Environment Protection Authority
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Baseline Groundwater Quality Assessment

Fishermans Bend Urban Renewal Area

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Client: Environment Protection Authority

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Executive Summary

In anticipation of future development at the Fishermans Bend Urban Renewal Area (the site), the Environment Protection Authority Victoria (EPA) engaged AECOM Australia Pty Ltd (AECOM) to undertake a baseline groundwater quality assessment the site (**Figure F1**).

The assessment focused primarily on characterising the condition of the shallow groundwater aquifer, to determine key factors that may be influencing its quality at a regional scale, and provide a summary of regional baseline groundwater quality for future reference. The regional groundwater conditions described in this report may be considered when informing future development decisions at the site.

The primary objectives of the assessment were to:

- Determine the baseline shallow groundwater quality across the site.
- Confirm the protected and precluded beneficial uses of shallow groundwater at the site.
- Provide possible regional background concentrations of chemicals of potential concern (CoPC) based on the data obtained.
- Gain a greater understanding of the potential risk of shallow groundwater contamination to impact on surface water receptors.
- Provide recommendations on risk mitigation and management strategies required during site development activities that relate to any potential shallow groundwater contamination identified through this assessment.

To achieve the project objectives, an assessment framework was developed to:

- Describe the physical-chemical condition of the shallow aquifer encountered.
- Evaluate whether the data collected are representative of a single or multiple elements of the groundwater flow system.
- Identify potential anomalies and/or outliers (including potential localised contaminant sources and or impacts from both soil and groundwater) for separate consideration to the main data set.
- Identify chemicals that are detectable in groundwater and whether they may be associated with natural and/or anthropogenic sources.
- Describe the range of chemical concentrations that may be encountered in groundwater in association with non-point source and/or natural background conditions.
- Identify whether the detected concentrations of these chemicals have the potential to preclude beneficial uses of the aquifer.

The scope of works to achieve the objectives included:

- Installation of 36 new groundwater monitoring wells across the site, and limited soil sampling and analysis.
- Gauging of standing water levels (SWL) within 38 groundwater monitoring wells (36 new groundwater wells and two existing groundwater wells).
- In-field measurement of groundwater quality parameters from 38 groundwater monitoring wells. Parameters included dissolved oxygen (DO), electrical conductivity (EC), pH, oxygen reduction potential (ORP) and temperature.
- Collection and laboratory analysis of groundwater samples from 38 groundwater monitoring wells, and quality control and quality assurance (QA/QC) samples.
- Preliminary assessment of potential tidal influence on groundwater.
- Data collation, assessment and reporting.

This is considered a baseline groundwater assessment only. Limited soil results have been provided and compared to applicable guidelines for the purpose of understanding potential sources of groundwater impacts where considered likely. However, no further interpretation of soil data has been conducted, nor was it required for the purposes of this assessment.

Key findings of the assessment

Baseline Shallow Groundwater Quality

- Of the 36 new groundwater well locations:
  - Five encountered groundwater within fill material.
  - Twenty-eight encountered groundwater within Port Melbourne Sands.
  - One encountered groundwater within Coode Island Silt (CIS).
  - Two encountered groundwater within Older Volcanic clays.

  These observations are consistent with the regional geological maps of the area.
- Field observations and bore logs indicated that fill and the Port Melbourne Sands are interconnected.
- SWL's were reported to range between 0.94 and 3.55 metres below top of casing (mBTOC). This variation across the site is expected due to the presence of former landfills/quarries, extensive sewer networks, former wetland areas and close proximity to the Yarra River.
- In a regional context, the shallow groundwater flow-paths within fill material and the Port Melbourne Sands are likely flow towards the south, based on the results of the gauging program.
- The shallow groundwater flowing in the fill material and Port Melbourne Sands is considered an unconfined aquifer and it is likely to be recharged by direct infiltration of rainfall, leaking services, or flows from the Yarra River under high tide conditions. Various site activities and surface coverage can also affect the extent of recharge of the shallow aquifer.
- Shallow underground infrastructure can create artificial recharge (via leakage at points that are shallower than groundwater) and preferential flow paths (via groundwater draining at points that are deeper than groundwater). However, given the shallow depth of the upper unconfined aquifer, it is unlikely that deep underground infrastructure has a significant impact on flow direction.
- The site itself appears to be generally acting as a groundwater flow-through zone with some possible discharge zones near the south east of the site.
- The potential tidal influence was measured in two transects running north to south across the site. Results of this work showed that there was consistency in the way the groundwater wells responded to changes in tides, indicating the tide was an influencing factor. However, the tidal response in relation to groundwater levels was considered a minimal reaction within the well locations along selected transects.
- The groundwater across the site appears to be mostly Ca/Na-HCO_3 dominant, with Na-Cl dominant groundwater occurring along the north eastern portion of the site. The pH ranged between 4.88 and 8.11, EC was reported as 241 to 35,600 uS/cm, while laboratory TDS concentrations were typically in excess of 632 mg/L.

Protected and precluded beneficial uses of shallow groundwater

Based on the TDS concentrations, the most sensitive segment of groundwater at the site that is likely to require protection in future assessments/environmental audits is Segment A2 (as defined by the *State Environment Protection Policy (Groundwaters of Victoria) 1997*) which requires the protection of Potable Water Supply – Acceptable and other sensitive beneficial uses. However, the area is serviced by a reticulated water supply which may limit the need for the use of groundwater as a drinking water supply in the region.

Regional background concentrations of chemicals of potential concern (CoPC)

Descriptive statistics of CoPC detected at concentrations in excess of the most conservative guideline (Drinking Water) were undertaken, as these are considered to be the CoPC at the site which are most likely to trigger further investigation during future assessments/environmental audits. In doing so, data points associated with potential point-sources of contamination have been removed, so that the remainder of the data can be used to determine possible regional background conditions.

The following CoPC were reported in concentrations that exceed Potable Water Supply (Drinking Water) criteria, and may therefore trigger further consideration in relation to future redevelopment of the site:

- Ammonia as N – likely from a diffuse source or co-source that is regionally elevated.

- Chloride – Considered to be regionally elevated in background conditions.
- Nitrate as N – Likely a diffuse source that is regionally elevated.
- Sulfate as SO_4 – Considered regionally elevated background conditions.
- TDS – Considered regionally elevated in background conditions.
- Arsenic – Considered regionally elevated in background conditions.
- Iron – Considered regionally elevated in background conditions.
- Manganese – Considered regionally elevated in background conditions.
- Nickel – Considered regionally elevated in background conditions.

Ground water clean up - Future site development

Ammonia and nitrate concentrations within groundwater are unlikely to be considered as background conditions (as defined by the State Environment Protection Policy (Groundwaters of Victoria) 1997), as they are expected to be present due to diffuse-source pollution. As nitrate and ammonia are elevated across the site, they may be considered regionally elevated, however, individual site assessments will need to consider the results of this assessment in conjunction with the potential for site-sourced contamination to determine groundwater clean up associated with the future redevelopment of the site.

Potential risk of shallow groundwater contamination impact on surface water receptors

The flow of shallow groundwater across the site has been considered from a regional perspective for the purposes of this regional baseline assessment. Generally, it is noted that under natural conditions groundwater moves along flow paths from areas of recharge to areas of discharge along rivers, lakes, wetlands, or seepage to bays and oceans.

Based on the site setting, topography and findings of this baseline groundwater assessment, groundwater is considered likely to flow in a southerly direction. Groundwater is therefore likely to discharge to the Yarra River and Hobsons Bay and place the following potential surface water receptors at risk:

- Aquatic ecosystems and groundwater dependent ecosystems (GDE's) in the Yarra River and Hobsons Bay.
- Users of water for potable supply.
- Terrestrial ecology where groundwater is used for irrigation or stock watering purposes.
- Recreational users in the Yarra River and Hobsons Bay.

In addition to the above surface water receptors, as groundwater is relatively shallow across the study area, there is potential for groundwater to come into contact with building foundations, basement structures and subsurface utilities. Vapours arising from groundwater contaminants may migrate through the subsurface and into buildings, which could result in potential risk to occupants of those buildings.

Risk mitigation and management strategies required during the site development

It is acknowledged that there are many ways in which the data in this report may be interpreted and/or presented. The assessment framework was worked through in a step-wise manner to identify a representative data set and characterise the general conditions of the shallow groundwater on a regional scale.

In addition to the findings of this report, and to ensure that the contamination risk is fully understood in relation to future redevelopment of individual parcels of land within the site, it is recommended that future assessments consider site-specific risk mitigation strategies for each redevelopment. These could include, but are not limited to:

- At least an environmental investigation in accordance with the *National Environmental Protection (Assessment of Site Contamination) Measures (NEPM),* varied in April 2013, to assess the potential for contamination and the likely impact on the proposed development.
- Consideration of potential vapour risk and risk to buildings and structures associated with identified regional and/or localised groundwater conditions.
- Consideration by the relevant planning authorities regarding the need for a statutory environmental audit to be undertaken prior to the redevelopment works – particularly if the redevelopment area is considered the point-source of contamination, or impacted by a point-source of contamination.

1.0 Introduction

In anticipation of future development at the Fishermans Bend Urban Renewal Area (the site), the Environment Protection Authority Victoria (EPA) engaged AECOM Australia Pty Ltd (AECOM) to undertake a baseline groundwater quality assessment at the site (**Figure F1**).

The assessment focused primarily on characterising the condition of the shallow groundwater aquifer, to determine key factors that may be influencing its quality at a regional scale, and provide a summary of regional baseline groundwater quality for future reference. The regional groundwater conditions described in this report may be considered when informing future development decisions at the site.

This report should be considered as a baseline groundwater assessment (only). Limited soil sampling was undertaken during installation of groundwater monitoring wells at the site. Whilst the soil results have been compared to applicable guidelines within tables of the report, no further interpretation of soil data has been conducted.

1.1 Background

AECOM issued a Desktop Study and Preliminary Regional Conceptual Site Model (PRCSM) for the Fishermans Bend Urban Renewal Area (FBURA) (the site) on 28 August 2015.

The Desktop Study reviewed existing publically available data to determine key factors that may be influencing shallow groundwater within the site on a regional scale. The study involved review of significant environmental conditions in broad terms as either being related to natural or anthropogenic (ambient) sources. The following features were found to have the potential to have significant influence on the overall groundwater migration and quality at the site:

- Inorganic substances that are naturally present in the environment.
- Organic substances that may be present in the environment as a result of organic matter decomposition or as the products of incomplete combustion.
- Tidal influences.
- Former swamp and wetlands.
- Geological Features.
- The sewer network across the site, particularly the Hobsons Bay Main Sewer and Melbourne Main Sewer.
- The drainage and stormwater system.
- Uncontrolled filling (including filling of former quarries/landfills).

Potential point sources of contamination were also considered during the Desktop Study to ensure that the groundwater sampling programme undertaken as part of this investigation aimed to avoid sampling groundwater that may be influenced by point sources.

This baseline groundwater assessment addresses the following recommendations that were provided within the Desktop Study:

- Implementation of a grid based groundwater investigation on a regional scale to gain a holistic understanding of groundwater flow and possible contaminant movement via groundwater.
- Further consideration of tidal influence on the regional groundwater quality including the impacts of regular flushing of water, salinity and migration pathways.
- Further investigation of sewers and drains if discrepancies in groundwater elevation are apparent in the vicinity of the sewer and drainage locations during any future sampling works.

1.2 Objectives

The assessment generally focused on understanding the condition and characteristics of the shallow aquifer located beneath the site, with the primary objectives of the assessment as follows:

- Determine the baseline shallow groundwater quality across the site.
- Confirm the protected and precluded beneficial uses of shallow groundwater at the site.
- Provide possible regional background concentrations of chemicals of potential concern (CoPC) based on the data obtained.
- Gain a greater understanding of the potential risk of shallow groundwater contamination to impact on surface water receptors.
- Provide recommendations on risk mitigation and management strategies required during the site development relating to any potential shallow groundwater contamination identified during the assessment.

1.3 Scope of Works

The general scope of works undertaken to achieve the objectives of this assessment was as follows:

- Installation of 36 new groundwater monitoring wells across the site, and limited soil sampling.
- Survey of the top of each groundwater monitoring well casing (PVC) and ground surface elevation at each location.
- Gauging of standing water levels (SWL) within 38 groundwater monitoring wells (i.e. 36 new groundwater wells and 2 existing groundwater wells).
- Collection of field groundwater quality parameters from 38 groundwater monitoring wells including dissolved oxygen (DO), electrical conductivity (EC), pH, oxygen reduction potential (ORP) and temperature.
- Collection of groundwater samples from 38 groundwater monitoring wells and quality control and quality assurance (QA/QC) samples.
- Preliminary assessment of potential tidal influence.
- Laboratory analysis of groundwater and QA/QC samples.
- Data collation, assessment and reporting.

2.0 Site Description and Environmental Setting

The site is located in the south-west of Melbourne and is bound by Lorimer Street to the north, Todd Road to the west, Williamstown Road/Boundary Street to the south and City Road to the east. The Yarra River is beyond Lorimer Street at the northern boundary of the site, while the Westgate Freeway separates the Lorimer sub-precinct from the other three sub-precincts.

The site is generally used for heavy and light commercial and industrial processes which are described in AECOM (August 2015). The following table summarises the relevant site details. Please refer to AECOM (August 2015) for the current zoning overlay conditions across the site.

Table 1 Site Information

Precinct	Area (ha)	Municipality	Current Zoning	Current Overlays
Wirraway	90	City of Port Phillip	IN1Z B3Z PPRZ PUZ6	EAO HO CLPO SBO RXO
Sandridge	80	City of Port Phillip	IN1Z B3Z PPRZ PUZ6	HO SBO DDO
Lorimer	45	City of Melbourne	IN1Z B3Z	CLPO SBO DDO
Montague	25	City of Port Phillip	IN1Z PUZ2 MUZ B1Z PUZ4	EAO HO SBO DDO

Notes:

Overlays: EAO = Environmental Audit Overlay, HO = Heritage Overlay, DDO = Design and Development, SBO – Special Building, CLPO = City Link Project, RXO = Road Closure.

Zoning: B1Z, B3Z = Business Zones, IN1Z = Industrial Zones, PPRZ – Public Park and Recreation Zones, PUZ2, PUZ4, PUZ6 = Public Use Zones, MUZ = Mixed Use Zones.

2.1 Topography

A detailed description of the desktop topography review is provided in AECOM (August 2015).

In summary, the topography across the entire site is relatively flat with a gradual decline in elevation towards the Yarra River at the east-northeast, and to Hobson's Bay located to the south of the site.

The elevation of the site ranges from 0 - >4 meters Australian Height Datum (mAHD), which is likely to result in a slightly variable depth to the underlying groundwater table.

The main topographic observations made across the entire site include:

- The areas immediately north of the Wirraway sub-precinct look to have been built up for construction of the freeway.
- There is a ridge of higher land that runs from west to east (starting from the Wirraway sub-precinct) that continues to drop in gradient towards the level of the Yarra River, which is located to the north – northeast of the site.

- There appears to be a saddle of depression between the two high points along the ridge in the Wirraway sub-precinct.
- There is a slight plateau on the southern side of the entire site itself.
- The gradient which is north of the site towards the Yarra River is slightly steeper than the gradient towards Hobson's Bay, the mouth of the Yarra River, located to the south of the site.
- It is likely that the higher elevation noted in the northern portions of the Wirraway sub-precinct will reduce surface water run-off to the north of the site.

2.2 Geological Conditions

The site is located in the Yarra delta, which is comprised of a number of flat lying sedimentary deposits. Together these deposits are known as the Yarra Delta Group.

The Yarra Delta Group is described as dipping in a south-westerly direction due to an erosion surface which has been cut into the Tertiary and Silurian aged formations underlying the Yarra delta group (Nelson, 1996).

According to the Melbourne 1:63,360 Geology Map and the Melbourne 1: 250,000 Geology Map, the majority of the site is underlain by Quaternary aged Port Melbourne Sands consisting of raised beach ridges, bedded and cross-bedded well sorted sand, shelly sand and minor silty or clayey sand. The Melbourne and Suburbs 1:31,680 Geology Map also indicate the presence of alluvial fields, mud flats, beach and estuarine deposits.

Based on our reviews of environmental audit reports across the site (AECOM, August 2015), limited reviews of groundwater wells across the site (AECOM, August 2015), and the information obtained in Golder (2012), the fill thickness overlying the Port Melbourne Sands across the site is expected to be highly variable. Overall, desktop information indicates that fill material is expected to range between 0.5 and 2 meters (m) and be considerably thicker in areas where old landfills or quarries were present. This is consistent with our field observations made during this project, as described in **Section 8.1**.

The fill in a small portion of the site (i.e. north eastern corner) is likely to overly the Coode Island Silt (Qri) which is described as silt, silty clay, sandy clay dark grey with minor peat and shell beds. The following geological units underlie the Coode Island Silt (from youngest to oldest):

- The pleistocene aged Fishermens Bend Silt (Qpf) described as silty clay, pale grey to pale brown, with some minor sandy clay and silt the upper part of the formation is mottled and fissured.
- The pleistocene aged Moray Street Gravel (Qpg) described as quartz gravel and sand, with minor silt, clay and carbonaceous clay.
- The tertiary aged Newport Formation (Tmn) described as silt, grey and green, with calcareous silt, silty clay and minor limestone.
- Miocene aged Older Volcanics (Tvo) described as dense blue / black basalt.
- The Eocene aged Werribee Sand (Tew) described as sand, sandy and silty clay, with pyritic and lignitic quartz sand.

The bedrock below the site and the surrounding area is the Upper Silurian aged Dargile formation which is described as sandstone, siltstone, minor shaley siltstone, thinly and regularly bedded.

2.3 Hydrogeological Conditions

According to the 12 environmental audit reports reviewed within 1 km of the site (AECOM, August 2015), the average depth to groundwater in the Port Melbourne Sands was expected to be approximately 3 meters below ground level (mBGL). The water levels recorded during this assessment were found to range between 0.94 and 3.55 meters below top of casing (mBTOC). The groundwater gauging event is described further in **Section 8.2**.

The topography of the site suggests that regional groundwater within the local aquifer system would flow to the north towards the Yarra River or west towards Port Phillip Bay. However, the results of the groundwater gauging program indicate that groundwater generally flows in a southerly direction across the site.

According to the *Victorian Groundwater Beneficial Use Map Series: South Western Victoria, Water Table Aquifers* (DCNR, 1995), the concentration of total dissolved solids (TDS) in groundwater in the upper aquifer in the study area is expected to range between 1,001 mg/L and 3,500 mg/L which falls within "Segment B" according to the

SEPP (GoV). Whilst desktop information indicates that groundwater falls within Segment B, site data suggests that regional groundwater actually falls within Segment A2 (**Section 8.4**).

The following protected beneficial uses are considered relevant for Segment A2:

- Maintenance of Ecosystems
- Potable water supply – acceptable
- Potable mineral water supply
- Agriculture, parks and gardens
- Stock watering
- Industrial water use
- Primary contact recreation
- Buildings and structures

As a wide range of TDS values have been recorded during this baseline assessment, the lower end of the range of reported values may indicate a potential for use of the groundwater for potable water supply purposes. The upper end of the range of reported values may indicate that in areas the groundwater is not suitable for use for potable water supply or irrigation purposes.

AECOM (August, 2015) presents a list of registered groundwater wells within a 1km radius of the site and the associated uses. According to the Visualising Victoria's Groundwater (VVG) website, there are 336 registered groundwater wells. Of these:

- 121 are registered as use for groundwater investigation purposes (ranging between 3 and 36 m in depth)
- 8 are registered as use for domestic purposes (ranging between 4 and 8.5 m in depth)
- 11 are registered as use for domestic and stock purposes (ranging between 4 and 10 m in depth)
- 6 are registered as use for irrigation purposes (ranging between 6 and 6.1 m in depth)
- 78 are registered as use for observation purposes (ranging between 4 and 38 m in depth)
- 3 are registered as use for 'miscellaneous' purposes (ranging between 9.14 and 13.07 m in depth)

An additional 109 wells are registered as 'use unidentified use' or have no comment in relation to use. Whilst no information is available, it is pertinent to understand that these wells exist across the site and that extractive uses cannot be ruled out. The location of all registered groundwater wells across the site is provided in the Desktop Study (AECOM, August 2015) and **Figure F2**.

Note that the above depths are assumed to be 'below top of casing', and should be used as a guide only.

Based on the Desktop Study (AECOM, August 2015), the groundwater uses listed above and the results of this assessment, groundwater within the site has a high potential to be influenced by natural and anthropogenic preferential pathways (e.g. sewer/water lines, filled quarries, former swamps and low lying wetlands that have since been filled).

Brief hydrogeological descriptions for each of the geological units discussed in **Section 2.2** are listed in **Table 2** below. Classification and hydraulic conductivities have been sourced from Leonard (1992).

Table 2 Hydrogeological Descriptions for each Geological Unit

Geological Unit (Youngest to Oldest)	Brief Hydrogeological Description
Port Melbourne sand (Qrp)	Unconfined aquifer. Medium porosity. K= 10^{-6} to 10^{-4} m/s.
Coode island silt (Qri)	Aquitard. Medium porosity. As there are sand layers and lenses, the horizontal hydraulic conductivity (Kh= 10^{-8} to 10^{-7} m/s) is generally greater than the vertical hydraulic conductivity (Kv= 10^{-9} to 10^{-8} m/s).
Fishermens Bend silt (Qpf)	Aquitard. Medium porosity. As there is fissuring, the vertical hydraulic conductivity (Kv= 10^{-8} m/s) may be greater than horizontal hydraulic conductivity (Kh= 10^{-9} to 10^{-8} m/s).
Moray Street Gravel (Qpg)	High yielding confined aquifer. Medium porosity. Hydraulic conductivity is likely to range between 10^{-5} and 10^{-4} m/s.
Newport formation (Tmn)	Aquitard. Medium porosity. Hydraulic conductivity is likely to range between 10^{-9} to 10^{-7} m/s.
Older Volcanics (Tvo)	Confined aquifer. Low to high hydraulic conductivity depending on the extent of weathering (K= 10^{-7} to 10^{-5} m/s).
Werribee sand (Tew)	Potentially high yielding aquifer. Medium porosity. Hydraulic conductivity is likely to range between (K= 10^{-8} to 10^{-5} m/s).

3.0 Preliminary Regional Conceptual Site Model

3.1 Conceptual Site Model

The preliminary regional conceptual site model (PRCSM) presented in AECOM (August, 2015) has been further informed by the results and observations of this baseline groundwater assessment.

Regional diffuse (non-point) sources:

- Natural background concentrations of metals in soil and groundwater derived from the geological parent material.
- Natural organic substances present in the environment as a result of organic matter decomposition (e.g. hydrocarbons) or as the products of incomplete combustion (e.g. polycyclic aromatic hydrocarbons [PAH] and dioxins).
- Anthropogenic activities may contribute to the background concentration of both inorganics and organic compounds, including:
    - Deposition of atmospheric pollution.
    - Leakage and other emissions from motor vehicles on public roads.
    - Leakage from waste water utilities (stormwater and sewer).
    - The use of pesticide and fertiliser on public land.
    - Backfilling with uncontrolled fill during early land reclamation activities.

The above activities have the potential to result in one or more groundwater contamination plumes, or comingled plumes, particularly given the urban and commercial/industrial nature of the site area.

Exposure Pathways:

- Lateral migration of groundwater.
- Groundwater abstraction.
- Direct contact with *in-situ* groundwater.
- Vapours derived from groundwater may migrate through the subsurface and into overlying buildings and other structures.

Potential Receptors:

- Aquatic ecosystems and groundwater dependent ecosystems (GDE's) in the Yarra River and Hobsons Bay.
- Users of water for potable supply.
- Terrestrial ecology and Agriculture, Parks and Gardens, where groundwater is used for irrigation or stock watering purposes.
- Recreational receptors in the Yarra River and Hobsons Bay.
- Buildings and structures in direct contact with groundwater.
- Occupants of building and structures where vapour intrusion may occur.

3.2 Chemicals of Potential Concern

The Chemicals of Potential Concern (CoPC) for regional groundwater at the site are summarised in **Table 3**, based on the identified potential regional diffuse (non-point) sources and the anticipated background groundwater conditions.

Table 3 Chemicals of potential concern

Potential Regional Source	Common Groundwater CoPC	Potential Additional Groundwater CoPC
Land reclamation using uncontrolled backfill	- Metals - Total Petroleum Hydrocarbons (TPH) - Benzene, Toluene, Ethylbenzene, Xylene, Naphthalene (BTEXN) - PAH - Chlorinated Volatile Organic Compounds (VOCs)/Semi-Volatile Organic Compounds (SVOCs)	- Phenolic compounds
Pesticide and fertiliser use	- Nitrates/ Nitrites - Phosphates - Ammonia	- Organochlorine Pesticides (OCPs) - Organophosphate Pesticides (OPPs) - Phenoxy acid herbicides
Leaks from vehicles	- Metals - TPH - BTEX - Polycyclic Aromatic Hydrocarbons (PAH)	
Deposition of atmospheric pollutants	- PAH - Nitrogen Oxides (NOx)/ Sulfur Oxides (SOx) - BTEX - Lead (Pb)	
Leaks from utilities	- Nutrients (e.g. nitrate (NO_3), nitrite (NO_2), ammonia (NH_3) phosphate (PO_4), sulphate (SO_4), fluoride (F), - Metals - Chlorinated VOCs/ SVOCs	- Phenolic compounds
Former Landfills	- Ammonia and Chloride	
Geological Parent Material	- Metals - Sulfate, pH (Coode Island Silt)	

Note:

- *Potential additional CoPC are those CoPC that may be more likely to be associated with soil impacts rather than groundwater impacts, or may be more likely to be related to specific source sites rather than regionally ubiquitous.*
- *VOCs and SVOCs are considered to be potentially associated with either regional diffuse sources or specific sources. As a conservative approach, we have incorporated these analytes in the common groundwater CoPC column.*
- *Metals include arsenic (As), cadmium (Cd), chromium (III + VI) (CrIII + VI), copper (Cu), iron (Fe), lead (Pb), mercury (Hg), nickel (Ni), selenium (Se) and zinc (Zn). Only Total Cr (or Cr III + VI) will be analysed as a CoPC for this assessment. Speciation may be undertaken at a later date if Total Cr results exceed guidelines in order to determine if the results represent CrIII or CrVI.*

3.3 Future Land Use Scenarios and Potential Receptors

The site has an anticipated future use as a mixed-use precinct with medium to high density residential sub-precincts. The potential receptors to groundwater contamination are discussed in **Table 4** in the context of the protected beneficial sues of groundwater.

Table 4 Potential Receptors

Beneficial Use of Groundwater	Identified Receptors
Maintenance of Ecosystems	Based on the site setting, topography and findings of this baseline groundwater assessment, groundwater is considered likely to flow in a southerly direction. Groundwater may therefore discharge to areas of the Yarra River and Hobsons Bay and influence aquatic ecosystems in these water bodies, as well as GDE's.
Potable water supply	The site is located in an area of reticulated water supply, which reduces the likelihood of extraction for potable use. However, owing to the low TDS reported in some areas, this beneficial use of groundwater cannot be excluded. Receptors for this beneficial use are humans.
Potable mineral water supply	The site is not located within a designated mineral water zone therefore this groundwater beneficial use is considered unlikely to be realised.
Agriculture, parks and gardens	The site is located in an area of reticulated water supply which reduces the likelihood of extraction for irrigation use. However, owing to the low TDS reported in some areas, this beneficial use of groundwater cannot be excluded. The receptors for this beneficial use include vegetation in public and private land, as well as food crops on private land.
Stock watering	The site is located in an area of reticulated water supply which reduces the likelihood of extraction for stock watering use. Such a use is also considered unlikely to be realised under the anticipated future land use and urban setting. However, owing to the low TDS reported in some areas, this beneficial use of groundwater cannot be excluded.
Industrial water use	It is considered unlikely that following redevelopment industrial land uses will continue in the area and therefore this groundwater beneficial use is considered unlikely to be realised. Furthermore it is considered likely that any groundwater extracted for industrial purposes would require treatment prior to use owing to the variable salinity.
Primary contact recreation	Based on the site setting, topography and findings of this baseline assessment, groundwater is considered likely to flow in a southerly direction. Groundwater may therefore discharge to the Yarra River and Hobsons Bay and be contacted by recreational users of these waterways.
Buildings and structures	Groundwater is relatively shallow across the study area and has the potential to come into contact with building foundations, basement structures and subsurface utilities. Vapours derived from groundwater may migrate through the subsurface and into buildings.

4.0 Regulatory Setting

4.1 EPA and the Environment Protection Act

In Victoria, protection of the environment is regulated by the Environment Protection Authority (EPA) which is established via the *Environment Protection Act 1970* (the Act). EPAs role is to be an effective environmental regulator and an influential authority on environmental impacts. EPA is responsible for the regulation of pollution and administration of the Act via its compliance and enforcement actions. EPA recommends and assists in the development of environment policy and prepares guidelines to further guide stakeholders in compliance with the Act.

4.2 State Environmental Policy

State Environment Protection Policy (SEPP) is subordinate legislation and provides further detail on interpretation and expectations for compliance with the Act. A number of policies have been published and include:

- State Environment Protection Policy - *Prevention and Management of Contamination of Land*;
- State Environment Protection Policy - *Groundwaters of Victoria*;
- State Environment Protection Policy - *Waters of Victoria*,
- State Environment Protection Policy – *Ambient Air Quality*;
- State Environment Protection Policy – *Air Quality Management*;
- State Environment Protection Policy - *Control of Noise from Industry, Commerce and Trade; and*
- State Environment Protection Policy - *Control of Music Noise from Public Premises*.

Some of these policies have been amended or varied and there is currently a review being undertaken to contemplate the amalgamation of the Waters of Victoria and Groundwaters of Victoria SEPPs.

For the purpose of this project the SEPPs for Groundwaters of Victoria and Waters of Victoria (as this relates to the point of discharge for groundwater) are most relevant. These are discussed in the following sections.

4.2.1 SEPP Groundwaters of Victoria

The State Environment Protection Policy (Groundwaters of Victoria) 1997 (SEPP GoV) applies to the management of groundwater quality in Victoria. The purpose of the policy is:

"to maintain and where necessary improve groundwater quality sufficient to protect existing and potential beneficial uses of groundwaters throughout Victoria"

Beneficial use means a use of the environment or any element or segment of the environment which is:

- Conducive to public benefit, welfare, safety, health or aesthetic enjoyment and which requires protection from the effects of waste discharges, emissions or deposits or of the emission of noise; or
- Declared to State Environment Protection Policy (SEPP) to be a beneficial use.

The SEPP (GoV) defines beneficial uses of groundwater on the basis of background salinity, measured as total dissolved solids (TDS). Groundwater is considered to be polluted where current and / or future protected beneficial uses for the relevant segment are precluded. Beneficial uses of groundwater are considered precluded when relevant groundwater quality objectives have been exceeded, or where non-aqueous phase liquid is present.

The SEPP GoV allows for the EPA to establish Groundwater Quality Restricted Use Zones (GQRUZ) where one or more beneficial uses are precluded due to contamination. It also indicates that if such a zone is established then the groundwater within the zone must be managed to enable the groundwater to be contained within the restricted use zone. Where pollution of groundwater has been established it must be cleaned up otherwise, in accordance with clause 19(2)(b), groundwater must be cleaned up to the extent practicable (CUTEP).

4.2.2 SEPP Waters of Victoria

The State Environment Protection Policy (Waters of Victoria) (SEPP WoV) was originally Gazetted in 1988. Since then a number of variations have been published. These include:

- Variation to the State Environment Protection Policy (Waters of Victoria) – Insertion of Schedule F6. Waters of Port Phillip Bay [27 August 1997]
- Variation to the State Environment Protection Policy (Waters of Victoria) – Insertion of Schedule F7. Waters of the Yarra Catchment [22 June 1999]
- Variation to the State Environment Protection Policy (Waters of Victoria) [4 June 2003]

The purpose of the SEPP (WoV) [clause 5] *is to help achieve sustainable surface waters by setting out the environmental values and beneficial uses of water that Victorians want, and the environmental quality required to protect them.*

The SEPP (WoV) is an important policy document for this project where the point of discharge for groundwater is the surface waters of the Yarra Port or Hobsons Bay.

4.3 National Environment Protection Measure

The National Environment Protection Council (NEPC) *National Environment Protection (Assessment of Site Contamination) Measure 1999* (NEPM) is the premier guidance document in Australia for the assessment of site contamination. The NEPM is made under the *National Environment Protection Council Act 1994* and is given effect by individual legislation and guidelines in each state and territory. In Victoria, these include the regulatory frameworks established in the relevant State environment protection policies.

The NEPM guidance document was subject to a review process that commenced in 2004 and concluded with the NEPC approving an amending instrument to the 1999 NEPM in April 2013 (NEPC, 2013, *National Environment Protection (Assessment of Site Contamination) Amendment Measure 2013 (No. 1)*). The amended 2013 NEPM guidance came into effect on 16 May 2013. The amendment includes repealing all the original schedules to the 1999 NEPM guidance and the substitution of new schedules. Implementation of the amended 2013 NEPM is the responsibility of each state jurisdiction.

It is noted that the SEPP (PMCL) was varied on 24 September 2013 to capture modifications to the schedules within the NEPM.

4.4 EPA Guidelines

As noted above, EPA is responsible for the publication of guidelines to further assist stakeholders to understand their environmental obligations and provide advice relating to compliance.

EPA guidelines which are most relevant to this project and which describe the procedural elements for establishing whether groundwater has been cleaned up to the extent practicable are discussed in the following sections.

4.4.1 EPA Publication 759.2

EPA Publication 759.2 *Environmental auditor (contaminated land): Guidelines for issue of certificates and statements of environmental audit* (February 2014) is relevant to this project as it includes guidance to auditors regarding expectations and interpretation of CUTEP process. This project is not subject to a statutory environmental audit, however, certain elements of the project reference the procedural steps in establishing groundwater pollution, the clean up of groundwater pollution and groundwater quality restricted use zones.

4.4.2 EPA Publication 840.1

EPA Publication 840.1 *The Clean Up and Management of Polluted Groundwater* (February 2004) provides details on EPA's requirements and expectations for developing and implementing the clean up and management of polluted groundwater to ensure the protection of human health and the environment. Where polluted groundwater has been identified, EPA's role is to require clean up of the pollutants. If it is impracticable to clean up groundwater to the level needed to restore beneficial uses, EPA may accept that clean up to the extent practicable has occurred and that, subject to appropriate ongoing management, further clean up is not required.

When clean up to protect beneficial uses is not practicable (or where clean up has not yet occurred or is currently occurring), polluted groundwater should be managed to ensure the protection of human health and the environment.

4.4.3 EPA Publication 862

As noted above, the SEPP (GoV) allows for the establishment of groundwater quality restricted use zones (GQRUZ) as a tracking and information tool to be applied when the beneficial uses of groundwater are precluded due to pollution. EPA Publication 862 *Groundwater Quality Restricted Use Zone* (July 2002) discusses the various aspects and impacts of GQRUZ for Victorians.

5.0 Beneficial Uses and Environmental Quality Criteria

5.1 Introduction

Beneficial use means a use of the environment or any element or segment of the environment which is:

- Conducive to public benefit, welfare, safety, health or aesthetic enjoyment and which requires protection from the effects of waste discharges, emissions or deposits or of the emission of noise, or:
- Declared in a State Environment Protection Policy (SEPP) to be a beneficial use.

An *element* of the environment is any of the principal constituent parts of the environment including land, water, atmosphere, vegetation, climate, sound, odour, aesthetics, fish and wildlife. The relevant elements for the site are considered to be the following:

- Land at the site.
- Groundwater beneath the surface of the site and down-hydraulic gradient of the site.
- Surface waters hydraulically connected to groundwater and/or receiving runoff from the site.

The selection of environmental quality criteria for this project is based on the consideration of any possible beneficial use that may be feasible, and is particularly focused on the existing and likely future uses of the site.

5.2 Land

As described in **Section 6.1.3**, limited soil sampling was undertaken during installation of groundwater monitoring wells to ascertain some preliminary data within fill material across the site. Soil results are listed against a number of guidelines within **Appendix A** for reference, however, no further interpretation of soil data has been conducted.

The site has an anticipated future use as a mixed-use precinct with medium to high density residential sub-precincts.

The State SEPP *Prevention and Management of Contamination of Land (PMCL)* provides a statutory framework for protecting people and the environment from the effects of contamination. Note that the SEPP (PMCL) was varied on 26 September 2013 to reflect the 2013 amendments to the NEPM 1999 for the Assessment of Site Contamination. The SEPP provides a list of beneficial uses to be protected under any given land use, as seen in **Table 5**.

Whilst this assessment involves only limited laboratory analysis of soil, a brief description of each soil quality objective is described in the following sub-sections.

Table 5 Protected Beneficial Uses of Land

Beneficial Use	Land Use						
	Parks and Reserves	Agricultural	Sensitive Use		Recreational / Open Space	Commercial	Industrial
			High Density	Other			
Maintenance of ecosystems							
Natural ecosystems	✓						
Modified ecosystems	✓	✓		✓	✓		
Highly modified ecosystems		✓	✓	✓	✓	✓	✓
Human health	✓	✓	✓	✓	✓	✓	✓
Buildings and structures	✓	✓	✓	✓	✓	✓	✓
Aesthetics	✓		✓	✓	✓	✓	
Production of food, flora & fibre	✓	✓		✓			

5.2.1 Maintenance of Ecosystems

Schedule B1 of the NEPM 1999 (as amended 2013) provides ecologically based investigation levels (EILs) for the protection of terrestrial ecosystems for common contaminants in soil based on a species sensitivity distribution (SSD) model developed for Australian conditions.

The NEPM 1999 (as amended 2013) contains EILs for a relatively small number of contaminants including arsenic (As), copper (Cu), chromium II (CrII), dichlorodiphenyltrichloroethane (DDT), naphthalene, nickel (Ni), lead (Pb) and zinc (Zn). Ecological Screening Levels (ESLs) are also provided in the NEPM (as amended 2013) for TPH, BTEX and benzo(a)pyrene (B(a)P). Both EILs and ESLs relate to the three generic land use settings as follows:

- Areas of ecological significance
- Urban residential areas and public open space
- Commercial and industrial land uses

Other alternative reference criteria can be referred to if justifiable and suitable for the site setting.

5.2.2 Human Health

Schedule B1 of the NEPM 1999 (as amended 2013) provides health investigation levels (HILs) 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.

It is important to note that the HILs are generic assessment criteria designed to be used in the first stage (Tier 1 or 'screening') of an assessment of potential risks to human health from chronic exposure to contaminants. As per NEPM 1999 (as amended 2013), they are intentionally conservative and are based on a reasonable worst case scenario for the following four generic land use settings:

- **HIL A:** Residential with garden/accessible soil (home grown produce <10% fruit and vegetable intake, (no poultry), also includes children's day care centres, preschools and primary schools.

- **HIL B:** Residential with minimal opportunities for soil access includes dwellings with fully and permanently paved yard space such as high-rise buildings and flats.
- **HIL C:** Public open space such as parks, playgrounds, playing fields (e.g. ovals), secondary schools and footpaths. It does not include undeveloped public open space (such as urban bushland and reserves) which should be subject to a site-specific assessment where appropriate.
- **HIL D:** Commercial/industrial such as shops, offices, factories and industrial sites.

Levels slightly in excess of the HILs do not imply unacceptability, or that a significant health risk is likely to be present. Exceeding a HIL means further investigation is required and not 'risk is present, clean-up required'.

Schedule B1 of the NEPM 1999 (as amended 2013) also provides health screening levels (HSLs) 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 physicochemical properties, land use scenarios, and the characteristics of building structures. They apply to different soil types, and depths below surface to greater than 4mBGL. Further detail on their use is provided in Friebel, E and Nadebaum, P (September 2011) *Health Screening Levels for Petroleum Hydrocarbons in Soil and Groundwater, CRC CARE Technical Report no. 10, CRC for Contamination Assessment and Remediation of the Environment, Adelaide Australia* (CRC CARE 2011).

5.2.3 Buildings and Structures

The SEPP (PMCL) states that the contamination must not cause the land to be corrosive to or adversely affect the integrity of structures or building materials.

The exposure classifications for concrete piles and steel piles outlined in Australian Standard 2159-2009 "Piling-Design and Installation" (AS2159) have been considered during this Audit. AS2159 provides exposure conditions for sulphates (expressed as SO_4), chlorides and pH in order to assess soil conditions under an exposure classification.

5.2.4 Aesthetics

According to the SEPP (PMCL), contamination must not cause the land to be offensive to the senses of human beings. Although this is a subjective parameter, aesthetic issues relating to the site may include discoloured soil (stained from spills, containing coloured waste, for example oil or carbon black), malodorous soils, abnormal consistency or soil containing waste (such as foundry slag, ash, bricks and concrete).

5.2.5 Production of Food, Flora and Fibre

For the protection of beneficial use 'food flora and fibre' it would be appropriate to adopt the same criteria as for the beneficial use maintenance of ecosystems.

5.3 Groundwater

In accordance with the SEPP Groundwaters of Victoria (SEPP GoV), groundwater quality objectives for beneficial uses are primarily sourced from the Australian Water Quality Guidelines for Fresh and Marine Waters, published by the Australian and New Zealand Environment and Conservation Council and Agriculture and Resource Management Council of Australia and New Zealand (ANZECC/ARMCANZ, 2000).

Given the beneficial uses identified in **Section 2.3**, AECOM has referenced the following groundwater quality objectives in order to determine which CoPC are likely to exceed beneficial use criteria on a regional scale.

It is noted that the adopted objectives are preliminary values that were developed using conservative assumptions that may not represent actual site conditions. Exceeding the reference values for a specific chemical does not necessarily indicate that the impact poses significant environmental concerns, only that additional evaluation is warranted. For this project, the additional evaluation is in the form of statistical analysis to determine possible regional background ranges of relevant CoPC.

Table 6 Adopted Guidelines for Groundwater Beneficial Uses

Receptor Type	Beneficial Use	Adopted Guideline Source
Discharge to surface water	Maintenance of Ecosystems	For maintenance of ecosystems, the SEPP Waters of Victoria (SEPP (WoV) and its schedules apply. The SEPP (WoV) adopts surface water objectives from Australian and New Zealand Guidelines for Fresh and Marine Water Quality (ANZECC/ARMCANZ, 2000). The Yarra River in the vicinity of the Site falls within the 'Yarra Port Segment' and 'Highly Modified ecosystem' in the SEPP (WoV) – Schedule F7 – Waters of the Yarra Catchment and therefore a 90% level of ecosystem protection will be adopted. Where no high reliability guideline values are available in ANZECC/ARMCANZ (2000) for potential contaminants of concern (*e.g.* metals, PAHs and TPH) the following guidelines will be adopted: - ANZECC/ARMANZ (2000) moderate and low reliability trigger values. Where exceedences of these low reliability screening values are reported, the magnitude of exceedence should be considered in light of the reliability of these values. - The errata to ANZECC/ARMCANZ (2000) replaced the trigger values for nitrate with "under review". The 90% grading value for nitrate from Hickey (2013). Updating nitrate toxicity effects on freshwater aquatic species will be adopted. - In the absence of receptor-specific screening values established in Australia, publications from other international jurisdictions (e.g. Canada, USA, UK, Netherlands) will be reviewed to identify an indicative screening value for comparative purposes.
Discharge to surface water	Primary Contact Recreation	AECOM has considered National Health and Medical Research Council (NHMRC) *Guidelines for Managing Risks in Recreational Water* (2008). This document references the NHMRC *Australian Drinking Water Guidelines* (2004) (the drinking water guidelines that were current at the time) as a guide. *Australian Drinking Water Guidelines 6* was published in 2011 (NHRMC 2011). Subsequent revisions to the guidelines were made in 2013, 2014, 2015 and 2016. NHMRC 2011 will be referred to for updated drinking water guideline values. NHMRC (2013) states that to account for percentage of daily intake from recreational waters, the drinking water guidelines provided can be modified by a factor of 10 to provide screening levels for chemicals. Hence, the objectives and approach presented in NHMRC (2011) have been adopted. Where no guidelines are listed for particular contaminants in NHMRC (2011), the following will be adopted (in order of preference) and multiplied by a factor of 10 for chemicals that are based on an ingestion scenario: - WHO (2011) Guidelines for Drinking Water Quality – Health - USEPA (November 2015) Regional Screening Levels for Residential Tap Water
Extractive Use	Potable water supply	The SEPP (GoV) specifies water quality indicator levels in groundwater should be less than the levels specified in the Australian Water Quality Guidelines for Fresh and Marine Waters. For drinking water, ANZECC/ARMCANZ (2000) refers to the Australian Drinking Water Guidelines.

Receptor Type	Beneficial Use	Adopted Guideline Source
		The following hierarchy for drinking water guidelines will therefore be adopted: - NHMRC (2011) Australian Drinking Water Guidelines - World Health Organization (WHO) (2011) Guidelines for Drinking Water - USEPA (November 2015) Regional Screening Levels for Residential Tap Water
Extractive Use	Agriculture, Parks and Gardens	The SEPP (GoV) specifies water quality indicator levels in groundwater should be less than the levels specified in the Australian Water Quality Guidelines for Fresh and Marine Waters. Section 4.2 of ANZECC/ARMCANZ (2000) contains trigger values for irrigation water use. Where both long-term and short-term trigger values are provided for specific chemicals (e.g. heavy metals) the long-term trigger values (LTV) have been conservatively adopted.
Extractive Use	Stock watering	The SEPP (GoV) specifies water quality indicator levels in groundwater should be less than the levels specified in the Australian Water Quality Guidelines for Fresh and Marine Waters. Where Section 4.3 of ANZECC 2000 does not specify IL for this beneficial use - Table 5.10 in ANZECC 1992 can be used. Where neither ANZECC 1992 or ANZECC 2000 specify IL, the *Australian Drinking Water Guidelines 2011* can be referred to in the first instance. WHO (2011) may be referred to where no ILs are specified in the Australian Drinking Water Guidelines (ADWG). For organic chemicals, the USEPA Regional Screening Levels for tap water may also be considered.
Extractive Use	Industrial Use	No adopted guidelines due to the wide range of possible industrial uses of water, and the application of other guidelines herein are considered sufficient to indicate protection of this beneficial use.
Direct contact	Buildings and Structures	The SEPP (GoV) specifies that introduced contaminants shall not cause groundwater to become corrosive to structures or building materials. Australian Standard AS2159 (2009) – Piling, Design and Installation includes exposure condition classifications for sulfate, pH and chloride. Table 6.4.2(C) of AS2159 will be referred to assess the severity of sulfate, pH and chloride on concrete structures.
Vapour Intrusion	Buildings and Structures	NEPM 1999 (as amended 2013) Groundwater HSLs

6.0 Field Investigation

A Sampling and Analysis Plan was developed to outline the methodology for collecting groundwater data to achieve the nominated data quality objectives (DQO's), and was provided to EPA prior to commencement of field work. This report summarises the adopted methodology.

The following work was conducted prior to the commencement of the field program:

- Development of a site-specific health and safety plan (HASP).
- Application for, and receipt of, groundwater well licenses from Southern Rural Water (SRW) (**Appendix B**).
- Application for, and receipt of, permits from the City of Port Phillip and the City of Melbourne to occupy the footpaths/roadways (**Appendix B**).
- Receipt of permission from the Department of Environment, Land, Water and Planning (DELWP), the land owner, to proceed with groundwater well installation works (**Appendix B**).
- Implementation of a letter box drop to privately owned properties located in the vicinity of field activities being undertaken on public land.

The field program was conducted between 12 October and 23 November 2015 as follows:

- Drilling and installation of 36 groundwater wells and soil sampling:
  - 12 – 30 October 2015 (non-consecutive days).
- Development of the 36 new groundwater monitoring wells and 2 pre-existing wells:
  - 14 October – 6 November 2015 (non-consecutive days).
- Survey of groundwater monitoring well casings and ground surface elevations:
  - 11 – 13, 16, 24 – 27 and 30 November 2015, and 1 – 2 December 2015.
- Groundwater gauging:
  - 16 November 2015 (within a 3 hour period).
- Groundwater sampling and installation of level loggers (smarTROLLS) for preliminary assessment of tidal influence:
  - 16 – 23 November 2015.

The above tasks are described in detail in the following sections.

6.1 Field Methodology

The groundwater field investigation included the following general activities:

- Groundwater well installation and limited soil sampling, which involved:
  - Pre-installation site inspections to assess the ground surface at each groundwater well location.
  - Subsurface service clearance of each groundwater well location.
  - Non-destructive digging (NDD) at each groundwater well location.
  - Drilling and installation of 36 groundwater monitoring wells at the locations presented on **Figure F3**. Note two additional, and pre-existing, groundwater wells (i.e. GW32 and GW35) were used in the sampling program, as seen in the figure.
  - Detailed geological logging of each borehole and documentation of the construction details for each new monitoring well.
  - Development of the 36 new groundwater monitoring wells plus 2 pre-existing groundwater wells to remove fines and promote connection between the well and the surrounding aquifer.
  - Visual assessment and measurement of volatile gases within fill material and soil at multiple depths within each groundwater well location.

  - Collection of soil samples at various depths at 10 groundwater well locations in an approximately even distribution across the site to establish a preliminary soil data within common fill types in the study area.
  - Reinstatement and management of spoil.
  - Survey of the top of each groundwater monitoring well casing and ground surface elevation at each location to allow groundwater elevations to be calculated, and flow directions and gradients to be estimated.
- Groundwater sampling program:
  - Equipment calibration.
  - Groundwater gauging.
  - Groundwater sampling.
  - Decontamination of groundwater sampling equipment.
  - Sample transport and laboratory analysis.

The above activities are discussed in detail in the following sub-sections.

6.1.1 Rationale for groundwater well placement

Groundwater wells were installed at locations based on a probability-based square grid sampling design, which has the following advantages (NEPM 1999 (as amended 2013)):

- The design is unbiased.
- It provides the ability to calculate uncertainty associated with estimates.
- It provides reproducible results within uncertainty limits.
- It provides the ability to make statistical inferences.
- It can handle decision error criteria.
- Grid sampling can be used to search for hotspots and to infer means, percentiles or other parameters and are also useful for defining spatial patterns or trends over time.

Where point sources of contamination were known or inferred (based on the available information), select locations in the grid layout were adjusted and moved up hydraulic gradient of these known or inferred point sources. In addition, some locations had to be moved due to access constraints and/or the presence of underground services. The final sampling pattern, following adjustments for the above constraints, resulted in a good distribution and coverage across the site for the purposes of this assessment. It is noted that there is an apparent gap in groundwater wells within the south western section of the Wirraway sub-precinct, however, given the above constraints and the intent of this baseline regional groundwater assessment, it is not considered to impact the conclusions of this report.

Table 7 provides a summary of each groundwater well location. The northings and eastings for each location can be seen in **Appendix C**.

Table 7 Summary of Groundwater Monitoring Wells

Well ID	Date Drilled	Depth groundwater encountered (mBTOC)	Screen (m)	Gravel Pack (m)	Bentonite Seal (m)	Elevation TOC (mAHD)	Total Well Depth (mBTOC)	Total Well Depth (mAHD)	SWL (mBTOC)	SWL (mAHD)
Wirraway:										
GW1	30-Oct-15	2.50	2.5-4.5	2.0-4.5	1.0-2.0	2.50	4.50	-2.01	2.91	-0.42
GW2	27-Oct-15	3.50	2.9-4.0	2.4-4.0	1.4-2.4	3.97	4.00	-0.03	3.24	0.73
GW3	15-Oct-15	3.20	3.0-4.9	2.5-4.9	2.0-2.5	3.85	4.90	-1.05	3.04	0.81
GW4	15-Oct-15	3.10	2.6-5.1	2.1-5.1	1.5-2.1	3.82	5.10	-1.28	3.55	0.27
GW5	15-Oct-15	3.00	2.5-4.5	2.0-4.5	1.0-2.0	3.05	4.50	-1.45	2.33	0.72
GW6	29-Oct-15	2.60	2.0-4.0	1.5-4.0	0.5-1.5	2.25	4.00	-1.76	1.90	0.34
GW7	16-Oct-15	3.10	3.0-5.5	2.5-5.5	1.5-2.5	3.09	5.50	-2.41	2.64	0.45
GW8	27-Oct-15	3.00	2.2-4.2	1.7-4.2	0.7-1.7	3.13	4.20	-1.07	2.63	0.50
GW9	30-Oct-15	3.60	3.5-5.5	3.1-5.5	0.5-3.1	3.28	5.50	-2.22	2.76	0.52
GW11	23-Oct-15	3.50	3.0-5.1	2.5-5.1	2.0-2..5	2.58	5.10	-2.52	2.12	0.46
GW12	29-Oct-15	3.00	2.2-4.2	1.7-4.2	0.7-1.7	2.85	4.20	-1.35	2.64	0.22
Lorimer										
GW13	29-Oct-15	2.90	2.2-4.2	1.7-4.2	0.7-1.7	2.40	4.20	-1.80	2.28	0.12
GW14	26-Oct-15	2.30	2.0-4.0	1.5-4.0	0.5-1.5	2.36	4.00	-1.64	1.94	0.42
GW15	30-Oct-15	3.10	2.5-4.5	2.0-4.5	1.0-2.0	1.22	4.50	-3.28	0.94	0.28
GW16	27-Oct-15	2.20	2.0-4.0	1.5-4.0	0.5-1.5	2.48	4.00	-1.52	2.19	0.28
GW17	29-Oct-15	2.30	1.5-3.0	1.0-3.0	0.0-1.0	2.04	3.00	-0.96	2.36	-0.33
GW18	14-Oct-15	2.30	2.0-4.5	1.6-4.5	1.0-1.6	0.78	4.50	-3.72	1.51	-0.73

Well ID	Date Drilled	Depth groundwater encountered (mBTOC)	Screen (m)	Gravel Pack (m)	Bentonite Seal (m)	Elevation TOC (mAHD)	Total Well Depth (mBTOC)	Total Well Depth (mAHD)	SWL (mBTOC)	SWL (mAHD)
GW19	26-Oct-15	3.00	2.5-5.5	1.5-5.5	0.5-1.5	1.56	5.50	-3.94	1.02	0.54
Sandridge										
GW10	16-Oct-15	3.10	3.0-5.5	2.3-5.5	1.3-2.3	3.10	5.50	-2.40	2.70	0.40
GW20	12-Oct-15	2.50	2.0-5.0	1.9-5.0	0.2-1.9	3.17	5.00	-1.84	2.87	0.30
GW21	13-Oct-15	2.60	2.5-4.0	2.0-2.5	1.0-2.0	2.61	4.00	-1.40	2.45	0.16
GW22	13-Oct-15	2.80	2.5-4.0	2.0-4.0	1.5-2.0	2.02	4.00	-1.98	2.37	-0.35
GW23	16-Oct-15	3.00	2.5-4.0	3.0-4.0	1.0-1.5	1.90	4.00	-2.10	2.30	-0.40
GW24	14-Oct-15	1.60	1.2-3.0	1.0-3.0	0.0-1.0	1.67	3.00	-1.33	1.38	0.30
GW25	12-Oct-15	2.50	2.0-4.45	2.1-4.45	0.5-2.0	3.42	4.45	-1.04	2.85	0.57
GW26	13-Oct-15	2.10	2.0-4.0	1.8-4.0	1.1-1.8	2.45	4.00	-1.55	2.48	-0.03
GW27	14-Oct-15	2.90	2.4-5.0	1.9-5.0	1.3-1.9	2.30	5.00	-2.70	3.19	-0.89
GW28	14-Oct-15	1.80	1.7-2.5	1.5-2.5	1.0-1.5	1.62	2.50	-0.88	1.43	0.19
GW30	13-Oct-15	2.50	2.1-4.5	1.8-4.5	0.6-1.8	2.16	4.50	-2.34	2.70	-0.54
South of Sandridge										
GW29	26-Oct-15	3.00	2.0-4.0	1.5-4.0	0.5-1.5	2.58	4.00	-1.42	2.85	-0.26
Montague										
GW31	29-Oct-15	3.80	2.5-4.5	2.0-4.5	1.0-2.0	1.49	4.50	-3.01	1.66	-0.18
GW32	-	-	-	-	-	1.88	-	-	2.28	-0.41
GW33	30-Oct-15	2.50	2.0-4.0	1.5-4.0	0.5-1.5	2.51	4.00	-1.49	2.35	0.16
GW34	14-Oct-15	1.90	1.7-4.0	1.4-4.0	0.8-1.4	1.10	4.00	-2.90	1.59	-0.50

Well ID	Date Drilled	Depth groundwater encountered (mBTOC)	Screen (m)	Gravel Pack (m)	Bentonite Seal (m)	Elevation TOC (mAHD)	Total Well Depth (mBTOC)	Total Well Depth (mAHD)	SWL (mBTOC)	SWL (mAHD)
GW35	-	-	-	-	-	2.00	4.0	-2.0	2.14	-0.14
GW36	15-Oct-15	1.50	1.3-3.5	1.0-3.5	0.4-1.0	1.67	3.50	-1.83	2.65	-0.98
GW37	14-Oct-15	5.00	4.0-7.0	3.5-7.0	1.5-3.5	2.24	7.00	-4.77	2.86	-0.63
GW38	27-Oct-15	5.00	4.0-7.0	3.5-7.0	2.5-3.5	2.36	7.00	-4.64	3.54	-1.18

Notes:

mBTOC = meters below top of casing

mAHD = meters Australian Height Datum

Shaded rows represent wells that have been assessed for tidal influence

" – " denotes that the information is unavailable as the groundwater well is pre-existing and there are no bore logs at this stage

SWL = Standing Water Level

6.1.2 Groundwater Well Installation

Groundwater monitoring wells were constructed in accordance with the following relevant statutory guidelines:

- *Minimum construction requirements for water bores in Australia – Edition 3* (National Uniform Drillers Licensing Committee 2012).
- National Environment Protection (Assessment of Site Contamination) Measure 1999 (as amended 2013).

AECOM obtained groundwater monitoring well construction permits from the licensing authority (SRW) prior to the commencement of installation, as well as permission from the land owner (**Appendix B**).

Service clearance was undertaken over the course of approximately 4 days, and approximately 1 week prior to the commencement of drilling.

Thirty-six (36) groundwater wells were installed to depths ranging between 2.5 and 7.0mBGL using two drill rigs provided by Matrix Drilling. Each drill rig was supervised by an AECOM staff member experienced with drilling supervision as well as the geological profile across the site.

Every location was cleared to at least 1.5mBGL using non-destructive digging (NDD) techniques (e.g. hydro excavation and hand auger) prior to the commencement of mechanical drilling.

Given the potential to encounter volatile contamination, each monitoring well was initially drilled using push tubes to observe the geological profile and obtain undisturbed soil samples from select groundwater well locations. Following use of the push tube, groundwater wells were drilled using hollow flight augers.

No non aqueous phase liquid (NAPL) was observed during drilling activities.

All soil cuttings and waste water derived from drilling groundwater monitoring wells were placed in appropriate labelled 200 L drums provided by the drilling contractor. Each drum was then manifested and removed off-site by a licensed waste contractor. Please refer to **Appendix D** for a copy of waste transport documentation.

All wells were designed and constructed using 50 mm diameter PN 12 u-PVC casing with a lower section of slotted screen (also minimum PN 12 u-PVC).

During installation works, every effort was made to construct screens within the geological unit that groundwater was encountered, despite the likely connection between fill material and the Port Melbourne Sands. This was not possible at every location due to the groundwater strike sometimes occurring in Port Melbourne Sands immediately below fill material. Based on the results of this assessment, and as discussed in **Section 8.0**, the shallow groundwater at the site is interconnected between the fill material and Port Melbourne Sands, and as such, the screens are considered to be appropriate.

The gravel packs were extended approximately 0.5 – 1 m above the top each screen where possible, while the gravel pack material consisted of washed, well rounded gravel with grading bigger than the screen slot size.

A bentonite seal was installed at the top of each gravel pack (see **Table 7** for details). The purpose of the seal is to isolate the filter pack and screened interval from vertical migration of contaminants/fluids from the site surface.

The remaining space within each groundwater monitoring well annulus was cement grouted to the surface. Grout consisted of a mixture of cement and bentonite powder.

All wells were completed with flush covers due to the potential for trip hazards and for traffic obstruction. Borelogs are provided in **Appendix E**.

Following groundwater monitoring well drilling and installation, a surveying contractor recorded the locations and elevations of the top of casing and ground surface at each location to calculate groundwater elevations.

Survey data was recorded relative to datum GDA 94 and projection MGA 54, with elevation data recorded in metres Australian Height Datum (m AHD) (**Appendix C**). As seen in **Appendix C**, the surveyor provided two readings for the existing well GW32 (i.e. GW32A and GW32B). The existing groundwater well that was gauged and sampled as part of this assessment is ‘GW32A’. Further, upon review of the northings and eastings, it became clear that the surveyor labelled well GW20 as ‘GW25’ and well GW25 as ‘GW20’. This has been corrected in **Appendix C** and the two locations highlighted for reference.

6.1.3 Limited Soil Sampling

Visual assessment and measurement of volatile gases within fill material and soil was undertaken at multiple depths within each groundwater well location to assess fill/soil type across the site. In addition, soil samples were collected for the purpose of laboratory analysis at various depths within 10 groundwater well locations in an approximately even distribution across the site to establish a preliminary soil data within common fill types in the study area.

The soil data was also obtained to act as a possible reference point at locations where elevated concentrations of CoPC within groundwater were identified. **Section 8.5.2** provides a summary of analytes detected in groundwater and the association (if any) with potential soil leaching pathways. It is emphasised that the limited soil sampling and analytical program is secondary to the baseline groundwater assessment.

Fifteen primary soil (fill) samples, one blind duplicate sample and one split duplicate sample were analysed from 10 of the groundwater well locations during the installation program. In addition, one sediment sample was collected from the saturated zone of each newly installed groundwater well location and analysed for total organic carbon (TOC). Please refer to **Figure F3,** which identifies which groundwater well locations also underwent soil laboratory analysis.

The soil profile at each location was assessed and recorded in the field in general accordance with the Unified Soil Classification System. Observations of anthropogenic materials (e.g. asbestos containing material (ACM), waste etc.) and field evidence of contamination (i.e. staining and/or odour) were noted. All soil observations were recorded on AECOM's standard field groundwater bore log sheets for uniformity in descriptions, presentation and to aid in any future interpretations. Please refer to **Appendix E** for a copy of the bore logs.

For each sample collected, additional soil was placed in a sealed plastic bag and screened for head space vapours and the presence of volatiles, using a calibrated photoionisation detector (PID). The PID readings were found to range between 0 and 285 ppm. The headspace readings were taken at ambient temperature and were recorded on the bore logs. PID equipment calibration certificates are provided in **Appendix F**.

All soil samples were collected using a clean pair of disposable nitrile gloves and transferred into laboratory supplied glass sample containers. A new pair of nitrile gloves were worn for each sample collected.

Field duplicate samples and triplicate samples were prepared in the field by splitting the primary soil samples. In order to minimise the loss of volatiles, samples were not mixed or homogenised during collection or splitting. Each soil jar was filled to minimise the amount of headspace.

Please refer to **Section 6.1.9** for details on decontamination procedures.

6.1.4 Groundwater Monitoring Well Development

Following installation works, groundwater wells were developed via surging (using hand bailers) and peristaltic pumping methods to vigorously agitate and remove stagnant groundwater and sediment within the wells and adjacent gravel pack.

Groundwater monitoring well development was conducted until a minimum of three well volumes of water were removed, until the well had been pumped dry at least twice (low yielding wells only) or until groundwater parameters had stabilised (whichever occurred first). The well volume was calculated using the water level measured within the well prior to development.

All purged groundwater was transported by a licensed waste disposal contractor for appropriate disposal at a licensed liquid waste facility. Please refer to **Appendix D** for a copy of waste disposal certificates.

Groundwater development logs were developed with groundwater observations including colour, turbidity, odour, presence of hydrocarbon sheen or phase separated hydrocarbons (if any) and other visual or olfactory evidence of contamination, depth to groundwater prior to and following development and the volume of water removed. Please refer to **Appendix G** for a copy of the well development records.

Each groundwater well was allowed 7 days to equilibrate prior to sampling.

6.1.5 Groundwater Gauging Program

To minimise tidal influence during the groundwater gauging event, AECOM gauged all groundwater wells within 3 hours on 16 November 2015 using a team of two field staff prior to the groundwater purging and sampling program.

Groundwater monitoring wells were gauged using an electronic oil/water interface probe, for depth to groundwater, potential light non aqueous phase liquid (LNAPL) presence, and total depth of each well. Gauging records were completed on site-specific field e-forms, as seen in **Appendix H**.

The water levels recorded during the gauging program were found to range between 0.94 and 3.55 mBTOC.

6.1.6 Groundwater Purging and Sampling

Groundwater purging and sampling was undertaken in general accordance with the following:

- EPA Publication 669 (Groundwater Sampling Guidelines) (EPA, 2000)
- EPA Publication 668 (Hydrogeological Assessment (Groundwater Quality) Guidelines) (EPA, 2006)
- Industrial Waste Guidelines, Publication IWRG701 (Sampling and Analysis of Waters, Wastewaters, Soil and Wastes) (EPA, 2009)

All groundwater samples were collected using low-flow, micropurge techniques.

The low flow pumps were placed approximately in the middle of the screened interval so as not to disturb the bottom of each well and allow for sufficient water above the pump.

During low-flow purging, groundwater was regularly tested with a small volume covered flow cell for water quality parameters including dissolved oxygen (DO), electrical conductivity (EC), pH, redox potential (Eh) and temperature (T). Water levels were also monitored throughout the purging process to ensure that drawdown was not greater than 10%. Please refer to **Appendix I** for a copy of the groundwater sampling forms.

To ensure that samples were as representative as possible of groundwater conditions within the aquifer, groundwater samples were collected when the above parameters had stabilised. Groundwater parameters were considered to have stabilised when at least 3 consecutive readings were taken at least 3 minutes apart within +/- 3% for EC, +/- 10% for DO and temperature, +/- 10 mV for Eh and +/- 0.05 for pH.

All groundwater samples were placed into appropriate laboratory supplied bottles with the appropriate preservative pre-dosed by the laboratory (as necessary). Groundwater samples that were to be analysed for dissolved metals and ferrous iron were filtered using 0.45 µm disposable Stericup filters and placed in sample containers containing appropriate preservatives. Groundwater samples were immediately chilled and stored at a temperature of approximately 4C or less prior to transit to the laboratory.

As seen in **Appendix A**, a number of groundwater wells were sampled on two separate days. This is due to the fact that some of the sampling bottles necessary to complete the required analysis were inadvertently omitted during the sampling process on Day 1. The wells that required sampling on a second day to ensure all of the appropriate bottles were filled included: GW05, GW13, GW17, GW19, GW20, GW22, GW25, GW26, GW29, GW30, GW31, GW33, GW34, GW35 and GW37.

6.1.7 Measuring Potential Tidal Influence

SmarTROLL (multimeters) were deployed in 11 wells around the study area to monitor tidal influence and variations in electrical conductivity (EC), dissolved oxygen (DO), oxygen reduction potential (ORP), pH, temperature and barometric pressure. The units were deployed using suspension cables attached to the gatic lids at a depth of approximately 1.0 m below SWL. Data logging was initiated using a direct connection to laptop and the multimeter software program within 5 minutes after submersion in the groundwater well. Units were left in place for a six day monitoring period between 18 and 23 November 2015 and logging was ceased using the multimeter software program when the units were removed from the study wells. The data stored on the units was compiled and sent to AECOM by the company from which the units were rented.

As the tidal influence was expected to be greater closer to the Yarra River to the north of the site, and become damped towards the south of the site, meters were placed in wells GW14, GW16, GW21, GW25 and GW29 (Transect 1), and GW15, GW17, GW22, GW23, GW27 and GW30 (Transect 2) in an approximate north to south configuration.

6.1.8 Sample Tracking and Chain of Custody Procedures

Once samples were collected, the primary and quality control sample numbers were transcribed onto a chain of custody form (COC). The COC analytical schedule was filled out by the field supervisor and then checked by the Project Manager before analysis.

All groundwater samples were transported cold (with ice) and couriered either overnight or via a same day courier. Courier consignment notes for each batch of samples were retained and the receiving laboratories were contacted the morning following dispatch to ensure their arrival. COC forms and sample receipt notifications (SRN) are provided in **Appendix J**.

6.1.9 Decontamination Procedure

Monitoring and sampling equipment (such as the interface probe and low flow sampling equipment) were decontaminated during the groundwater sampling process. In summary, sampling equipment was washed with Decon 90 solution, prior to being double rinsed (first with potable water and then with clean deionised water).

6.1.10 Laboratory Analysis

All primary groundwater and soil samples were sent to chemical analytical laboratory ALS Environmental (ALS), while secondary soil samples were sent to Eurofins MGT and secondary groundwater samples were sent to Envirolab Services (Envirolab). Each laboratory is NATA accredited for the analytical methodologies used. Please refer to **Appendix A** for a summary of the results and **Appendix J** for a copy of the laboratory transcripts.

Groundwater:

Groundwater samples underwent the laboratory analysis described in **Table 8**. All analyses and sampling was undertaken in accordance with Victorian EPA (2000b) *Publication 669 – Groundwater Sampling Guidelines*, and Victorian EPA (2009) Industrial Waste Resource Guidelines (IWRG701) – *Sampling and Analysis of Waters, Wastewaters, Soils, and Wastes*.

Table 8 Groundwater Laboratory Analysis

Analyte	No. of Primary Samples
pH, TDS	38
Metals (Arsenic [As], Cadmium [Cd], Total Chromium [Cr], Copper [Cu], Lead [Pb], Nickel [Ni], Zinc [Zn], Aluminium [Al], Iron [Fe], Selenium [Se] and Mercury [Hg])	38
Benzene, Toluene, Ethylbenzene, Xylene, Naphthalene (BTEXN) / Total Recoverable Hydrocarbon (TRH(C_6 – C_{40}))	38
VOC Trace Suite (71 analytes) ALS Method Code: EP074-WF – Includes BTEXN	14
Polycyclic aromatic hydrocarbons (PAH)	38
Nitrogen Oxides (NOx)/ Sulfur Oxides (SOx)	38
Ionic Chemistry Suite: Sodium (Na), calcium (Ca), magnesium (Mg), potassium (K), chloride (Cl), bicarbonate (HCO_3), nitrate (NO_3), nitrite (NO_2), ammonia (NH_3) phosphate (PO_4), sulphate (SO_4), fluoride (F), and manganese (Mn)	38

Soil:

Soil (fill) samples were analysed for the chemicals of concern listed in **Table 9**.

Table 9 Soil Laboratory Analysis

Analyte	No. of Primary Samples
TOC and moisture (to be collected from sediment within the saturated zone)	36
Metals (As, Cd, Cr, Cu, Pb, Ni, Zn, Al, Fe, Se, Hg)	15
TRH(C_6-C_{40})	15
Full VOC Scan (70 Analytes) ASL Method Code: EP074 (A-H) – Includes BTEXN	15
PAH	15

6.1.11 Quality Assurance / Quality Control Procedures

Quality assurance/quality control (QA/QC) procedures were conducted in general accordance with EPA Publication 669 (Groundwater Sampling Guidelines) (EPA, 2000), Industrial Waste Guidelines, Publication IWRG701 (Sampling and Analysis of Waters, Wastewaters, Soils and Wastes) (EPA, 2009), NEPM 1999 (as amended 2013) and Australian Standards (AS4482.1). Please refer to **Appendix K** for a register of the QA/QC samples.

7.0 Assessment Framework

To achieve the project objectives, an assessment framework has been developed that aims to:

- Describe the physical-chemical condition of the shallow aquifer encountered.
- Evaluate whether the data collected are representative of a single or multiple elements of the groundwater flow system.
- Identify potential anomalies and/or outliers (including potential localised contaminant sources/ impacts) for separate consideration to the main data set.
- Identify chemicals that are detectable in groundwater and whether they may be associated with natural and/or anthropogenic sources.
- Described the concentration ranges of these chemicals that may be encountered in groundwater in association with anthropogenic ambient conditions (non-point source) and/or natural background conditions
- Identify whether the detected concentrations of these chemicals have the potential to preclude beneficial uses of the aquifer.

The assessment framework was intended to be worked through in a step-wise manner to identify a representative data set that can be utilised as a point of reference for future environmental assessments at the site, and is described in the following flow diagram and **Sections 8.1** to **8.6**.

