	30%	Pass	
4.4'-DDD	S21-Se45482	NCP	mg/L	< 0.0002	< 0.0002	<1	30%	Pass	
4.4'-DDE	S21-Se45482	NCP	mg/L	< 0.0002	< 0.0002	<1	30%	Pass	
4.4'-DDT	S21-Se45482	NCP	mg/L	< 0.0002	< 0.0002	<1	30%	Pass	
a-HCH	S21-Se45482	NCP	mg/L	< 0.0002	< 0.0002	<1	30%	Pass	
Aldrin	S21-Se45482	NCP	mg/L	< 0.0002	< 0.0002	<1	30%	Pass	
b-HCH	S21-Se45482	NCP	mg/L	< 0.0002	< 0.0002	<1	30%	Pass	
d-HCH	S21-Se45482	NCP	mg/L	< 0.0002	< 0.0002	<1	30%	Pass	
Dieldrin	S21-Se45482	NCP	mg/L	< 0.0002	< 0.0002	<1	30%	Pass	
Endosulfan I	S21-Se45482	NCP	mg/L	< 0.0002	< 0.0002	<1	30%	Pass	
Endosulfan II	S21-Se45482	NCP	mg/L	< 0.0002	< 0.0002	<1	30%	Pass	
Endosulfan sulphate	S21-Se45482	NCP	mg/L	< 0.0002	< 0.0002	<1	30%	Pass	
Endrin	S21-Se45482	NCP	mg/L	< 0.0002	< 0.0002	<1	30%	Pass	
Endrin aldehyde	S21-Se45482	NCP	mg/L	< 0.0002	< 0.0002	<1	30%	Pass	
Endrin ketone	S21-Se45482	NCP	mg/L	< 0.0002	< 0.0002	<1	30%	Pass	
g-HCH (Lindane)	S21-Se45482	NCP	mg/L	< 0.0002	< 0.0002	<1	30%	Pass	
Heptachlor	S21-Se45482	NCP	mg/L	< 0.0002	< 0.0002	<1	30%	Pass	
Heptachlor epoxide	S21-Se45482	NCP	mg/L	< 0.0002	< 0.0002	<1	30%	Pass	
Hexachlorobenzene	S21-Se45482	NCP	mg/L	< 0.0002	< 0.0002	<1	30%	Pass	
Methoxychlor	S21-Se45482	NCP	mg/L	< 0.0002	< 0.0002	<1	30%	Pass	
Duplicate									
Organophosphorus Pesticides				Result 1	Result 2	RPD			
Azinphos-methyl	S21-Se45482	NCP	mg/L	< 0.002	< 0.002	<1	30%	Pass	
Bolstar	S21-Se45482	NCP	mg/L	< 0.002	< 0.002	<1	30%	Pass	
Chlorfenvinphos	S21-Se45482	NCP	mg/L	< 0.02	< 0.02	<1	30%	Pass	
Chlorpyrifos	S21-Se45482	NCP	mg/L	< 0.002	< 0.002	<1	30%	Pass	
Chlorpyrifos-methyl	S21-Se45482	NCP	mg/L	< 0.002	< 0.002	<1	30%	Pass	
Coumaphos	S21-Se45482	NCP	mg/L	< 0.02	< 0.02	<1	30%	Pass	
Demeton-S	S21-Se45482	NCP	mg/L	< 0.002	< 0.002	<1	30%	Pass	
Demeton-O	S21-Se45482	NCP	mg/L	< 0.002	< 0.002	<1	30%	Pass	
Diazinon	S21-Se45482	NCP	mg/L	< 0.002	< 0.002	<1	30%	Pass	
Dichlorvos	S21-Se45482	NCP	mg/L	< 0.002	< 0.002	<1	30%	Pass	
Dimethoate	S21-Se45482	NCP	mg/L	< 0.002	< 0.002	<1	30%	Pass	
Disulfoton	S21-Se45482	NCP	mg/L	< 0.002	< 0.002	<1	30%	Pass	
EPN	S21-Se45482	NCP	mg/L	< 0.002	< 0.002	<1	30%	Pass	
Ethion	S21-Se45482	NCP	mg/L	< 0.002	< 0.002	<1	30%	Pass	
Ethoprop	S21-Se45482	NCP	mg/L	< 0.002	< 0.002	<1	30%	Pass	
Ethyl parathion	S21-Se45482	NCP	mg/L	< 0.002	< 0.002	<1	30%	Pass	
Fenitrothion	S21-Se45482	NCP	mg/L	< 0.002	< 0.002	<1	30%	Pass	
Fensulfothion	S21-Se45482	NCP	mg/L	< 0.002	< 0.002	<1	30%	Pass	
Fenthion	S21-Se45482	NCP	mg/L	< 0.002	< 0.002	<1	30%	Pass	

Duplicate									
Organophosphorus Pesticides				Result 1	Result 2	RPD			
Malathion	S21-Se45482	NCP	mg/L	< 0.002	< 0.002	<1	30%	Pass	
Merphos	S21-Se45482	NCP	mg/L	< 0.002	< 0.002	<1	30%	Pass	
Methyl parathion	S21-Se45482	NCP	mg/L	< 0.002	< 0.002	<1	30%	Pass	
Mevinphos	S21-Se45482	NCP	mg/L	< 0.002	< 0.002	<1	30%	Pass	
Monocrotophos	S21-Se45482	NCP	mg/L	< 0.002	< 0.002	<1	30%	Pass	
Naled	S21-Se45482	NCP	mg/L	< 0.002	< 0.002	<1	30%	Pass	
Omethoate	S21-Se45482	NCP	mg/L	< 0.02	< 0.02	<1	30%	Pass	
Phorate	S21-Se45482	NCP	mg/L	< 0.002	< 0.002	<1	30%	Pass	
Pirimiphos-methyl	S21-Se45482	NCP	mg/L	< 0.02	< 0.02	<1	30%	Pass	
Pyrazophos	S21-Se45482	NCP	mg/L	< 0.002	< 0.002	<1	30%	Pass	
Ronnel	S21-Se45482	NCP	mg/L	< 0.002	< 0.002	<1	30%	Pass	
Terbufos	S21-Se45482	NCP	mg/L	< 0.002	< 0.002	<1	30%	Pass	
Tetrachlorvinphos	S21-Se45482	NCP	mg/L	< 0.002	< 0.002	<1	30%	Pass	
Tokuthion	S21-Se45482	NCP	mg/L	< 0.002	< 0.002	<1	30%	Pass	
Trichloronate	S21-Se45482	NCP	mg/L	< 0.002	< 0.002	<1	30%	Pass	
Duplicate									
Heavy Metals				Result 1	Result 2	RPD			
Arsenic (filtered)	S21-Se56099	NCP	mg/L	< 0.001	< 0.001	<1	30%	Pass	
Cadmium (filtered)	S21-Se56099	NCP	mg/L	< 0.0002	< 0.0002	<1	30%	Pass	
Chromium (filtered)	S21-Se56099	NCP	mg/L	0.003	0.003	3.0	30%	Pass	
Copper (filtered)	S21-Se56099	NCP	mg/L	< 0.001	< 0.001	<1	30%	Pass	
Lead (filtered)	S21-Se56099	NCP	mg/L	< 0.001	< 0.001	<1	30%	Pass	
Mercury (filtered)	S21-Se56099	NCP	mg/L	< 0.0001	< 0.0001	<1	30%	Pass	
Nickel (filtered)	S21-Se56099	NCP	mg/L	0.001	0.001	7.0	30%	Pass	
Zinc (filtered)	S21-Se56099	NCP	mg/L	0.023	0.025	7.0	30%	Pass	

Comments

Total coliforms analysed by; Eurofins AMS; accreditation number 15773; report reference NJ21AB2107

Sample Integrity

Custody Seals Intact (if used)	N/A
Attempt to Chill was evident	Yes
Sample correctly preserved	Yes
Appropriate sample containers have been used	Yes
Sample containers for volatile analysis received with minimal headspace	Yes
Samples received within HoldingTime	Yes
Some samples have been subcontracted	No

Qualifier Codes/Comments

Code	Description
N01	F2 is determined by arithmetically subtracting the "naphthalene" value from the ">C10-C16" value. The naphthalene value used in this calculation is obtained from volatiles (Purge & Trap analysis).
N02	Where we have reported both volatile (P&T GCMS) and semivolatile (GCMS) naphthalene data, results may not be identical. Provided correct sample handling protocols have been followed, any observed differences in results are likely to be due to procedural differences within each methodology. Results determined by both techniques have passed all QAQC acceptance criteria, and are entirely technically valid.
N04	F1 is determined by arithmetically subtracting the "Total BTEX" value from the "C6-C10" value. The "Total BTEX" value is obtained by summing the concentrations of BTEX analytes. The "C6-C10" value is obtained by quantitating against a standard of mixed aromatic/aliphatic analytes.
N07	Please note:- These two PAH isomers closely co-elute using the most contemporary analytical methods and both the reported concentration (and the TEQ) apply specifically to the total of the two co-eluting PAHs
Q08	The matrix spike recovery is outside of the recommended acceptance criteria. An acceptable recovery was obtained for the laboratory control sample indicating a sample matrix interference.
Q09	The Surrogate recovery is outside of the recommended acceptance criteria due to matrix interference. Acceptance criteria were met for all other QC

Authorised by:

Andrew Black	Analytical Services Manager
Andrew Sullivan	Senior Analyst-Organic (NSW)
John Nguyen	Senior Analyst-Metal (NSW)
Roopesh Rangarajan	Senior Analyst-Volatile (NSW)

Glenn Jackson
General Manager

Final Report – this report replaces any previously issued Report

- Indicates Not Requested

* Indicates NATA accreditation does not cover the performance of this service

Measurement uncertainty of test data is available on request or please click here.

Certificate of Analysis

Analytical Report: AAR06222
Eurofins Sample Number: NJ21AB2107-1
Version: 1

NATA Accreditation No: 15773
Accredited for compliance with ISO/IEC 17025 - Testing

Eurofins Environment Testing Australia
PO BOX 276 OAKLEIGH VIC 3166
VIC,
AU

Client Account Number: A00493042GS3
Eurofins Quote Number: AGW3PH19000708

Collected On:	21-Sep-2021
Original Received Date:	23-Sep-2021
Description:	Water Sample; Client ID: QC201_210921; Eurofins|mgt ID: S21-Se46881
Containers Submitted:	1 Bottle(s)

# Total Coliform Count		
Total Coliform Count	3.9×10^3	CFU/100 mL

Method: AS4276.5,TMW 142
Analysis Date: 23-Sep-2021

Supplemental Information

Samplesweretestedasreceived.

Specifications(if) reportedareasprovidedbytheclient.

Accredited for compliance with ISO/IEC 17025:2017- Testing. NATA Accreditation Number 15773.

Contracted Company: Eurofins ams Laboratories (Sydney)

8, Rachael Close, Silverwater, NSW 2128 Australia
SampleReceiptAMS@eurofins.com

TGA Licence No: MI-15112007-LI-002191-11 APVMA Licence No: 6139
Questions about this report should be directed to your project manager or the general email listed above.

Reviewed and electronically signed for Data Reviewer Approval by
Mona Patel, Team Leader - NSPT
for Eurofins ams Laboratories Pty Ltd, on 28-Sep-2021 14:02:52 UTC+10:00

ALS Environmental

CHAIN OF CUSTODY

ALS Laboratory: please tick →

☐ ADELAIDE 21 Burma Road Pooraka SA 5095 Ph: 08 8359 0890 E: adelaide@alsglobal.com
☐ BRISBANE 32 Shand Street Stafford QLD 4053 Ph: 07 3243 7222 E: samples.brisbane@alsglobal.com
☐ GLADSTONE 46 Callemondah Drive Clinton QLD 4680 Ph: 07 7471 5600 E: gladstone@alsglobal.com
☐ MACKAY 78 Harbour Road Mackay QLD 4740 Ph: 07 4944 0177 E: mackay@alsglobal.com
☐ MELBOURNE 2-4 Westall Road Springvale VIC 3171 Ph: 03 8549 9600 E: samples.melbourne@alsglobal.com
☐ MUDGEE 27 Sydney Road Mudgee NSW 2850 Ph: 02 6372 6735 E: mudgee.mail@alsglobal.com
☐ NEWCASTLE 5/585 Maitland Rd Mayfield West NSW 2304 Ph: 02 4014 2500 E: samples.newcastle@alsglobal.com
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☐ WOLLONGONG 99 Kenny Street Wollongong NSW 2500 Ph: 02 4225 3125 E: portkembla@alsglobal.com

URGENT

CLIENT: Jacobs Arcadis Joint Venture (JAJV)
OFFICE: Sydney
PROJECT: IA254001
ORDER NUMBER: -
PROJECT MANAGER: Amanda Mullen
SAMPLER: NK
COC emailed to ALS? (YES / [✓ NO])
Email Reports to (will default to PM if no other addresses are listed): nick.keatley@jacobs.com amanda.mullen@jacobs.com
Email Invoice to (will default to PM if no other addresses are listed): Nick/Amanda.