Chart 1 – Assessment Framework

8.0 Data Assessment

The following discussion of results follows the structure of the assessment framework that is provided in **Section 7.0**.

8.1 Lithology Encountered

8.1.1 Fill Material

Thirty-four of the 36 new groundwater wells were drilled to depths ranging between 2.5mBGL (GW28) and 5.5mBGL (GW07, GW09, GW10 and GW19). The remaining two groundwater wells were drilled to 7mBGL.

The depth of fill material across the site ranged between 0mBGL (GW06, GW14, GW18, GW19, GW31 and GW38) to >4.9mBGL (GW03). The average depth of fill material across the entire site was found to be approximately 1.7mBGL. Note that four of the six locations that contained no fill material are located close to the Yarra River in the Lorimer Precinct and the northern portion of the Montague sub-precinct.

Generally, fill material was described as grey, brown, gravely sands with a varying degree of inclusions such as rubble, wood, brick, glass, coke, charcoal, ash, slag, concrete and scrap metal (mainly large brick and concrete pieces). Many of the locations in the Sandridge sub-precinct (i.e. GW21 to GW30) also contained silt inclusions.

Additional pertinent fill observations include:

- Fill material was found to be deepest along the northern boundary of the Wirraway sub-precinct at locations GW01 to GW03, with depths ranging between >4 to >4.9mBGL (i.e. not vertically delineated). These locations contained a significant volume of rubble, wood, garbage, brick and concrete and are inferred to exist immediately south of, or within, former quarry/landfill zones. Location GW01 also contained what appeared to be oil (**Plate 1**).
- Hydrocarbon odour was noted at GW24 (between 1.1 and 3 mBGL), however the majority of locations either reported no odour, or a natural organic odour (**Plate 2**).
- A number of locations contained full bricks, not just brick pieces (**Plate 3**)
- One location, approximately 2 m from groundwater well GW21, was abandoned due to the presence of the asbestos and refusal at approximately 0.5mBGL.
- Other than the above points, there are no obvious trends in the type and/or depth of fill material across the site. As such, limited soil samples were collected from fill material at an approximate even distribution within the study area to establish some initial soil data of the type of CoPC that may be present.

Plate 1 - GW01

Plate 2 - GW24

Plate 3 - GW27 brick content

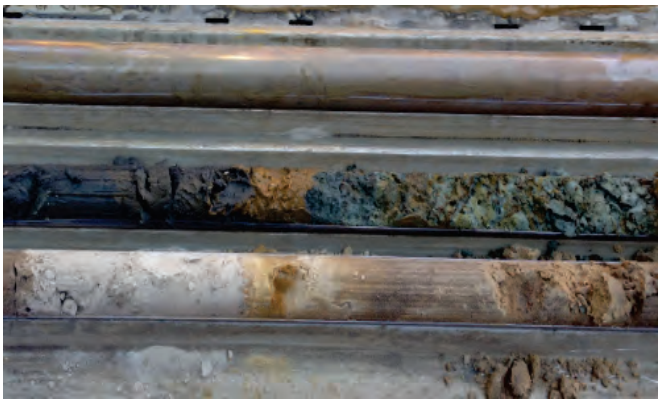


Plate 4 - GW37

8.1.2 Natural Material

Thirty (30) of the 36 new groundwater well locations were found to contain natural material during the drilling program. The natural material observed is inferred to be either Port Melbourne Sands (majority of locations), Coode Island Silt (CIS) (1 location – GW19) or Older Volcanic material (2 locations – GW37 and GW38). Whilst we have observed only 1 location as encountering groundwater, it is noted that the contact between the Port Melbourne Sands and CIS is gradational in instances rather than distinct.

The Port Melbourne Sands observed at the site can be generally described as brown, grey (sometimes mottled with orange), fine to coarse grained sands, with minor clay lenses. Shell fragments were also noted in approximately half of the locations, while sulfidic odours were present at GW15, GW18 and GW34.

The observed shell grit is to be expected given the depositional nature of the geological environment, and the presence of CIS within the north-eastern portion of the site in particular. As seen in **Figure F4**, GW15 and GW18 are positioned in an area of the site that is anticipated to contain CIS beneath Port Melbourne Sands and as such, the sulfidic odour is expected. Location GW34 is slightly removed from the inferred CIS boundary, however, it is not considered an anomaly to encounter a sulfidic odour at this location (i.e. immediately south east of the inferred geological boundary).

The CIS identified at groundwater well GW19 was described as dark grey clayey silt, however, no sulfidic odour was noted. Following close review of the bore logs, **Figure F4** and analysis of our findings in the field, GW15 and GW18 have not been considered as CIS for the purposes of this assessment. It is acknowledged that, in general, sulfidic odours and shell fragments are associated with CIS (which is expected to sit beneath Port Melbourne Sands), however, the lack of silt inclusions at these locations suggest that Port Melbourne Sands are likely the more dominant material.

Older Volcanic material that was identified in the south east corner of the site consisted of soft to stiff clays with minor basaltic pieces. **Plates 4 to 7** show some examples of the soil profiles and natural material encountered during drilling.

Plate 5 - GW25

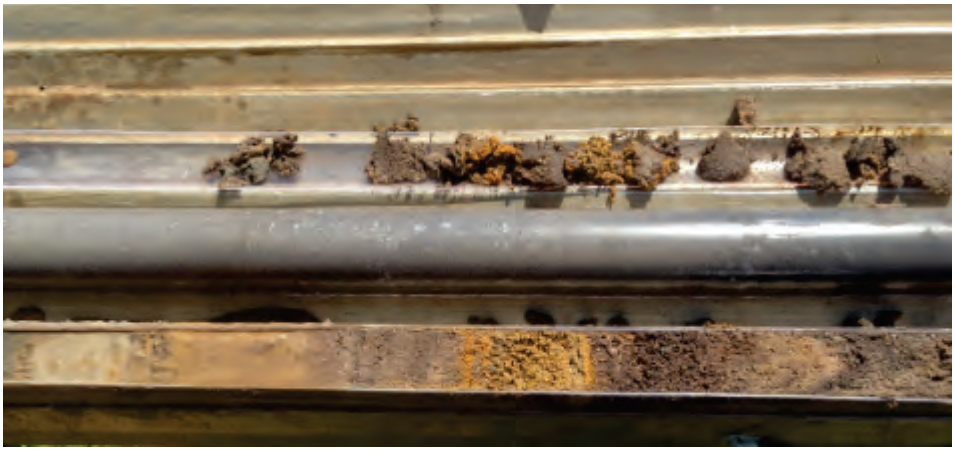


Plate 6 - GW22

Plate 7 – GW19

8.1.3 Lithology where groundwater was encountered

Table 10 identifies whether groundwater was encountered in fill or natural material. The following observations in relation to the presence of groundwater at the locations drilled can be made based on **Table 10**:

- 5 of the 36 new groundwater well locations (GW01 – GW03, GW04 and GW24) encountered groundwater within fill material.
- 28 of the 36 new groundwater well locations encountered groundwater within Port Melbourne Sands.
- 1 of the 36 new groundwater well locations encountered groundwater within CIS (GW19). Note that no fill or Port Melbourne Sands were identified in this borehole.

- 2 of the 36 new groundwater well locations encountered groundwater within Older Volcanic material (GW37 and GW38).
    - Groundwater well GW37 reported lenses of fill, Port Melbourne Sands and CIS above the Older Volcanic clays, however, there was an obvious impermeable layer at the interface of the clay. As such, AECOM installed in the aquifer below (Older Volcanics).
    - According to the bore logs, groundwater well GW38 encountered Older Volcanic clays from the surface.
- The above observations are consistent with the geology map (**Figure F4**).
- Standing water levels (SWL's) were reported to range between 0.94mBTOC (0.28mAHD) and 3.55mBTOC (0.27mAHD) at GW15 and GW04 respectively. Location GW04 is in the north eastern portion of the Wirraway sub-precinct (possibly near the boundary of a former landfill/quarry), while GW15 is positioned within the northern boundary of the Lorimer sub-precinct along the Yarra River. In summary:
    - 1 location (GW15) reported a SWL <1mBTOC.
    - 8 locations (GW06, GW14, GW18, GW19, GW24, GW28, GW31 and GW34) reported SWL's between 1 and 2mBTOC.
    - 23 locations (GW01, GW05, GW07, GW08, GW09, GW10, GW11, GW12, GW13, GW16, GW17, GW21, GW22, GW23, GW25, GW29, GW32, GW26, GW30, GW33, GW35, GW36 and GW37) reported SWL's between 2 and 3mBTOC.
    - 6 locations (GW02, GW03, GW04, GW20, GW27 and GW38) reported a SWL between 3 and 4mBTOC.

The above variation in SWL's is to be expected across the site area due to significant presence of former landfills/quarries, extensive sewer network, former wetlands area and proximity to the Yarra River. Based on the SWL's recorded during the gauging event, the data set should be considered as a whole for the purposes of this assessment. Prior to the consideration of additional variables (i.e. groundwater chemistry, tidal influence etc.), the data set indicates fill and the Port Melbourne Sands are interconnected.

In terms of the field observations (only), we are of the opinion that all groundwater locations (except GW19 [CIS], GW37 and GW38 [Older Volcanics]) should be considered as one data set as these locations show evidence of hydraulic continuity. As such, for the purposes of the second phase of the data assessment process (**Section 8.2**), locations GW19, GW37 and GW38 will be removed from the data set.

Table 10 Lithology where groundwater was encountered

Well ID	Total Well Depth (mBTOC)	Total Well Depth (mAHD)	SWL (mBTOC)	SWL (mAHD)	Is groundwater in Fill or Natural?	Inferred Geology where groundwater is encountered.	Lithology in Screened Zone
Wirraway							
GW1	4.50	-2.01	2.91	-0.42	Fill	Fill	Dark grey, soft, silts and clays with rubble, wood pieces, garbage, possible creosote/oil and petroleum odour.
GW2	4.00	-0.03	3.24	0.73	Fill	Fill	Dark grey and black firm silty gravely clay with rubble, garbage, crushed rock and minor solvent odour.
GW3	4.90	-1.05	3.04	0.81	Fill	Fill	Grey, loose, sandy gravel, minor occasional brick fragments and no odour.
GW4	5.10	-1.28	3.55	0.27	Natural	Port Melbourne Sands	Dark grey, loose, sand with shell fragments.
GW5	4.50	-1.45	2.33	0.72	Fill	Fill	Dark grey, fine to medium grained silty sand, minor ash noted below depth to groundwater and no odour.
GW6	4.00	-1.76	1.90	0.34	Natural	Port Melbourne Sands	Brown, medium to coarse grained sand, some shell fragments with no odour.
GW7	5.50	-2.41	2.64	0.45	Natural	Port Melbourne Sands	Dark grey, loose, fine grained sand with occasional black streaks, shell fragments loose and no odour.
GW8	4.20	-1.07	2.63	0.50	Natural	Port Melbourne Sands	Light grey, fine grained sand, some shell fragments, no odour.
GW9	5.50	-2.22	2.76	0.52	Natural	Port Melbourne Sands	Brown grey sand with some shell fragments.
GW11	5.10	-2.52	2.12	0.46	Natural	Port Melbourne Sands	Light grey, medium grained sand with shell fragments and no odour.
GW12	4.20	-1.35	2.64	0.22	Natural	Port Melbourne Sands	Grey, fine grained sand with some shell fragments and no odour.

Well ID	Total Well Depth (mBTOC)	Total Well Depth (mAHD)	SWL (mBTOC)	SWL (mAHD)	Is groundwater in Fill or Natural?	Inferred Geology where groundwater is encountered.	Lithology in Screened Zone
Lorimer							
GW13	4.20	-1.80	2.28	0.12	Natural	Port Melbourne Sands	Light grey, fine grained sand with no odour.
GW14	4.00	-1.64	1.94	0.42	Natural	Port Melbourne Sands	Sands/sandy clays.
GW15	4.50	-3.28	0.94	0.28	Natural	Port Melbourne Sands	Grey, coarse grained sand with shell fragments.
GW16	4.00	-1.52	2.19	0.28	Natural	Port Melbourne Sands	Grey brown fine grained sand with no odour.
GW17	3.00	-0.96	2.36	-0.33	Natural	Port Melbourne Sands	Dark grey sandy silt with natural organic odour.
GW18	4.50	-3.72	1.51	-0.73	Natural	Port Melbourne Sands	Dark brown sandy clays, sands, highly plasticity (clay) and sulfidic odour.
GW19	5.50	-3.94	1.02	0.54	Natural	Coode Island Silt	Dark grey clayey silt/clay with sand, no odour.
Sandridge							
GW10	5.50	-2.40	2.70	0.40	Natural	Port Melbourne Sands	Light brown, loose, fine to medium grained sand, no odour.
GW20	4.45	-1.04	2.85	0.57	Natural	Port Melbourne Sands	Black sand with natural organic odour.
GW21	4.00	-1.40	2.45	0.16	Natural	Port Melbourne Sands	Grey, loose, medium grained sand with no odour.
GW22	4.00	-1.98	2.37	-0.35	Natural	Port Melbourne Sands	Light grey/brown silty sand, no odour.
GW23	4.00	-2.10	2.30	-0.40	Natural	Port Melbourne Sands	Grey, medium to coarse grained sand with no odour.
GW24	3.00	-1.33	1.38	0.30	Fill	Fill	Light grey, fine, silty sand with hydrocarbon odour and black staining.
GW25	5.00	-1.84	2.87	0.30	Natural	Port Melbourne Sands	Grey coarse grained sand with no odour.
GW26	4.00	-1.55	2.48	-0.03	Natural	Port Melbourne Sands	Grey, loose, coarse grained sand, quartz inclusions, no odour.
GW27	5.00	-2.70	3.19	-0.89	Natural	Port Melbourne Sands	Grey/brown, medium grained sand, no odour.

Well ID	Total Well Depth (mBTOC)	Total Well Depth (mAHD)	SWL (mBTOC)	SWL (mAHD)	Is groundwater in Fill or Natural?	Inferred Geology where groundwater is encountered.	Lithology in Screened Zone
GW28	2.50	-0.88	1.43	0.19	Natural	Port Melbourne Sands	Grey, loose, fine grained sand, no odour.
GW30	4.50	-2.34	2.70	-0.54	Natural	Port Melbourne Sands	Medium grained sand, no odour.
South of Sandridge							
GW29	4.00	-1.42	2.85	-0.26	Natural	Port Melbourne Sands	Grey/orange mottled sand, no odour.
Montague							
GW31	4.50	-3.01	1.66	-0.18	Natural	Port Melbourne Sands	Dark grey silty sand, with some shell fragments, no odour.
GW32	-	-	2.28	-0.41	-	-	-
GW33	4.00	-1.49	2.35	0.16	Natural	Port Melbourne Sands	Silty sand with black gravel inclusions.
GW34	4.00	-2.90	1.59	-0.50	Natural	Port Melbourne Sands	Dark grey, loose, medium grained sand with no odour.
GW35	4.00	-2.00	2.14	-0.14	-	-	-
GW36	3.50	-1.83	2.65	-0.98	Natural	Port Melbourne Sands	Dark grey, stiff sandy clays, clayey sands with no odour.
GW37	7.00	-4.77	2.86	-0.63	Natural	Older Volcanics	Grey brown, stiff, Older Volcanic clays, with minor basalt pieces, no odour.
GW38	7.00	-4.64	3.54	-1.18	Natural	Older Volcanics	Red brown, soft, clay, no odour.

Notes:

mBTOC = meters below top of casing

mAHD = meters Australian Height Datum

" – " denotes that the information is unavailable as the groundwater well was not installed by AECOM and there are no bore logs at this stage

SWL = Standing Water Level

8.2 Groundwater flow paths

8.2.1 Flow Direction and Hydraulic Gradient

Flow of shallow groundwater across the site has been considered from a regional perspective for the purposes of this regional baseline assessment.

Generally, it is noted that (under natural conditions) groundwater moves along flow paths from areas of recharge to areas of discharge along streams, lakes, wetlands, seepage to bays/oceans or transpiration by plants whose roots extend to near the water table. This section provides a preliminary view of the groundwater flow system across the site, and is based on the limited data available.

In a regional context, the shallow groundwater flow paths in fill and the Port Melbourne Sands across the site are likely to be southerly based on the results of the gauging program conducted on 16 November 2015 **(Figures F5A to F5C).** However, some anomalies are observed, as discussed in **Section 8.3**. The hydraulic gradient (or change in groundwater head across the site) has been estimated as approximately -0.005 through the centre of the site and closer to -0.002 in the eastern portion of the site.

The shallow groundwater flowing in the fill material and Port Melbourne Sands is considered an unconfined aquifer and it is likely to be recharged by direct infiltration of rainfall, leaking services, or flows from the Yarra River under high tide conditions. Historical Yarra River elevation data reported by Melbourne Water indicates that the Yarra River is generally tidal near the site, and the rising and falling of the river will likely result in some mixing of the groundwater. It is also expected that more dense (i.e. saline) water would exist at the base of the river.

It should be acknowledged that various site activities and surface coverage of land can affect the extent of recharge of the shallow aquifer. In addition, shallow underground infrastructure can create artificial recharge (via leakage at points that are shallower than groundwater) and preferential flow paths (via groundwater draining at points that are deeper than groundwater). Given the shallow depth of the upper unconfined aquifer being assessed at the site, it is unlikely that deep underground infrastructure has a significant impact on flow direction. It is however noted that this is dependent upon the hydraulic connectivity of aquifers beneath the site.

It is possible that a small component of the shallow groundwater discharge across the site would occur as leakage to the CIS, however, it is anticipated that horizontal flow paths would dominate over vertical flow paths to the CIS due to the lower permeability of CIS.

In summary, and based on the initial groundwater contours on **Figures F5A to F5C** it appears that the area north of the Lorimer sub-precinct is acting as a recharge zone. This is supported by the maximum elevation of the Yarra River north of the site, which was reported by Melbourne Water to be 0.530m on 11 October 2015. Note that this reading has been collected from what is considered to be the nearest weather station with available data (i.e. Maribyrnong). Further, historical river elevation data are not available for the month of November 2015, and the depth is assumed to be mAHD, as units are not supplied by Melbourne Water. The site itself appears to be generally acting as a groundwater flow through zone with some possible discharge zones near the south east of the site.

The above assessment is a very preliminary, as it is based on only one round of gauging data. Further, it must be highlighted that the large site area and distance between groundwater wells is significant (note that a number of the groundwater wells are located >200m from each other). As such, the possible variation in groundwater depth requires further investigation.

8.2.2 Tidal Influence

The potential tidal influence was measured in two transects running north to south across the site as described in **Section 6.1.7**. The main purpose of this work was to assess the change in groundwater levels over the course of approximately 6 days. The raw data obtained during this time was graphed against the predicted tidal elevations provided on the Bureau of Meteorology (BoM) website (**Chart 2** and **3**) for the same dates. Although the data is preliminary, it provides a good indication of potential tidal influence through the centre of the site.

Prior to summarising the findings, we note the following:

- Data from groundwater well GW27 (Transect 2) was not incorporated into **Chart 3** as it showed very little to no change in groundwater elevation. The data itself is considered to be valuable as it is one line of evidence to suggest that there is little to no influence to groundwater depth from tides along the southern boundary, however, inclusion of the data on the chart reduces the scale it reduces the scale. This response in well GW27 was expected, given its distance from the Yarra River (i.e. approximately 800m south of the river).

- The data available for groundwater well GW25 (Transect 1) is limited to approximately 1 day, as the multimeter ceased to work in the field during the program. Further, the data obtained from groundwater well GW15 (Transect 2) was removed from **Chart 3** as it demonstrated a consistent drop in elevation from approximately 0.3mAHD to -0.25mAHD over the course of the monitoring period. It is possible that this is due to groundwater pumping occurring in the vicinity of GW15 (not confirmed) or that the multimeter may have physically dropped within the well itself during the monitoring period. All other data are considered to be reliable and suitable for assessment and interpretation.

The findings, as shown in **Charts 2** and **3**, are as follows:

- There was very minimal tidal response in the groundwater within the well locations along both Transects 1 and 2 between 18 November and 23 November 2015, however, the changes that were observed appeared to be consistent across the transects. The actual change in tidal elevations were as follows:
  - **Chart 2** indicates that there was approximately a 0.5cm variation in groundwater elevation.
  - **Chart 3** indicates that there was approximately a 2cm variation in groundwater elevation.
- The variation (albeit it very low) appears to correlate with change in predicted tide elevations.
- The magnitude of variation in standing water level was not noted to change significantly with distance from the Yarra River.
- The tidal data obtained correlates with the general groundwater chemistry described in **Section 8.4,** as more saline conditions and Na/Cl dominant groundwater appears to be present further east of Transects 1 and 2. Based on the data obtained to date, greater tidal influence could therefore potentially occur in groundwater wells located further east of Transects 1 and 2. This should be considered in future investigations across the site.

Based on our review of the preliminary gauging and tidal data with respect to groundwater flow paths, there is not sufficient evidence to identify a recharge or discharge mixing zone based on tidal influence, particularly given there is only one round of gauging data available. As such, for the purposes of the third phase of the data assessment process (**Section 8.3**), the data set is considered most likely to represent a single flow-through groundwater zone.

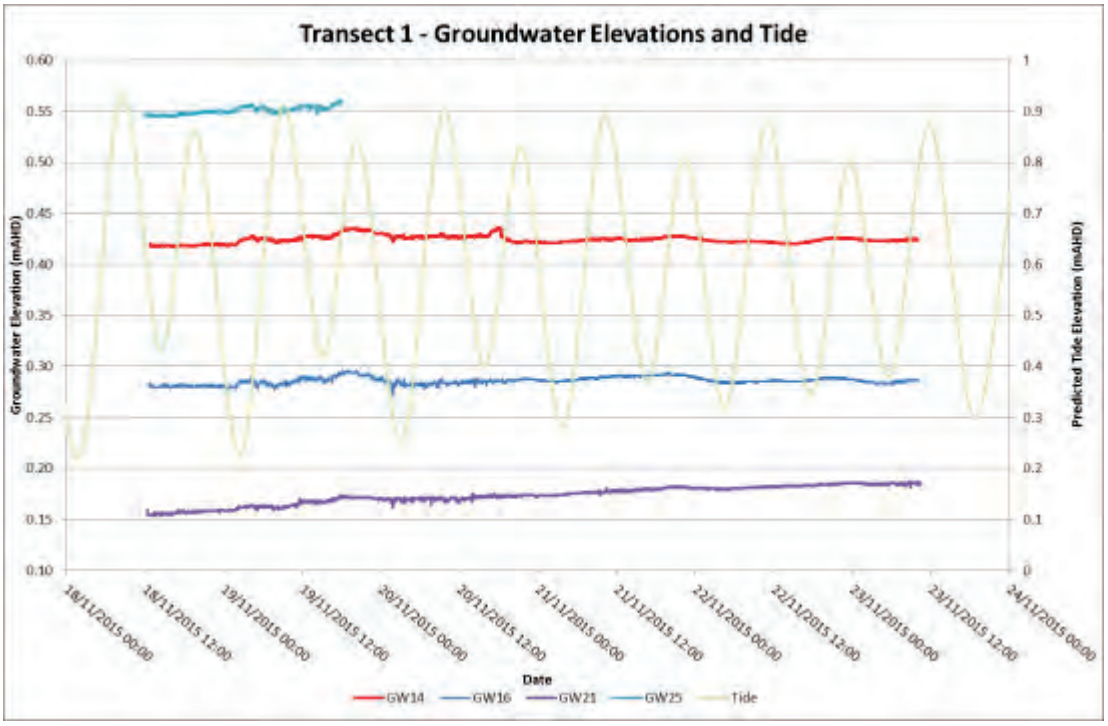


Chart 2

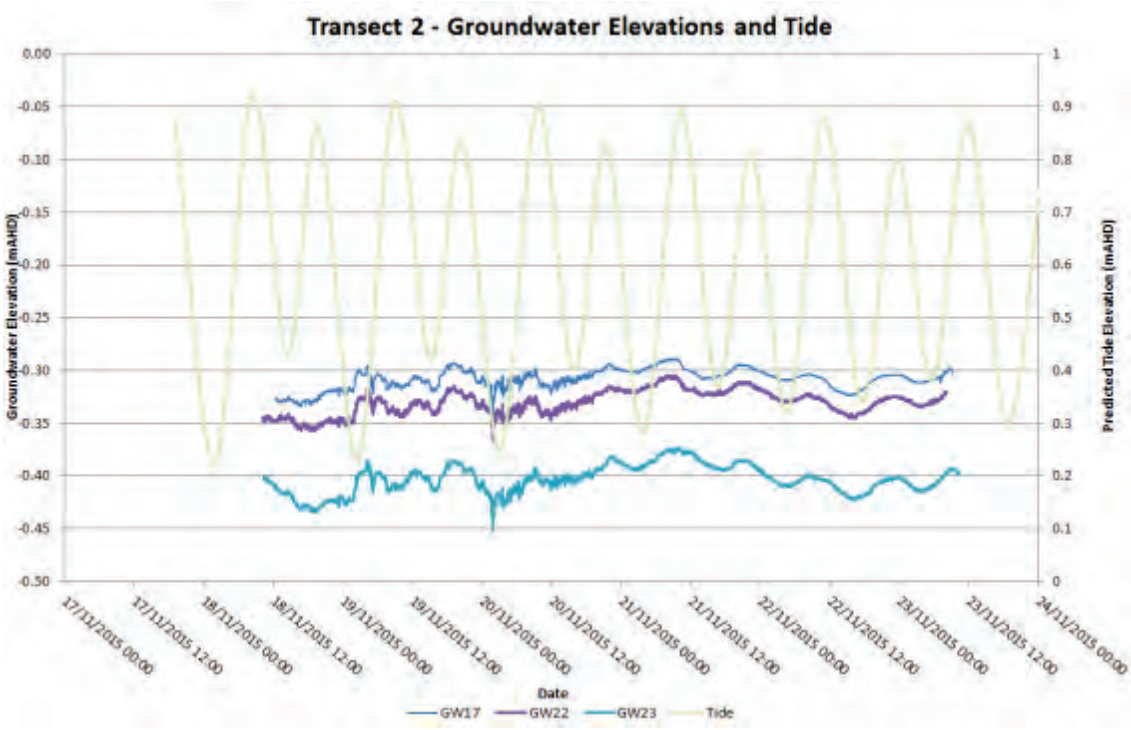


Chart 3

8.3 Potential groundwater flow anomalies

Based on AECOM (August, 2015) there are many physical features across the site that could act as preferential flow pathways, including:

- Former swamps and wetlands.
- The local sewer network across the site, noting that the main sewers are positioned well below the shallow groundwater table, as discussed below.
- The drainage and stormwater system.
- Former quarries/landfills.

In addition to above, the following anomalies in the groundwater contours are observed:

- The shallow groundwater in the south east portion of the site appears to be draining slightly, possibly towards underground services such as sewer and/or water. It is understood that the Melbourne Main is present in this area, however, it is unlikely that shallow groundwater is draining through this particular system as the anticipated depth is between 10 and 15mBGL (AECOM, August 2015). It is more likely that shallow groundwater is draining to local sewer and/or stormwater systems. AECOM has further reviewed aerial photographs, land uses and the registered uses of groundwater in the south east section of the site and found the following:
    - Many groundwater wells are listed on the Visualising Victoria's Groundwater (VVG) website as being located near groundwater well GW38 and installed in 1986 for groundwater investigation purposes.
    - One Melbourne Water groundwater well is present in the vicinity of well GW38, however, no further information is available.
    - A number of additional wells are listed on the VVG website as being installed near well GW36 between 1994 – 2006 for groundwater investigation and domestic/stock use.
    - A public park is present to the east of groundwater well GW30.
    - It is unclear what is influencing the apparent drainage in the south east portion of the site.

In summary, the apparent drainage occurring in the south east portion of the site appears to be widespread and as such, a regional influence may be at play.

Based on our assessment of the preliminary and limited gauging data available, there are no obvious 'localised' anomalies and the data set should not be separated further when assessing possible regional background conditions in the following phases of data assessment.

8.4 General chemistry of shallow groundwater

As seen in **Figure F6**, the groundwater across the site appears to be mostly Ca/Na- HCO_3 dominant, with Na-Cl dominant groundwater occurring along the north eastern portion of the site. Note that three of the Na-Cl dominant groundwater wells (i.e. GW15, GW18 and GW19) reported TDS concentrations relative to seawater (21,400 to 30,300mg/L TDS).

Of note are groundwater wells GW26, GW30 and GW35 which express a Ca-SO_4 dominant water type. There is insufficient data to determine what is causing a shift in chemistry from bicarbonate to sulfate. These groundwater wells can be seen on **Chart 4** as the top three wells in the diamond (see following page).

Laboratory pH and TDS concentrations generally correlate well with the field measured pH and EC data. Field pH was found to range between 4.88 (GW30) to 7.56 (GW05), while laboratory pH ranged between 5.26 (GW30) and 8.11 (GW38). Field EC was reported as 241 (GW14) to 35,600uS/cm (GW18), while laboratory TDS ranged between 336 (GW14) and 30,300mg/L (GW15). Only one groundwater well (GW14) reported a TDS concentration <500mg/L. The next lowest TDS concentration was reported as 632mg/L in GW11, which is located on the southern boundary of the site, approximately 1.5km from GW14.

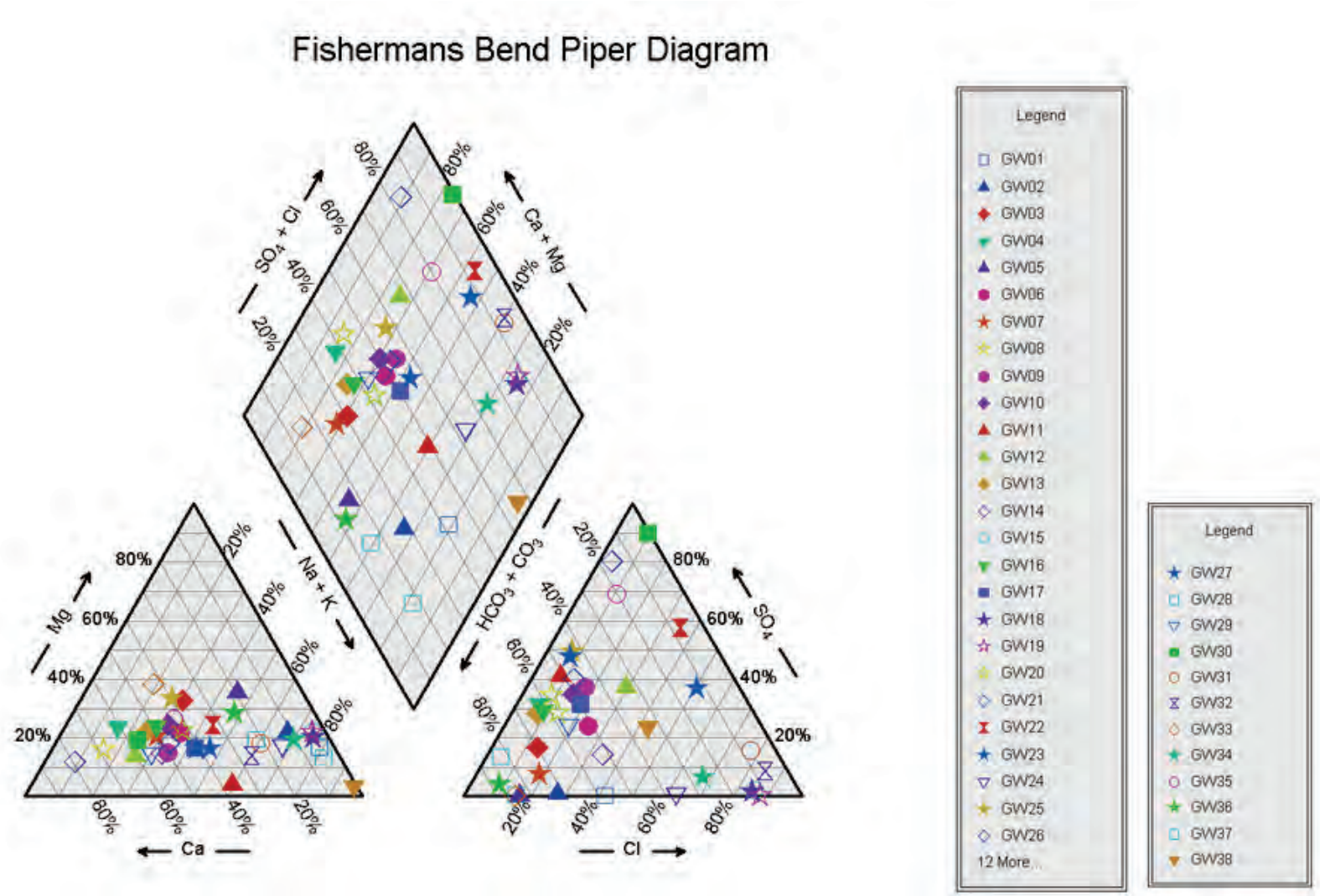
A TDS concentration below 500mg/L in the shallow groundwater at the site is considered to be an anomaly in the data set and possibly representative of a fresh water source leaking from a nearby service. It is particularly unusual for groundwater within groundwater well GW14 to report a TDS concentration <500mg/L given its close proximity to the Yarra River, which is known to be a partially mixed estuary. It is noted that groundwater within groundwater well GW13 (located approximately 200m south west of GW14) reported a TDS concentration of 751mg/L. However, when reviewing the low TDS values across the remainder of the site, it is difficult to conclude that any trends in the spatial distribution of fresh water are present (**Figure F6**).

Based on the laboratory reported TDS values:

- 1 groundwater well corresponds with Segment A1.
- 11 groundwater wells correspond with Segment A2.
- 19 groundwater wells correspond with Segment B.
- 4 groundwater wells correspond with Segment C.
- 3 groundwater wells correspond with Segment D.

Based on the limited data set, it is not possible to establish the reason for the variation in TDS concentrations. As described in **Section 8.1.3**, all but three groundwater wells appear to be installed within the same formation, and based on the tidal data obtained (**Section 8.2.2**), groundwater does not appear to be strongly influenced by tides at the transects investigated.

Despite the limited data available, we can conclude that groundwater at GW14 is likely to have been strongly influenced by a fresh water source at the time of sampling and as such, this data point will be considered separately to the overall data set when assessing possible regional background conditions in the following phases of data assessment. We acknowledge that there are a number of possible anomalies in the ionic chemistry reported within the remainder of the data set and that the north eastern areas of the site may be influenced by mixing with the Yarra River (i.e. Na-Cl dominant groundwater). However, given that the data set has not yet been reproduced or validated, the remainder of the data set will not be separated further for the fourth phase of this data assessment.


Fishermans Bend Piper Diagram
SO4 + Cl
Ca + Mg
Na + K
HCO3 + CO3
Mg
Ca
Cl
SO4
80%
60%
40%
20%
Legend
GW01
GW02
GW03
GW04
GW05
GW06
GW07
GW08
GW09
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GW22
GW23
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GW25
GW26
12 More...
Legend
GW27
GW28
GW29
GW30
GW31
GW32
GW33
GW34
GW35
GW36
GW37
GW38

Chart 4

8.5 Detected Contaminants of Potential Concern

Both soil and groundwater results have been tabulated against applicable guidelines within **Appendix A**, whilst laboratory transcripts are provided in **Appendix J**.

8.5.1 Soil

As this is a regional baseline groundwater assessment, no interpretation of soil data is required. **Table 11** provides a brief summary of the detectable concentrations of CoPC in soil (including QA/QC samples) and may be a useful reference point for future soil and/or groundwater assessments, should they be conducted at the site.

As detailed in **Section 3.2**, the presence of PAH and heavy metals in soil could potentially be associated with uncontrolled backfill, leaks from vehicles and deposition of atmospheric pollutants which could represent a source of regional groundwater contamination. The locations where these CoPC were detected are as follows:

- GW01 (Cu, Fe, Pb, Ni, Zn and Total PAH)
- GW02 (Cu, Ni and Total PAH)
- GW04 (Ni, Zn and BaP)
- GW27 (Cu, Ni, Zn, BaP and Total PAH)
- GW18 (Ni, BaP and Total PAH)
- GW21 (BaP)
- GW36 (BaP)

Table 12 details the locations where the above CoPC were also detected in groundwater.

Table 11 Summary of Soil Results

	No. of Results	No. of Detects	Min. Conc.	Min. Detect	Max Conc.	Max. Detect	Avg. Conc.	Median Conc.	Std Dev	Exceedances
Ethylbenzene	15	2	<0.1	1.6	8.8	8.8	0.9	0.25	2.2	0
Toluene	15	2	<0.1	1	42.8	42.8	3.1	0.25	11	0
Total BTEX	14	2	<0.2	11	91.4	91.4	7.4	0.1	24	0
Xylene (m & p)	15	2	<0.2	6.8	32.5	32.5	2.8	0.25	8.4	0
Xylene (o)	15	2	<0.1	1.6	7.3	7.3	0.8	0.25	1.8	0
Xylene Total	15	2	<0.3	8.4	39.8	39.8	3.4	0.25	10	0
C6-C10 less BTEX (F1)	15	2	<10	175	184	184	29	5	61	GW01(2.5-2.6)
1,3-dichlorobenzene	17	1	<0.05	0.6	0.6	0.6	0.26	0.25	0.1	0
1,4-dichlorobenzene	17	1	<0.05	1.3	1.3	1.3	0.3	0.25	0.26	GW01(4.5-4.6)
pH (CaCl2)	14	14	4.5	4.5	11.5	11.5	7.8	7.9	2.1	GW01(2.5-2.6) GW01(4.5-4.6) GW10(0.5-0.6) GW12(0.9-1.0) GW14(0.5-0.6) GW14(0.9-1.0) GW36(0.9-1.0)
Sulfate (as SO4)	14	10	<50	50	4,470	4,470	774	145	1,404	0
Total Organic Carbon	37	36	<0.02	0.03	8.46	8.46	1.26	0.13	0.8	0
1,2,4-trimethylbenzene	17	2	<0.05	10.9	26.3	26.3	2.4	0.25	6.7	0
1,3,5-trimethylbenzene	17	2	<0.05	2.6	8.5	8.5	0.86	0.25	2.1	0

	No. of Results	No. of Detects	Min. Conc.	Min. Detect	Max Conc.	Max. Detect	Avg. Conc.	Median Conc.	Std Dev	Exceedances
Isopropylbenzene	17	2	<0.05	3.5	3.9	3.9	0.64	0.25	1.2	0
n-butylbenzene	16	2	<0.5	5.7	6.6	6.6	0.99	0.25	2	0
n-propylbenzene	16	2	<0.5	5.8	6.8	6.8	1	0.25	2.1	0
p-isopropyltoluene	16	2	<0.5	1.9	2.9	2.9	0.52	0.25	0.76	0
sec-butylbenzene	16	2	<0.5	2.4	3.9	3.9	0.61	0.25	1	0
Aluminium	17	17	90	90	12,800	12,800	5,635	6,870	4482	0
Arsenic	17	10	<5	6	25	25	9.9	10	8	0
Cadmium	17	4	0.5	0.5	5	5	1.1	0.5	1.4	0
Chromium (III+VI)	17	14	<2	5	95	95	24	21	24	0
Copper	17	13	<5	6	1,640	1,640	143	26	390	GW01(2.5-2.6) GW01(4.5-4.6) GW02(0.5-0.6) GW27(0.5-0.6)
Iron	17	17	120	120	62,300	62,300	23,059	26,500	20,174	GW01(2.5-2.6) GW01(4.5-4.6)
Lead	17	15	<5	8	664	664	142	67	178	GW01(4.5-4.6)
Mercury	17	6	<0.1	0.3	1.6	1.6	0.26	0.05	0.4	0
Nickel	17	14	<2	4	88	88	33	38	28	GW01(2.5-2.6) GW01(4.5-4.6) GW02(0.5-0.6) GW02(1.0-1.1) GW04(0.5-0.6)

	No. of Results	No. of Detects	Min. Conc.	Min. Detect	Max Conc.	Max. Detect	Avg. Conc.	Median Conc.	Std Dev	Exceedances
										QC06 QC07 GW18(0.4-0.5) GW27(0.5-0.6)
Zinc	17	15	<5	15	3,060	3,060	488	87	930	GW01(2.5-2.6) GW01(4.5-4.6) GW04(0.5-0.6) QC07 GW27(0.5-0.6)
Acenaphthylene	17	2	<0.5	0.6	<2.3	1.2	0.43	0.25	0.36	0
Anthracene	17	4	<0.5	0.9	<2.3	2.2	0.6	0.25	0.56	0
Benz(a)anthracene	17	10	<0.5	1.1	5.8	5.8	1.5	1.1	1.6	0
Benzo(a) pyrene	17	8	<0.5	0.8	7.1	7.1	1.4	1	1.9	GW04(0.5-0.6) QC06 QC07 GW18(0.4-0.5) GW21(0.5-0.6) GW27(0.5-0.6) GW36(0.5-0.6)
Benzo[b+j]fluoranthene	17	9	<0.5	1.1	9.4	9.4	1.7	1.15	2.4	0
Benzo(g,h,i)perylene	17	8	<0.5	0.5	5.2	5.2	1.1	0.6	1.4	0
Benzo(k)fluoranthene	17	8	<0.5	0.5	2.9	2.9	0.84	0.5	0.86	0
Chrysene	17	8	<0.5	1	5.7	5.7	1.2	1	1.4	0

	No. of Results	No. of Detects	Min. Conc.	Min. Detect	Max Conc.	Max. Detect	Avg. Conc.	Median Conc.	Std Dev	Exceedances
Dibenz(a,h)anthracene	17	3	<0.5	0.5	<2.3	1.7	0.52	0.25	0.48	0
Fluoranthene	17	8	<0.5	2.1	10.5	10.5	2.2	1.15	2.7	0
Fluorene	17	0	<0.5	ND	<2.3	ND	0.36	0.25	0.3	0
Indeno(1,2,3-c,d)pyrene	17	7	<0.5	0.5	4.5	4.5	0.94	0.5	1.2	0
Naphthalene	17	3	<0.5	11	28.4	28.4	2.5	0.25	6.4	0
PAHs (Sum of total)	17	10	<0.5	12.6	73.3	73.3	16	12.8	21	GW01(2.5-2.6) GW01(4.5-4.6) GW02(0.5-0.6) GW18(0.4-0.5) GW27(0.5-0.6)
Phenanthrene	17	10	<0.5	1	5.2	5.2	1.5	1	1.4	0
Pyrene	17	10	<0.5	2	11.3	11.3	2.4	2.4	2.9	0
Benzo(a)pyrene TEQ (half LOR)	17	15	0.6	0.6	11.2	11.2	2.2	0.75	2.9	GW18(0.4-0.5) GW27(0.5-0.6)
Benzo(a)pyrene TEQ (LOR)	17	16	1.2	1.2	11.2	11.2	2.6	1.6	2.7	GW18(0.4-0.5) GW27(0.5-0.6)
Benzo(a)pyrene TEQ (zero)	17	8	<0.5	1	11.2	11.2	2	0.75	3	GW18(0.4-0.5) GW27(0.5-0.6)
F2-NAPHTHALENE	15	3	<50	70	2,310	2,310	327	25	789	GW01(2.5-2.6)
+C10 - C36 (Sum of total)	15	6	<50	220	27,400	27,400	3,118	25	8,042	0

	No. of Results	No. of Detects	Min. Conc.	Min. Detect	Max Conc.	Max. Detect	Avg. Conc.	Median Conc.	Std Dev	Exceedances
C6 - C9	15	2	<10	137	194	194	27	5	57	0
C10 - C14	15	2	<20	2,280	2,420	2,420	334	25	819	0
C15 - C28	15	6	88	88	14,400	14,400	1,649	50	4,201	0
C29-C36	15	6	<100	130	10,700	10,700	1,200	50	3,031	0
C6-C10	15	2	<10	195	266	266	35	5	80	0
>C10-C16	15	3	<50	70	2,320	2320	329	25	794	GW01(2.5-2.6) GW01(4.5-4.6)
>C16-C34	15	6	<100	140	23,100	23,100	2,597	50	6,676	GW01(2.5-2.6) GW01(4.5-4.6) GW27(0.5-0.6)
>C34-C40	15	5	<100	130	3,820	3,820	441	50	1,042	GW01(4.5-4.6)
C10 - C40 (Sum of total)	14	5	<50	250	29,200	29,200	3,520	25	8,792	0

8.5.2 Groundwater

Following a detailed historical and desktop review process (AECOM, August 2015), AECOM positioned the groundwater locations at points that are considered to be away from, or up hydraulic gradient of, possible point sources.

The contaminants of potential concern (CoPC) that have been detected in groundwater as part of this assessment are considered to be representative of CoPC that would likely be detected in future assessments or environmental audits at the site. **Table 12** provides a summary of the CoPC that have been detected in soil and groundwater.

Locations where potential soil leaching has occurred have been removed from the final phase of the data assessment process as they are potentially not representative of regional background conditions (**Section 8.6**).

Table 12 Detectable CoPC in shallow groundwater

Location	Analytes detected in groundwater	Discussion of potential soil leaching pathway
GW01	Nutrient ions (Ammonia, Nitrate, Phosphorous, total oxidised sulfur, total organic carbon). Inorganics (Chloride, Fluoride, Sodium, Aluminium, Arsenic, Calcium, Chromium, Iron, Magnesium, Manganese, Nickel, Potassium, Zinc) Chlorinated hydrocarbons (Chlorobenzene, 1,4-dichlorobenzene, Benzene, Toluene, Xylene [m&p]) Petroleum hydrocarbons (1,2,4-trimethylbenzene, Isopropylbenzene, F2-Naphthalene, TPH C_{10}-$_{40}$, TRH C_{10}-C_{36})	Dichlorobenzenes and petroleum hydrocarbons were detected in soil and therefore may be present in groundwater due to leaching from soil impacts. Soil data are indicative of a potential localised soil source, suggesting that that hydrocarbon impacts at this location may not be representative of regional background conditions. This data point will be assessed separately to the remainder of the data set.
GW02	Nutrient ions (Ammonia, Nitrate, Total oxidised sulfur) Inorganics (Chloride, Fluoride, Sodium, Arsenic Calcium, Chromium, Iron, Magnesium, Manganese, Nickle, Potassium) Chlorinated hydrocarbons (Chlorobenzene) Petroleum hydrocarbons (Isopropylbenzene, n-propylbenzene, p-isopropyltoulene, F2-Naphthalene, TPH C_{6}-$_{40}$, TRH C_{10}-C_{36})	Metals (Al, As, CrIII+VI, Cu, Fe, Pb, Hg, Ni, Se and Zn) and petroleum hydrocarbons were detected in soil. TRH analysis includes naturally occurring hydrocarbons associated with organic degradation and anthropogenic sources such as land reclamation using uncontrolled backfill or leaks from vehicles. Metals may be present in association with natural geological parent material or anthropogenic sources such as land reclamation using uncontrolled backfill or leaks from vehicles. Both metals and TRH are potentially associated with a soil contamination source, or naturally occurring and as such, this data point will not be removed from the data set.
GW03	Nutrient ions (Ammonia, Nitrate, Total oxidised sulfur) Inorganics (Chloride, Fluoride, Sodium, Aluminium, Arsenic, Calcium, Iron, Magnesium, Manganese, Nickel, Potassium, Zinc) Chlorinated hydrocarbons (Benzene) Petroleum hydrocarbons (Phenathrene)	No soil analysis undertaken.

Location	Analytes detected in groundwater	Discussion of potential soil leaching pathway
GW04	Nutrient ions (Ammonia, Nitrate, Total oxidised sulfur, Total organic carbon). . Inorganics (Chloride, Fluoride, Sodium, Aluminium, Arsenic, Calcium, Copper, Iron, Magnesium, Manganese, Nickel, Potassium, Zinc)	Metals (Al, As, Cd, CrIII+VI, Cu, Fe, Pb, Hg, Ni, Se and Zn) and petroleum hydrocarbons were detected in soil. TRH analysis includes naturally occurring hydrocarbons associated with organic degradation and anthropogenic sources such as land reclamation using uncontrolled backfill or leaks from vehicles. Metals may be present in association with natural geological parent material or anthropogenic sources such as land reclamation using uncontrolled backfill or leaks from vehicles. Both metals and TRH are potentially associated with a soil contamination source, or naturally occurring and as such, this data point will not be removed from the data set.
GW05	Nutrient ions (Ammonia, Nitrate, Total oxidised sulfur) Inorganics (Chloride, Fluoride, Sodium, Arsenic Calcium, Iron, Magnesium, Manganese, Nickel, Potassium, Zinc) Petroleum hydrocarbons (Isopropylbenzene, n-propylbenzene, p-isopropyltoulene, F2-Naphthalene, TPH C_{10}-$_{40}$, TRH C_{10}-C_{36})	No soil analysis undertaken.
GW06	Nutrient ions (Ammonia, Nitrate, Total oxidised sulfur, Total organic carbon) Inorganics (Chloride, Fluoride, Sodium, Aluminium, Arsenic, Calcium, Chromium, Iron, Magnesium, Manganese, Nickel, Potassium, Zinc)	No soil analysis undertaken.
GW07	Nutrient ions (Ammonia, Nitrate, Phosphorous, Total oxidised sulfur) Inorganics (Chloride, Fluoride, Sodium, Aluminium, Arsenic, Calcium, Chromium, Iron, Magnesium, Manganese, Nickel, Potassium, Zinc)	No soil analysis undertaken.
GW08	Nutrient ions (Ammonia, Nitrate, Total oxidised sulfur) Inorganics (Chloride, Fluoride, Sodium, Aluminium, Arsenic, Calcium, Chromium, Iron, Magnesium, Manganese, Nickel, Potassium, Zinc)	No soil analysis undertaken.
GW09	Nutrient ions (Ammonia, Nitrate, Total oxidised sulfur) Inorganics (Chloride, Fluoride, Sodium, Aluminium, Arsenic, Calcium, Iron, Magnesium, Manganese, Nickel, Potassium, Zinc)	No soil analysis undertaken.

Location	Analytes detected in groundwater	Discussion of potential soil leaching pathway
GW10	Nutrient ions (Ammonia, Nitrate, Total oxidised sulfur, Total organic carbon) Inorganics (Chloride, Fluoride, Sodium, Aluminium, Arsenic, Calcium, Chromium, Copper, Iron, Magnesium, Manganese, Nickel, Potassium, Zinc)	Aluminium and Iron were detected in soil and are likely to be naturally occurring and as such, this data point will not be removed from the data set.
GW11	Nutrient ions (Ammonia, Total oxidised sulfur) Inorganics (Chloride, Fluoride, Sodium, Aluminium, Arsenic, Calcium, Chromium, Iron, Magnesium, Manganese, Nickel, Potassium, Zinc)	No soil analysis undertaken.
GW12	Nutrient ions (Ammonia, Nitrate, Total oxidised sulfur) Inorganics (Chloride, Fluoride, Sodium, Aluminium, Arsenic, Calcium, Iron, Magnesium, Manganese, Nickel, Potassium, Zinc)	Metals (Al, CrIII+VI, Cu, Fe, Pb, Ni, Se and Zn) were detected in soil. Metals may be present in association with natural geological parent material or anthropogenic sources such as land reclamation using uncontrolled backfill or leaks from vehicles. As these metals have the potential to be naturally occurring, this data point will not be removed from the data set.
GW13	Nutrient ions (Ammonia, Nitrate, Total oxidised sulfur, Total organic carbon) Inorganics (Chloride, Fluoride, Sodium, Aluminium, Arsenic, Calcium, Iron, Magnesium, Manganese, Nickel, Potassium, Zinc)	No soil analysis undertaken.
GW14	Nutrient ions (Ammonia, Nitrate, Phosphorous, Total oxidised sulfur, Total organic carbon) Inorganics (Chloride, Fluoride, Sodium, Aluminium, Arsenic, Calcium, Copper, Iron, Magnesium, Manganese, Nickel, Potassium, Zinc)	Metals (Al, CrIII+VI, Cu, Fe, Pb, Ni, Se and Zn) were detected in soil. Metals may be present in association with natural geological parent material or anthropogenic sources such as land reclamation using uncontrolled backfill or leaks from vehicles. As these metals have the potential to be naturally occurring, this data point will not be removed from the data set.
GW15	Nutrient ions (Ammonia, Nitrate, Phosphorous, Total oxidised sulfur, Total organic carbon) Inorganics (Chloride, Fluoride, Sodium, Aluminium, Arsenic, Calcium, Chromium, Copper, Iron, Magnesium, Manganese, Nickel, Potassium) Petroleum Hydrocarbons (TRH C_{10}-C_{36}, TPH C_{10}-C_{40})	No soil analysis undertaken.

Location	Analytes detected in groundwater	Discussion of potential soil leaching pathway
GW16	Nutrient ions (Ammonia, Nitrate, Phosphorous, Total oxidised sulfur, Total organic carbon) Inorganics (Chloride, Fluoride, Sodium, Aluminium, Arsenic, Calcium, Iron, Magnesium, Manganese, Nickel, Potassium, Zinc)	No soil analysis undertaken.
GW17	Nutrient ions (Ammonia, Nitrate, Phosphorous, Total oxidised sulfur, Total organic carbon) Inorganics (Chloride, Fluoride, Sodium, Aluminium, Arsenic, Calcium, Chromium, Iron, Magnesium, Manganese, Nickel, Potassium)	No soil analysis undertaken.
GW18	Nutrient ions (Ammonia, Nutrient ions (Ammonia, Nitrate, Phosphorous, Total oxidised sulfur, Total organic carbon) Inorganics (Chloride, Fluoride, Sodium, Aluminium, Arsenic, Calcium, Chromium, Magnesium, Manganese, Nickel, Potassium) Petroleum Hydrocarbons (F2-Naphthalene, TRH C_{10}-C_{36}, TPH C_{10}-C_{40})	Metals (Al, As, CrIII+VI, Cu, Fe, Pb, Ni, Se and Zn) and petroleum hydrocarbons were detected in soil. TRH analysis includes naturally occurring hydrocarbons associated with organic degradation and anthropogenic sources such as land reclamation using uncontrolled backfill or leaks from vehicles. Metals may be present in association with natural geological parent material or anthropogenic sources such as land reclamation using uncontrolled backfill or leaks from vehicles. Both metals and TRH are potentially associated with a soil contamination source, or naturally occurring and as such, this data point will not be removed from the data set.
GW19	Nutrient ions (Ammonia, Nitrate, Phosphorous, Total oxidised sulfur, Total organic carbon) Inorganics (Chloride, Fluoride, Sodium, Aluminium, Arsenic, Calcium, Chromium, Copper, Iron, Magnesium, Manganese, Nickel, Potassium, Zinc) Petroleum Hydrocarbons (TRH C_{10}-C_{36}, TPH C_{10}-C_{40})	No soil analysis undertaken.
GW20	Nutrient ions (Ammonia, Nitrate, Total oxidised sulfur, Total organic carbon) Inorganics (Chloride, Fluoride, Sodium, Aluminium, Arsenic, Calcium, Iron, Magnesium, Manganese, Nickel, Potassium, Zinc)	No soil analysis undertaken.

Location	Analytes detected in groundwater	Discussion of potential soil leaching pathway
GW21	Nutrient ions (Ammonia, Nitrate, Total oxidised sulfur, Total organic carbon) Inorganics (Chloride, Fluoride, Sodium, Aluminium, Arsenic, Calcium, Chromium, Iron, Magnesium, Manganese, Nickel, Potassium) Petroleum Hydrocarbons (TRH C_{10}-C_{36}, TPH C_{10}-C_{40})	Metals (Al, CrIII+VI, Cu, Fe, Pb, Ni, Se and Zn) and petroleum hydrocarbons were detected in soil. TRH analysis includes naturally occurring hydrocarbons associated with organic degradation and anthropogenic sources such as land reclamation using uncontrolled backfill or leaks from vehicles. Metals may be present in association with natural geological parent material or anthropogenic sources such as land reclamation using uncontrolled backfill or leaks from vehicles. Both metals and TRH are potentially associated with a soil contamination source, or naturally occurring and as such, this data point will not be removed from the data set.
GW22	Nutrient ions (Ammonia, Nitrate, Total oxidised sulfur, Total organic carbon) Inorganics (Chloride, Fluoride, Sodium, Aluminium, Arsenic, Cadmium, Calcium, Chromium, Iron, Lead, Magnesium, Manganese, Nickel, Potassium, Zinc) Petroleum Hydrocarbons (TRH C_{10}-C_{36}, TPH $C1_0$-C_{40})	No soil analysis undertaken.
GW23	Nutrient ions (Ammonia, Nitrate, Total oxidised sulfur) Inorganics (Chloride, Fluoride, Sodium, Aluminium, Arsenic, Calcium, Chromium, Copper, Iron, Magnesium, Manganese, Nickel, Potassium, Zinc)	No soil analysis undertaken.
GW24	Nutrient ions (Ammonia, Nitrate, Phosphorous, Total oxidised sulfur, Total organic carbon) Inorganics (Chloride, Fluoride, Sodium, Aluminium, Arsenic, Calcium, Chromium, Iron, Magnesium, Manganese, Nickel, Potassium, Zinc) Chlorinated hydrocarbons (Benzene, Toulene, Xylene [m&p]) Petroleum Hydrocarbons (F2-Naphthalene, TRH C_{10}-C_{36}, TPH C_{10}-C_{40})	No soil analysis undertaken.
GW25	Nutrient ions (Ammonia, Nitrate, Total oxidised sulfur, Total organic carbon) Inorganics (Chloride, Fluoride, Sodium, Aluminium, Arsenic, Calcium, Iron, Magnesium, Manganese, Nickel, Potassium, Zinc)	No soil analysis undertaken.

Location	Analytes detected in groundwater	Discussion of potential soil leaching pathway
GW26	Nutrient ions (Ammonia, Nitrate, Total oxidised sulfur, Total organic carbon) Inorganics (Chloride, Fluoride, Sodium, Aluminium, Arsenic, Calcium, Chromium, Iron, Magnesium, Manganese, Nickel, Potassium, Zinc)	No soil analysis undertaken.
GW27	Nutrient ions (Ammonia, Nitrate, Total oxidised sulfur, Total organic carbon) Inorganics (Chloride, Fluoride, Sodium, Aluminium, Calcium, Chromium, Iron, Magnesium, Manganese, Nickel, Potassium, Zinc).	Metals (Al, As, CrIII+VI, Cu, Fe, Pb, Hg, Ni, Se and Zn) and petroleum hydrocarbons were detected in soil. It is noted that TRH analysis includes both naturally occurring hydrocarbons associated with organic degradation and anthropogenic sources such as land reclamation using uncontrolled backfill or leaks from vehicles. Metals may be present in association with natural geological parent material or anthropogenic sources such as land reclamation using uncontrolled backfill or leaks from vehicles. Both metals and TRH are potentially associated with a soil contamination source, or naturally occurring and as such, this data point will not be removed from the data set.
GW28	Nutrient ions (Ammonia, Nitrate, Phosphorous, Total oxidised sulfur, Total organic carbon) Inorganics (Chloride, Fluoride, Sodium, Aluminium, Arsenic, Calcium, Chromium, Copper, Iron, Magnesium, Manganese, Nickel, Potassium, Zinc) Chlorinated hydrocarbons (Benzene, Toulene) Petroleum Hydrocarbons (TRH C_{10}-C_{36}, TPH C_{10}-C_{40})	No soil analysis undertaken.
GW29	Nutrient ions (Ammonia, Nitrate, Total oxidised sulfur, Total organic carbon) Inorganics (Chloride, Fluoride, Sodium, Aluminium, Arsenic, Calcium, Iron, Magnesium, Manganese, Nickel, Potassium, Zinc) Petroleum Hydrocarbons (TRH C_{10}-C_{36}, TPH C_{10}-C_{14})	No soil analysis undertaken.

Location	Analytes detected in groundwater	Discussion of potential soil leaching pathway
GW30	Nutrient ions (Ammonia, Nitrate, Phosphorous, Total oxidised sulfur, Total organic carbon) Inorganics (Chloride, Sodium, Aluminium, Arsenic, Calcium, Chromium, Iron, Magnesium, Manganese, Nickel, Potassium, Zinc) Petroleum Hydrocarbons (TRH $_{C10}$-C_{36}, TPH C_{10}-C_{40})	No soil analysis undertaken.
GW31	Nutrient ions (Ammonia, Nitrate, Total oxidised sulfur, Total organic carbon) Inorganics (Chloride, Fluoride, Sodium, Arsenic, Calcium, Iron, Magnesium, Manganese, Nickel, Potassium, Zinc)	No soil analysis undertaken.
GW32	Nutrient ions (Ammonia, Nitrate, Phosphorous, Total oxidised sulfur) Inorganics (Chloride, Fluoride, Sodium, Calcium, Iron, Magnesium, Manganese, Nickel, Potassium, Zinc)	No soil analysis undertaken.
GW33	Nutrient ions (Ammonia, Nitrate, Total oxidised sulfur, Total organic carbon) Inorganics (Chloride, Fluoride, Sodium, Aluminium, Arsenic, Calcium, Copper, Iron, Lead, Magnesium, Manganese, Nickel, Potassium, Zinc)	No soil analysis undertaken.
GW34	Nutrient ions (Ammonia, Nitrate, Phosphorous, Total oxidised sulfur, Total organic carbon) Inorganics (Chloride, Fluoride, Sodium, Aluminium, Arsenic, Calcium, Chromium, Copper, Iron, Magnesium, Manganese, Nickel, Potassium)	No soil analysis undertaken.
GW35	Nutrient ions (Ammonia, Nitrate, Total oxidised sulfur, Total organic carbon) Inorganics (Chloride, Fluoride, Sodium, Arsenic, Calcium, Iron, Magnesium, Manganese, Nickel, Potassium, Zinc) Petroleum Hydrocarbons (TRH $C1_0$-C_{36}, TPH C_{15}-C_{28})	No soil analysis undertaken.

Location	Analytes detected in groundwater	Discussion of potential soil leaching pathway
GW36	Nutrient ions (Ammonia, Nitrate, Phosphorous, Total oxidised sulfur, Total organic carbon) Inorganics (Chloride, Fluoride, Sodium, Aluminium, Arsenic, Calcium, Chromium, Iron, Lead, Magnesium, Manganese, Nickel, Potassium, Zinc)	Metals (Al, As, CrIII+VI, Cu, Fe, Pb, Hg, Ni, Se and Zn) and petroleum hydrocarbons were detected in soil. It is noted that TRH analysis includes both naturally occurring hydrocarbons associated with organic degradation and anthropogenic sources such as land reclamation using uncontrolled backfill or leaks from vehicles. Metals may be present in association with natural geological parent material or anthropogenic sources such as land reclamation using uncontrolled backfill or leaks from vehicles. Both metals and TRH are potentially associated with a soil contamination source, or naturally occurring and as such, this data point will not be removed from the data set.
GW37	Nutrient ions (Ammonia, Nitrate, Total organic carbon) Inorganics (Chloride, Fluoride, Sodium, Aluminium, Arsenic, Calcium, Copper, Lead, Magnesium, Manganese, Nickel, Potassium, Zinc)	No soil analysis undertaken.
GW38	Nutrient ions (Ammonia, Nitrate, Phosphorous, Total oxidised sulfur, Total organic carbon) Inorganics (Chloride, Fluoride, Sodium, Aluminium, Arsenic, Calcium, Copper, Lead, Magnesium, Manganese, Nickel, Potassium)	No soil analysis undertaken.

8.6 Beneficial Uses of Shallow Groundwater

As discussed in **Section 2.3** and **Section 8.4**, the most sensitive groundwater segment that may be applicable at the site (based on TDS concentrations reported in November 2015) is Segment A2 (501-1,000mg/L). It is noted that one data point (GW14) reported a TDS concentration <500mg/L, however, this is considered likely to have been influenced by a fresh water source in the vicinity of the groundwater well.

Segment A2 requires the protection of Potable Water Supply - Acceptable, which aligns with the most conservative guidelines. AECOM has therefore summarised descriptive statistics of CoPC detected at concentrations in excess of the most conservative guideline (Potable Water Supply - Acceptable). These are considered to be the CoPC at the site, which are most likely to trigger further investigation during future assessments/audits. It should be noted that the area is serviced by a reticulated water supply, which may limit the potential for this beneficial use to be realised.

As detailed in the above sections, a number of groundwater wells (i.e. GW01, GW14, GW19, GW37 and GW38) have been removed from the statistical analysis process. **Table 13** provides a summary of groundwater CoPC that reported concentrations in excess of Potable Water Supply – Acceptable, while box plots have been developed as an additional data visualisation tool for those CoPC with a minimum of 10 data points, as seen in **Appendix L.** Please note that it would be a reasonable to assume that CoPC with <10 detections would indicate the relevant CoPC is associated with specific sources.

Table 13 Summary of CoPC in groundwater in excess of Potable Water Supply guidelines (minimum of 10 detectable concentrations)

Statistical Summary	Ammonia as N	Chloride	Nitrate (as N)	Sulfate as SO4 (Filtered)	Sodium (Filtered)	TDS	Arsenic (Filtered)	Iron (Filtered)	Manganese (Filtered)	Nickel (Filtered)
No. of Results	33	33	33	33	33	33	33	33	33	33
No. of Detects	36	36	34	36	35	35	34	36	36	35
Min. Conc.	50	15	<0.01	2	32	632	<0.001	<0.05	0.066	<0.001
Min. Detect	50	15	0.01	2	32	632	0.001	0.18	0.066	0.004
Max. Conc.	78,100	12,200	16.4	2,110	7,680	30,300	0.076	50.6	3.25	0.204
Maximum Detect	78,100	12,200	16.4	2,110	7,680	30,300	0.076	50.6	3.25	0.204
Avg. Conc.	9,039	1,111	0.6	403	705	3,317	0.01	11	0.42	0.028
Median Conc.	2,680	101	0.04	266	143	1,250	0.006	5.54	0.293	0.016
Std Dev	16,050	3,011	2.8	433	1745	6,419	0.015	13	0.57	0.037
No. of Exceedances	26	22	1	18	14	33	18	30	31	14

9.0 Conclusions

The assessment focused primarily on characterising the condition of the shallow groundwater aquifer, to determine key factors that may be influencing its quality at a regional scale, and provide a summary of regional baseline groundwater quality for future reference. The regional groundwater conditions described in this report may be considered when informing future development decisions at the site. The primary objectives of the assessment were to:

- Determine the baseline shallow groundwater quality across the site.
- Confirm the protected and precluded beneficial uses of shallow groundwater at the site.
- Provide possible regional background concentrations of chemicals of potential concern (CoPC) based on the data obtained.
- Gain a greater understanding of the potential risk of shallow groundwater contamination to impact on surface water receptors.
- Provide recommendations on risk mitigation and management strategies required during site development activities that relate to any potential shallow groundwater contamination identified through this assessment.

Based on the above objectives and scope of work, the following conclusions can be made:

Baseline Shallow Groundwater Quality

- Of the 36 new groundwater well locations:
  - Five encountered groundwater within fill material.
  - Twenty-eight encountered groundwater within Port Melbourne Sands.
  - One encountered groundwater within Coode Island Silt (CIS).
  - Two encountered groundwater within Older Volcanic clays.

  These observations are consistent with the regional geological maps of the area.
- Field observations and bore logs indicated that fill and the Port Melbourne Sands are interconnected.
- SWL's were reported to range between 0.94 and 3.55 metres below top of casing (mBTOC). This variation across the site is expected due to the presence of former landfills/quarries, extensive sewer networks, former wetland areas and close proximity to the Yarra River.
- In a regional context, the shallow groundwater flow-paths within fill material and the Port Melbourne Sands are likely flow towards the south, based on the results of the gauging program.
- The shallow groundwater flowing in the fill material and Port Melbourne Sands is considered an unconfined aquifer and it is likely to be recharged by direct infiltration of rainfall, leaking services, or flows from the Yarra River under high tide conditions. Various site activities and surface coverage can also affect the extent of recharge of the shallow aquifer.
- Shallow underground infrastructure can create artificial recharge (via leakage at points that are shallower than groundwater) and preferential flow paths (via groundwater draining at points that are deeper than groundwater). However, given the shallow depth of the upper unconfined aquifer, it is unlikely that deep underground infrastructure has a significant impact on flow direction.
- The site itself appears to be generally acting as a groundwater flow-through zone with some possible discharge zones near the south east of the site.
- The potential tidal influence was measured in two transects running north to south across the site. Results of this work showed that there was consistency in the way the groundwater wells responded to changes in tides, indicating the tide was an influencing factor. However, the tidal response in relation to groundwater levels was considered a minimal reaction within the well locations along selected transects.
- The groundwater across the site appears to be mostly Ca/Na-HCO_3 dominant, with Na-Cl dominant groundwater occurring along the north eastern portion of the site. The pH ranged between 4.88 and 8.11, EC was reported as 241 to 35,600 uS/cm, while laboratory TDS concentrations were typically in excess of 632 mg/L.

Protected and precluded beneficial uses of shallow groundwater

Based on the TDS concentrations, the most sensitive segment of groundwater at the site that is likely to require protection in future assessments/environmental audits is Segment A2 (as defined by the *State Environment Protection Policy (Groundwaters of Victoria) 1997*) which requires the protection of Potable Water Supply – Acceptable and other sensitive beneficial uses. However, the area is serviced by a reticulated water supply which may limit the need for the use of groundwater as a drinking water supply in the region.

Regional background concentrations of chemicals of potential concern (CoPC)

Descriptive statistics of CoPC detected at concentrations in excess of the most conservative guideline (Drinking Water) were undertaken, as these are considered to be the CoPC at the site which are most likely to trigger further investigation during future assessments/environmental audits. In doing so, data points associated with potential point-sources of contamination have been removed, so that the remainder of the data can be used to determine possible regional background conditions.

The following CoPC were reported in concentrations that exceed Potable Water Supply (Drinking Water) criteria, and may therefore trigger further consideration in relation to future redevelopment of the site:

- Ammonia as N – likely from a diffuse source or co-source that is regionally elevated.
- Chloride – Considered to be regionally elevated in background conditions.
- Nitrate as N – Likely a diffuse source that is regionally elevated.
- Sulfate as SO_4 – Considered regionally elevated background conditions.
- TDS – Considered regionally elevated in background conditions.
- Arsenic – Considered regionally elevated in background conditions.
- Iron – Considered regionally elevated in background conditions.
- Manganese – Considered regionally elevated in background conditions.
- Nickel – Considered regionally elevated in background conditions.

Ground water clean up - Future site development

Ammonia and nitrate concentrations within groundwater are unlikely to be considered as background conditions (as defined by the State Environment Protection Policy (Groundwaters of Victoria) 1997), as they are expected to be present due to diffuse-source pollution. As nitrate and ammonia are elevated across the site, they may be considered regionally elevated, however, individual site assessments will need to consider the results of this assessment in conjunction with the potential for site-sourced contamination to determine groundwater clean up associated with the future redevelopment of the site.

Potential risk of shallow groundwater contamination impact on surface water receptors

The flow of shallow groundwater across the site has been considered from a regional perspective for the purposes of this regional baseline assessment. Generally, it is noted that under natural conditions groundwater moves along flow paths from areas of recharge to areas of discharge along rivers, lakes, wetlands, or seepage to bays and oceans.

Based on the site setting, topography and findings of this baseline groundwater assessment, groundwater is considered likely to flow in a southerly direction. Groundwater is therefore likely to discharge to the Yarra River and Hobsons Bay and place the following potential surface water receptors at risk:

- Aquatic ecosystems and groundwater dependent ecosystems (GDE's) in the Yarra River and Hobsons Bay.
- Users of water for potable supply.
- Terrestrial ecology where groundwater is used for irrigation or stock watering purposes.
- Recreational users in the Yarra River and Hobsons Bay.

In addition to the above surface water receptors, as groundwater is relatively shallow across the study area, there is potential for groundwater to come into contact with building foundations, basement structures and subsurface utilities. Vapours arising from groundwater contaminants may migrate through the subsurface and into buildings, which could result in potential risk to occupants of those buildings.

Risk mitigation and management strategies required during the site development

It is acknowledged that there are many ways in which the data in this report may be interpreted and/or presented. The assessment framework was worked through in a step-wise manner to identify a representative data set and characterise the general conditions of the shallow groundwater on a regional scale.

In addition to the findings of this report, and to ensure that the contamination risk is fully understood in relation to future redevelopment of individual parcels of land within the site, it is recommended that future assessments consider site-specific risk mitigation strategies for each redevelopment. These could include, but are not limited to:

- At least an environmental investigation in accordance with the *National Environmental Protection (Assessment of Site Contamination) Measures (NEPM),* varied in April 2013, to assess the potential for contamination and the likely impact on the proposed development.
- Consideration of potential vapour risk and risk to buildings and structures associated with identified regional and/or localised groundwater conditions.
- Consideration by the relevant planning authorities regarding the need for a statutory environmental audit to be undertaken prior to the redevelopment works – particularly if the redevelopment area is considered the point-source of contamination, or impacted by a point-source of contamination.

10.0 Limitations

AECOM has performed the services for this project in accordance with its current professional standards for site assessment investigations and remedial activities. The scope of works for the investigation works was limited to that detailed in communications with EPA Victoria.

We do not assume any liability for misrepresentation or items not visible, accessible or present at the subject site during the time of the works. AECOM assumes that all historical information provided by other parties is accurate.

There are no remedial or investigative works which are thorough enough to preclude the presence of material, which presently or in the future, may be considered hazardous at or surrounding the site or at sampling locations. Because regulatory evaluation criteria are constantly changing, concentrations of contaminants presently considered low may, in the future, fall under different regulatory standards that require further remediation.

Opinions and judgements expressed herein, which are based on our understanding and interpretation of current regulatory standards, should not be construed as legal opinions. This document and the information herein have been prepared for EPA Victoria. This report may not be relied upon by any other party without the explicit written agreement of AECOM. No other warranty, expressed or implied, is made as to the professional advice included in this report.

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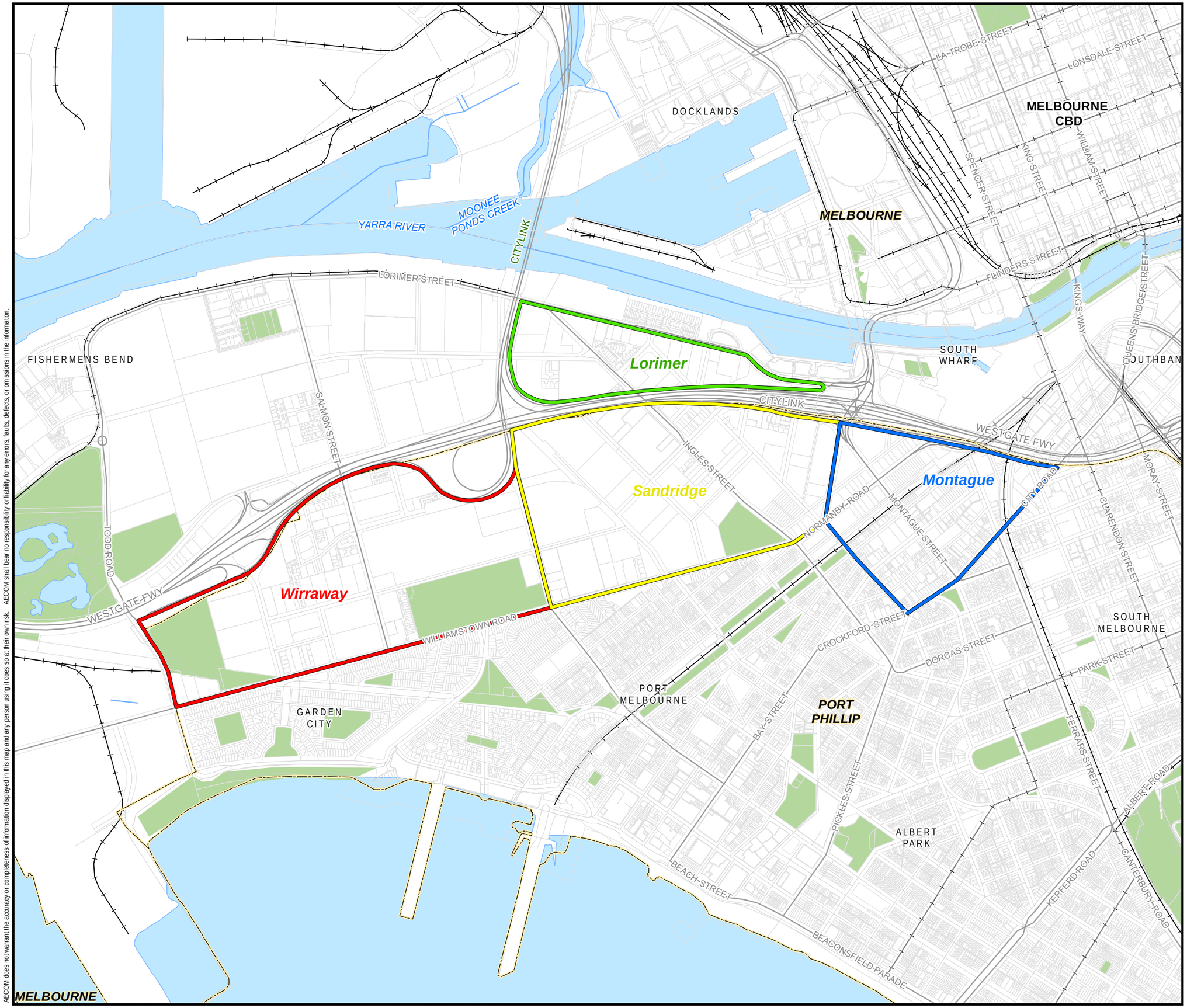
Figures



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metres

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LEGEND

- Lorimer Precinct
- Montague Precinct
- Sandridge Precinct
- Wirraway Precinct
- LGA Boundary
- Major Roads
- Roads
- Rail
- Watercourse
- Waterbody
- Park/Reserve

Data sources:
Base Data: (c) 2012 StreetPro
Aerial photography service layer credits:

SITE LOCATION AND SUB-PRECINCT BOUNDARIES

EPA

Fisherman's Bend Baseline Groundwater Assessment

Fisherman's Bend, Port Melbourne, VIC

Figure

F1

A3 size

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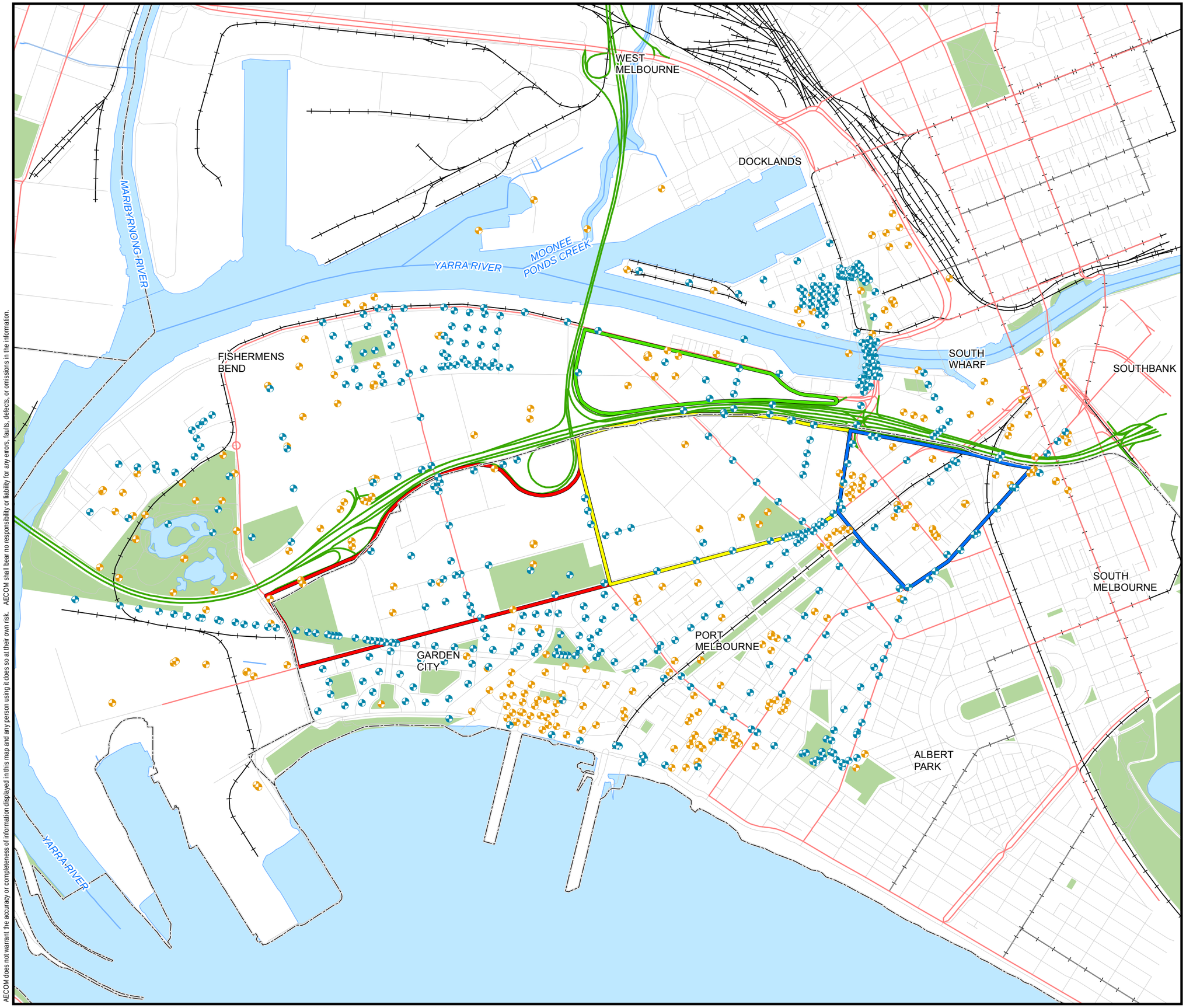

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LAST MODIFIED DJB23 JUL 2015

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LEGEND

- Melbourne Water Groundwater Bore Location
- VVG Groundwater Bore Location
- LGA Boundary
- Lorimer Precinct
- Montague Precinct
- Sandridge Precinct
- Wirraway Precinct

Data sources:
Base Data: (c) 20XX (data source)
(additional data)

VISUALISING VICTORIA'S GROUNDWATER AND MELBOURNE WATER GROUNDWATER BORES WITHIN 1KM OF THE SITE

EPA

FBURA Bore Census Survey

Fisherman's Bend, Port Melbourne, VIC

Figure

F2

Map Document: (P:\604X\6043108714. Tech work area\4.99 GIS\02_Maps\Desktop_Study_Figures\FINAL\60431087_FigF9_Regional_Bore_Locations_20150723.mxd)

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LEGEND

- Groundwater Well Locations
- Soil samples collected
- Wells marked for Tidal Assessment
- Lorimer Precinct
- Montague Precinct
- Sandridge Precinct
- Wirraway Precinct
- LGA Boundary
- Major Roads
- Roads
- Rail
- Watercourse

Data sources:
Base Data: (c) 2012 StreetPro
Aerial photography service layer credits:

GROUNDWATER WELL LOCATIONS

EPA

Fisherman's Bend Baseline Groundwater Assessment

Fisherman's Bend, Port Melbourne, VIC

Figure

F3

Map Document: (P:\604X\60431087\4. Tech work area\4.99 GIS\02_Maps\2016\01\Baseline_Groundwater_Quality_Assessment\60431087_FigF2_Groundwater_Well_Locations_20160118.mxd)

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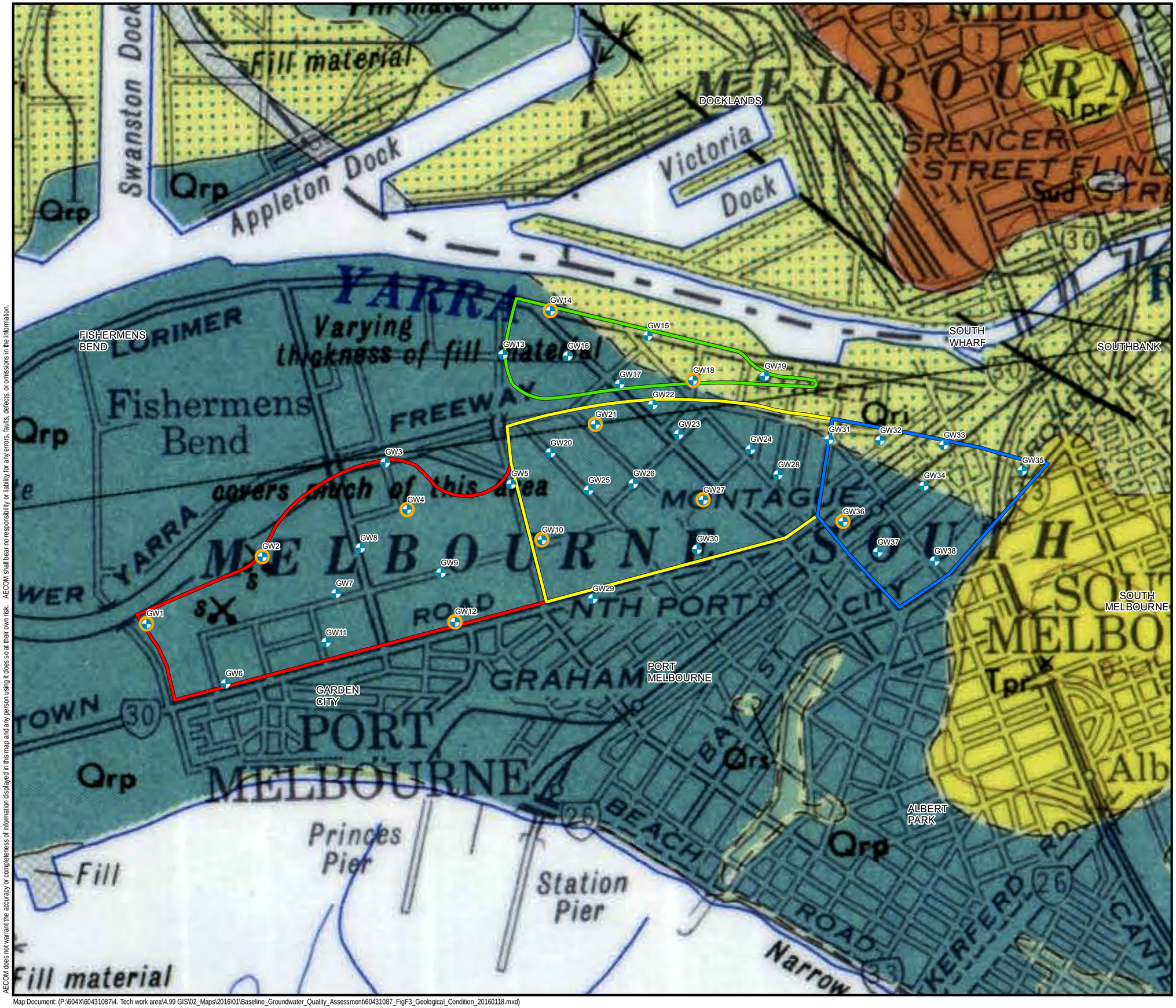

PROJECT ID 60431087
CREATED BY DJB
LAST MODIFIED DJB20 JAN 2016

AECOM
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N

DATUM GDA 1994, PROJECTION MGA ZONE 55

0 200 400 800
metres

1:15,000 (when printed at A3)

LEGEND

- Groundwater Well Locations
- Soil samples collected
- Lorimer Precinct
- Montague Precinct
- Sandridge Precinct
- Wirraway Precinct

NEWER VOLCANICS

Qrp — *Raised beach ridges: bedded and cross bedded well sorted sand, shelly sand, minor silty or clayey sand*

Qrs — *Coastal swamp deposits: fine sand, silt, silty clay often with shell beds*

Qri — *Silt, silty clay, sandy clay, dark grey, minor peat and shell beds*

BRIGHTON GROUP

Tpr — *Sand, red-brown, yellow, and white, well bedded to cross bedded; silty sand, minor gravel, sometimes includes clay balls*

Data sources:
Base Data: (c) 20XX (data source)
(additional data)

GEOLOGICAL CONDITIONS

EPA

Fisherman's Bend Baseline Groundwater Assessment

Fisherman's Bend, Port Melbourne, VIC

Figure **F4**

A3 size

Map Document: (P:\604X\60431087\4. Tech work area\4.99 GIS\02_Maps\2016\01\Baseline_Groundwater_Quality_Assessment\60431087_FigF3_Geological_Condition_20160118.mxd)

PROJECT ID	60431087
CREATED BY	DJB
LAST MODIFIED	DJB20 JAN 2016

AECOM
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N

DATUM GDA 1994, PROJECTION MGA ZONE 55

0 200 400 800

metres

1:15,000 (when printed at A3)

LEGEND

- Groundwater Well Locations
- Soil samples collected
- Groundwater Contour (mAHD)
- Inferred Groundwater Contour
- Inferred Groundwater Flow Direction
- Wells marked for Tidal Assessment
- Lorimer Precinct
- Montague Precinct
- Sandridge Precinct
- Wirraway Precinct
- Inferred Historical Quarry / Landfill
- Wetlands (1788)

GW33 Sample ID
0.16 RWL (mAHD)

Data sources:
Base Data: (c) 2012 StreetPro
Aerial photography service layer credits:

INFERRED GROUNDWATER FLOW DIRECTION

EPA

Fisherman's Bend Baseline Groundwater Assessment

Fisherman's Bend, Port Melbourne, VIC

Figure

F5a

Map Document: (P:\604X\60431087\4. Tech work area\4.99 GIS\02_Maps\2016\01\Baseline_Groundwater_Quality_Assessment\60431087_FigF4_Groundwater_Contours_20160119_v2.mxd)

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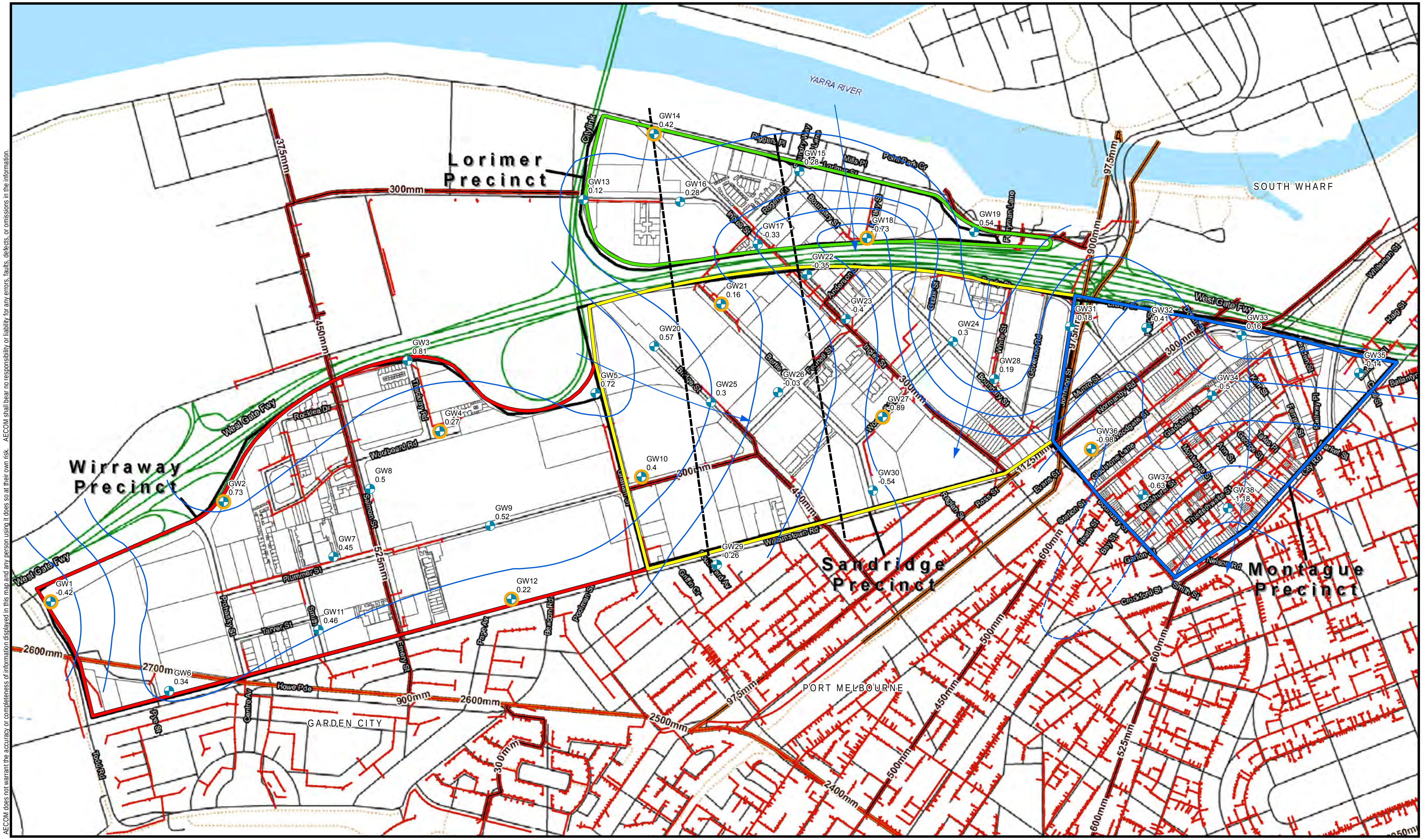

PROJECT ID 60431087
CREATED BY DJB
LAST MODIFIED DJB 15 MAR 2016

AECOM
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N

DATUM GDA 1994, PROJECTION MGA ZONE XX

0 115 230 460
metres
1:10,000 (when printed at A3)

LEGEND

- Groundwater Well Locations
- Soil samples collected
- Groundwater Contour (mAHD)
- Inferred Groundwater Contour
- Inferred Groundwater Flow Direction
- Wells marked for Tidal Assessment
- Lorimer Precinct
- Montague Precinct
- Sandridge Precinct
- Wirraway Precinct

Data sources: Infrastructure-Assessment-GHD_December-2012 report

GROUNDWATER CONTOURS AND SEWER INFRASTRUCTURE

EPA

Fisherman's Bend Baseline Groundwater Assessment

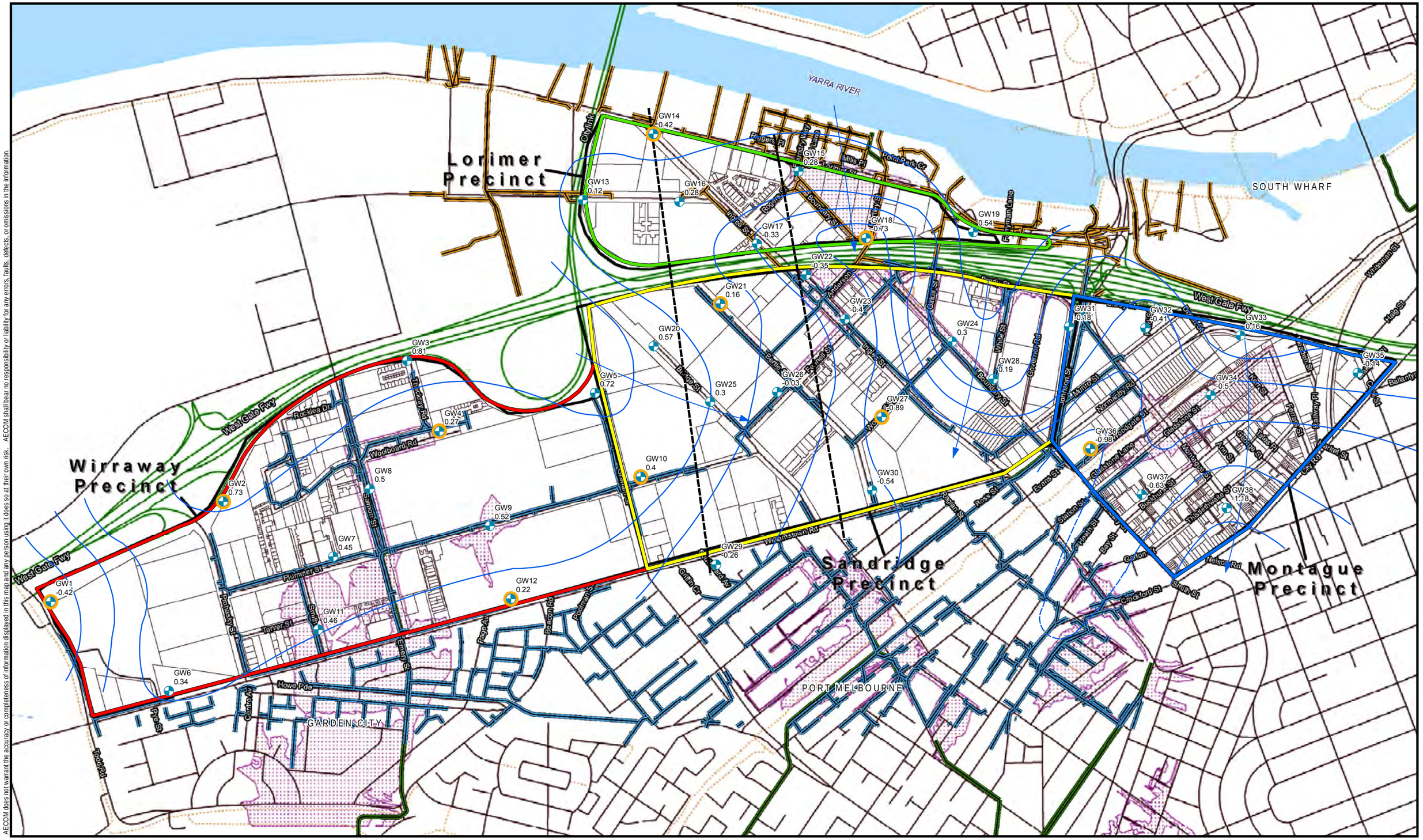
Fisherman's Bend, Port Melbourne, VIC

Figure

F5b

Map Document: (P:\604x\60431087\4. Tech work area\4.99 GIS\02_Maps\2016\03\60431087_FigF4b_Groundwater_Contours_Sewer_20160311.mxd)

A3 size



PROJECT ID 60431087
CREATED BY DJB
LAST MODIFIED DJB 15 MAR 2016

AECOM
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N

DATUM GDA 1994, PROJECTION MGA ZONE XX

0 115 230 460
metres

1:10,000 (when printed at A3)

LEGEND

- Groundwater Well Locations
- Soil samples collected
- Groundwater Contour (mAHD)
- Inferred Groundwater Contour
- Inferred Groundwater Flow Direction
- Wells marked for Tidal Assessment
- Lorimer Precinct
- Montague Precinct
- Sandridge Precinct
- Wirraway Precinct

Data sources: Infrastructure-Assessment-GHD_December-2012 report

GROUNDWATER CONTOURS AND STORMWATER INFRASTRUCTURE

EPA

Fisherman's Bend Baseline Groundwater Assessment

Fisherman's Bend, Port Melbourne, VIC

Figure

F5c

Map Document: (P:\604x\60431087\4. Tech work area\4.99 GIS\02_Maps\2016\03\60431087_FigF4c_Groundwater_Contours_Stormwater_20160311.mxd)

A3 size

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N

DATUM GDA 1994, PROJECTION MGA ZONE 55

0 200 400 800

metres

1:15,000 (when printed at A3)

LEGEND

- Ca-HC03 Dominant
- Ca-SO4 Dominant
- Na-Cl Dominant
- Na-HC03 Dominant
- Wells marked for Tidal Assessment
- Lorimer Precinct
- Montague Precinct
- Sandridge Precinct
- Wirraway Precinct
- Inferred Historical Quarry / Landfill
- Wetlands (1788)
- LGA Boundary
- Major Roads
- Roads
- Rail
- Watercourse

GW33 Sample ID
837 TDS (mg/L)

Data sources:
Base Data: (c) 2012 StreetPro
Aerial photography service layer credits:

GROUNDWATER CHEMISTRY

EPA

Fisherman's Bend Baseline Groundwater Assessment

Fisherman's Bend, Port Melbourne, VIC

Figure

F6

A3 size

Map Document: (P:\604X\604310874. Tech work area\4.99 GIS\02_Maps\2016\01\Baseline_Groundwater_Quality_Assessment\60431087_FigF5_Groundwater_Chemistry_20160118.mxd)

Appendix A

Results Summary Tables

		BTEX								Chlorinated Hydrocarbons																				
		Benzene	Ethylbenzene	Toluene	Total BTEX	Xylene (m & p)	Xylene (o)	Xylene Total	C6-C10 less BTEX (F1)	1,1,1,2-tetrachloroethane	1,1,1-trichloroethane	1,1,2,2-tetrachloroethane	1,1,2-trichloroethane	1,1-dichloroethane	1,1-dichloroethene	1,1-dichloropropene	1,2,3-trichloropropane	1,2-dibromo-3-chloropropane	1,2-dichloroethane	1,2-dichloropropane	1,3-dichloropropane	2,2-dichloropropane	Bromochloromethane	Bromodichloromethane	Bromoform	Carbon tetrachloride	Chlorodibromomethane	Chloroethane	Chloroform	cis-1,2-dichloroethene
		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	mg/kg
EQL		0.1	0.1	0.1	0.2	0.2	0.1	0.3	10	0.05	0.05	0.05	0.05	0.05	0.05	0.5	0.05	0.5	0.05	0.05	0.05	0.5		0.05	0.05	0.05	0.05	0.05	0.05	0.05
Ecosystems Screening	NEPM 2013 Residential & Public Open Space	50	70	85				105	180		5 a	5 a	5 a	5 a					5 a	5 a										5 a
Health Screening	**NEPM 2013 Residential A**	**100**	**4500**	**14000**				**12000**		**20 d**	**8100 d**	**0.6 d**	**1.5 d**	**36 d**	**230 d**		**0.052 d**	**0.053 d**	**4.6 d**	**10 d**	**1600 d**		**150 d**	**2.9 d**	**190 d**	**6.5 d**		**14000 d**	**3.2 d**	**160 d**
	NEPM 2013 Residential B	140	5900	21000				17000		20 d	8100 d	0.6 d	1.5 d	36 d	230 d		0.052 d	0.053 d	4.6 d	10 d	1600 d		150 d	2.9 d	190 d	6.5 d		14000 d	3.2 d	160 d
Vapour Intrusion	*HSL A/B for Vapour Intrusion, 0 to <1 m, Sand*	*0.5*	*55*	*160*				*40*	*45*																					
	HSL A/B for Vapour Intrusion, 1 to <2 m, Sand	*0.5*	*NL*	*220*				*60*	*70*																					
	HSL A/B for Vapour Intrusion, 2 to <4 m, Sand	*0.5*	*NL*	*310*				*95*	*110*																					
	HSL A/B for Vapour Intrusion, 4 m+, Sand	*0.5*	*NL*	*540*				*170*	*200*																					
Buildings & Structures	AS2159 Piling - Design & Installation (2009)																													

LocCode	Field_ID	Sample_Depth	Date	Lab_Report	Sample_Type																											
GW01	GW01(2.5-2.6)	2.5-2.6	29/10/2015	EM1516495	Normal	<0.2	1.6	1	11	6.8	1.6	8.4	*184*	<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	<0.5	<0.5
	GW01(4.5-4.6)	4.5-4.6	29/10/2015	EM1516495	Normal	<0.2	8.8	42.8	91.4	32.5	7.3	39.8	175	<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	<0.5	<0.5
GW02	GW02_0.5-0.6	0.5-0.6	23/10/2015	EM1516274	Normal	<0.2	<0.5	<0.5	<0.2	<0.5	<0.5	<0.5	<10	<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	<0.5	<0.5
	GW02_1.0-1.1	1-1.1	23/10/2015	EM1516274	Normal	<0.2	<0.5	<0.5	<0.2	<0.5	<0.5	<0.5	<10	<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	<0.5	<0.5
	GW02_3.9-4.0	3.9-4	27/10/2015	EM1516404	Normal	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
GW03	GW03_3.0-3.1	3-3.1	15/10/2015	EM1516063	Normal	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
GW04	GW04_0.5-0.6	0.5-0.6	14/10/2015	EM1515593	Normal	<0.2	<0.5	<0.5	<0.2	<0.5	<0.5	<0.5	<10	<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	<0.5	<0.5
	QC06	0.5-0.6	14/10/2015	EM1515593	Field_D	<0.2	<0.5	<0.5	<0.2	<0.5	<0.5	<0.5	<10	<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	<0.5	<0.5
	QC07	0.5-0.6	14/10/2015	476023	Interlab_D	<0.1	<0.1	<0.1	-	<0.2	<0.1	<0.3	<20	<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	<0.05	<0.05	<0.05	<0.05
	GW04_3.3-3.4	3.3-3.4	15/10/2015	EM1515910	Normal	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
GW05	GW05_3.6-3.7	3.6-3.7	15/10/2015	EM1516063	Normal	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
GW06	GW06(2.9-3.0)	2.9-3	29/10/2015	EM1516495	Normal	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
GW07	GW07_3.0-3.1	3-3.1	16/10/2015	EM1516063	Normal	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
GW08	GW08_3.1-3.2	3.1-3.2	27/10/2015	EM1516404	Normal	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
GW09	GW09(3.0-3.1)	3-3.1	30/10/2015	EM1516378	Normal	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
GW10	GW10_0.5-0.6	0.5-0.6	16/10/2015	EM1515997	Normal	<0.2	<0.5	<0.5	<0.2	<0.5	<0.5	<0.5	<10	<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	<0.5	<0.5
	GW10_2.9-3.0	2.9-3	16/10/2015	EM1516063	Normal	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
GW11	GW11(4.4-4.5)	4.4-4.5	30/10/2015	EM1516378	Normal	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
	GW11_2.3-2.4	2.3-2.4	15/10/2015	EM1515910	Normal	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
GW12	GW12(2.9-3.0)	2.9-3	29/10/2015	EM1516495	Normal	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
	GW12_0.5-0.6	0.5-0.6	15/10/2015	EM1515910	Normal	-	-	-	-	-	-	-	-	<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	<0.5	<0.5
	GW12_0.9-1.0	0.9-1	15/10/2015	EM1515910	Normal	-	-	-	-	-	-	-	-	<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	<0.5	<0.5
GW13	GW13(2.9-3.0)	2.9-3	29/10/2015	EM1516495	Normal	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
GW14	GW14_0.5-0.6	0.5-0.6	16/10/2015	EM1515997	Normal	<0.2	<0.5	<0.5	<0.2	<0.5	<0.5	<0.5	<10	<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	<0.5	<0.5
	GW14_0.9-1.0	0.9-1	16/10/2015	EM1515997	Normal	<0.2	<0.5	<0.5	<0.2	<0.5	<0.5	<0.5	<10	<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	<0.5	<0.5
	GW14_2.9-3.0	2.9-3	26/10/2015	EM1516331	Normal	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
GW15	GW15(3.3-3.4)	3.3-3.4	30/10/2015	EM1516378	Normal	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
GW16	GW16_2.2-2.3	2.2-2.3	27/10/2015	EM1516404	Normal	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
GW17	GW17(2.2-2.3)	2.2-2.3	29/10/2015	EM1516495	Normal	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
GW18	GW18_0.4-0.5	0.4-0.5	14/10/2015	EM1515593	Normal	<0.2	<0.5	<0.5	<0.2	<0.5	<0.5	<0.5	<10	<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	<0.5	<0.5
	GW18_2.3-2.4	2.3-2.4	14/10/2015	EM1515593	Normal	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
GW19	GW19_3.2-3.3	3.2-3.3	26/10/2015	EM1516331	Normal	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
GW20	GW20_2.5-2.6	2.5-2.6	12/10/2015	EM1515643	Normal	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
GW21	GW21_0.5-0.6	0.5-0.6	13/10/2015	EM1515737	Normal	<0.2	<0.5	<0.5	<0.2	<0.5	<0.5	<0.5	<10	<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	<0.5	<0.5
	GW21_2.8-2.9	2.8-2.9	13/10/2015	EM1515737	Normal	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
GW22	GW22_2.5-2.6	2.5-2.6	13/10/2015	EM1515737	Normal	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
GW23	GW23_2.3-2.4	2.3-2.4	16/10/2015	EM1516063	Normal	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
GW24	GW24_1.6-1.7	1.6-1.7	14/10/2015	EM1515593	Normal	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
GW25	GW25_2.5-2.6	2.5-2.6	12/10/2015	EM1515643	Normal	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
GW26	GW26_3.0-3.1	3-3.1	13/10/2015	EM1515737	Normal	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
GW27	GW27_0.5-0.6	0.5-0.6	13/10/2015	EM1515737	Normal	<0.2	<0.5	<0.5	<0.2	<0.5	<0.5	<0.5	<10	<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	<0.5	<0.5
	GW27_2.9-3.0	2.9-3	14/10/2015	EM1515593	Normal	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
GW28	GW28_1.6-1.7	1.6-1.7	14/10/2015	EM1515593	Normal	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
GW29	GW29_3.1-3.2	3.1-3.2	26/10/2015	EM1516331	Normal	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
GW30	GW30_3.5-3.6	3.5-3.6	13/10/2015	EM1515737	Normal	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
GW31	GW31(3.9-4.0)	3.9-4	29/10/2015	EM1516495	Normal	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
GW33	GW33(2.5-2.6)	2.5-2.6	30/10/2015	EM1516378	Normal	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
GW34	GW34_2.2-2.3	2.2-2.3	14/10/2015	EM1515593	Normal	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
GW36	GW36_0.5-0.6	0.5-0.6	15/10/2015	EM1515910	Normal	<0.2	<0.5	<0.5	<0.2	<0.5	<0.5	<0.5	<10	<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	<0.5	<0.5
	GW36_0.9-1.0	0.9-1	15/10/2015	EM1515910	Normal	<0.2	<0.5	<0.5	<0.2	<0.5	<0.5	<0.5	<10	<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	<0.5	<0.5
	GW36_1.6-1.7	1.6-1.7	15/10/2015	EM1515910	Normal	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
GW37	GW37_5.3-5.4	5.3-5.4	16/10/2015	EM1515997	Normal	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
GW38	GW38_5.0-5.1	5-5.1	27/10/2015	EM1516331	Normal	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-

Notes:
a CCME 2007
b IWRG621
c USEPA Eco-SSL
d USEPA RSLs November 2015
e Cr (VI) HIL
f Site-specific EIL, average pH 7.8 and assuming 5% CEC, 1% clay, old suburb, low traffic

Statistical Summary

Number of Results	15	15	15	14	15	15	15	15	17	17	17	17	17	17	16	17	16	17	17	17	16	1	17	17	17	17	17	17	17
Number of Detects	0	2	2	2	2	2	2	2	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Minimum Concentration	<0.1	<0.1	<0.1	<0.2	<0.2	<0.1	<0.3	<10	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.5	<0.05	<0.5	<0.05	<0.05	<0.05	<0.5	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05
Minimum Detect	ND	1.6	1	11	6.8	1.6	8.4	175	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
Maximum Concentration	<0.2	8.8	42.8	91.4	32.5	7.3	39.8	184	<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	<0.05	<0.5	<0.5	<0.5	<0.5	<5	<0.5	<0.5
Maximum Detect	ND	8.8	42.8	91.4	32.5	7.3	39.8	184	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
Average Concentration	0.097	0.9	3.1	7.4	2.8	0.8	3.4	29	0.24	0.24	0.24	0.24	0.24	0.24	0.25	0.24	0.25	0.24	0.24	0.24	0.25		0.24	0.24	0.24	0.24	2.4	0.24	0.24
Median Concentration	0.1	0.25	0.25	0.1	0.25	0.25	0.25	5	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.025	0.25	0.25	0.25	0.25	2.5	0.25	0.25
Standard Deviation	0.013	2.2	11	24	8.4	1.8	10	61	0.055	0.055	0.055	0.055	0.055	0.055	0	0.055	0	0.055	0.055	0.055	0		0.055	0.055	0.055	0.055	0.6	0.055	0.055
Number of Guideline Exceedances (Detects Only)	0	0	0	0	0	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0

		Halogenated Benzenes																			Halogenated Hydrocarbons						Inorganics					
		cis-1,3-dichloropropene	Dibromomethane	Dichloromethane	Hexachlorobutadiene	Trichloroethene	Tetrachloroethene	trans-1,2-dichloroethene	trans-1,3-dichloropropene	Vinyl chloride	1,2,3-trichlorobenzene	1,2,4-trichlorobenzene	1,2-dichlorobenzene	1,3-dichlorobenzene	1,4-dichlorobenzene	2-chlorotoluene	4-chlorotoluene	Bromobenzene	Chlorobenzene	1,2-dibromoethane	Bromomethane	Chloromethane	Dichlorodifluoromethane	Iodomethane	Trichlorofluoromethane	pH (CaCl2)	Moisture	Sulfate (as SO4)	Total Organic Carbon	1,2,4-trimethylbenzene	1,3,5-trimethylbenzene
		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	pH Unit	%	mg/kg	%	mg/kg	mg/kg
EQL		0.05	0.05		0.5	0.05	0.05	0.05	0.05	0.05	0.5	0.5	0.05	0.05	0.05	0.5	0.05	0.05	0.05	0.05	0.05	0.05	0.05	0.05	0.05	0.1	1	50	0.02	0.05	0.05
Ecosystems Screening	NEPM 2013 Residential & Public Open Space	5 a				0.01 a	0.2 a	5 a	5 a		2 a	2 a	1 a	1 a	1 a				1 a							6-8 a					
Health Screening	**NEPM 2013 Residential A**	**18 d**	**24 d**	**35 d**	**12 d**	**4.1 d**	**81 d**	**1600 d**	**18 d**	**0.59 d**	**63 d**	**58 d**	**1800 d**		**26 d**	**1600 d**	**1600 d**	**290 d**	**280 d**	**0.36 d**	**6.8 d**	**110 d**	**87 d**		**23000 d**					**58 d**	**780 d**
	NEPM 2013 Residential B	18 d	24 d	35 d	12 d	4.1 d	81 d	1600 d	18 d	0.59 d	63 d	58 d	1800 d		26 d	1600 d	1600 d	290 d	280 d	0.36 d	6.8 d	110 d	87 d		23000 d					58 d	780 d
Vapour Intrusion	*HSL A/B for Vapour Intrusion, 0 to <1 m, Sand*																															
	HSL A/B for Vapour Intrusion, 1 to <2 m, Sand																															
	HSL A/B for Vapour Intrusion, 2 to <4 m, Sand																															
	HSL A/B for Vapour Intrusion, 4 m+, Sand																															
Buildings & Structures	AS2159 Piling - Design & Installation (2009)																									<5.5		5000				

LocCode	Field_ID	Sample_Depth	Date	Lab_Report	Sample_Ty																													
GW01	GW01(2.5-2.6)	2.5-2.6	29/10/2015	EM1516495	Normal	<0.5	<0.5	-	<0.5	<0.5	<0.5	<0.5	<0.5	<5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<5	<5	<5	<5	<0.5	<5	11.5	18.4	2330	3.26	10.9	2.6
	GW01(4.5-4.6)	4.5-4.6	29/10/2015	EM1516495	Normal	<0.5	<0.5	-	<0.5	<0.5	<0.5	<0.5	<0.5	<5	<0.5	<0.5	<0.5	0.6	1.3	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<5	<5	<5	<5	<0.5	<5	11.3	42.4	2900	-	26.3	8.5
GW02	GW02_0.5-0.6	0.5-0.6	23/10/2015	EM1516274	Normal	<0.5	<0.5	-	<0.5	<0.5	<0.5	<0.5	<0.5	<5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<5	<5	<5	<5	<0.5	<5	7.9	12.3	290	-	<0.5	<0.5
	GW02_1.0-1.1	1-1.1	23/10/2015	EM1516274	Normal	<0.5	<0.5	-	<0.5	<0.5	<0.5	<0.5	<0.5	<5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<5	<5	<5	<5	<0.5	<5	7.9	14.3	120	-	<0.5	<0.5
	GW02_3.9-4.0	3.9-4	27/10/2015	EM1516404	Normal	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	52.6	-	18.1	-	-
GW03	GW03_3.0-3.1	3-3.1	15/10/2015	EM1516063	Normal	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	16.2	-	3.22	-	-
GW04	GW04_0.5-0.6	0.5-0.6	14/10/2015	EM1515593	Normal	<0.5	<0.5	-	<0.5	<0.5	<0.5	<0.5	<0.5	<5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<5	<5	<5	<5	<0.5	<5	8	7.7	50	-	<0.5	<0.5
	QC06	0.5-0.6	14/10/2015	EM1515593	Field_D	<0.5	<0.5	-	<0.5	<0.5	<0.5	<0.5	<0.5	<5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<5	<5	<5	<5	<0.5	<5	7.9	8	60	-	<0.5	<0.5
	QC07	0.5-0.6	14/10/2015	476023	Interlab_D	<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	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	-	5.8	-	-	<0.05	<0.05
	GW04_3.3-3.4	3.3-3.4	15/10/2015	EM1515910	Normal	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	17.4	-	0.51	-	-
GW05	GW05_3.6-3.7	3.6-3.7	15/10/2015	EM1516063	Normal	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	29.2	-	8.46	-	-
GW06	GW06(2.9-3.0)	2.9-3	29/10/2015	EM1516495	Normal	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	15.6	-	0.11	-	-
GW07	GW07_3.0-3.1	3-3.1	16/10/2015	EM1516063	Normal	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	19.2	-	0.7	-	-
GW08	GW08_3.1-3.2	3.1-3.2	27/10/2015	EM1516404	Normal	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	17.4	-	0.07	-	-
GW09	GW09(3.0-3.1)	3-3.1	30/10/2015	EM1516378	Normal	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	12	-	0.08	-	-
GW10	GW10_0.5-0.6	0.5-0.6	16/10/2015	EM1515997	Normal	<0.5	<0.5	-	<0.5	<0.5	<0.5	<0.5	<0.5	<5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<5	<5	<5	<5	<0.5	<5	5.2	4.3	<50	-	<0.5	<0.5
	GW10_2.9-3.0	2.9-3	16/10/2015	EM1516063	Normal	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	8.9	-	0.08	-	-
GW11	GW11(4.4-4.5)	4.4-4.5	30/10/2015	EM1516378	Normal	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	19.8	-	0.07	-	-
	GW11_2.3-2.4	2.3-2.4	15/10/2015	EM1515910	Normal	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	16.6	-	0.06	-	-
GW12	GW12(2.9-3.0)	2.9-3	29/10/2015	EM1516495	Normal	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	13.4	-	0.07	-	-
	GW12_0.5-0.6	0.5-0.6	15/10/2015	EM1515910	Normal	<0.5	<0.5	-	<0.5	<0.5	<0.5	<0.5	<0.5	<5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<5	<5	<5	<5	<0.5	<5	4.5	4	<50	-	<0.5	<0.5
	GW12_0.9-1.0	0.9-1	15/10/2015	EM1515910	Normal	<0.5	<0.5	-	<0.5	<0.5	<0.5	<0.5	<0.5	<5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<5	<5	<5	<5	<0.5	<5	6.8	18.8	<50	-	<0.5	<0.5
GW13	GW13(2.9-3.0)	2.9-3	29/10/2015	EM1516495	Normal	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	19.1	-	0.06	-	-
GW14	GW14_0.5-0.6	0.5-0.6	16/10/2015	EM1515997	Normal	<0.5	<0.5	-	<0.5	<0.5	<0.5	<0.5	<0.5	<5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<5	<5	<5	<5	<0.5	<5	10.2	9.3	170	-	<0.5	<0.5
	GW14_0.9-1.0	0.9-1	16/10/2015	EM1515997	Normal	<0.5	<0.5	-	<0.5	<0.5	<0.5	<0.5	<0.5	<5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<5	<5	<5	<5	<0.5	<5	8.2	1.5	<50	-	<0.5	<0.5
	GW14_2.9-3.0	2.9-3	26/10/2015	EM1516331	Normal	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	18.6	-	0.04	-	-
GW15	GW15(3.3-3.4)	3.3-3.4	30/10/2015	EM1516378	Normal	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	37.1	-	2.13	-	-
GW16	GW16_2.2-2.3	2.2-2.3	27/10/2015	EM1516404	Normal	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	18.6	-	0.06	-	-
GW17	GW17(2.2-2.3)	2.2-2.3	29/10/2015	EM1516495	Normal	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	25	-	0.45	-	-
GW18	GW18_0.4-0.5	0.4-0.5	14/10/2015	EM1515593	Normal	<0.5	<0.5	-	<0.5	<0.5	<0.5	<0.5	<0.5	<5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<5	<5	<5	<5	<0.5	<5	7.9	12.8	170	-	<0.5	<0.5
	GW18_2.3-2.4	2.3-2.4	14/10/2015	EM1515593	Normal	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	31.2	-	1.93	-	-
GW19	GW19_3.2-3.3	3.2-3.3	26/10/2015	EM1516331	Normal	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	22.4	-	0.27	-	-
GW20	GW20_2.5-2.6	2.5-2.6	12/10/2015	EM1515643	Normal	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	15.8	-	0.11	-	-
GW21	GW21_0.5-0.6	0.5-0.6	13/10/2015	EM1515737	Normal	<0.5	<0.5	-	<0.5	<0.5	<0.5	<0.5	<0.5	<5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<5	<5	<5	<5	<0.5	<5	-	14	-	-	<0.5	<0.5
	GW21_2.8-2.9	2.8-2.9	13/10/2015	EM1515737	Normal	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	16.8	-	0.05	-	-
GW22	GW22_2.5-2.6	2.5-2.6	13/10/2015	EM1515737	Normal	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	18.7	-	0.12	-	-
GW23	GW23_2.3-2.4	2.3-2.4	16/10/2015	EM1516063	Normal	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	4.5	-	<0.02	-	-
GW24	GW24_1.6-1.7	1.6-1.7	14/10/2015	EM1515593	Normal	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	17.7	-	0.36	-	-
GW25	GW25_2.5-2.6	2.5-2.6	12/10/2015	EM1515643	Normal	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	24.3	-	0.18	-	-
GW26	GW26_3.0-3.1	3-3.1	13/10/2015	EM1515737	Normal	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	18.8	-	0.12	-	-
GW27	GW27_0.5-0.6	0.5-0.6	13/10/2015	EM1515737	Normal	<0.5	<0.5	-	<0.5	<0.5	<0.5	<0.5	<0.5	<5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<5	<5	<5	<5	<0.5	<5	-	15.4	-	-	<0.5	<0.5
	GW27_2.9-3.0	2.9-3	14/10/2015	EM1515593	Normal	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	21.2	-	0.09	-	-
GW28	GW28_1.6-1.7	1.6-1.7	14/10/2015	EM1515593	Normal	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	17.3	-	0.16	-	-
GW29	GW29_3.1-3.2	3.1-3.2	26/10/2015	EM1516331	Normal	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	21.7	-	0.05	-	-
GW30	GW30_3.5-3.6	3.5-3.6	13/10/2015	EM1515737	Normal	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	23.4	-	0.22	-	-
GW31	GW31(3.9-4.0)	3.9-4	29/10/2015	EM1516495	Normal	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	18.5	-	0.09	-	-
GW33	GW33(2.5-2.6)	2.5-2.6	30/10/2015	EM1516378	Normal	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	16.5	-	3.64	-	-
GW34	GW34_2.2-2.3	2.2-2.3	14/10/2015	EM1515593	Normal	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	18.4	-	0.24	-	-
GW36	GW36_0.5-0.6	0.5-0.6	15/10/2015	EM1515910	Normal	<0.5	<0.5	-	<0.5	<0.5	<0.5	<0.5	<0.5	<5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<5	<5	<5	<5	<0.5	<5	7.4	22.6	4470	-	<0.5	<0.5
	GW36_0.9-1.0	0.9-1	15/10/2015	EM1515910	Normal	<0.5	<0.5	-	<0.5	<0.5	<0.5	<0.5	<0.5	<5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<5	<5	<5	<5	<0.5	<5	4.9	11.4	180	-	<0.5	<0.5
	GW36_1.6-1.7	1.6-1.7	15/10/2015	EM1515910	Normal	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	18.5	-	0.17	-	-
GW37	GW37_5.3-5.4	5.3-5.4	16/10/2015	EM1515997	Normal	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	0.14	-	-
GW38	GW38_5.0-5.1	5-5.1	27/10/2015	EM1516331	Normal	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	23.6	-	0.03	-	-

Notes:
a CCME 2007
b IWRG621
c USEPA Eco-SSL
d USEPA RSLs November 2015
e Cr (VI) HIL
f Site-specific EIL, average pH 7.8 and assuming 5% CEC, 1% clay, old suburb, low traffic

Statistical Summary

Number of Results	17	17	1	16	17	17	17	17	17	16	16	17	17	17	16	17	17	17	17	17	17	17	17	17	17	14	51	14	37	17	17
Number of Detects	0	0	0	0	0	0	0	0	0	0	0	0	1	1	0	0	0	0	0	0	0	0	0	0	0	14	51	10	36	2	2
Minimum Concentration	<0.05	<0.05	<0.05	<0.5	<0.05	<0.05	<0.05	<0.05	<0.05	<0.5	<0.5	<0.05	<0.05	<0.05	<0.5	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	4.5	1.5	<50	<0.02	<0.05	<0.05
Minimum Detect	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	0.6	1.3	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	4.5	1.5	50	0.03	10.9	2.6
Maximum Concentration	<0.5	<0.5	<0.05	<0.5	<0.5	<0.5	<0.5	<0.5	<5	<0.5	<0.5	<0.5	0.6	1.3	<0.5	<0.5	<0.5	<0.5	<0.5	<5	<5	<5	<0.5	<5	11.5	52.6	4470	8.46	26.3	8.5
Maximum Detect	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	0.6	1.3	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	11.5	52.6	4470	8.46	26.3	8.5
Average Concentration	0.24	0.24		0.25	0.24	0.24	0.24	0.24	2.4	0.25	0.25	0.24	0.26	0.3	0.25	0.24	0.24	0.24	0.24	2.4	2.4	2.4	2.4	0.24	2.4	7.8	18	774	1.26	2.4	0.86
Median Concentration	0.25	0.25	0.025	0.25	0.25	0.25	0.25	0.25	2.5	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	2.5	2.5	2.5	0.25	2.5	7.9	17.7	145	0.13	0.25	0.25
Standard Deviation	0.055	0.055		0	0.055	0.055	0.055	0.055	0.6	0	0	0.055	0.1	0.26	0	0.055	0.055	0.055	0.055	0.6	0.6	0.6	0.055	0.6	2.1	9.1	1404	0.8	6.7	2.1
Number of Guideline Exceedances (Detects Only)	0	0	0	0	0	0	0	0	0	0	0	0	0	1	0	0	0	0	0	0	0	0	0	0	0	7	0	0	0	0	0

		MAH							Metals												PAH											
		Isopropylbenzene	n-butylbenzene	n-propylbenzene	p-isopropyltoluene	sec-butylbenzene	Styrene	tert-butylbenzene	Aluminium	Arsenic	Cadmium	Chromium (III+VI)	Copper	Iron	Lead	Mercury	Nickel	Selenium	Zinc	Acenaphthene	Acenaphthylene	Anthracene	Benz(a)anthracene	Benzo(a) pyrene	Benzo[b+j]fluoranthene	Benzo(g,h,i)perylene	Benzo(k)fluoranthene	Chrysene	Dibenz(a,h)anthracene	Fluoranthene	Fluorene
		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	mg/kg	mg/kg
EQL		0.05	0.5	0.5	0.5	0.5	0.05	0.5	10	2	0.4	2	5	5	5	0.1	2	2	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
Ecosystems Screening	NEPM 2013 Residential & Public Open Space						5 a			100	10 a	200 f	100 f		1100	6.6 a	30 f	10 b	270 f					0.7								
Health Screening	**NEPM 2013 Residential A**	**1900 d**	**3900 d**	**3300 d**		**7800 d**	**6000 d**	**7800 d**	**77000 d**	**100**	**20**	**100 e**	**6000**	**55000 d**	**300**	**40**	**400**	**200**	**7400**												
	NEPM 2013 Residential B	1900 d	3900 d	3300 d		7800 d	6000 d	7800 d	77000 d	500	150	500 e	30000	55000 d	1200	120	1200	1400	60000												
Vapour Intrusion	*HSL A/B for Vapour Intrusion, 0 to <1 m, Sand*																														
	HSL A/B for Vapour Intrusion, 1 to <2 m, Sand																														
	HSL A/B for Vapour Intrusion, 2 to <4 m, Sand																														
	HSL A/B for Vapour Intrusion, 4 m+, Sand																														
Buildings & Structures	AS2159 Piling - Design & Installation (2009)																														

LocCode	Field_ID	Sample_Depth	Date	Lab_Report	Sample_Ty																											
GW01	GW01(2.5-2.6)	2.5-2.6	29/10/2015	EM1516495	Normal	3.9	6.6	6.8	1.9	3.9	<0.5	<0.5	1760	12	2	42	148	**61,400**	182	0.4	40	<5	965	<2.3	<2.3	<2.3	2.4	<2.3	<2.3	<2.3	<2.3	<2.3	<2.3	<2.3	<2.3
	GW01(4.5-4.6)	4.5-4.6	29/10/2015	EM1516495	Normal	3.5	5.7	5.8	2.9	2.4	<0.5	<0.5	6870	25	5	95	1640	**62,300**	**664**	0.4	88	<5	2690	<2.3	<2.3	<2.3	3.7	<2.3	2.6	<2.3	2.6	<2.3	<2.3	<2.3	<2.3
GW02	GW02_0.5-0.6	0.5-0.6	23/10/2015	EM1516274	Normal	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	10,500	22	<1	41	173	44,400	215	0.3	67	<5	263	<0.5	<0.5	1	1.9	*2*	2.4	1.4	0.9	1.8	<0.5	4	<0.5
	GW02_1.0-1.1	1-1.1	23/10/2015	EM1516274	Normal	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	12,700	14	<1	36	21	29,800	24	<0.1	49	<5	81	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5
	GW02_3.9-4.0	3.9-4	27/10/2015	EM1516404	Normal	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
GW03	GW03_3.0-3.1	3-3.1	15/10/2015	EM1516063	Normal	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
GW04	GW04_0.5-0.6	0.5-0.6	14/10/2015	EM1515593	Normal	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	7470	17	<1	22	60	25,700	217	<0.1	40	<5	318	<0.5	<0.5	<0.5	1.1	*1.3*	1.5	0.8	0.6	1	<0.5	2.2	<0.5
	QC06	0.5-0.6	14/10/2015	EM1515593	Field_D	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	7010	23	<1	21	52	28,400	271	<0.1	38	<5	233	<0.5	<0.5	<0.5	1.2	*1.4*	1.6	0.8	0.6	1.1	<0.5	2.4	<0.5
	QC07	0.5-0.6	14/10/2015	476023	Interlab_D	<0.05	-	-	-	-	<0.05	-	9200	12	0.5	21	57	29,000	180	0.3	44	<2	310	<0.5	<0.5	<0.5	1.3	*1.7*	1.3	1.7	1.1	1.3	0.5	2.1	<0.5
	GW04_3.3-3.4	3.3-3.4	15/10/2015	EM1515910	Normal	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
GW05	GW05_3.6-3.7	3.6-3.7	15/10/2015	EM1516063	Normal	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
GW06	GW06(2.9-3.0)	2.9-3	29/10/2015	EM1516495	Normal	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
GW07	GW07_3.0-3.1	3-3.1	16/10/2015	EM1516063	Normal	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
GW08	GW08_3.1-3.2	3.1-3.2	27/10/2015	EM1516404	Normal	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
GW09	GW09(3.0-3.1)	3-3.1	30/10/2015	EM1516378	Normal	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
GW10	GW10_0.5-0.6	0.5-0.6	16/10/2015	EM1515997	Normal	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	120	<5	<1	<2	<5	160	<5	<0.1	<2	<5	<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
	GW10_2.9-3.0	2.9-3	16/10/2015	EM1516063	Normal	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
GW11	GW11(4.4-4.5)	4.4-4.5	30/10/2015	EM1516378	Normal	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
	GW11_2.3-2.4	2.3-2.4	15/10/2015	EM1515910	Normal	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
GW12	GW12(2.9-3.0)	2.9-3	29/10/2015	EM1516495	Normal	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
	GW12_0.5-0.6	0.5-0.6	15/10/2015	EM1515910	Normal	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	560	<5	<1	5	19	3250	104	<0.1	4	<5	87	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5
	GW12_0.9-1.0	0.9-1	15/10/2015	EM1515910	Normal	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	90	<5	<1	<2	<5	120	8	<0.1	<2	<5	15	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5
GW13	GW13(2.9-3.0)	2.9-3	29/10/2015	EM1516495	Normal	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
GW14	GW14_0.5-0.6	0.5-0.6	16/10/2015	EM1515997	Normal	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	3250	<5	<1	7	14	12,000	17	<0.1	26	<5	30	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5
	GW14_0.9-1.0	0.9-1	16/10/2015	EM1515997	Normal	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	190	<5	<1	<2	<5	180	<5	<0.1	<2	<5	<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
	GW14_2.9-3.0	2.9-3	26/10/2015	EM1516331	Normal	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
GW15	GW15(3.3-3.4)	3.3-3.4	30/10/2015	EM1516378	Normal	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
GW16	GW16_2.2-2.3	2.2-2.3	27/10/2015	EM1516404	Normal	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
GW17	GW17(2.2-2.3)	2.2-2.3	29/10/2015	EM1516495	Normal	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
GW18	GW18_0.4-0.5	0.4-0.5	14/10/2015	EM1515593	Normal	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	7580	6	<1	31	26	26,500	28	<0.1	65	<5	83	<0.5	0.6	1.1	3.2	*5*	5.5	4	2	3	1.3	6	<0.5
	GW18_2.3-2.4	2.3-2.4	14/10/2015	EM1515593	Normal	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
GW19	GW19_3.2-3.3	3.2-3.3	26/10/2015	EM1516331	Normal	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
GW20	GW20_2.5-2.6	2.5-2.6	12/10/2015	EM1515643	Normal	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
GW21	GW21_0.5-0.6	0.5-0.6	13/10/2015	EM1515737	Normal	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	2030	<5	<1	5	6	4290	24	<0.1	5	<5	36	<0.5	<0.5	<0.5	1.2	*1*	1.3	0.6	0.5	1	<0.5	2.8	<0.5
	GW21_2.8-2.9	2.8-2.9	13/10/2015	EM1515737	Normal	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
GW22	GW22_2.5-2.6	2.5-2.6	13/10/2015	EM1515737	Normal	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
GW23	GW23_2.3-2.4	2.3-2.4	16/10/2015	EM1516063	Normal	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
GW24	GW24_1.6-1.7	1.6-1.7	14/10/2015	EM1515593	Normal	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
GW25	GW25_2.5-2.6	2.5-2.6	12/10/2015	EM1515643	Normal	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
GW26	GW26_3.0-3.1	3-3.1	13/10/2015	EM1515737	Normal	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
GW27	GW27_0.5-0.6	0.5-0.6	13/10/2015	EM1515737	Normal	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	10,000	10	4	38	171	29,900	**396**	1.6	63	<5	3060	<0.5	1.2	2.2	5.8	*7.1*	9.4	5.2	2.9	5.7	1.7	10.5	<0.5
	GW27_2.9-3.0	2.9-3	14/10/2015	EM1515593	Normal	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
GW28	GW28_1.6-1.7	1.6-1.7	14/10/2015	EM1515593	Normal	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
GW29	GW29_3.1-3.2	3.1-3.2	26/10/2015	EM1516331	Normal	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
GW30	GW30_3.5-3.6	3.5-3.6	13/10/2015	EM1515737	Normal	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
GW31	GW31(3.9-4.0)	3.9-4	29/10/2015	EM1516495	Normal	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
GW33	GW33(2.5-2.6)	2.5-2.6	30/10/2015	EM1516378	Normal	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
GW34	GW34_2.2-2.3	2.2-2.3	14/10/2015	EM1515593	Normal	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
GW36	GW36_0.5-0.6	0.5-0.6	15/10/2015	EM1515910	Normal	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	12,800	10	<1	29	28	30,800	67	0.8	22	<5	89	<0.5	<0.5	0.9	1.1	*0.8*	1.1	0.5	<0.5	1.1	<0.5	2.9	<0.5
	GW36_0.9-1.0	0.9-1	15/10/2015	EM1515910	Normal	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	3670	<5	<1	8	<5	3800	11	<0.1	4	<5	27	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5
	GW36_1.6-1.7	1.6-1.7	15/10/2015	EM1515910	Normal	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
GW37	GW37_5.3-5.4	5.3-5.4	16/10/2015	EM1515997	Normal	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
GW38	GW38_5.0-5.1	5-5.1	27/10/2015	EM1516331	Normal	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-

Notes:
a CCME 2007
b IWRG621
c USEPA Eco-SSL
d USEPA RSLs November 2015
e Cr (VI) HIL
f Site-specific EIL, average pH 7.8 and assuming 5% CEC, 1% clay, old suburb, low traffic

Statistical Summary

Number of Results	17	16	16	16	16	17	16	17	17	17	17	17	17	17	17	17	17	17	17	17	17	17	17	17	17	17	17	17	17	17	17
Number of Detects	2	2	2	2	2	0	0	17	10	4	14	13	17	15	6	14	0	15	0	2	4	10	8	9	8	8	8	3	8	0
Minimum Concentration	<0.05	<0.5	<0.5	<0.5	<0.5	<0.05	<0.5	90	<5	0.5	<2	<5	120	<5	<0.1	<2	<2	<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
Minimum Detect	3.5	5.7	5.8	1.9	2.4	ND	ND	90	6	0.5	5	6	120	8	0.3	4	ND	15	ND	0.6	0.9	1.1	0.8	1.1	0.5	0.5	1	0.5	2.1	ND
Maximum Concentration	3.9	6.6	6.8	2.9	3.9	<0.5	<0.5	12800	25	5	95	1640	62300	664	1.6	88	<5	3060	<2.3	<2.3	<2.3	5.8	7.1	9.4	5.2	2.9	5.7	<2.3	10.5	<2.3
Maximum Detect	3.9	6.6	6.8	2.9	3.9	ND	ND	12800	25	5	95	1640	62300	664	1.6	88	ND	3060	ND	1.2	2.2	5.8	7.1	9.4	5.2	2.9	5.7	1.7	10.5	ND
Average Concentration	0.64	0.99	1	0.52	0.61	0.24	0.25	5635	9.9	1.1	24	143	23059	142	0.26	33	2.4	488	0.36	0.43	0.6	1.5	1.4	1.7	1.1	0.84	1.2	0.52	2.2	0.36
Median Concentration	0.25	0.25	0.25	0.25	0.25	0.25	0.25	6870	10	0.5	21	26	26500	67	0.05	38	2.5	87	0.25	0.25	0.25	1.1	1	1.15	0.6	0.5	1	0.25	1.15	0.25
Standard Deviation	1.2	2	2.1	0.76	1	0.055	0	4482	8	1.4	24	390	20174	178	0.4	28	0.36	930	0.3	0.36	0.56	1.6	1.9	2.4	1.4	0.86	1.4	0.48	2.7	0.3
Number of Guideline Exceedances (Detects Only)	0	0	0	0	0	0	0	0	0	0	0	4	2	1	0	9	0	5	0	0	0	0	8	0	0	0	0	0	0	0	0