TURNAROUND REQUIREMENTS : (Standard TAT may be longer for some tests e.g. Ultra Trace Organics)
☒ Standard TAT (List due date):
☐ Non Standard or urgent TAT (List due date):
ALS QUOTE NO.:
CONTACT PH: -
SAMPLER MOBILE: 0421201294
EDD FORMAT (or default):

COC SEQUENCE NUMBER (Circle)
COC: [✓ 1] 2 3 4 5 6 7
OF: [✓ 1] 2 3 4 5 6 7

FOR LABORATORY USE ONLY (Circle)
Custody Seal Intact? Yes No [✓ N/A]
Free ice / frozen ice bricks present upon receipt? Yes No N/A
Random Sample Temperature on Receipt: 4.5 °C
Other comment:

RELINQUISHED BY: NK
DATE/TIME: 21/9/21
RECEIVED BY: Juliana G
DATE/TIME: 21/9/21 2:45 pm
RELINQUISHED BY:
DATE/TIME:
RECEIVED BY: ALS
DATE/TIME: 21/9/21 1810

COMMENTS/SPECIAL HANDLING/STORAGE OR DISPOSAL: Also email results to EDMANZ@jacobs.com, jacobs.labresults@esdat.net

ALS USE	SAMPLE DETAILS MATRIX: SOLID (S) WATER (W)			CONTAINER INFORMATION		ANALYSIS REQUIRED including SUITES (NB. Suite Codes must be listed to attract suite price) Where Metals are required, specify Total (unfiltered bottle required) or Dissolved (field filtered bottle required).									Additional Information
LAB ID	SAMPLE ID	DATE / TIME	MATRIX	TYPE & PRESERVATIVE (refer to codes below)	TOTAL CONTAINERS	W-26	W-2	W-12	NT-8	Cyanide	Total Coliforms	Formaldehyde	BTEX	PFAS (LEX	
1	GW01	20/9/21	W			X									
2	GW05	↓	↓				X			X					
3	GW07	↓	↓			X									
4	GW03	↓	↓				X		X			X			
5	GW02	21/9/21	↓			X		X			X				
6	GW06	↓	↓			X		X			X				
7	QC101_210921	↓	↓			X		X			X				Duplicate
-	QC201_210921	↓	↓			X		X			X				Send to eurofins
8	QC501_210921	↓	↓			X									Rinsate (total metals)
9	QC300_210921	↓	↓										X		Trip Blank
10	QC501_210917	~~21~~ 17/9/21	↓											X	Rinsate.

Subcon / Forward Lab / Split WO:
Lab / Analysis: Eurofins → QC201_2109
Organised By / Date:
Relinquished By / Date:
Connote / Courier:
WO No:
Attached By PO / Internal Sheet:

Environmental Division
Sydney
Work Order Reference
ES2134103
Telephone : + 61-2-8784 8555

Water Container Codes: P = Unpreserved Plastic; N = Nitric Preserved Plastic; ORC = Nitric Preserved ORC; SH = Sodium Hydroxide/Cd Preserved; S = Sodium Hydroxide Preserved Plastic; AG = Amber Glass Unpreserved; AP - Airfreight Unpreserved Plastic
V = VOA Vial HCl Preserved; VB = VOA Vial Sodium Bisulphate Preserved; VS = VOA Vial Sulfuric Preserved; AV = Airfreight Unpreserved Vial SG = Sulfuric Preserved Amber Glass; H = HCl preserved Plastic; HS = HCl preserved Speciation bottle; SP = Sulfuric Preserved Plastic; F = Formaldehyde Preserved Glass;
Z = Zinc Acetate Preserved Bottle; E = EDTA Preserved Bottles; ST = Sterile Bottle; ASS = Plastic Bag for Acid Sulphate Soils; B = Unpreserved Bag.

M.H 22/9/21 #826833

Appendix E. Calibration Certificates

PID Calibration Certificate

Instrument **PhoCheck Tiger**
Serial No. **T-111096**

airmet

Air-Met Scientific Pty Ltd
1300 137 067

Item	Test	Pass	Comments			
Battery	Charge Condition	✓				
	Fuses	✓				
	Capacity	✓				
	Recharge OK?	✓				
Switch/keypad	Operation	✓				
Display	Intensity	✓				
	Operation (segments)	✓				
Grill Filter	Condition	✓				
	Seal	✓				
Pump	Operation	✓				
	Filter	✓				
	Flow	✓				
	Valves, Diaphragm	✓				
PCB	Condition	✓				
Connectors	Condition	✓				
Sensor	PID	✓	10.6 ev			
Alarms	Beeper	✓	Low	High	TWA	STEL
	Settings	✓	50ppm	100ppm		
Software	Version	✓				
Data logger	Operation	✓				
Download	Operation	✓				
Other tests:						

Certificate of Calibration

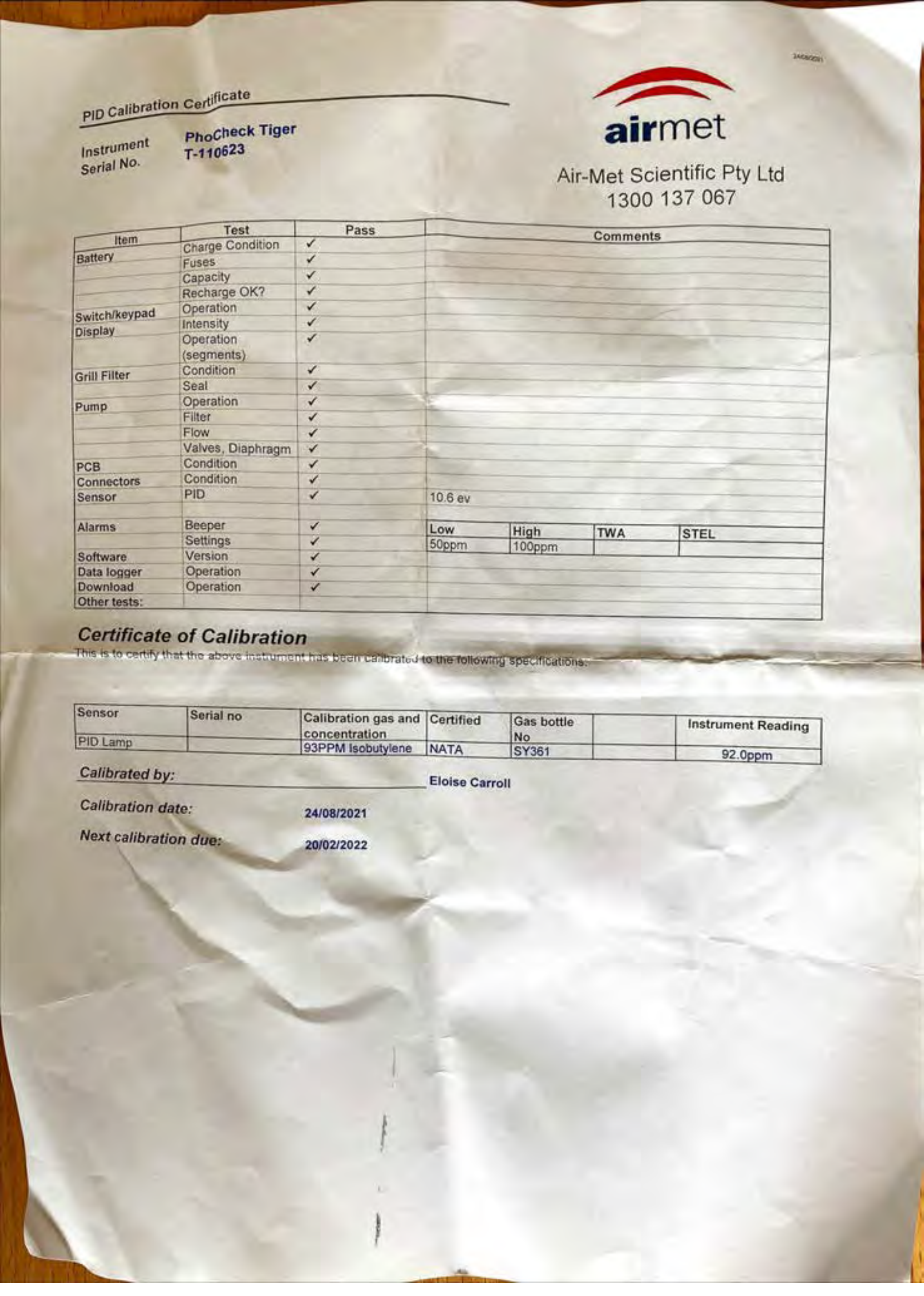
This is to certify that the above instrument has been calibrated to the following specifications:

Sensor	Serial no	Calibration gas and concentration	Certified	Gas bottle No		Instrument Reading
PID Lamp		93ppm Isobutylene	NATA	SY361		90.3ppm

Calibrated by: **Kylie Rawlings**

Calibration date: **19/08/2021**

Next calibration due: **18/09/2021**



PID Calibration Certificate

Instrument **PhoCheck Tiger**
Serial No. **T-110623**

airmet

Air-Met Scientific Pty Ltd
1300 137 067

Item	Test	Pass	Comments			
Battery	Charge Condition	✓				
	Fuses	✓				
	Capacity	✓				
	Recharge OK?	✓				
Switch/keypad	Operation	✓				
Display	Intensity	✓				
	Operation (segments)	✓				
Grill Filter	Condition	✓				
	Seal	✓				
Pump	Operation	✓				
	Filter	✓				
	Flow	✓				
	Valves, Diaphragm	✓				
PCB	Condition	✓				
Connectors	Condition	✓				
Sensor	PID	✓	10.6 ev			
Alarms	Beeper	✓	Low	High	TWA	STEL
	Settings	✓	50ppm	100ppm		
Software	Version	✓				
Data logger	Operation	✓				
Download	Operation	✓				
Other tests:						

Certificate of Calibration

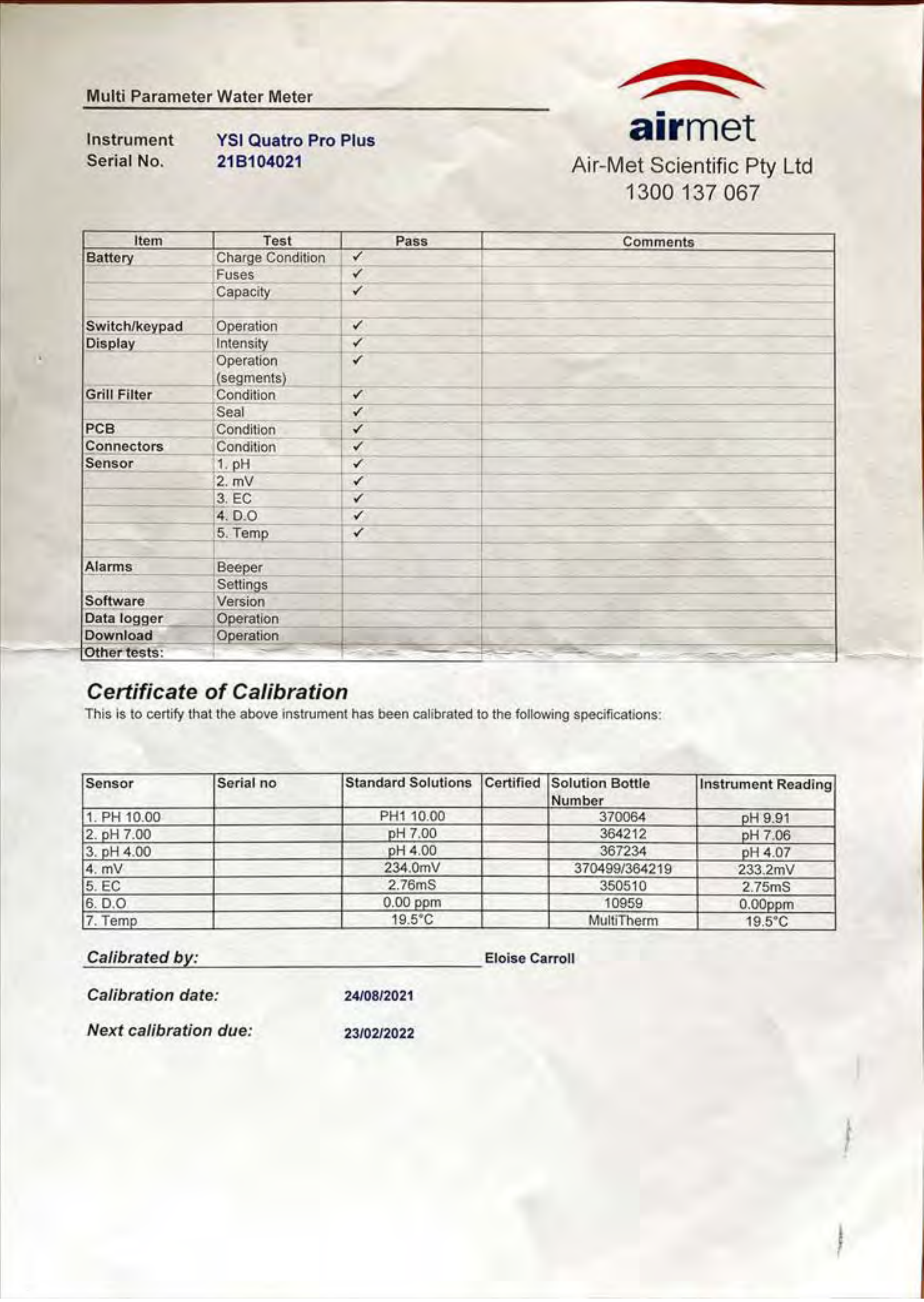
This is to certify that the above instrument has been calibrated to the following specifications:

Sensor	Serial no	Calibration gas and concentration	Certified	Gas bottle No		Instrument Reading
PID Lamp		93PPM Isobutylene	NATA	SY361		92.0ppm

Calibrated by: **Eloise Carroll**

Calibration date: **24/08/2021**

Next calibration due: **20/02/2022**



Multi Parameter Water Meter

Instrument **YSI Quatro Pro Plus**
Serial No. **21B104021**

airmet
Air-Met Scientific Pty Ltd
1300 137 067

Item	Test	Pass	Comments
Battery	Charge Condition	✓	
	Fuses	✓	
	Capacity	✓	
Switch/keypad	Operation	✓	
Display	Intensity	✓	
	Operation (segments)	✓	
Grill Filter	Condition	✓	
	Seal	✓	
PCB	Condition	✓	
Connectors	Condition	✓	
Sensor	1. pH	✓	
	2. mV	✓	
	3. EC	✓	
	4. D.O	✓	
	5. Temp	✓	
Alarms	Beeper		
	Settings		
Software	Version		
Data logger	Operation		
Download	Operation		
Other tests:			

Certificate of Calibration

This is to certify that the above instrument has been calibrated to the following specifications:

Sensor	Serial no	Standard Solutions	Certified	Solution Bottle Number	Instrument Reading
1. PH 10.00		PH1 10.00		370064	pH 9.91
2. pH 7.00		pH 7.00		364212	pH 7.06
3. pH 4.00		pH 4.00		367234	pH 4.07
4. mV		234.0mV		370499/364219	233.2mV
5. EC		2.76mS		350510	2.75mS
6. D.O		0.00 ppm		10959	0.00ppm
7. Temp		19.5°C		MultiTherm	19.5°C

Calibrated by: **Eloise Carroll**

Calibration date: **24/08/2021**

Next calibration due: **23/02/2022**

Appendix F. Sampling, Analysis and Quality Plan - Stage 2 Contamination Assessment

Great Western Highway Upgrade Program
Design and Environmental Assessment Services
West Package

Sampling Analysis and Quality Plan – Stage 2 Contamination Assessment

GWHW-JAJV-GWH-CT-RPT-000002

20 August 2021

Transport for NSW

Contract No. 19.0000302650.1982

Great Western Highway Upgrade Program – Design and Environmental Assessment Services – West Package

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Document Title:	Sampling Analysis and Quality Plan – Stage 2 Contamination Assessment
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Client Name:	Transport for NSW
Client No:	Contract No. 19.0000302650.1982
Project Manager:	Dion Bowen
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File Name:	

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Document history and status

Revision	Date	Description	Author	Reviewed	Approved
1	05/08/21	Technical review	N. Keatley	M. Stacey	K. Wiggins
2	19/08/21	Response to client comments	N. Keatley	M. Stacey	K. Wiggins
Final	20/08/2021	Final	-	-	K. Wiggins

Contents

Table and Figures

Glossary of terms and acronyms

Term	Meaning
ACM	Asbestos containing material
AEI	Area of Environmental Interest
CLM Act	Contaminated Land Management Act 1997
CRR	Coxs River Road Intersection design stage
CSM	Conceptual Site Model
DEC	Department of Environment and Conservation
DQO	Data Quality Objective
DSI	Detailed Site Investigation
EP&A Act	Environmental Planning and Assessment Act
EPL	Environment Protection Licence
FBL	Forty Bends to Lithgow design stage
GWH	Great Western Highway
GWHU	Great Western Highway Upgrade
JAJV	Jacobs Arcadis Joint Venture
L2R	Little Hartley to River Lett design stage
mbgl	Metres below ground level
NATA	National Association of Testing Authorities
NEMP	National Environmental Management Plan
NEPM	National Environment Protection (Assessment of Site Contamination) Measure 1999 (Amended 2013)
NSW EPA	NSW Environment Protection Authority
NSW OEH	NSW Office of Environment and Heritage
PFAS	Per- and poly-fluoroalkyl substances
PSI	Preliminary Site Investigation
R2F	River Lett to Forty Bends design stage
RAP	Remedial Action Plan
REF	Review of Environmental Factors
SAQP	Sampling Analysis and Quality Plan
SPT	Standard Penetration Test
Transport	Transport for New South Wales
USEPA	United State Environmental Protection Agency

1. Introduction

1.1 Great Western Highway Upgrade

Transport for NSW (Transport) is planning and investigating an upgrade of the Great Western Highway (HW5) between Katoomba and Lithgow. The Great Western Highway Upgrade program will deliver around 34 kilometres of four lane divided highway between Katoomba and Lithgow. The program is needed to provide a safer and more efficient link between the Central West NSW and the Sydney Motorway Network for freight, tourists and general traffic. The program to deliver the upgrade consists of a series of projects.

In May 2010 a preferred route for the Great Western Highway Upgrade between Mount Victoria and Lithgow was announced and the preferred corridor was subsequently reserved via SP2 Infrastructure zoning in the Blue Mountains Local Environmental Plan 2015 and the Lithgow Local Environmental Plan 2014.

A Jacobs Arcadis joint venture has been engaged to progress the concept design and prepare a review of environmental factors (REF), including specialist environmental investigations, for the Little Hartley to Lithgow section of the Great Western Highway (herein after referred to as ‘the site’). The project includes:

- Upgrade of the Great Western Highway between Little Hartley and Lithgow to a four lane divided highway, about 14 kilometres in length
- Provision of service roads where possible to minimise direct access to the Great Western Highway from adjacent properties, with the existing highway to be used as service road wherever possible
- Provision of two heavy vehicle rest areas, one eastbound and one westbound.

The project is being designed in four stages. A description and key features of each design stage is provided below. The design stages and construction footprint are shown in Figure 1-1.

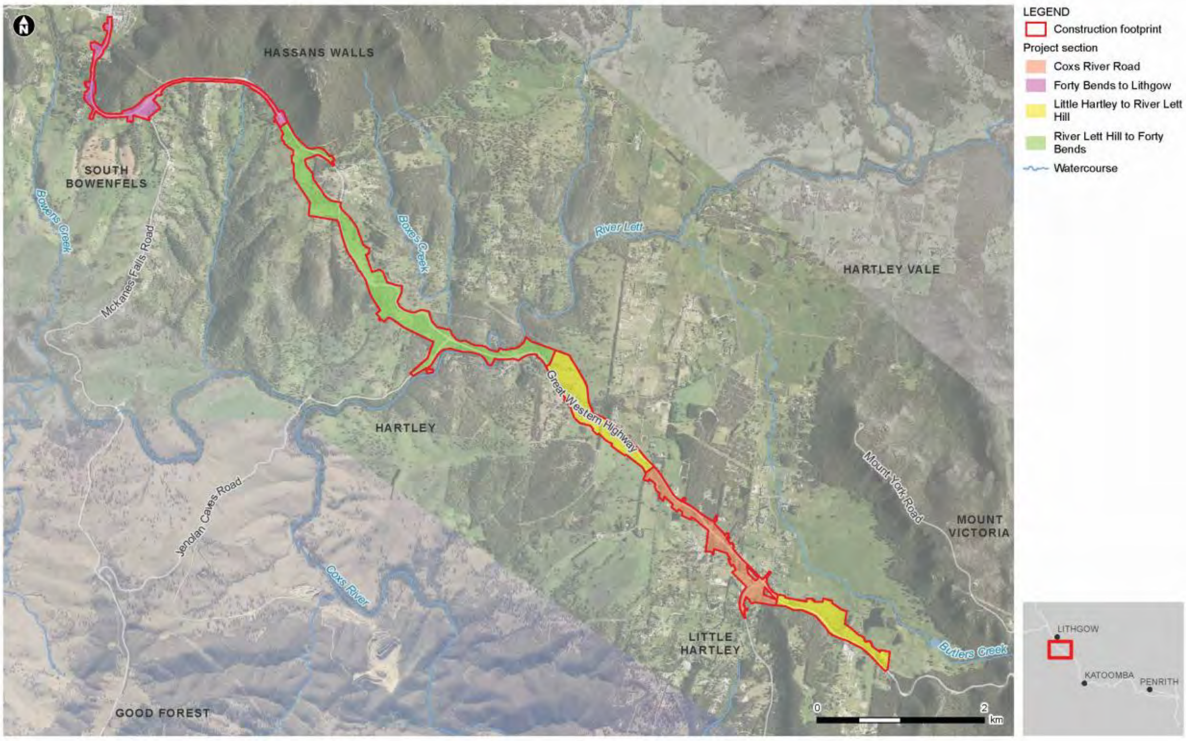

Figure 1-1: Project footprint and design stages

1.1.1 Little Hartley to River Lett Hill (L2R)

Little Hartley to River Lett Hill (L2R) involves widening approximately six kilometres of the Great Western Highway to two lanes in each direction between the base of Mount Victoria Pass and west of the River Lett (excluding Coxs River Road Intersection). Key features include:

- Bridges over the new Great Western Highway east of Cox's River Road and west of Mid Hartley Road to maintain the local access road connection
- Realignment of the existing highway in some sections to become a local service road
- New twin bridges over the River Lett
- Refurbishment of bridge over the River Lett on the existing Great Western Highway as part of a local service road
- Upgrades to intersections at Carroll Drive and Kelly Street, including a realignment of Kelly Street
- Construction of two heavy vehicle rest areas near Mid Hartley Rd & Carroll Drive, connected by a service road.

1.1.2 Coxs River Road Intersection (CRR)

Coxs River Road Intersection (CRR) involves widening about 3.4 kilometres of the Great Western Highway to two lanes in each direction between east of the Coxs River Road intersection and in the vicinity of Mid Hartley Road. The project also involves creating a grade separated intersection crossing the upgraded highway between Coxs River Road and the old Great Western Highway. Key features include:

- Provision of a grade separated interchange at Coxs River Road, supplemented by new sections of connecting roadway to create a local service road network
- Realignment of the existing highway in the vicinity of Browns Gap to create a local service road
- Upgrades to intersections at Browns Gap Road and Baaners Lane.

1.1.3 River Lett Hill to Forty Bends (R2F)

River Lett Hill to Forty Bends (R2F) project involves widening approximately four kilometres of the Great Western Highway to two lanes in each direction between the River Lett and Forty Bends Road. Key features include:

- Twin bridges over Jenolan Caves Road (360 metres long and 25 metres high) to form a grade separated intersection. This would connect to new sections of roadway to create a local service road network, including on and off ramps
- Upgrade to the intersection at Blackmans Creek Road
- Realignment of the existing highway in a number of locations, and extension of box culverts in the vicinity of Box's Creek to create local service roads
- Extensive fills at the abutments for the bridge over Jenolan Caves Road and Fernhill Road and extensive cuts at River Lett Hill
- Relocation of 132kV overhead powerlines.

1.1.4 Forty Bends to Lithgow (FBL)

Forty Bends to Lithgow (FBL) involves widening approximately 4.5 kilometres of the Great Western Highway to two lanes in each direction between Forty Bends Road and Magpie Hollow Road.

- Upgrades to intersections at McKanes Falls Road, Old Bathurst Road and Mudgee Street, and modifications to the intersection at Forty Bends Road (western junction)
- Provision of significant retaining structures

- Significant provisions for private property access.

1.2 Purpose and scope

Jacobs Arcadis Joint Venture (JAJV) was commissioned by Transport to undertake a Stage 2 Contamination Assessment as part of the Little Hartley to Lithgow section of the GWHU project.

The Stage 2 assessment report will be prepared as an appendix to the Contamination Assessment standalone report that has been prepared to support the Review of Environmental Factors (REF) under Part 5 of the Environmental Planning and Assessment (EP&A) Act for the project. The report will be incorporated at the Submissions Report phase.

This document presents the Sampling Analysis and Quality Plan (SAQP) for the Stage 2 contamination assessment for the GWHU project.

The purpose of this SAQP is to define the objectives of the data collection efforts, the proposed investigations to meet these objectives, and the quality controls that will be implemented to ensure that the data collected is suitable for site assessment decisions. The SAQP includes the following:

a) Investigation objectives

c) Data Quality Objectives

d) Sampling and analysis plan including field methodology

e) Quality control and quality assurance plan.

1.3 Objectives

The objectives of the Stage 2 assessment outlined in this SAQP are to:

- Further understand the potential presence and magnitude of contamination to refine the conceptual site model and project impact assessment, as detailed in the JAJV (April 2021) Stage 1 Preliminary Site Investigation (PSI)
- Inform the assessment of risk and liabilities associated with contamination with regards to the design and development works for the project.
- Inform the need for further mitigation measures, such as a Remedial Action Plan (RAP), based on the contamination assessment findings.

1.4 Relevant standards and guidelines

This SAQP has been developed in accordance with Schedule B2 of the National Environment Protection (Assessment of Site Contamination) Measure 1999 (as amended in 2013) (NEPM) (NEPC, 2013) and the Per- and poly-fluoroalkyl substances (PFAS) National Environmental Management Plan (NEMP) (PFAS NEMP, 2020). The following standards and guidelines have also been considered:

- Contaminated Sites: Guidelines for Consultants Reporting on Contaminated Sites (NSW Office of Environment & Heritage (OEH) 2011)
- Guidelines for the NSW Site Auditor Scheme (3rd edition) (NSW EPA 2017)
- Guidelines for the Assessment and Management of Groundwater Contamination, (Department of Environment and Conservation NSW 2007)
- Guidelines on the Duty to Report Contamination under the Contamination Land Management Act 1997 (NSW EPA 2015)

- Technical Note: Investigation of Service Station Sites (NSW EPA 2014).

2. Background

A Stage 1 Preliminary Site Investigation (PSI) was undertaken by JAJV in April 2021. Based on the findings of the Stage 1 PSI, the JAJV concluded the following with regards to the site:

- There are a number of locations within the site that have a moderate to high contamination impact potential in relation to soil, groundwater and vapour across the site, requiring further investigation. These include:
    - Soil and groundwater sampling within areas of proposed cutting or piling at the former service station in Little Hartley
    - Groundwater sampling within the proposed area of cutting near Hartley Cemetery
    - Sampling of soil stockpiles
    - Sampling of surface soil and sediment along the current road corridor
    - Soil sampling within the construction footprint at the Little Hartley Airfield
    - Soil sampling within agricultural properties along the construction footprint to target specific point sources (for example sheep dips or waste burial, where identified) as well as general agricultural land use
    - Groundwater sampling nearby areas of identified septic tank use, including in Hartley Village
    - Soil and groundwater sampling within the proposed area of cutting or piling for bridge construction near River Lett, where there is a history of mining operations
    - Groundwater sampling within the construction footprint in South Bowenfels to assess the potential impact from the former service station.

Based on the results of the PSI, a stage 2 contamination assessment was recommended to further investigate these potential contamination impacts and inform the need for a Remedial Action Plan (RAP).

2.1 Conceptual Site Model (CSM)

As part of the PSI, a conceptual site model (CSM) was developed as part of a high-level contamination prioritisation. This outlined the potential contamination impacts for each of the four project design areas. This CSM is shown in Appendix A.

Based on this high-level contamination prioritisation, it was recommended that areas identified as having a moderate or above contamination impact to be further investigated as part of this Stage 2 Contamination Assessment. A summary of these areas and the investigations planned is detailed in Section 4.1.