														Solvents								TRH/TPH													VOC			
						Indeno(1,2,3-c,d)pyrene	Naphthalene	PAHs (Sum of total)	Phenanthrene	Pyrene	Benzo(a)pyrene TEQ (half LOR)	Benzo(a)pyrene TEQ (LOR)	Benzo(a)pyrene TEQ (zero)	2-hexanone (MBK)	Methyl Ethyl Ketone	4-Methyl-2-pentanone	Acetone	Allyl chloride	Carbon disulfide	Vinyl acetate	F2-NAPHTHALENE	+C10 - C36 (Sum of total)	C6 - C9	C10 - C14	C15 - C28	C29-C36	C6-C10	>C10-C16	>C16-C34	>C34-C40	C10 - C40 (Sum of total)	cis-1,4-Dichloro-2-butene	Pentachloroethane	trans-1,4-Dichloro-2-butene
						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	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg
EQL						0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5	5	0.05	0.05			0.05	5	50	50	10	20	50	50	10	50	100	100	50	0.5	0.5	0.5
Ecosystems Screening	NEPM 2013 Residential & Public Open Space						170	18 c																				120	300	2800								
Health Screening	**NEPM 2013 Residential A**						**1400**	**300**			**3**	**3**	**3**	**200 d**	**27000 d**	**33000 d**	**61000 d**	**7.2 d**	**770 d**	**910 d**							**4400**	**3300**	**4500**	**6300**		**0.021 d**	**77 d**	**0.074 d**
	NEPM 2013 Residential B						2200	400			4	4	4	200 d	27000 d	33000 d	61000 d	7.2 d	770 d	910 d							5600	4200	5800	8100		0.021 d	77 d	0.074 d
Vapour Intrusion	*HSL A/B for Vapour Intrusion, 0 to <1 m, Sand*						*3*														*110*																
	HSL A/B for Vapour Intrusion, 1 to <2 m, Sand						*NL*														*240*																
	HSL A/B for Vapour Intrusion, 2 to <4 m, Sand						*NL*														*440*																
	HSL A/B for Vapour Intrusion, 4 m+, Sand						*NL*														*NL*																
Buildings & Structures	AS2159 Piling - Design & Installation (2009)																																					
LocCode	**Field_ID**	**Sample_Depth**	**Date**	**Lab_Report**	**Sample_Ty**																																	
GW01	GW01(2.5-2.6)	2.5-2.6	29/10/2015	EM1516495	Normal	<2.3	11 - 18.7	25.9	2.4	2.4	<1.4	<1.4	<1.4	<5	<5	<5	-	-	<0.5	<5	*2310*	17,300	137	2420	8950	5950	195	2320	**13,800**	1850	18,000	<0.5	<0.5	<0.5
	GW01(4.5-4.6)	4.5-4.6	29/10/2015	EM1516495	Normal	<2.3	18 - 28.4	44.6	3.7	3.6	<1.5	2	<1.5	<5	<5	<5	-	-	<0.5	<5	2230	27,400	194	2280	14,400	10,700	266	2250	**23,100**	3820	29,200	<0.5	<0.5	<0.5
GW02	GW02_0.5-0.6	0.5-0.6	23/10/2015	EM1516274	Normal	1.1	<0.5	22.4	1.8	4.1	2.9	3.2	2.7	<5	<5	<5	-	-	<0.5	<5	<50	280	<10	<50	140	140	<10	<50	250	<100	250	<0.5	<0.5	<0.5
	GW02_1.0-1.1	1-1.1	23/10/2015	EM1516274	Normal	<0.5	<0.5	<0.5	<0.5	<0.5	0.6	1.2	<0.5	<5	<5	<5	-	-	<0.5	<5	<50	<50	<10	<50	<100	<100	<10	<50	<100	<100	<50	<0.5	<0.5	<0.5
	GW02_3.9-4.0	3.9-4	27/10/2015	EM1516404	Normal	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
GW03	GW03_3.0-3.1	3-3.1	15/10/2015	EM1516063	Normal	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
GW04	GW04_0.5-0.6	0.5-0.6	14/10/2015	EM1515593	Normal	0.7	<0.5	12.6	1	2.4	2	2.2	1.7	<5	<5	<5	-	-	<0.5	<5	<50	<50	<10	<50	<100	<100	<10	<50	<100	<100	<50	<0.5	<0.5	<0.5
	QC06	0.5-0.6	14/10/2015	EM1515593	Field_D	0.7	<0.5	13.2	1	2.4	2.1	2.3	1.8	<5	<5	<5	-	-	<0.5	<5	<50	<50	<10	<50	<100	<100	<10	<50	<100	<100	<50	<0.5	<0.5	<0.5
	QC07	0.5-0.6	14/10/2015	476023	Interlab_D	1.1	<0.5	15	1.2	2	2.7	2.7	2.7	-	<0.05	<0.05	<0.05	<0.05	<0.05	-	<50	220	<20	<20	88	130	<20	<50	140	130	-	-	-	-
	GW04_3.3-3.4	3.3-3.4	15/10/2015	EM1515910	Normal	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
GW05	GW05_3.6-3.7	3.6-3.7	15/10/2015	EM1516063	Normal	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
GW06	GW06(2.9-3.0)	2.9-3	29/10/2015	EM1516495	Normal	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
GW07	GW07_3.0-3.1	3-3.1	16/10/2015	EM1516063	Normal	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
GW08	GW08_3.1-3.2	3.1-3.2	27/10/2015	EM1516404	Normal	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
GW09	GW09(3.0-3.1)	3-3.1	30/10/2015	EM1516378	Normal	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
GW10	GW10_0.5-0.6	0.5-0.6	16/10/2015	EM1515997	Normal	<0.5	<0.5	<0.5	<0.5	<0.5	0.6	1.2	<0.5	<5	<5	<5	-	-	<0.5	<5	<50	<50	<10	<50	<100	<100	<10	<50	<100	<100	<50	<0.5	<0.5	<0.5
	GW10_2.9-3.0	2.9-3	16/10/2015	EM1516063	Normal	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
GW11	GW11(4.4-4.5)	4.4-4.5	30/10/2015	EM1516378	Normal	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
	GW11_2.3-2.4	2.3-2.4	15/10/2015	EM1515910	Normal	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
GW12	GW12(2.9-3.0)	2.9-3	29/10/2015	EM1516495	Normal	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
	GW12_0.5-0.6	0.5-0.6	15/10/2015	EM1515910	Normal	<0.5	<0.5	<0.5	<0.5	<0.5	0.6	1.2	<0.5	<5	<5	<5	-	-	<0.5	<5	-	-	-	-	-	-	-	-	-	-	-	-	<0.5	<0.5	<0.5
	GW12_0.9-1.0	0.9-1	15/10/2015	EM1515910	Normal	<0.5	<0.5	<0.5	<0.5	<0.5	0.6	1.2	<0.5	<5	<5	<5	-	-	<0.5	<5	-	-	-	-	-	-	-	-	-	-	-	-	<0.5	<0.5	<0.5
GW13	GW13(2.9-3.0)	2.9-3	29/10/2015	EM1516495	Normal	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
GW14	GW14_0.5-0.6	0.5-0.6	16/10/2015	EM1515997	Normal	<0.5	<0.5	<0.5	<0.5	<0.5	0.6	1.2	<0.5	<5	<5	<5	-	-	<0.5	<5	<50	<50	<10	<50	<100	<100	<10	<50	<100	<100	<50	<0.5	<0.5	<0.5
	GW14_0.9-1.0	0.9-1	16/10/2015	EM1515997	Normal	<0.5	<0.5	<0.5	<0.5	<0.5	0.6	1.2	<0.5	<5	<5	<5	-	-	<0.5	<5	<50	<50	<10	<50	<100	<100	<10	<50	<100	<100	<50	<0.5	<0.5	<0.5
	GW14_2.9-3.0	2.9-3	26/10/2015	EM1516331	Normal	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
GW15	GW15(3.3-3.4)	3.3-3.4	30/10/2015	EM1516378	Normal	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
GW16	GW16_2.2-2.3	2.2-2.3	27/10/2015	EM1516404	Normal	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
GW17	GW17(2.2-2.3)	2.2-2.3	29/10/2015	EM1516495	Normal	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
GW18	GW18_0.4-0.5	0.4-0.5	14/10/2015	EM1515593	Normal	3.1	<0.5	43.7	2.5	6.4	**7.8**	**7.8**	**7.8**	<5	<5	<5	-	-	<0.5	<5	<50	340	<10	<50	140	200	<10	<50	300	140	440	<0.5	<0.5	<0.5
	GW18_2.3-2.4	2.3-2.4	14/10/2015	EM1515593	Normal	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
GW19	GW19_3.2-3.3	3.2-3.3	26/10/2015	EM1516331	Normal	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
GW20	GW20_2.5-2.6	2.5-2.6	12/10/2015	EM1515643	Normal	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
GW21	GW21_0.5-0.6	0.5-0.6	13/10/2015	EM1515737	Normal	0.5	<0.5	12.8	1.4	2.5	1.6	1.9	1.4	<5	<5	<5	-	-	<0.5	<5	<50	<50	<10	<50	<100	<100	<10	<50	<100	<100	<50	<0.5	<0.5	<0.5
	GW21_2.8-2.9	2.8-2.9	13/10/2015	EM1515737	Normal	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
GW22	GW22_2.5-2.6	2.5-2.6	13/10/2015	EM1515737	Normal	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
GW23	GW23_2.3-2.4	2.3-2.4	16/10/2015	EM1516063	Normal	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
GW24	GW24_1.6-1.7	1.6-1.7	14/10/2015	EM1515593	Normal	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
GW25	GW25_2.5-2.6	2.5-2.6	12/10/2015	EM1515643	Normal	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
GW26	GW26_3.0-3.1	3-3.1	13/10/2015	EM1515737	Normal	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
GW27	GW27_0.5-0.6	0.5-0.6	13/10/2015	EM1515737	Normal	4.5	<1 - 0.6	73.3	5.2	11.3	**11.2**	**11.2**	**11.2**	<5	<5	<5	-	-	<0.5	<5	70	1000	<10	<50	570	430	<10	70	910	180	1160	<0.5	<0.5	<0.5
	GW27_2.9-3.0	2.9-3	14/10/2015	EM1515593	Normal	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
GW28	GW28_1.6-1.7	1.6-1.7	14/10/2015	EM1515593	Normal	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
GW29	GW29_3.1-3.2	3.1-3.2	26/10/2015	EM1516331	Normal	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
GW30	GW30_3.5-3.6	3.5-3.6	13/10/2015	EM1515737	Normal	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
GW31	GW31(3.9-4.0)	3.9-4	29/10/2015	EM1516495	Normal	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
GW33	GW33(2.5-2.6)	2.5-2.6	30/10/2015	EM1516378	Normal	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
GW34	GW34_2.2-2.3	2.2-2.3	14/10/2015	EM1515593	Normal	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
GW36	GW36_0.5-0.6	0.5-0.6	15/10/2015	EM1515910	Normal	<0.5	<0.5	13.6	2.8	2.4	1.3	1.6	1	<5	<5	<5	-	-	<0.5	<5	<50	<50	<10	<50	<100	<100	<10	<50	<100	<100	<50	<0.5	<0.5	<0.5
	GW36_0.9-1.0	0.9-1	15/10/2015	EM1515910	Normal	<0.5	<0.5	<0.5	<0.5	<0.5	0.6	1.2	<0.5	<5	<5	<5	-	-	<0.5	<5	<50	<50	<10	<50	<100	<100	<10	<50	<100	<100	<50	<0.5	<0.5	<0.5
	GW36_1.6-1.7	1.6-1.7	15/10/2015	EM1515910	Normal	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
GW37	GW37_5.3-5.4	5.3-5.4	16/10/2015	EM1515997	Normal	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
GW38	GW38_5.0-5.1	5-5.1	27/10/2015	EM1516331	Normal	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-

Notes:
a CCME 2007
b IWRG621
c USEPA Eco-SSL
d USEPA RSLs November 2015
e Cr (VI) HIL
f Site-specific EIL, average pH 7.8 and assuming 5% CEC, 1% clay, old suburb, low traffic

Statistical Summary

Number of Results						17	17	17	17	17	17	17	17	16	17	17	1	1	17	16	15	15	15	15	15	15	15	15	15	15	14	16	16	16				
Number of Detects						7	3	10	10	10	15	16	8	0	0	0	0	0	0	0	3	6	2	2	6	6	2	3	6	5	5	0	0	0				
Minimum Concentration						<0.5	<0.5	<0.5	<0.5	<0.5	0.6	1.2	<0.5	<5	<0.05	<0.05	<0.05	<0.05	<0.05	<5	<50	<50	<10	<20	88	<100	<10	<50	<100	<100	<50	<0.5	<0.5	<0.5				
Minimum Detect						0.5	11	12.6	1	2	0.6	1.2	1	ND	ND	ND	ND	ND	ND	ND	70	220	137	2280	88	130	195	70	140	130	250	ND	ND	ND				
Maximum Concentration						4.5	28.4	73.3	5.2	11.3	11.2	11.2	11.2	<5	<5	<5	<0.05	<0.05	<0.5	<5	2310	27400	194	2420	14400	10700	266	2320	23100	3820	29200	<0.5	<0.5	<0.5				
Maximum Detect						4.5	28.4	73.3	5.2	11.3	11.2	11.2	11.2	ND	ND	ND	ND	ND	ND	ND	2310	27400	194	2420	14400	10700	266	2320	23100	3820	29200	ND	ND	ND				
Average Concentration						0.94	2.5	16	1.5	2.4	2.2	2.6	2	2.5	2.4	2.4			0.24	2.5	327	3118	27	334	1649	1200	35	329	2597	441	3520	0.25	0.25	0.25				
Median Concentration						0.5	0.25	12.8	1	2.4	0.75	1.6	0.75	2.5	2.5	2.5	0.025	0.025	0.25	2.5	25	25	5	25	50	50	5	25	50	50	25	0.25	0.25	0.25				
Standard Deviation						1.2	6.4	21	1.4	2.9	2.9	2.7	3	0	0.6	0.6			0.055	0	789	8042	57	819	4201	3031	80	794	6676	1042	8792	0	0	0				
Number of Guideline Exceedances (Detects Only)						0	0	5	0	0	2	2	2	0	0	0	0	0	0	0	1	0	0	0	0	0	0	2	3	1	0	0	0	0				

Data Entry: NLO
Data Review: AC
AECOM

				BTEX								Chlorinated Hydrocarbons																											
				Benzene	Ethylbenzene	Toluene	Total BTEX	Xylene (m & p)	Xylene (o)	Xylene Total	C6-C10 less BTEX (F1)	1,1,1,2-tetrachloroethane	1,1,1-trichloroethane	1,1,2,2-tetrachloroethane	1,1,2-trichloroethane	1,1-dichloroethane	1,1-dichloroethene	1,1-dichloropropene	1,2,3-trichloropropane	1,2-dibromo-3-chloropropane	1,2-dichloroethane	1,2-dichloropropane	1,3-dichloropropane	2,2-dichloropropane	Bromodichloromethane	Bromoform	Carbon tetrachloride	Chlorodibromomethane	Chloroethane	Chloroform	cis-1,2-dichloroethene	cis-1,3-dichloropropene	Dibromomethane	Dichloromethane	Hexachlorobutadiene	Trichloroethene	Tetrachloroethene
				µg/L	µg/L	µg/L	mg/L	µg/L	µg/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	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				1	1	1	0.001	1	1	2	0.01	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	10	1	1	1	1	2	0.5	1	1
Maintenance of Ecosystems	ANZECC 2000 Marine 90%			900											5800																							
	ANZECC 2000 Low Reliability Value				5	180			350				270	400		250	900				1900	1200	1400				240			370		0.8		4000	0.03	400	100
	Dutch 2009 Intervention Value																																					
	Dutch 1989[f]																																					
Potable Water Supply	ADWG 2011 Aesthetic				3	25				20																												
	ADWG 2011 Health			1													30				3	5			250		3	250		250	60	100		4	0.7		50
	WHO 2011																																			20		
	USEPA RSLs November 2015											5.7	8000	0.76	0.41	28			0.0075	0.0033			370						2100				8.3					
Agriculture, Parks and Gardens	*ANZECC 2000 LTV*																																					
Stock Watering	**ANZECC 2000 Stock water**																																					
	ADWG 2011 Health			**1**	**300**	**800**				**600**							**30**				**3**	**5**			**250**		**3**	**250**		**250**	**60**	**100**		**4**	**0.7**		**50**
	WHO 2011																																			**20**		
	USEPA RSLs November 2015											**5.7**	**8000**	**0.76**	**0.41**	**28**			**0.0075**	**0.0033**			**370**						**2100**				**8.3**					
Primary Contact Recreation	NHMRC 2008 Aesthetic				3	25				20																												
	NHMRC 2008 Health (x10 inorganics)			1													30				3	5			250		3	250		250	60	100		4	0.7		50
	WHO 2011																																			20		
	USEPA RSLs November 2015											5.7	8000	0.76	0.41	28			0.0075	0.0033			370						2100				8.3					
Buildings and Structures	AS2159																																					
Vapour Intrusion	NEPM 2013 >2-4m, Sand			800	NL	NL				NL	1																											
Field_ID	**Date**	**Lab_Report_Number**	**Sample_Type**																																			
GW01	20/11/2015	EM1517387	Normal	**2**	<1	4	-	2	<1	-	<0.02	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<10	<1	<1	<2	<1	<5	<1	<1	<1
GW02	20/11/2015	EM1517387	Normal	<1	<1	<1	-	<1	<1	-	0.03	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<10	<1	<1	<2	<1	<5	<1	<1	<1
GW03	19/11/2015	EM1517384	Normal	**2**	<2	<2	0.002	<2	<2	<2	<0.02	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
GW04	19/11/2015	EM1517384	Normal	<1	<1	<1	-	<1	<1	-	<0.02	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<10	<1	<1	<2	<1	<5	<1	<1	<1
GW05	18/11/2015	EM1517312 / EM1517387	Normal	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
GW06	20/11/2015	EM1517387	Normal	<1	<2	<2	<0.001	<2	<2	<2	<0.02	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
GW07	19/11/2015	EM1517384	Normal	<1	<2	<2	<0.001	<2	<2	<2	<0.02	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
GW08	19/11/2015	EM1517384	Normal	<1	<2	<2	<0.001	<2	<2	<2	<0.02	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
GW09	19/11/2015	EM1517384	Normal	<1	<2	<2	<0.001	<2	<2	<2	<0.02	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
GW10	18/11/2015	EM1517312	Normal	<1	<1	<1	-	<1	<1	-	<0.02	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<10	<1	<1	<2	<1	<5	<1	<1	<1
GW11	19/11/2015	EM1517384	Normal	<1	<2	<2	<0.001	<2	<2	<2	<0.02	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
GW12	19/11/2015	EM1517384	Normal	<1	<1	<1	-	<1	<1	-	<0.02	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<10	<1	<1	<2	<1	<5	<1	<1	<1
GW13	18/11/2015	EM1517312 / EM1517387	Normal	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
GW14	17/11/2015	EM1517312	Normal	<1	<1	<1	-	<1	<1	-	<0.02	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<10	2	<1	<2	<1	<5	<1	<1	<1
GW15	17/11/2015	EM1517312	Normal	<1	<2	<2	<0.001	<2	<2	<2	<0.02	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
GW16	17/11/2015	EM1517312	Normal	<1	<1	<1	-	<1	<1	-	<0.02	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<10	<1	<1	<2	<1	<5	<1	<1	<1
GW17	18/11/2015	EM1517312 / EM1517502	Normal	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
GW18	17/11/2015	EM1517153	Normal	<1	<1	<1	<0.001	<1	<1	<2	<0.02	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<10	<1	<1	<2	<1	<5	<1	<1	<1
GW19	17/11/2015	EM1517153 / EM1517387	Normal	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
GW20	18/11/2015	EM1517312 / EM1517384	Normal	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
GW21	18/11/2015	EM1517312	Normal	<1	<1	<1	-	<1	<1	-	<0.02	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<10	<1	<1	<2	<1	<5	<1	<1	<1
GW22	18/11/2015	EM1517312 / EM1517502	Normal	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
GW23	17/11/2015	EM1517312	Normal	<1	<2	<2	<0.001	<2	<2	<2	<0.02	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
GW24	17/11/2015	EM1517153	Normal	**21 - 22**	<1	4	0.033	7 - 8	<2 - 2	8	0.05	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<10	<1	<1	<2	<1	<5	<1	<1	<1
GW25	18/11/2015	EM1517312 / EM1517502	Normal	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
GW26	18/11/2015	EM1517312 / EM1517384	Normal	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
GW27	18/11/2015	EM1517312	Normal	<1	<1	<1	-	<1	<1	-	<0.02	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<10	<1	<1	<2	<1	<5	<1	<1	<1
GW28	17/11/2015	EM1517153	Normal	**10 - 14**	<1	5 - 7	0.015	<2 - 2	<1	<2	<0.02	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<10	<1	<1	<2	<1	<5	<1	<1	<1
GW29	18/11/2015	EM1517312 / EM1517502	Normal	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
GW30	18/11/2015	EM1517312 / EM1517502	Normal	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
GW31	17/11/2015	EM1517153 / EM1517384	Normal	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
GW32	19/11/2015	EM1517384	Normal	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
GW33	16/11/2015	EM1517153 / EM1517384	Normal	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
GW34	16/11/2015	EM1517153 / EM1517384	Normal	<1	<2	<2	<0.001	<2	<2	<2	<0.02	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
GW35	17/11/2015	EM1517153 / EM1517387	Normal	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
GW36	16/11/2015	EM1517153	Normal	<1	<1	<1	<0.001	<1	<1	<2	<0.02	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<10	<1	<1	<2	<1	<5	<1	<1	<1
GW37	16/11/2015	EM1517153 / EM1517384	Normal	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
GW38	17/11/2015	EM1517153	Normal	<1	<1	<1	<0.001	<1	<1	<2	<0.02	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<10	<1	<1	<2	<1	<5	<1	<1	<1

Notes:
a Adjusted for average laboratory pH of 7.1
b Long term trigger value for total nitrogen
c 90% grading value from Hickey (2013)
d Cr(VI) low reliability value
e Odour threshold conservatively adopted (converted from 1.5 mg/L ammonia as NH3)
f C. Osmers, EPA Victoria (1990) Report on Overseas Visit May 1989 Clean-Up of Chemically Contaminated Sites.

Statistical Summary

Number of Results				38	38	38	29	38	38	29	38	14	14	14	14	14	14	14	14	14	14	14	14	14	14	14	14	14	14	14	14	14	14	14	14	14	14
Number of Detects				4	0	3	3	3	1	1	2	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	0	0	0	0	0	0	0
Minimum Concentration				<1	<1	<1	<0.001	<1	<1	<2	<0.02	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<10	<1	<1	<2	<1	<5	<1	<1	<1
Minimum Detect				2	ND	4	0.002	2	ND	8	0.03	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	2	ND	ND	ND	ND	ND	ND	ND
Maximum Concentration				22	<2	7	0.033	8	2	8	0.05	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<10	2	<1	<2	<1	<5	<1	<1	<1
Maximum Detect				22	ND	7	0.033	8	2	8	0.05	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	2	ND	ND	ND	ND	ND	ND	ND
Average Concentration				1.4	0.82	1.1	0.0022	1.1	0.84	1.2	0.012	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	0.61	0.5	1	0.5	2.5	0.5	0.5	0.5
Median Concentration				0.5	1	1	0.0005	1	1	1	0.01	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	0.5	0.5	1	0.5	2.5	0.5	0.5	0.5
Standard Deviation				3.8	0.24	1.1	0.0065	1.1	0.26	1.3	0.0072	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0.4	0	0	0	0	0	0	0	0
Number of Guideline Exceedances(Detects Only)				4	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0

Guideline criteria – organics

					Halogenated Benzenes								Halogenated Hydrocarbons					
		trans-1,2-dichloroethene	trans-1,3-dichloropropene	Vinyl chloride	1,2,3-trichlorobenzene	1,2,4-trichlorobenzene	1,2-dichlorobenzene	1,3-dichlorobenzene	1,4-dichlorobenzene	2-chlorotoluene	4-chlorotoluene	Bromobenzene	Chlorobenzene	1,2-dibromoethane	Bromomethane	Chloromethane	Dichlorodifluoromethane	Iodomethane	Trichlorofluoromethane
		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		1	1	0.2	1	1	1	1	0.1	1	1	1	1	1	10	10	10	1	10
Maintenance of Ecosystems	ANZECC 2000 Marine 90%					80													
	ANZECC 2000 Low Reliability Value		0.8	140	3		200	350	75				55						
	Dutch 2009 Intervention Value																		
	Dutch 1989[f]																		
Potable Water Supply	ADWG 2011 Aesthetic				5	5	1	20	0.3				10						
	ADWG 2011 Health	60	100	0.3											1				
	WHO 2011																		
	USEPA RSLs November 2015									240	250	62		0.075		190	200		5200
Agriculture, Parks and Gardens	*ANZECC 2000 LTV*																		
Stock Watering	**ANZECC 2000 Stock water**																		
	ADWG 2011 Health	**60**	**100**	**0.3**	**30**	**30**	**1500**		**40**				**300**		**1**				
	WHO 2011																		
	USEPA RSLs November 2015									**240**	**250**	**62**				**190**	**200**		**5200**
Primary Contact Recreation	NHMRC 2008 Aesthetic				5	5	1	20	0.3				10						
	NHMRC 2008 Health (x10 inorganics)	60	100	0.3											1				
	WHO 2011																		
	USEPA RSLs November 2015									240	250	62		0.075		190	200		5200
Buildings and Structures	AS2159																		
Vapour Intrusion	NEPM 2013 >2-4m, Sand																		

Guideline criteria – Inorganics

		Alkalinity (Hydroxide) as CaCO3	Alkalinity (total) as CaCO3	Ammonia as N	Anions Total	Alkalinity (Bicarbonate as CaCO	Alkalinity (Carbonate as CaCO3)	Cations Total	Chloride	Fluoride	Ionic Balance	Nitrate (as N)	Nitrite (as N)	Nitrogen (Total Oxidised)	pH (Lab)	Reactive Phosphorus as P	Sulfate as SO4 (Filtered)
		µg/L	mg/L	µg/L	meq/L	mg/L	mg/L	meq/L	mg/L	mg/L	%	mg/L	mg/L	mg/L	pH Units	mg/L	mg/L
EQL		1000	1	10	0.01	1	1	0.01	1	0.1	0.01	0.005	0.005	0.01	0.01	0.01	1
Maintenance of Ecosystems	ANZECC 2000 Marine 90%			4700[a]								3.8[c]					
	ANZECC 2000 Low Reliability Value																
	Dutch 2009 Intervention Value																
	Dutch 1989[f]																
Potable Water Supply	ADWG 2011 Aesthetic			420					250								250
	ADWG 2011 Health									1.5		11.3	0.91				
	WHO 2011																
	USEPA RSLs November 2015																
Agriculture, Parks and Gardens	*ANZECC 2000 LTV*			*5000[b]*					*40*	*1*		*5[b]*	*5[b]*	*5[b]*			
Stock Watering	**ANZECC 2000 Stock water**									**2**		**90.3**	**9**				**1000**
	ADWG 2011 Health			**1250[e]**													
	WHO 2011																
	USEPA RSLs November 2015																
Primary Contact Recreation	NHMRC 2008 Aesthetic			420					250								250
	NHMRC 2008 Health (x10 inorganics)									15		113	9.1				
	WHO 2011																
	USEPA RSLs November 2015																
Buildings and Structures	AS2159								6000						<5.5		1000
Vapour Intrusion	NEPM 2013 >2-4m, Sand																

Results – organics (µg/L)

Field_ID	Date	Lab_Report_Number	Sample_Type	trans-1,2-dichloroethene	trans-1,3-dichloropropene	Vinyl chloride	1,2,3-trichlorobenzene	1,2,4-trichlorobenzene	1,2-dichlorobenzene	1,3-dichlorobenzene	1,4-dichlorobenzene	2-chlorotoluene	4-chlorotoluene	Bromobenzene	Chlorobenzene	1,2-dibromoethane	Bromomethane	Chloromethane	Dichlorodifluoromethane	Iodomethane	Trichlorofluoromethane
GW01	20/11/2015	EM1517387	Normal	<1	<2	<10	<1	<1	<1	<1	1.1	<1	<1	<1	3	<1	<10	<10	<10	<1	<10
GW02	20/11/2015	EM1517387	Normal	<1	<2	<10	<1	<1	<1	<1	3.4	<1	<1	<1	22	<1	<10	<10	<10	<1	<10
GW03	19/11/2015	EM1517384	Normal	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
GW04	19/11/2015	EM1517384	Normal	<1	<2	<10	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<10	<10	<10	<1	<10
GW05	18/11/2015	EM1517312 / EM1517387	Normal	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
GW06	20/11/2015	EM1517387	Normal	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
GW07	19/11/2015	EM1517384	Normal	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
GW08	19/11/2015	EM1517384	Normal	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
GW09	19/11/2015	EM1517384	Normal	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
GW10	18/11/2015	EM1517312	Normal	<1	<2	<10	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<10	<10	<10	<1	<10
GW11	19/11/2015	EM1517384	Normal	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
GW12	19/11/2015	EM1517384	Normal	<1	<2	<10	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<10	<10	<10	<1	<10
GW13	18/11/2015	EM1517312 / EM1517387	Normal	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
GW14	17/11/2015	EM1517312	Normal	<1	<2	<10	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<10	<10	<10	<1	<10
GW15	17/11/2015	EM1517312	Normal	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
GW16	17/11/2015	EM1517312	Normal	<1	<2	<10	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<10	<10	<10	<1	<10
GW17	18/11/2015	EM1517312 / EM1517502	Normal	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
GW18	17/11/2015	EM1517153	Normal	<1	<2	<10	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<10	<10	<10	<1	<10
GW19	17/11/2015	EM1517153 / EM1517387	Normal	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
GW20	18/11/2015	EM1517312 / EM1517384	Normal	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
GW21	18/11/2015	EM1517312	Normal	<1	<2	<10	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<10	<10	<10	<1	<10
GW22	18/11/2015	EM1517312 / EM1517502	Normal	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
GW23	17/11/2015	EM1517312	Normal	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
GW24	17/11/2015	EM1517153	Normal	<1	<2	<10	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<10	<10	<10	<1	<10
GW25	18/11/2015	EM1517312 / EM1517502	Normal	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
GW26	18/11/2015	EM1517312 / EM1517384	Normal	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
GW27	18/11/2015	EM1517312	Normal	<1	<2	<10	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<10	<10	<10	<1	<10
GW28	17/11/2015	EM1517153	Normal	<1	<2	<10	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<10	<10	<10	<1	<10
GW29	18/11/2015	EM1517312 / EM1517502	Normal	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
GW30	18/11/2015	EM1517312 / EM1517502	Normal	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
GW31	17/11/2015	EM1517153 / EM1517384	Normal	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
GW32	19/11/2015	EM1517384	Normal	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
GW33	16/11/2015	EM1517153 / EM1517384	Normal	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
GW34	16/11/2015	EM1517153 / EM1517384	Normal	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
GW35	17/11/2015	EM1517153 / EM1517387	Normal	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
GW36	16/11/2015	EM1517153	Normal	<1	<2	<10	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<10	<10	<10	<1	<10
GW37	16/11/2015	EM1517153 / EM1517384	Normal	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
GW38	17/11/2015	EM1517153	Normal	<1	<2	<10	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<10	<10	<10	<1	<10

Results – Inorganics

Field_ID	Alkalinity (Hydroxide) as CaCO3	Alkalinity (total) as CaCO3	Ammonia as N	Anions Total	Alkalinity (Bicarbonate as CaCO	Alkalinity (Carbonate as CaCO3)	Cations Total	Chloride	Fluoride	Ionic Balance	Nitrate (as N)	Nitrite (as N)	Nitrogen (Total Oxidised)	pH (Lab)	Reactive Phosphorus as P	Sulfate as SO4 (Filtered)
GW01	<1000	1740	106,000	57.8	1740	<1	53.6	815	0.4	3.78	0.02	<0.01	0.02	7.33	0.03	<1
GW02	<1000	1470	78,100	38.4	1470	<1	36.1	307	0.5	3.1	0.1	<0.01	0.1	6.85	<0.01	16
GW03	<1000	852	2230	25.2	852	<1	23.8	101	0.4	2.85	0.05	0.01	0.06	7.1	<0.01	255
GW04	<1000	535	50	15.6	535	<1	14.4	22	0.3	4.23	0.02	<0.01	0.02	6.38	0.04	208
GW05	<1000	1020	5520	24.4	1020	<1	22.7	138	0.5	3.51	0.05	<0.01	0.05	7.8	<0.01	5
GW06	<1000	871	14,600	31.6	871	<1	29.1	203	0.3	3.99	0.01	<0.01	0.01	6.63	<0.01	405
GW07	<1000	894	26,700	24.3	894	<1	20.9	142	0.4	7.42	0.02	<0.01	0.02	7.25	0.03	116
GW08	<1000	406	2680	15.4	406	<1	15.2	38	0.3	0.65	0.02	<0.01	0.02	7.03	<0.01	299
GW09	<1000	436	7860	20.9	436	<1	20.2	102	0.3	1.65	0.02	<0.01	0.02	7.1	<0.01	447
GW10	<1000	236	240	8.91	236	<1	9.14	33	0.4	1.26	0.16	<0.01	0.16	6.64	<0.01	157
GW11	<1000	186	1050	8.67	186	<1	8.51	20	0.4	0.98	<0.01	<0.01	<0.01	7.61	<0.01	211
GW12	<1000	334	170	21.8	334	<1	21.7	186	0.1	0.37	1.03	0.04	1.07	7.19	<0.01	477
GW13	<1000	343	110	10.6	343	<1	10.6	20	0.6	0.1	0.57	<0.01	0.57	6.67	<0.01	151
GW14	<1000	85	20	2.42	85	<1	2.3	16	0.5	2.55	0.05	<0.01	0.05	6.19	0.18	13
GW15	<1000	2790	47,000	408	2790	<1	454	12,100	0.5	5.32	16.4	0.49	16.9	7.38	1.51	528
GW16	<1000	352	390	12.6	352	<1	13	34	0.6	1.32	0.03	<0.01	0.03	7.38	0.02	224
GW17	<1000	350	1090	15.2	350	<1	15.2	83	0.4	0.08	0.03	<0.01	0.03	7.19	0.02	281
GW18	<1000	3070	30,500	414	3070	<1	397	12,200	0.7	2.17	0.07	<0.01	0.07	7.3	3.47	435
GW19	<1000	2460	35,200	346	2460	<1	318	10,500	0.6	4.15	0.02	<0.01	0.02	6.97	0.01	10
GW20	<1000	700	5800	27.2	700	<1	28.4	113	0.8	2.15	<0.01	0.02	0.02	7.7	<0.01	484
GW21	<1000	222	640	10.2	222	<1	10.6	36	0.5	1.6	0.02	<0.01	0.02	7.09	<0.01	230
GW22	<1000	58	1000	8.98	58	<1	9.48	81	0.2	2.67	0.06	<0.01	0.06	6.14	<0.01	266
GW23	<1000	173	1810	27	173	<1	27.3	398	0.3	0.47	0.05	<0.01	0.05	6.97	<0.01	594
GW24	<1000	644	13,200	31.5	644	<1	28	647	0.7	5.91	0.05	<0.01	0.05	7.01	0.27	18
GW25	<1000	605	4710	33.7	605	<1	34.4	69	0.4	1	0.02	<0.01	0.02	7.47	<0.01	944
GW26	<1000	114	310	16.2	114	<1	17.4	15	0.3	3.72	0.27	0.04	0.31	6.89	<0.01	648
GW27	<1000	256	540	14.2	256	<1	15.1	31	0.5	2.94	0.02	<0.01	0.02	8.05	<0.01	395
GW28	<1000	914	9000	21.4	914	<1	18.4	104	0.7	7.57	0.02	0.02	0.04	7.29	<0.01	9
GW29	<1000	396	190	15.2	396	<1	15.9	88	0.2	2.15	0.29	0.02	0.31	7.51	<0.01	233
GW30	<1000	33	860	13.9	33	<1	12.5	31	<0.1	5.06	0.02	<0.01	0.02	5.26	0.02	593
GW31	<1000	574	3960	131	574	<1	119	3250	0.3	4.98	0.02	<0.01	0.02	6.69	<0.01	1340
GW32	<1000	601	10,900	169	601	<1	163	4820	0.7	1.74	0.02	<0.01	0.02	6.96	0.38	1000
GW33	<1000	774	9350	18.2	774	<1	15.5	94	0.2	7.76	0.04	<0.01	0.04	7.63	<0.01	2
GW34	<1000	598	8500	43.6	598	<1	40.6	977	0.5	3.62	0.04	<0.01	0.04	7.19	0.66	196
GW35	<1000	487	7220	58.2	487	<1	59.7	161	0.2	1.31	0.07	<0.01	0.07	7.08	<0.01	2110
GW36	<1000	525	2010	12.1	525	<1	11	35	1.1	4.87	0.04	<0.01	0.04	7.55	0.05	30
GW37	<1000	613	90	15.8	613	<1	13.9	22	1	6.42	0.21	0.48	0.69	7.76	<0.01	141
GW38	<1000	918	100	60.8	918	<1	57.4	817	1.7	2.91	1.78	0.04	1.82	8.11	0.22	931

Notes:

a Adjusted for average laboratory pH of 7.1
b Long term trigger value for total nitrogen
c 90% grading value from Hickey (2013)
d Cr(VI) low reliability value
e Odour threshold conservatively adopted (converted from 1.5 mg/L ammonia as
f C. Osmers, EPA Victoria (1990) Report on Overseas Visit May 1989 Clean-Up c

Statistical Summary

	trans-1,2-dichloroethene	trans-1,3-dichloropropene	Vinyl chloride	1,2,3-trichlorobenzene	1,2,4-trichlorobenzene	1,2-dichlorobenzene	1,3-dichlorobenzene	1,4-dichlorobenzene	2-chlorotoluene	4-chlorotoluene	Bromobenzene	Chlorobenzene	1,2-dibromoethane	Bromomethane	Chloromethane	Dichlorodifluoromethane	Iodomethane	Trichlorofluoromethane
Number of Results	14	14	14	14	14	14	14	14	14	14	14	14	14	14	14	14	14	14
Number of Detects	0	0	0	0	0	0	0	2	0	0	0	2	0	0	0	0	0	0
Minimum Concentration	<1	<2	<10	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<10	<10	<10	<1	<10
Minimum Detect	ND	ND	ND	ND	ND	ND	ND	1.1	ND	ND	ND	3	ND	ND	ND	ND	ND	ND
Maximum Concentration	<1	<2	<10	<1	<1	<1	<1	3.4	<1	<1	<1	22	<1	<10	<10	<10	<1	<10
Maximum Detect	ND	ND	ND	ND	ND	ND	ND	3.4	ND	ND	ND	22	ND	ND	ND	ND	ND	ND
Average Concentration	0.5	1	5	0.5	0.5	0.5	0.5	0.75	0.5	0.5	0.5	2.2	0.5	5	5	5	0.5	5
Median Concentration	0.5	1	5	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5	5	5	5	0.5	5
Standard Deviation	0	0	0	0	0	0	0	0.78	0	0	0	5.7	0	0	0	0	0	0
Number of Guideline Exceedances(Detects Only)	0	0	0	0	0	0	0	2	0	0	0	2	0	0	0	0	0	0

	Alkalinity (Hydroxide) as CaCO3	Alkalinity (total) as CaCO3	Ammonia as N	Anions Total	Alkalinity (Bicarbonate as CaCO	Alkalinity (Carbonate as CaCO3)	Cations Total	Chloride	Fluoride	Ionic Balance	Nitrate (as N)	Nitrite (as N)	Nitrogen (Total Oxidised)	pH (Lab)	Reactive Phosphorus as P	Sulfate as SO4 (Filtered)
Number of Results	38	38	38	38	38	38	38	38	38	38	38	38	38	38	38	38
Number of Detects	0	38	38	38	38	0	38	38	37	38	36	9	37	38	15	37
Minimum Concentration	<1000	33	20	2.42	33	<1	2.3	15	<0.1	0.08	<0.01	<0.01	<0.01	5.26	<0.01	<1
Minimum Detect	ND	33	20	2.42	33	ND	2.3	15	0.1	0.08	0.01	0.01	0.01	5.26	0.01	2
Maximum Concentration	<1000	3070	106000	414	3070	<1	454	12200	1.7	7.76	16.4	0.49	16.9	8.11	3.47	2110
Maximum Detect	ND	3070	106000	414	3070	ND	454	12200	1.7	7.76	16.4	0.49	16.9	8.11	3.47	2110
Average Concentration	500	727	11571	59	727	0.5	57	1286	0.49	3.1	0.57	0.034	0.6	7.1	0.18	379
Median Concentration	500	554.5	2455	21.6	554.5	0.5	20.55	101.5	0.4	2.88	0.04	0.005	0.04	7.145	0.005	244
Standard Deviation	0	711	22256	104	711	0	104	3203	0.3	2.1	2.7	0.11	2.7	0.55	0.61	428
Number of Guideline Exceedances(Detects Only)	0	0	28	0	0	0	0	25	2	0	1	0	0	1	0	19

Guideline criteria – General and MAH

Category	Guideline	Total Oxidised Sulfur as SO4 2-	Sodium (Filtered)	TDS	TOC	1,2,4-trimethylbenzene (MAH)	1,3,5-trimethylbenzene (MAH)	Isopropylbenzene (MAH)	n-butylbenzene (MAH)	n-propylbenzene (MAH)	p-isopropyltoluene (MAH)	sec-butylbenzene (MAH)	Styrene (MAH)	tert-butylbenzene (MAH)
		mg/L	mg/L	mg/L	mg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L
EQL		1	1	5	1	1	1	1	1	1	1	1	1	1
Maintenance of Ecosystems	ANZECC 2000 Marine 90%													
	ANZECC 2000 Low Reliability Value							30						
	Dutch 2009 Intervention Value													
	Dutch 1989[f]													
Potable Water Supply	ADWG 2011 Aesthetic		180	600									4	
	ADWG 2011 Health													
	WHO 2011													
	USEPA RSLs November 2015					15	120	450	1000	660		2000		690
Agriculture, Parks and Gardens	*ANZECC 2000 LTV*		*115*											
Stock Watering	**ANZECC 2000 Stock water**													
	ADWG 2011 Health												**30**	
	WHO 2011			**4000 (sheep)**										
	USEPA RSLs November 2015					**15**	**120**	**450**	**1000**	**660**		**2000**		**690**
Primary Contact Recreation	NHMRC 2008 Aesthetic		180	600									4	
	NHMRC 2008 Health (x10 inorganics)													
	WHO 2011													
	USEPA RSLs November 2015					15	120	450	1000	660		2000		690
Buildings and Structures	AS2159													
Vapour Intrusion	NEPM 2013 >2-4m, Sand													

Guideline criteria – Metals

Category	Guideline	Aluminium (Filtered)	Arsenic (Filtered)	Cadmium (Filtered)	Calcium (Filtered)	Chromium (III+VI) (Filtered)	Copper (Filtered)	Iron (Filtered)	Lead (Filtered)	Magnesium (Filtered)	Manganese (Filtered)	Mercury (Filtered)	Nickel (Filtered)	Potassium (Filtered)	Selenium (Filtered)	Zinc (Filtered)
		mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L
EQL		0.01	0.001	0.0001	1	0.001	0.001	0.01	0.001	1	0.001	0.00005	0.001	1	0.001	0.001
Maintenance of Ecosystems	ANZECC 2000 Marine 90%			0.0014			0.003		0.0066			0.0007	0.2			0.023
	ANZECC 2000 Low Reliability Value	0.0005	0.0045			0.0044[d]		0.3			0.08				0.003	
	Dutch 2009 Intervention Value															
	Dutch 1989[f]															
Potable Water Supply	ADWG 2011 Aesthetic	0.2					1				0.1					3
	ADWG 2011 Health		0.01	0.002		0.05			0.01			0.001	0.02		0.01	
	WHO 2011															
	USEPA RSLs November 2015							14								
Agriculture, Parks and Gardens	*ANZECC 2000 LTV*	*5*	*0.1*	*0.01*		*0.1*	*0.2*	*0.2*	*2*		*0.2*	*0.002*	*0.2*		*0.02*	*2*
Stock Watering	**ANZECC 2000 Stock water**	**5**	**0.5**	**0.01**	**1000**	**0.5**	**0.5 (sheep)**		**0.1**			**0.002**	**1**		**0.02**	**20**
	ADWG 2011 Health										**0.5**					
	WHO 2011															
	USEPA RSLs November 2015							**14**								
Primary Contact Recreation	NHMRC 2008 Aesthetic	0.2					1	0.3			0.1					3
	NHMRC 2008 Health (x10 inorganics)		0.1	0.02		0.5			0.1			0.01	0.2		0.1	
	WHO 2011															
	USEPA RSLs November 2015															
Buildings and Structures	AS2159															
Vapour Intrusion	NEPM 2013 >2-4m, Sand															

Guideline criteria – PAH

Category	Guideline	Acenaphthene	Acenaphthylene	Anthracene	Benz(a)anthracene	Benzo(a) pyrene	Benzo(g,h,i)perylene
		µg/L	µg/L	µg/L	µg/L	µg/L	µg/L
EQL		1	1	1	1	0.5	1
Maintenance of Ecosystems	ANZECC 2000 Marine 90%						
	ANZECC 2000 Low Reliability Value			1.5		0.4	
	Dutch 2009 Intervention Value						
	Dutch 1989[f]						
Potable Water Supply	ADWG 2011 Aesthetic						
	ADWG 2011 Health					0.01	
	WHO 2011						
	USEPA RSLs November 2015	530		1800	0.12		
Agriculture, Parks and Gardens	*ANZECC 2000 LTV*						
Stock Watering	**ANZECC 2000 Stock water**						
	ADWG 2011 Health					**0.01**	
	WHO 2011						
	USEPA RSLs November 2015	**530**		**1800**	**0.12**		
Primary Contact Recreation	NHMRC 2008 Aesthetic						
	NHMRC 2008 Health (x10 inorganics)					0.01	
	WHO 2011						
	USEPA RSLs November 2015	530		1800	0.12		
Buildings and Structures	AS2159						
Vapour Intrusion	NEPM 2013 >2-4m, Sand						

Results – General and MAH

Field_ID	Date	Lab_Report_Number	Sample_Type	Total Oxidised Sulfur as SO4 2-	Sodium (Filtered)	TDS	TOC	1,2,4-trimethylbenzene	1,3,5-trimethylbenzene	Isopropylbenzene	n-butylbenzene	n-propylbenzene	p-isopropyltoluene	sec-butylbenzene	Styrene	tert-butylbenzene
GW01	20/11/2015	EM1517387	Normal	12	740	2960	52	2	<1	1	<1	<1	<1	<1	<1	<1
GW02	20/11/2015	EM1517387	Normal	19	443	1910	40	<1	<1	3	<1	3	2	<1	<1	<1
GW03	19/11/2015	EM1517384	Normal	236	143	1390	-	-	-	-	-	-	-	-	-	-
GW04	19/11/2015	EM1517384	Normal	209	46	787	-	<1	<1	<1	<1	<1	<1	<1	<1	<1
GW05	18/11/2015	EM1517312 / EM1517387	Normal	19	208	1330	17	-	-	-	-	-	-	-	-	-
GW06	20/11/2015	EM1517387	Normal	371	214	1550	35	-	-	-	-	-	-	-	-	-
GW07	19/11/2015	EM1517384	Normal	106	123	1250	-	-	-	-	-	-	-	-	-	-
GW08	19/11/2015	EM1517384	Normal	310	46	996	-	-	-	-	-	-	-	-	-	-
GW09	19/11/2015	EM1517384	Normal	478	149	1240	-	-	-	-	-	-	-	-	-	-
GW10	18/11/2015	EM1517312	Normal	156	58	642	10	<1	<1	<1	<1	<1	<1	<1	<1	<1
GW11	19/11/2015	EM1517384	Normal	212	111	632	-	-	-	-	-	-	-	-	-	-
GW12	19/11/2015	EM1517384	Normal	466	115	1380	-	<1	<1	<1	<1	<1	<1	<1	<1	<1
GW13	18/11/2015	EM1517312 / EM1517387	Normal	172	54	751	6	-	-	-	-	-	-	-	-	-
GW14	17/11/2015	EM1517312	Normal	18	16	336	3	<1	<1	<1	<1	<1	<1	<1	<1	<1
GW15	17/11/2015	EM1517312	Normal	468	7680	**30,300**	96	-	-	-	-	-	-	-	-	-
GW16	17/11/2015	EM1517312	Normal	225	67	881	13	<1	<1	<1	<1	<1	<1	<1	<1	<1
GW17	18/11/2015	EM1517312 / EM1517502	Normal	306	139	1020	13	-	-	-	-	-	-	-	-	-
GW18	17/11/2015	EM1517153	Normal	495	6770	**23,500**	91	<1	<1	<1	<1	<1	<1	<1	<1	<1
GW19	17/11/2015	EM1517153 / EM1517387	Normal	171	5330	**21,400**	183	-	-	-	-	-	-	-	-	-
GW20	18/11/2015	EM1517312 / EM1517384	Normal	558	217	1740	13	-	-	-	-	-	-	-	-	-
GW21	18/11/2015	EM1517312	Normal	266	79	787	9	<1	<1	<1	<1	<1	<1	<1	<1	<1
GW22	18/11/2015	EM1517312 / EM1517502	Normal	320	89	819	16	-	-	-	-	-	-	-	-	-
GW23	17/11/2015	EM1517312	Normal	677	279	1860	<1	-	-	-	-	-	-	-	-	-
GW24	17/11/2015	EM1517153	Normal	23	416	1780	30	2	1	7	<1	3	<1	<1	<1	<1
GW25	18/11/2015	EM1517312 / EM1517502	Normal	1030	194	2200	12	-	-	-	-	-	-	-	-	-
GW26	18/11/2015	EM1517312 / EM1517384	Normal	713	32	1360	6	-	-	-	-	-	-	-	-	-
GW27	18/11/2015	EM1517312	Normal	467	144	1040	5	<1	<1	<1	<1	<1	<1	<1	<1	<1
GW28	17/11/2015	EM1517153	Normal	11	233	1200	25	<1	<1	<1	<1	<1	<1	<1	<1	<1
GW29	18/11/2015	EM1517312 / EM1517502	Normal	238	105	1060	14	-	-	-	-	-	-	-	-	-
GW30	18/11/2015	EM1517312 / EM1517502	Normal	701	64	1170	14	-	-	-	-	-	-	-	-	-
GW31	17/11/2015	EM1517153 / EM1517384	Normal	1380	1620	**6860**	15	-	-	-	-	-	-	-	-	-
GW32	19/11/2015	EM1517384	Normal	1020	2230	**9950**	-	-	-	-	-	-	-	-	-	-
GW33	16/11/2015	EM1517153 / EM1517384	Normal	<10	55	837	8	-	-	-	-	-	-	-	-	-
GW34	16/11/2015	EM1517153 / EM1517384	Normal	238	627	2760	6	-	-	-	-	-	-	-	-	-
GW35	17/11/2015	EM1517153 / EM1517387	Normal	2200	401	3760	26	-	-	-	-	-	-	-	-	-
GW36	16/11/2015	EM1517153	Normal	63	108	724	50	<1	<1	<1	<1	<1	<1	<1	<1	<1
GW37	16/11/2015	EM1517153 / EM1517384	Normal	-	248	914	4	-	-	-	-	-	-	-	-	-
GW38	17/11/2015	EM1517153	Normal	1030	1250	3680	9	<1	<1	<1	<1	<1	<1	<1	<1	<1

Results – Metals

Field_ID	Aluminium (Filtered)	Arsenic (Filtered)	Cadmium (Filtered)	Calcium (Filtered)	Chromium (III+VI) (Filtered)	Copper (Filtered)	Iron (Filtered)	Lead (Filtered)	Magnesium (Filtered)	Manganese (Filtered)	Mercury (Filtered)	Nickel (Filtered)	Potassium (Filtered)	Selenium (Filtered)	Zinc (Filtered)
GW01	0.01	0.003	<0.0001	42	0.005	<0.001	7.57	<0.001	92	0.04	<0.0001	0.028	162	<0.01	0.009
GW02	<0.01	0.003	<0.0001	69	0.004	<0.001	13.6	<0.001	81	0.092	<0.0001	0.052	44	<0.01	<0.005
GW03	0.04	0.007	<0.0001	176	<0.001	<0.001	6.85	<0.001	94	0.475	<0.0001	0.014	41	<0.01	0.029
GW04	0.04	0.002	<0.0001	174	<0.001	0.002	0.25	<0.001	41	0.098	<0.0001	0.042	12	<0.01	0.09
GW05	<0.01	0.001	<0.0001	87	<0.001	<0.001	2.24	<0.001	98	0.264	<0.0001	0.009	50	<0.01	0.015
GW06	0.03	0.05	<0.0001	252	0.002	<0.001	**35.6**	<0.001	76	0.671	<0.0001	0.011	39	<0.01	0.014
GW07	0.06	0.021	<0.0001	212	0.002	<0.001	9.95	<0.001	52	0.15	<0.0001	0.006	28	<0.01	0.01
GW08	0.06	0.003	<0.0001	209	0.001	<0.001	2.65	<0.001	29	0.253	<0.0001	0.009	15	<0.01	0.009
GW09	0.03	0.001	<0.0001	203	<0.001	<0.001	**20**	<0.001	36	0.346	<0.0001	0.06	25	<0.01	0.016
GW10	0.02	0.007	<0.0001	83	0.002	0.002	4.92	<0.001	27	0.066	<0.0001	0.009	10	<0.01	0.062
GW11	0.05	0.009	<0.0001	62	0.001	<0.001	1.08	<0.001	4	0.073	<0.0001	0.007	10	<0.01	0.006
GW12	0.03	0.012	<0.0001	262	<0.001	<0.001	2.61	<0.001	36	0.113	<0.0001	0.008	25	<0.01	0.015
GW13	0.03	0.004	<0.0001	111	<0.001	0.002	0.83	0.001	29	0.082	<0.0001	0.02	12	<0.01	0.028
GW14	0.06	0.005	<0.0001	24	<0.001	0.002	0.05	<0.001	4	0.002	<0.0001	0.054	3	<0.01	0.02
GW15	0.15	0.076	<0.0001	319	0.012	0.001	0.98	<0.001	1200	0.408	<0.0001	0.204	209	<0.01	<0.005
GW16	0.03	0.014	<0.0001	127	<0.001	<0.001	3.87	<0.001	38	0.304	<0.0001	0.045	24	<0.01	0.091
GW17	0.03	0.004	<0.0001	127	0.002	<0.001	1.61	<0.001	30	0.329	<0.0001	0.042	14	<0.01	<0.005
GW18	0.03	0.023	<0.0001	355	0.012	<0.001	<0.05	<0.001	975	0.094	<0.0001	0.004	182	<0.01	<0.005
GW19	0.03	0.004	<0.0001	258	0.014	0.002	**28.3**	<0.001	843	0.581	<0.0001	0.087	158	<0.01	0.07
GW20	0.04	0.007	<0.0001	240	<0.001	<0.001	4.8	<0.001	78	0.233	<0.0001	0.022	24	<0.01	0.014
GW21	0.01	0.006	<0.0001	102	0.002	<0.001	11.8	<0.001	23	0.202	<0.0001	0.015	6	<0.01	<0.005
GW22	0.3	0.01	0.0001	61	0.007	<0.001	11.7	0.004	28	0.215	<0.0001	0.031	10	<0.01	0.284
GW23	0.06	0.003	<0.0001	202	0.002	0.002	10.8	<0.001	54	0.293	<0.0001	0.03	25	<0.01	0.154
GW24	0.04	0.007	<0.0001	83	0.003	<0.001	13.7	<0.001	59	0.441	<0.0001	0.021	35	<0.01	0.006
GW25	0.04	0.006	<0.0001	273	<0.001	<0.001	13.9	<0.001	139	0.739	<0.0001	0.015	34	<0.01	0.01
GW26	0.03	0.003	<0.0001	276	0.001	<0.001	0.72	<0.001	25	0.462	<0.0001	0.047	8	<0.01	1.05
GW27	0.11	<0.001	<0.0001	123	0.001	<0.001	**20.1**	<0.001	30	0.542	<0.0001	0.016	8	<0.01	0.017
GW28	0.02	0.009	<0.0001	80	0.001	0.001	4.28	<0.001	43	0.354	<0.0001	0.02	28	<0.01	0.012
GW29	0.03	0.006	<0.0001	176	<0.001	<0.001	5.54	<0.001	28	0.108	<0.0001	0.012	10	<0.01	0.01
GW30	0.21	0.007	<0.0001	143	0.012	<0.001	**50.6**	<0.001	29	0.25	<0.0001	0.029	9	<0.01	0.054
GW31	<0.01	0.003	<0.0001	496	<0.001	<0.001	**49.8**	<0.001	259	0.61	<0.0001	0.024	81	<0.01	0.016
GW32	<0.01	<0.001	<0.0001	845	<0.001	<0.001	0.2	<0.001	273	3.25	<0.0001	<0.001	54	<0.01	0.006
GW33	0.01	0.015	<0.0001	133	<0.001	0.001	**21.7**	0.002	72	0.359	<0.0001	0.004	23	<0.01	0.013
GW34	0.01	0.003	<0.0001	87	0.005	<0.001	0.18	<0.001	95	0.083	<0.0001	0.009	44	<0.01	<0.005
GW35	<0.01	0.002	<0.0001	510	<0.001	<0.001	**16.6**	<0.001	192	1.3	<0.0001	0.087	41	<0.01	0.007
GW36	0.03	0.004	<0.0001	52	0.001	<0.001	6.53	0.011	38	0.548	<0.0001	0.013	22	<0.01	0.02
GW37	0.02	0.002	<0.0001	14	<0.001	0.002	<0.05	<0.001	22	0.109	<0.0001	0.014	24	<0.01	0.014
GW38	0.01	0.004	<0.0001	8	<0.001	0.004	<0.05	<0.001	24	0.042	<0.0001	0.026	25	<0.01	<0.005

Results – PAH

Field_ID	Acenaphthene	Acenaphthylene	Anthracene	Benz(a)anthracene	Benzo(a) pyrene	Benzo(g,h,i)perylene
GW01	<1	<1	<1	<1	<0.5	<1
GW02	<1	<1	<1	<1	<0.5	<1
GW03	<1	<1	<1	<1	<0.5	<1
GW04	<1	<1	<1	<1	<0.5	<1
GW05	<1	<1	<1	<1	<0.5	<1
GW06	<1	<1	<1	<1	<0.5	<1
GW07	<1	<1	<1	<1	<0.5	<1
GW08	<1	<1	<1	<1	<0.5	<1
GW09	<1	<1	<1	<1	<0.5	<1
GW10	<1	<1	<1	<1	<0.5	<1
GW11	<1	<1	<1	<1	<0.5	<1
GW12	<1	<1	<1	<1	<0.5	<1
GW13	<1	<1	<1	<1	<0.5	<1
GW14	<1	<1	<1	<1	<0.5	<1
GW15	<1	<1	<1	<1	<0.5	<1
GW16	<1	<1	<1	<1	<0.5	<1
GW17	<1	<1	<1	<1	<0.5	<1
GW18	<1	<1	<1	<1	<0.5	<1
GW19	<1	<1	<1	<1	<0.5	<1
GW20	<1	<1	<1	<1	<0.5	<1
GW21	<1	<1	<1	<1	<0.5	<1
GW22	<1	<1	<1	<1	<0.5	<1
GW23	<1	<1	<1	<1	<0.5	<1
GW24	1.5	<1	<1	<1	<0.5	<1
GW25	<1	<1	<1	<1	<0.5	<1
GW26	<1	<1	<1	<1	<0.5	<1
GW27	<1	<1	<1	<1	<0.5	<1
GW28	<1	<1	<1	<1	<0.5	<1
GW29	<1	<1	<1	<1	<0.5	<1
GW30	<1	<1	<1	<1	<0.5	<1
GW31	<1	<1	<1	<1	<0.5	<1
GW32	-	-	-	-	-	-
GW33	<1	<1	<1	<1	<0.5	<1
GW34	<1	<1	<1	<1	<0.5	<1
GW35	<1	<1	<1	<1	<0.5	<1
GW36	<1	<1	<1	<1	<0.5	<1
GW37	<1	<1	<1	<1	<0.5	<1
GW38	<1	<1	<1	<1	<0.5	<1

Notes:
a Adjusted for average laboratory pH of 7.1
b Long term trigger value for total nitrogen
c 90% grading value from Hickey (2013)
d Cr(VI) low reliability value
e Odour threshold conservatively adopted (converted from 1.5 mg/L ammonia as
f C. Osmers, EPA Victoria (1990) Report on Overseas Visit May 1989 Clean-Up c

Statistical Summary

Statistic	Total Oxidised Sulfur as SO4 2-	Sodium (Filtered)	TDS	TOC	1,2,4-trimethylbenzene	1,3,5-trimethylbenzene	Isopropylbenzene	n-butylbenzene	n-propylbenzene	p-isopropyltoluene	sec-butylbenzene	Styrene	tert-butylbenzene
Number of Results	37	38	38	30	14	14	14	14	14	14	14	14	14
Number of Detects	36	38	38	29	2	1	3	0	2	1	0	0	0
Minimum Concentration	<10	16	336	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1
Minimum Detect	11	16	336	3	2	1	1	ND	3	2	ND	ND	ND
Maximum Concentration	2200	7680	30300	183	2	1	7	<1	3	2	<1	<1	<1
Maximum Detect	2200	7680	30300	183	2	1	7	ND	3	2	ND	ND	ND
Average Concentration	416	812	3651	27	0.71	0.54	1.2	0.5	0.86	0.61	0.5	0.5	0.5
Median Concentration	266	146.5	1290	13.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5
Standard Deviation	451	1796	6690	38	0.54	0.13	1.8	0	0.91	0.4	0	0	0
Number of Guideline Exceedances(Detects Only)	0	18	37	0	0	0	0	0	0	0	0	0	0

Statistic	Aluminium (Filtered)	Arsenic (Filtered)	Cadmium (Filtered)	Calcium (Filtered)	Chromium (III+VI) (Filtered)	Copper (Filtered)	Iron (Filtered)	Lead (Filtered)	Magnesium (Filtered)	Manganese (Filtered)	Mercury (Filtered)	Nickel (Filtered)	Potassium (Filtered)	Selenium (Filtered)	Zinc (Filtered)
Number of Results	38	38	38	38	38	38	38	38	38	38	38	38	38	38	38
Number of Detects	33	36	1	38	21	11	35	4	38	38	0	37	38	0	31
Minimum Concentration	<0.01	<0.001	<0.0001	8	<0.001	<0.001	<0.05	<0.001	4	0.002	<0.0001	<0.001	3	<0.01	<0.005
Minimum Detect	0.01	0.001	0.0001	8	0.001	0.001	0.05	0.001	4	0.002	ND	0.004	3	ND	0.006
Maximum Concentration	0.3	0.076	0.0001	845	0.014	0.004	50.6	0.011	1200	3.25	<0.0001	0.204	209	<0.01	1.05
Maximum Detect	0.3	0.076	0.0001	845	0.014	0.004	50.6	0.011	1200	3.25	ND	0.204	209	ND	1.05
Average Concentration	0.045	0.0091	5.1E-05	186	0.0026	0.00091	10	0.00092	139	0.38	0.00005	0.03	41	0.005	0.058
Median Concentration	0.03	0.0045	0.00005	138	0.001	0.0005	5.23	0.0005	42	0.2585	0.00005	0.02	25	0.005	0.014
Standard Deviation	0.059	0.014	8.1E-06	162	0.0038	0.00078	13	0.0018	267	0.54	0	0.036	50	0	0.17
Number of Guideline Exceedances(Detects Only)	33	18	0	0	7	1	32	1	0	33	0	18	0	0	10

Statistic	Acenaphthene	Acenaphthylene	Anthracene	Benz(a)anthracene	Benzo(a) pyrene	Benzo(g,h,i)perylene
Number of Results	37	37	37	37	37	37
Number of Detects	1	0	0	0	0	0
Minimum Concentration	<1	<1	<1	<1	<0.5	<1
Minimum Detect	1.5	ND	ND	ND	ND	ND
Maximum Concentration	1.5	<1	<1	<1	<0.5	<1
Maximum Detect	1.5	ND	ND	ND	ND	ND
Average Concentration	0.53	0.5	0.5	0.5	0.25	0.5
Median Concentration	0.5	0.5	0.5	0.5	0.25	0.5
Standard Deviation	0.16	0	0	0	0	0
Number of Guideline Exceedances(Detects Only)	0	0	0	0	0	0

AECOM

Groundwater Analytical Results
Fishermans Bend Urban Renewal Area

		PAH											Solvents							TPH											VOCs		
		Benzo[b+j]fluoranthene	Benzo(k)fluoranthene	Chrysene	Dibenz(a,h)anthracene	Fluoranthene	Fluorene	Indeno(1,2,3-c,d)pyrene	Naphthalene	PAHs (Sum of total)	Phenanthrene	Pyrene	2-hexanone (MBK)	Methyl Ethyl Ketone	4-Methyl-2-pentanone	Acetone	Carbon disulfide	Vinyl acetate	F2-NAPHTHALENE	+C10 - C36 (Sum of total)	C6 - C9	C10 - C14	C15 - C28	C29-C36	C10 - C40 (Sum of total)	>C10-C16	>C16-C34	>C34-C40	C6-C10	cis-1,4-Dichloro-2-butene	Pentachloroethane	trans-1,4-Dichloro-2-butene
		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	mg/L	µg/L	µg/L	mg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	mg/L	mg/L	mg/L	mg/L	µg/L	µg/L	µg/L
EQL		0.001	1	1	1	1	1	1	1	0.5	1	1	10	10	10	0.01	1	10	0.05	50	10	50	100	50	100	0.05	0.1	0.1	0.01	1	1	1
Maintenance of Ecosystems	ANZECC 2000 Marine 90%								90																						80	
	ANZECC 2000 Low Reliability Value						1				4						20															
	Dutch 2009 Intervention Value																			600					600							
	Dutch 1989[f]																				150								0.15			
Potable Water Supply	ADWG 2011 Aesthetic																															
	ADWG 2011 Health																															
	WHO 2011																															
	USEPA RSLs November 2015	0.34	3.4	34	0.034	800	290	0.34	6.1			120	38	5600	6300	14	810	410												0.013	0.65	0.013
Agriculture, Parks and Gardens	*ANZECC 2000 LTV*																															
Stock Watering	**ANZECC 2000 Stock water**																															
	ADWG 2011 Health																															
	WHO 2011																															
	USEPA RSLs November 2015	**0.34**	**3.4**	**34**	**0.034**	**800**	**290**	**0.34**	**6.1**			**120**	**38**	**5600**	**6300**	**14**	**810**	**410**												**0.013**	**0.65**	**0.013**
Primary Contact Recreation	NHMRC 2008 Aesthetic																															
	NHMRC 2008 Health (x10 inorganics)																															
	WHO 2011																															
	USEPA RSLs November 2015	0.34	3.4	34	0.034	800	290	0.34	6.1			120	38	5600	6300	14	810	410												0.013	0.65	0.013
Buildings and Structures	AS2159																															
Vapour Intrusion	NEPM 2013 >2-4m, Sand																		1													

Field_ID	Date	Lab_Report_Number	Sample_Type																														
GW01	20/11/2015	EM1517387	Normal	<0.001	<1	<1	<1	<1	<1	<1	<1	<0.5	<1	<1	<10	<10	<10	<0.01	<1	<10	0.19	640	<20	160	410	70	590	0.19	0.4	<0.1	<0.02	<1	<1	<1
GW02	20/11/2015	EM1517387	Normal	<0.001	<1	<1	<1	<1	<1	<1	<1	<0.5	<1	<1	<10	<10	<10	<0.01	<1	<10	0.27	700	40	200	500	<50	690	0.27	0.42	<0.1	0.03	<1	<1	<1
GW03	19/11/2015	EM1517384	Normal	<0.001	<1	<1	<1	<1	<1	<1	<5 - 2.3	3.3	1	<1	-	-	-	-	-	-	<0.1	<50	<20	<50	<100	<50	<100	<0.1	<0.1	<0.1	<0.02	-	-	-
GW04	19/11/2015	EM1517384	Normal	<0.001	<1	<1	<1	<1	<1	<1	<1	<0.5	<1	<1	<10	<10	<10	<0.01	<1	<10	<0.1	<50	<20	<50	<100	<50	<100	<0.1	<0.1	<0.1	<0.02	<1	<1	<1
GW05	18/11/2015	EM1517312 / EM1517387	Normal	<0.001	<1	<1	<1	<1	<1	<1	<1	<0.5	<1	<1	-	-	-	-	-	-	<0.1	570	-	80	330	160	440	<0.1	0.44	<0.1	-	-	-	-
GW06	20/11/2015	EM1517387	Normal	<0.001	<1	<1	<1	<1	<1	<1	<1	<0.5	<1	<1	-	-	-	-	-	-	<0.1	<50	<20	<50	<100	<50	<100	<0.1	<0.1	<0.1	<0.02	-	-	-
GW07	19/11/2015	EM1517384	Normal	<0.001	<1	<1	<1	<1	<1	<1	<1	<0.5	<1	<1	-	-	-	-	-	-	<0.1	50	<20	50	<100	<50	<100	<0.1	<0.1	<0.1	<0.02	-	-	-
GW08	19/11/2015	EM1517384	Normal	<0.001	<1	<1	<1	<1	<1	<1	<1	<0.5	<1	<1	-	-	-	-	-	-	<0.1	<50	<20	<50	<100	<50	<100	<0.1	<0.1	<0.1	<0.02	-	-	-
GW09	19/11/2015	EM1517384	Normal	<0.001	<1	<1	<1	<1	<1	<1	<1	<0.5	<1	<1	-	-	-	-	-	-	<0.1	<50	<20	<50	<100	<50	<100	<0.1	<0.1	<0.1	<0.02	-	-	-
GW10	18/11/2015	EM1517312	Normal	<0.001	<1	<1	<1	<1	<1	<1	<1	<0.5	<1	<1	<10	<10	<10	<0.01	<1	<10	<0.1	<50	<20	<50	<100	<50	<100	<0.1	<0.1	<0.1	<0.02	<1	<1	<1
GW11	19/11/2015	EM1517384	Normal	<0.001	<1	<1	<1	<1	<1	<1	<1	<0.5	<1	<1	-	-	-	-	-	-	<0.1	<50	<20	<50	<100	<50	<100	<0.1	<0.1	<0.1	<0.02	-	-	-
GW12	19/11/2015	EM1517384	Normal	<0.001	<1	<1	<1	<1	<1	<1	<1	<0.5	<1	<1	<10	<10	<10	<0.01	<1	<10	<0.1	<50	<20	<50	<100	<50	<100	<0.1	<0.1	<0.1	<0.02	<1	<1	<1
GW13	18/11/2015	EM1517312 / EM1517387	Normal	<0.001	<1	<1	<1	<1	<1	<1	<1	<0.5	<1	<1	-	-	-	-	-	-	-	<50	-	<50	<100	<50	<100	<0.1	<0.1	<0.1	-	-	-	-
GW14	17/11/2015	EM1517312	Normal	<0.001	<1	<1	<1	<1	<1	<1	<1	<0.5	<1	<1	<10	<10	<10	<0.01	<1	<10	<0.1	<50	<20	<50	<100	<50	<100	<0.1	<0.1	<0.1	<0.02	<1	<1	<1
GW15	17/11/2015	EM1517312	Normal	<0.001	<1	<1	<1	<1	<1	<1	<1	<0.5	<1	<1	-	-	-	-	-	-	<0.1	270	<20	80	190	<50	190	<0.1	0.19	<0.1	<0.02	-	-	-
GW16	17/11/2015	EM1517312	Normal	<0.001	<1	<1	<1	<1	<1	<1	<1	<0.5	<1	<1	<10	<10	<10	<0.01	<1	<10	<0.1	<50	<20	<50	<100	<50	<100	<0.1	<0.1	<0.1	<0.02	<1	<1	<1
GW17	18/11/2015	EM1517312 / EM1517502	Normal	<0.001	<1	<1	<1	<1	<1	<1	<1	<0.5	<1	<1	-	-	-	-	-	-	-	60	-	60	<100	<50	<100	<0.1	<0.1	<0.1	-	-	-	-
GW18	17/11/2015	EM1517153	Normal	<0.001	<1	<1	<1	<1	<1	<1	<1	<0.5	<1	<1	<10	<10	<10	<0.01	5	<10	0.22	410	<20	190	220	<50	430	0.22	0.21	<0.1	<0.02	<1	<1	<1
GW19	17/11/2015	EM1517153 / EM1517387	Normal	<0.001	<1	<1	<1	<1	<1	<1	<1	<0.5	<1	<1	-	-	-	-	-	-	-	290	-	<50	230	60	260	<0.1	0.26	<0.1	-	-	-	-
GW20	18/11/2015	EM1517312 / EM1517384	Normal	<0.001	<1	<1	<1	<1	<1	<1	<1	<0.5	<1	<1	-	-	-	-	-	-	-	<50	-	<50	<100	<50	<100	<0.1	<0.1	<0.1	-	-	-	-
GW21	18/11/2015	EM1517312	Normal	<0.001	<1	<1	<1	<1	<1	<1	<1	<0.5	<1	<1	<10	<10	<10	<0.01	<1	<10	<0.1	240	<20	70	170	<50	160	<0.1	0.16	<0.1	<0.02	<1	<1	<1
GW22	18/11/2015	EM1517312 / EM1517502	Normal	<0.001	<1	<1	<1	<1	<1	<1	<1	<0.5	<1	<1	-	-	-	-	-	-	-	110	-	110	<100	<50	100	<0.1	0.1	<0.1	-	-	-	-
GW23	17/11/2015	EM1517312	Normal	<0.001	<1	<1	<1	<1	<1	<1	<1	<0.5	<1	<1	-	-	-	-	-	-	<0.1	<50	<20	<50	<100	<50	<100	<0.1	<0.1	<0.1	<0.02	-	-	-
GW24	17/11/2015	EM1517153	Normal	<0.001	<1	<1	<1	<1	<1	<1	<5 - 1.9	3.4	<1	<1	<10	<10	<10	<0.01	<1	<10	0.38	640	60	360	280	<50	570	0.38	0.19	<0.1	0.08	<1	<1	<1
GW25	18/11/2015	EM1517312 / EM1517502	Normal	<0.001	<1	<1	<1	<1	<1	<1	<1	<0.5	<1	<1	-	-	-	-	-	-	-	<50	-	<50	<100	<50	<100	<0.1	<0.1	<0.1	-	-	-	-
GW26	18/11/2015	EM1517312 / EM1517384	Normal	<0.001	<1	<1	<1	<1	<1	<1	<1	<0.5	<1	<1	-	-	-	-	-	-	-	<50	-	<50	<100	<50	<100	<0.1	<0.1	<0.1	-	-	-	-
GW27	18/11/2015	EM1517312	Normal	<0.001	<1	<1	<1	<1	<1	<1	<1	<0.5	<1	<1	<10	<10	<10	<0.01	<1	<10	<0.1	<50	<20	<50	<100	<50	<100	<0.1	<0.1	<0.1	<0.02	<1	<1	<1
GW28	17/11/2015	EM1517153	Normal	<0.001	<1	<1	<1	<1	<1	<1	<1	<0.5	<1	<1	<10	<10	<10	0.01	1	<10	<0.1	160	20	<50	160	<50	160	<0.1	0.16	<0.1	0.02	<1	<1	<1
GW29	18/11/2015	EM1517312 / EM1517502	Normal	<0.001	<1	<1	<1	<1	<1	<1	<1	<0.5	<1	<1	-	-	-	-	-	-	-	50	-	50	<100	<50	<100	<0.1	<0.1	<0.1	-	-	-	-
GW30	18/11/2015	EM1517312 / EM1517502	Normal	<0.001	<1	<1	<1	<1	<1	<1	<1	<0.5	<1	<1	-	-	-	-	-	-	-	250	-	50	200	<50	220	<0.1	0.22	<0.1	-	-	-	-
GW31	17/11/2015	EM1517153 / EM1517384	Normal	<0.001	<1	<1	<1	<1	<1	<1	<1	<0.5	<1	<1	-	-	-	-	-	-	-	<50	-	<50	<100	<50	<100	<0.1	<0.1	<0.1	-	-	-	-
GW32	19/11/2015	EM1517384	Normal	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
GW33	16/11/2015	EM1517153 / EM1517384	Normal	<0.001	<1	<1	<1	<1	<1	<1	<1	<0.5	<1	<1	-	-	-	-	-	-	-	<50	-	<50	<100	<50	<100	<0.1	<0.1	<0.1	-	-	-	-
GW34	16/11/2015	EM1517153 / EM1517384	Normal	<0.001	<1	<1	<1	<1	<1	<1	<1	<0.5	<1	<1	-	-	-	-	-	-	<0.1	<50	<20	<50	<100	<50	<100	<0.1	<0.1	<0.1	<0.02	-	-	-
GW35	17/11/2015	EM1517153 / EM1517387	Normal	<0.001	<1	<1	<1	<1	<1	<1	<1	<0.5	<1	<1	-	-	-	-	-	-	-	110	-	<50	110	<50	100	<0.1	0.1	<0.1	-	-	-	-
GW36	16/11/2015	EM1517153	Normal	<0.001	<1	<1	<1	<1	<1	<1	<1	<0.5	<1	<1	<10	<10	<10	<0.01	<1	<10	<0.1	<50	<20	<50	<100	<50	<100	<0.1	<0.1	<0.1	<0.02	<1	<1	<1
GW37	16/11/2015	EM1517153 / EM1517384	Normal	<0.001	<1	<1	<1	<1	<1	<1	<1	<0.5	<1	<1	-	-	-	-	-	-	-	<50	-	<50	<100	<50	<100	<0.1	<0.1	<0.1	-	-	-	-
GW38	17/11/2015	EM1517153	Normal	<0.001	<1	<1	<1	<1	<1	<1	<1	<0.5	<1	<1	<10	<10	<10	<0.01	<1	<10	<0.1	<50	<20	<50	<100	<50	<100	<0.1	<0.1	<0.1	<0.02	<1	<1	<1

Notes:

a Adjusted for average laboratory pH of 7.1
b Long term trigger value for total nitrogen
c 90% grading value from Hickey (2013)
d Cr(VI) low reliability value
e Odour threshold conservatively adopted (converted from 1.5 mg/L ammonia as
f C. Osmers, EPA Victoria (1990) Report on Overseas Visit May 1989 Clean-Up c

Statistical Summary

Number of Results	37	37	37	37	37	37	37	52	37	37	37	14	14	14	14	14	14	23	37	38	37	37	37	37	37	37	37	38	14	14	14
Number of Detects	0	0	0	0	0	0	0	2	2	1	0	0	0	0	1	2	0	4	15	3	12	11	3	12	4	12	0	3	0	0	0
Minimum Concentration	<0.001	<1	<1	<1	<1	<1	<1	<1	<0.5	<1	<1	<10	<10	<10	<0.01	<1	<10	<0.1	<50	<20	<50	<100	<50	<100	<0.1	<0.1	<0.1	<0.02	<1	<1	<1
Minimum Detect	ND	ND	ND	ND	ND	ND	ND	ND	3.3	1	ND	ND	ND	ND	0.01	1	ND	0.19	50	20	50	110	60	100	0.19	0.1	ND	0.02	ND	ND	ND
Maximum Concentration	<0.001	<1	<1	<1	<1	<1	<1	<5	3.4	1	<1	<10	<10	<10	0.01	5	<10	0.38	700	60	360	500	160	690	0.38	0.44	<0.1	0.08	<1	<1	<1
Maximum Detect	ND	ND	ND	ND	ND	ND	ND	2.3	3.4	1	ND	ND	ND	ND	0.01	5	ND	0.38	700	60	360	500	160	690	0.38	0.44	ND	0.08	ND	ND	ND
Average Concentration	0.0005	0.5	0.5	0.5	0.5	0.5	0.5	1.1	0.42	0.51	0.5	5	5	5	0.0054	0.86	5	0.087	138	12	56	111	31	139	0.073	0.11	0.05	0.013	0.5	0.5	0.5
Median Concentration	0.0005	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.25	0.5	0.5	5	5	5	0.005	0.5	5	0.05	25	10	25	50	25	50	0.05	0.05	0.05	0.01	0.5	0.5	0.5
Standard Deviation	0	0	0	0	0	0	0	0.94	0.71	0.082	0	0	0	0	0.0013	1.2	0	0.089	201	9.4	69	113	24	174	0.072	0.11	0	0.012	0	0	0
Number of Guideline Exceedances(Detects Only)	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	3	0	0	0	0	1	0	0	0	0	0	0	0

Appendix B

Licences and Permits

CONSENT FOR WORKS

Road Management Act 2004
Road Management (Works and Infrastructure) Regulations 2005

CITY OF MELBOURNE

GPO Box 1603
Melbourne VIC 3001
ABN 55 370 219 287
Hotline (03) 9658 9658
Facsimile (03) 9654 4854
DX210487
ABN 55 370 219 287

Construction Management Group
3rd Floor 240 Little Collins Street
Melbourne Vic 3000

Telephone: 03 9658 9658
After Hours: 03 9658 9774

Consent Number: CW-2015-5821A

Attention:
Consent is given for the proposed works subject to the attached general and specific conditions.