3. Data Quality Objectives

The Data Quality Objectives (DQOs) process is used to define the type, quantity and quality of data needed to support decisions relating to the environmental condition of a site. Schedule B2 of the NEPM (NEPC 2013) outlines the seven step DQO process as one example of a suitable systematic planning approach for site investigations.

These steps were developed by the USEPA guidance on 'Systematic Planning Using the Data Quality Objectives Process' (US EPA 2006), and are as follows:

- Step 1: State the problem
- Step 2: Identify the decision or goal of the investigation
- Step 3: Identify the information inputs
- Step 4: Define the investigation boundaries
- Step 5: Develop the analytical approach or decision rule
- Step 6: Specify the performance or acceptance criteria, and
- Step 7: Optimise the design for obtaining the data.

The DQO process has been applied, as described below, to ensure that data collection activities are appropriate and achieve the stated objectives.

3.1 Step 1: State the problem

Table 3.1: Key aspects to the problem

Aspect	Description
Project Drivers	Transport are undertaking the realignment and upgrade of a section of the Great Western Highway between Little Hartley and Lithgow. As part of this process a PSI was completed by the JAJV. The PSI identified potential contamination that may impact on the project. Based on the outcomes of the PSI and previous investigation reports, there is a need to further investigate these contamination sources by way of soil and groundwater sampling and analysis in order to better understand the contamination impact to the project and any management or remediation measures required to manage contamination (if identified).
Objectives	The objectives of the Stage 2 assessment outlined in this SAQP are to: ▪ Further understand the potential presence and magnitude of contamination to refine the conceptual site model and project impact assessment, as detailed in the desktop report – PSI ▪ Inform the assessment of risk and liabilities associated with contamination with regards to the design and development works for the project. ▪ Inform the need for further mitigation measures, such as a Remedial Action Plan (RAP), based on the contamination assessment findings.

Key Issues	The PSI identified historical activities which have potentially caused contamination of soil and groundwater at the site. Further data is required to determine the presence, location, and extent of potential contamination within the site

3.2 Step 2: Identification of the decision or goal of the investigation

The decision statements that need to be answered by additional source characterisation are:

- What is the extent of contamination present within the previously identified Areas of Environmental Interest (AEIs)?
- What need is there for remediation or management based on the contamination within the site?

3.3 Step 3: Identify the information inputs

Table 3.2: Information inputs

Aspect	Description
Site conditions	▪ Information obtained through the PSI (JAJV 2021) ▪ Site plans and information gained from discussions with Transport ▪ General site observations ▪ Information on the environmental site setting including potential source – receptor pathways
Analytical data	▪ Contaminant concentrations in soil samples ▪ Contaminant concentrations in groundwater samples
Geological and hydrogeological data	▪ Logging of soil composition and conditions ▪ Measurement of the water depth in groundwater wells

3.4 Step 4: Define the investigation boundaries

Table 3.3: Investigation boundaries

Aspect	Description
Lateral boundaries	The assessment is limited to a 500 metre buffer around the proposed construction alignment for the proposed upgraded section of the Great Western Highway. This extends from Little Hartley in the east to Lithgow in the West. The focus will be on the AEIs identified during the PSI. The Investigation boundaries are shown in Figure 4-1.
Vertical boundaries	The investigation is limited from the ground to approximately 20 metres below ground level (mbgl) (depth TBC based on cutting depths from the design).

Temporal boundaries	The investigation will be undertaken from approximately August to September 2021. Previous investigation data will be considered during development of the Stage 2 contamination assessment report that has been collected since 2010 over various seasons. It is not expected that temporal conditions will significantly change the outcome of the investigation.
Constraints	▪ Sampling locations may be constrained by the ability to gain access to the properties adjacent to the construction ▪ Sampling locations may be constrained by the presence of underground services and / or access provisions of sampling equipment.

3.5 Step 5: Develop the analytical approach or decision rule

The purpose of this step is to define the parameters of interest, specific action levels and combine the outputs of the previous DQO steps to develop a series of options based on the outcome of the key decision rules outlined below.

The key decision rules for the investigation will be:

1) Have the analytical data collected as part of the investigation met the Data Quality Indicators (DQI) (see below)? If yes, then the data can be used to answer the decision rule below and the decision statement developed in Step 2. If no, then an assessment of the need to collect additional data will be required.
2) Does the analytical data collected meet the requirements for more accurate data on the contamination status of the site, and address the decision points for the investigation? If yes, then the data can be used to inform remediation requirements. If no, then an assessment of an alternative approach to collect this data will be required.

In order to assess the usability of the data for making decisions, the data will be assessed against a set of DQI, developed based on the following parameters:

- Precision: A quantitative measure of the variability (or reproducibility) of data
- Accuracy: A quantitative measure of the closeness of reported data to the “true” value
- Representativeness: The confidence (expressed qualitatively) that data are representative of each media
- Completeness: A measure of the amount of useable data from a data collection activity
- Comparability: The confidence (expressed qualitatively) that data may be considered to be equivalent for each sampling and analytical event.

The measures employed to enable review of these parameters are presented in Table 3.4 below. Acceptance criteria for a number of these indicators are presented in Section 7.3.

Table 3.4: Data quality indicators

Data Quality Indicators	Field	Laboratory
Precision	▪ Compliance with Standards and Guidelines for collection of samples (AS 4482.1 – 2005) ▪ Investigation by suitably qualified and experienced personnel ▪ Collection of blind replicate and split samples	▪ Use of National Association of Testing Authorities, Australia (NATA) accredited laboratories ▪ Analysis of blind replicate and split samples at a frequency of 1 in every 20 primary samples for each matrix (1 in 10 primary samples for PFAS investigation locations) ▪ Laboratory internal duplicate samples
Accuracy	▪ Compliance with Standards and Guidelines for collection of samples (AS 4482.1 – 2005) ▪ Investigation by suitably qualified and experienced personnel ▪ Collection of rinsate samples and trip blanks	▪ Analysis of method blanks, matrix spike recoveries, surrogate spikes recoveries, laboratory control spike recoveries ▪ Analysis of rinsate blanks, trip blanks and trip spike samples ▪ Compliance with sample holding times
Representativeness	▪ Compliance with Standards and Guidelines for collection of samples	▪ Analysis of contaminants of concern
Comparability	▪ Compliance with Standards and Guidelines for collection of samples	▪ Use of NATA accredited laboratories ▪ Analysis of split sample (1 in 20 primary) (1 in 10 primary samples for PFAS investigation locations)
Completeness	▪ All critical locations sampled	▪ All critical samples analysed

3.6 Step 6: Specify performance or acceptance limits

This step involves specifying acceptable limits on decision errors. Decision errors are incorrect decisions caused by using data that are not representative of site conditions due to sampling or analytical error (DEC, 2006).

There are two key types of decision errors that can occur for the investigation:

a) Collection of samples which overestimate real contamination concentrations or contribution to risk, resulting in implementation of management actions, or remediation areas being defined, or potential liability for acquisition of the site which are too stringent. The consequence of this error would be corrective actions being undertaken to a degree which is more than necessary.

b) Collection of samples which underestimate real contamination concentrations, resulting in implementation of management actions, or remediation areas being defined, or potential liability for acquisition of the site being underestimated which are not stringent enough to sufficiently understand risks associated with contamination. The consequence of this error may be unacceptable impacts to human health and the environment, and/or liabilities not being understood and accounted for by Transport.

The more severe consequences are with decision error (b) since the risk of jeopardising human health and / or the environment and not fully understanding operational risks outweighs the consequences of undertaking actions that are not necessary.

3.7 Step 7: Develop the plan for obtaining data

A Quality Assurance and Quality Control plan is presented in Section 7. This plan has been developed to meet the data quality objectives and has been optimised based on the current understanding of site conditions. It is noted that a review of the data collected during the investigation will need to be ongoing to determine the need for included provisional items. Deviations from this plan, including the reasons for change, will be documented in the contamination assessment report.

4. Sampling and Analysis Plan

4.1 Investigation rationale

Based on the conceptual site model developed during the PSI (see Appendix A), AEIs identified as having a moderate or higher contamination impact potential will be investigated as part of this Stage 2 contamination assessment. These AEIs and the reason for investigation is summarised in Table 4.1.

Table 4.1: Summary of AEI's

Area of interest	Potential source of contamination	Target matrixes	Stage 1 PSI Outcome
AEI 2: Stockpiles.	Potential contamination associated with bitumen, asphalt, asbestos or other miscellaneous wastes or contaminated soil. Three observed stockpiles within project footprint and potential for additional stockpiles.	Soil	Moderate potential impact from stockpiled soil.
AEI 3: Former service station (Little Hartley).	Potential contamination associated with fuel storage and use or workshop activities. Underground fuel storage tanks potentially still present adjoining current highway (MV2L, 2011).	Soil, groundwater, and vapour	High potential impact
AEI 4: Former Little Hartley Airfield.	Potential contamination associated with refuelling, maintenance or incident firefighting however these activities appear to have been on a small scale (if occurred).	Soil	Moderate potential impact
AEI 5: Hartley Cemetery.	Potential contamination associated with breakdown of organic sources.	Soil and groundwater	Moderate potential impact where cutting and construction of water quality control basins
General: agricultural land use.	Potential contamination associated with use of herbicides, pesticides, fuel, machinery, sheep/cattle dips, and waste disposal.	Soil and groundwater	Moderate potential impact
General: septic tanks including in Hartley Village.	Potential contamination associated with leaks or spills.	Soil and groundwater	Moderate potential impact
AEI 10: Former service station South Bowenfels.	Known groundwater contamination associated with fuel storage.	Soil and groundwater	Moderate potential impact
General: current road corridor.	Potential contamination associated with vehicle emissions, fuel spills, and bitumen surface	Soil	Moderate potential impact from surface soils/sediment
AEI 12: Mining Operations, River Lett.	Potential contamination associated with mining operations. No ore processing understood to have occurred or visual evidence of tailings/stockpiles.	Soil and groundwater	Moderate potential impact where cutting and construction of new bridge

4.2 Detailed sampling plan

A summary of the field investigation is provided in Table 4.2. A detailed sampling plan for the investigation is provided in Appendix B. The planned locations for these investigations are presented below in Figure 4-1 to Figure 4-3.

Table 4.2: Summary of field investigation

Location Type	Target Depth (mbgl)	No. locations	No. samples excl QA/QC	
			Soil	Groundwater
Soil Bores (Drilled)	5mbgl (final depth based on design)	8	16	-
Test Pits	3mgl	3	6	-
Soil Bores (Hand Augered)	1.5mbgl	7	14	-
Stockpiles	-	5	10	-
Surficial soil	-	24	24	-
Groundwater Wells	2m beyond encountering groundwater (Approximately 4-8m, up to a maximum depth of 20m)	8 (converted from soil bores/existing wells)	-	8
Total primary samples			70	8