Council conditions must be adhered to prior to and/or during proposed works. Failure to comply with Council conditions and requirements of the Road Management Act 2004 will result in this consent being revoked.

Any alterations to this consent will make it null and void.

Property Address:	Lorimer Street, PORT MELBOURNE
Location (if different from property address)	
Applicant:	Aecom Australia Pty Ltd
Address of Applicant:	Level 9, 8 Exhibition St, MELBOURNE VIC 3000
Contact Details:	Averyll - 0499 252 502
Description of Work:	Consent for works issued at 6 locations to assist with drilling & installation of groud water monitoring wells at the subject sites as per sr3102064 # 9450653. sr3118375 SR3133129 Date: 5/10/2015 to 6/11/2015 (Monday to Friday 7.30am to 5.30pm) (Saturday 8am to 3pm) Council ESG Reference: SR 3102064 #9450653 Full traffic management is required to direct pedestrians to a safe route of passage. The site is to be signed and managed in accordance with AS 1742.3 and Vic Roads Worksite Code of Practice. It is the responsibility of the applicant to ensure that all Council assets are reinstated in accordance with Councils current standards and specifications. No-one is to be denied vehicular or pedestrian access to their property. It is the responsibility of the applicant to apply for and obtain TSA reserved parking permits should the occupation of parking bays be required.

Date(s) permitted:

From: 5 Oct 2015 **To:** 6 Nov 2015

Fees/Charges:
The following fees/charges apply to this consent:

Consent for Works Fee	$913.80

Signature of Delegated Officer:  Date: 27 Oct 2015

Mal Smith

NOTE: This consent must be kept on site and produced when required by Council's officers or Victoria Police and is subject to conditions specified being adhered to.

The holder of the consent must comply with the following conditions:

1. The consent holder ("Applicant") is responsible for ensuring the works are carried out in a safe manner, in compliance with these conditions and in accordance with the City of Melbourne Activities Local Law 2009.
2. The consent is not transferable. It must be held on site by the person in charge of the work and be produced on request by an authorised officer or a member of the Victoria Police Force. The consent holder must comply promptly with any notices and instructions.
3. Any variation required to a consent must be submitted to the Council or delegate for endorsement. Change/variation of work must not commence prior to relevant approval being granted in writing by the Council or delegate.
4. Vehicles must not cross any footpath to gain access to the site of the work or project unless vehicular crossing (either temporary or permanent) has been constructed to the approval of the Council or delegate or authorised officer.
5. Every stormwater channel adjacent to the site of work or project will be kept clear of obstruction at all times.
6. Rubbish or building materials must not be left in or on any road or public place.
7. Building materials spilt on to the roadway or the footpath must be removed immediately. Equipment used for transporting or handling building materials must not be washed in or on any road or public place or into any drain. Hoses must not be used for these purposes in or on a road or footpath.
8. Barricades must consist, unless alternative arrangements are approved, of minimum 1 metre height timber or steel rails on stable supporting posts at maximum 4.8 metre centres, continuous around the entire working area. Warning signage must be erected at each end of the barricaded area with the appropriate standard 'Detour', 'Road Closed', arrow etc.
9. Appropriate warning signage and lighting must be erected in accordance with AS1742.3.
10. Any occupation of space within the street environment must not hinder disabled facilities, carparks or access.
11. In regards to any areas or works that require the implementation of public protection, the Relevant Building Surveyor must assess all public protection structures.
12. Any area closed between sunset and sunrise shall be fitted with battery operated flashing lights in accordance with the Council's plans.
13. Unless otherwise stated, this consent must comply with the City of Melbourne's Code of Good Practice for Public Safety and Amenity at Construction Sites.
14. Safe and equitable pedestrian access is required at all times. Pedestrian ramps must be installed where necessary.
15. This consent does not exclude the consent holder from the City of Melbourne's Local Laws or the relevant parking laws.
16. The scheduled works are to be undertaken during the hours stated in this consent, or in a relevant Out of Hours consent.

1) This permit relates to the surface opening of any road within the City of Melbourne and the specific use thereof of any part of a road and reinstatement or reconstruction of any road.

2) When the abovementioned work has been completed, notice thereof must be given to the Council, delegate or authorised officer.

3) Wood blocks, flagging, pitchers, bluestone kerbing or other material required to be replaced must be taken from the site to a location designated by the Council, delegate or authorised officer.

4) The permit holder must ensure that all excavation work is clear of services and is responsible and liable for any damage or alterations to services and any related costs.

NOTE: This consent must be kept on site and produced when required by Council's officers or Victoria Police and is subject to conditions specified being adhered to.

5) All private service connections, ie water, gas, power or other property services must be placed at least 450mm clear depth below surface level or in accordance with the requirements of the Supply Authority and installed at right angles to the building line.

6) Boundary trap and disconnected trap covers which cannot be placed inside the building line must be placed 300mm below the surface of the pavement within 230mm of the building line. No other fittings may be placed in the pavement without the consent of the Council, delegate or authorised officer.

NOTE: This consent must be kept on site and produced when required by Council's officers or Victoria Police and is subject to conditions specified being adhered to.

CONSENT FOR WORKS

Road Management Act 2004
Road Management (Works and Infrastructure) Regulations 2005

CITY OF MELBOURNE

GPO Box 1603
Melbourne VIC 3001
ABN 55 370 219 287
Hotline (03) 9658 9658
Facsimile (03) 9654 4854
DX210487
ABN 55 370 219 287

Construction Management Group
3rd Floor 240 Little Collins Street
Melbourne Vic 3000

Telephone: 03 9658 9658
After Hours: 03 9658 9774

Consent Number: CW-D-2015-5759B

Attention:
Consent is given for the proposed works subject to the attached general and specific conditions.

Council conditions must be adhered to prior to and/or during proposed works. Failure to comply with Council conditions and requirements of the Road Management Act 2004 will result in this consent being revoked.

Any alterations to this consent will make it null and void.

Property Address:	Lorimer Street, PORT MELBOURNE
Location (if different from property address)	
Applicant:	Aecom Australia Pty Ltd
Address of Applicant:	Level 9, 8 Exhibition St, MELBOURNE VIC 3000
Contact Details:	Averyll - 0499 252 502
Description of Work:	Consent for works issued at LorimerStreet to assist with installing ground water monitoring works at the subject site. Date: 5/10/2015 to6/11/2015 SR3133123 (Monday to Friday 7.30am to 5.30pm (Saturday 8am to 3pm) Council ESG Reference: SR 3107436# 9448109 sr3118375 Full traffic management is required to direct pedestrians to a safe route of passage. The site is to be signed and managed in accordance with AS 1742.3 and Vic Roads Worksite Code of Practice. It is the responsibility of the applicant to ensure that all Council assets are reinstated in accordance with Councils current standards and specifications. No-one is to be denied vehicular or pedestrian access to their property. It is the responsibility of the applicant to apply for and obtain TSA reserved parking permits should the occupation of parking bays be required.

Date(s) permitted:

From: 5 Oct 2015 **To:** 6 Nov 2015

Fees/Charges:
The following fees/charges apply to this consent:

Consent for Works Fee - Docklands	$152.30

Signature of Delegated Officer:  Date: 27 Oct 2015

Mal Smith

NOTE: This consent must be kept on site and produced when required by Council's officers or Victoria Police and is subject to conditions specified being adhered to.

The holder of the consent must comply with the following conditions:

1. The consent holder ("Applicant") is responsible for ensuring the works are carried out in a safe manner, in compliance with these conditions and in accordance with the City of Melbourne Activities Local Law 2009.
2. The consent is not transferable. It must be held on site by the person in charge of the work and be produced on request by an authorised officer or a member of the Victoria Police Force. The consent holder must comply promptly with any notices and instructions.
3. Any variation required to a consent must be submitted to the Council or delegate for endorsement. Change/variation of work must not commence prior to relevant approval being granted in writing by the Council or delegate.
4. Vehicles must not cross any footpath to gain access to the site of the work or project unless vehicular crossing (either temporary or permanent) has been constructed to the approval of the Council or delegate or authorised officer.
5. Every stormwater channel adjacent to the site of work or project will be kept clear of obstruction at all times.
6. Rubbish or building materials must not be left in or on any road or public place.
7. Building materials spilt on to the roadway or the footpath must be removed immediately. Equipment used for transporting or handling building materials must not be washed in or on any road or public place or into any drain. Hoses must not be used for these purposes in or on a road or footpath.
8. Barricades must consist, unless alternative arrangements are approved, of minimum 1 metre height timber or steel rails on stable supporting posts at maximum 4.8 metre centres, continuous around the entire working area. Warning signage must be erected at each end of the barricaded area with the appropriate standard 'Detour', 'Road Closed', arrow etc.
9. Appropriate warning signage and lighting must be erected in accordance with AS1742.3.
10. Any occupation of space within the street environment must not hinder disabled facilities, carparks or access.
11. In regards to any areas or works that require the implementation of public protection, the Relevant Building Surveyor must assess all public protection structures.
12. Any area closed between sunset and sunrise shall be fitted with battery operated flashing lights in accordance with the Council's plans.
13. Unless otherwise stated, this consent must comply with the City of Melbourne's Code of Good Practice for Public Safety and Amenity at Construction Sites.
14. Safe and equitable pedestrian access is required at all times. Pedestrian ramps must be installed where necessary.
15. This consent does not exclude the consent holder from the City of Melbourne's Local Laws or the relevant parking laws.
16. The scheduled works are to be undertaken during the hours stated in this consent, or in a relevant Out of Hours consent.

1) In the event that any works or activity in the precinct damages coloured concrete panels, the reinstatement of full panels only will be accepted. No part panel replacement will be acceptable.

2) No works are to be carried out within the 3 hour period prior to the commencement of any Etihad Stadium event, or after 16:00hrs, whichever is the earlier, during an Etihad Stadium event, or within a 2 hour period following the completion of any Etihad Stadium event.

3) Unless prior consent is given in writing by the relevant authority, delegate or authorised officer, all private service connections, ie water, gas, power or other property services must be placed at least 450mm clear depth below surface level or in accordance with the requirements of the Supply Authority and installed at right angles to the building line

NOTE: This consent must be kept on site and produced when required by Council's officers or Victoria Police and is subject to conditions specified being adhered to.

4) Boundary trap and disconnected trap covers which cannot be placed inside the building line must be placed 300mm below the surface of the pavement within 230mm of the building line. No other fittings may be placed in the pavement without the consent of the relevant authority, delegate or authorised officer

5) No vehicle is permitted to access any promenade, wharf or plaza within the Docklands precinct without written authority to do so.

6) Vehicle access to promenades, wharf or plazas may only be obtained by the removal of bollards, chains or locks. Bollards, chains or locks may only be removed by an authorised representative of City of Melbourne. No vehicles are permitted to be in motion on any promenade or walkway within the Docklands precinct between 12:00hrs and 14:00hrs

7) Due to load limitations, no items such as vehicles or stages etc are permitted to be erected within 3m of the water's edge along Grand Plaza

8) The number of vehicles permitted to access the promenade or walkway is strictly restricted to XX vehicles at any one time

9) Whilst any vehicle, associated with this permit, is in motion on any walkway or promenade, a traffic controller must be outside of the vehicle to assist with pedestrian and cyclist management

10) Whilst any vehicle, associated with this permit, is in motion on any walkway or promenade, their speed must not exceed 5kph

11) No vehicles are permitted to access any site via the tram reserves without prior approval from Yarra Trams

12) Vehicles at Yarra's Edge are permitted to park on the upper promenade only. Under no circumstances are vehicles allowed to access the lower promenade or the Webb Bridge

13) Vehicles are not to be parked on or driven over the Perspex numbering laid within the promenade

14) Drip trays must be installed under the vehicle whilst it is parked on any promenade or walkway

15) This permit relates to the surface opening of any road within the City of Melbourne and the specific use thereof of any part of a road and reinstatement or reconstruction of any road.

16) When the abovementioned work has been completed, notice thereof must be given to the Council, delegate or authorised officer.

17) Wood blocks, flagging, pitchers, bluestone kerbing or other material required to be replaced must be taken from the site to a location designated by the Council, delegate or authorised officer.

18) The permit holder must ensure that all excavation work is clear of services and is responsible and liable for any damage or alterations to services and any related costs.

19) All private service connections, ie water, gas, power or other property services must be placed at least 450mm clear depth below surface level or in accordance with the requirements of the Supply Authority and installed at right angles to the building line.

20) Boundary trap and disconnected trap covers which cannot be placed inside the building line must be placed 300mm below the surface of the pavement within 230mm of the building line. No other fittings may be placed in the pavement without the consent of the Council, delegate or authorised officer.

NOTE: This consent must be kept on site and produced when required by Council's officers or Victoria Police and is subject to conditions specified being adhered to.

Enquiries:
Email: devpermits@portphillip.vic.gov.au
Phone: 9209 6216
Mail: Private Bag No. 3, PO ST KILDA VIC 3182

CITY OF PORT PHILLIP
ABN 21 762 977 945

8 October 2015

AECOM
9/8 Exhibition St
MELBOURNE VIC 3000

ROAD OPENING PERMIT
208/2015/RO
Issued Under Community Amenity Local Law No: 1 (Clause 14)

This permit has been approved and issued subject to the following conditions and the permit holder shall be held to have agreed to such conditions and to have accepted any liability or responsibility thereby imposed.

Site of Works: Thackray Road, all of street, PORT MELBOURNE

Description of Works: Bore holes for groundwater sampling.(MW3)

Permit Valid From: 12 October 2015 **To:** 6 November 2015

In addition to complying with any relevant requirements in the Local Law No. 1, Community Amenity the following conditions apply to the activity or use:

Standard Conditions:

1. All works associated with the road opening including the set-up and removal of necessary signs and barriers may be undertaken between 7am to 6pm Monday to Friday and 9am to 3pm Saturday. Obstructions to traffic flow are not permitted outside of this period including setting up or removal of the infrastructure.

2. To amend the dates of this licence requires a written request to be received by the City Permits by 5pm, while the permit is still valid. Once a permit has expired it cannot be re-used or amended.

3. A maximum of two (2) amendments to re-schedule the dates of this permit can be considered prior to incurring additional fees.

4. An absolute minimum width of 1.5 metres must be maintained for safe pedestrian access. Pedestrian safety must be maintained at all times by the appopriate use of bollards and tape. On both approaches to the works, the following signs must be clearly displayed and in place during the works;

    a) Pedestrian arrow signs
    a) Pedestrians Watch Your Step or,
    b) Pedestrian Use Other Footpath

5. All traffic treatments must be installed in accordance with any Traffic Management Plan submitted to Council and maintained during the works.

6. Signage must be visible and must not obstruct sightlines, designated pedestrian footpaths and crossovers/accesses. If on-street parking spaces are required to be used, only the spaces clearly specified on the plan can be used for that purpose.

7. Accredited Traffic Control Officers must be present to manage traffic flow during a partial or full road closure. Traffic Control Officers must also assist pedestrians and cyclists as required.

8. If vehicular traffic flow is affected by the works, emergency services, including, Fire Brigade, Ambulance and Police must be notified by the permit-holder a minimum of 24 hours prior the commencement of works.

9. To the satisfaction of, and at no cost to Council, the permit-holder must reinstate all assets and infrastructure.

10. City of Port Phillip does not accept any responsibility for accidents, damage or injury to property, participants or third parties that may arise out of this event. There must be public liability insurance for the type of work proposed with an indemnity of not less than $10M, including full indemnity for the City of Port Phillip Council against any claim laid against it either by members of the public or persons engaged in any activities associated with the traffic diversion who, as a result of the diversion, suffer personal injury, property damage or financial loss.

11. The permit-holder must comply with AS 1742.3 2002. Manual of uniform traffic control devices, Part 3 Traffic Control Devices for lane and Road Closures and the relevant Standards Australia Field Guides Part 1. Short term urban works, daytime/night time SAA HB 81.1 & 4 1996.

12. City of Port Phillip reserves the right to amend or revoke the above at any time.

Prior to commencement

13. In addition to the requirement to obtain a Road Opening Permit, further permits may be required for activities on Council land such as Skip Bin, Road Closure, Street Occupation, or Asset Protection. Consents may also be required from VicRoads, utilities and public transport operators. The permit-holder must ensure all relevant permits and approvals have been obtained prior to commencing any works.

14. The permit-holder must provide a minimum of 2 business day's written notification to the occupants of all affected owners, occupiers and businesses affected by the works. The notification must include the following information and a copy forwarded to the City Permits unit, e-mail: devpermits@portphillip.vic.gov.au and must include:-

    a) The nature of the works being performed
    a) The date and hours of works occurring under this permit
    b) Council's permit reference
    c) Contact name and phone number for the permit holder and/or site manager

15. The permit-holder must contact City Permits unit at least 2 business days prior to commencing works, by e-mail: devpermits@portphillip.vic.gov.au, or ph: 03 9209 6216, to organise an inspection with Council's Asset Inspection Officer to determine:

    - the extent of reinstatement works including road pavement, signage and markings
    - the requirement for further inspections,
    - any requirements for the removal, storage and reinstatement of bluestone assets
    - removal and reinstatement of street furniture, (litter bins, public seating and bicycle hoops)

During construction

16. Works that may cause significant delay to traffic and/or public transport services must be scheduled outside peak periods of 7–9am and 4–6pm weekdays unless otherwise permitted with the written consent of Council.

17. Works must be carried out in accordance with '*Road Management Act 2004 Code of Practice Worksite Safety – Traffic Management'* and any approved Traffic Management Plan.

Work execution

18. Without the written consent of the Council the permit-holder must utilise boring techniques when installing underground services. Any piping or cabling work under an existing vehicle crossing must be carried out by boring, unless approval from Council's Asset Inspection Officer has been obtained.

19. If agricultural drains or irrigation pipes are encountered during excavation the permit-holder must carefully replace the pipes to their original position prior to backfilling.

20. The minimum lateral clearance from a drain is 500mm and a vertical clearance of 300mm. If the proposed road opening or any other work interferes with any underground drains, the approval must be obtained from the Council's Assets department prior to the commencement of works.

21. The minimum lateral clearance from a street tree is 2 metres. If the proposed road opening is less than 2 metres, consent must be obtained from Council's Arborist.

22. In the event of cancellation of this permit, the Council reserves the right to reinstate the area at the expense of the permit-holder.

23. Surplus excavated material must be removed from the road reserve daily and the area left in a clean and tidy condition.

24. All finished surfaces must match and be flush with existing surfaces.

25. Within 7 days of completion of the works, the permit holder must submit a request for final inspection to City Permits unit, e-mail: devpermits@portphillip.vic.gov.au.

26. Any damage to Council assets caused by the permit- holder's reinstatement works must be rectified to the satisfaction of Council's Asset Inspection Officer.

27. Failure to restore the road reserve and repair any damage caused to assets will result in Council undertaking the necessary reinstatement works and deducting the cost from the security bond and the remainder refunded. Where costs exceed the security bond amount held, the permit holder will be liable for the excess and charged accordingly.

28. If works are conducted in contravention of this permit, the City of Port Phillip reserves the right to amend or revoke the above at any time.

Reinstatement of footpaths

Asphalt footpaths
Specification for Asphalt Footpath – Refer to Standard Drawing: SD3103

29. The permanent asphalt layer of footpaths must be constructed in accordance with Council's current Standard Drawing.

30. The Bituminous surface at the edges of the trench must be cut with a circular saw.

31. A temporary bituminous surface of premix (cold-mix) minimum depth 75mm must be constructed before the crossing is opened to traffic, unless the permit-holder is completing a permanent reinstatement immediately with hot-mix asphalt.

32. The full width of the footpath must be reinstated. Where only part of a concrete footpath/vehicle crossing panel has been damaged, reinstatement must include the removal and reinstatement of the whole panel.

Concrete footpaths
Specification for Concrete Footpaths – Refer to Standard Drawing: SD3103

33. The permanent concrete layer of footpaths must be constructed in accordance with Council's current Standard Drawing.

34. Concrete footpath areas affected by works will be reinstated in full sections within the surrounding joints unless directed otherwise by Council's Asset Inspection Officer.

35. Existing surface levels must be maintained and the tops of all service pits/junction boxes must be at the footpath surface level.

Reinstatement of road pavements

36. Where the permit-holder or contractor's road opening is less than 1.0 metre from the lip of a channel, the floating section of pavement must be removed and the final surface reinstatement will be from the furthest edge from opening/trench to the lip of channel.

37. All road pavement surfaces must be cut with a circular saw.

Flexible road pavement (Asphalt)
Specification for Flexible Road Pavements – Refer to Standard Drawing SD3103

Rigid Road Pavement (Concrete)

Temporary reinstatements

38. All temporary road reinstatements must be finished with cold-mix (premix asphalt) flush with the existing surfaces unless permanent hot-mix asphalt reinstatement is being completed immediately following the compaction of the pavement surface.

Nature strips

39. All nature strips must be reinstated. Backfilling of nature strips must be completed with natural soil material compacted in 150mm layers, 90% standard compaction to a level 75mm below surface. The remaining backfill must be uncompacted topsoil to 15mm above the surface level and the surface even and seeded to Council's satisfaction. The area must be kept moist until germination has occurred.

Reinstatement of vehicle crossings
Specification for Vehicle Crossings – Refer to Standard Drawing SD4101

40. The vehicle crossing must be constructed in accordance with Council's current Standard Drawing.

41. Concrete vehicle crossings affected by works must be reinstated in full sections (panels) within the surrounding joints unless otherwise directed by Council's 'Asset Inspection Officer'.

42. When reinstating a section/panel, Y16 dowel bars 400mm lengths must be inserted 200mm into the existing concrete surface and spaced 300mm apart.

Kerb and channel
Specification for Concrete Kerb and Channel – Refer to Standard Drawing SD1101
Specification for Bluestone Kerb and Channel – Refer to Standard Drawing SD1102

43. The kerb and channel must be reinstated to the satisfaction of Council's Asset Inspection Officer.

Bluestone pitchers
Specification for Bluestone Pitchers – Refer to Standard Drawing SD3101

44. The bluestone pitcher kerb and channel, and pavement must be reinstated to the satisfaction of Council's Asset Inspection Officer.

Footnotes:

Permitted Construction Hours
Under Council's Local Law No. 1 (Community Amenity), A *builder* requires a permit to carry out building works on a building site other than between 7.00am to 6.00pm Monday to Friday, and 9.00am to 3.00pm Saturday. No works are permitted on a public holiday as defined by the *Public Holidays Act* 1993.

Dial Before You Dig
Neglecting to dial 1100 before excavating can lead to costly disruption to essential services. Dial Before You Dig is a free referral service for information on locating underground utilities.
Ph: 1100
Web: www.1100.com.au

Standard Construction Drawings
http://www.portphillip.vic.gov.au/road_opening_permit.htm

City of Port Phillip Permits Index
http://www.portphillip.vic.gov.au/permits_licenses_index.htm

Contacts / Links

Asset Inspection Officer
Ph: 9209 6590
Fx: 9536 2710
Email: helpassetinspection@portphillip.vic.gov.au

City Permits
Ph: 9209 6216
Fx: 9536 2745
Email: devpermits@portphillip.vic.gov.au

Road Opening Request for Final Inspection

Community Amenity Local Law No. 1 Clause 14

This form must be completed within 48 hours of completion of works.
Any security bond refunds will be issued within 20 business days.

Applicant Details			
Site Address:			
Applicant/Business Name:			
Applicant's Postal Address:			
Telephone Number:		Mobile Number:	
E-mail Address:			
ABN:		ACN:	
Road Opening Details			
Road Opening Permit No:	.... / .... / **RO**		
Reason for Permit (tick appropriate box)			
Start & Completion Date of Works:	From: / /	To: / /	

What part of the Road Reserve are your works in?									
Footpath		Nature Strip		Road or Lane		Car Park		Kerb Channel	
Size of Opening:	**m L x m W = m²**								

Did any of the following assets require relocation as a result of the Road Opening?							
Parking Ticket Machine		Street Furniture		Litter Bin		Other (please state)	
The applicant is responsible for all associated costs as a result of the relocation of any Council assets.							

Our enquiries counter at St Kilda Town Hall
is open from 8.30am to 5.00pm Monday to Friday
T: 9209 6216 F: 9536 2745 E: devpermits@portphillip.vic.gov.au

www.portphillip.vic.gov.au/road_permits.htm

Road Opening Request for Final Inspection

Community Amenity Local Law No. 1 Clause 14

Request for Final Reinstatement

Any excavation or opening must be reinstated to Council requirements as per items (7), (9), (10) and (11) of Port Phillip City Council conditions on which a permit to open or obstruct roadways is issued (attached to Permit). The permanent reinstatement can be undertaken by Council if the applicant is unable to. The applicant at a bare minimum must be reinstated to temporary measures once the permit expires or when the safety precautions are removed.
Any opening within the City of Port Phillip must be back filled with crushed rock, compacted and finished with cold mix as a temporary measure until full reinstatement is completed by the applicant. If the applicant submits this application (Request for Final Inspection) without fully reinstating the surface to the original material being concrete, bluestone or asphalt and to Council requirements, the cost of shall be deducted from the security bond.

How have you reinstated the Road Opening?					
Permanent reinstatement (to original standard)		Temporary reinstatement (less than original standard)			
What material has been used in your reinstatement?					
Crushed and compacted rock (temporary)		Finished with asphalt cold mix (temporary			
Concrete (permanent)		Asphalt hot mix (permanent)		Bluestone (permanent)	
NOTE: If you have reinstated to less than the original quality and material or not to Council standards the reinstatement will be performed by Council's Infrastructure Services and the applicant will be debited or invoiced for the difference. The work will be inspected and final reinstatement (if required) will be undertaken by Council within 28 days on receipt of this form.					

Applicant's Name: .....

Applicant's Signature: ..... **Date:** .....

How to Apply

Submit this application form to: City Permits, City of Port Phillip, Private Bag No. 3, PO St Kilda VIC 3182
Or email a scan to devpermits@portphillip.vic.gov.au or fax to 9536 2745.

Further Information

Contact City Permits on 9209 6216 or devpermits@portphillip.vic.gov.au

Privacy Statement: The personal information requested on this form is being collected by the council for purposes of assessment in accordance with Community Amenity Local Law No. 1, Clause 14. The personal information will be used solely by the council for that primary purpose or directly related purposes. The applicant understands that the personal information provided is for the purpose of considering the application for an Asset Protection Permit and that he or she may apply to the council for access to the information. Requests for access and or correction should be made to Freedom of Information & Privacy Officer Governance & Engagement Department, City of Port Phillip.

Our enquiries counter at St Kilda Town Hall
is open from 8.30am to 5.00pm Monday to Friday
T: 9209 6216 F: 9536 2745 E: devpermits@portphillip.vic.gov.au

www.portphillip.vic.gov.au/road_permits.htm

Enquiries:
Email: devpermits@portphillip.vic.gov.au
Phone: 9209 6216
Mail: Private Bag No. 3, PO ST KILDA VIC 3182

CITY OF PORT PHILLIP
ABN 21 762 977 945

8 October 2015

AECOM
9/8 Exhibition St
MELBOURNE VIC 3000

ROAD OPENING PERMIT
209/2015/RO
Issued Under Community Amenity Local Law No: 1 (Clause 14)

This permit has been approved and issued subject to the following conditions and the permit holder shall be held to have agreed to such conditions and to have accepted any liability or responsibility thereby imposed.

Site of Works: Thackray Road, all of street, PORT MELBOURNE VIC 3207, Woolboard Road, all of street, PORT MELBOURNE

Description of Works: Bore holes for groundwater sampling.(MW4)

Permit Valid From: 12 October 2015 **To:** 6 November 2015

In addition to complying with any relevant requirements in the Local Law No. 1, Community Amenity the following conditions apply to the activity or use:

Standard Conditions:

1. All works associated with the road opening including the set-up and removal of necessary signs and barriers may be undertaken between 7am to 6pm Monday to Friday and 9am to 3pm Saturday. Obstructions to traffic flow are not permitted outside of this period including setting up or removal of the infrastructure. .

2. To amend the dates of this licence requires a written request to be received by the City Permits by 5pm, while the permit is still valid. Once a permit has expired it cannot be re-used or amended.

3. A maximum of two (2) amendments to re-schedule the dates of this permit can be considered prior to incurring additional fees.

4. An absolute minimum width of 1.5 metres must be maintained for safe pedestrian access. Pedestrian safety must be maintained at all times by the appopriate use of bollards and tape. On both approaches to the works, the following signs must be clearly displayed and in place during the works;

    a) Pedestrian arrow signs
    a) Pedestrians Watch Your Step or,
    b) Pedestrian Use Other Footpath

5. All traffic treatments must be installed in accordance with any Traffic Management Plan submitted to Council and maintained during the works.

6. Signage must be visible and must not obstruct sightlines, designated pedestrian footpaths and crossovers/accesses. If on-street parking spaces are required to be used, only the spaces clearly specified on the

plan can be used for that purpose.

7. Accredited Traffic Control Officers must be present to manage traffic flow during a partial or full road closure. Traffic Control Officers must also assist pedestrians and cyclists as required.

8. If vehicular traffic flow is affected by the works, emergency services, including, Fire Brigade, Ambulance and Police must be notified by the permit-holder a minimum of 24 hours prior the commencement of works.

9. To the satisfaction of, and at no cost to Council, the permit-holder must reinstate all assets and infrastructure.

10. City of Port Phillip does not accept any responsibility for accidents, damage or injury to property, participants or third parties that may arise out of this event. There must be public liability insurance for the type of work proposed with an indemnity of not less than $10M, including full indemnity for the City of Port Phillip Council against any claim laid against it either by members of the public or persons engaged in any activities associated with the traffic diversion who, as a result of the diversion, suffer personal injury, property damage or financial loss.

11. The permit-holder must comply with AS 1742.3 2002. Manual of uniform traffic control devices, Part 3 Traffic Control Devices for lane and Road Closures and the relevant Standards Australia Field Guides Part 1. Short term urban works, daytime/night time SAA HB 81.1 & 4 1996.

12. City of Port Phillip reserves the right to amend or revoke the above at any time.

Prior to commencement

13. In addition to the requirement to obtain a Road Opening Permit, further permits may be required for activities on Council land such as Skip Bin, Road Closure, Street Occupation, or Asset Protection. Consents may also be required from VicRoads, utilities and public transport operators. The permit-holder must ensure all relevant permits and approvals have been obtained prior to commencing any works.

14. The permit-holder must provide a minimum of 2 business day's written notification to the occupants of all affected owners, occupiers and businesses affected by the works. The notification must include the following information and a copy forwarded to the City Permits unit, e-mail: devpermits@portphillip.vic.gov.au and must include:-

    a) The nature of the works being performed
    a) The date and hours of works occurring under this permit
    b) Council's permit reference
    c) Contact name and phone number for the permit holder and/or site manager

15. The permit-holder must contact City Permits unit at least 2 business days prior to commencing works, by e-mail: devpermits@portphillip.vic.gov.au, or ph: 03 9209 6216, to organise an inspection with Council's Asset Inspection Officer to determine:

    - the extent of reinstatement works including road pavement, signage and markings
    - the requirement for further inspections,
    - any requirements for the removal, storage and reinstatement of bluestone assets
    - removal and reinstatement of street furniture, (litter bins, public seating and bicycle hoops)

During construction

16. Works that may cause significant delay to traffic and/or public transport services must be scheduled outside peak periods of 7–9am and 4–6pm weekdays unless otherwise permitted with the written consent of Council.

17. Works must be carried out in accordance with '*Road Management Act 2004 Code of Practice Worksite Safety – Traffic Management'* and any approved Traffic Management Plan.

Work execution

18. Without the written consent of the Council the permit-holder must utilise boring techniques when installing underground services. Any piping or cabling work under an existing vehicle crossing must be carried out by boring, unless approval from Council's Asset Inspection Officer has been obtained.

19. If agricultural drains or irrigation pipes are encountered during excavation the permit-holder must carefully replace the pipes to their original position prior to backfilling.

20. The minimum lateral clearance from a drain is 500mm and a vertical clearance of 300mm. If the proposed road opening or any other work interferes with any underground drains, the approval must be obtained from the Council's Assets department prior to the commencement of works.

21. The minimum lateral clearance from a street tree is 2 metres. If the proposed road opening is less than 2 metres, consent must be obtained from Council's Arborist.

22. In the event of cancellation of this permit, the Council reserves the right to reinstate the area at the expense of the permit-holder.

23. Surplus excavated material must be removed from the road reserve daily and the area left in a clean and tidy condition.

24. All finished surfaces must match and be flush with existing surfaces.

25. Within 7 days of completion of the works, the permit holder must submit a request for final inspection to City Permits unit, e-mail: devpermits@portphillip.vic.gov.au.

26. Any damage to Council assets caused by the permit- holder's reinstatement works must be rectified to the satisfaction of Council's Asset Inspection Officer.

27. Failure to restore the road reserve and repair any damage caused to assets will result in Council undertaking the necessary reinstatement works and deducting the cost from the security bond and the remainder refunded. Where costs exceed the security bond amount held, the permit holder will be liable for the excess and charged accordingly.

28. If works are conducted in contravention of this permit, the City of Port Phillip reserves the right to amend or revoke the above at any time.

Reinstatement of footpaths

Asphalt footpaths
Specification for Asphalt Footpath – Refer to Standard Drawing: SD3103

29. The permanent asphalt layer of footpaths must be constructed in accordance with Council's current Standard Drawing.

30. The Bituminous surface at the edges of the trench must be cut with a circular saw.

31. A temporary bituminous surface of premix (cold-mix) minimum depth 75mm must be constructed before the crossing is opened to traffic, unless the permit-holder is completing a permanent reinstatement immediately with hot-mix asphalt.

32. The full width of the footpath must be reinstated. Where only part of a concrete footpath/vehicle crossing panel has been damaged, reinstatement must include the removal and reinstatement of the whole panel.

Concrete footpaths
Specification for Concrete Footpaths – Refer to Standard Drawing: SD3103

33. The permanent concrete layer of footpaths must be constructed in accordance with Council's current Standard Drawing.

34. Concrete footpath areas affected by works will be reinstated in full sections within the surrounding joints unless directed otherwise by Council's Asset Inspection Officer.

35. Existing surface levels must be maintained and the tops of all service pits/junction boxes must be at the footpath surface level.

Reinstatement of road pavements

36. Where the permit-holder or contractor's road opening is less than 1.0 metre from the lip of a channel, the floating section of pavement must be removed and the final surface reinstatement will be from the furthest edge from opening/trench to the lip of channel.

37. All road pavement surfaces must be cut with a circular saw.

Flexible road pavement (Asphalt)
Specification for Flexible Road Pavements – Refer to Standard Drawing SD3103

Rigid Road Pavement (Concrete)

Temporary reinstatements

38. All temporary road reinstatements must be finished with cold-mix (premix asphalt) flush with the existing surfaces unless permanent hot-mix asphalt reinstatement is being completed immediately following the compaction of the pavement surface.

Nature strips

39. All nature strips must be reinstated. Backfilling of nature strips must be completed with natural soil material compacted in 150mm layers, 90% standard compaction to a level 75mm below surface. The remaining backfill must be uncompacted topsoil to 15mm above the surface level and the surface even and seeded to Council's satisfaction. The area must be kept moist until germination has occurred.

Reinstatement of vehicle crossings
Specification for Vehicle Crossings – Refer to Standard Drawing SD4101

40. The vehicle crossing must be constructed in accordance with Council's current Standard Drawing.

41. Concrete vehicle crossings affected by works must be reinstated in full sections (panels) within the surrounding joints unless otherwise directed by Council's 'Asset Inspection Officer'.

42. When reinstating a section/panel, Y16 dowel bars 400mm lengths must be inserted 200mm into the existing concrete surface and spaced 300mm apart.

Kerb and channel
Specification for Concrete Kerb and Channel – Refer to Standard Drawing SD1101
Specification for Bluestone Kerb and Channel – Refer to Standard Drawing SD1102

43. The kerb and channel must be reinstated to the satisfaction of Council's Asset Inspection Officer.

Bluestone pitchers
Specification for Bluestone Pitchers – Refer to Standard Drawing SD3101

44. The bluestone pitcher kerb and channel, and pavement must be reinstated to the satisfaction of Council's Asset Inspection Officer.

Footnotes:

Permitted Construction Hours
Under Council's Local Law No. 1 (Community Amenity), A *builder* requires a permit to carry out building works on a building site other than between 7.00am to 6.00pm Monday to Friday, and 9.00am to 3.00pm Saturday. No works are permitted on a public holiday as defined by the *Public Holidays Act* 1993.

Dial Before You Dig
Neglecting to dial 1100 before excavating can lead to costly disruption to essential services. Dial Before You Dig is a free referral service for information on locating underground utilities.
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Web: www.1100.com.au

Standard Construction Drawings
http://www.portphillip.vic.gov.au/road_opening_permit.htm

City of Port Phillip Permits Index
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Contacts / Links

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Fx: 9536 2710
Email: helpassetinspection@portphillip.vic.gov.au

City Permits
Ph: 9209 6216
Fx: 9536 2745
Email: devpermits@portphillip.vic.gov.au

Road Opening Request for Final Inspection

Community Amenity Local Law No. 1 Clause 14

This form must be completed within 48 hours of completion of works.
Any security bond refunds will be issued within 20 business days.

Applicant Details			
Site Address:			
Applicant/Business Name:			
Applicant's Postal Address:			
Telephone Number:		Mobile Number:	
E-mail Address:			
ABN:		ACN:	
Road Opening Details			
Road Opening Permit No:	.... / .... / **RO**		
Reason for Permit (tick appropriate box)			
Start & Completion Date of Works:	From: / /	To: / /	

What part of the Road Reserve are your works in?									
Footpath		Nature Strip		Road or Lane		Car Park		Kerb Channel	
Size of Opening:	**m L x m W = m²**								

Did any of the following assets require relocation as a result of the Road Opening?							
Parking Ticket Machine		Street Furniture		Litter Bin		Other (please state)	
The applicant is responsible for all associated costs as a result of the relocation of any Council assets.							

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is open from 8.30am to 5.00pm Monday to Friday
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www.portphillip.vic.gov.au/road_permits.htm

Road Opening Request for Final Inspection

Community Amenity Local Law No. 1 Clause 14

Request for Final Reinstatement

Any excavation or opening must be reinstated to Council requirements as per items (7), (9), (10) and (11) of Port Phillip City Council conditions on which a permit to open or obstruct roadways is issued (attached to Permit). The permanent reinstatement can be undertaken by Council if the applicant is unable to. The applicant at a bare minimum must be reinstated to temporary measures once the permit expires or when the safety precautions are removed.
Any opening within the City of Port Phillip must be back filled with crushed rock, compacted and finished with cold mix as a temporary measure until full reinstatement is completed by the applicant. If the applicant submits this application (Request for Final Inspection) without fully reinstating the surface to the original material being concrete, bluestone or asphalt and to Council requirements, the cost of shall be deducted from the security bond.

How have you reinstated the Road Opening?					
Permanent reinstatement (to original standard)		Temporary reinstatement (less than original standard)			
What material has been used in your reinstatement?					
Crushed and compacted rock (temporary)		Finished with asphalt cold mix (temporary			
Concrete (permanent)		Asphalt hot mix (permanent)		Bluestone (permanent)	
NOTE: If you have reinstated to less than the original quality and material or not to Council standards the reinstatement will be performed by Council's Infrastructure Services and the applicant will be debited or invoiced for the difference. The work will be inspected and final reinstatement (if required) will be undertaken by Council within 28 days on receipt of this form.					

Applicant's Name: .....

Applicant's Signature: ..... **Date:** .....

How to Apply

Submit this application form to: City Permits, City of Port Phillip, Private Bag No. 3, PO St Kilda VIC 3182
Or email a scan to devpermits@portphillip.vic.gov.au or fax to 9536 2745.

Further Information

Contact City Permits on 9209 6216 or devpermits@portphillip.vic.gov.au

Privacy Statement: The personal information requested on this form is being collected by the council for purposes of assessment in accordance with Community Amenity Local Law No. 1, Clause 14. The personal information will be used solely by the council for that primary purpose or directly related purposes. The applicant understands that the personal information provided is for the purpose of considering the application for an Asset Protection Permit and that he or she may apply to the council for access to the information. Requests for access and or correction should be made to Freedom of Information & Privacy Officer Governance & Engagement Department, City of Port Phillip.

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is open from 8.30am to 5.00pm Monday to Friday
T: 9209 6216 F: 9536 2745 E: devpermits@portphillip.vic.gov.au

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Enquiries:
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CITY OF PORT PHILLIP
ABN 21 762 977 945

8 October 2015

AECOM
9/8 Exhibition St
MELBOURNE VIC 3000

ROAD OPENING PERMIT
210/2015/RO
Issued Under Community Amenity Local Law No: 1 (Clause 14)

This permit has been approved and issued subject to the following conditions and the permit holder shall be held to have agreed to such conditions and to have accepted any liability or responsibility thereby imposed.

Site of Works: Graham Street, all of Port Melbourne section, PORT MELBOURNE

Description of Works: Bore holes for groundwater sampling.(MW5)

Permit Valid From: 12 October 2015 **To:** 6 November 2015

In addition to complying with any relevant requirements in the Local Law No. 1, Community Amenity the following conditions apply to the activity or use:

Standard Conditions:

1. All works associated with the road opening including the set-up and removal of necessary signs and barriers may be undertaken between 7am to 6pm Monday to Friday and 9am to 3pm Saturday. Obstructions to traffic flow are not permitted outside of this period including setting up or removal of the infrastructure.

2. To amend the dates of this licence requires a written request to be received by the City Permits by 5pm, while the permit is still valid. Once a permit has expired it cannot be re-used or amended.

3. A maximum of two (2) amendments to re-schedule the dates of this permit can be considered prior to incurring additional fees.

4. An absolute minimum width of 1.5 metres must be maintained for safe pedestrian access. Pedestrian safety must be maintained at all times by the appopriate use of bollards and tape. On both approaches to the works, the following signs must be clearly displayed and in place during the works;

    a) Pedestrian arrow signs
    a) Pedestrians Watch Your Step or,
    b) Pedestrian Use Other Footpath

5. All traffic treatments must be installed in accordance with any Traffic Management Plan submitted to Council and maintained during the works.

6. Signage must be visible and must not obstruct sightlines, designated pedestrian footpaths and crossovers/accesses. If on-street parking spaces are required to be used, only the spaces clearly specified on the plan can be used for that purpose.

7. Accredited Traffic Control Officers must be present to manage traffic flow during a partial or full road closure. Traffic Control Officers must also assist pedestrians and cyclists as required.

8. If vehicular traffic flow is affected by the works, emergency services, including, Fire Brigade, Ambulance and Police must be notified by the permit-holder a minimum of 24 hours prior the commencement of works.

9. To the satisfaction of, and at no cost to Council, the permit-holder must reinstate all assets and infrastructure.

10. City of Port Phillip does not accept any responsibility for accidents, damage or injury to property, participants or third parties that may arise out of this event. There must be public liability insurance for the type of work proposed with an indemnity of not less than $10M, including full indemnity for the City of Port Phillip Council against any claim laid against it either by members of the public or persons engaged in any activities associated with the traffic diversion who, as a result of the diversion, suffer personal injury, property damage or financial loss.

11. The permit-holder must comply with AS 1742.3 2002. Manual of uniform traffic control devices, Part 3 Traffic Control Devices for lane and Road Closures and the relevant Standards Australia Field Guides Part 1. Short term urban works, daytime/night time SAA HB 81.1 & 4 1996.

12. City of Port Phillip reserves the right to amend or revoke the above at any time.

Prior to commencement

13. In addition to the requirement to obtain a Road Opening Permit, further permits may be required for activities on Council land such as Skip Bin, Road Closure, Street Occupation, or Asset Protection. Consents may also be required from VicRoads, utilities and public transport operators. The permit-holder must ensure all relevant permits and approvals have been obtained prior to commencing any works.

14. The permit-holder must provide a minimum of 2 business day's written notification to the occupants of all affected owners, occupiers and businesses affected by the works. The notification must include the following information and a copy forwarded to the City Permits unit, e-mail: devpermits@portphillip.vic.gov.au and must include:-

    a) The nature of the works being performed
    a) The date and hours of works occurring under this permit
    b) Council's permit reference
    c) Contact name and phone number for the permit holder and/or site manager

15. The permit-holder must contact City Permits unit at least 2 business days prior to commencing works, by e-mail: devpermits@portphillip.vic.gov.au, or ph: 03 9209 6216, to organise an inspection with Council's Asset Inspection Officer to determine:

    - the extent of reinstatement works including road pavement, signage and markings
    - the requirement for further inspections,
    - any requirements for the removal, storage and reinstatement of bluestone assets
    - removal and reinstatement of street furniture, (litter bins, public seating and bicycle hoops)

During construction

16. Works that may cause significant delay to traffic and/or public transport services must be scheduled outside peak periods of 7–9am and 4–6pm weekdays unless otherwise permitted with the written consent of Council.

17. Works must be carried out in accordance with '*Road Management Act 2004 Code of Practice Worksite Safety – Traffic Management'* and any approved Traffic Management Plan.

Work execution

18. Without the written consent of the Council the permit-holder must utilise boring techniques when installing underground services. Any piping or cabling work under an existing vehicle crossing must be carried out by boring, unless approval from Council's Asset Inspection Officer has been obtained.

19. If agricultural drains or irrigation pipes are encountered during excavation the permit-holder must carefully replace the pipes to their original position prior to backfilling.

20. The minimum lateral clearance from a drain is 500mm and a vertical clearance of 300mm. If the proposed road opening or any other work interferes with any underground drains, the approval must be obtained from the Council's Assets department prior to the commencement of works.

21. The minimum lateral clearance from a street tree is 2 metres. If the proposed road opening is less than 2 metres, consent must be obtained from Council's Arborist.

22. In the event of cancellation of this permit, the Council reserves the right to reinstate the area at the expense of the permit-holder.

23. Surplus excavated material must be removed from the road reserve daily and the area left in a clean and tidy condition.

24. All finished surfaces must match and be flush with existing surfaces.

25. Within 7 days of completion of the works, the permit holder must submit a request for final inspection to City Permits unit, e-mail: devpermits@portphillip.vic.gov.au.

26. Any damage to Council assets caused by the permit- holder's reinstatement works must be rectified to the satisfaction of Council's Asset Inspection Officer.

27. Failure to restore the road reserve and repair any damage caused to assets will result in Council undertaking the necessary reinstatement works and deducting the cost from the security bond and the remainder refunded. Where costs exceed the security bond amount held, the permit holder will be liable for the excess and charged accordingly.

28. If works are conducted in contravention of this permit, the City of Port Phillip reserves the right to amend or revoke the above at any time.

Reinstatement of footpaths

Asphalt footpaths
Specification for Asphalt Footpath – Refer to Standard Drawing: SD3103

29. The permanent asphalt layer of footpaths must be constructed in accordance with Council's current Standard Drawing.

30. The Bituminous surface at the edges of the trench must be cut with a circular saw.

31. A temporary bituminous surface of premix (cold-mix) minimum depth 75mm must be constructed before the crossing is opened to traffic, unless the permit-holder is completing a permanent reinstatement immediately with hot-mix asphalt.

32. The full width of the footpath must be reinstated. Where only part of a concrete footpath/vehicle crossing panel has been damaged, reinstatement must include the removal and reinstatement of the whole panel.

Concrete footpaths
Specification for Concrete Footpaths – Refer to Standard Drawing: SD3103

33. The permanent concrete layer of footpaths must be constructed in accordance with Council's current Standard Drawing.

34. Concrete footpath areas affected by works will be reinstated in full sections within the surrounding joints unless directed otherwise by Council's Asset Inspection Officer.

35. Existing surface levels must be maintained and the tops of all service pits/junction boxes must be at the footpath surface level.

Reinstatement of road pavements

36. Where the permit-holder or contractor's road opening is less than 1.0 metre from the lip of a channel, the floating section of pavement must be removed and the final surface reinstatement will be from the furthest edge from opening/trench to the lip of channel.

37. All road pavement surfaces must be cut with a circular saw.

Flexible road pavement (Asphalt)
Specification for Flexible Road Pavements – Refer to Standard Drawing SD3103

Rigid Road Pavement (Concrete)

Temporary reinstatements

38. All temporary road reinstatements must be finished with cold-mix (premix asphalt) flush with the existing surfaces unless permanent hot-mix asphalt reinstatement is being completed immediately following the compaction of the pavement surface.

Nature strips

39. All nature strips must be reinstated. Backfilling of nature strips must be completed with natural soil material compacted in 150mm layers, 90% standard compaction to a level 75mm below surface. The remaining backfill must be uncompacted topsoil to 15mm above the surface level and the surface even and seeded to Council's satisfaction. The area must be kept moist until germination has occurred.

Reinstatement of vehicle crossings
Specification for Vehicle Crossings – Refer to Standard Drawing SD4101

40. The vehicle crossing must be constructed in accordance with Council's current Standard Drawing.

41. Concrete vehicle crossings affected by works must be reinstated in full sections (panels) within the surrounding joints unless otherwise directed by Council's 'Asset Inspection Officer'.

42. When reinstating a section/panel, Y16 dowel bars 400mm lengths must be inserted 200mm into the existing concrete surface and spaced 300mm apart.

Kerb and channel
Specification for Concrete Kerb and Channel – Refer to Standard Drawing SD1101
Specification for Bluestone Kerb and Channel – Refer to Standard Drawing SD1102

43. The kerb and channel must be reinstated to the satisfaction of Council's Asset Inspection Officer.

Bluestone pitchers
Specification for Bluestone Pitchers – Refer to Standard Drawing SD3101

44. The bluestone pitcher kerb and channel, and pavement must be reinstated to the satisfaction of Council's Asset Inspection Officer.

Footnotes:

Permitted Construction Hours
Under Council's Local Law No. 1 (Community Amenity), A *builder* requires a permit to carry out building works on a building site other than between 7.00am to 6.00pm Monday to Friday, and 9.00am to 3.00pm Saturday. No works are permitted on a public holiday as defined by the *Public Holidays Act* 1993.

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Email: devpermits@portphillip.vic.gov.au

Road Opening Request for Final Inspection

Community Amenity Local Law No. 1 Clause 14

This form must be completed within 48 hours of completion of works.
Any security bond refunds will be issued within 20 business days.

Applicant Details			
Site Address:			
Applicant/Business Name:			
Applicant's Postal Address:			
Telephone Number:		Mobile Number:	
E-mail Address:			
ABN:		ACN:	
Road Opening Details			
Road Opening Permit No:	.... / .... / **RO**		
Reason for Permit (tick appropriate box)			
Start & Completion Date of Works:	From: / /	To: / /	

What part of the Road Reserve are your works in?									
Footpath		Nature Strip		Road or Lane		Car Park		Kerb Channel	
Size of Opening:	**m L x m W = m²**								

Did any of the following assets require relocation as a result of the Road Opening?							
Parking Ticket Machine		Street Furniture		Litter Bin		Other (please state)	
The applicant is responsible for all associated costs as a result of the relocation of any Council assets.							

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Road Opening Request for Final Inspection

Community Amenity Local Law No. 1 Clause 14

Request for Final Reinstatement

Any excavation or opening must be reinstated to Council requirements as per items (7), (9), (10) and (11) of Port Phillip City Council conditions on which a permit to open or obstruct roadways is issued (attached to Permit). The permanent reinstatement can be undertaken by Council if the applicant is unable to. The applicant at a bare minimum must be reinstated to temporary measures once the permit expires or when the safety precautions are removed.
Any opening within the City of Port Phillip must be back filled with crushed rock, compacted and finished with cold mix as a temporary measure until full reinstatement is completed by the applicant. If the applicant submits this application (Request for Final Inspection) without fully reinstating the surface to the original material being concrete, bluestone or asphalt and to Council requirements, the cost of shall be deducted from the security bond.

How have you reinstated the Road Opening?					
Permanent reinstatement (to original standard)		Temporary reinstatement (less than original standard)			
What material has been used in your reinstatement?					
Crushed and compacted rock (temporary)		Finished with asphalt cold mix (temporary			
Concrete (permanent)		Asphalt hot mix (permanent)		Bluestone (permanent)	
NOTE: If you have reinstated to less than the original quality and material or not to Council standards the reinstatement will be performed by Council's Infrastructure Services and the applicant will be debited or invoiced for the difference. The work will be inspected and final reinstatement (if required) will be undertaken by Council within 28 days on receipt of this form.					

Applicant's Name: .....

Applicant's Signature: ..... **Date:** .....

How to Apply

Submit this application form to: City Permits, City of Port Phillip, Private Bag No. 3, PO St Kilda VIC 3182
Or email a scan to devpermits@portphillip.vic.gov.au or fax to 9536 2745.

Further Information

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CITY OF PORT PHILLIP
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8 October 2015

AECOM
9/8 Exhibition St
MELBOURNE VIC 3000

ROAD OPENING PERMIT
213/2015/RO
Issued Under Community Amenity Local Law No: 1 (Clause 14)

This permit has been approved and issued subject to the following conditions and the permit holder shall be held to have agreed to such conditions and to have accepted any liability or responsibility thereby imposed.

Site of Works: Salmon Street, all of street, PORT MELBOURNE

Description of Works: Bore holes for groundwater sampling.(MW8)

Permit Valid From: 12 October 2015 **To:** 6 November 2015

In addition to complying with any relevant requirements in the Local Law No. 1, Community Amenity the following conditions apply to the activity or use:

Standard Conditions:

1. All works associated with the road opening including the set-up and removal of necessary signs and barriers may be undertaken between 7am to 6pm Monday to Friday and 9am to 3pm Saturday. Obstructions to traffic flow are not permitted outside of this period including setting up or removal of the infrastructure. .

2. To amend the dates of this licence requires a written request to be received by the City Permits by 5pm, while the permit is still valid. Once a permit has expired it cannot be re-used or amended.

3. A maximum of two (2) amendments to re-schedule the dates of this permit can be considered prior to incurring additional fees.

4. An absolute minimum width of 1.5 metres must be maintained for safe pedestrian access. Pedestrian safety must be maintained at all times by the appopriate use of bollards and tape. On both approaches to the works, the following signs must be clearly displayed and in place during the works;

    a) Pedestrian arrow signs
    a) Pedestrians Watch Your Step or,
    b) Pedestrian Use Other Footpath

5. All traffic treatments must be installed in accordance with any Traffic Management Plan submitted to Council and maintained during the works.

6. Signage must be visible and must not obstruct sightlines, designated pedestrian footpaths and crossovers/accesses. If on-street parking spaces are required to be used, only the spaces clearly specified on the plan can be used for that purpose.

7. Accredited Traffic Control Officers must be present to manage traffic flow during a partial or full road closure. Traffic Control Officers must also assist pedestrians and cyclists as required.

8. If vehicular traffic flow is affected by the works, emergency services, including, Fire Brigade, Ambulance and Police must be notified by the permit-holder a minimum of 24 hours prior the commencement of works.

9. To the satisfaction of, and at no cost to Council, the permit-holder must reinstate all assets and infrastructure.

10. City of Port Phillip does not accept any responsibility for accidents, damage or injury to property, participants or third parties that may arise out of this event. There must be public liability insurance for the type of work proposed with an indemnity of not less than $10M, including full indemnity for the City of Port Phillip Council against any claim laid against it either by members of the public or persons engaged in any activities associated with the traffic diversion who, as a result of the diversion, suffer personal injury, property damage or financial loss.

11. The permit-holder must comply with AS 1742.3 2002. Manual of uniform traffic control devices, Part 3 Traffic Control Devices for lane and Road Closures and the relevant Standards Australia Field Guides Part 1. Short term urban works, daytime/night time SAA HB 81.1 & 4 1996.

12. City of Port Phillip reserves the right to amend or revoke the above at any time.

Prior to commencement

13. In addition to the requirement to obtain a Road Opening Permit, further permits may be required for activities on Council land such as Skip Bin, Road Closure, Street Occupation, or Asset Protection. Consents may also be required from VicRoads, utilities and public transport operators. The permit-holder must ensure all relevant permits and approvals have been obtained prior to commencing any works.

14. The permit-holder must provide a minimum of 2 business day's written notification to the occupants of all affected owners, occupiers and businesses affected by the works. The notification must include the following information and a copy forwarded to the City Permits unit, e-mail: devpermits@portphillip.vic.gov.au and must include:-

    a) The nature of the works being performed
    a) The date and hours of works occurring under this permit
    b) Council's permit reference
    c) Contact name and phone number for the permit holder and/or site manager

15. The permit-holder must contact City Permits unit at least 2 business days prior to commencing works, by e-mail: devpermits@portphillip.vic.gov.au, or ph: 03 9209 6216, to organise an inspection with Council's Asset Inspection Officer to determine:

    - the extent of reinstatement works including road pavement, signage and markings
    - the requirement for further inspections,
    - any requirements for the removal, storage and reinstatement of bluestone assets
    - removal and reinstatement of street furniture, (litter bins, public seating and bicycle hoops)

During construction

16. Works that may cause significant delay to traffic and/or public transport services must be scheduled outside peak periods of 7–9am and 4–6pm weekdays unless otherwise permitted with the written consent of Council.

17. Works must be carried out in accordance with '*Road Management Act 2004 Code of Practice Worksite Safety – Traffic Management'* and any approved Traffic Management Plan.

Work execution

18. Without the written consent of the Council the permit-holder must utilise boring techniques when installing underground services. Any piping or cabling work under an existing vehicle crossing must be carried out by boring, unless approval from Council's Asset Inspection Officer has been obtained.

19. If agricultural drains or irrigation pipes are encountered during excavation the permit-holder must carefully replace the pipes to their original position prior to backfilling.

20. The minimum lateral clearance from a drain is 500mm and a vertical clearance of 300mm. If the proposed road opening or any other work interferes with any underground drains, the approval must be obtained from the Council's Assets department prior to the commencement of works.

21. The minimum lateral clearance from a street tree is 2 metres. If the proposed road opening is less than 2 metres, consent must be obtained from Council's Arborist.

22. In the event of cancellation of this permit, the Council reserves the right to reinstate the area at the expense of the permit-holder.

23. Surplus excavated material must be removed from the road reserve daily and the area left in a clean and tidy condition.

24. All finished surfaces must match and be flush with existing surfaces.

25. Within 7 days of completion of the works, the permit holder must submit a request for final inspection to City Permits unit, e-mail: devpermits@portphillip.vic.gov.au.

26. Any damage to Council assets caused by the permit- holder's reinstatement works must be rectified to the satisfaction of Council's Asset Inspection Officer.

27. Failure to restore the road reserve and repair any damage caused to assets will result in Council undertaking the necessary reinstatement works and deducting the cost from the security bond and the remainder refunded. Where costs exceed the security bond amount held, the permit holder will be liable for the excess and charged accordingly.

28. If works are conducted in contravention of this permit, the City of Port Phillip reserves the right to amend or revoke the above at any time.

Reinstatement of footpaths

Asphalt footpaths
Specification for Asphalt Footpath – Refer to Standard Drawing: SD3103

29. The permanent asphalt layer of footpaths must be constructed in accordance with Council's current Standard Drawing.

30. The Bituminous surface at the edges of the trench must be cut with a circular saw.

31. A temporary bituminous surface of premix (cold-mix) minimum depth 75mm must be constructed before the crossing is opened to traffic, unless the permit-holder is completing a permanent reinstatement immediately with hot-mix asphalt.

32. The full width of the footpath must be reinstated. Where only part of a concrete footpath/vehicle crossing panel has been damaged, reinstatement must include the removal and reinstatement of the whole panel.

Concrete footpaths
Specification for Concrete Footpaths – Refer to Standard Drawing: SD3103

33. The permanent concrete layer of footpaths must be constructed in accordance with Council's current Standard Drawing.

34. Concrete footpath areas affected by works will be reinstated in full sections within the surrounding joints unless directed otherwise by Council's Asset Inspection Officer.

35. Existing surface levels must be maintained and the tops of all service pits/junction boxes must be at the footpath surface level.

Reinstatement of road pavements

36. Where the permit-holder or contractor's road opening is less than 1.0 metre from the lip of a channel, the floating section of pavement must be removed and the final surface reinstatement will be from the furthest edge from opening/trench to the lip of channel.

37. All road pavement surfaces must be cut with a circular saw.

Flexible road pavement (Asphalt)
Specification for Flexible Road Pavements – Refer to Standard Drawing SD3103

Rigid Road Pavement (Concrete)

Temporary reinstatements

38. All temporary road reinstatements must be finished with cold-mix (premix asphalt) flush with the existing surfaces unless permanent hot-mix asphalt reinstatement is being completed immediately following the compaction of the pavement surface.

Nature strips

39. All nature strips must be reinstated. Backfilling of nature strips must be completed with natural soil material compacted in 150mm layers, 90% standard compaction to a level 75mm below surface. The remaining backfill must be uncompacted topsoil to 15mm above the surface level and the surface even and seeded to Council's satisfaction. The area must be kept moist until germination has occurred.

Reinstatement of vehicle crossings
Specification for Vehicle Crossings – Refer to Standard Drawing SD4101

40. The vehicle crossing must be constructed in accordance with Council's current Standard Drawing.

41. Concrete vehicle crossings affected by works must be reinstated in full sections (panels) within the surrounding joints unless otherwise directed by Council's 'Asset Inspection Officer'.

42. When reinstating a section/panel, Y16 dowel bars 400mm lengths must be inserted 200mm into the existing concrete surface and spaced 300mm apart.

Kerb and channel
Specification for Concrete Kerb and Channel – Refer to Standard Drawing SD1101
Specification for Bluestone Kerb and Channel – Refer to Standard Drawing SD1102

43. The kerb and channel must be reinstated to the satisfaction of Council's Asset Inspection Officer.

Bluestone pitchers
Specification for Bluestone Pitchers – Refer to Standard Drawing SD3101

44. The bluestone pitcher kerb and channel, and pavement must be reinstated to the satisfaction of Council's Asset Inspection Officer.

Footnotes:

Permitted Construction Hours
Under Council's Local Law No. 1 (Community Amenity), A *builder* requires a permit to carry out building works on a building site other than between 7.00am to 6.00pm Monday to Friday, and 9.00am to 3.00pm Saturday. No works are permitted on a public holiday as defined by the *Public Holidays Act* 1993.

Dial Before You Dig
Neglecting to dial 1100 before excavating can lead to costly disruption to essential services. Dial Before You Dig is a free referral service for information on locating underground utilities.
Ph: 1100
Web: www.1100.com.au

Standard Construction Drawings
http://www.portphillip.vic.gov.au/road_opening_permit.htm

City of Port Phillip Permits Index
http://www.portphillip.vic.gov.au/permits_licenses_index.htm

Contacts / Links

Asset Inspection Officer
Ph: 9209 6590
Fx: 9536 2710
Email: helpassetinspection@portphillip.vic.gov.au

City Permits
Ph: 9209 6216
Fx: 9536 2745
Email: devpermits@portphillip.vic.gov.au

Road Opening Request for Final Inspection

Community Amenity Local Law No. 1 Clause 14

This form must be completed within 48 hours of completion of works.
Any security bond refunds will be issued within 20 business days.

Applicant Details			
Site Address:			
Applicant/Business Name:			
Applicant's Postal Address:			
Telephone Number:		Mobile Number:	
E-mail Address:			
ABN:		ACN:	
Road Opening Details			
Road Opening Permit No:	.... / .... / **RO**		
Reason for Permit (tick appropriate box)			
Start & Completion Date of Works:	From: / /	To: / /	

What part of the Road Reserve are your works in?									
Footpath		Nature Strip		Road or Lane		Car Park		Kerb Channel	
Size of Opening:	**m L x m W = m²**								

Did any of the following assets require relocation as a result of the Road Opening?							
Parking Ticket Machine		Street Furniture		Litter Bin		Other (please state)	
The applicant is responsible for all associated costs as a result of the relocation of any Council assets.							

Our enquiries counter at St Kilda Town Hall
is open from 8.30am to 5.00pm Monday to Friday
T: 9209 6216 F: 9536 2745 E: devpermits@portphillip.vic.gov.au

www.portphillip.vic.gov.au/road_permits.htm

Road Opening Request for Final Inspection

Community Amenity Local Law No. 1 Clause 14

Request for Final Reinstatement

Any excavation or opening must be reinstated to Council requirements as per items (7), (9), (10) and (11) of Port Phillip City Council conditions on which a permit to open or obstruct roadways is issued (attached to Permit). The permanent reinstatement can be undertaken by Council if the applicant is unable to. The applicant at a bare minimum must be reinstated to temporary measures once the permit expires or when the safety precautions are removed.
Any opening within the City of Port Phillip must be back filled with crushed rock, compacted and finished with cold mix as a temporary measure until full reinstatement is completed by the applicant. If the applicant submits this application (Request for Final Inspection) without fully reinstating the surface to the original material being concrete, bluestone or asphalt and to Council requirements, the cost of shall be deducted from the security bond.

How have you reinstated the Road Opening?					
Permanent reinstatement (to original standard)		Temporary reinstatement (less than original standard)			
What material has been used in your reinstatement?					
Crushed and compacted rock (temporary)		Finished with asphalt cold mix (temporary			
Concrete (permanent)		Asphalt hot mix (permanent)		Bluestone (permanent)	
NOTE: If you have reinstated to less than the original quality and material or not to Council standards the reinstatement will be performed by Council's Infrastructure Services and the applicant will be debited or invoiced for the difference. The work will be inspected and final reinstatement (if required) will be undertaken by Council within 28 days on receipt of this form.					

Applicant's Name: .....

Applicant's Signature: ..... **Date:** .....

How to Apply

Submit this application form to: City Permits, City of Port Phillip, Private Bag No. 3, PO St Kilda VIC 3182
Or email a scan to devpermits@portphillip.vic.gov.au or fax to 9536 2745.

Further Information

Contact City Permits on 9209 6216 or devpermits@portphillip.vic.gov.au

Privacy Statement: The personal information requested on this form is being collected by the council for purposes of assessment in accordance with Community Amenity Local Law No. 1, Clause 14. The personal information will be used solely by the council for that primary purpose or directly related purposes. The applicant understands that the personal information provided is for the purpose of considering the application for an Asset Protection Permit and that he or she may apply to the council for access to the information. Requests for access and or correction should be made to Freedom of Information & Privacy Officer Governance & Engagement Department, City of Port Phillip.

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is open from 8.30am to 5.00pm Monday to Friday
T: 9209 6216 F: 9536 2745 E: devpermits@portphillip.vic.gov.au

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Enquiries:
Email: devpermits@portphillip.vic.gov.au
Phone: 9209 6216
Mail: Private Bag No. 3, PO ST KILDA VIC 3182

CITY OF PORT PHILLIP
ABN 21 762 977 945

8 October 2015

AECOM
9/8 Exhibition St
MELBOURNE VIC 3000

ROAD OPENING PERMIT
215/2015/RO
Issued Under Community Amenity Local Law No: 1 (Clause 14)

This permit has been approved and issued subject to the following conditions and the permit holder shall be held to have agreed to such conditions and to have accepted any liability or responsibility thereby imposed.

Site of Works: Smith Street, all of street, PORT MELBOURNE

Description of Works: Bore holes for groundwater sampling.(MW11)

Permit Valid From: 12 October 2015 **To:** 6 November 2015

In addition to complying with any relevant requirements in the Local Law No. 1, Community Amenity the following conditions apply to the activity or use:

Standard Conditions:

1. All works associated with the road opening including the set-up and removal of necessary signs and barriers may be undertaken between 7am to 6pm Monday to Friday and 9am to 3pm Saturday. Obstructions to traffic flow are not permitted outside of this period including setting up or removal of the infrastructure. .

2. To amend the dates of this licence requires a written request to be received by the City Permits by 5pm, while the permit is still valid. Once a permit has expired it cannot be re-used or amended.

3. A maximum of two (2) amendments to re-schedule the dates of this permit can be considered prior to incurring additional fees.

4. An absolute minimum width of 1.5 metres must be maintained for safe pedestrian access. Pedestrian safety must be maintained at all times by the appopriate use of bollards and tape. On both approaches to the works, the following signs must be clearly displayed and in place during the works;

    a) Pedestrian arrow signs
    a) Pedestrians Watch Your Step or,
    b) Pedestrian Use Other Footpath

5. All traffic treatments must be installed in accordance with any Traffic Management Plan submitted to Council and maintained during the works.

6. Signage must be visible and must not obstruct sightlines, designated pedestrian footpaths and crossovers/accesses. If on-street parking spaces are required to be used, only the spaces clearly specified on the plan can be used for that purpose.

7. Accredited Traffic Control Officers must be present to manage traffic flow during a partial or full road closure. Traffic Control Officers must also assist pedestrians and cyclists as required.

8. If vehicular traffic flow is affected by the works, emergency services, including, Fire Brigade, Ambulance and Police must be notified by the permit-holder a minimum of 24 hours prior the commencement of works.

9. To the satisfaction of, and at no cost to Council, the permit-holder must reinstate all assets and infrastructure.

10. City of Port Phillip does not accept any responsibility for accidents, damage or injury to property, participants or third parties that may arise out of this event. There must be public liability insurance for the type of work proposed with an indemnity of not less than $10M, including full indemnity for the City of Port Phillip Council against any claim laid against it either by members of the public or persons engaged in any activities associated with the traffic diversion who, as a result of the diversion, suffer personal injury, property damage or financial loss.

11. The permit-holder must comply with AS 1742.3 2002. Manual of uniform traffic control devices, Part 3 Traffic Control Devices for lane and Road Closures and the relevant Standards Australia Field Guides Part 1. Short term urban works, daytime/night time SAA HB 81.1 & 4 1996.

12. City of Port Phillip reserves the right to amend or revoke the above at any time.

Prior to commencement

13. In addition to the requirement to obtain a Road Opening Permit, further permits may be required for activities on Council land such as Skip Bin, Road Closure, Street Occupation, or Asset Protection. Consents may also be required from VicRoads, utilities and public transport operators. The permit-holder must ensure all relevant permits and approvals have been obtained prior to commencing any works.

14. The permit-holder must provide a minimum of 2 business day's written notification to the occupants of all affected owners, occupiers and businesses affected by the works. The notification must include the following information and a copy forwarded to the City Permits unit, e-mail: devpermits@portphillip.vic.gov.au and must include:-

    a) The nature of the works being performed
    a) The date and hours of works occurring under this permit
    b) Council's permit reference
    c) Contact name and phone number for the permit holder and/or site manager

15. The permit-holder must contact City Permits unit at least 2 business days prior to commencing works, by e-mail: devpermits@portphillip.vic.gov.au, or ph: 03 9209 6216, to organise an inspection with Council's Asset Inspection Officer to determine:

    - the extent of reinstatement works including road pavement, signage and markings
    - the requirement for further inspections,
    - any requirements for the removal, storage and reinstatement of bluestone assets
    - removal and reinstatement of street furniture, (litter bins, public seating and bicycle hoops)

During construction

16. Works that may cause significant delay to traffic and/or public transport services must be scheduled outside peak periods of 7–9am and 4–6pm weekdays unless otherwise permitted with the written consent of Council.

17. Works must be carried out in accordance with '*Road Management Act 2004 Code of Practice Worksite Safety – Traffic Management'* and any approved Traffic Management Plan.

Work execution

18. Without the written consent of the Council the permit-holder must utilise boring techniques when installing underground services. Any piping or cabling work under an existing vehicle crossing must be carried out by boring, unless approval from Council's Asset Inspection Officer has been obtained.

19. If agricultural drains or irrigation pipes are encountered during excavation the permit-holder must carefully replace the pipes to their original position prior to backfilling.

20. The minimum lateral clearance from a drain is 500mm and a vertical clearance of 300mm. If the proposed road opening or any other work interferes with any underground drains, the approval must be obtained from the Council's Assets department prior to the commencement of works.

21. The minimum lateral clearance from a street tree is 2 metres. If the proposed road opening is less than 2 metres, consent must be obtained from Council's Arborist.

22. In the event of cancellation of this permit, the Council reserves the right to reinstate the area at the expense of the permit-holder.

23. Surplus excavated material must be removed from the road reserve daily and the area left in a clean and tidy condition.

24. All finished surfaces must match and be flush with existing surfaces.

25. Within 7 days of completion of the works, the permit holder must submit a request for final inspection to City Permits unit, e-mail: devpermits@portphillip.vic.gov.au.

26. Any damage to Council assets caused by the permit- holder's reinstatement works must be rectified to the satisfaction of Council's Asset Inspection Officer.

27. Failure to restore the road reserve and repair any damage caused to assets will result in Council undertaking the necessary reinstatement works and deducting the cost from the security bond and the remainder refunded. Where costs exceed the security bond amount held, the permit holder will be liable for the excess and charged accordingly.

28. If works are conducted in contravention of this permit, the City of Port Phillip reserves the right to amend or revoke the above at any time.

Reinstatement of footpaths

Asphalt footpaths
Specification for Asphalt Footpath – Refer to Standard Drawing: SD3103

29. The permanent asphalt layer of footpaths must be constructed in accordance with Council's current Standard Drawing.

30. The Bituminous surface at the edges of the trench must be cut with a circular saw.

31. A temporary bituminous surface of premix (cold-mix) minimum depth 75mm must be constructed before the crossing is opened to traffic, unless the permit-holder is completing a permanent reinstatement immediately with hot-mix asphalt.

32. The full width of the footpath must be reinstated. Where only part of a concrete footpath/vehicle crossing panel has been damaged, reinstatement must include the removal and reinstatement of the whole panel.

Concrete footpaths
Specification for Concrete Footpaths – Refer to Standard Drawing: SD3103

33. The permanent concrete layer of footpaths must be constructed in accordance with Council's current Standard Drawing.

34. Concrete footpath areas affected by works will be reinstated in full sections within the surrounding joints unless directed otherwise by Council's Asset Inspection Officer.

35. Existing surface levels must be maintained and the tops of all service pits/junction boxes must be at the footpath surface level.

Reinstatement of road pavements

36. Where the permit-holder or contractor's road opening is less than 1.0 metre from the lip of a channel, the floating section of pavement must be removed and the final surface reinstatement will be from the furthest edge from opening/trench to the lip of channel.

37. All road pavement surfaces must be cut with a circular saw.

Flexible road pavement (Asphalt)
Specification for Flexible Road Pavements – Refer to Standard Drawing SD3103

Rigid Road Pavement (Concrete)

Temporary reinstatements

38. All temporary road reinstatements must be finished with cold-mix (premix asphalt) flush with the existing surfaces unless permanent hot-mix asphalt reinstatement is being completed immediately following the compaction of the pavement surface.

Nature strips

39. All nature strips must be reinstated. Backfilling of nature strips must be completed with natural soil material compacted in 150mm layers, 90% standard compaction to a level 75mm below surface. The remaining backfill must be uncompacted topsoil to 15mm above the surface level and the surface even and seeded to Council's satisfaction. The area must be kept moist until germination has occurred.

Reinstatement of vehicle crossings
Specification for Vehicle Crossings – Refer to Standard Drawing SD4101

40. The vehicle crossing must be constructed in accordance with Council's current Standard Drawing.

41. Concrete vehicle crossings affected by works must be reinstated in full sections (panels) within the surrounding joints unless otherwise directed by Council's 'Asset Inspection Officer'.

42. When reinstating a section/panel, Y16 dowel bars 400mm lengths must be inserted 200mm into the existing concrete surface and spaced 300mm apart.

Kerb and channel
Specification for Concrete Kerb and Channel – Refer to Standard Drawing SD1101
Specification for Bluestone Kerb and Channel – Refer to Standard Drawing SD1102

43. The kerb and channel must be reinstated to the satisfaction of Council's Asset Inspection Officer.

Bluestone pitchers
Specification for Bluestone Pitchers – Refer to Standard Drawing SD3101

44. The bluestone pitcher kerb and channel, and pavement must be reinstated to the satisfaction of Council's Asset Inspection Officer.

Footnotes:

Permitted Construction Hours
Under Council's Local Law No. 1 (Community Amenity), A *builder* requires a permit to carry out building works on a building site other than between 7.00am to 6.00pm Monday to Friday, and 9.00am to 3.00pm Saturday. No works are permitted on a public holiday as defined by the *Public Holidays Act* 1993.

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Contacts / Links

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Email: helpassetinspection@portphillip.vic.gov.au

City Permits
Ph: 9209 6216
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Email: devpermits@portphillip.vic.gov.au

Road Opening Request for Final Inspection

Community Amenity Local Law No. 1 Clause 14

This form must be completed within 48 hours of completion of works.
Any security bond refunds will be issued within 20 business days.

Applicant Details			
Site Address:			
Applicant/Business Name:			
Applicant's Postal Address:			
Telephone Number:		Mobile Number:	
E-mail Address:			
ABN:		ACN:	
Road Opening Details			
Road Opening Permit No:	.... / .... / **RO**		
Reason for Permit (tick appropriate box)			
Start & Completion Date of Works:	From: / /	To: / /	

What part of the Road Reserve are your works in?									
Footpath		Nature Strip		Road or Lane		Car Park		Kerb Channel	
Size of Opening:	**m L x m W = m²**								

Did any of the following assets require relocation as a result of the Road Opening?							
Parking Ticket Machine		Street Furniture		Litter Bin		Other (please state)	
The applicant is responsible for all associated costs as a result of the relocation of any Council assets.							

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www.portphillip.vic.gov.au/road_permits.htm

Road Opening Request for Final Inspection

Community Amenity Local Law No. 1 Clause 14

Request for Final Reinstatement

Any excavation or opening must be reinstated to Council requirements as per items (7), (9), (10) and (11) of Port Phillip City Council conditions on which a permit to open or obstruct roadways is issued (attached to Permit). The permanent reinstatement can be undertaken by Council if the applicant is unable to. The applicant at a bare minimum must be reinstated to temporary measures once the permit expires or when the safety precautions are removed.
Any opening within the City of Port Phillip must be back filled with crushed rock, compacted and finished with cold mix as a temporary measure until full reinstatement is completed by the applicant. If the applicant submits this application (Request for Final Inspection) without fully reinstating the surface to the original material being concrete, bluestone or asphalt and to Council requirements, the cost of shall be deducted from the security bond.

How have you reinstated the Road Opening?					
Permanent reinstatement (to original standard)		Temporary reinstatement (less than original standard)			
What material has been used in your reinstatement?					
Crushed and compacted rock (temporary)		Finished with asphalt cold mix (temporary			
Concrete (permanent)		Asphalt hot mix (permanent)		Bluestone (permanent)	
NOTE: If you have reinstated to less than the original quality and material or not to Council standards the reinstatement will be performed by Council's Infrastructure Services and the applicant will be debited or invoiced for the difference. The work will be inspected and final reinstatement (if required) will be undertaken by Council within 28 days on receipt of this form.					

Applicant's Name: .....

Applicant's Signature: ..... **Date:** .....

How to Apply

Submit this application form to: City Permits, City of Port Phillip, Private Bag No. 3, PO St Kilda VIC 3182
Or email a scan to devpermits@portphillip.vic.gov.au or fax to 9536 2745.

Further Information

Contact City Permits on 9209 6216 or devpermits@portphillip.vic.gov.au

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Enquiries:
Email: devpermits@portphillip.vic.gov.au
Phone: 9209 6216
Mail: Private Bag No. 3, PO ST KILDA VIC 3182

CITY OF PORT PHILLIP
ABN 21 762 977 945

8 October 2015

AECOM
9/8 Exhibition St
MELBOURNE VIC 3000

ROAD OPENING PERMIT
225/2015/RO
Issued Under Community Amenity Local Law No: 1 (Clause 14)

This permit has been approved and issued subject to the following conditions and the permit holder shall be held to have agreed to such conditions and to have accepted any liability or responsibility thereby imposed.

Site of Works: Bridge Street, all of street, PORT MELBOURNE

Description of Works: Bore holes for groundwater sampling.(MW20)

Permit Valid From: 12 October 2015 **To:** 6 November 2015

In addition to complying with any relevant requirements in the Local Law No. 1, Community Amenity the following conditions apply to the activity or use:

Standard Conditions:

1. All works associated with the road opening including the set-up and removal of necessary signs and barriers may be undertaken between 7am to 6pm Monday to Friday and 9am to 3pm Saturday. Obstructions to traffic flow are not permitted outside of this period including setting up or removal of the infrastructure.

2. To amend the dates of this licence requires a written request to be received by the City Permits by 5pm, while the permit is still valid. Once a permit has expired it cannot be re-used or amended.

3. A maximum of two (2) amendments to re-schedule the dates of this permit can be considered prior to incurring additional fees.

4. An absolute minimum width of 1.5 metres must be maintained for safe pedestrian access. Pedestrian safety must be maintained at all times by the appopriate use of bollards and tape. On both approaches to the works, the following signs must be clearly displayed and in place during the works;

    a) Pedestrian arrow signs
    a) Pedestrians Watch Your Step or,
    b) Pedestrian Use Other Footpath

5. All traffic treatments must be installed in accordance with any Traffic Management Plan submitted to Council and maintained during the works.

6. Signage must be visible and must not obstruct sightlines, designated pedestrian footpaths and crossovers/accesses. If on-street parking spaces are required to be used, only the spaces clearly specified on the plan can be used for that purpose.

7. Accredited Traffic Control Officers must be present to manage traffic flow during a partial or full road closure. Traffic Control Officers must also assist pedestrians and cyclists as required.

8. If vehicular traffic flow is affected by the works, emergency services, including, Fire Brigade, Ambulance and Police must be notified by the permit-holder a minimum of 24 hours prior the commencement of works.

9. To the satisfaction of, and at no cost to Council, the permit-holder must reinstate all assets and infrastructure.

10. City of Port Phillip does not accept any responsibility for accidents, damage or injury to property, participants or third parties that may arise out of this event. There must be public liability insurance for the type of work proposed with an indemnity of not less than $10M, including full indemnity for the City of Port Phillip Council against any claim laid against it either by members of the public or persons engaged in any activities associated with the traffic diversion who, as a result of the diversion, suffer personal injury, property damage or financial loss.

11. The permit-holder must comply with AS 1742.3 2002. Manual of uniform traffic control devices, Part 3 Traffic Control Devices for lane and Road Closures and the relevant Standards Australia Field Guides Part 1. Short term urban works, daytime/night time SAA HB 81.1 & 4 1996.

12. City of Port Phillip reserves the right to amend or revoke the above at any time.

Prior to commencement

13. In addition to the requirement to obtain a Road Opening Permit, further permits may be required for activities on Council land such as Skip Bin, Road Closure, Street Occupation, or Asset Protection. Consents may also be required from VicRoads, utilities and public transport operators. The permit-holder must ensure all relevant permits and approvals have been obtained prior to commencing any works.

14. The permit-holder must provide a minimum of 2 business day's written notification to the occupants of all affected owners, occupiers and businesses affected by the works. The notification must include the following information and a copy forwarded to the City Permits unit, e-mail: devpermits@portphillip.vic.gov.au and must include:-

    a) The nature of the works being performed
    a) The date and hours of works occurring under this permit
    b) Council's permit reference
    c) Contact name and phone number for the permit holder and/or site manager

15. The permit-holder must contact City Permits unit at least 2 business days prior to commencing works, by e-mail: devpermits@portphillip.vic.gov.au, or ph: 03 9209 6216, to organise an inspection with Council's Asset Inspection Officer to determine:

    - the extent of reinstatement works including road pavement, signage and markings
    - the requirement for further inspections,
    - any requirements for the removal, storage and reinstatement of bluestone assets
    - removal and reinstatement of street furniture, (litter bins, public seating and bicycle hoops)

During construction

16. Works that may cause significant delay to traffic and/or public transport services must be scheduled outside peak periods of 7–9am and 4–6pm weekdays unless otherwise permitted with the written consent of Council.

17. Works must be carried out in accordance with '*Road Management Act 2004 Code of Practice Worksite Safety – Traffic Management'* and any approved Traffic Management Plan.

Work execution

18. Without the written consent of the Council the permit-holder must utilise boring techniques when installing underground services. Any piping or cabling work under an existing vehicle crossing must be carried out by boring, unless approval from Council's Asset Inspection Officer has been obtained.

19. If agricultural drains or irrigation pipes are encountered during excavation the permit-holder must carefully replace the pipes to their original position prior to backfilling.

20. The minimum lateral clearance from a drain is 500mm and a vertical clearance of 300mm. If the proposed road opening or any other work interferes with any underground drains, the approval must be obtained from the Council's Assets department prior to the commencement of works.

21. The minimum lateral clearance from a street tree is 2 metres. If the proposed road opening is less than 2 metres, consent must be obtained from Council's Arborist.

22. In the event of cancellation of this permit, the Council reserves the right to reinstate the area at the expense of the permit-holder.

23. Surplus excavated material must be removed from the road reserve daily and the area left in a clean and tidy condition.

24. All finished surfaces must match and be flush with existing surfaces.

25. Within 7 days of completion of the works, the permit holder must submit a request for final inspection to City Permits unit, e-mail: devpermits@portphillip.vic.gov.au.

26. Any damage to Council assets caused by the permit- holder's reinstatement works must be rectified to the satisfaction of Council's Asset Inspection Officer.

27. Failure to restore the road reserve and repair any damage caused to assets will result in Council undertaking the necessary reinstatement works and deducting the cost from the security bond and the remainder refunded. Where costs exceed the security bond amount held, the permit holder will be liable for the excess and charged accordingly.

28. If works are conducted in contravention of this permit, the City of Port Phillip reserves the right to amend or revoke the above at any time.

Reinstatement of footpaths

Asphalt footpaths
Specification for Asphalt Footpath – Refer to Standard Drawing: SD3103

29. The permanent asphalt layer of footpaths must be constructed in accordance with Council's current Standard Drawing.

30. The Bituminous surface at the edges of the trench must be cut with a circular saw.

31. A temporary bituminous surface of premix (cold-mix) minimum depth 75mm must be constructed before the crossing is opened to traffic, unless the permit-holder is completing a permanent reinstatement immediately with hot-mix asphalt.

32. The full width of the footpath must be reinstated. Where only part of a concrete footpath/vehicle crossing panel has been damaged, reinstatement must include the removal and reinstatement of the whole panel.

Concrete footpaths
Specification for Concrete Footpaths – Refer to Standard Drawing: SD3103

33. The permanent concrete layer of footpaths must be constructed in accordance with Council's current Standard Drawing.

34. Concrete footpath areas affected by works will be reinstated in full sections within the surrounding joints unless directed otherwise by Council's Asset Inspection Officer.

35. Existing surface levels must be maintained and the tops of all service pits/junction boxes must be at the footpath surface level.

Reinstatement of road pavements

36. Where the permit-holder or contractor's road opening is less than 1.0 metre from the lip of a channel, the floating section of pavement must be removed and the final surface reinstatement will be from the furthest edge from opening/trench to the lip of channel.

37. All road pavement surfaces must be cut with a circular saw.

Flexible road pavement (Asphalt)
Specification for Flexible Road Pavements – Refer to Standard Drawing SD3103

Rigid Road Pavement (Concrete)

Temporary reinstatements

38. All temporary road reinstatements must be finished with cold-mix (premix asphalt) flush with the existing surfaces unless permanent hot-mix asphalt reinstatement is being completed immediately following the compaction of the pavement surface.

Nature strips

39. All nature strips must be reinstated. Backfilling of nature strips must be completed with natural soil material compacted in 150mm layers, 90% standard compaction to a level 75mm below surface. The remaining backfill must be uncompacted topsoil to 15mm above the surface level and the surface even and seeded to Council's satisfaction. The area must be kept moist until germination has occurred.

Reinstatement of vehicle crossings
Specification for Vehicle Crossings – Refer to Standard Drawing SD4101

40. The vehicle crossing must be constructed in accordance with Council's current Standard Drawing.

41. Concrete vehicle crossings affected by works must be reinstated in full sections (panels) within the surrounding joints unless otherwise directed by Council's 'Asset Inspection Officer'.

42. When reinstating a section/panel, Y16 dowel bars 400mm lengths must be inserted 200mm into the existing concrete surface and spaced 300mm apart.

Kerb and channel
Specification for Concrete Kerb and Channel – Refer to Standard Drawing SD1101
Specification for Bluestone Kerb and Channel – Refer to Standard Drawing SD1102

43. The kerb and channel must be reinstated to the satisfaction of Council's Asset Inspection Officer.

Bluestone pitchers
Specification for Bluestone Pitchers – Refer to Standard Drawing SD3101

44. The bluestone pitcher kerb and channel, and pavement must be reinstated to the satisfaction of Council's Asset Inspection Officer.

Footnotes:

Permitted Construction Hours
Under Council's Local Law No. 1 (Community Amenity), A *builder* requires a permit to carry out building works on a building site other than between 7.00am to 6.00pm Monday to Friday, and 9.00am to 3.00pm Saturday. No works are permitted on a public holiday as defined by the *Public Holidays Act* 1993.

Dial Before You Dig
Neglecting to dial 1100 before excavating can lead to costly disruption to essential services. Dial Before You Dig is a free referral service for information on locating underground utilities.
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Web: www.1100.com.au

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http://www.portphillip.vic.gov.au/road_opening_permit.htm

City of Port Phillip Permits Index
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Contacts / Links

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Ph: 9209 6590
Fx: 9536 2710
Email: helpassetinspection@portphillip.vic.gov.au

City Permits
Ph: 9209 6216
Fx: 9536 2745
Email: devpermits@portphillip.vic.gov.au

Road Opening Request for Final Inspection

Community Amenity Local Law No. 1 Clause 14

This form must be completed within 48 hours of completion of works.
Any security bond refunds will be issued within 20 business days.

Applicant Details			
Site Address:			
Applicant/Business Name:			
Applicant's Postal Address:			
Telephone Number:		Mobile Number:	
E-mail Address:			
ABN:		ACN:	
Road Opening Details			
Road Opening Permit No:	.... / .... / **RO**		
Reason for Permit (tick appropriate box)			
Start & Completion Date of Works:	From: / /	To: / /	

What part of the Road Reserve are your works in?									
Footpath		Nature Strip		Road or Lane		Car Park		Kerb Channel	
Size of Opening:	**m L x m W = m²**								

Did any of the following assets require relocation as a result of the Road Opening?							
Parking Ticket Machine		Street Furniture		Litter Bin		Other (please state)	
The applicant is responsible for all associated costs as a result of the relocation of any Council assets.							

Our enquiries counter at St Kilda Town Hall
is open from 8.30am to 5.00pm Monday to Friday
T: 9209 6216 F: 9536 2745 E: devpermits@portphillip.vic.gov.au

www.portphillip.vic.gov.au/road_permits.htm

Road Opening Request for Final Inspection

Community Amenity Local Law No. 1 Clause 14

Request for Final Reinstatement

Any excavation or opening must be reinstated to Council requirements as per items (7), (9), (10) and (11) of Port Phillip City Council conditions on which a permit to open or obstruct roadways is issued (attached to Permit). The permanent reinstatement can be undertaken by Council if the applicant is unable to. The applicant at a bare minimum must be reinstated to temporary measures once the permit expires or when the safety precautions are removed.
Any opening within the City of Port Phillip must be back filled with crushed rock, compacted and finished with cold mix as a temporary measure until full reinstatement is completed by the applicant. If the applicant submits this application (Request for Final Inspection) without fully reinstating the surface to the original material being concrete, bluestone or asphalt and to Council requirements, the cost of shall be deducted from the security bond.

How have you reinstated the Road Opening?					
Permanent reinstatement (to original standard)		Temporary reinstatement (less than original standard)			
What material has been used in your reinstatement?					
Crushed and compacted rock (temporary)		Finished with asphalt cold mix (temporary			
Concrete (permanent)		Asphalt hot mix (permanent)		Bluestone (permanent)	
NOTE: If you have reinstated to less than the original quality and material or not to Council standards the reinstatement will be performed by Council's Infrastructure Services and the applicant will be debited or invoiced for the difference. The work will be inspected and final reinstatement (if required) will be undertaken by Council within 28 days on receipt of this form.					

Applicant's Name: .....

Applicant's Signature: ..... **Date:** .....

How to Apply

Submit this application form to: City Permits, City of Port Phillip, Private Bag No. 3, PO St Kilda VIC 3182
Or email a scan to devpermits@portphillip.vic.gov.au or fax to 9536 2745.

Further Information

Contact City Permits on 9209 6216 or devpermits@portphillip.vic.gov.au

Privacy Statement: The personal information requested on this form is being collected by the council for purposes of assessment in accordance with Community Amenity Local Law No. 1, Clause 14. The personal information will be used solely by the council for that primary purpose or directly related purposes. The applicant understands that the personal information provided is for the purpose of considering the application for an Asset Protection Permit and that he or she may apply to the council for access to the information. Requests for access and or correction should be made to Freedom of Information & Privacy Officer Governance & Engagement Department, City of Port Phillip.

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Enquiries:
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Phone: 9209 6216
Mail: Private Bag No. 3, PO ST KILDA VIC 3182

CITY OF PORT PHILLIP
ABN 21 762 977 945

8 October 2015

AECOM
9/8 Exhibition St
MELBOURNE VIC 3000

ROAD OPENING PERMIT
230/2015/RO
Issued Under Community Amenity Local Law No: 1 (Clause 14)

This permit has been approved and issued subject to the following conditions and the permit holder shall be held to have agreed to such conditions and to have accepted any liability or responsibility thereby imposed.

Site of Works: Bertie Street, all of street, PORT MELBOURNE

Description of Works: Bore holes for groundwater sampling.(MW21)

Permit Valid From: 12 October 2015 **To:** 6 November 2015

In addition to complying with any relevant requirements in the Local Law No. 1, Community Amenity the following conditions apply to the activity or use:

Standard Conditions:

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2. To amend the dates of this licence requires a written request to be received by the City Permits by 5pm, while the permit is still valid. Once a permit has expired it cannot be re-used or amended.

3. A maximum of two (2) amendments to re-schedule the dates of this permit can be considered prior to incurring additional fees.

4. An absolute minimum width of 1.5 metres must be maintained for safe pedestrian access. Pedestrian safety must be maintained at all times by the appopriate use of bollards and tape. On both approaches to the works, the following signs must be clearly displayed and in place during the works;

    a) Pedestrian arrow signs
    a) Pedestrians Watch Your Step or,
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5. All traffic treatments must be installed in accordance with any Traffic Management Plan submitted to Council and maintained during the works.

6. Signage must be visible and must not obstruct sightlines, designated pedestrian footpaths and crossovers/accesses. If on-street parking spaces are required to be used, only the spaces clearly specified on the plan can be used for that purpose.

7. Accredited Traffic Control Officers must be present to manage traffic flow during a partial or full road closure. Traffic Control Officers must also assist pedestrians and cyclists as required.

8. If vehicular traffic flow is affected by the works, emergency services, including, Fire Brigade, Ambulance and Police must be notified by the permit-holder a minimum of 24 hours prior the commencement of works.

9. To the satisfaction of, and at no cost to Council, the permit-holder must reinstate all assets and infrastructure.

10. City of Port Phillip does not accept any responsibility for accidents, damage or injury to property, participants or third parties that may arise out of this event. There must be public liability insurance for the type of work proposed with an indemnity of not less than $10M, including full indemnity for the City of Port Phillip Council against any claim laid against it either by members of the public or persons engaged in any activities associated with the traffic diversion who, as a result of the diversion, suffer personal injury, property damage or financial loss.

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Prior to commencement

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    a) The nature of the works being performed
    a) The date and hours of works occurring under this permit
    b) Council's permit reference
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15. The permit-holder must contact City Permits unit at least 2 business days prior to commencing works, by e-mail: devpermits@portphillip.vic.gov.au, or ph: 03 9209 6216, to organise an inspection with Council's Asset Inspection Officer to determine:

    - the extent of reinstatement works including road pavement, signage and markings
    - the requirement for further inspections,
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    - removal and reinstatement of street furniture, (litter bins, public seating and bicycle hoops)

During construction

16. Works that may cause significant delay to traffic and/or public transport services must be scheduled outside peak periods of 7–9am and 4–6pm weekdays unless otherwise permitted with the written consent of Council.

17. Works must be carried out in accordance with '*Road Management Act 2004 Code of Practice Worksite Safety – Traffic Management'* and any approved Traffic Management Plan.

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23. Surplus excavated material must be removed from the road reserve daily and the area left in a clean and tidy condition.

24. All finished surfaces must match and be flush with existing surfaces.

25. Within 7 days of completion of the works, the permit holder must submit a request for final inspection to City Permits unit, e-mail: devpermits@portphillip.vic.gov.au.

26. Any damage to Council assets caused by the permit- holder's reinstatement works must be rectified to the satisfaction of Council's Asset Inspection Officer.

27. Failure to restore the road reserve and repair any damage caused to assets will result in Council undertaking the necessary reinstatement works and deducting the cost from the security bond and the remainder refunded. Where costs exceed the security bond amount held, the permit holder will be liable for the excess and charged accordingly.

28. If works are conducted in contravention of this permit, the City of Port Phillip reserves the right to amend or revoke the above at any time.

Reinstatement of footpaths

Asphalt footpaths
Specification for Asphalt Footpath – Refer to Standard Drawing: SD3103

29. The permanent asphalt layer of footpaths must be constructed in accordance with Council's current Standard Drawing.

30. The Bituminous surface at the edges of the trench must be cut with a circular saw.

31. A temporary bituminous surface of premix (cold-mix) minimum depth 75mm must be constructed before the crossing is opened to traffic, unless the permit-holder is completing a permanent reinstatement immediately with hot-mix asphalt.

32. The full width of the footpath must be reinstated. Where only part of a concrete footpath/vehicle crossing panel has been damaged, reinstatement must include the removal and reinstatement of the whole panel.

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Reinstatement of road pavements

36. Where the permit-holder or contractor's road opening is less than 1.0 metre from the lip of a channel, the floating section of pavement must be removed and the final surface reinstatement will be from the furthest edge from opening/trench to the lip of channel.

37. All road pavement surfaces must be cut with a circular saw.

Flexible road pavement (Asphalt)
Specification for Flexible Road Pavements – Refer to Standard Drawing SD3103

Rigid Road Pavement (Concrete)

Temporary reinstatements

38. All temporary road reinstatements must be finished with cold-mix (premix asphalt) flush with the existing surfaces unless permanent hot-mix asphalt reinstatement is being completed immediately following the compaction of the pavement surface.

Nature strips

39. All nature strips must be reinstated. Backfilling of nature strips must be completed with natural soil material compacted in 150mm layers, 90% standard compaction to a level 75mm below surface. The remaining backfill must be uncompacted topsoil to 15mm above the surface level and the surface even and seeded to Council's satisfaction. The area must be kept moist until germination has occurred.

Reinstatement of vehicle crossings
Specification for Vehicle Crossings – Refer to Standard Drawing SD4101

40. The vehicle crossing must be constructed in accordance with Council's current Standard Drawing.

41. Concrete vehicle crossings affected by works must be reinstated in full sections (panels) within the surrounding joints unless otherwise directed by Council's 'Asset Inspection Officer'.

42. When reinstating a section/panel, Y16 dowel bars 400mm lengths must be inserted 200mm into the existing concrete surface and spaced 300mm apart.

Kerb and channel
Specification for Concrete Kerb and Channel – Refer to Standard Drawing SD1101
Specification for Bluestone Kerb and Channel – Refer to Standard Drawing SD1102

43. The kerb and channel must be reinstated to the satisfaction of Council's Asset Inspection Officer.

Bluestone pitchers
Specification for Bluestone Pitchers – Refer to Standard Drawing SD3101

44. The bluestone pitcher kerb and channel, and pavement must be reinstated to the satisfaction of Council's Asset Inspection Officer.

Footnotes:

Permitted Construction Hours
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Road Opening Request for Final Inspection

Community Amenity Local Law No. 1 Clause 14

This form must be completed within 48 hours of completion of works.
Any security bond refunds will be issued within 20 business days.

Applicant Details			
Site Address:			
Applicant/Business Name:			
Applicant's Postal Address:			
Telephone Number:		Mobile Number:	
E-mail Address:			
ABN:		ACN:	
Road Opening Details			
Road Opening Permit No:	.... / .... / **RO**		
Reason for Permit (tick appropriate box)			
Start & Completion Date of Works:	From: / /	To: / /	

What part of the Road Reserve are your works in?									
Footpath		Nature Strip		Road or Lane		Car Park		Kerb Channel	
Size of Opening:	**m L x m W = m²**								

Did any of the following assets require relocation as a result of the Road Opening?							
Parking Ticket Machine		Street Furniture		Litter Bin		Other (please state)	
The applicant is responsible for all associated costs as a result of the relocation of any Council assets.							

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Road Opening Request for Final Inspection

Community Amenity Local Law No. 1 Clause 14

Request for Final Reinstatement

Any excavation or opening must be reinstated to Council requirements as per items (7), (9), (10) and (11) of Port Phillip City Council conditions on which a permit to open or obstruct roadways is issued (attached to Permit). The permanent reinstatement can be undertaken by Council if the applicant is unable to. The applicant at a bare minimum must be reinstated to temporary measures once the permit expires or when the safety precautions are removed.
Any opening within the City of Port Phillip must be back filled with crushed rock, compacted and finished with cold mix as a temporary measure until full reinstatement is completed by the applicant. If the applicant submits this application (Request for Final Inspection) without fully reinstating the surface to the original material being concrete, bluestone or asphalt and to Council requirements, the cost of shall be deducted from the security bond.

How have you reinstated the Road Opening?					
Permanent reinstatement (to original standard)		Temporary reinstatement (less than original standard)			
What material has been used in your reinstatement?					
Crushed and compacted rock (temporary)		Finished with asphalt cold mix (temporary			
Concrete (permanent)		Asphalt hot mix (permanent)		Bluestone (permanent)	
NOTE: If you have reinstated to less than the original quality and material or not to Council standards the reinstatement will be performed by Council's Infrastructure Services and the applicant will be debited or invoiced for the difference. The work will be inspected and final reinstatement (if required) will be undertaken by Council within 28 days on receipt of this form.					

Applicant's Name: .....

Applicant's Signature: ..... **Date:** .....

How to Apply

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Further Information

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Enquiries:
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Phone: 9209 6216
Mail: Private Bag No. 3, PO ST KILDA VIC 3182

CITY OF PORT PHILLIP
ABN 21 762 977 945

8 October 2015

AECOM
9/8 Exhibition St
MELBOURNE VIC 3000

ROAD OPENING PERMIT
229/2015/RO
Issued Under Community Amenity Local Law No: 1 (Clause 14)

This permit has been approved and issued subject to the following conditions and the permit holder shall be held to have agreed to such conditions and to have accepted any liability or responsibility thereby imposed.

Site of Works: Ingles Street, all of street, PORT MELBOURNE

Description of Works: Bore holes for groundwater sampling.(MW22)

Permit Valid From: 12 October 2015 **To:** 6 November 2015

In addition to complying with any relevant requirements in the Local Law No. 1, Community Amenity the following conditions apply to the activity or use:

Standard Conditions:

1. All works associated with the road opening including the set-up and removal of necessary signs and barriers may be undertaken between 7am to 6pm Monday to Friday and 9am to 3pm Saturday. Obstructions to traffic flow are not permitted outside of this period including setting up or removal of the infrastructure.

2. To amend the dates of this licence requires a written request to be received by the City Permits by 5pm, while the permit is still valid. Once a permit has expired it cannot be re-used or amended.

3. A maximum of two (2) amendments to re-schedule the dates of this permit can be considered prior to incurring additional fees.

4. An absolute minimum width of 1.5 metres must be maintained for safe pedestrian access. Pedestrian safety must be maintained at all times by the appopriate use of bollards and tape. On both approaches to the works, the following signs must be clearly displayed and in place during the works;

    a) Pedestrian arrow signs
    a) Pedestrians Watch Your Step or,
    b) Pedestrian Use Other Footpath

5. All traffic treatments must be installed in accordance with any Traffic Management Plan submitted to Council and maintained during the works.

6. Signage must be visible and must not obstruct sightlines, designated pedestrian footpaths and crossovers/accesses. If on-street parking spaces are required to be used, only the spaces clearly specified on the plan can be used for that purpose.

7. Accredited Traffic Control Officers must be present to manage traffic flow during a partial or full road closure. Traffic Control Officers must also assist pedestrians and cyclists as required.

8. If vehicular traffic flow is affected by the works, emergency services, including, Fire Brigade, Ambulance and Police must be notified by the permit-holder a minimum of 24 hours prior the commencement of works.

9. To the satisfaction of, and at no cost to Council, the permit-holder must reinstate all assets and infrastructure.

10. City of Port Phillip does not accept any responsibility for accidents, damage or injury to property, participants or third parties that may arise out of this event. There must be public liability insurance for the type of work proposed with an indemnity of not less than $10M, including full indemnity for the City of Port Phillip Council against any claim laid against it either by members of the public or persons engaged in any activities associated with the traffic diversion who, as a result of the diversion, suffer personal injury, property damage or financial loss.

11. The permit-holder must comply with AS 1742.3 2002. Manual of uniform traffic control devices, Part 3 Traffic Control Devices for lane and Road Closures and the relevant Standards Australia Field Guides Part 1. Short term urban works, daytime/night time SAA HB 81.1 & 4 1996.

12. City of Port Phillip reserves the right to amend or revoke the above at any time.

Prior to commencement

13. In addition to the requirement to obtain a Road Opening Permit, further permits may be required for activities on Council land such as Skip Bin, Road Closure, Street Occupation, or Asset Protection. Consents may also be required from VicRoads, utilities and public transport operators. The permit-holder must ensure all relevant permits and approvals have been obtained prior to commencing any works.

14. The permit-holder must provide a minimum of 2 business day's written notification to the occupants of all affected owners, occupiers and businesses affected by the works. The notification must include the following information and a copy forwarded to the City Permits unit, e-mail: devpermits@portphillip.vic.gov.au and must include:-

    a) The nature of the works being performed
    a) The date and hours of works occurring under this permit
    b) Council's permit reference
    c) Contact name and phone number for the permit holder and/or site manager

15. The permit-holder must contact City Permits unit at least 2 business days prior to commencing works, by e-mail: devpermits@portphillip.vic.gov.au, or ph: 03 9209 6216, to organise an inspection with Council's Asset Inspection Officer to determine:

    - the extent of reinstatement works including road pavement, signage and markings
    - the requirement for further inspections,
    - any requirements for the removal, storage and reinstatement of bluestone assets
    - removal and reinstatement of street furniture, (litter bins, public seating and bicycle hoops)

During construction

16. Works that may cause significant delay to traffic and/or public transport services must be scheduled outside peak periods of 7–9am and 4–6pm weekdays unless otherwise permitted with the written consent of Council.

17. Works must be carried out in accordance with '*Road Management Act 2004 Code of Practice Worksite Safety – Traffic Management'* and any approved Traffic Management Plan.

Work execution

18. Without the written consent of the Council the permit-holder must utilise boring techniques when installing underground services. Any piping or cabling work under an existing vehicle crossing must be carried out by boring, unless approval from Council's Asset Inspection Officer has been obtained.

19. If agricultural drains or irrigation pipes are encountered during excavation the permit-holder must carefully replace the pipes to their original position prior to backfilling.

20. The minimum lateral clearance from a drain is 500mm and a vertical clearance of 300mm. If the proposed road opening or any other work interferes with any underground drains, the approval must be obtained from the Council's Assets department prior to the commencement of works.

21. The minimum lateral clearance from a street tree is 2 metres. If the proposed road opening is less than 2 metres, consent must be obtained from Council's Arborist.

22. In the event of cancellation of this permit, the Council reserves the right to reinstate the area at the expense of the permit-holder.

23. Surplus excavated material must be removed from the road reserve daily and the area left in a clean and tidy condition.

24. All finished surfaces must match and be flush with existing surfaces.

25. Within 7 days of completion of the works, the permit holder must submit a request for final inspection to City Permits unit, e-mail: devpermits@portphillip.vic.gov.au.

26. Any damage to Council assets caused by the permit- holder's reinstatement works must be rectified to the satisfaction of Council's Asset Inspection Officer.

27. Failure to restore the road reserve and repair any damage caused to assets will result in Council undertaking the necessary reinstatement works and deducting the cost from the security bond and the remainder refunded. Where costs exceed the security bond amount held, the permit holder will be liable for the excess and charged accordingly.

28. If works are conducted in contravention of this permit, the City of Port Phillip reserves the right to amend or revoke the above at any time.

Reinstatement of footpaths

Asphalt footpaths
Specification for Asphalt Footpath – Refer to Standard Drawing: SD3103

29. The permanent asphalt layer of footpaths must be constructed in accordance with Council's current Standard Drawing.

30. The Bituminous surface at the edges of the trench must be cut with a circular saw.

31. A temporary bituminous surface of premix (cold-mix) minimum depth 75mm must be constructed before the crossing is opened to traffic, unless the permit-holder is completing a permanent reinstatement immediately with hot-mix asphalt.

32. The full width of the footpath must be reinstated. Where only part of a concrete footpath/vehicle crossing panel has been damaged, reinstatement must include the removal and reinstatement of the whole panel.

Concrete footpaths
Specification for Concrete Footpaths – Refer to Standard Drawing: SD3103

33. The permanent concrete layer of footpaths must be constructed in accordance with Council's current Standard Drawing.

34. Concrete footpath areas affected by works will be reinstated in full sections within the surrounding joints unless directed otherwise by Council's Asset Inspection Officer.

35. Existing surface levels must be maintained and the tops of all service pits/junction boxes must be at the footpath surface level.

Reinstatement of road pavements

36. Where the permit-holder or contractor's road opening is less than 1.0 metre from the lip of a channel, the floating section of pavement must be removed and the final surface reinstatement will be from the furthest edge from opening/trench to the lip of channel.

37. All road pavement surfaces must be cut with a circular saw.

Flexible road pavement (Asphalt)
Specification for Flexible Road Pavements – Refer to Standard Drawing SD3103

Rigid Road Pavement (Concrete)

Temporary reinstatements

38. All temporary road reinstatements must be finished with cold-mix (premix asphalt) flush with the existing surfaces unless permanent hot-mix asphalt reinstatement is being completed immediately following the compaction of the pavement surface.

Nature strips

39. All nature strips must be reinstated. Backfilling of nature strips must be completed with natural soil material compacted in 150mm layers, 90% standard compaction to a level 75mm below surface. The remaining backfill must be uncompacted topsoil to 15mm above the surface level and the surface even and seeded to Council's satisfaction. The area must be kept moist until germination has occurred.

Reinstatement of vehicle crossings
Specification for Vehicle Crossings – Refer to Standard Drawing SD4101

40. The vehicle crossing must be constructed in accordance with Council's current Standard Drawing.

41. Concrete vehicle crossings affected by works must be reinstated in full sections (panels) within the surrounding joints unless otherwise directed by Council's 'Asset Inspection Officer'.

42. When reinstating a section/panel, Y16 dowel bars 400mm lengths must be inserted 200mm into the existing concrete surface and spaced 300mm apart.

Kerb and channel
Specification for Concrete Kerb and Channel – Refer to Standard Drawing SD1101
Specification for Bluestone Kerb and Channel – Refer to Standard Drawing SD1102

43. The kerb and channel must be reinstated to the satisfaction of Council's Asset Inspection Officer.

Bluestone pitchers
Specification for Bluestone Pitchers – Refer to Standard Drawing SD3101

44. The bluestone pitcher kerb and channel, and pavement must be reinstated to the satisfaction of Council's Asset Inspection Officer.

Footnotes:

Permitted Construction Hours
Under Council's Local Law No. 1 (Community Amenity), A *builder* requires a permit to carry out building works on a building site other than between 7.00am to 6.00pm Monday to Friday, and 9.00am to 3.00pm Saturday. No works are permitted on a public holiday as defined by the *Public Holidays Act* 1993.

Dial Before You Dig
Neglecting to dial 1100 before excavating can lead to costly disruption to essential services. Dial Before You Dig is a free referral service for information on locating underground utilities.
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Web: www.1100.com.au

Standard Construction Drawings
http://www.portphillip.vic.gov.au/road_opening_permit.htm

City of Port Phillip Permits Index
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Contacts / Links

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Ph: 9209 6590
Fx: 9536 2710
Email: helpassetinspection@portphillip.vic.gov.au

City Permits
Ph: 9209 6216
Fx: 9536 2745
Email: devpermits@portphillip.vic.gov.au

Road Opening Request for Final Inspection

Community Amenity Local Law No. 1 Clause 14

This form must be completed within 48 hours of completion of works.
Any security bond refunds will be issued within 20 business days.

Applicant Details			
Site Address:			
Applicant/Business Name:			
Applicant's Postal Address:			
Telephone Number:		Mobile Number:	
E-mail Address:			
ABN:		ACN:	
Road Opening Details			
Road Opening Permit No:	.... / .... / **RO**		
Reason for Permit (tick appropriate box)			
Start & Completion Date of Works:	From: / /	To: / /	

What part of the Road Reserve are your works in?									
Footpath		Nature Strip		Road or Lane		Car Park		Kerb Channel	
Size of Opening:	**m L x m W = m²**								

Did any of the following assets require relocation as a result of the Road Opening?							
Parking Ticket Machine		Street Furniture		Litter Bin		Other (please state)	
The applicant is responsible for all associated costs as a result of the relocation of any Council assets.							

Our enquiries counter at St Kilda Town Hall
is open from 8.30am to 5.00pm Monday to Friday
T: 9209 6216 F: 9536 2745 E: devpermits@portphillip.vic.gov.au

www.portphillip.vic.gov.au/road_permits.htm

Road Opening Request for Final Inspection

Community Amenity Local Law No. 1 Clause 14

Request for Final Reinstatement

Any excavation or opening must be reinstated to Council requirements as per items (7), (9), (10) and (11) of Port Phillip City Council conditions on which a permit to open or obstruct roadways is issued (attached to Permit). The permanent reinstatement can be undertaken by Council if the applicant is unable to. The applicant at a bare minimum must be reinstated to temporary measures once the permit expires or when the safety precautions are removed.
Any opening within the City of Port Phillip must be back filled with crushed rock, compacted and finished with cold mix as a temporary measure until full reinstatement is completed by the applicant. If the applicant submits this application (Request for Final Inspection) without fully reinstating the surface to the original material being concrete, bluestone or asphalt and to Council requirements, the cost of shall be deducted from the security bond.

How have you reinstated the Road Opening?					
Permanent reinstatement (to original standard)		Temporary reinstatement (less than original standard)			
What material has been used in your reinstatement?					
Crushed and compacted rock (temporary)		Finished with asphalt cold mix (temporary			
Concrete (permanent)		Asphalt hot mix (permanent)		Bluestone (permanent)	
NOTE: If you have reinstated to less than the original quality and material or not to Council standards the reinstatement will be performed by Council's Infrastructure Services and the applicant will be debited or invoiced for the difference. The work will be inspected and final reinstatement (if required) will be undertaken by Council within 28 days on receipt of this form.					

Applicant's Name: .....

Applicant's Signature: ..... **Date:** .....

How to Apply

Submit this application form to: City Permits, City of Port Phillip, Private Bag No. 3, PO St Kilda VIC 3182
Or email a scan to devpermits@portphillip.vic.gov.au or fax to 9536 2745.

Further Information

Contact City Permits on 9209 6216 or devpermits@portphillip.vic.gov.au

Privacy Statement: The personal information requested on this form is being collected by the council for purposes of assessment in accordance with Community Amenity Local Law No. 1, Clause 14. The personal information will be used solely by the council for that primary purpose or directly related purposes. The applicant understands that the personal information provided is for the purpose of considering the application for an Asset Protection Permit and that he or she may apply to the council for access to the information. Requests for access and or correction should be made to Freedom of Information & Privacy Officer Governance & Engagement Department, City of Port Phillip.

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Enquiries:
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Phone: 9209 6216
Mail: Private Bag No. 3, PO ST KILDA VIC 3182

CITY OF PORT PHILLIP
ABN 21 762 977 945

8 October 2015

AECOM
9/8 Exhibition St
MELBOURNE VIC 3000

ROAD OPENING PERMIT
232/2015/RO
Issued Under Community Amenity Local Law No: 1 (Clause 14)

This permit has been approved and issued subject to the following conditions and the permit holder shall be held to have agreed to such conditions and to have accepted any liability or responsibility thereby imposed.

Site of Works: Ingles Street, all of street, PORT MELBOURNE

Description of Works: Bore Holes for Ground Water Montitoring (MW23)

Permit Valid From: 12 October 2015 **To:** 6 November 2015

In addition to complying with any relevant requirements in the Local Law No. 1, Community Amenity the following conditions apply to the activity or use:

Standard Conditions:

1. All works associated with the road opening including the set-up and removal of necessary signs and barriers may be undertaken between 7am to 6pm Monday to Friday and 9am to 3pm Saturday. Obstructions to traffic flow are not permitted outside of this period including setting up or removal of the infrastructure.

2. To amend the dates of this licence requires a written request to be received by the City Permits by 5pm, while the permit is still valid. Once a permit has expired it cannot be re-used or amended.

3. A maximum of two (2) amendments to re-schedule the dates of this permit can be considered prior to incurring additional fees.

4. An absolute minimum width of 1.5 metres must be maintained for safe pedestrian access. Pedestrian safety must be maintained at all times by the appopriate use of bollards and tape. On both approaches to the works, the following signs must be clearly displayed and in place during the works;

    a) Pedestrian arrow signs
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5. All traffic treatments must be installed in accordance with any Traffic Management Plan submitted to Council and maintained during the works.

6. Signage must be visible and must not obstruct sightlines, designated pedestrian footpaths and crossovers/accesses. If on-street parking spaces are required to be used, only the spaces clearly specified on the plan can be used for that purpose.

7. Accredited Traffic Control Officers must be present to manage traffic flow during a partial or full road closure. Traffic Control Officers must also assist pedestrians and cyclists as required.

8. If vehicular traffic flow is affected by the works, emergency services, including, Fire Brigade, Ambulance and Police must be notified by the permit-holder a minimum of 24 hours prior the commencement of works.

9. To the satisfaction of, and at no cost to Council, the permit-holder must reinstate all assets and infrastructure.

10. City of Port Phillip does not accept any responsibility for accidents, damage or injury to property, participants or third parties that may arise out of this event. There must be public liability insurance for the type of work proposed with an indemnity of not less than $10M, including full indemnity for the City of Port Phillip Council against any claim laid against it either by members of the public or persons engaged in any activities associated with the traffic diversion who, as a result of the diversion, suffer personal injury, property damage or financial loss.

11. The permit-holder must comply with AS 1742.3 2002. Manual of uniform traffic control devices, Part 3 Traffic Control Devices for lane and Road Closures and the relevant Standards Australia Field Guides Part 1. Short term urban works, daytime/night time SAA HB 81.1 & 4 1996.

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Prior to commencement

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    a) The nature of the works being performed
    a) The date and hours of works occurring under this permit
    b) Council's permit reference
    c) Contact name and phone number for the permit holder and/or site manager

15. The permit-holder must contact City Permits unit at least 2 business days prior to commencing works, by e-mail: devpermits@portphillip.vic.gov.au, or ph: 03 9209 6216, to organise an inspection with Council's Asset Inspection Officer to determine:

    - the extent of reinstatement works including road pavement, signage and markings
    - the requirement for further inspections,
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    - removal and reinstatement of street furniture, (litter bins, public seating and bicycle hoops)

During construction

16. Works that may cause significant delay to traffic and/or public transport services must be scheduled outside peak periods of 7–9am and 4–6pm weekdays unless otherwise permitted with the written consent of Council.

17. Works must be carried out in accordance with '*Road Management Act 2004 Code of Practice Worksite Safety – Traffic Management'* and any approved Traffic Management Plan.

Work execution

18. Without the written consent of the Council the permit-holder must utilise boring techniques when installing underground services. Any piping or cabling work under an existing vehicle crossing must be carried out by boring, unless approval from Council's Asset Inspection Officer has been obtained.

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22. In the event of cancellation of this permit, the Council reserves the right to reinstate the area at the expense of the permit-holder.

23. Surplus excavated material must be removed from the road reserve daily and the area left in a clean and tidy condition.

24. All finished surfaces must match and be flush with existing surfaces.

25. Within 7 days of completion of the works, the permit holder must submit a request for final inspection to City Permits unit, e-mail: devpermits@portphillip.vic.gov.au.

26. Any damage to Council assets caused by the permit- holder's reinstatement works must be rectified to the satisfaction of Council's Asset Inspection Officer.

27. Failure to restore the road reserve and repair any damage caused to assets will result in Council undertaking the necessary reinstatement works and deducting the cost from the security bond and the remainder refunded. Where costs exceed the security bond amount held, the permit holder will be liable for the excess and charged accordingly.

28. If works are conducted in contravention of this permit, the City of Port Phillip reserves the right to amend or revoke the above at any time.

Reinstatement of footpaths

Asphalt footpaths
Specification for Asphalt Footpath – Refer to Standard Drawing: SD3103

29. The permanent asphalt layer of footpaths must be constructed in accordance with Council's current Standard Drawing.

30. The Bituminous surface at the edges of the trench must be cut with a circular saw.

31. A temporary bituminous surface of premix (cold-mix) minimum depth 75mm must be constructed before the crossing is opened to traffic, unless the permit-holder is completing a permanent reinstatement immediately with hot-mix asphalt.

32. The full width of the footpath must be reinstated. Where only part of a concrete footpath/vehicle crossing panel has been damaged, reinstatement must include the removal and reinstatement of the whole panel.

Concrete footpaths
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34. Concrete footpath areas affected by works will be reinstated in full sections within the surrounding joints unless directed otherwise by Council's Asset Inspection Officer.

35. Existing surface levels must be maintained and the tops of all service pits/junction boxes must be at the footpath surface level.

Reinstatement of road pavements

36. Where the permit-holder or contractor's road opening is less than 1.0 metre from the lip of a channel, the floating section of pavement must be removed and the final surface reinstatement will be from the furthest edge from opening/trench to the lip of channel.

37. All road pavement surfaces must be cut with a circular saw.

Flexible road pavement (Asphalt)
Specification for Flexible Road Pavements – Refer to Standard Drawing SD3103

Rigid Road Pavement (Concrete)

Temporary reinstatements

38. All temporary road reinstatements must be finished with cold-mix (premix asphalt) flush with the existing surfaces unless permanent hot-mix asphalt reinstatement is being completed immediately following the compaction of the pavement surface.

Nature strips

39. All nature strips must be reinstated. Backfilling of nature strips must be completed with natural soil material compacted in 150mm layers, 90% standard compaction to a level 75mm below surface. The remaining backfill must be uncompacted topsoil to 15mm above the surface level and the surface even and seeded to Council's satisfaction. The area must be kept moist until germination has occurred.

Reinstatement of vehicle crossings
Specification for Vehicle Crossings – Refer to Standard Drawing SD4101

40. The vehicle crossing must be constructed in accordance with Council's current Standard Drawing.

41. Concrete vehicle crossings affected by works must be reinstated in full sections (panels) within the surrounding joints unless otherwise directed by Council's 'Asset Inspection Officer'.

42. When reinstating a section/panel, Y16 dowel bars 400mm lengths must be inserted 200mm into the existing concrete surface and spaced 300mm apart.

Kerb and channel
Specification for Concrete Kerb and Channel – Refer to Standard Drawing SD1101
Specification for Bluestone Kerb and Channel – Refer to Standard Drawing SD1102

43. The kerb and channel must be reinstated to the satisfaction of Council's Asset Inspection Officer.

Bluestone pitchers
Specification for Bluestone Pitchers – Refer to Standard Drawing SD3101

44. The bluestone pitcher kerb and channel, and pavement must be reinstated to the satisfaction of Council's Asset Inspection Officer.

Footnotes:

Permitted Construction Hours
Under Council's Local Law No. 1 (Community Amenity), A *builder* requires a permit to carry out building works on a building site other than between 7.00am to 6.00pm Monday to Friday, and 9.00am to 3.00pm Saturday. No works are permitted on a public holiday as defined by the *Public Holidays Act* 1993.

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Road Opening Request for Final Inspection

Community Amenity Local Law No. 1 Clause 14

This form must be completed within 48 hours of completion of works.
Any security bond refunds will be issued within 20 business days.

Applicant Details			
Site Address:			
Applicant/Business Name:			
Applicant's Postal Address:			
Telephone Number:		Mobile Number:	
E-mail Address:			
ABN:		ACN:	
Road Opening Details			
Road Opening Permit No:	.... / .... / **RO**		
Reason for Permit (tick appropriate box)			
Start & Completion Date of Works:	From: / /	To: / /	

What part of the Road Reserve are your works in?									
Footpath		Nature Strip		Road or Lane		Car Park		Kerb Channel	
Size of Opening:	**m L x m W = m²**								

Did any of the following assets require relocation as a result of the Road Opening?							
Parking Ticket Machine		Street Furniture		Litter Bin		Other (please state)	
The applicant is responsible for all associated costs as a result of the relocation of any Council assets.							

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Road Opening Request for Final Inspection

Community Amenity Local Law No. 1 Clause 14

Request for Final Reinstatement

Any excavation or opening must be reinstated to Council requirements as per items (7), (9), (10) and (11) of Port Phillip City Council conditions on which a permit to open or obstruct roadways is issued (attached to Permit). The permanent reinstatement can be undertaken by Council if the applicant is unable to. The applicant at a bare minimum must be reinstated to temporary measures once the permit expires or when the safety precautions are removed.
Any opening within the City of Port Phillip must be back filled with crushed rock, compacted and finished with cold mix as a temporary measure until full reinstatement is completed by the applicant. If the applicant submits this application (Request for Final Inspection) without fully reinstating the surface to the original material being concrete, bluestone or asphalt and to Council requirements, the cost of shall be deducted from the security bond.

How have you reinstated the Road Opening?					
Permanent reinstatement (to original standard)		Temporary reinstatement (less than original standard)			
What material has been used in your reinstatement?					
Crushed and compacted rock (temporary)		Finished with asphalt cold mix (temporary			
Concrete (permanent)		Asphalt hot mix (permanent)		Bluestone (permanent)	
NOTE: If you have reinstated to less than the original quality and material or not to Council standards the reinstatement will be performed by Council's Infrastructure Services and the applicant will be debited or invoiced for the difference. The work will be inspected and final reinstatement (if required) will be undertaken by Council within 28 days on receipt of this form.					

Applicant's Name: .....

Applicant's Signature: ..... **Date:** .....

How to Apply

Submit this application form to: City Permits, City of Port Phillip, Private Bag No. 3, PO St Kilda VIC 3182
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Further Information

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www.portphillip.vic.gov.au/road_permits.htm

Enquiries:
Email: devpermits@portphillip.vic.gov.au
Phone: 9209 6216
Mail: Private Bag No. 3, PO ST KILDA VIC 3182

CITY OF PORT PHILLIP
ABN 21 762 977 945

8 October 2015

AECOM
9/8 Exhibition St
MELBOURNE VIC 3000

ROAD OPENING PERMIT
233/2015/RO
Issued Under Community Amenity Local Law No: 1 (Clause 14)

This permit has been approved and issued subject to the following conditions and the permit holder shall be held to have agreed to such conditions and to have accepted any liability or responsibility thereby imposed.

Site of Works: Boundary Street, all of street, SOUTH MELBOURNE

Description of Works: Bore Holes for Ground Water Monitoring (MW24)

Permit Valid From: 12 October 2015 **To:** 6 November 2015

In addition to complying with any relevant requirements in the Local Law No. 1, Community Amenity the following conditions apply to the activity or use:

Standard Conditions:

1. All works associated with the road opening including the set-up and removal of necessary signs and barriers may be undertaken between 7am to 6pm Monday to Friday and 9am to 3pm Saturday. Obstructions to traffic flow are not permitted outside of this period including setting up or removal of the infrastructure.

2. To amend the dates of this licence requires a written request to be received by the City Permits by 5pm, while the permit is still valid. Once a permit has expired it cannot be re-used or amended.

3. A maximum of two (2) amendments to re-schedule the dates of this permit can be considered prior to incurring additional fees.

4. An absolute minimum width of 1.5 metres must be maintained for safe pedestrian access. Pedestrian safety must be maintained at all times by the appopriate use of bollards and tape. On both approaches to the works, the following signs must be clearly displayed and in place during the works;

    a) Pedestrian arrow signs
    a) Pedestrians Watch Your Step or,
    b) Pedestrian Use Other Footpath

5. All traffic treatments must be installed in accordance with any Traffic Management Plan submitted to Council and maintained during the works.

6. Signage must be visible and must not obstruct sightlines, designated pedestrian footpaths and crossovers/accesses. If on-street parking spaces are required to be used, only the spaces clearly specified on the plan can be used for that purpose.

7. Accredited Traffic Control Officers must be present to manage traffic flow during a partial or full road closure. Traffic Control Officers must also assist pedestrians and cyclists as required.

8. If vehicular traffic flow is affected by the works, emergency services, including, Fire Brigade, Ambulance and Police must be notified by the permit-holder a minimum of 24 hours prior the commencement of works.

9. To the satisfaction of, and at no cost to Council, the permit-holder must reinstate all assets and infrastructure.

10. City of Port Phillip does not accept any responsibility for accidents, damage or injury to property, participants or third parties that may arise out of this event. There must be public liability insurance for the type of work proposed with an indemnity of not less than $10M, including full indemnity for the City of Port Phillip Council against any claim laid against it either by members of the public or persons engaged in any activities associated with the traffic diversion who, as a result of the diversion, suffer personal injury, property damage or financial loss.

11. The permit-holder must comply with AS 1742.3 2002. Manual of uniform traffic control devices, Part 3 Traffic Control Devices for lane and Road Closures and the relevant Standards Australia Field Guides Part 1. Short term urban works, daytime/night time SAA HB 81.1 & 4 1996.

12. City of Port Phillip reserves the right to amend or revoke the above at any time.

Prior to commencement

13. In addition to the requirement to obtain a Road Opening Permit, further permits may be required for activities on Council land such as Skip Bin, Road Closure, Street Occupation, or Asset Protection. Consents may also be required from VicRoads, utilities and public transport operators. The permit-holder must ensure all relevant permits and approvals have been obtained prior to commencing any works.

14. The permit-holder must provide a minimum of 2 business day's written notification to the occupants of all affected owners, occupiers and businesses affected by the works. The notification must include the following information and a copy forwarded to the City Permits unit, e-mail: devpermits@portphillip.vic.gov.au and must include:-

    a) The nature of the works being performed
    a) The date and hours of works occurring under this permit
    b) Council's permit reference
    c) Contact name and phone number for the permit holder and/or site manager

15. The permit-holder must contact City Permits unit at least 2 business days prior to commencing works, by e-mail: devpermits@portphillip.vic.gov.au, or ph: 03 9209 6216, to organise an inspection with Council's Asset Inspection Officer to determine:

    - the extent of reinstatement works including road pavement, signage and markings
    - the requirement for further inspections,
    - any requirements for the removal, storage and reinstatement of bluestone assets
    - removal and reinstatement of street furniture, (litter bins, public seating and bicycle hoops)

During construction

16. Works that may cause significant delay to traffic and/or public transport services must be scheduled outside peak periods of 7–9am and 4–6pm weekdays unless otherwise permitted with the written consent of Council.

17. Works must be carried out in accordance with '*Road Management Act 2004 Code of Practice Worksite Safety – Traffic Management'* and any approved Traffic Management Plan.

Work execution

18. Without the written consent of the Council the permit-holder must utilise boring techniques when installing underground services. Any piping or cabling work under an existing vehicle crossing must be carried out by boring, unless approval from Council's Asset Inspection Officer has been obtained.

19. If agricultural drains or irrigation pipes are encountered during excavation the permit-holder must carefully replace the pipes to their original position prior to backfilling.

20. The minimum lateral clearance from a drain is 500mm and a vertical clearance of 300mm. If the proposed road opening or any other work interferes with any underground drains, the approval must be obtained from the Council's Assets department prior to the commencement of works.

21. The minimum lateral clearance from a street tree is 2 metres. If the proposed road opening is less than 2 metres, consent must be obtained from Council's Arborist.

22. In the event of cancellation of this permit, the Council reserves the right to reinstate the area at the expense of the permit-holder.

23. Surplus excavated material must be removed from the road reserve daily and the area left in a clean and tidy condition.

24. All finished surfaces must match and be flush with existing surfaces.

25. Within 7 days of completion of the works, the permit holder must submit a request for final inspection to City Permits unit, e-mail: devpermits@portphillip.vic.gov.au.

26. Any damage to Council assets caused by the permit- holder's reinstatement works must be rectified to the satisfaction of Council's Asset Inspection Officer.

27. Failure to restore the road reserve and repair any damage caused to assets will result in Council undertaking the necessary reinstatement works and deducting the cost from the security bond and the remainder refunded. Where costs exceed the security bond amount held, the permit holder will be liable for the excess and charged accordingly.

28. If works are conducted in contravention of this permit, the City of Port Phillip reserves the right to amend or revoke the above at any time.

Reinstatement of footpaths

Asphalt footpaths
Specification for Asphalt Footpath – Refer to Standard Drawing: SD3103

29. The permanent asphalt layer of footpaths must be constructed in accordance with Council's current Standard Drawing.

30. The Bituminous surface at the edges of the trench must be cut with a circular saw.

31. A temporary bituminous surface of premix (cold-mix) minimum depth 75mm must be constructed before the crossing is opened to traffic, unless the permit-holder is completing a permanent reinstatement immediately with hot-mix asphalt.

32. The full width of the footpath must be reinstated. Where only part of a concrete footpath/vehicle crossing panel has been damaged, reinstatement must include the removal and reinstatement of the whole panel.

Concrete footpaths
Specification for Concrete Footpaths – Refer to Standard Drawing: SD3103

33. The permanent concrete layer of footpaths must be constructed in accordance with Council's current Standard Drawing.

34. Concrete footpath areas affected by works will be reinstated in full sections within the surrounding joints unless directed otherwise by Council's Asset Inspection Officer.

35. Existing surface levels must be maintained and the tops of all service pits/junction boxes must be at the footpath surface level.

Reinstatement of road pavements

36. Where the permit-holder or contractor's road opening is less than 1.0 metre from the lip of a channel, the floating section of pavement must be removed and the final surface reinstatement will be from the furthest edge from opening/trench to the lip of channel.

37. All road pavement surfaces must be cut with a circular saw.

Flexible road pavement (Asphalt)
Specification for Flexible Road Pavements – Refer to Standard Drawing SD3103

Rigid Road Pavement (Concrete)

Temporary reinstatements

38. All temporary road reinstatements must be finished with cold-mix (premix asphalt) flush with the existing surfaces unless permanent hot-mix asphalt reinstatement is being completed immediately following the compaction of the pavement surface.

Nature strips

39. All nature strips must be reinstated. Backfilling of nature strips must be completed with natural soil material compacted in 150mm layers, 90% standard compaction to a level 75mm below surface. The remaining backfill must be uncompacted topsoil to 15mm above the surface level and the surface even and seeded to Council's satisfaction. The area must be kept moist until germination has occurred.

Reinstatement of vehicle crossings
Specification for Vehicle Crossings – Refer to Standard Drawing SD4101

40. The vehicle crossing must be constructed in accordance with Council's current Standard Drawing.

41. Concrete vehicle crossings affected by works must be reinstated in full sections (panels) within the surrounding joints unless otherwise directed by Council's 'Asset Inspection Officer'.

42. When reinstating a section/panel, Y16 dowel bars 400mm lengths must be inserted 200mm into the existing concrete surface and spaced 300mm apart.

Kerb and channel
Specification for Concrete Kerb and Channel – Refer to Standard Drawing SD1101
Specification for Bluestone Kerb and Channel – Refer to Standard Drawing SD1102

43. The kerb and channel must be reinstated to the satisfaction of Council's Asset Inspection Officer.

Bluestone pitchers
Specification for Bluestone Pitchers – Refer to Standard Drawing SD3101

44. The bluestone pitcher kerb and channel, and pavement must be reinstated to the satisfaction of Council's Asset Inspection Officer.

Footnotes:

Permitted Construction Hours
Under Council's Local Law No. 1 (Community Amenity), A *builder* requires a permit to carry out building works on a building site other than between 7.00am to 6.00pm Monday to Friday, and 9.00am to 3.00pm Saturday. No works are permitted on a public holiday as defined by the *Public Holidays Act* 1993.

Dial Before You Dig
Neglecting to dial 1100 before excavating can lead to costly disruption to essential services. Dial Before You Dig is a free referral service for information on locating underground utilities.
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http://www.portphillip.vic.gov.au/road_opening_permit.htm

City of Port Phillip Permits Index
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Contacts / Links

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Fx: 9536 2710
Email: helpassetinspection@portphillip.vic.gov.au

City Permits
Ph: 9209 6216
Fx: 9536 2745
Email: devpermits@portphillip.vic.gov.au

Road Opening Request for Final Inspection

Community Amenity Local Law No. 1 Clause 14

This form must be completed within 48 hours of completion of works.
Any security bond refunds will be issued within 20 business days.

Applicant Details			
Site Address:			
Applicant/Business Name:			
Applicant's Postal Address:			
Telephone Number:		Mobile Number:	
E-mail Address:			
ABN:		ACN:	
Road Opening Details			
Road Opening Permit No:	.... / .... / **RO**		
Reason for Permit (tick appropriate box)			
Start & Completion Date of Works:	From: / /	To: / /	

What part of the Road Reserve are your works in?									
Footpath		Nature Strip		Road or Lane		Car Park		Kerb Channel	
Size of Opening:	**m L x m W = m²**								

Did any of the following assets require relocation as a result of the Road Opening?							
Parking Ticket Machine		Street Furniture		Litter Bin		Other (please state)	
The applicant is responsible for all associated costs as a result of the relocation of any Council assets.							

Our enquiries counter at St Kilda Town Hall
is open from 8.30am to 5.00pm Monday to Friday
T: 9209 6216 F: 9536 2745 E: devpermits@portphillip.vic.gov.au

www.portphillip.vic.gov.au/road_permits.htm

Road Opening Request for Final Inspection

Community Amenity Local Law No. 1 Clause 14

Request for Final Reinstatement

Any excavation or opening must be reinstated to Council requirements as per items (7), (9), (10) and (11) of Port Phillip City Council conditions on which a permit to open or obstruct roadways is issued (attached to Permit). The permanent reinstatement can be undertaken by Council if the applicant is unable to. The applicant at a bare minimum must be reinstated to temporary measures once the permit expires or when the safety precautions are removed.
Any opening within the City of Port Phillip must be back filled with crushed rock, compacted and finished with cold mix as a temporary measure until full reinstatement is completed by the applicant. If the applicant submits this application (Request for Final Inspection) without fully reinstating the surface to the original material being concrete, bluestone or asphalt and to Council requirements, the cost of shall be deducted from the security bond.

How have you reinstated the Road Opening?					
Permanent reinstatement (to original standard)		Temporary reinstatement (less than original standard)			
What material has been used in your reinstatement?					
Crushed and compacted rock (temporary)		Finished with asphalt cold mix (temporary			
Concrete (permanent)		Asphalt hot mix (permanent)		Bluestone (permanent)	
NOTE: If you have reinstated to less than the original quality and material or not to Council standards the reinstatement will be performed by Council's Infrastructure Services and the applicant will be debited or invoiced for the difference. The work will be inspected and final reinstatement (if required) will be undertaken by Council within 28 days on receipt of this form.					

Applicant's Name: .....

Applicant's Signature: ..... **Date:** .....

How to Apply

Submit this application form to: City Permits, City of Port Phillip, Private Bag No. 3, PO St Kilda VIC 3182
Or email a scan to devpermits@portphillip.vic.gov.au or fax to 9536 2745.

Further Information

Contact City Permits on 9209 6216 or devpermits@portphillip.vic.gov.au

Privacy Statement: The personal information requested on this form is being collected by the council for purposes of assessment in accordance with Community Amenity Local Law No. 1, Clause 14. The personal information will be used solely by the council for that primary purpose or directly related purposes. The applicant understands that the personal information provided is for the purpose of considering the application for an Asset Protection Permit and that he or she may apply to the council for access to the information. Requests for access and or correction should be made to Freedom of Information & Privacy Officer Governance & Engagement Department, City of Port Phillip.

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Enquiries:
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Phone: 9209 6216
Mail: Private Bag No. 3, PO ST KILDA VIC 3182

CITY OF PORT PHILLIP
ABN 21 762 977 945

8 October 2015

AECOM
9/8 Exhibition St
MELBOURNE VIC 3000

ROAD OPENING PERMIT
234/2015/RO
Issued Under Community Amenity Local Law No: 1 (Clause 14)

This permit has been approved and issued subject to the following conditions and the permit holder shall be held to have agreed to such conditions and to have accepted any liability or responsibility thereby imposed.

Site of Works: Bridge Street, all of street, PORT MELBOURNE

Description of Works: Bore Holes for Ground Water Monitoring (MW25)

Permit Valid From: 12 October 2015 **To:** 6 November 2015

In addition to complying with any relevant requirements in the Local Law No. 1, Community Amenity the following conditions apply to the activity or use:

Standard Conditions:

1. All works associated with the road opening including the set-up and removal of necessary signs and barriers may be undertaken between 7am to 6pm Monday to Friday and 9am to 3pm Saturday. Obstructions to traffic flow are not permitted outside of this period including setting up or removal of the infrastructure. .