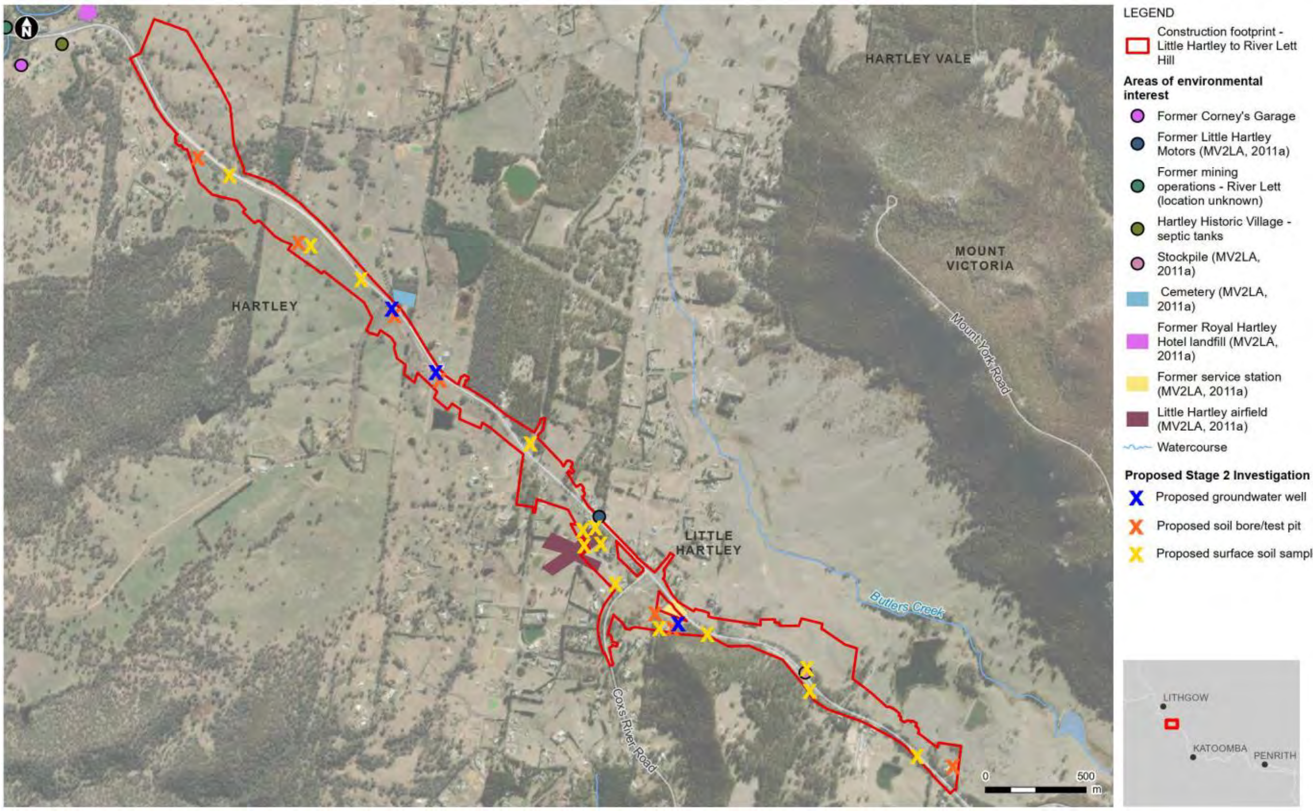

Figure 4-1: Proposed investigation locations within L2R and CRR study area

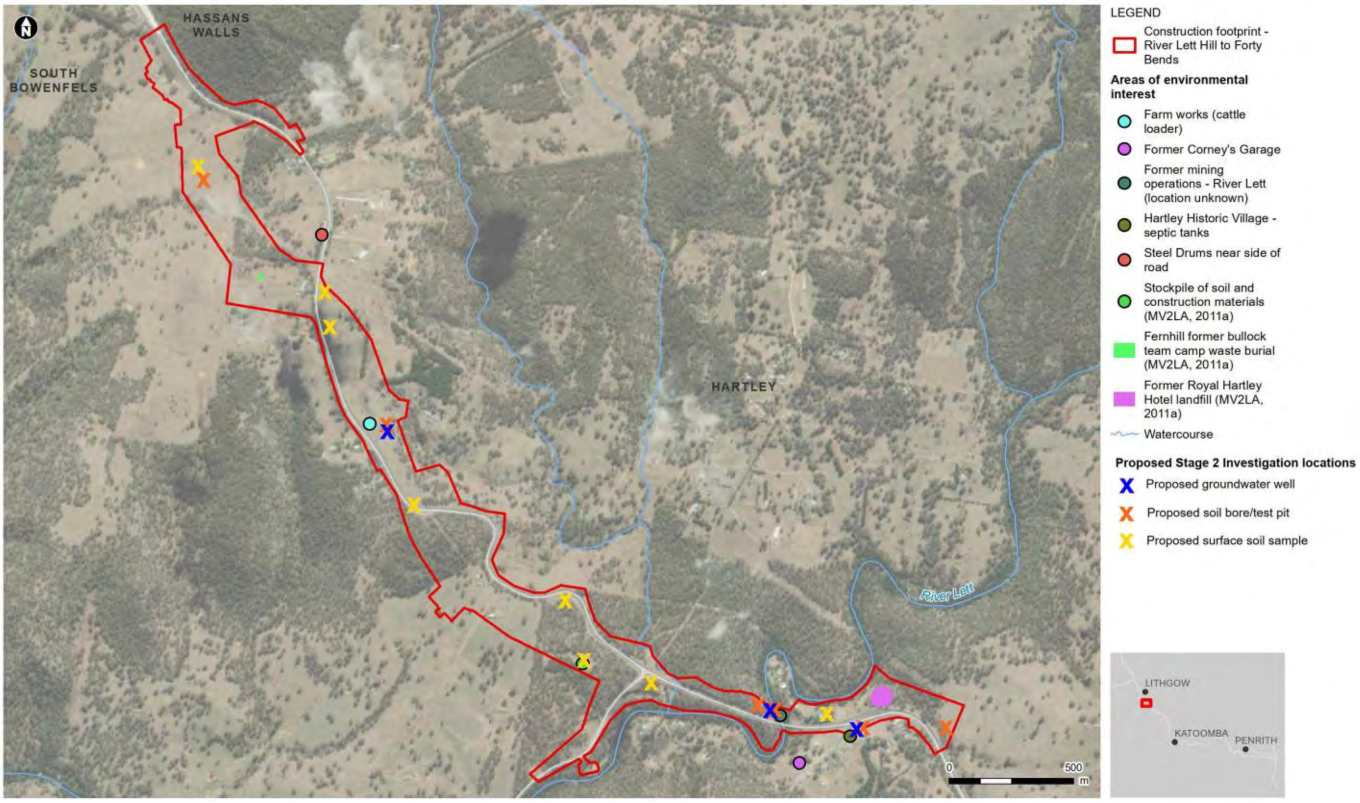

Figure 4-2: Proposed investigation locations within R2F study area

Figure 4-3: Proposed investigation locations within FBL study area

4.3 Alignment with geotechnical investigation

As part of Stage 2 contamination assessment it is planned that, where possible, sampling efforts will be paired with the work being undertaken by the geotechnical team in order to reduce sampling costs. At locations where groundwater piezometers have been installed, these will also be utilised as part of the investigation. The current planned combined contamination/geotechnical investigation locations are detailed in Table 4.3 below. An overview of planned geotechnical investigation locations is shown in **Error! Reference source not found.**. These l ocations are subject to change based on scheduling and access restraints.

Table 4.3: Planned locations for alignment with geotechnical investigation

Site of concern	Associated geotechnical location ID	Assumed efficiencies
General: agricultural land use.	TP368, TP428, TP450	Utilise 4 geotechnical test pits.
AEI 3: Former service station (Little Hartley).	BH309	Utilise one previously installed piezometer.
AEI 12: Mining Operations, River Lett.	BH323, BH324	Utilise two geotechnical boreholes and one piezometer. No additional subcontractor costs for this location.

5. Methodology

5.1 Fieldwork health and safety procedures

All investigations will be carried out in accordance with the Jacobs site specific Health, Safety and Environment Plan developed for the project.

5.2 Soil bores

Fourteen soil bores are proposed throughout the site, as identified in Table 4.2 and Appendix B. The locations of the proposed soil bores are shown in Figure 4-1 to Figure 4-3. Seven soil bores will be advanced using a SPT drilling methodology to a depth of five metres below ground level (mbgl) (final depth will correspond to the design), or when refusal on rock is reached (whichever is shallower).

The geotechnical investigation methodology is to drill boreholes using augering and wash boring techniques, with standard penetration tests (SPTs) every 1.5 metres. Additional SPTs therefore will be completed where contamination samples are to be collected. SPTs will be decontaminated between sampling locations. Where soil bores are additional to the geotechnical investigation, seven soil bores will be advanced to 1.5 mbgl using a hand auger.

Soil bores are to be backfilled with cuttings then reinstated with the original surface material (concrete or left as bare hand tool compacted soil).

5.3 Test pits

Three test pits are proposed throughout the site, based on alignment with currently planned geotechnical investigation locations, as identified in Table 4.3. Test pits will be advanced to 3mbgl using a 5 tonne backhoe excavator or until excavation method refusal (whichever was shallower).

All test pits will be reinstated with the excavated material. Care will be taken to reinstate testpits with materials in the order in which they were excavated. Test pits will be then compacted, trackrolled and re-turfed to reinstate the area as close to the surrounding conditions as is practicable.

5.4 Groundwater well installation

Up to seven of the soil bores will be advanced to approximately two metres beyond encountering groundwater, to a maximum depth of 20 metres. Where refusal on rock is encountered during drilling, wells will be advanced using air hammer techniques (or rock coring if co-located with a geotechnical investigation location).

Up to seven wells will be installed in accordance with the Minimum Construction Requirements for Water Bores in Australia – Edition 4 – 2020, and developed using air lift methodology following installation until stable water quality parameters measured. A 50mm diameter well be installed as detailed below:

- 50 mm diameter Class 18 PVC slotted screen installed across water bearing fractures in the base of the borehole. The length of screen may need to be adjusted based on the observed ground conditions.
- 50 mm diameter Class 18 PVC casing (or length required to reach the surface) above the screen.
- Filter pack (graded sand) surrounding the screen to 1 m above the top of the screen.
- Bentonite seal above the filter pack – minimum of 1 m thick.
- Cement grout to the surface.
- Steel flush-mounted gatic at the ground surface.

Following installation, the well will be developed to remove any material introduced during drilling and encourage connection with the surrounding water body. Development of deep wells will be completed by:

- Air lift technique to bring water to the surface.
- During development, water quality parameters (pH, temperature, electrical conductivity, redox potential and dissolved oxygen) and the water level will be measured at regular intervals.
- Development will continue until water quality parameters have generally stabilized, or the well has been purged dry and recovered a minimum of three times.
- Wastewater will be collected into 205L drums or intermediate bulk containers (IBCs) for appropriate disposal.

Sampling of each well will not occur until at least one week following well development.

5.5 Soil sampling

Soil samples from boreholes and test pits will be collected directly from the drill rig (SPT), excavator bucket or hand auger using new nitrile gloves from the following depths:

- At surface (or immediately beneath hardstand), 0.5 mbgl, 1 mbgl and each metre thereafter
- Where changes in lithology are observed
- At the top of natural soil (if encountered)
- Where visual or olfactory evidence of contamination is observed (e.g. staining, hydrocarbon odour, waste).

Where sampling of stockpiles or surficial soil sampling is required, shallow samples will be taken from below the surface of the soil (approximately 5-10cm for surface soils and approximately 10-20cm for stockpiles) using a trowel or hand auger.

If fragments of potential asbestos containing material (PACM) are observed, samples of the material will be collected and sent to the laboratory for confirmatory analysis. The type and condition of the material will be recorded.

Samples will be collected directly into laboratory supplied containers suitable for the analysis (typically one glass jar with Teflon lined lid, one HDPE jar for PFAS analysis and one zip-lock bag for analysis of asbestos presence/absence). Collected samples will be labelled with a unique identifier, as specified in Section 5.7.

Volatile contaminants will be measured for each soil sample by placing a sub-sample into a zip lock bag then measurement using a calibrated photoionisation detector (PID). PID measurements will be recorded on boreholes and logs.

5.6 Groundwater sampling

Groundwater samples will be collected a minimum of one week following development. Samples will be collected as follows:

- Deployment of a Hydrasleeve ™ to the mid-point of the screen interval. Hydrasleeves may be deployed at the time of development and left in place for one week prior to sampling, ensuring that it remains intact
- Measurement of the groundwater level and any light non-aqueous phase liquid (LNAPL)
- If LNAPL is measured, collection of a sample using a bailer
- Removal of the Hydrasleeve ™ from the well
- Measurement of the groundwater level

- Filling of laboratory supplied bottles suitable for the analysis using the manufacturer provided straw
- The electrodes of a calibrated water quality meter will be used to measure water quality parameters (pH, temperature, electrical conductivity, redox potential and dissolved oxygen).
- Samples will be submitted to a laboratory for testing of contaminants of concern, as outlined in Table 6.1.

5.7 Sample nomenclature

Sample containers will be labelled with a unique identifier, the project name, the date and time of sampling. Unique identifiers will be as follows.

Table 5.1: Sample nomenclature

Sample type	Naming convention	Example
Soil	Location_depth	BH01_0.5
Groundwater	Location_date	GW01_210701
Duplicate	QC10x_date (x is consecutive number 1 +)	QC101_210701 is the first duplicate collected on the 1/7/21 QC102_210701 is the second duplicate collected on the 1/7/21
Triplicate	QC20x_date (x is consecutive number 1 +)	QC202_210701
Trip blank	QC300_date	QC300_210701
Trip spike	QC400_date	QC400_210701
Rinsate blank	QC50x_date (x is consecutive number 1 +)	QC502_210701

6. Laboratory Analysis

Samples will be submitted to National Association of Testing Authorities Australia (NATA) accredited laboratories for analysis. Primary samples and quality assurance samples (with the exception of triplicates) will be submitted to Envirolab Services, Sydney (Envirolab). Triplicates will be submitted to the secondary laboratory, Eurofins.

A summary of analytical testing to be completed is shown in Table 6.1. Analytical testing quantities and locations are subject to change based on changes in contaminants identified during fieldwork. Further details on the sampling plan are available in Appendix B.

Table 6.1: Laboratory analytical schedule

Area of interest	**Analytes**	**Matrix**	**No. of Samples**
AEI 2: Stockpiles	Heavy metals, TRH, BTEX, PAH, OCP/OPP, asbestos	Soil	10
AEI 3: Former service station (Little Hartley)	Heavy metals, TRH, BTEX, PAH	Soil	4
		Groundwater	1
AEI 4: Former Little Hartley Airfield	Heavy metals, TRH, BTEX, PAH, PFAS	Soil	4
AEI 5: Hartley Cemetery	Heavy metals, nutrients, formaldehyde	Soil	2
		Groundwater	1
General: agricultural land use	Heavy metals, TRH, BTEX, PAH, OCP/OPP, asbestos (soil only), microbiological (where source is identified in the field)	Soil	30
		Groundwater	2
General: septic tanks including in Hartley Village	Heavy metals, nutrients, microbiological	Soil	4
		Groundwater	2
AEI 10: Former service station at South Bowenfels	Heavy metals, TRH, BTEX, PAH	Soil	2
		Groundwater	1
General: current road corridor	TRH, BTEX, PAH	Soil	10
AEI 12: Mining Operations, River Lett	Heavy metals, cyanide	Soil	4
		Groundwater	1
General classification of spoil generated from boreholes	Waste Classification (PFAS (extended suite), Metals, TRH, BTEX, PAH)	Soil	10
		Groundwater	3
Total (including additional waste classification of spoil)		Soil	**70** (80)
		Groundwater	**8** (11)

7. Quality Assurance and Quality Control Plan

Quality Assurance and Quality Control (QA/QC) procedures have been developed based on the guidance in Schedules B2 and B3 of the NEPM (NEPC 2013), Section 18 of the PFAS NEMP (2020) and Section 8 of the Australian Standard: Guide to the investigation and sampling of sites with potentially contaminated soil (Standards Australia 2005).

7.1 Field QA/QC program

Field quality control will comprise of:

- Ensuring all sampling is undertaken by suitably qualified and experience JAJV personnel
- Adherence to standard procedures for field sampling and record keeping
- Use of laboratory supplied sample containers
- Preservation of samples on ice and transport to laboratories under chain of custody documentation
- Submission of samples within the recommended holding times
- Appropriate decontamination of any sampling equipment prior to sampling and between sampling locations
- Collection of quality control samples; inter- and intra-laboratory duplicates, rinsate blanks and trip blanks
- Calibration of all field measuring equipment, such as water quality meters, and retention of calibration records.

7.1.1 Sample labelling

All samples (including QC samples) will be labelled to include the sample identification number, date of collection, sampler initials and project number. The unique sample identification numbers will be determined in accordance with the protocol outlined in Section 5.7.