2. To amend the dates of this licence requires a written request to be received by the City Permits by 5pm, while the permit is still valid. Once a permit has expired it cannot be re-used or amended.

3. A maximum of two (2) amendments to re-schedule the dates of this permit can be considered prior to incurring additional fees.

4. An absolute minimum width of 1.5 metres must be maintained for safe pedestrian access. Pedestrian safety must be maintained at all times by the appopriate use of bollards and tape. On both approaches to the works, the following signs must be clearly displayed and in place during the works;

    a) Pedestrian arrow signs
    a) Pedestrians Watch Your Step or,
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5. All traffic treatments must be installed in accordance with any Traffic Management Plan submitted to Council and maintained during the works.

6. Signage must be visible and must not obstruct sightlines, designated pedestrian footpaths and crossovers/accesses. If on-street parking spaces are required to be used, only the spaces clearly specified on the plan can be used for that purpose.

7. Accredited Traffic Control Officers must be present to manage traffic flow during a partial or full road closure. Traffic Control Officers must also assist pedestrians and cyclists as required.

8. If vehicular traffic flow is affected by the works, emergency services, including, Fire Brigade, Ambulance and Police must be notified by the permit-holder a minimum of 24 hours prior the commencement of works.

9. To the satisfaction of, and at no cost to Council, the permit-holder must reinstate all assets and infrastructure.

10. City of Port Phillip does not accept any responsibility for accidents, damage or injury to property, participants or third parties that may arise out of this event. There must be public liability insurance for the type of work proposed with an indemnity of not less than $10M, including full indemnity for the City of Port Phillip Council against any claim laid against it either by members of the public or persons engaged in any activities associated with the traffic diversion who, as a result of the diversion, suffer personal injury, property damage or financial loss.

11. The permit-holder must comply with AS 1742.3 2002. Manual of uniform traffic control devices, Part 3 Traffic Control Devices for lane and Road Closures and the relevant Standards Australia Field Guides Part 1. Short term urban works, daytime/night time SAA HB 81.1 & 4 1996.

12. City of Port Phillip reserves the right to amend or revoke the above at any time.

Prior to commencement

13. In addition to the requirement to obtain a Road Opening Permit, further permits may be required for activities on Council land such as Skip Bin, Road Closure, Street Occupation, or Asset Protection. Consents may also be required from VicRoads, utilities and public transport operators. The permit-holder must ensure all relevant permits and approvals have been obtained prior to commencing any works.

14. The permit-holder must provide a minimum of 2 business day's written notification to the occupants of all affected owners, occupiers and businesses affected by the works. The notification must include the following information and a copy forwarded to the City Permits unit, e-mail: devpermits@portphillip.vic.gov.au and must include:-

    a) The nature of the works being performed
    a) The date and hours of works occurring under this permit
    b) Council's permit reference
    c) Contact name and phone number for the permit holder and/or site manager

15. The permit-holder must contact City Permits unit at least 2 business days prior to commencing works, by e-mail: devpermits@portphillip.vic.gov.au, or ph: 03 9209 6216, to organise an inspection with Council's Asset Inspection Officer to determine:

    - the extent of reinstatement works including road pavement, signage and markings
    - the requirement for further inspections,
    - any requirements for the removal, storage and reinstatement of bluestone assets
    - removal and reinstatement of street furniture, (litter bins, public seating and bicycle hoops)

During construction

16. Works that may cause significant delay to traffic and/or public transport services must be scheduled outside peak periods of 7–9am and 4–6pm weekdays unless otherwise permitted with the written consent of Council.

17. Works must be carried out in accordance with '*Road Management Act 2004 Code of Practice Worksite Safety – Traffic Management'* and any approved Traffic Management Plan.

Work execution

18. Without the written consent of the Council the permit-holder must utilise boring techniques when installing underground services. Any piping or cabling work under an existing vehicle crossing must be carried out by boring, unless approval from Council's Asset Inspection Officer has been obtained.

19. If agricultural drains or irrigation pipes are encountered during excavation the permit-holder must carefully replace the pipes to their original position prior to backfilling.

20. The minimum lateral clearance from a drain is 500mm and a vertical clearance of 300mm. If the proposed road opening or any other work interferes with any underground drains, the approval must be obtained from the Council's Assets department prior to the commencement of works.

21. The minimum lateral clearance from a street tree is 2 metres. If the proposed road opening is less than 2 metres, consent must be obtained from Council's Arborist.

22. In the event of cancellation of this permit, the Council reserves the right to reinstate the area at the expense of the permit-holder.

23. Surplus excavated material must be removed from the road reserve daily and the area left in a clean and tidy condition.

24. All finished surfaces must match and be flush with existing surfaces.

25. Within 7 days of completion of the works, the permit holder must submit a request for final inspection to City Permits unit, e-mail: devpermits@portphillip.vic.gov.au.

26. Any damage to Council assets caused by the permit- holder's reinstatement works must be rectified to the satisfaction of Council's Asset Inspection Officer.

27. Failure to restore the road reserve and repair any damage caused to assets will result in Council undertaking the necessary reinstatement works and deducting the cost from the security bond and the remainder refunded. Where costs exceed the security bond amount held, the permit holder will be liable for the excess and charged accordingly.

28. If works are conducted in contravention of this permit, the City of Port Phillip reserves the right to amend or revoke the above at any time.

Reinstatement of footpaths

Asphalt footpaths
Specification for Asphalt Footpath – Refer to Standard Drawing: SD3103

29. The permanent asphalt layer of footpaths must be constructed in accordance with Council's current Standard Drawing.

30. The Bituminous surface at the edges of the trench must be cut with a circular saw.

31. A temporary bituminous surface of premix (cold-mix) minimum depth 75mm must be constructed before the crossing is opened to traffic, unless the permit-holder is completing a permanent reinstatement immediately with hot-mix asphalt.

32. The full width of the footpath must be reinstated. Where only part of a concrete footpath/vehicle crossing panel has been damaged, reinstatement must include the removal and reinstatement of the whole panel.

Concrete footpaths
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34. Concrete footpath areas affected by works will be reinstated in full sections within the surrounding joints unless directed otherwise by Council's Asset Inspection Officer.

35. Existing surface levels must be maintained and the tops of all service pits/junction boxes must be at the footpath surface level.

Reinstatement of road pavements

36. Where the permit-holder or contractor's road opening is less than 1.0 metre from the lip of a channel, the floating section of pavement must be removed and the final surface reinstatement will be from the furthest edge from opening/trench to the lip of channel.

37. All road pavement surfaces must be cut with a circular saw.

Flexible road pavement (Asphalt)
Specification for Flexible Road Pavements – Refer to Standard Drawing SD3103

Rigid Road Pavement (Concrete)

Temporary reinstatements

38. All temporary road reinstatements must be finished with cold-mix (premix asphalt) flush with the existing surfaces unless permanent hot-mix asphalt reinstatement is being completed immediately following the compaction of the pavement surface.

Nature strips

39. All nature strips must be reinstated. Backfilling of nature strips must be completed with natural soil material compacted in 150mm layers, 90% standard compaction to a level 75mm below surface. The remaining backfill must be uncompacted topsoil to 15mm above the surface level and the surface even and seeded to Council's satisfaction. The area must be kept moist until germination has occurred.

Reinstatement of vehicle crossings
Specification for Vehicle Crossings – Refer to Standard Drawing SD4101

40. The vehicle crossing must be constructed in accordance with Council's current Standard Drawing.

41. Concrete vehicle crossings affected by works must be reinstated in full sections (panels) within the surrounding joints unless otherwise directed by Council's 'Asset Inspection Officer'.

42. When reinstating a section/panel, Y16 dowel bars 400mm lengths must be inserted 200mm into the existing concrete surface and spaced 300mm apart.

Kerb and channel
Specification for Concrete Kerb and Channel – Refer to Standard Drawing SD1101
Specification for Bluestone Kerb and Channel – Refer to Standard Drawing SD1102

43. The kerb and channel must be reinstated to the satisfaction of Council's Asset Inspection Officer.

Bluestone pitchers
Specification for Bluestone Pitchers – Refer to Standard Drawing SD3101

44. The bluestone pitcher kerb and channel, and pavement must be reinstated to the satisfaction of Council's Asset Inspection Officer.

Footnotes:

Permitted Construction Hours
Under Council's Local Law No. 1 (Community Amenity), A *builder* requires a permit to carry out building works on a building site other than between 7.00am to 6.00pm Monday to Friday, and 9.00am to 3.00pm Saturday. No works are permitted on a public holiday as defined by the *Public Holidays Act* 1993.

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Road Opening Request for Final Inspection

Community Amenity Local Law No. 1 Clause 14

This form must be completed within 48 hours of completion of works.
Any security bond refunds will be issued within 20 business days.

Applicant Details			
Site Address:			
Applicant/Business Name:			
Applicant's Postal Address:			
Telephone Number:		Mobile Number:	
E-mail Address:			
ABN:		ACN:	
Road Opening Details			
Road Opening Permit No:	.... / .... / **RO**		
Reason for Permit (tick appropriate box)			
Start & Completion Date of Works:	From: / /	To: / /	

What part of the Road Reserve are your works in?									
Footpath		Nature Strip		Road or Lane		Car Park		Kerb Channel	
Size of Opening:	**m L x m W = m²**								

Did any of the following assets require relocation as a result of the Road Opening?							
Parking Ticket Machine		Street Furniture		Litter Bin		Other (please state)	
The applicant is responsible for all associated costs as a result of the relocation of any Council assets.							

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Road Opening Request for Final Inspection

Community Amenity Local Law No. 1 Clause 14

Request for Final Reinstatement

Any excavation or opening must be reinstated to Council requirements as per items (7), (9), (10) and (11) of Port Phillip City Council conditions on which a permit to open or obstruct roadways is issued (attached to Permit). The permanent reinstatement can be undertaken by Council if the applicant is unable to. The applicant at a bare minimum must be reinstated to temporary measures once the permit expires or when the safety precautions are removed.
Any opening within the City of Port Phillip must be back filled with crushed rock, compacted and finished with cold mix as a temporary measure until full reinstatement is completed by the applicant. If the applicant submits this application (Request for Final Inspection) without fully reinstating the surface to the original material being concrete, bluestone or asphalt and to Council requirements, the cost of shall be deducted from the security bond.

How have you reinstated the Road Opening?					
Permanent reinstatement (to original standard)		Temporary reinstatement (less than original standard)			
What material has been used in your reinstatement?					
Crushed and compacted rock (temporary)		Finished with asphalt cold mix (temporary			
Concrete (permanent)		Asphalt hot mix (permanent)		Bluestone (permanent)	
NOTE: If you have reinstated to less than the original quality and material or not to Council standards the reinstatement will be performed by Council's Infrastructure Services and the applicant will be debited or invoiced for the difference. The work will be inspected and final reinstatement (if required) will be undertaken by Council within 28 days on receipt of this form.					

Applicant's Name: .....

Applicant's Signature: ..... **Date:** .....

How to Apply

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Further Information

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Enquiries:
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Phone: 9209 6216
Mail: Private Bag No. 3, PO ST KILDA VIC 3182

CITY OF PORT PHILLIP
ABN 21 762 977 945

8 October 2015

AECOM
9/8 Exhibition St
MELBOURNE VIC 3000

ROAD OPENING PERMIT
235/2015/RO
Issued Under Community Amenity Local Law No: 1 (Clause 14)

This permit has been approved and issued subject to the following conditions and the permit holder shall be held to have agreed to such conditions and to have accepted any liability or responsibility thereby imposed.

Site of Works: Fennell Street, all of street, PORT MELBOURNE

Description of Works: Bore Holes for Ground Water Monitoring (MW26)

Permit Valid From: 12 October 2015 **To:** 6 November 2015

In addition to complying with any relevant requirements in the Local Law No. 1, Community Amenity the following conditions apply to the activity or use:

Standard Conditions:

1. All works associated with the road opening including the set-up and removal of necessary signs and barriers may be undertaken between 7am to 6pm Monday to Friday and 9am to 3pm Saturday. Obstructions to traffic flow are not permitted outside of this period including setting up or removal of the infrastructure. .

2. To amend the dates of this licence requires a written request to be received by the City Permits by 5pm, while the permit is still valid. Once a permit has expired it cannot be re-used or amended.

3. A maximum of two (2) amendments to re-schedule the dates of this permit can be considered prior to incurring additional fees.

4. An absolute minimum width of 1.5 metres must be maintained for safe pedestrian access. Pedestrian safety must be maintained at all times by the appopriate use of bollards and tape. On both approaches to the works, the following signs must be clearly displayed and in place during the works;

    a) Pedestrian arrow signs
    a) Pedestrians Watch Your Step or,
    b) Pedestrian Use Other Footpath

5. All traffic treatments must be installed in accordance with any Traffic Management Plan submitted to Council and maintained during the works.

6. Signage must be visible and must not obstruct sightlines, designated pedestrian footpaths and crossovers/accesses. If on-street parking spaces are required to be used, only the spaces clearly specified on the plan can be used for that purpose.

7. Accredited Traffic Control Officers must be present to manage traffic flow during a partial or full road closure. Traffic Control Officers must also assist pedestrians and cyclists as required.

8. If vehicular traffic flow is affected by the works, emergency services, including, Fire Brigade, Ambulance and Police must be notified by the permit-holder a minimum of 24 hours prior the commencement of works.

9. To the satisfaction of, and at no cost to Council, the permit-holder must reinstate all assets and infrastructure.

10. City of Port Phillip does not accept any responsibility for accidents, damage or injury to property, participants or third parties that may arise out of this event. There must be public liability insurance for the type of work proposed with an indemnity of not less than $10M, including full indemnity for the City of Port Phillip Council against any claim laid against it either by members of the public or persons engaged in any activities associated with the traffic diversion who, as a result of the diversion, suffer personal injury, property damage or financial loss.

11. The permit-holder must comply with AS 1742.3 2002. Manual of uniform traffic control devices, Part 3 Traffic Control Devices for lane and Road Closures and the relevant Standards Australia Field Guides Part 1. Short term urban works, daytime/night time SAA HB 81.1 & 4 1996.

12. City of Port Phillip reserves the right to amend or revoke the above at any time.

Prior to commencement

13. In addition to the requirement to obtain a Road Opening Permit, further permits may be required for activities on Council land such as Skip Bin, Road Closure, Street Occupation, or Asset Protection. Consents may also be required from VicRoads, utilities and public transport operators. The permit-holder must ensure all relevant permits and approvals have been obtained prior to commencing any works.

14. The permit-holder must provide a minimum of 2 business day's written notification to the occupants of all affected owners, occupiers and businesses affected by the works. The notification must include the following information and a copy forwarded to the City Permits unit, e-mail: devpermits@portphillip.vic.gov.au and must include:-

    a) The nature of the works being performed
    a) The date and hours of works occurring under this permit
    b) Council's permit reference
    c) Contact name and phone number for the permit holder and/or site manager

15. The permit-holder must contact City Permits unit at least 2 business days prior to commencing works, by e-mail: devpermits@portphillip.vic.gov.au, or ph: 03 9209 6216, to organise an inspection with Council's Asset Inspection Officer to determine:

    - the extent of reinstatement works including road pavement, signage and markings
    - the requirement for further inspections,
    - any requirements for the removal, storage and reinstatement of bluestone assets
    - removal and reinstatement of street furniture, (litter bins, public seating and bicycle hoops)

During construction

16. Works that may cause significant delay to traffic and/or public transport services must be scheduled outside peak periods of 7–9am and 4–6pm weekdays unless otherwise permitted with the written consent of Council.

17. Works must be carried out in accordance with '*Road Management Act 2004 Code of Practice Worksite Safety – Traffic Management'* and any approved Traffic Management Plan.

Work execution

18. Without the written consent of the Council the permit-holder must utilise boring techniques when installing underground services. Any piping or cabling work under an existing vehicle crossing must be carried out by boring, unless approval from Council's Asset Inspection Officer has been obtained.

19. If agricultural drains or irrigation pipes are encountered during excavation the permit-holder must carefully replace the pipes to their original position prior to backfilling.

20. The minimum lateral clearance from a drain is 500mm and a vertical clearance of 300mm. If the proposed road opening or any other work interferes with any underground drains, the approval must be obtained from the Council's Assets department prior to the commencement of works.

21. The minimum lateral clearance from a street tree is 2 metres. If the proposed road opening is less than 2 metres, consent must be obtained from Council's Arborist.

22. In the event of cancellation of this permit, the Council reserves the right to reinstate the area at the expense of the permit-holder.

23. Surplus excavated material must be removed from the road reserve daily and the area left in a clean and tidy condition.

24. All finished surfaces must match and be flush with existing surfaces.

25. Within 7 days of completion of the works, the permit holder must submit a request for final inspection to City Permits unit, e-mail: devpermits@portphillip.vic.gov.au.

26. Any damage to Council assets caused by the permit- holder's reinstatement works must be rectified to the satisfaction of Council's Asset Inspection Officer.

27. Failure to restore the road reserve and repair any damage caused to assets will result in Council undertaking the necessary reinstatement works and deducting the cost from the security bond and the remainder refunded. Where costs exceed the security bond amount held, the permit holder will be liable for the excess and charged accordingly.

28. If works are conducted in contravention of this permit, the City of Port Phillip reserves the right to amend or revoke the above at any time.

Reinstatement of footpaths

Asphalt footpaths
Specification for Asphalt Footpath – Refer to Standard Drawing: SD3103

29. The permanent asphalt layer of footpaths must be constructed in accordance with Council's current Standard Drawing.

30. The Bituminous surface at the edges of the trench must be cut with a circular saw.

31. A temporary bituminous surface of premix (cold-mix) minimum depth 75mm must be constructed before the crossing is opened to traffic, unless the permit-holder is completing a permanent reinstatement immediately with hot-mix asphalt.

32. The full width of the footpath must be reinstated. Where only part of a concrete footpath/vehicle crossing panel has been damaged, reinstatement must include the removal and reinstatement of the whole panel.

Concrete footpaths
Specification for Concrete Footpaths – Refer to Standard Drawing: SD3103

33. The permanent concrete layer of footpaths must be constructed in accordance with Council's current Standard Drawing.

34. Concrete footpath areas affected by works will be reinstated in full sections within the surrounding joints unless directed otherwise by Council's Asset Inspection Officer.

35. Existing surface levels must be maintained and the tops of all service pits/junction boxes must be at the footpath surface level.

Reinstatement of road pavements

36. Where the permit-holder or contractor's road opening is less than 1.0 metre from the lip of a channel, the floating section of pavement must be removed and the final surface reinstatement will be from the furthest edge from opening/trench to the lip of channel.

37. All road pavement surfaces must be cut with a circular saw.

Flexible road pavement (Asphalt)
Specification for Flexible Road Pavements – Refer to Standard Drawing SD3103

Rigid Road Pavement (Concrete)

Temporary reinstatements

38. All temporary road reinstatements must be finished with cold-mix (premix asphalt) flush with the existing surfaces unless permanent hot-mix asphalt reinstatement is being completed immediately following the compaction of the pavement surface.

Nature strips

39. All nature strips must be reinstated. Backfilling of nature strips must be completed with natural soil material compacted in 150mm layers, 90% standard compaction to a level 75mm below surface. The remaining backfill must be uncompacted topsoil to 15mm above the surface level and the surface even and seeded to Council's satisfaction. The area must be kept moist until germination has occurred.

Reinstatement of vehicle crossings
Specification for Vehicle Crossings – Refer to Standard Drawing SD4101

40. The vehicle crossing must be constructed in accordance with Council's current Standard Drawing.

41. Concrete vehicle crossings affected by works must be reinstated in full sections (panels) within the surrounding joints unless otherwise directed by Council's 'Asset Inspection Officer'.

42. When reinstating a section/panel, Y16 dowel bars 400mm lengths must be inserted 200mm into the existing concrete surface and spaced 300mm apart.

Kerb and channel
Specification for Concrete Kerb and Channel – Refer to Standard Drawing SD1101
Specification for Bluestone Kerb and Channel – Refer to Standard Drawing SD1102

43. The kerb and channel must be reinstated to the satisfaction of Council's Asset Inspection Officer.

Bluestone pitchers
Specification for Bluestone Pitchers – Refer to Standard Drawing SD3101

44. The bluestone pitcher kerb and channel, and pavement must be reinstated to the satisfaction of Council's Asset Inspection Officer.

Footnotes:

Permitted Construction Hours
Under Council's Local Law No. 1 (Community Amenity), A *builder* requires a permit to carry out building works on a building site other than between 7.00am to 6.00pm Monday to Friday, and 9.00am to 3.00pm Saturday. No works are permitted on a public holiday as defined by the *Public Holidays Act* 1993.

Dial Before You Dig
Neglecting to dial 1100 before excavating can lead to costly disruption to essential services. Dial Before You Dig is a free referral service for information on locating underground utilities.
Ph: 1100
Web: www.1100.com.au

Standard Construction Drawings
http://www.portphillip.vic.gov.au/road_opening_permit.htm

City of Port Phillip Permits Index
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Contacts / Links

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Ph: 9209 6590
Fx: 9536 2710
Email: helpassetinspection@portphillip.vic.gov.au

City Permits
Ph: 9209 6216
Fx: 9536 2745
Email: devpermits@portphillip.vic.gov.au

Road Opening Request for Final Inspection

Community Amenity Local Law No. 1 Clause 14

This form must be completed within 48 hours of completion of works.
Any security bond refunds will be issued within 20 business days.

Applicant Details			
Site Address:			
Applicant/Business Name:			
Applicant's Postal Address:			
Telephone Number:		Mobile Number:	
E-mail Address:			
ABN:		ACN:	
Road Opening Details			
Road Opening Permit No:	.... / .... / **RO**		
Reason for Permit (tick appropriate box)			
Start & Completion Date of Works:	From: / /	To: / /	

What part of the Road Reserve are your works in?									
Footpath		Nature Strip		Road or Lane		Car Park		Kerb Channel	
Size of Opening:	**m L x m W = m²**								

Did any of the following assets require relocation as a result of the Road Opening?							
Parking Ticket Machine		Street Furniture		Litter Bin		Other (please state)	
The applicant is responsible for all associated costs as a result of the relocation of any Council assets.							

Our enquiries counter at St Kilda Town Hall
is open from 8.30am to 5.00pm Monday to Friday
T: 9209 6216 F: 9536 2745 E: devpermits@portphillip.vic.gov.au

www.portphillip.vic.gov.au/road_permits.htm

Road Opening Request for Final Inspection

Community Amenity Local Law No. 1 Clause 14

Request for Final Reinstatement

Any excavation or opening must be reinstated to Council requirements as per items (7), (9), (10) and (11) of Port Phillip City Council conditions on which a permit to open or obstruct roadways is issued (attached to Permit). The permanent reinstatement can be undertaken by Council if the applicant is unable to. The applicant at a bare minimum must be reinstated to temporary measures once the permit expires or when the safety precautions are removed.
Any opening within the City of Port Phillip must be back filled with crushed rock, compacted and finished with cold mix as a temporary measure until full reinstatement is completed by the applicant. If the applicant submits this application (Request for Final Inspection) without fully reinstating the surface to the original material being concrete, bluestone or asphalt and to Council requirements, the cost of shall be deducted from the security bond.

How have you reinstated the Road Opening?					
Permanent reinstatement (to original standard)		Temporary reinstatement (less than original standard)			
What material has been used in your reinstatement?					
Crushed and compacted rock (temporary)		Finished with asphalt cold mix (temporary			
Concrete (permanent)		Asphalt hot mix (permanent)		Bluestone (permanent)	
NOTE: If you have reinstated to less than the original quality and material or not to Council standards the reinstatement will be performed by Council's Infrastructure Services and the applicant will be debited or invoiced for the difference. The work will be inspected and final reinstatement (if required) will be undertaken by Council within 28 days on receipt of this form.					

Applicant's Name: .....

Applicant's Signature: ..... **Date:** .....

How to Apply

Submit this application form to: City Permits, City of Port Phillip, Private Bag No. 3, PO St Kilda VIC 3182
Or email a scan to devpermits@portphillip.vic.gov.au or fax to 9536 2745.

Further Information

Contact City Permits on 9209 6216 or devpermits@portphillip.vic.gov.au

Privacy Statement: The personal information requested on this form is being collected by the council for purposes of assessment in accordance with Community Amenity Local Law No. 1, Clause 14. The personal information will be used solely by the council for that primary purpose or directly related purposes. The applicant understands that the personal information provided is for the purpose of considering the application for an Asset Protection Permit and that he or she may apply to the council for access to the information. Requests for access and or correction should be made to Freedom of Information & Privacy Officer Governance & Engagement Department, City of Port Phillip.

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is open from 8.30am to 5.00pm Monday to Friday
T: 9209 6216 F: 9536 2745 E: devpermits@portphillip.vic.gov.au

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Enquiries:
Email: devpermits@portphillip.vic.gov.au
Phone: 9209 6216
Mail: Private Bag No. 3, PO ST KILDA VIC 3182

CITY OF PORT PHILLIP
ABN 21 762 977 945

8 October 2015

AECOM
9/8 Exhibition St
MELBOURNE VIC 3000

ROAD OPENING PERMIT
236/2015/RO
Issued Under Community Amenity Local Law No: 1 (Clause 14)

This permit has been approved and issued subject to the following conditions and the permit holder shall be held to have agreed to such conditions and to have accepted any liability or responsibility thereby imposed.

Site of Works: Woodruff Street, all of street, PORT MELBOURNE

Description of Works: Bore Holes for Ground Water Monitoring (MW27)

Permit Valid From: 12 October 2015 **To:** 6 November 2015

In addition to complying with any relevant requirements in the Local Law No. 1, Community Amenity the following conditions apply to the activity or use:

Standard Conditions:

1. All works associated with the road opening including the set-up and removal of necessary signs and barriers may be undertaken between 7am to 6pm Monday to Friday and 9am to 3pm Saturday. Obstructions to traffic flow are not permitted outside of this period including setting up or removal of the infrastructure. .

2. To amend the dates of this licence requires a written request to be received by the City Permits by 5pm, while the permit is still valid. Once a permit has expired it cannot be re-used or amended.

3. A maximum of two (2) amendments to re-schedule the dates of this permit can be considered prior to incurring additional fees.

4. An absolute minimum width of 1.5 metres must be maintained for safe pedestrian access. Pedestrian safety must be maintained at all times by the appopriate use of bollards and tape. On both approaches to the works, the following signs must be clearly displayed and in place during the works;

    a) Pedestrian arrow signs
    a) Pedestrians Watch Your Step or,
    b) Pedestrian Use Other Footpath

5. All traffic treatments must be installed in accordance with any Traffic Management Plan submitted to Council and maintained during the works.

6. Signage must be visible and must not obstruct sightlines, designated pedestrian footpaths and crossovers/accesses. If on-street parking spaces are required to be used, only the spaces clearly specified on the plan can be used for that purpose.

7. Accredited Traffic Control Officers must be present to manage traffic flow during a partial or full road closure. Traffic Control Officers must also assist pedestrians and cyclists as required.

8. If vehicular traffic flow is affected by the works, emergency services, including, Fire Brigade, Ambulance and Police must be notified by the permit-holder a minimum of 24 hours prior the commencement of works.

9. To the satisfaction of, and at no cost to Council, the permit-holder must reinstate all assets and infrastructure.

10. City of Port Phillip does not accept any responsibility for accidents, damage or injury to property, participants or third parties that may arise out of this event. There must be public liability insurance for the type of work proposed with an indemnity of not less than $10M, including full indemnity for the City of Port Phillip Council against any claim laid against it either by members of the public or persons engaged in any activities associated with the traffic diversion who, as a result of the diversion, suffer personal injury, property damage or financial loss.

11. The permit-holder must comply with AS 1742.3 2002. Manual of uniform traffic control devices, Part 3 Traffic Control Devices for lane and Road Closures and the relevant Standards Australia Field Guides Part 1. Short term urban works, daytime/night time SAA HB 81.1 & 4 1996.

12. City of Port Phillip reserves the right to amend or revoke the above at any time.

Prior to commencement

13. In addition to the requirement to obtain a Road Opening Permit, further permits may be required for activities on Council land such as Skip Bin, Road Closure, Street Occupation, or Asset Protection. Consents may also be required from VicRoads, utilities and public transport operators. The permit-holder must ensure all relevant permits and approvals have been obtained prior to commencing any works.

14. The permit-holder must provide a minimum of 2 business day's written notification to the occupants of all affected owners, occupiers and businesses affected by the works. The notification must include the following information and a copy forwarded to the City Permits unit, e-mail: devpermits@portphillip.vic.gov.au and must include:-

    a) The nature of the works being performed
    a) The date and hours of works occurring under this permit
    b) Council's permit reference
    c) Contact name and phone number for the permit holder and/or site manager

15. The permit-holder must contact City Permits unit at least 2 business days prior to commencing works, by e-mail: devpermits@portphillip.vic.gov.au, or ph: 03 9209 6216, to organise an inspection with Council's Asset Inspection Officer to determine:

    - the extent of reinstatement works including road pavement, signage and markings
    - the requirement for further inspections,
    - any requirements for the removal, storage and reinstatement of bluestone assets
    - removal and reinstatement of street furniture, (litter bins, public seating and bicycle hoops)

During construction

16. Works that may cause significant delay to traffic and/or public transport services must be scheduled outside peak periods of 7–9am and 4–6pm weekdays unless otherwise permitted with the written consent of Council.

17. Works must be carried out in accordance with '*Road Management Act 2004 Code of Practice Worksite Safety – Traffic Management'* and any approved Traffic Management Plan.

Work execution

18. Without the written consent of the Council the permit-holder must utilise boring techniques when installing underground services. Any piping or cabling work under an existing vehicle crossing must be carried out by boring, unless approval from Council's Asset Inspection Officer has been obtained.

19. If agricultural drains or irrigation pipes are encountered during excavation the permit-holder must carefully replace the pipes to their original position prior to backfilling.

20. The minimum lateral clearance from a drain is 500mm and a vertical clearance of 300mm. If the proposed road opening or any other work interferes with any underground drains, the approval must be obtained from the Council's Assets department prior to the commencement of works.

21. The minimum lateral clearance from a street tree is 2 metres. If the proposed road opening is less than 2 metres, consent must be obtained from Council's Arborist.

22. In the event of cancellation of this permit, the Council reserves the right to reinstate the area at the expense of the permit-holder.

23. Surplus excavated material must be removed from the road reserve daily and the area left in a clean and tidy condition.

24. All finished surfaces must match and be flush with existing surfaces.

25. Within 7 days of completion of the works, the permit holder must submit a request for final inspection to City Permits unit, e-mail: devpermits@portphillip.vic.gov.au.

26. Any damage to Council assets caused by the permit- holder's reinstatement works must be rectified to the satisfaction of Council's Asset Inspection Officer.

27. Failure to restore the road reserve and repair any damage caused to assets will result in Council undertaking the necessary reinstatement works and deducting the cost from the security bond and the remainder refunded. Where costs exceed the security bond amount held, the permit holder will be liable for the excess and charged accordingly.

28. If works are conducted in contravention of this permit, the City of Port Phillip reserves the right to amend or revoke the above at any time.

Reinstatement of footpaths

Asphalt footpaths
Specification for Asphalt Footpath – Refer to Standard Drawing: SD3103

29. The permanent asphalt layer of footpaths must be constructed in accordance with Council's current Standard Drawing.

30. The Bituminous surface at the edges of the trench must be cut with a circular saw.

31. A temporary bituminous surface of premix (cold-mix) minimum depth 75mm must be constructed before the crossing is opened to traffic, unless the permit-holder is completing a permanent reinstatement immediately with hot-mix asphalt.

32. The full width of the footpath must be reinstated. Where only part of a concrete footpath/vehicle crossing panel has been damaged, reinstatement must include the removal and reinstatement of the whole panel.

Concrete footpaths
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34. Concrete footpath areas affected by works will be reinstated in full sections within the surrounding joints unless directed otherwise by Council's Asset Inspection Officer.

35. Existing surface levels must be maintained and the tops of all service pits/junction boxes must be at the footpath surface level.

Reinstatement of road pavements

36. Where the permit-holder or contractor's road opening is less than 1.0 metre from the lip of a channel, the floating section of pavement must be removed and the final surface reinstatement will be from the furthest edge from opening/trench to the lip of channel.

37. All road pavement surfaces must be cut with a circular saw.

Flexible road pavement (Asphalt)
Specification for Flexible Road Pavements – Refer to Standard Drawing SD3103

Rigid Road Pavement (Concrete)

Temporary reinstatements

38. All temporary road reinstatements must be finished with cold-mix (premix asphalt) flush with the existing surfaces unless permanent hot-mix asphalt reinstatement is being completed immediately following the compaction of the pavement surface.

Nature strips

39. All nature strips must be reinstated. Backfilling of nature strips must be completed with natural soil material compacted in 150mm layers, 90% standard compaction to a level 75mm below surface. The remaining backfill must be uncompacted topsoil to 15mm above the surface level and the surface even and seeded to Council's satisfaction. The area must be kept moist until germination has occurred.

Reinstatement of vehicle crossings
Specification for Vehicle Crossings – Refer to Standard Drawing SD4101

40. The vehicle crossing must be constructed in accordance with Council's current Standard Drawing.

41. Concrete vehicle crossings affected by works must be reinstated in full sections (panels) within the surrounding joints unless otherwise directed by Council's 'Asset Inspection Officer'.

42. When reinstating a section/panel, Y16 dowel bars 400mm lengths must be inserted 200mm into the existing concrete surface and spaced 300mm apart.

Kerb and channel
Specification for Concrete Kerb and Channel – Refer to Standard Drawing SD1101
Specification for Bluestone Kerb and Channel – Refer to Standard Drawing SD1102

43. The kerb and channel must be reinstated to the satisfaction of Council's Asset Inspection Officer.

Bluestone pitchers
Specification for Bluestone Pitchers – Refer to Standard Drawing SD3101

44. The bluestone pitcher kerb and channel, and pavement must be reinstated to the satisfaction of Council's Asset Inspection Officer.

Footnotes:

Permitted Construction Hours
Under Council's Local Law No. 1 (Community Amenity), A *builder* requires a permit to carry out building works on a building site other than between 7.00am to 6.00pm Monday to Friday, and 9.00am to 3.00pm Saturday. No works are permitted on a public holiday as defined by the *Public Holidays Act* 1993.

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Email: devpermits@portphillip.vic.gov.au

Road Opening Request for Final Inspection

Community Amenity Local Law No. 1 Clause 14

This form must be completed within 48 hours of completion of works.
Any security bond refunds will be issued within 20 business days.

Applicant Details			
Site Address:			
Applicant/Business Name:			
Applicant's Postal Address:			
Telephone Number:		Mobile Number:	
E-mail Address:			
ABN:		ACN:	
Road Opening Details			
Road Opening Permit No:	.... / .... / **RO**		
Reason for Permit (tick appropriate box)			
Start & Completion Date of Works:	From: / /	To: / /	

What part of the Road Reserve are your works in?									
Footpath		Nature Strip		Road or Lane		Car Park		Kerb Channel	
Size of Opening:	**m L x m W = m²**								

Did any of the following assets require relocation as a result of the Road Opening?							
Parking Ticket Machine		Street Furniture		Litter Bin		Other (please state)	
The applicant is responsible for all associated costs as a result of the relocation of any Council assets.							

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Road Opening Request for Final Inspection

Community Amenity Local Law No. 1 Clause 14

Request for Final Reinstatement

Any excavation or opening must be reinstated to Council requirements as per items (7), (9), (10) and (11) of Port Phillip City Council conditions on which a permit to open or obstruct roadways is issued (attached to Permit). The permanent reinstatement can be undertaken by Council if the applicant is unable to. The applicant at a bare minimum must be reinstated to temporary measures once the permit expires or when the safety precautions are removed.
Any opening within the City of Port Phillip must be back filled with crushed rock, compacted and finished with cold mix as a temporary measure until full reinstatement is completed by the applicant. If the applicant submits this application (Request for Final Inspection) without fully reinstating the surface to the original material being concrete, bluestone or asphalt and to Council requirements, the cost of shall be deducted from the security bond.

How have you reinstated the Road Opening?					
Permanent reinstatement (to original standard)		Temporary reinstatement (less than original standard)			
What material has been used in your reinstatement?					
Crushed and compacted rock (temporary)		Finished with asphalt cold mix (temporary			
Concrete (permanent)		Asphalt hot mix (permanent)		Bluestone (permanent)	
NOTE: If you have reinstated to less than the original quality and material or not to Council standards the reinstatement will be performed by Council's Infrastructure Services and the applicant will be debited or invoiced for the difference. The work will be inspected and final reinstatement (if required) will be undertaken by Council within 28 days on receipt of this form.					

Applicant's Name: .....

Applicant's Signature: ..... **Date:** .....

How to Apply

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Or email a scan to devpermits@portphillip.vic.gov.au or fax to 9536 2745.

Further Information

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Enquiries:
Email: devpermits@portphillip.vic.gov.au
Phone: 9209 6216
Mail: Private Bag No. 3, PO ST KILDA VIC 3182

CITY OF PORT PHILLIP
ABN 21 762 977 945

8 October 2015

AECOM
9/8 Exhibition St
MELBOURNE VIC 3000

ROAD OPENING PERMIT
237/2015/RO
Issued Under Community Amenity Local Law No: 1 (Clause 14)

This permit has been approved and issued subject to the following conditions and the permit holder shall be held to have agreed to such conditions and to have accepted any liability or responsibility thereby imposed.

Site of Works: White Street, all of street, SOUTH MELBOURNE

Description of Works: Bore Holes for Ground Water Monitoring (MW28)

Permit Valid From: 12 October 2015 **To:** 6 November 2015

In addition to complying with any relevant requirements in the Local Law No. 1, Community Amenity the following conditions apply to the activity or use:

Standard Conditions:

1. All works associated with the road opening including the set-up and removal of necessary signs and barriers may be undertaken between 7am to 6pm Monday to Friday and 9am to 3pm Saturday. Obstructions to traffic flow are not permitted outside of this period including setting up or removal of the infrastructure. .

2. To amend the dates of this licence requires a written request to be received by the City Permits by 5pm, while the permit is still valid. Once a permit has expired it cannot be re-used or amended.

3. A maximum of two (2) amendments to re-schedule the dates of this permit can be considered prior to incurring additional fees.

4. An absolute minimum width of 1.5 metres must be maintained for safe pedestrian access. Pedestrian safety must be maintained at all times by the appopriate use of bollards and tape. On both approaches to the works, the following signs must be clearly displayed and in place during the works;

    a) Pedestrian arrow signs
    a) Pedestrians Watch Your Step or,
    b) Pedestrian Use Other Footpath

5. All traffic treatments must be installed in accordance with any Traffic Management Plan submitted to Council and maintained during the works.

6. Signage must be visible and must not obstruct sightlines, designated pedestrian footpaths and crossovers/accesses. If on-street parking spaces are required to be used, only the spaces clearly specified on the plan can be used for that purpose.

7. Accredited Traffic Control Officers must be present to manage traffic flow during a partial or full road closure. Traffic Control Officers must also assist pedestrians and cyclists as required.

8. If vehicular traffic flow is affected by the works, emergency services, including, Fire Brigade, Ambulance and Police must be notified by the permit-holder a minimum of 24 hours prior the commencement of works.

9. To the satisfaction of, and at no cost to Council, the permit-holder must reinstate all assets and infrastructure.

10. City of Port Phillip does not accept any responsibility for accidents, damage or injury to property, participants or third parties that may arise out of this event. There must be public liability insurance for the type of work proposed with an indemnity of not less than $10M, including full indemnity for the City of Port Phillip Council against any claim laid against it either by members of the public or persons engaged in any activities associated with the traffic diversion who, as a result of the diversion, suffer personal injury, property damage or financial loss.

11. The permit-holder must comply with AS 1742.3 2002. Manual of uniform traffic control devices, Part 3 Traffic Control Devices for lane and Road Closures and the relevant Standards Australia Field Guides Part 1. Short term urban works, daytime/night time SAA HB 81.1 & 4 1996.

12. City of Port Phillip reserves the right to amend or revoke the above at any time.

Prior to commencement

13. In addition to the requirement to obtain a Road Opening Permit, further permits may be required for activities on Council land such as Skip Bin, Road Closure, Street Occupation, or Asset Protection. Consents may also be required from VicRoads, utilities and public transport operators. The permit-holder must ensure all relevant permits and approvals have been obtained prior to commencing any works.

14. The permit-holder must provide a minimum of 2 business day's written notification to the occupants of all affected owners, occupiers and businesses affected by the works. The notification must include the following information and a copy forwarded to the City Permits unit, e-mail: devpermits@portphillip.vic.gov.au and must include:-

    a) The nature of the works being performed
    a) The date and hours of works occurring under this permit
    b) Council's permit reference
    c) Contact name and phone number for the permit holder and/or site manager

15. The permit-holder must contact City Permits unit at least 2 business days prior to commencing works, by e-mail: devpermits@portphillip.vic.gov.au, or ph: 03 9209 6216, to organise an inspection with Council's Asset Inspection Officer to determine:

    - the extent of reinstatement works including road pavement, signage and markings
    - the requirement for further inspections,
    - any requirements for the removal, storage and reinstatement of bluestone assets
    - removal and reinstatement of street furniture, (litter bins, public seating and bicycle hoops)

During construction

16. Works that may cause significant delay to traffic and/or public transport services must be scheduled outside peak periods of 7–9am and 4–6pm weekdays unless otherwise permitted with the written consent of Council.

17. Works must be carried out in accordance with '*Road Management Act 2004 Code of Practice Worksite Safety – Traffic Management'* and any approved Traffic Management Plan.

Work execution

18. Without the written consent of the Council the permit-holder must utilise boring techniques when installing underground services. Any piping or cabling work under an existing vehicle crossing must be carried out by boring, unless approval from Council's Asset Inspection Officer has been obtained.

19. If agricultural drains or irrigation pipes are encountered during excavation the permit-holder must carefully replace the pipes to their original position prior to backfilling.

20. The minimum lateral clearance from a drain is 500mm and a vertical clearance of 300mm. If the proposed road opening or any other work interferes with any underground drains, the approval must be obtained from the Council's Assets department prior to the commencement of works.

21. The minimum lateral clearance from a street tree is 2 metres. If the proposed road opening is less than 2 metres, consent must be obtained from Council's Arborist.

22. In the event of cancellation of this permit, the Council reserves the right to reinstate the area at the expense of the permit-holder.

23. Surplus excavated material must be removed from the road reserve daily and the area left in a clean and tidy condition.

24. All finished surfaces must match and be flush with existing surfaces.

25. Within 7 days of completion of the works, the permit holder must submit a request for final inspection to City Permits unit, e-mail: devpermits@portphillip.vic.gov.au.

26. Any damage to Council assets caused by the permit- holder's reinstatement works must be rectified to the satisfaction of Council's Asset Inspection Officer.

27. Failure to restore the road reserve and repair any damage caused to assets will result in Council undertaking the necessary reinstatement works and deducting the cost from the security bond and the remainder refunded. Where costs exceed the security bond amount held, the permit holder will be liable for the excess and charged accordingly.

28. If works are conducted in contravention of this permit, the City of Port Phillip reserves the right to amend or revoke the above at any time.

Reinstatement of footpaths

Asphalt footpaths
Specification for Asphalt Footpath – Refer to Standard Drawing: SD3103

29. The permanent asphalt layer of footpaths must be constructed in accordance with Council's current Standard Drawing.

30. The Bituminous surface at the edges of the trench must be cut with a circular saw.

31. A temporary bituminous surface of premix (cold-mix) minimum depth 75mm must be constructed before the crossing is opened to traffic, unless the permit-holder is completing a permanent reinstatement immediately with hot-mix asphalt.

32. The full width of the footpath must be reinstated. Where only part of a concrete footpath/vehicle crossing panel has been damaged, reinstatement must include the removal and reinstatement of the whole panel.

Concrete footpaths
Specification for Concrete Footpaths – Refer to Standard Drawing: SD3103

33. The permanent concrete layer of footpaths must be constructed in accordance with Council's current Standard Drawing.

34. Concrete footpath areas affected by works will be reinstated in full sections within the surrounding joints unless directed otherwise by Council's Asset Inspection Officer.

35. Existing surface levels must be maintained and the tops of all service pits/junction boxes must be at the footpath surface level.

Reinstatement of road pavements

36. Where the permit-holder or contractor's road opening is less than 1.0 metre from the lip of a channel, the floating section of pavement must be removed and the final surface reinstatement will be from the furthest edge from opening/trench to the lip of channel.

37. All road pavement surfaces must be cut with a circular saw.

Flexible road pavement (Asphalt)
Specification for Flexible Road Pavements – Refer to Standard Drawing SD3103

Rigid Road Pavement (Concrete)

Temporary reinstatements

38. All temporary road reinstatements must be finished with cold-mix (premix asphalt) flush with the existing surfaces unless permanent hot-mix asphalt reinstatement is being completed immediately following the compaction of the pavement surface.

Nature strips

39. All nature strips must be reinstated. Backfilling of nature strips must be completed with natural soil material compacted in 150mm layers, 90% standard compaction to a level 75mm below surface. The remaining backfill must be uncompacted topsoil to 15mm above the surface level and the surface even and seeded to Council's satisfaction. The area must be kept moist until germination has occurred.

Reinstatement of vehicle crossings
Specification for Vehicle Crossings – Refer to Standard Drawing SD4101

40. The vehicle crossing must be constructed in accordance with Council's current Standard Drawing.

41. Concrete vehicle crossings affected by works must be reinstated in full sections (panels) within the surrounding joints unless otherwise directed by Council's 'Asset Inspection Officer'.

42. When reinstating a section/panel, Y16 dowel bars 400mm lengths must be inserted 200mm into the existing concrete surface and spaced 300mm apart.

Kerb and channel
Specification for Concrete Kerb and Channel – Refer to Standard Drawing SD1101
Specification for Bluestone Kerb and Channel – Refer to Standard Drawing SD1102

43. The kerb and channel must be reinstated to the satisfaction of Council's Asset Inspection Officer.

Bluestone pitchers
Specification for Bluestone Pitchers – Refer to Standard Drawing SD3101

44. The bluestone pitcher kerb and channel, and pavement must be reinstated to the satisfaction of Council's Asset Inspection Officer.

Footnotes:

Permitted Construction Hours
Under Council's Local Law No. 1 (Community Amenity), A *builder* requires a permit to carry out building works on a building site other than between 7.00am to 6.00pm Monday to Friday, and 9.00am to 3.00pm Saturday. No works are permitted on a public holiday as defined by the *Public Holidays Act* 1993.

Dial Before You Dig
Neglecting to dial 1100 before excavating can lead to costly disruption to essential services. Dial Before You Dig is a free referral service for information on locating underground utilities.
Ph: 1100
Web: www.1100.com.au

Standard Construction Drawings
http://www.portphillip.vic.gov.au/road_opening_permit.htm

City of Port Phillip Permits Index
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Contacts / Links

Asset Inspection Officer
Ph: 9209 6590
Fx: 9536 2710
Email: helpassetinspection@portphillip.vic.gov.au

City Permits
Ph: 9209 6216
Fx: 9536 2745
Email: devpermits@portphillip.vic.gov.au

Road Opening Request for Final Inspection

Community Amenity Local Law No. 1 Clause 14

This form must be completed within 48 hours of completion of works.
Any security bond refunds will be issued within 20 business days.

Applicant Details			
Site Address:			
Applicant/Business Name:			
Applicant's Postal Address:			
Telephone Number:		Mobile Number:	
E-mail Address:			
ABN:		ACN:	
Road Opening Details			
Road Opening Permit No:	.... / .... / **RO**		
Reason for Permit (tick appropriate box)			
Start & Completion Date of Works:	From: / /	To: / /	

What part of the Road Reserve are your works in?									
Footpath		Nature Strip		Road or Lane		Car Park		Kerb Channel	
Size of Opening:	**m L x m W = m²**								

Did any of the following assets require relocation as a result of the Road Opening?							
Parking Ticket Machine		Street Furniture		Litter Bin		Other (please state)	
The applicant is responsible for all associated costs as a result of the relocation of any Council assets.							

Our enquiries counter at St Kilda Town Hall
is open from 8.30am to 5.00pm Monday to Friday
T: 9209 6216 F: 9536 2745 E: devpermits@portphillip.vic.gov.au

www.portphillip.vic.gov.au/road_permits.htm

Road Opening Request for Final Inspection

Community Amenity Local Law No. 1 Clause 14

Request for Final Reinstatement

Any excavation or opening must be reinstated to Council requirements as per items (7), (9), (10) and (11) of Port Phillip City Council conditions on which a permit to open or obstruct roadways is issued (attached to Permit). The permanent reinstatement can be undertaken by Council if the applicant is unable to. The applicant at a bare minimum must be reinstated to temporary measures once the permit expires or when the safety precautions are removed.
Any opening within the City of Port Phillip must be back filled with crushed rock, compacted and finished with cold mix as a temporary measure until full reinstatement is completed by the applicant. If the applicant submits this application (Request for Final Inspection) without fully reinstating the surface to the original material being concrete, bluestone or asphalt and to Council requirements, the cost of shall be deducted from the security bond.

How have you reinstated the Road Opening?					
Permanent reinstatement (to original standard)		Temporary reinstatement (less than original standard)			
What material has been used in your reinstatement?					
Crushed and compacted rock (temporary)		Finished with asphalt cold mix (temporary			
Concrete (permanent)		Asphalt hot mix (permanent)		Bluestone (permanent)	
NOTE: If you have reinstated to less than the original quality and material or not to Council standards the reinstatement will be performed by Council's Infrastructure Services and the applicant will be debited or invoiced for the difference. The work will be inspected and final reinstatement (if required) will be undertaken by Council within 28 days on receipt of this form.					

Applicant's Name: .....

Applicant's Signature: ..... **Date:** .....

How to Apply

Submit this application form to: City Permits, City of Port Phillip, Private Bag No. 3, PO St Kilda VIC 3182
Or email a scan to devpermits@portphillip.vic.gov.au or fax to 9536 2745.

Further Information

Contact City Permits on 9209 6216 or devpermits@portphillip.vic.gov.au

Privacy Statement: The personal information requested on this form is being collected by the council for purposes of assessment in accordance with Community Amenity Local Law No. 1, Clause 14. The personal information will be used solely by the council for that primary purpose or directly related purposes. The applicant understands that the personal information provided is for the purpose of considering the application for an Asset Protection Permit and that he or she may apply to the council for access to the information. Requests for access and or correction should be made to Freedom of Information & Privacy Officer Governance & Engagement Department, City of Port Phillip.

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Enquiries:
Email: devpermits@portphillip.vic.gov.au
Phone: 9209 6216
Mail: Private Bag No. 3, PO ST KILDA VIC 3182

CITY OF PORT PHILLIP
ABN 21 762 977 945

8 October 2015

AECOM
9/8 Exhibition St
MELBOURNE VIC 3000

ROAD OPENING PERMIT
239/2015/RO
Issued Under Community Amenity Local Law No: 1 (Clause 14)

This permit has been approved and issued subject to the following conditions and the permit holder shall be held to have agreed to such conditions and to have accepted any liability or responsibility thereby imposed.

Site of Works: Bertie Street, all of street, PORT MELBOURNE

Description of Works: Bore Holes for Ground Water Monitoring (MW30)

Permit Valid From: 12 October 2015 **To:** 6 November 2015

In addition to complying with any relevant requirements in the Local Law No. 1, Community Amenity the following conditions apply to the activity or use:

Standard Conditions:

1. All works associated with the road opening including the set-up and removal of necessary signs and barriers may be undertaken between 7am to 6pm Monday to Friday and 9am to 3pm Saturday. Obstructions to traffic flow are not permitted outside of this period including setting up or removal of the infrastructure. .

2. To amend the dates of this licence requires a written request to be received by the City Permits by 5pm, while the permit is still valid. Once a permit has expired it cannot be re-used or amended.

3. A maximum of two (2) amendments to re-schedule the dates of this permit can be considered prior to incurring additional fees.

4. An absolute minimum width of 1.5 metres must be maintained for safe pedestrian access. Pedestrian safety must be maintained at all times by the appopriate use of bollards and tape. On both approaches to the works, the following signs must be clearly displayed and in place during the works;

    a) Pedestrian arrow signs
    a) Pedestrians Watch Your Step or,
    b) Pedestrian Use Other Footpath

5. All traffic treatments must be installed in accordance with any Traffic Management Plan submitted to Council and maintained during the works.

6. Signage must be visible and must not obstruct sightlines, designated pedestrian footpaths and crossovers/accesses. If on-street parking spaces are required to be used, only the spaces clearly specified on the plan can be used for that purpose.

7. Accredited Traffic Control Officers must be present to manage traffic flow during a partial or full road closure. Traffic Control Officers must also assist pedestrians and cyclists as required.

8. If vehicular traffic flow is affected by the works, emergency services, including, Fire Brigade, Ambulance and Police must be notified by the permit-holder a minimum of 24 hours prior the commencement of works.

9. To the satisfaction of, and at no cost to Council, the permit-holder must reinstate all assets and infrastructure.

10. City of Port Phillip does not accept any responsibility for accidents, damage or injury to property, participants or third parties that may arise out of this event. There must be public liability insurance for the type of work proposed with an indemnity of not less than $10M, including full indemnity for the City of Port Phillip Council against any claim laid against it either by members of the public or persons engaged in any activities associated with the traffic diversion who, as a result of the diversion, suffer personal injury, property damage or financial loss.

11. The permit-holder must comply with AS 1742.3 2002. Manual of uniform traffic control devices, Part 3 Traffic Control Devices for lane and Road Closures and the relevant Standards Australia Field Guides Part 1. Short term urban works, daytime/night time SAA HB 81.1 & 4 1996.

12. City of Port Phillip reserves the right to amend or revoke the above at any time.

Prior to commencement

13. In addition to the requirement to obtain a Road Opening Permit, further permits may be required for activities on Council land such as Skip Bin, Road Closure, Street Occupation, or Asset Protection. Consents may also be required from VicRoads, utilities and public transport operators. The permit-holder must ensure all relevant permits and approvals have been obtained prior to commencing any works.

14. The permit-holder must provide a minimum of 2 business day's written notification to the occupants of all affected owners, occupiers and businesses affected by the works. The notification must include the following information and a copy forwarded to the City Permits unit, e-mail: devpermits@portphillip.vic.gov.au and must include:-

    a) The nature of the works being performed
    a) The date and hours of works occurring under this permit
    b) Council's permit reference
    c) Contact name and phone number for the permit holder and/or site manager

15. The permit-holder must contact City Permits unit at least 2 business days prior to commencing works, by e-mail: devpermits@portphillip.vic.gov.au, or ph: 03 9209 6216, to organise an inspection with Council's Asset Inspection Officer to determine:

    - the extent of reinstatement works including road pavement, signage and markings
    - the requirement for further inspections,
    - any requirements for the removal, storage and reinstatement of bluestone assets
    - removal and reinstatement of street furniture, (litter bins, public seating and bicycle hoops)

During construction

16. Works that may cause significant delay to traffic and/or public transport services must be scheduled outside peak periods of 7–9am and 4–6pm weekdays unless otherwise permitted with the written consent of Council.

17. Works must be carried out in accordance with '*Road Management Act 2004 Code of Practice Worksite Safety – Traffic Management'* and any approved Traffic Management Plan.

Work execution

18. Without the written consent of the Council the permit-holder must utilise boring techniques when installing underground services. Any piping or cabling work under an existing vehicle crossing must be carried out by boring, unless approval from Council's Asset Inspection Officer has been obtained.

19. If agricultural drains or irrigation pipes are encountered during excavation the permit-holder must carefully replace the pipes to their original position prior to backfilling.

20. The minimum lateral clearance from a drain is 500mm and a vertical clearance of 300mm. If the proposed road opening or any other work interferes with any underground drains, the approval must be obtained from the Council's Assets department prior to the commencement of works.

21. The minimum lateral clearance from a street tree is 2 metres. If the proposed road opening is less than 2 metres, consent must be obtained from Council's Arborist.

22. In the event of cancellation of this permit, the Council reserves the right to reinstate the area at the expense of the permit-holder.

23. Surplus excavated material must be removed from the road reserve daily and the area left in a clean and tidy condition.

24. All finished surfaces must match and be flush with existing surfaces.

25. Within 7 days of completion of the works, the permit holder must submit a request for final inspection to City Permits unit, e-mail: devpermits@portphillip.vic.gov.au.

26. Any damage to Council assets caused by the permit- holder's reinstatement works must be rectified to the satisfaction of Council's Asset Inspection Officer.

27. Failure to restore the road reserve and repair any damage caused to assets will result in Council undertaking the necessary reinstatement works and deducting the cost from the security bond and the remainder refunded. Where costs exceed the security bond amount held, the permit holder will be liable for the excess and charged accordingly.

28. If works are conducted in contravention of this permit, the City of Port Phillip reserves the right to amend or revoke the above at any time.

Reinstatement of footpaths

Asphalt footpaths
Specification for Asphalt Footpath – Refer to Standard Drawing: SD3103

29. The permanent asphalt layer of footpaths must be constructed in accordance with Council's current Standard Drawing.

30. The Bituminous surface at the edges of the trench must be cut with a circular saw.

31. A temporary bituminous surface of premix (cold-mix) minimum depth 75mm must be constructed before the crossing is opened to traffic, unless the permit-holder is completing a permanent reinstatement immediately with hot-mix asphalt.

32. The full width of the footpath must be reinstated. Where only part of a concrete footpath/vehicle crossing panel has been damaged, reinstatement must include the removal and reinstatement of the whole panel.

Concrete footpaths
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34. Concrete footpath areas affected by works will be reinstated in full sections within the surrounding joints unless directed otherwise by Council's Asset Inspection Officer.

35. Existing surface levels must be maintained and the tops of all service pits/junction boxes must be at the footpath surface level.

Reinstatement of road pavements

36. Where the permit-holder or contractor's road opening is less than 1.0 metre from the lip of a channel, the floating section of pavement must be removed and the final surface reinstatement will be from the furthest edge from opening/trench to the lip of channel.

37. All road pavement surfaces must be cut with a circular saw.

Flexible road pavement (Asphalt)
Specification for Flexible Road Pavements – Refer to Standard Drawing SD3103

Rigid Road Pavement (Concrete)

Temporary reinstatements

38. All temporary road reinstatements must be finished with cold-mix (premix asphalt) flush with the existing surfaces unless permanent hot-mix asphalt reinstatement is being completed immediately following the compaction of the pavement surface.

Nature strips

39. All nature strips must be reinstated. Backfilling of nature strips must be completed with natural soil material compacted in 150mm layers, 90% standard compaction to a level 75mm below surface. The remaining backfill must be uncompacted topsoil to 15mm above the surface level and the surface even and seeded to Council's satisfaction. The area must be kept moist until germination has occurred.

Reinstatement of vehicle crossings
Specification for Vehicle Crossings – Refer to Standard Drawing SD4101

40. The vehicle crossing must be constructed in accordance with Council's current Standard Drawing.

41. Concrete vehicle crossings affected by works must be reinstated in full sections (panels) within the surrounding joints unless otherwise directed by Council's 'Asset Inspection Officer'.

42. When reinstating a section/panel, Y16 dowel bars 400mm lengths must be inserted 200mm into the existing concrete surface and spaced 300mm apart.

Kerb and channel
Specification for Concrete Kerb and Channel – Refer to Standard Drawing SD1101
Specification for Bluestone Kerb and Channel – Refer to Standard Drawing SD1102

43. The kerb and channel must be reinstated to the satisfaction of Council's Asset Inspection Officer.

Bluestone pitchers
Specification for Bluestone Pitchers – Refer to Standard Drawing SD3101

44. The bluestone pitcher kerb and channel, and pavement must be reinstated to the satisfaction of Council's Asset Inspection Officer.

Footnotes:

Permitted Construction Hours
Under Council's Local Law No. 1 (Community Amenity), A *builder* requires a permit to carry out building works on a building site other than between 7.00am to 6.00pm Monday to Friday, and 9.00am to 3.00pm Saturday. No works are permitted on a public holiday as defined by the *Public Holidays Act* 1993.

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Email: devpermits@portphillip.vic.gov.au

Road Opening Request for Final Inspection

Community Amenity Local Law No. 1 Clause 14

This form must be completed within 48 hours of completion of works.
Any security bond refunds will be issued within 20 business days.

Applicant Details			
Site Address:			
Applicant/Business Name:			
Applicant's Postal Address:			
Telephone Number:		Mobile Number:	
E-mail Address:			
ABN:		ACN:	
Road Opening Details			
Road Opening Permit No:	.... / .... / **RO**		
Reason for Permit (tick appropriate box)			
Start & Completion Date of Works:	From: / /	To: / /	

What part of the Road Reserve are your works in?									
Footpath		Nature Strip		Road or Lane		Car Park		Kerb Channel	
Size of Opening:	**m L x m W = m²**								

Did any of the following assets require relocation as a result of the Road Opening?							
Parking Ticket Machine		Street Furniture		Litter Bin		Other (please state)	
The applicant is responsible for all associated costs as a result of the relocation of any Council assets.							

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Road Opening Request for Final Inspection

Community Amenity Local Law No. 1 Clause 14

Request for Final Reinstatement

Any excavation or opening must be reinstated to Council requirements as per items (7), (9), (10) and (11) of Port Phillip City Council conditions on which a permit to open or obstruct roadways is issued (attached to Permit). The permanent reinstatement can be undertaken by Council if the applicant is unable to. The applicant at a bare minimum must be reinstated to temporary measures once the permit expires or when the safety precautions are removed.
Any opening within the City of Port Phillip must be back filled with crushed rock, compacted and finished with cold mix as a temporary measure until full reinstatement is completed by the applicant. If the applicant submits this application (Request for Final Inspection) without fully reinstating the surface to the original material being concrete, bluestone or asphalt and to Council requirements, the cost of shall be deducted from the security bond.

How have you reinstated the Road Opening?					
Permanent reinstatement (to original standard)		Temporary reinstatement (less than original standard)			
What material has been used in your reinstatement?					
Crushed and compacted rock (temporary)		Finished with asphalt cold mix (temporary			
Concrete (permanent)		Asphalt hot mix (permanent)		Bluestone (permanent)	
NOTE: If you have reinstated to less than the original quality and material or not to Council standards the reinstatement will be performed by Council's Infrastructure Services and the applicant will be debited or invoiced for the difference. The work will be inspected and final reinstatement (if required) will be undertaken by Council within 28 days on receipt of this form.					

Applicant's Name: .....

Applicant's Signature: ..... **Date:** .....

How to Apply

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Or email a scan to devpermits@portphillip.vic.gov.au or fax to 9536 2745.

Further Information

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Enquiries:
Email: devpermits@portphillip.vic.gov.au
Phone: 9209 6216
Mail: Private Bag No. 3, PO ST KILDA VIC 3182

CITY OF PORT PHILLIP
ABN 21 762 977 945

8 October 2015

AECOM
9/8 Exhibition St
MELBOURNE VIC 3000

ROAD OPENING PERMIT
243/2015/RO
Issued Under Community Amenity Local Law No: 1 (Clause 14)

This permit has been approved and issued subject to the following conditions and the permit holder shall be held to have agreed to such conditions and to have accepted any liability or responsibility thereby imposed.

Site of Works: Johnson Street, all of street, SOUTH MELBOURNE

Description of Works: Bore holes for groundwater sampling (MW31)

Permit Valid From: 12 October 2015 **To:** 30 October 2015

In addition to complying with any relevant requirements in the Local Law No. 1, Community Amenity the following conditions apply to the activity or use:

Standard Conditions:

1. All works associated with the road opening including the set-up and removal of necessary signs and barriers may be taken **12 October and 30 October 2015** between **Monday to Friday 7am to 5pm and Saturday 9am to 3pm**. Obstructions to traffic flow are not permitted outside of this period including setting up or removal of the infrastructure.

2. To amend the dates of this licence requires a written request to be received by the City Permits by 5pm, while the permit is still valid. Once a permit has expired it cannot be re-used or amended.

3. A maximum of two (2) amendments to re-schedule the dates of this permit can be considered prior to incurring additional fees.

4. An absolute minimum width of 1.5 metres must be maintained for safe pedestrian access. Pedestrian safety must be maintained at all times by the appopriate use of bollards and tape. On both approaches to the works, the following signs must be clearly displayed and in place during the works;

    a) Pedestrian arrow signs
    a) Pedestrians Watch Your Step or,
    b) Pedestrian Use Other Footpath

5. All traffic treatments must be installed in accordance with any Traffic Management Plan submitted to Council and maintained during the works.

6. Signage must be visible and must not obstruct sightlines, designated pedestrian footpaths and crossovers/accesses. If on-street parking spaces are required to be used, only the spaces clearly specified on the

plan can be used for that purpose.

7. Accredited Traffic Control Officers must be present to manage traffic flow during a partial or full road closure. Traffic Control Officers must also assist pedestrians and cyclists as required.

8. If vehicular traffic flow is affected by the works, emergency services, including, Fire Brigade, Ambulance and Police must be notified by the permit-holder a minimum of 24 hours prior the commencement of works.

9. To the satisfaction of, and at no cost to Council, the permit-holder must reinstate all assets and infrastructure.

10. City of Port Phillip does not accept any responsibility for accidents, damage or injury to property, participants or third parties that may arise out of this event. There must be public liability insurance for the type of work proposed with an indemnity of not less than $10M, including full indemnity for the City of Port Phillip Council against any claim laid against it either by members of the public or persons engaged in any activities associated with the traffic diversion who, as a result of the diversion, suffer personal injury, property damage or financial loss.

11. The permit-holder must comply with AS 1742.3 2002. Manual of uniform traffic control devices, Part 3 Traffic Control Devices for lane and Road Closures and the relevant Standards Australia Field Guides Part 1. Short term urban works, daytime/night time SAA HB 81.1 & 4 1996.

12. City of Port Phillip reserves the right to amend or revoke the above at any time.

Prior to commencement

13. In addition to the requirement to obtain a Road Opening Permit, further permits may be required for activities on Council land such as Skip Bin, Road Closure, Street Occupation, or Asset Protection. Consents may also be required from VicRoads, utilities and public transport operators. The permit-holder must ensure all relevant permits and approvals have been obtained prior to commencing any works.

14. The permit-holder must provide a minimum of 2 business day's written notification to the occupants of all affected owners, occupiers and businesses affected by the works. The notification must include the following information and a copy forwarded to the City Permits unit, e-mail: devpermits@portphillip.vic.gov.au and must include:-

    a) The nature of the works being performed
    a) The date and hours of works occurring under this permit
    b) Council's permit reference
    c) Contact name and phone number for the permit holder and/or site manager

15. The permit-holder must contact City Permits unit at least 2 business days prior to commencing works, by e-mail: devpermits@portphillip.vic.gov.au, or ph: 03 9209 6216, to organise an inspection with Council's Asset Inspection Officer to determine:

    - the extent of reinstatement works including road pavement, signage and markings
    - the requirement for further inspections,
    - any requirements for the removal, storage and reinstatement of bluestone assets
    - removal and reinstatement of street furniture, (litter bins, public seating and bicycle hoops)

During construction

16. Works that may cause significant delay to traffic and/or public transport services must be scheduled outside peak periods of 7–9am and 4–6pm weekdays unless otherwise permitted with the written consent of Council.

17. Works must be carried out in accordance with '*Road Management Act 2004 Code of Practice Worksite Safety – Traffic Management'* and any approved Traffic Management Plan.

Work execution

18. Without the written consent of the Council the permit-holder must utilise boring techniques when installing underground services. Any piping or cabling work under an existing vehicle crossing must be carried out by boring, unless approval from Council's Asset Inspection Officer has been obtained.

19. If agricultural drains or irrigation pipes are encountered during excavation the permit-holder must carefully replace the pipes to their original position prior to backfilling.

20. The minimum lateral clearance from a drain is 500mm and a vertical clearance of 300mm. If the proposed road opening or any other work interferes with any underground drains, the approval must be obtained from the Council's Assets department prior to the commencement of works.

21. The minimum lateral clearance from a street tree is 2 metres. If the proposed road opening is less than 2 metres, consent must be obtained from Council's Arborist.

22. In the event of cancellation of this permit, the Council reserves the right to reinstate the area at the expense of the permit-holder.

23. Surplus excavated material must be removed from the road reserve daily and the area left in a clean and tidy condition.

24. All finished surfaces must match and be flush with existing surfaces.

25. Within 7 days of completion of the works, the permit holder must submit a request for final inspection to City Permits unit, e-mail: devpermits@portphillip.vic.gov.au.

26. Any damage to Council assets caused by the permit- holder's reinstatement works must be rectified to the satisfaction of Council's Asset Inspection Officer.

27. Failure to restore the road reserve and repair any damage caused to assets will result in Council undertaking the necessary reinstatement works and deducting the cost from the security bond and the remainder refunded. Where costs exceed the security bond amount held, the permit holder will be liable for the excess and charged accordingly.

28. If works are conducted in contravention of this permit, the City of Port Phillip reserves the right to amend or revoke the above at any time.

Reinstatement of footpaths

Asphalt footpaths
Specification for Asphalt Footpath – Refer to Standard Drawing: SD3103

29. The permanent asphalt layer of footpaths must be constructed in accordance with Council's current Standard Drawing.

30. The Bituminous surface at the edges of the trench must be cut with a circular saw.

31. A temporary bituminous surface of premix (cold-mix) minimum depth 75mm must be constructed before the crossing is opened to traffic, unless the permit-holder is completing a permanent reinstatement immediately with hot-mix asphalt.

32. The full width of the footpath must be reinstated. Where only part of a concrete footpath/vehicle crossing panel has been damaged, reinstatement must include the removal and reinstatement of the whole panel.

Concrete footpaths
Specification for Concrete Footpaths – Refer to Standard Drawing: SD3103

33. The permanent concrete layer of footpaths must be constructed in accordance with Council's current Standard Drawing.

34. Concrete footpath areas affected by works will be reinstated in full sections within the surrounding joints unless directed otherwise by Council's Asset Inspection Officer.

35. Existing surface levels must be maintained and the tops of all service pits/junction boxes must be at the footpath surface level.

Reinstatement of road pavements

36. Where the permit-holder or contractor's road opening is less than 1.0 metre from the lip of a channel, the floating section of pavement must be removed and the final surface reinstatement will be from the furthest edge from opening/trench to the lip of channel.

37. All road pavement surfaces must be cut with a circular saw.

Flexible road pavement (Asphalt)
Specification for Flexible Road Pavements – Refer to Standard Drawing SD3103

Rigid Road Pavement (Concrete)

Temporary reinstatements

38. All temporary road reinstatements must be finished with cold-mix (premix asphalt) flush with the existing surfaces unless permanent hot-mix asphalt reinstatement is being completed immediately following the compaction of the pavement surface.

Nature strips

39. All nature strips must be reinstated. Backfilling of nature strips must be completed with natural soil material compacted in 150mm layers, 90% standard compaction to a level 75mm below surface. The remaining backfill must be uncompacted topsoil to 15mm above the surface level and the surface even and seeded to Council's satisfaction. The area must be kept moist until germination has occurred.

Reinstatement of vehicle crossings
Specification for Vehicle Crossings – Refer to Standard Drawing SD4101

40. The vehicle crossing must be constructed in accordance with Council's current Standard Drawing.

41. Concrete vehicle crossings affected by works must be reinstated in full sections (panels) within the surrounding joints unless otherwise directed by Council's 'Asset Inspection Officer'.

42. When reinstating a section/panel, Y16 dowel bars 400mm lengths must be inserted 200mm into the existing concrete surface and spaced 300mm apart.

Kerb and channel
Specification for Concrete Kerb and Channel – Refer to Standard Drawing SD1101
Specification for Bluestone Kerb and Channel – Refer to Standard Drawing SD1102

43. The kerb and channel must be reinstated to the satisfaction of Council's Asset Inspection Officer.

Bluestone pitchers
Specification for Bluestone Pitchers – Refer to Standard Drawing SD3101

44. The bluestone pitcher kerb and channel, and pavement must be reinstated to the satisfaction of Council's Asset Inspection Officer.

Footnotes:

Permitted Construction Hours
Under Council's Local Law No. 1 (Community Amenity), A *builder* requires a permit to carry out building works on a building site other than between 7.00am to 6.00pm Monday to Friday, and 9.00am to 3.00pm Saturday. No works are permitted on a public holiday as defined by the *Public Holidays Act* 1993.