7.1.2 Intra-laboratory duplicate samples

Blind replicate samples will be provided by the collection of two environmental samples from the same location. These samples will be preserved, stored, transported, prepared and analysed in an identical manner. As a minimum, the results of analyses on the blind replicate sample pair will be assessed by calculating the Relative Percentage Differences (RPDs) between the results. The RPD will be calculated as the difference between the results divided by their mean value and expressed as a percentage. If the RPD exceeded the value adopted for any analytes, additional investigation would be required, or justification provided for not conducting additional investigation.

Blind replicate samples will be collected at a rate of one duplicate for every 20 environmental samples for all analyses except PFAS in accordance with AS 4482.1-2005. In accordance with the PFAS NEMP, blind replicate samples for PFAS will be collected at a rate of one duplicate for every 10 environmental samples.

7.1.3 Inter-laboratory duplicate samples

Split samples provide a check on the analytical proficiency of the laboratories. Split samples will be provided by the collection of two environmental samples from the same location. These samples will be preserved, stored and transported in an identical manner. The spilt samples will be analysed by the secondary laboratory. As a minimum, the results of analyses on the split replicate sample pair will be assessed by calculating the RPDs between the results. The RPD will be calculated as the difference between the results divided by their mean value and expressed as a percentage. If the RPD exceeds the value adopted for any analytes, additional investigation would be required, or justification provided for not conducting additional investigation.

Split samples will be collected at a rate of one triplicate for every 20 environmental samples for all analyses except PFAS in accordance with AS 4482.1-2005. In accordance with the PFAS NEMP, split samples for PFAS will be collected at a rate of one duplicate for every 10 environmental samples.

7.1.4 Rinsate blanks

Rinsate blanks are collected from decontaminated field equipment using laboratory-supplied water. The purpose of the rinsate blanks are to detect potential cross-contamination associated with using the same equipment at multiple sampling locations (e.g. hand auger or interface probe).

One rinsate blank sample should be collected each week for each equipment type when reusable equipment is utilised.

7.1.5 Trip blanks

Trip blanks consist of laboratory-supplied water and clean sand. The purpose of trip blanks are to detect potential contamination during sample transport. These samples will be kept within eskies during sampling activities and will not be opened in the field. Trip blanks will be analysed for BTEX.

Trip blanks will be submitted with every batch of soil and water samples delivered to the primary laboratory.

7.1.6 Trip spikes

Laboratory-prepared trip spikes consist of water or sand spiked with known concentrations of BTEX. These samples will be submitted for BTEX analysis with the results compared with the known additions. The purpose of these samples is to monitor volatile organic compound (VOC) losses during transit.

Trip spikes will be submitted with every batch of soil and water samples delivered to the primary laboratory.

7.2 Laboratory QA/QC program

All analysis will be performed by laboratories accredited by NATA. For the purposes of this investigation Envirolab will be the primary laboratory and Eurofins will be the nominated secondary laboratory. The reliability of test results from the analytical laboratories will be monitored according to the QA/QC procedures used by the NATA accredited laboratories. The laboratory QA/QC program will specify holding times, extraction dates, method descriptions, Chain of Custody (CoC) requirements, analysis, Limit of reporting (LOR) and acceptance criteria for the results. Laboratory QA/QC requirements will be consistent with NEPM requirements and are outlined below.

7.2.1 Laboratory duplicate samples

Laboratory duplicates provide data on analytical precision for each batch of samples.

Laboratory duplicates are performed at a rate of one duplicate for batches of 8 - 10 samples with an additional duplicate for each subsequent ten samples.

7.2.2 Laboratory control samples

Laboratory control samples consist of a clean matrix (de-ionised water or clean sand) spiked with a known concentration of the analyte being measured. These samples monitored method recovery in clean samples and are used (where required) to evaluate matrix interference by comparison with matrix spikes.

7.2.3 Surrogate spike recoveries

For organic analyses, a surrogate is added at the extraction stage in order to verify method effectiveness. The surrogate is then analysed with the batch of samples and percentage recovery calculated.

7.2.4 Matrix spike recoveries

Matrix spikes consist of samples spiked with a known concentration of the analyte being measured, in order to identify properties of the matrix that may hinder method effectiveness. Samples are spiked with concentrations equivalent to 5 to 10 times the LOR and percentage recovery calculated.

7.2.5 Method blanks

Method blanks (de-ionised water or clean sand) are carried through all stages of sample preparation and analysis at a rate of approximately 10%. Analyte concentrations in blanks should be less than the stated LOR. Reagent blanks are run if the method blank exceeds the LOR. The purpose of method blanks are to detect laboratory contamination.

7.3 Data validation acceptance criteria

Data validation of the QA/QC elements will be undertaken to ensure that the data reported can be used to achieve the project objectives. Should data be found to fall outside the data acceptance criteria, an investigation will be performed to determine if the data is acceptable or if corrective actions need to be instigated. The QAQC data will be assessed against the Data Acceptance Criteria (DAC) provided in Table 7.1 below.

Table 7.1: Summary of QAQC elements and data acceptance criteria

Element	Data Quality Indicator (DQI)	Objectives	Acceptance criteria
Field QA/QC			
Standard procedures	Precision Accuracy Representativeness Completeness	▪ All sampling undertaken by suitably qualified and experienced Jacobs personnel ▪ Adherence to the relevant Jacobs Work Instructions or Standard Operating Procedure, including record keeping	▪ No deviation from standard procedure, unless deviation provides greater certainty and is reported ▪ All appropriate field records kept and maintained
Sample collection, preservation, handling and analysis	Accuracy Representativeness	▪ All analysis within holding times ▪ Samples collected in appropriate containers for the analysis with suitable preservation applied upon collection ▪ Samples received at the laboratory in good condition, appropriately chilled and chain of custody intact	▪ Use of laboratory supplied sample containers including polypropylene or high-density polyethylene (HDPE) containers for PFAS analysis. ▪ Preservation and storage of samples chilled in ice chests and transported to laboratories under chain of custody documentation. ▪ Samples received at laboratory appropriately chilled (<5°C), with ice. Samples remain not

Element	Data Quality Indicator (DQI)	Objectives	Acceptance criteria
		▪ Compliance with WA DER (2017) for PFAS sampling	waterlogged and in separate bags to ice. ▪ Samples extracted and analysed within holding times relevant for the sample matrix: ▪ For soil and sediment samples, the samples are to be extracted within 60 days of sample collection and analysed within 30 days of extraction (US EPA 821-R-11-007) ▪ For water samples, the samples are to be extracted within 14 days of sample collection and analysed within 28 days of extraction (US EPA 537) ▪ Comply with PFAS NEMP (2020) for PFAS sampling ▪ Use of NATA accredited laboratories for all analysis undertaken
Decontamination	Precision Accuracy Representativeness Comparability	Prevention of cross-contamination between sampling locations Collection and analysis of rinsate blanks from reusable sampling equipment	Decontamination using a triple wash system for all reusable equipment prior to sampling and between sampling locations Collection of rinsate blanks from reusable sampling equipment at a rate of 1 per day, per matrix, per set of equipment
Collection of field quality control samples	Precision Comparability	Field quality control sampling in accordance with AS 4482.1 – 2005	Collection of blind replicate samples for analysis by the primary laboratory at a rate of 1 per 20 primary samples, and 1 per 10 primary samples for PFAS analysis Collection of split duplicates for analysis by the secondary laboratory at a rate of 1 per 20 primary samples, and 1 per 10 primary samples for PFAS analysis. Collection of trip blanks and trip spikes at a rate of one per laboratory batch per sample matrix. Collection of rinsate blanks from reusable equipment at a rate of one per day when sampling equipment may come into contact with multiple samples

Element	Data Quality Indicator (DQI)	Objectives	Acceptance criteria
Calibration	Precision Representativeness	Calibration of field measuring equipment as specified by the manufacturer and retaining of calibration records.	All equipment will be calibrated prior to use in the field. Calibration of equipment if observed to be outside of acceptable range from standard Calibration of field measuring equipment at the rate specified by the manufacturer Calibration records retained
Data handling	Comparability Completeness	Appropriate labelling of sampling containers Central database of correct field and laboratory data.	Labelling of sample containers to include a unique sample identification number, date of collection, sampler's initials and project number Field data and laboratory reports undergo secondary check
Laboratory QAQC			
Analytical methods	Precision Accuracy Comparability Repeatability	NATA accredited methods used for all analyses undertaken.	Primary and secondary laboratories NATA accredited methods for all analyses undertaken.
Analysis of laboratory QAQC samples	Precision Accuracy	Laboratory QAQC samples are undertaken at a rate according to their NATA accreditation.	Analysis of laboratory method blanks at a rate of one per 20 samples or one per batch, whichever is greater. Analysis of laboratory duplicates at a rate of one per 20 samples. Analysis of matrix spikes at a rate of one per sample batch, or one per 20 samples, whichever is greater.
Intra- and inter-lab duplicate samples	Precision Comparability	To ensure the primary data is reliable and fit for purpose. The assessment of blind replicate and split samples is undertaken by calculating the Relative Percent Difference (RPD) of the replicate or split concentration compared with the original sample concentration. The RPD is defined as: $RPD = 100 \times \frac{(X1 - X2)}{average}$	Analysed for the same analytes as the primary sample. Typical RPDs are noted in AS 4482.1-2005 as between 30 – 50%. Higher RPDs may be acceptable for heterogeneous material or where concentrations are close to the LOR (i.e. less than 10 times the LOR)

Element	Data Quality Indicator (DQI)	Objectives	Acceptance criteria
		Where, *X1* and *X2* are the concentration of the original and replicate samples.	
Trip blanks and rinsate samples	Precision Accuracy Representativeness	Ensure that cross contamination has not occurred from sampling equipment, sampling procedure, or during storage and transport of samples	Each trip blank and rinsate sample is analysed for the same analytes as the primary samples Analytical result < LOR
Laboratory duplicates	Precision	To ensure precision of the analysis method and replicability of analysis due to potential sample heterogeneity. Assessment as per blind replicates and split samples	As per laboratory quality control report
Matrix spike recoveries	Accuracy	To assess the effect of the matrix on the accuracy of the analytical method used. Assessment is undertaken by determining the percent recovery of the known spike or addition to the sample. $\% \, Recovery \ = 100 \ \times \ \frac{C-A}{B}$ Where, *A* = concentration of analyte determined in the original sample, *B* = added concentration, and *C* = calculated concentration	As per laboratory quality control report
Method blanks	Accuracy	To assess potential bias introduced by the laboratory analytical method for a relevant analyte. A method blank assesses the component of the analytical result introduced from laboratory equipment. Each blank is analysed as per the original samples.	Analytical result < LOR

8. Site Assessment Criteria

To address potential health and environmental impacts within the site, analytical test results will be compared against a set of health and ecological based soil, groundwater investigation levels referred to as Site Assessment Criteria (SAC). SAC are considered to be appropriate for the current land use and main potential receptors of concern (i.e. site workers, drinking water, freshwater receiving water bodies and primary and secondary contact users of surrounding water bodies).

That is, the SAC has been set at levels that provide confidence that contaminant concentrations below the SAC will not adversely affect human health or aquatic ecosystems.

The NEPM (NEPC 2013) outlines a tiered approach for the assessment of human health and ecological risks associated with contaminated sites. Three tiers are defined as:

- Tier 1 (or screening level) assessment is the first stage of assessment at the site. It includes a comparison of known site data with published risk-based guidance levels. The assessment provides an initial screening of the data to determine whether further assessment is required. Exceedance of Tier 1 criteria is generally used to define the contaminants that require more detailed assessment at Tier 2.
- A Tier 2 assessment is typically required when one or more contaminants are present at the site at levels that exceed Tier 1 guidance criteria, if there are no appropriate Tier 1 criteria, or if there are unresolved and significant uncertainties (limiting the reliability of the assessment conducted) identified in the Tier 1 assessment. Exceedance of the Tier 2 criteria triggers a Tier 3 risk assessment.
- A Tier 3 assessment may be required where exceedance of Tier 2 site-specific risk-based criteria is judged to represent a potentially unacceptable risk to human health. The Tier 3 assessment typically focuses on the risk-driving contaminants in more detail, although studies aimed at reducing the uncertainties inherent in the modelling of exposure pathways are also common at Tier 3

Sample analytical results will be screened against Tier 1 criteria to provide an initial screen of risk to human health or ecological receptors. Where results exceed the investigation Tier 1 criteria, further assessment will be required to determine the potential for unacceptable risks to the relevant receptor (i.e. Tier 2 or 3 assessment).

There are no generic risk screening values for PFAS in the NEPM (NEPC 2013). The PFAS NEMP (2020) provides guideline values to inform site investigations. These guideline values are based on existing nationally agreed guidelines or have been derived based on recognised processes. The PFAS NEMP (2020) notes that the guideline values include a degree of conservatism in order to be protective of affected communities where multiple exposure pathways may be present.

The guideline values cover risks to human health and risks to ecological receptors. The guideline values are described in further detail in the sections below.

8.1 Soil

8.1.1 Aesthetics

Aesthetics on sites relates to the presence of observable odours, discoloration and erroneous wastes materials in soil which could possibly indicate contamination. Such olfactory evidence can point to how receptors can be impacted by vapours on and migrating from the site. Odour threshold for organic substances can be exceeded in off-site settings (through groundwater transmission of hydrocarbons) and whilst may not represent a direct health risk, could possibly prompt civil action. Aesthetics will be continually assessed during the investigation and reported on the field logs (where present).

8.1.2 Investigation criteria for the protection of human health

The soil chemical analyses will be assessed (as a Tier 1 assessment) against the investigation and screening levels in Schedule B1 of the NEPM (NEPC 2013). This guideline has been endorsed by the NSW EPA. NEPM (NEPC 2013) provides investigation and screening levels for commonly encountered contaminants which are applicable to generic land uses and includes consideration of, where relevant, the soil type and the depth of contamination.

The health investigation levels (HILs) are scientifically based, generic assessment criteria designed to be used in the first stage (Tier 1) of an assessment of potential risks to human health from chronic exposure to contaminants. They are intentionally conservative and are based on a reasonable worst-case scenario for four generic land use scenarios.

Given the existing and proposed land use of the site (former commercial/agricultural land to form part of the Great Western Highway upgrade works), the HILs for commercial/industrial sites, column D of Table 1A(1) of NEPM (NEPC 2013) have been adopted (HIL D).

Health Screening Levels (HSLs) are used for selected petroleum compounds and fractions to assess the risk to human health via inhalation and direct contact with affected soils. The HSLs were derived through the consideration of health effects only, with particular emphasis on the vapour exposure pathway. Other considerations such as ecological risk, aesthetics, the presence of free phase product and explosive / fire risk are not addressed by the HSLs. As such the HSLs are used similarly to the HILs, i.e. as a screening tool.

The HSLs have been developed for a range of petroleum hydrocarbons, and for different land uses, media, pathways, soil types and depths to contamination. HSLs have also been derived for direct contact with petroleum hydrocarbons for the four land use scenarios and intrusive maintenance workers.

The HSL for commercial/industrial sites (HSL D) has been adopted for this investigation (considered appropriate to assess contamination risk to construction workers based on a short term exposure scenario and restricted exposure scenario for future road users).

8.1.3 Soil PFAS criteria for the protection of human health

The PFAS NEMP (2020) provides guideline values for the sum of perfluorooctane sulfonate (PFOS) and perfluorohexane sulfonate (PFHxS) and for perfluorooctanoic acid (PFOA) in soil to be used for the assessment of potential human exposure through direct soil contact. The PFAS NEMP (2020) further notes that the guideline values should be used in conjunction with other lines of investigations to account for potential leaching, off-site transport, bioaccumulation and secondary exposure.

The soil guideline values are based on the NEPM (NEPC 2013) Health Investigation Level (HIL) assumptions for specific land uses. All of the guideline values assume that 20% of the Food Standards Australia and New Zealand Tolerable Daily Intake (FSANZ TDI) is from the exposure scenario (i.e. up to 80% of exposure is assumed to come from other pathways). The guideline values and additional assumptions are as follows:

- Residential with garden / accessible soil: These values were derived based on standard NEPM assumptions for HIL—A including the consumption of up to 10 % plant produce grown on-site. These values are not protective of other food-based exposures such as consumption of eggs or home-slaughtered livestock
- Residential with minimal opportunities for soil access: These values were derived based on standard NEPM assumptions in HIL-B. It is useful for considering risk to human receptors where consumption of home-grown produce is not a foreseeable activity at that site and minimal opportunities exist for soil access
- Public open space: These values were derived based on standard NEPM assumptions for HIL-C and apply for public open space such as parks, playgrounds, playing fields (eg. ovals), secondary schools

and footpaths. These values do not apply to undeveloped public open space such as urban bushland and reserves

- Commercial/Industrial: These values were derived based on standard NEPM assumptions for HIL—D. The values assume 8 hours spent indoors and 1 hour spent outdoors at a site such as a shop, office, factory or industrial site.

PFAS concentrations in soil will be screened against the guideline values for commercial/industrial category presented above.

8.1.4 Health screening levels for asbestos in soils

The initial assessment of asbestos in soils at the site will be limited to visual observations and the presence/absence in material and soil samples. Where potential asbestos containing materials are identified during the investigation, samples of these materials will be collected and sent to the lab for confirmatory identification. The need for more detailed investigation of asbestos in soils at the site will be determined based on the results of the initial sampling.

The NEPM (NEPC 2013) presents HSLs for asbestos contamination in soils (Table 7 in Schedule B1 Guideline on Investigation Levels for Soil and Groundwater). These are defined for bonded ACM, fibrous asbestos and asbestos fibres. An assessment against these values may be undertaken if more detailed asbestos investigations are undertaken.

8.1.5 Investigation criteria for ecological protection

The NEPM (NEPC 2013) presents ecological investigation levels (EILs) and ecological screening levels (ESLs) that are applicable for assessing potential risk to terrestrial ecosystems. The EILs have been developed for selected metals (arsenic, copper, chromium III, nickel, lead and zinc) and organic substances (DDT and naphthalene). The EILs are dependent on specific soil physiochemical properties (i.e. pH, cation exchange capacity [CEC] and % clay) and land use scenarios.

The NEPM (NEPC 2013) ESLs have been developed for selected petroleum hydrocarbons compounds (BTEX and B(a)P) and TRH fractions and are broadly apply to coarse / fine-grained soils and various land uses. Both the EILs and ESLs generally apply to the top 2 m of soil.

The EILs and ESLs applicable to commercial / industrial land use will be adopted for the investigation.

8.2 Groundwater

Groundwater investigation levels (GILs) are the concentrations of a contaminant in groundwater above which further investigation (point of extraction) or a response (point of use) is required. GILs are based on Australian water quality guidelines and drinking water guidelines and are applicable for assessing human health risk and ecological risk from direct contact (including consumption) with groundwater.

8.2.1 Investigation criteria for the protection of human health

The NSW EPA has endorsed the use of the water quality trigger levels given in the Australia New Zealand Guidelines for fresh and marine water quality (ANZG, 2018). These GIL's will be applied for the protection of human health at the site.

For the protection of human health in relation to groundwater, the protection levels for recreational use and drinking water will be considered. Recreational use GIL's are applicable due to the potential external exposure of construction workers to contaminated groundwater. Drinking water GIL's are applicable due to the potential for accidental ingestion of contaminated groundwater by construction workers. The NSW EPA has endorsed the use of the water quality trigger levels given in the Australia New Zealand Guidelines for fresh and marine water quality (ANZG, 2018). These guidelines provide criteria for aquatic ecosystems.

For the protection of the aquatic ecosystems below the site, the most appropriate GILs are generally the 95% protection levels for freshwater given in the ANZG (2018) guideline. Where the guideline does not provide these criteria or the guideline considers the 95% protection level is inappropriate, GILs will be sourced by using:

- The 99% and 95% protection levels for freshwater ecosystems provided in the ANZG 2018 guidelines (where applicable/available).
- NEPC (2013) prescribed GILs.
- Low reliability trigger values provided in the ANZG 2018 guidelines.

9. Reporting

Based on the results of the sampling conducted as out lined in this SAQP, a Stage 2 contamination assessment report will be produced to provide an updated CSM and an update to the impact assessment and mitigation measures with consideration of the Stage 2 assessment scope and sampling data.

The report will provide recommendations for discussion with Transport regarding the requirement for further works or preparation of a Remediation Action Plan (if significant contamination is identified).

10. References

Australian and New Zealand Governments and Australian state and territory governments (ANZG) (2018) *Australian and New Zealand Guidelines for Fresh and Marine Water Quality.*, Canberra ACT, Australia.

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Appendix G. Ecological Investigation Level Methodology

NEPM 2013 Ecological Investigation Levels Methodology

Ecological investigation levels (EILs) for the protection of terrestrial ecosystems have been derived for common contaminants in soil based on a species sensitivity distribution (SSD) model developed for Australian conditions. EILs have been derived for As, Cu, CrIII, DDT, naphthalene, Ni, Pb and Zn.

EILs apply principally to contaminants in the top 2 metres of soil at the finished surface/ground level which corresponds to the root zone and habitation zone of many species. In arid regions, where the predominant species may have greater root penetration, specific considerations may result in their application to 3 metres depth.

The methodology assumes that the ecosystem is adapted to the ambient background concentration (ABC) for the locality and that it is only adding contaminants over and above this background concentration which has an adverse effect on the environment.

The ABC of a contaminant is the soil concentration in a specified locality that is the sum of the naturally occurring background level and the contaminant levels that have been introduced from diffuse or non-point sources by general anthropogenic activity not attributed to industrial, commercial, or agricultural activities, for example, motor vehicle emissions.

The preferred method to determine the ABC is to measure the ABC at an appropriate reference site. This approach is essential in areas where there is a high naturally occurring background level such as will occur in mineralised areas.

An added contaminant limit (ACL) 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.

For the purpose of this assessment, the ACL was calculated using pH, %clay and CEC values from two representative samples (BH08_1.0 and BH16_1.5). Where values differed, the more conservative of the two values was used.

Calculating the EIL for GWHU

ACL									
	mg/kg	Arsenic	Cadmium	Chromium	Copper	Lead	Mercury	Nickel	Zinc
	pH								210
	CEC				140			55	
	% clay			530					
	Generic					1800			

Information derived from **Table 1B(1)** *Soil-specific added contaminant limits for aged zinc in soils,* **Table 1B(2)** *Soil-specific added contaminant limits for aged copper in soils,* **Table 1B(3)**

Soil-specific added contaminant limits for aged chromium III and nickel in soils, and **Table 1B(4)** *Generic added contaminant limits for lead in soils irrespective of their physicochemical properties (NEPM 2013)*.

ABC									
	mg/kg	**Arsenic**	**Cadmium**	**Chromium**	**Copper**	**Lead**	**Mercury**	**Nickel**	**Zinc**
	pH	n/a	n/a	12	5	14	n/a	<2	<5

Sample BH04_4.0 was assumed to be representative of the 'background concentration' of the site due to the depth (4.0 mbgl), and that the soils are unlikely to be impacted by anthropogenic sources.

EIL										
mg/kg	**Arsenic**	**Cadmium**	**Chromium**	**Copper**	**Lead**	**Mercury**	**Nickel**	**Zinc**	**DDT**	**Naphthalene**
ABC + ACL[1]			542	145	1105		57	215		
NEPM 2013[2]	160								640	370
No Criteria		-				-				

[1] EILs derived from NEPM 2013 equation ABC+ACL

[2] Generic EILs for aged arsenic, DDT and Naphthalene from **Table 1B(5)** for commercial and industrial land use.

Appendix H. Coal Tar Assessment

Table of Contents

1. Introduction

During the Safety in Desktop Workshop, Transport detailed new information to the JAJV team regarding the potential presence of coal tar material in the design area. Although the presence of the material doesn't impact the JAJV design, it will however indicate whether specific management measures are required for excavating, storing, and removing material containing coal tar during construction. It was not included as part of the JAJV's original scope of works as it was not previously clarified by Transport that the coal tar material existed in the area.

There is the potential that coal tar has historically been used to provide the binding component for asphalt along the Great Western Highway. Coal tar asphalts may still exist as a road surface layer but is more commonly found as a discreet subsurface layer overlaid by more modern bitumen asphalt[1]. Additionally, section repairs along the Great Western Highway may have been undertaken at different times using different methods (i.e. earlier pavement works may have used coal tar asphalt during repairs, whereas later pavement works may have used bitumen asphalt).

Any excavation, storage, and removal of the coal tar asphalt during construction and/or operation of the Great Western Highway would need to be undertaken in accordance with the NSW Government (2015) *Technical Direction 21: coal tar asphalt handling and disposal* procedure.

This assessment forms part of the Technical Working Paper – Stage 2 Contamination Assessment.

2. Assessment Methodology

As part of this variation, 25 samples were taken from 23 cores by Macquarie Geotech from the Great Western Highway during the geotechnical investigation for the presence of coal tar in the existing pavements. These cores were then sub-sampled at selected depths where asphalt was identified by Alliance Geotechnical as directed by JAJV environmental scientists.

Analytical testing was undertaken by Eurofins (a National Association for Testing Authorities (NATA) accredited laboratory) using Roads and Maritime Test Method T542 (NSW Government, 2012)[2]. Laboratory reports are provided in Appendix D.

A summary of the sampled pavement core locations is shown in **Table 1** and **Figure 1.1** to **Figure 1.4** below

Table 1. Summary of pavement core locations

Study Area	Sample ID	Longitude	Latitude
L2R	PC301	150.2219	-33.5790
L2R	PC302	150.2179	-33.5762
L2R	PC303	150.2146	-33.5742
L2R	PC304	150.2080	-33.5710
CRR	PC310	150.1965	-33.5608
L2R	PC312	150.1822	-33.5493
R2F	PC317	150.1647	-33.5407
R2F	PC318	150.1536	-33.5303
F2L	PC323	150.1269	-33.5173
F2L	PC324	150.1258	-33.5173

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[1] NSW Government Transport Roads and Maritime Services (2015) *Technical Direction 21: coal tar asphalt handling and disposal*

[2] Note that the RMS Test Method T542 is not itself NATA accredited.

Study Area	Sample ID	Longitude	Latitude
F2L	PC325	150.1249	-33.5174
F2L	PC326	150.1238	-33.5173
F2L	PC327	150.1228	-33.5169
F2L	PC328	150.1222	-33.5162
F2L	PC329	150.1219	-33.5157
F2L	PC330	150.1218	-33.5151
F2L	PC331	150.1219	-33.5135
F2L	PC332	150.1220	-33.5128
F2L	PC334	150.1228	-33.5110
F2L	PC335	150.1234	-33.5102
F2L	PC336	150.1240	-33.5095
F2L	PC337	150.1243	-33.5087
F2L	PC338	150.1245	-33.5079

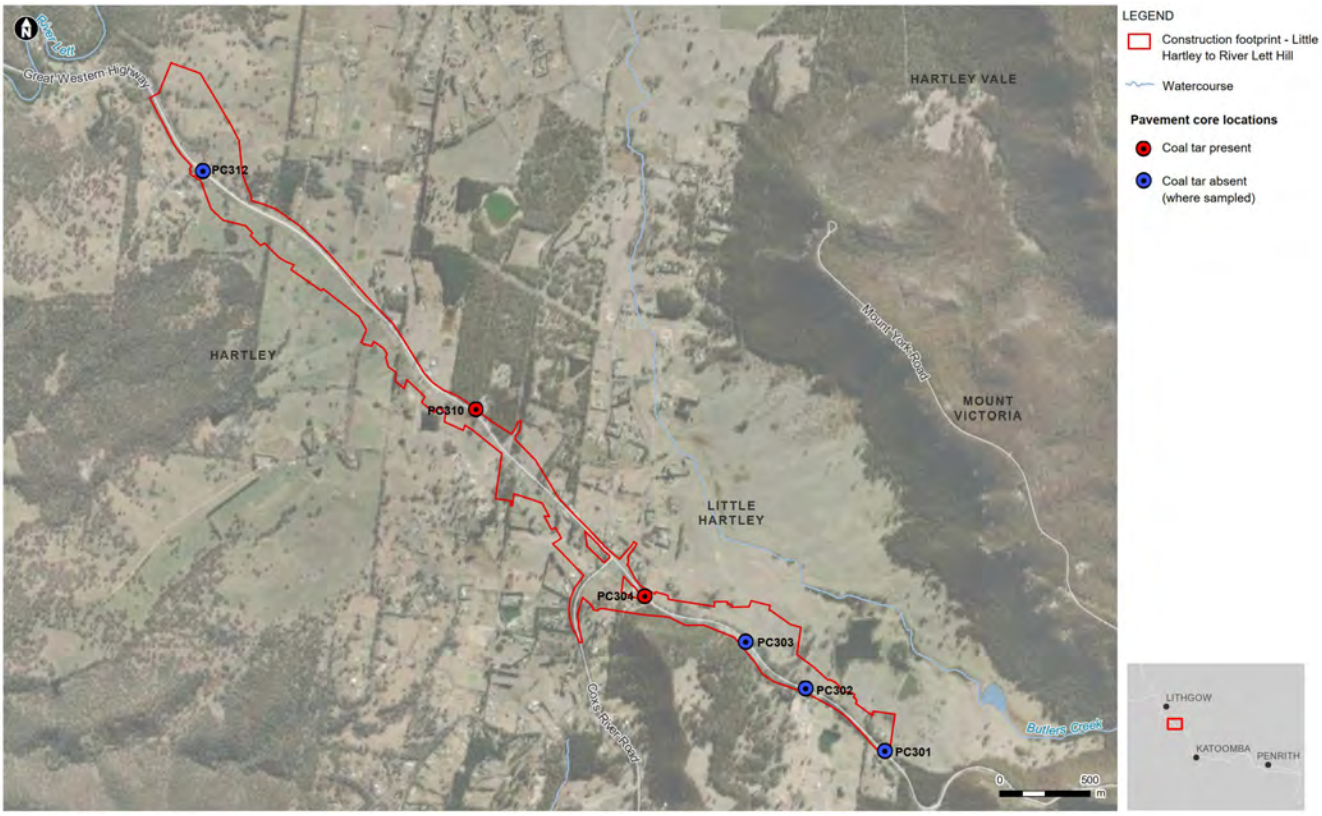


Figure 1.1: Pavement core locations for L2R study area

Figure 1.2: Pavement core locations for CRR study area

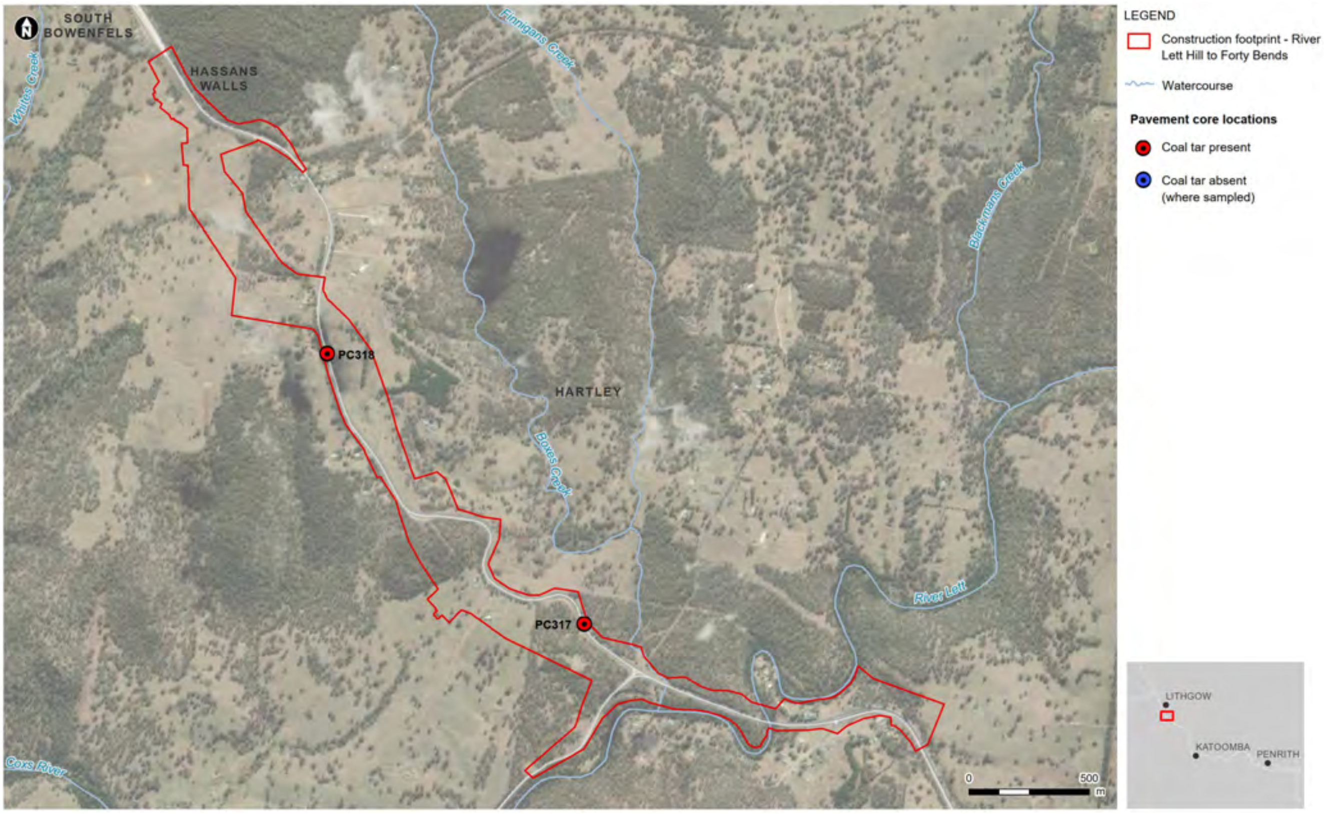


Figure 1.3: Pavement core locations for R2F study area

Figure 1.4: Pavement core locations for F2L study area

3. Assessment Results

The results of the coal tar analysis are summarised in **Table 2** below. Coal tar was detected within asphalt layers in four samples taken from four cores (PC304, PC310, PC317 and PC318) across three of the four study areas (L2R, CRR and R2F).

Table 2. Summary of coal tar results

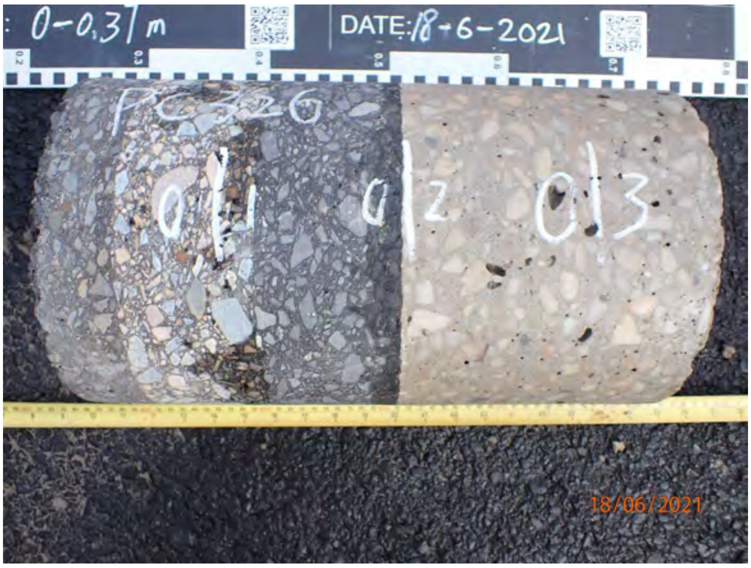
Study Area	**Sample ID**	**Sample Depth (mbgl)**	**Coal Tar (Present/ Absent)**	**Core Photo**
L2R	PC 301 DEPTH 0.3M (16680A)	0.30	Absent	
L2R	PC 302 DEPTH 0.45M (16680B)	0.45	Absent	

Study Area	Sample ID	Sample Depth (mbgl)	Coal Tar (Present/ Absent)	Core Photo
L2R	PC 303 DEPTH 0.1M (16680C)	0.10	Absent	
L2R	PC 304 DEPTH 0.35M (16680D)	0.35	Present	

Study Area	Sample ID	Sample Depth (mbgl)	Coal Tar (Present/ Absent)	Core Photo
L2R/ CRR	PC 310 DEPTH 0.25M (16680E)	0.25	Present	
L2R	PC 312 DEPTH 0.1M (16680F)	0.10	Absent	
R2F	PC 317 DEPTH 0.05M (16680G)	0.05	Absent	
R2F	PC 317 DEPTH 0.25M (16680H)	0.25	Absent	

Study Area	Sample ID	Sample Depth (mbgl)	Coal Tar (Present/ Absent)	Core Photo
R2F	PC 317 DEPTH 0.4M (16680I)	0.40	Present	 
R2F	PC 318 DEPTH 0.4M (16680J)	0.40	Present	

Study Area	**Sample ID**	**Sample Depth (mbgl)**	**Coal Tar (Present/ Absent)**	**Core Photo**
F2L	PC 323 DEPTH 0.2M (16680K)	0.20	Absent	
F2L	PC 324 DEPTH 0.2M (16680L)	0.20	Absent	

Study Area	Sample ID	Sample Depth (mbgl)	Coal Tar (Present/ Absent)	Core Photo
F2L	PC 325 DEPTH 0.2M (16680M)	0.20	Absent	
F2L	PC 326 DEPTH 0.2M (16680N)	0.20	Absent	

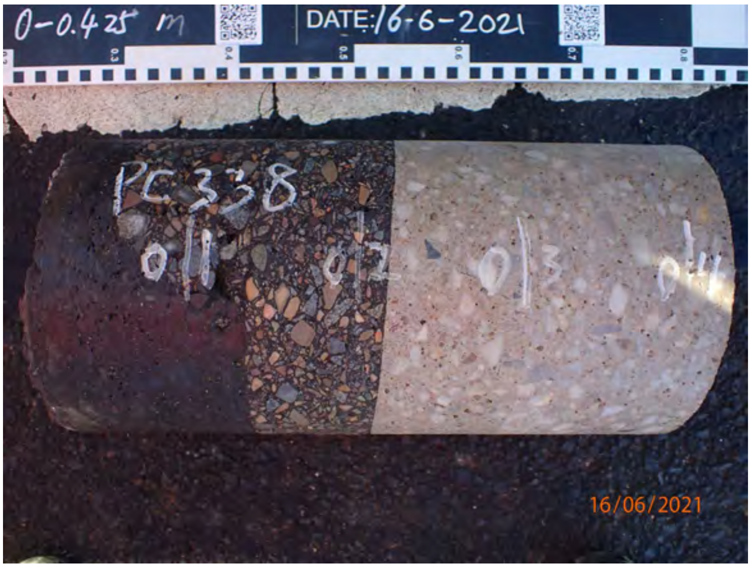
Study Area	Sample ID	Sample Depth (mbgl)	Coal Tar (Present/ Absent)	Core Photo
F2L	PC 327 DEPTH 0.05M (16680O)	0.05	Absent	
F2L	PC 328 DEPTH 0.2M (16680P)	0.20	Absent	

Study Area	Sample ID	Sample Depth (mbgl)	Coal Tar (Present/ Absent)	Core Photo
F2L	PC 329 DEPTH 0.2M (16680Q)	0.20	Absent	 15/06/2021
F2L	PC 330 DEPTH 0.1M (16680R)	0.10	Absent	 18/06/2021

Study Area	Sample ID	Sample Depth (mbgl)	Coal Tar (Present/ Absent)	Core Photo
F2L	PC 331 DEPTH 0.2M (16680S)	0.20	Absent	
F2L	PC 332 DEPTH 0.15M (16680T)	0.15	Absent	

Study Area	Sample ID	Sample Depth (mbgl)	Coal Tar (Present/ Absent)	Core Photo
F2L	PC 334 DEPTH 0.2M (16680U)	0.20	Absent	
F2L	PC 335 DEPTH 0.1M (16680V)	0.10	Absent	

Study Area	Sample ID	Sample Depth (mbgl)	Coal Tar (Present/ Absent)	Core Photo
F2L	PC 336 DEPTH 0.2M (16680W)	0.20	Absent	
F2L	PC 337 DEPTH 0.2M (16680X)	0.20	Absent	

Study Area	Sample ID	Sample Depth (mbgl)	Coal Tar (Present/ Absent)	Core Photo
F2L	PC 338 DEPTH 0.05M (16680Y)	0.05	Absent	

4. Conclusions and Recommendations

4.1 Conclusions

The key findings of the coal tar assessment are as follows:

- Coal tar was detected in samples taken from four cores (PC304, PC310, PC317 and PC318) across three of four the study areas (L2R, CRR and R2F).
- Coal tar was detected at depths ranging from 0.25mbgl (PC310) to 0.4mbgl (PC317 and PC318).
- Coal tar was not detected in any of the fifteen cores taken within the F2L study area.
- Cutting activities are expected to take place during construction within areas where coal tar has been detected, which will need to be appropriately managed.

4.2 Recommendations

Based on the results of the coal tar assessment, the following recommendations are made based on the findings of this assessment:

- Further testing should be completed on pavement cores at additional locations and depths across the L2R, CRR and R2F study areas to provide a greater understanding of the lateral and vertical extent of coal tar containing asphalt across the site.
- Where coal tar is present, measures should be developed under a CEMP to appropriately manage and dispose of coal tar containing asphalt in accordance with the NSW Government (2015) *Technical Direction 21: coal tar asphalt handling and disposal* procedure.

5. References

NSW Government - Transport Roads and Maritime Services (2015) *Technical Direction 21: coal tar asphalt handling and disposal* procedure. September 2015.

NSW Government - Transport Roads and Maritime Services (2012) *Test method T542: Identification of tar or pitch in asphalt.* November 2012.