Dial Before You Dig
Neglecting to dial 1100 before excavating can lead to costly disruption to essential services. Dial Before You Dig is a free referral service for information on locating underground utilities.
Ph: 1100
Web: www.1100.com.au

Standard Construction Drawings
http://www.portphillip.vic.gov.au/road_opening_permit.htm

City of Port Phillip Permits Index
http://www.portphillip.vic.gov.au/permits_licenses_index.htm

Contacts / Links

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Fx: 9536 2710
Email: helpassetinspection@portphillip.vic.gov.au

City Permits
Ph: 9209 6216
Fx: 9536 2745
Email: devpermits@portphillip.vic.gov.au

Road Opening Request for Final Inspection

Community Amenity Local Law No. 1 Clause 14

This form must be completed within 48 hours of completion of works.
Any security bond refunds will be issued within 20 business days.

Applicant Details			
Site Address:			
Applicant/Business Name:			
Applicant's Postal Address:			
Telephone Number:		Mobile Number:	
E-mail Address:			
ABN:		ACN:	
Road Opening Details			
Road Opening Permit No:	.... / .... / **RO**		
Reason for Permit (tick appropriate box)			
Start & Completion Date of Works:	From: / /	To: / /	

What part of the Road Reserve are your works in?									
Footpath		Nature Strip		Road or Lane		Car Park		Kerb Channel	
Size of Opening:	**m L x m W = m²**								

Did any of the following assets require relocation as a result of the Road Opening?							
Parking Ticket Machine		Street Furniture		Litter Bin		Other (please state)	
The applicant is responsible for all associated costs as a result of the relocation of any Council assets.							

Our enquiries counter at St Kilda Town Hall
is open from 8.30am to 5.00pm Monday to Friday
T: 9209 6216 F: 9536 2745 E: devpermits@portphillip.vic.gov.au

www.portphillip.vic.gov.au/road_permits.htm

Road Opening Request for Final Inspection

Community Amenity Local Law No. 1 Clause 14

Request for Final Reinstatement

Any excavation or opening must be reinstated to Council requirements as per items (7), (9), (10) and (11) of Port Phillip City Council conditions on which a permit to open or obstruct roadways is issued (attached to Permit). The permanent reinstatement can be undertaken by Council if the applicant is unable to. The applicant at a bare minimum must be reinstated to temporary measures once the permit expires or when the safety precautions are removed.
Any opening within the City of Port Phillip must be back filled with crushed rock, compacted and finished with cold mix as a temporary measure until full reinstatement is completed by the applicant. If the applicant submits this application (Request for Final Inspection) without fully reinstating the surface to the original material being concrete, bluestone or asphalt and to Council requirements, the cost of shall be deducted from the security bond.

How have you reinstated the Road Opening?					
Permanent reinstatement (to original standard)		Temporary reinstatement (less than original standard)			
What material has been used in your reinstatement?					
Crushed and compacted rock (temporary)		Finished with asphalt cold mix (temporary			
Concrete (permanent)		Asphalt hot mix (permanent)		Bluestone (permanent)	
NOTE: If you have reinstated to less than the original quality and material or not to Council standards the reinstatement will be performed by Council's Infrastructure Services and the applicant will be debited or invoiced for the difference. The work will be inspected and final reinstatement (if required) will be undertaken by Council within 28 days on receipt of this form.					

Applicant's Name: .....

Applicant's Signature: ..... **Date:** .....

How to Apply

Submit this application form to: City Permits, City of Port Phillip, Private Bag No. 3, PO St Kilda VIC 3182
Or email a scan to devpermits@portphillip.vic.gov.au or fax to 9536 2745.

Further Information

Contact City Permits on 9209 6216 or devpermits@portphillip.vic.gov.au

Privacy Statement: The personal information requested on this form is being collected by the council for purposes of assessment in accordance with Community Amenity Local Law No. 1, Clause 14. The personal information will be used solely by the council for that primary purpose or directly related purposes. The applicant understands that the personal information provided is for the purpose of considering the application for an Asset Protection Permit and that he or she may apply to the council for access to the information. Requests for access and or correction should be made to Freedom of Information & Privacy Officer Governance & Engagement Department, City of Port Phillip.

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T: 9209 6216 F: 9536 2745 E: devpermits@portphillip.vic.gov.au

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Enquiries:
Email: devpermits@portphillip.vic.gov.au
Phone: 9209 6216
Mail: Private Bag No. 3, PO ST KILDA VIC 3182

CITY OF PORT PHILLIP
ABN 21 762 977 945

8 October 2015

AECOM
9/8 Exhibition St
MELBOURNE VIC 3000

ROAD OPENING PERMIT
245/2015/RO
Issued Under Community Amenity Local Law No: 1 (Clause 14)

This permit has been approved and issued subject to the following conditions and the permit holder shall be held to have agreed to such conditions and to have accepted any liability or responsibility thereby imposed.

Site of Works: Gladstone Street, all of street, SOUTH MELBOURNE

Description of Works: Bore holes for groundwater sampling.(MW34)

Permit Valid From: 12 October 2015 **To:** 30 October 2015

In addition to complying with any relevant requirements in the Local Law No. 1, Community Amenity the following conditions apply to the activity or use:

Standard Conditions:

1. All works associated with the road opening including the set-up and removal of necessary signs and barriers may be taken **12 October and 30 October 2015** between **Monday to Friday 7am to 5pm and Saturday 9am to 3pm**. Obstructions to traffic flow are not permitted outside of this period including setting up or removal of the infrastructure.

2. To amend the dates of this licence requires a written request to be received by the City Permits by 5pm, while the permit is still valid. Once a permit has expired it cannot be re-used or amended.

3. A maximum of two (2) amendments to re-schedule the dates of this permit can be considered prior to incurring additional fees.

4. An absolute minimum width of 1.5 metres must be maintained for safe pedestrian access. Pedestrian safety must be maintained at all times by the appopriate use of bollards and tape. On both approaches to the works, the following signs must be clearly displayed and in place during the works;

    a) Pedestrian arrow signs
    a) Pedestrians Watch Your Step or,
    b) Pedestrian Use Other Footpath

5. All traffic treatments must be installed in accordance with any Traffic Management Plan submitted to Council and maintained during the works.

6. Signage must be visible and must not obstruct sightlines, designated pedestrian footpaths and crossovers/accesses. If on-street parking spaces are required to be used, only the spaces clearly specified on the

plan can be used for that purpose.

7. Accredited Traffic Control Officers must be present to manage traffic flow during a partial or full road closure. Traffic Control Officers must also assist pedestrians and cyclists as required.

8. If vehicular traffic flow is affected by the works, emergency services, including, Fire Brigade, Ambulance and Police must be notified by the permit-holder a minimum of 24 hours prior the commencement of works.

9. To the satisfaction of, and at no cost to Council, the permit-holder must reinstate all assets and infrastructure.

10. City of Port Phillip does not accept any responsibility for accidents, damage or injury to property, participants or third parties that may arise out of this event. There must be public liability insurance for the type of work proposed with an indemnity of not less than $10M, including full indemnity for the City of Port Phillip Council against any claim laid against it either by members of the public or persons engaged in any activities associated with the traffic diversion who, as a result of the diversion, suffer personal injury, property damage or financial loss.

11. The permit-holder must comply with AS 1742.3 2002. Manual of uniform traffic control devices, Part 3 Traffic Control Devices for lane and Road Closures and the relevant Standards Australia Field Guides Part 1. Short term urban works, daytime/night time SAA HB 81.1 & 4 1996.

12. City of Port Phillip reserves the right to amend or revoke the above at any time.

Prior to commencement

13. In addition to the requirement to obtain a Road Opening Permit, further permits may be required for activities on Council land such as Skip Bin, Road Closure, Street Occupation, or Asset Protection. Consents may also be required from VicRoads, utilities and public transport operators. The permit-holder must ensure all relevant permits and approvals have been obtained prior to commencing any works.

14. The permit-holder must provide a minimum of 2 business day's written notification to the occupants of all affected owners, occupiers and businesses affected by the works. The notification must include the following information and a copy forwarded to the City Permits unit, e-mail: devpermits@portphillip.vic.gov.au and must include:-

    a) The nature of the works being performed
    a) The date and hours of works occurring under this permit
    b) Council's permit reference
    c) Contact name and phone number for the permit holder and/or site manager

15. The permit-holder must contact City Permits unit at least 2 business days prior to commencing works, by e-mail: devpermits@portphillip.vic.gov.au, or ph: 03 9209 6216, to organise an inspection with Council's Asset Inspection Officer to determine:

    - the extent of reinstatement works including road pavement, signage and markings
    - the requirement for further inspections,
    - any requirements for the removal, storage and reinstatement of bluestone assets
    - removal and reinstatement of street furniture, (litter bins, public seating and bicycle hoops)

During construction

16. Works that may cause significant delay to traffic and/or public transport services must be scheduled outside peak periods of 7–9am and 4–6pm weekdays unless otherwise permitted with the written consent of Council.

17. Works must be carried out in accordance with '*Road Management Act 2004 Code of Practice Worksite Safety – Traffic Management'* and any approved Traffic Management Plan.

Work execution

18. Without the written consent of the Council the permit-holder must utilise boring techniques when installing underground services. Any piping or cabling work under an existing vehicle crossing must be carried out by boring, unless approval from Council's Asset Inspection Officer has been obtained.

19. If agricultural drains or irrigation pipes are encountered during excavation the permit-holder must carefully replace the pipes to their original position prior to backfilling.

20. The minimum lateral clearance from a drain is 500mm and a vertical clearance of 300mm. If the proposed road opening or any other work interferes with any underground drains, the approval must be obtained from the Council's Assets department prior to the commencement of works.

21. The minimum lateral clearance from a street tree is 2 metres. If the proposed road opening is less than 2 metres, consent must be obtained from Council's Arborist.

22. In the event of cancellation of this permit, the Council reserves the right to reinstate the area at the expense of the permit-holder.

23. Surplus excavated material must be removed from the road reserve daily and the area left in a clean and tidy condition.

24. All finished surfaces must match and be flush with existing surfaces.

25. Within 7 days of completion of the works, the permit holder must submit a request for final inspection to City Permits unit, e-mail: devpermits@portphillip.vic.gov.au.

26. Any damage to Council assets caused by the permit- holder's reinstatement works must be rectified to the satisfaction of Council's Asset Inspection Officer.

27. Failure to restore the road reserve and repair any damage caused to assets will result in Council undertaking the necessary reinstatement works and deducting the cost from the security bond and the remainder refunded. Where costs exceed the security bond amount held, the permit holder will be liable for the excess and charged accordingly.

28. If works are conducted in contravention of this permit, the City of Port Phillip reserves the right to amend or revoke the above at any time.

Reinstatement of footpaths

Asphalt footpaths
Specification for Asphalt Footpath – Refer to Standard Drawing: SD3103

29. The permanent asphalt layer of footpaths must be constructed in accordance with Council's current Standard Drawing.

30. The Bituminous surface at the edges of the trench must be cut with a circular saw.

31. A temporary bituminous surface of premix (cold-mix) minimum depth 75mm must be constructed before the crossing is opened to traffic, unless the permit-holder is completing a permanent reinstatement immediately with hot-mix asphalt.

32. The full width of the footpath must be reinstated. Where only part of a concrete footpath/vehicle crossing panel has been damaged, reinstatement must include the removal and reinstatement of the whole panel.

Concrete footpaths
Specification for Concrete Footpaths – Refer to Standard Drawing: SD3103

33. The permanent concrete layer of footpaths must be constructed in accordance with Council's current Standard Drawing.

34. Concrete footpath areas affected by works will be reinstated in full sections within the surrounding joints unless directed otherwise by Council's Asset Inspection Officer.

35. Existing surface levels must be maintained and the tops of all service pits/junction boxes must be at the footpath surface level.

Reinstatement of road pavements

36. Where the permit-holder or contractor's road opening is less than 1.0 metre from the lip of a channel, the floating section of pavement must be removed and the final surface reinstatement will be from the furthest edge from opening/trench to the lip of channel.

37. All road pavement surfaces must be cut with a circular saw.

Flexible road pavement (Asphalt)
Specification for Flexible Road Pavements – Refer to Standard Drawing SD3103

Rigid Road Pavement (Concrete)

Temporary reinstatements

38. All temporary road reinstatements must be finished with cold-mix (premix asphalt) flush with the existing surfaces unless permanent hot-mix asphalt reinstatement is being completed immediately following the compaction of the pavement surface.

Nature strips

39. All nature strips must be reinstated. Backfilling of nature strips must be completed with natural soil material compacted in 150mm layers, 90% standard compaction to a level 75mm below surface. The remaining backfill must be uncompacted topsoil to 15mm above the surface level and the surface even and seeded to Council's satisfaction. The area must be kept moist until germination has occurred.

Reinstatement of vehicle crossings
Specification for Vehicle Crossings – Refer to Standard Drawing SD4101

40. The vehicle crossing must be constructed in accordance with Council's current Standard Drawing.

41. Concrete vehicle crossings affected by works must be reinstated in full sections (panels) within the surrounding joints unless otherwise directed by Council's 'Asset Inspection Officer'.

42. When reinstating a section/panel, Y16 dowel bars 400mm lengths must be inserted 200mm into the existing concrete surface and spaced 300mm apart.

Kerb and channel
Specification for Concrete Kerb and Channel – Refer to Standard Drawing SD1101
Specification for Bluestone Kerb and Channel – Refer to Standard Drawing SD1102

43. The kerb and channel must be reinstated to the satisfaction of Council's Asset Inspection Officer.

Bluestone pitchers
Specification for Bluestone Pitchers – Refer to Standard Drawing SD3101

44. The bluestone pitcher kerb and channel, and pavement must be reinstated to the satisfaction of Council's Asset Inspection Officer.

Footnotes:

Permitted Construction Hours
Under Council's Local Law No. 1 (Community Amenity), A *builder* requires a permit to carry out building works on a building site other than between 7.00am to 6.00pm Monday to Friday, and 9.00am to 3.00pm Saturday. No works are permitted on a public holiday as defined by the *Public Holidays Act* 1993.

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Ph: 9209 6216
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Email: devpermits@portphillip.vic.gov.au

Road Opening Request for Final Inspection

Community Amenity Local Law No. 1 Clause 14

This form must be completed within 48 hours of completion of works.
Any security bond refunds will be issued within 20 business days.

Applicant Details			
Site Address:			
Applicant/Business Name:			
Applicant's Postal Address:			
Telephone Number:		Mobile Number:	
E-mail Address:			
ABN:		ACN:	
Road Opening Details			
Road Opening Permit No:	.... / .... / **RO**		
Reason for Permit (tick appropriate box)			
Start & Completion Date of Works:	From: / /	To: / /	

What part of the Road Reserve are your works in?									
Footpath		Nature Strip		Road or Lane		Car Park		Kerb Channel	
Size of Opening:	**m L x m W = m²**								

Did any of the following assets require relocation as a result of the Road Opening?							
Parking Ticket Machine		Street Furniture		Litter Bin		Other (please state)	
The applicant is responsible for all associated costs as a result of the relocation of any Council assets.							

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Road Opening Request for Final Inspection

Community Amenity Local Law No. 1 Clause 14

Request for Final Reinstatement

Any excavation or opening must be reinstated to Council requirements as per items (7), (9), (10) and (11) of Port Phillip City Council conditions on which a permit to open or obstruct roadways is issued (attached to Permit). The permanent reinstatement can be undertaken by Council if the applicant is unable to. The applicant at a bare minimum must be reinstated to temporary measures once the permit expires or when the safety precautions are removed.
Any opening within the City of Port Phillip must be back filled with crushed rock, compacted and finished with cold mix as a temporary measure until full reinstatement is completed by the applicant. If the applicant submits this application (Request for Final Inspection) without fully reinstating the surface to the original material being concrete, bluestone or asphalt and to Council requirements, the cost of shall be deducted from the security bond.

How have you reinstated the Road Opening?					
Permanent reinstatement (to original standard)		Temporary reinstatement (less than original standard)			
What material has been used in your reinstatement?					
Crushed and compacted rock (temporary)		Finished with asphalt cold mix (temporary			
Concrete (permanent)		Asphalt hot mix (permanent)		Bluestone (permanent)	
NOTE: If you have reinstated to less than the original quality and material or not to Council standards the reinstatement will be performed by Council's Infrastructure Services and the applicant will be debited or invoiced for the difference. The work will be inspected and final reinstatement (if required) will be undertaken by Council within 28 days on receipt of this form.					

Applicant's Name: .....

Applicant's Signature: ..... **Date:** .....

How to Apply

Submit this application form to: City Permits, City of Port Phillip, Private Bag No. 3, PO St Kilda VIC 3182
Or email a scan to devpermits@portphillip.vic.gov.au or fax to 9536 2745.

Further Information

Contact City Permits on 9209 6216 or devpermits@portphillip.vic.gov.au

Privacy Statement: The personal information requested on this form is being collected by the council for purposes of assessment in accordance with Community Amenity Local Law No. 1, Clause 14. The personal information will be used solely by the council for that primary purpose or directly related purposes. The applicant understands that the personal information provided is for the purpose of considering the application for an Asset Protection Permit and that he or she may apply to the council for access to the information. Requests for access and or correction should be made to Freedom of Information & Privacy Officer Governance & Engagement Department, City of Port Phillip.

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www.portphillip.vic.gov.au/road_permits.htm

Enquiries:
Email: devpermits@portphillip.vic.gov.au
Phone: 9209 6216
Mail: Private Bag No. 3, PO ST KILDA VIC 3182

CITY OF PORT PHILLIP
ABN 21 762 977 945

8 October 2015

AECOM
9/8 Exhibition St
MELBOURNE VIC 3000

ROAD OPENING PERMIT
246/2015/RO
Issued Under Community Amenity Local Law No: 1 (Clause 14)

This permit has been approved and issued subject to the following conditions and the permit holder shall be held to have agreed to such conditions and to have accepted any liability or responsibility thereby imposed.

Site of Works: Woodgate Street, all of Sth Melbourne section, SOUTH MELBOURNE

Description of Works: Bore holes for groundwater sampling (MW36)

Permit Valid From: 12 October 2015 **To:** 30 October 2015

In addition to complying with any relevant requirements in the Local Law No. 1, Community Amenity the following conditions apply to the activity or use:

Standard Conditions:

1. All works associated with the road opening including the set-up and removal of necessary signs and barriers may be taken **12 October and 30 October 2015** between **Monday to Friday 7am to 5pm and Saturday 9am to 3pm**. Obstructions to traffic flow are not permitted outside of this period including setting up or removal of the infrastructure.

2. To amend the dates of this licence requires a written request to be received by the City Permits by 5pm, while the permit is still valid. Once a permit has expired it cannot be re-used or amended.

3. A maximum of two (2) amendments to re-schedule the dates of this permit can be considered prior to incurring additional fees.

4. An absolute minimum width of 1.5 metres must be maintained for safe pedestrian access. Pedestrian safety must be maintained at all times by the appopriate use of bollards and tape. On both approaches to the works, the following signs must be clearly displayed and in place during the works;

    a) Pedestrian arrow signs
    a) Pedestrians Watch Your Step or,
    b) Pedestrian Use Other Footpath

5. All traffic treatments must be installed in accordance with any Traffic Management Plan submitted to Council and maintained during the works.

6. Signage must be visible and must not obstruct sightlines, designated pedestrian footpaths and crossovers/accesses. If on-street parking spaces are required to be used, only the spaces clearly specified on the

plan can be used for that purpose.

7. Accredited Traffic Control Officers must be present to manage traffic flow during a partial or full road closure. Traffic Control Officers must also assist pedestrians and cyclists as required.

8. If vehicular traffic flow is affected by the works, emergency services, including, Fire Brigade, Ambulance and Police must be notified by the permit-holder a minimum of 24 hours prior the commencement of works.

9. To the satisfaction of, and at no cost to Council, the permit-holder must reinstate all assets and infrastructure.

10. City of Port Phillip does not accept any responsibility for accidents, damage or injury to property, participants or third parties that may arise out of this event. There must be public liability insurance for the type of work proposed with an indemnity of not less than $10M, including full indemnity for the City of Port Phillip Council against any claim laid against it either by members of the public or persons engaged in any activities associated with the traffic diversion who, as a result of the diversion, suffer personal injury, property damage or financial loss.

11. The permit-holder must comply with AS 1742.3 2002. Manual of uniform traffic control devices, Part 3 Traffic Control Devices for lane and Road Closures and the relevant Standards Australia Field Guides Part 1. Short term urban works, daytime/night time SAA HB 81.1 & 4 1996.

12. City of Port Phillip reserves the right to amend or revoke the above at any time.

Prior to commencement

13. In addition to the requirement to obtain a Road Opening Permit, further permits may be required for activities on Council land such as Skip Bin, Road Closure, Street Occupation, or Asset Protection. Consents may also be required from VicRoads, utilities and public transport operators. The permit-holder must ensure all relevant permits and approvals have been obtained prior to commencing any works.

14. The permit-holder must provide a minimum of 2 business day's written notification to the occupants of all affected owners, occupiers and businesses affected by the works. The notification must include the following information and a copy forwarded to the City Permits unit, e-mail: devpermits@portphillip.vic.gov.au and must include:-

    a) The nature of the works being performed
    a) The date and hours of works occurring under this permit
    b) Council's permit reference
    c) Contact name and phone number for the permit holder and/or site manager

15. The permit-holder must contact City Permits unit at least 2 business days prior to commencing works, by e-mail: devpermits@portphillip.vic.gov.au, or ph: 03 9209 6216, to organise an inspection with Council's Asset Inspection Officer to determine:

    - the extent of reinstatement works including road pavement, signage and markings
    - the requirement for further inspections,
    - any requirements for the removal, storage and reinstatement of bluestone assets
    - removal and reinstatement of street furniture, (litter bins, public seating and bicycle hoops)

During construction

16. Works that may cause significant delay to traffic and/or public transport services must be scheduled outside peak periods of 7–9am and 4–6pm weekdays unless otherwise permitted with the written consent of Council.

17. Works must be carried out in accordance with '*Road Management Act 2004 Code of Practice Worksite Safety – Traffic Management'* and any approved Traffic Management Plan.

Work execution

18. Without the written consent of the Council the permit-holder must utilise boring techniques when installing underground services. Any piping or cabling work under an existing vehicle crossing must be carried out by boring, unless approval from Council's Asset Inspection Officer has been obtained.

19. If agricultural drains or irrigation pipes are encountered during excavation the permit-holder must carefully replace the pipes to their original position prior to backfilling.

20. The minimum lateral clearance from a drain is 500mm and a vertical clearance of 300mm. If the proposed road opening or any other work interferes with any underground drains, the approval must be obtained from the Council's Assets department prior to the commencement of works.

21. The minimum lateral clearance from a street tree is 2 metres. If the proposed road opening is less than 2 metres, consent must be obtained from Council's Arborist.

22. In the event of cancellation of this permit, the Council reserves the right to reinstate the area at the expense of the permit-holder.

23. Surplus excavated material must be removed from the road reserve daily and the area left in a clean and tidy condition.

24. All finished surfaces must match and be flush with existing surfaces.

25. Within 7 days of completion of the works, the permit holder must submit a request for final inspection to City Permits unit, e-mail: devpermits@portphillip.vic.gov.au.

26. Any damage to Council assets caused by the permit- holder's reinstatement works must be rectified to the satisfaction of Council's Asset Inspection Officer.

27. Failure to restore the road reserve and repair any damage caused to assets will result in Council undertaking the necessary reinstatement works and deducting the cost from the security bond and the remainder refunded. Where costs exceed the security bond amount held, the permit holder will be liable for the excess and charged accordingly.

28. If works are conducted in contravention of this permit, the City of Port Phillip reserves the right to amend or revoke the above at any time.

Reinstatement of footpaths

Asphalt footpaths
Specification for Asphalt Footpath – Refer to Standard Drawing: SD3103

29. The permanent asphalt layer of footpaths must be constructed in accordance with Council's current Standard Drawing.

30. The Bituminous surface at the edges of the trench must be cut with a circular saw.

31. A temporary bituminous surface of premix (cold-mix) minimum depth 75mm must be constructed before the crossing is opened to traffic, unless the permit-holder is completing a permanent reinstatement immediately with hot-mix asphalt.

32. The full width of the footpath must be reinstated. Where only part of a concrete footpath/vehicle crossing panel has been damaged, reinstatement must include the removal and reinstatement of the whole panel.

Concrete footpaths
Specification for Concrete Footpaths – Refer to Standard Drawing: SD3103

33. The permanent concrete layer of footpaths must be constructed in accordance with Council's current Standard Drawing.

34. Concrete footpath areas affected by works will be reinstated in full sections within the surrounding joints unless directed otherwise by Council's Asset Inspection Officer.

35. Existing surface levels must be maintained and the tops of all service pits/junction boxes must be at the footpath surface level.

Reinstatement of road pavements

36. Where the permit-holder or contractor's road opening is less than 1.0 metre from the lip of a channel, the floating section of pavement must be removed and the final surface reinstatement will be from the furthest edge from opening/trench to the lip of channel.

37. All road pavement surfaces must be cut with a circular saw.

Flexible road pavement (Asphalt)
Specification for Flexible Road Pavements – Refer to Standard Drawing SD3103

Rigid Road Pavement (Concrete)

Temporary reinstatements

38. All temporary road reinstatements must be finished with cold-mix (premix asphalt) flush with the existing surfaces unless permanent hot-mix asphalt reinstatement is being completed immediately following the compaction of the pavement surface.

Nature strips

39. All nature strips must be reinstated. Backfilling of nature strips must be completed with natural soil material compacted in 150mm layers, 90% standard compaction to a level 75mm below surface. The remaining backfill must be uncompacted topsoil to 15mm above the surface level and the surface even and seeded to Council's satisfaction. The area must be kept moist until germination has occurred.

Reinstatement of vehicle crossings
Specification for Vehicle Crossings – Refer to Standard Drawing SD4101

40. The vehicle crossing must be constructed in accordance with Council's current Standard Drawing.

41. Concrete vehicle crossings affected by works must be reinstated in full sections (panels) within the surrounding joints unless otherwise directed by Council's 'Asset Inspection Officer'.

42. When reinstating a section/panel, Y16 dowel bars 400mm lengths must be inserted 200mm into the existing concrete surface and spaced 300mm apart.

Kerb and channel
Specification for Concrete Kerb and Channel – Refer to Standard Drawing SD1101
Specification for Bluestone Kerb and Channel – Refer to Standard Drawing SD1102

43. The kerb and channel must be reinstated to the satisfaction of Council's Asset Inspection Officer.

Bluestone pitchers
Specification for Bluestone Pitchers – Refer to Standard Drawing SD3101

44. The bluestone pitcher kerb and channel, and pavement must be reinstated to the satisfaction of Council's Asset Inspection Officer.

Footnotes:

Permitted Construction Hours
Under Council's Local Law No. 1 (Community Amenity), A *builder* requires a permit to carry out building works on a building site other than between 7.00am to 6.00pm Monday to Friday, and 9.00am to 3.00pm Saturday. No works are permitted on a public holiday as defined by the *Public Holidays Act* 1993.

Dial Before You Dig
Neglecting to dial 1100 before excavating can lead to costly disruption to essential services. Dial Before You Dig is a free referral service for information on locating underground utilities.
Ph: 1100
Web: www.1100.com.au

Standard Construction Drawings
http://www.portphillip.vic.gov.au/road_opening_permit.htm

City of Port Phillip Permits Index
http://www.portphillip.vic.gov.au/permits_licenses_index.htm

Contacts / Links

Asset Inspection Officer
Ph: 9209 6590
Fx: 9536 2710
Email: helpassetinspection@portphillip.vic.gov.au

City Permits
Ph: 9209 6216
Fx: 9536 2745
Email: devpermits@portphillip.vic.gov.au

Road Opening Request for Final Inspection

Community Amenity Local Law No. 1 Clause 14

This form must be completed within 48 hours of completion of works.
Any security bond refunds will be issued within 20 business days.

Applicant Details			
Site Address:			
Applicant/Business Name:			
Applicant's Postal Address:			
Telephone Number:		Mobile Number:	
E-mail Address:			
ABN:		ACN:	
Road Opening Details			
Road Opening Permit No:	.... / .... / **RO**		
Reason for Permit (tick appropriate box)			
Start & Completion Date of Works:	From: / /	To: / /	

What part of the Road Reserve are your works in?									
Footpath		Nature Strip		Road or Lane		Car Park		Kerb Channel	
Size of Opening:	**m L x m W = m²**								

Did any of the following assets require relocation as a result of the Road Opening?							
Parking Ticket Machine		Street Furniture		Litter Bin		Other (please state)	
The applicant is responsible for all associated costs as a result of the relocation of any Council assets.							

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is open from 8.30am to 5.00pm Monday to Friday
T: 9209 6216 F: 9536 2745 E: devpermits@portphillip.vic.gov.au

www.portphillip.vic.gov.au/road_permits.htm

Road Opening Request for Final Inspection

Community Amenity Local Law No. 1 Clause 14

Request for Final Reinstatement

Any excavation or opening must be reinstated to Council requirements as per items (7), (9), (10) and (11) of Port Phillip City Council conditions on which a permit to open or obstruct roadways is issued (attached to Permit). The permanent reinstatement can be undertaken by Council if the applicant is unable to. The applicant at a bare minimum must be reinstated to temporary measures once the permit expires or when the safety precautions are removed.
Any opening within the City of Port Phillip must be back filled with crushed rock, compacted and finished with cold mix as a temporary measure until full reinstatement is completed by the applicant. If the applicant submits this application (Request for Final Inspection) without fully reinstating the surface to the original material being concrete, bluestone or asphalt and to Council requirements, the cost of shall be deducted from the security bond.

How have you reinstated the Road Opening?					
Permanent reinstatement (to original standard)		Temporary reinstatement (less than original standard)			
What material has been used in your reinstatement?					
Crushed and compacted rock (temporary)		Finished with asphalt cold mix (temporary			
Concrete (permanent)		Asphalt hot mix (permanent)		Bluestone (permanent)	
NOTE: If you have reinstated to less than the original quality and material or not to Council standards the reinstatement will be performed by Council's Infrastructure Services and the applicant will be debited or invoiced for the difference. The work will be inspected and final reinstatement (if required) will be undertaken by Council within 28 days on receipt of this form.					

Applicant's Name: .....

Applicant's Signature: ..... **Date:** .....

How to Apply

Submit this application form to: City Permits, City of Port Phillip, Private Bag No. 3, PO St Kilda VIC 3182
Or email a scan to devpermits@portphillip.vic.gov.au or fax to 9536 2745.

Further Information

Contact City Permits on 9209 6216 or devpermits@portphillip.vic.gov.au

Privacy Statement: The personal information requested on this form is being collected by the council for purposes of assessment in accordance with Community Amenity Local Law No. 1, Clause 14. The personal information will be used solely by the council for that primary purpose or directly related purposes. The applicant understands that the personal information provided is for the purpose of considering the application for an Asset Protection Permit and that he or she may apply to the council for access to the information. Requests for access and or correction should be made to Freedom of Information & Privacy Officer Governance & Engagement Department, City of Port Phillip.

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Enquiries:
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Phone: 9209 6216
Mail: Private Bag No. 3, PO ST KILDA VIC 3182

CITY OF PORT PHILLIP
ABN 21 762 977 945

8 October 2015

AECOM
9/8 Exhibition St
MELBOURNE VIC 3000

ROAD OPENING PERMIT
252/2015/RO
Issued Under Community Amenity Local Law No: 1 (Clause 14)

This permit has been approved and issued subject to the following conditions and the permit holder shall be held to have agreed to such conditions and to have accepted any liability or responsibility thereby imposed.

Site of Works: Buckhurst Street, all of street, SOUTH MELBOURNE

Description of Works: Bore holes for groundwater sampling (MW37)

Permit Valid From: 12 October 2015 **To:** 30 October 2015

In addition to complying with any relevant requirements in the Local Law No. 1, Community Amenity the following conditions apply to the activity or use:

Standard Conditions:

1. All works associated with the road opening including the set-up and removal of necessary signs and barriers may be taken **12 October and 30 October 2015** between **Monday to Friday 7am to 5pm and Saturday 9am to 3pm**. Obstructions to traffic flow are not permitted outside of this period including setting up or removal of the infrastructure.

2. To amend the dates of this licence requires a written request to be received by the City Permits by 5pm, while the permit is still valid. Once a permit has expired it cannot be re-used or amended.

3. A maximum of two (2) amendments to re-schedule the dates of this permit can be considered prior to incurring additional fees.

4. An absolute minimum width of 1.5 metres must be maintained for safe pedestrian access. Pedestrian safety must be maintained at all times by the appopriate use of bollards and tape. On both approaches to the works, the following signs must be clearly displayed and in place during the works;

    a) Pedestrian arrow signs
    a) Pedestrians Watch Your Step or,
    b) Pedestrian Use Other Footpath

5. All traffic treatments must be installed in accordance with any Traffic Management Plan submitted to Council and maintained during the works.

6. Signage must be visible and must not obstruct sightlines, designated pedestrian footpaths and crossovers/accesses. If on-street parking spaces are required to be used, only the spaces clearly specified on the

plan can be used for that purpose.

7. Accredited Traffic Control Officers must be present to manage traffic flow during a partial or full road closure. Traffic Control Officers must also assist pedestrians and cyclists as required.

8. If vehicular traffic flow is affected by the works, emergency services, including, Fire Brigade, Ambulance and Police must be notified by the permit-holder a minimum of 24 hours prior the commencement of works.

9. To the satisfaction of, and at no cost to Council, the permit-holder must reinstate all assets and infrastructure.

10. City of Port Phillip does not accept any responsibility for accidents, damage or injury to property, participants or third parties that may arise out of this event. There must be public liability insurance for the type of work proposed with an indemnity of not less than $10M, including full indemnity for the City of Port Phillip Council against any claim laid against it either by members of the public or persons engaged in any activities associated with the traffic diversion who, as a result of the diversion, suffer personal injury, property damage or financial loss.

11. The permit-holder must comply with AS 1742.3 2002. Manual of uniform traffic control devices, Part 3 Traffic Control Devices for lane and Road Closures and the relevant Standards Australia Field Guides Part 1. Short term urban works, daytime/night time SAA HB 81.1 & 4 1996.

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Prior to commencement

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    a) The nature of the works being performed
    a) The date and hours of works occurring under this permit
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15. The permit-holder must contact City Permits unit at least 2 business days prior to commencing works, by e-mail: devpermits@portphillip.vic.gov.au, or ph: 03 9209 6216, to organise an inspection with Council's Asset Inspection Officer to determine:

    - the extent of reinstatement works including road pavement, signage and markings
    - the requirement for further inspections,
    - any requirements for the removal, storage and reinstatement of bluestone assets
    - removal and reinstatement of street furniture, (litter bins, public seating and bicycle hoops)

During construction

16. Works that may cause significant delay to traffic and/or public transport services must be scheduled outside peak periods of 7–9am and 4–6pm weekdays unless otherwise permitted with the written consent of Council.

17. Works must be carried out in accordance with '*Road Management Act 2004 Code of Practice Worksite Safety – Traffic Management'* and any approved Traffic Management Plan.

Work execution

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23. Surplus excavated material must be removed from the road reserve daily and the area left in a clean and tidy condition.

24. All finished surfaces must match and be flush with existing surfaces.

25. Within 7 days of completion of the works, the permit holder must submit a request for final inspection to City Permits unit, e-mail: devpermits@portphillip.vic.gov.au.

26. Any damage to Council assets caused by the permit- holder's reinstatement works must be rectified to the satisfaction of Council's Asset Inspection Officer.

27. Failure to restore the road reserve and repair any damage caused to assets will result in Council undertaking the necessary reinstatement works and deducting the cost from the security bond and the remainder refunded. Where costs exceed the security bond amount held, the permit holder will be liable for the excess and charged accordingly.

28. If works are conducted in contravention of this permit, the City of Port Phillip reserves the right to amend or revoke the above at any time.

Reinstatement of footpaths

Asphalt footpaths
Specification for Asphalt Footpath – Refer to Standard Drawing: SD3103

29. The permanent asphalt layer of footpaths must be constructed in accordance with Council's current Standard Drawing.

30. The Bituminous surface at the edges of the trench must be cut with a circular saw.

31. A temporary bituminous surface of premix (cold-mix) minimum depth 75mm must be constructed before the crossing is opened to traffic, unless the permit-holder is completing a permanent reinstatement immediately with hot-mix asphalt.

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37. All road pavement surfaces must be cut with a circular saw.

Flexible road pavement (Asphalt)
Specification for Flexible Road Pavements – Refer to Standard Drawing SD3103

Rigid Road Pavement (Concrete)

Temporary reinstatements

38. All temporary road reinstatements must be finished with cold-mix (premix asphalt) flush with the existing surfaces unless permanent hot-mix asphalt reinstatement is being completed immediately following the compaction of the pavement surface.

Nature strips

39. All nature strips must be reinstated. Backfilling of nature strips must be completed with natural soil material compacted in 150mm layers, 90% standard compaction to a level 75mm below surface. The remaining backfill must be uncompacted topsoil to 15mm above the surface level and the surface even and seeded to Council's satisfaction. The area must be kept moist until germination has occurred.

Reinstatement of vehicle crossings
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40. The vehicle crossing must be constructed in accordance with Council's current Standard Drawing.

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Specification for Bluestone Kerb and Channel – Refer to Standard Drawing SD1102

43. The kerb and channel must be reinstated to the satisfaction of Council's Asset Inspection Officer.

Bluestone pitchers
Specification for Bluestone Pitchers – Refer to Standard Drawing SD3101

44. The bluestone pitcher kerb and channel, and pavement must be reinstated to the satisfaction of Council's Asset Inspection Officer.

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Email: devpermits@portphillip.vic.gov.au

Road Opening Request for Final Inspection

Community Amenity Local Law No. 1 Clause 14

This form must be completed within 48 hours of completion of works.
Any security bond refunds will be issued within 20 business days.

Applicant Details			
Site Address:			
Applicant/Business Name:			
Applicant's Postal Address:			
Telephone Number:		Mobile Number:	
E-mail Address:			
ABN:		ACN:	
Road Opening Details			
Road Opening Permit No:	.... / .... / **RO**		
Reason for Permit (tick appropriate box)			
Start & Completion Date of Works:	From: / /	To: / /	

What part of the Road Reserve are your works in?									
Footpath		Nature Strip		Road or Lane		Car Park		Kerb Channel	
Size of Opening:	**m L x m W = m²**								

Did any of the following assets require relocation as a result of the Road Opening?							
Parking Ticket Machine		Street Furniture		Litter Bin		Other (please state)	
The applicant is responsible for all associated costs as a result of the relocation of any Council assets.							

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Road Opening Request for Final Inspection

Community Amenity Local Law No. 1 Clause 14

Request for Final Reinstatement

Any excavation or opening must be reinstated to Council requirements as per items (7), (9), (10) and (11) of Port Phillip City Council conditions on which a permit to open or obstruct roadways is issued (attached to Permit). The permanent reinstatement can be undertaken by Council if the applicant is unable to. The applicant at a bare minimum must be reinstated to temporary measures once the permit expires or when the safety precautions are removed.
Any opening within the City of Port Phillip must be back filled with crushed rock, compacted and finished with cold mix as a temporary measure until full reinstatement is completed by the applicant. If the applicant submits this application (Request for Final Inspection) without fully reinstating the surface to the original material being concrete, bluestone or asphalt and to Council requirements, the cost of shall be deducted from the security bond.

How have you reinstated the Road Opening?					
Permanent reinstatement (to original standard)		Temporary reinstatement (less than original standard)			
What material has been used in your reinstatement?					
Crushed and compacted rock (temporary)		Finished with asphalt cold mix (temporary			
Concrete (permanent)		Asphalt hot mix (permanent)		Bluestone (permanent)	
NOTE: If you have reinstated to less than the original quality and material or not to Council standards the reinstatement will be performed by Council's Infrastructure Services and the applicant will be debited or invoiced for the difference. The work will be inspected and final reinstatement (if required) will be undertaken by Council within 28 days on receipt of this form.					

Applicant's Name: .....

Applicant's Signature: ..... **Date:** .....

How to Apply

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Department of Environment,
Land, Water & Planning

Port Phillip Region
609 Burwood Hwy, Knoxfield 3180
Private Bag 15, Ferntree Gully Delivery Centre 3156
DX210098
enviroplan.portphillip@delwp.vic.gov.au
www.delwp.vic.gov.au

Averyll Coyne
Principal Environmental Scientist
AECOM
Averyll.Coyne@aecom.com.au

Dear Ms Coyne,

APPLICATION FOR LANDOWNER CONSENT FOR WORKS ON CROWN LAND
INSTALLATION OF 36 GROUNWATER WELLS, VARIOUS LOCATIONS, FISHERMANS BEND

Thank you for your application email dated 17 September 2015 requesting land owner consent to use and develop Crown land. This application was received on 17 September 2015.

The application is for the installation of 36 groundwater wells to be installed in various locations within footpaths and roadways at Fishermans Bend.

As landowner, the Department of Environment, Land, Water and Planning (DELWP) has no objection to the proposal.

There are no Native Title requirements and you have advised that a Cultural Heritage Management Plan is not required to be prepared for the proposed works, however you must comply with the provisions of the *Aboriginal Heritage Act 2006* in the event that any Aboriginal cultural heritage is disturbed or uncovered during the proposed works. Enquiries regarding this should be directed to Aboriginal Affairs Victoria on phone 9208 3333 as the body who is responsible for the administration of cultural heritage.

If you have any further inquiries, please contact Victoria Purdue, Program Manager, Regional Planning and Approvals, at DELWP's Port Phillip regional office on 9210 9431 or email enviroplan.portphillip@delwp.vic.gov.au

Yours sincerely

CHRIS PADOVANI
REGIONAL MANAGER
LAND, PLANNING AND APPROVALS
PORT PHILLIP REGION

DATE: 30/9/15

Works Licence ID:

WLE063167

Printed on: 06 Oct 2015 10:24:13 am

COPY OF RECORD IN THE VICTORIAN WATER REGISTER

LICENCE TO CONSTRUCT WORKS

under Section 67 of the Water Act 1989

The information in this copy of record is as recorded at the time of printing. Current information should be obtained by a search of the register. The State of Victoria does not warrant the accuracy or completeness of this information and accepts no responsibility for any subsequent release, publication or reproduction of this information.

This licence does not remove the need to apply for any authorisation or permission necessary under any other Act of Parliament with respect to anything authorised by the works licence.

Water used under this licence is not fit for any use that may involve human consumption, directly or indirectly, without first being properly treated.

This licence is not to be interpreted as an endorsement of the design and/or construction of any works (including dams). The Authority does not accept any responsibility or liability for any suits or actions arising from injury, loss, damage or death to person or property which may arise from the maintenance, existence or use of the works.

Each person named as a licence holder is responsible for ensuring all the conditions of this licence are complied with.

This licence authorises its holders to construct the described works, subject to the conditions.

Licence Holder(s)

EPA VICTORIA of GPO BOX 4395 MELBOURNE VIC 3001

Licence Contact Details

EPA VICTORIA	GPO BOX 4395 MELBOURNE VIC 3001

Licence Details

Expiry date	06 Oct 2016
Status	Active
Authority	Southern Rural Water
Name of waterway or aquifer	NA for construct/decommission
Water system	Unincorporated (GMU)

Summary of Licensed Works

The details in this section are a summary only. They are subject to the conditions specified in this licence.

Works ID	*Works type*	*Use of water*
WRK089414	Bore	Investigation
WRK089415	Bore	Investigation
WRK089416	Bore	Investigation
WRK089417	Bore	Investigation
WRK089418	Bore	Investigation
WRK089419	Bore	Investigation
WRK089420	Bore	Investigation
WRK089421	Bore	Investigation
WRK089422	Bore	Investigation
WRK089423	Bore	Investigation
WRK089424	Bore	Investigation
WRK089425	Bore	Investigation
WRK089426	Bore	Investigation
WRK089427	Bore	Investigation
WRK089428	Bore	Investigation
WRK089429	Bore	Investigation
WRK089430	Bore	Investigation
WRK089431	Bore	Investigation
WRK089432	Bore	Investigation

Description of Licensed Works

WORKS ID WRK089414

Works type	Bore
Works subtype	Drilled bore
Proposed maximum depth	30.000 metres

Works location

Easting	*Northing*	*Zone MGA*
318246.168	5810699.995	Zone 55

Other land description

78 G7

Property address

Location(s) in or near PORT MELBOURNE, Parish: Melbourne South

Description of Licensed Works

WORKS ID WRK089415

Works type	Bore
Works subtype	Drilled bore
Proposed maximum depth	30.000 metres

Works location

Easting	*Northing*	*Zone MGA*
318097.721	5811278.979	Zone 55

Other land description
78 G7

Property address
Location(s) in or near PORT MELBOURNE, Parish: Melbourne South

Description of Licensed Works

WORKS ID WRK089416

Works type	Bore
Works subtype	Drilled bore
Proposed maximum depth	30.000 metres

Works location

Easting	*Northing*	*Zone MGA*
318453.637	5811147.567	Zone 55

Other land description
78 G7

Property address
Location(s) in or near PORT MELBOURNE, Parish: Melbourne South

Description of Licensed Works

WORKS ID WRK089417

Works type	Bore
Works subtype	Drilled bore
Proposed maximum depth	30.000 metres

Works location

Easting	*Northing*	*Zone MGA*
318510.320	5811489.879	Zone 55

Other land description
78 G7

Property address
Location(s) in or near PORT MELBOURNE, Parish: Melbourne South

Description of Licensed Works

WORKS ID WRK089418

Works type	Bore
Works subtype	Drilled bore
Proposed maximum depth	30.000 metres

Works location

Easting	*Northing*	*Zone MGA*
318272.097	5811403.751	Zone 55

Other land description

78 G7

Property address

Location(s) in or near PORT MELBOURNE, Parish: Melbourne South

Description of Licensed Works

WORKS ID WRK089419

Works type	Bore
Works subtype	Drilled bore
Proposed maximum depth	30.000 metres

Works location

Easting	*Northing*	*Zone MGA*
318650.338	5811350.839	Zone 55

Other land description

78 G7

Property address

Location(s) in or near PORT MELBOURNE, Parish: Melbourne South

Description of Licensed Works

WORKS ID WRK089420

Works type	Bore
Works subtype	Drilled bore
Proposed maximum depth	30.000 metres

Works location

Easting	*Northing*	*Zone MGA*
318762.911	5811092.177	Zone 55

Other land description

78 G7

Property address

Location(s) in or near PORT MELBOURNE, Parish: Melbourne South

Description of Licensed Works

WORKS ID WRK089421

Works type	Bore
Works subtype	Drilled bore
Proposed maximum depth	30.000 metres

Works location

Easting	*Northing*	*Zone MGA*
318714.356	5810884.079	Zone 55

Other land description

78 G7

Property address

Location(s) in or near PORT MELBOURNE, Parish: Melbourne South

Description of Licensed Works

WORKS ID WRK089422

Works type	Bore
Works subtype	Drilled bore
Proposed maximum depth	30.000 metres

Works location

Easting	*Northing*	*Zone MGA*
318939.701	5811291.021	Zone 55

Other land description

78 G7

Property address

Location(s) in or near PORT MELBOURNE, Parish: Melbourne South

Description of Licensed Works

WORKS ID WRK089423

Works type	Bore
Works subtype	Drilled bore
Proposed maximum depth	30.000 metres

Works location

Easting	*Northing*	*Zone MGA*
319062.886	5811190.632	Zone 55

Other land description
78 G7

Property address
Location(s) in or near PORT MELBOURNE, Parish: Melbourne South

Description of Licensed Works

WORKS ID WRK089424

Works type	Bore
Works subtype	Drilled bore
Proposed maximum depth	30.000 metres

Works location

Easting	*Northing*	*Zone MGA*
317942.554	5811704.777	Zone 55

Other land description
78 G7

Property address
Location(s) in or near PORT MELBOURNE, Parish: Melbourne South

Description of Licensed Works

WORKS ID WRK089425

Works type	Bore
Works subtype	Drilled bore
Proposed maximum depth	30.000 metres

Works location

Easting	*Northing*	*Zone MGA*
318110.989	5811873.433	Zone 55

Other land description
78 G7

Property address
Location(s) in or near PORT MELBOURNE, Parish: Melbourne South

Description of Licensed Works

WORKS ID WRK089426

Works type	Bore
Works subtype	Drilled bore
Proposed maximum depth	30.000 metres

Works location

Easting	*Northing*	*Zone MGA*
318482.960	5811786.377	Zone 55

Other land description
78 G7

Property address
Location(s) in or near PORT MELBOURNE, Parish: Melbourne South

Description of Licensed Works

WORKS ID WRK089427

Works type	Bore
Works subtype	Drilled bore
Proposed maximum depth	30.000 metres

Works location

Easting	*Northing*	*Zone MGA*
318407.988	5811550.704	Zone 55

Other land description
78 G7

Property address
Location(s) in or near PORT MELBOURNE, Parish: Melbourne South

Description of Licensed Works

WORKS ID WRK089428

Works type	Bore
Works subtype	Drilled bore
Proposed maximum depth	30.000 metres

Works location

Easting	*Northing*	*Zone MGA*
318709.570	5811574.171	Zone 55

Other land description
78 G7

Property address
Location(s) in or near PORT MELBOURNE, Parish: Melbourne South

Description of Licensed Works

WORKS ID WRK089429

Works type	Bore
Works subtype	Drilled bore
Proposed maximum depth	30.000 metres

Works location

Easting	*Northing*	*Zone MGA*
318168.094	5811682.602	Zone 55

Other land description

78 G7

Property address

Location(s) in or near PORT MELBOURNE, Parish: Melbourne South

Description of Licensed Works

WORKS ID WRK089430

Works type	Bore
Works subtype	Drilled bore
Proposed maximum depth	30.000 metres

Works location

Easting	*Northing*	*Zone MGA*
319011.153	5811597.638	Zone 55

Other land description

78 G7

Property address

Location(s) in or near PORT MELBOURNE, Parish: Melbourne South

Description of Licensed Works

WORKS ID WRK089431

Works type	Bore
Works subtype	Drilled bore
Proposed maximum depth	30.000 metres

Works location

Easting	*Northing*	*Zone MGA*
318042.853	5810898.695	Zone 55

Other land description

78 G7

Property address

Location(s) in or near PORT MELBOURNE, Parish: Melbourne South

Description of Licensed Works

WORKS ID WRK089432

Works type	Bore
Works subtype	Drilled bore
Proposed maximum depth	30.000 metres

Works location

Easting	*Northing*	*Zone MGA*
318283.738	5811093.912	Zone 55

Other land description

78 G7

Property address

Location(s) in or near PORT MELBOURNE, Parish: Melbourne South

Related Instruments

Related entitlements	Nil
Related water-use entities	Nil

Application History

Reference	*Type*	*Status*	*Lodged date*	*Approved date*	*Recorded date*
WLI602375	Issue	Approved	06 Oct 2015	06 Oct 2015	

Conditions

Licence WLE063167 is subject to the following conditions:

Siting and construction

1 The bore(s) must be drilled at the location specified in the application approved by the Authority.

2 If after drilling the bore is considered unsatisfactory a replacement bore may be drilled on the land specified in the licence.

Preventing pollution

3 All earthworks must be carried out, and all drilling fluids and waters produced during construction and development must be disposed of, in ways that avoid contaminating native vegetation, waterways, aquifers, the riparian environment, the riverine environment or other people's property.

4 Construction must stop immediately if the Authority reasonably believes that fuel, lubricant, drilling fluid, soil or water produced during construction and development is at risk of being spilled into native vegetation, waterways, aquifers, the riparian environment, the riverine environment or other people's property.

5 The licence holder must construct and maintain bund walls, in accordance with the timeframe, specifications, guidelines or standards prescribed by the Authority, to prevent fuel, lubricant, drilling fluid, soil or water produced during construction and development from being spilled into native vegetation, waterways, aquifers, the riparian environment, the riverine environment or other people's property.

Construction standards

6 The bore(s) must be constructed, and where relevant decommissioned, in accordance with the Minimum Construction Requirements for Water Bores in Australia, Edition 3 or its successor.

Drilling licence and supervision requirements

7 The bore(s) must be constructed by, or under the direct supervision of, a driller licensed under the Water Act 1989 and endorsed as a Class 1, 2, or 3 driller, with appropriate endorsements.

8 If artesian pressure is expected or encountered, then a driller licensed under the Water Act 1989, and endorsed as a class 3 driller, must install casing in the bore(s) to a suitable depth, and in a suitable manner, to prevent its outbreak. A suitable valve must also be fitted to the bore.

Bore completion report

9 A Bore Completion Report must be submitted to the Authority within 28 working days of the bore(s) being completed.

Protecting water resources

10 At the completion of drilling, and before the drilling rig leaves the site, all bore(s) must be decommissioned so as to eliminate physical hazards, conserve aquifer yield, prevent groundwater contamination and prevent the intermingling of desirable and undesirable waters.

11 The bore(s) must be located at least 30 metres from any authority's channel, reserve or easement unless authorised by the Authority.

Protecting water quality

12 Drilling must not exceed the maximum depth.

13 The bore(s) must be constructed so as to prevent aquifer contamination caused by vertical flow outside the casing.

14 If two or more aquifers are encountered, the bore(s) must be constructed to ensure that an impervious seal is made and maintained between each aquifer to prevent aquifer connection through vertical flow outside the casing; under no circumstances are two or more aquifers to be screened within the one bore or in any other manner to allow connection between them.

15 Boreheads must be constructed, to ensure that no flood water, surface runoff or potential subsurface contaminated soakage can enter the bore or bore annulus.

Fees and charges

16 The licence holder must, when requested by the Authority, pay all fees, costs and other charges under the Water Act 1989 in respect of this licence.

END OF COPY OF RECORD

Works Licence ID:

WLE063168

Printed on: 06 Oct 2015 10:33:30 am

COPY OF RECORD IN THE VICTORIAN WATER REGISTER

LICENCE TO CONSTRUCT WORKS

under Section 67 of the Water Act 1989

The information in this copy of record is as recorded at the time of printing. Current information should be obtained by a search of the register. The State of Victoria does not warrant the accuracy or completeness of this information and accepts no responsibility for any subsequent release, publication or reproduction of this information.

This licence does not remove the need to apply for any authorisation or permission necessary under any other Act of Parliament with respect to anything authorised by the works licence.

Water used under this licence is not fit for any use that may involve human consumption, directly or indirectly, without first being properly treated.

This licence is not to be interpreted as an endorsement of the design and/or construction of any works (including dams). The Authority does not accept any responsibility or liability for any suits or actions arising from injury, loss, damage or death to person or property which may arise from the maintenance, existence or use of the works.

Each person named as a licence holder is responsible for ensuring all the conditions of this licence are complied with.

This licence authorises its holders to construct the described works, subject to the conditions.

Licence Holder(s)

EPA VICTORIA of GPO BOX 4395 MELBOURNE VIC 3001

Licence Contact Details

EPA VICTORIA	GPO BOX 4395 MELBOURNE VIC 3001

Licence Details

Expiry date	06 Oct 2016
Status	Active
Authority	Southern Rural Water
Name of waterway or aquifer	NA for construct/decommission
Water system	Unincorporated (GMU)

Summary of Licensed Works

The details in this section are a summary only. They are subject to the conditions specified in this licence.

Works ID	*Works type*	*Use of water*
WRK089433	Bore	Investigation
WRK089434	Bore	Investigation
WRK089435	Bore	Investigation
WRK089436	Bore	Investigation
WRK089437	Bore	Investigation
WRK089438	Bore	Investigation

Description of Licensed Works

WORKS ID WRK089433

Works type	Bore
Works subtype	Drilled bore
Proposed maximum depth	30.000 metres

Works location

Easting	*Northing*	*Zone MGA*
319269.006	5811281.072	Zone 55

Other land description
78 H7

Property address
Location(s) in or near SOUTH MELBOURNE, Parish: Melbourne South

Description of Licensed Works

WORKS ID WRK089434

Works type	Bore
Works subtype	Drilled bore
Proposed maximum depth	30.000 metres

Works location

Easting	*Northing*	*Zone MGA*
319346.250	5810990.646	Zone 55

Other land description
78 H7

Property address
Location(s) in or near SOUTH MELBOURNE, Parish: Melbourne South

Description of Licensed Works

WORKS ID WRK089435

Works type	Bore
Works subtype	Drilled bore
Proposed maximum depth	30.000 metres

Works location

Easting	*Northing*	*Zone MGA*
319483.246	5810852.543	Zone 55

Other land description
78 H7

Property address

Location(s) in or near SOUTH MELBOURNE, Parish: Melbourne South

Description of Licensed Works

WORKS ID WRK089436

Works type	Bore
Works subtype	Drilled bore
Proposed maximum depth	30.000 metres

Works location

Easting	*Northing*	*Zone MGA*
319786.784	5811298.169	Zone 55

Other land description

78 H7

Property address

Location(s) in or near SOUTH MELBOURNE, Parish: Melbourne South

Description of Licensed Works

WORKS ID WRK089437

Works type	Bore
Works subtype	Drilled bore
Proposed maximum depth	30.000 metres

Works location

Easting	*Northing*	*Zone MGA*
319683.739	5811158.923	Zone 55

Other land description

78 H7

Property address

Location(s) in or near SOUTH MELBOURNE, Parish: Melbourne South

Description of Licensed Works

WORKS ID WRK089438

Works type	Bore
Works subtype	Drilled bore
Proposed maximum depth	30.000 metres

Works location

Easting	*Northing*	*Zone MGA*
319704.485	5810844.280	Zone 55

Other land description
78 H7

Property address
Location(s) in or near SOUTH MELBOURNE, Parish: Melbourne South

Related Instruments

Related entitlements Nil

Related water-use entities Nil

Application History

Reference	*Type*	*Status*	*Lodged date*	*Approved date*	*Recorded date*
WLI602376	Issue	Approved	06 Oct 2015	06 Oct 2015	

Conditions

Licence WLE063168 is subject to the following conditions:

Siting and construction

1 The bore(s) must be drilled at the location specified in the application approved by the Authority.

2 If after drilling the bore is considered unsatisfactory a replacement bore may be drilled on the land specified in the licence.

Preventing pollution

3 All earthworks must be carried out, and all drilling fluids and waters produced during construction and development must be disposed of, in ways that avoid contaminating native vegetation, waterways, aquifers, the riparian environment, the riverine environment or other people's property.

4 Construction must stop immediately if the Authority reasonably believes that fuel, lubricant, drilling fluid, soil or water produced during construction and development is at risk of being spilled into native vegetation, waterways, aquifers, the riparian environment, the riverine environment or other people's property.

5 The licence holder must construct and maintain bund walls, in accordance with the timeframe, specifications, guidelines or standards prescribed by the Authority, to prevent fuel, lubricant, drilling fluid, soil or water produced during construction and development from being spilled into native vegetation, waterways, aquifers, the riparian environment, the riverine environment or other people's property.

Construction standards

6 The bore(s) must be constructed, and where relevant decommissioned, in accordance with the Minimum Construction Requirements for Water Bores in Australia, Edition 3 or its successor.

Drilling licence and supervision requirements

7 The bore(s) must be constructed by, or under the direct supervision of, a driller licensed under the Water Act 1989 and endorsed as a Class 1, 2, or 3 driller, with appropriate endorsements.

8 If artesian pressure is expected or encountered, then a driller licensed under the Water Act 1989, and endorsed as a class 3 driller, must install casing in the bore(s) to a suitable depth, and in a suitable manner, to prevent its outbreak. A suitable valve must also be fitted to the bore.

Bore completion report

9 A Bore Completion Report must be submitted to the Authority within 28 working days of the bore(s) being completed.

Protecting water resources

10 At the completion of drilling, and before the drilling rig leaves the site, all bore(s) must be decommissioned so as to eliminate physical hazards, conserve aquifer yield, prevent groundwater contamination and prevent the intermingling of desirable and undesirable waters.

11 The bore(s) must be located at least 30 metres from any authority's channel, reserve or easement unless authorised by the Authority.

Protecting water quality

12 Drilling must not exceed the maximum depth.

13 The bore(s) must be constructed so as to prevent aquifer contamination caused by vertical flow outside the casing.

14 If two or more aquifers are encountered, the bore(s) must be constructed to ensure that an impervious seal is made and maintained between each aquifer to prevent aquifer connection through vertical flow outside the casing; under no circumstances are two or more aquifers to be screened within the one bore or in any other manner to allow connection between them.

15 Boreheads must be constructed, to ensure that no flood water, surface runoff or potential subsurface contaminated soakage can enter the bore or bore annulus.

Fees and charges

16 The licence holder must, when requested by the Authority, pay all fees, costs and other charges under the Water Act 1989 in respect of this licence.

END OF COPY OF RECORD

Enquiries:
Email: devpermits@portphillip.vic.gov.au
Phone: 9209 6216
Mail: Private Bag No. 3, PO ST KILDA VIC 3182

CITY OF PORT PHILLIP
ABN 21 762 977 945

14 October 2015

AECOM
9/8 Exhibition St
MELBOURNE VIC 3000

ROAD OPENING PERMIT
261/2015/RO
Issued Under Community Amenity Local Law No: 1 (Clause 14)

This permit has been approved and issued subject to the following conditions and the permit holder shall be held to have agreed to such conditions and to have accepted any liability or responsibility thereby imposed.

Site of Works: Todd Road, intersection with West Gate Fwy, PORT MELBOURNE

Description of Works: Bore holes for groundwater sampling (MW1)

Permit Valid From: 10am 14 October 2015 **To:** 30 October 2015

In addition to complying with any relevant requirements in the Local Law No. 1, Community Amenity the following conditions apply to the activity or use:

Standard Conditions:

1. All works associated with the road opening including the set-up and removal of necessary signs and barriers may be taken **14 October and 6 November 2015** between Monday to Friday **7am to 5pm** and Saturday **9am to 3pm**. Obstructions to traffic flow are not permitted outside of this period including setting up or removal of the infrastructure.

2. To amend the dates of this licence requires a written request to be received by the City Permits by 5pm, while the permit is still valid. Once a permit has expired it cannot be re-used or amended.

3. A maximum of two (2) amendments to re-schedule the dates of this permit can be considered prior to incurring additional fees.

4. An absolute minimum width of 1.5 metres must be maintained for safe pedestrian access. Pedestrian safety must be maintained at all times by the appopriate use of bollards and tape. On both approaches to the works, the following signs must be clearly displayed and in place during the works;

    a) Pedestrian arrow signs
    a) Pedestrians Watch Your Step or,
    b) Pedestrian Use Other Footpath

5. All traffic treatments must be installed in accordance with any Traffic Management Plan submitted to Council and maintained during the works.

6. Signage must be visible and must not obstruct sightlines, designated pedestrian footpaths and crossovers/accesses. If on-street parking spaces are required to be used, only the spaces clearly specified on the

plan can be used for that purpose.

7. Accredited Traffic Control Officers must be present to manage traffic flow during a partial or full road closure. Traffic Control Officers must also assist pedestrians and cyclists as required.

8. If vehicular traffic flow is affected by the works, emergency services, including, Fire Brigade, Ambulance and Police must be notified by the permit-holder a minimum of 24 hours prior the commencement of works.

9. To the satisfaction of, and at no cost to Council, the permit-holder must reinstate all assets and infrastructure.

10. City of Port Phillip does not accept any responsibility for accidents, damage or injury to property, participants or third parties that may arise out of this event. There must be public liability insurance for the type of work proposed with an indemnity of not less than $10M, including full indemnity for the City of Port Phillip Council against any claim laid against it either by members of the public or persons engaged in any activities associated with the traffic diversion who, as a result of the diversion, suffer personal injury, property damage or financial loss.

11. The permit-holder must comply with AS 1742.3 2002. Manual of uniform traffic control devices, Part 3 Traffic Control Devices for lane and Road Closures and the relevant Standards Australia Field Guides Part 1. Short term urban works, daytime/night time SAA HB 81.1 & 4 1996.

12. City of Port Phillip reserves the right to amend or revoke the above at any time.

Prior to commencement

13. In addition to the requirement to obtain a Road Opening Permit, further permits may be required for activities on Council land such as Skip Bin, Road Closure, Street Occupation, or Asset Protection. Consents may also be required from VicRoads, utilities and public transport operators. The permit-holder must ensure all relevant permits and approvals have been obtained prior to commencing any works.

14. The permit-holder must provide a minimum of 2 business day's written notification to the occupants of all affected owners, occupiers and businesses affected by the works. The notification must include the following information and a copy forwarded to the City Permits unit, e-mail: devpermits@portphillip.vic.gov.au and must include:-

    a) The nature of the works being performed
    a) The date and hours of works occurring under this permit
    b) Council's permit reference
    c) Contact name and phone number for the permit holder and/or site manager

15. The permit-holder must contact City Permits unit at least 2 business days prior to commencing works, by e-mail: devpermits@portphillip.vic.gov.au, or ph: 03 9209 6216, to organise an inspection with Council's Asset Inspection Officer to determine:

    - the extent of reinstatement works including road pavement, signage and markings
    - the requirement for further inspections,
    - any requirements for the removal, storage and reinstatement of bluestone assets
    - removal and reinstatement of street furniture, (litter bins, public seating and bicycle hoops)

During construction

16. Works that may cause significant delay to traffic and/or public transport services must be scheduled outside peak periods of 7–9am and 4–6pm weekdays unless otherwise permitted with the written consent of Council.

17. Works must be carried out in accordance with '*Road Management Act 2004 Code of Practice Worksite Safety – Traffic Management'* and any approved Traffic Management Plan.

Work execution

18. Without the written consent of the Council the permit-holder must utilise boring techniques when installing underground services. Any piping or cabling work under an existing vehicle crossing must be carried out by boring, unless approval from Council's Asset Inspection Officer has been obtained.

19. If agricultural drains or irrigation pipes are encountered during excavation the permit-holder must carefully replace the pipes to their original position prior to backfilling.

20. The minimum lateral clearance from a drain is 500mm and a vertical clearance of 300mm. If the proposed road opening or any other work interferes with any underground drains, the approval must be obtained from the Council's Assets department prior to the commencement of works.

21. The minimum lateral clearance from a street tree is 2 metres. If the proposed road opening is less than 2 metres, consent must be obtained from Council's Arborist.

22. In the event of cancellation of this permit, the Council reserves the right to reinstate the area at the expense of the permit-holder.

23. Surplus excavated material must be removed from the road reserve daily and the area left in a clean and tidy condition.

24. All finished surfaces must match and be flush with existing surfaces.

25. Within 7 days of completion of the works, the permit holder must submit a request for final inspection to City Permits unit, e-mail: devpermits@portphillip.vic.gov.au.

26. Any damage to Council assets caused by the permit- holder's reinstatement works must be rectified to the satisfaction of Council's Asset Inspection Officer.

27. Failure to restore the road reserve and repair any damage caused to assets will result in Council undertaking the necessary reinstatement works and deducting the cost from the security bond and the remainder refunded. Where costs exceed the security bond amount held, the permit holder will be liable for the excess and charged accordingly.

28. If works are conducted in contravention of this permit, the City of Port Phillip reserves the right to amend or revoke the above at any time.

Reinstatement of footpaths

Asphalt footpaths
Specification for Asphalt Footpath – Refer to Standard Drawing: SD3103

29. The permanent asphalt layer of footpaths must be constructed in accordance with Council's current Standard Drawing.

30. The Bituminous surface at the edges of the trench must be cut with a circular saw.

31. A temporary bituminous surface of premix (cold-mix) minimum depth 75mm must be constructed before the crossing is opened to traffic, unless the permit-holder is completing a permanent reinstatement immediately with hot-mix asphalt.

32. The full width of the footpath must be reinstated. Where only part of a concrete footpath/vehicle crossing panel has been damaged, reinstatement must include the removal and reinstatement of the whole panel.

Concrete footpaths
Specification for Concrete Footpaths – Refer to Standard Drawing: SD3103

33. The permanent concrete layer of footpaths must be constructed in accordance with Council's current Standard Drawing.

34. Concrete footpath areas affected by works will be reinstated in full sections within the surrounding joints unless directed otherwise by Council's Asset Inspection Officer.

35. Existing surface levels must be maintained and the tops of all service pits/junction boxes must be at the footpath surface level.

Reinstatement of road pavements

36. Where the permit-holder or contractor's road opening is less than 1.0 metre from the lip of a channel, the floating section of pavement must be removed and the final surface reinstatement will be from the furthest edge from opening/trench to the lip of channel.

37. All road pavement surfaces must be cut with a circular saw.

Flexible road pavement (Asphalt)
Specification for Flexible Road Pavements – Refer to Standard Drawing SD3103

Rigid Road Pavement (Concrete)

Temporary reinstatements

38. All temporary road reinstatements must be finished with cold-mix (premix asphalt) flush with the existing surfaces unless permanent hot-mix asphalt reinstatement is being completed immediately following the compaction of the pavement surface.

Nature strips

39. All nature strips must be reinstated. Backfilling of nature strips must be completed with natural soil material compacted in 150mm layers, 90% standard compaction to a level 75mm below surface. The remaining backfill must be uncompacted topsoil to 15mm above the surface level and the surface even and seeded to Council's satisfaction. The area must be kept moist until germination has occurred.

Reinstatement of vehicle crossings
Specification for Vehicle Crossings – Refer to Standard Drawing SD4101

40. The vehicle crossing must be constructed in accordance with Council's current Standard Drawing.

41. Concrete vehicle crossings affected by works must be reinstated in full sections (panels) within the surrounding joints unless otherwise directed by Council's 'Asset Inspection Officer'.

42. When reinstating a section/panel, Y16 dowel bars 400mm lengths must be inserted 200mm into the existing concrete surface and spaced 300mm apart.

Kerb and channel
Specification for Concrete Kerb and Channel – Refer to Standard Drawing SD1101
Specification for Bluestone Kerb and Channel – Refer to Standard Drawing SD1102

43. The kerb and channel must be reinstated to the satisfaction of Council's Asset Inspection Officer.

Bluestone pitchers
Specification for Bluestone Pitchers – Refer to Standard Drawing SD3101

44. The bluestone pitcher kerb and channel, and pavement must be reinstated to the satisfaction of Council's Asset Inspection Officer.

Footnotes:

Permitted Construction Hours
Under Council's Local Law No. 1 (Community Amenity), A *builder* requires a permit to carry out building works on a building site other than between 7.00am to 6.00pm Monday to Friday, and 9.00am to 3.00pm Saturday. No works are permitted on a public holiday as defined by the *Public Holidays Act* 1993.

Dial Before You Dig
Neglecting to dial 1100 before excavating can lead to costly disruption to essential services. Dial Before You Dig is a free referral service for information on locating underground utilities.
Ph: 1100
Web: www.1100.com.au

Standard Construction Drawings
http://www.portphillip.vic.gov.au/road_opening_permit.htm

City of Port Phillip Permits Index
http://www.portphillip.vic.gov.au/permits_licenses_index.htm

Contacts / Links

Asset Inspection Officer
Ph: 9209 6590
Fx: 9536 2710
Email: helpassetinspection@portphillip.vic.gov.au

City Permits
Ph: 9209 6216
Fx: 9536 2745
Email: devpermits@portphillip.vic.gov.au

Road Opening Request for Final Inspection

Community Amenity Local Law No. 1 Clause 14

This form must be completed within 48 hours of completion of works.
Any security bond refunds will be issued within 20 business days.

Applicant Details			
Site Address:			
Applicant/Business Name:			
Applicant's Postal Address:			
Telephone Number:		Mobile Number:	
E-mail Address:			
ABN:		ACN:	
Road Opening Details			
Road Opening Permit No:	.... / .... / **RO**		
Reason for Permit (tick appropriate box)			
Start & Completion Date of Works:	From: / /	To: / /	

What part of the Road Reserve are your works in?									
Footpath		Nature Strip		Road or Lane		Car Park		Kerb Channel	
Size of Opening:	**m L x m W = m²**								

Did any of the following assets require relocation as a result of the Road Opening?							
Parking Ticket Machine		Street Furniture		Litter Bin		Other (please state)	
The applicant is responsible for all associated costs as a result of the relocation of any Council assets.							

Our enquiries counter at St Kilda Town Hall
is open from 8.30am to 5.00pm Monday to Friday
T: 9209 6216 F: 9536 2745 E: devpermits@portphillip.vic.gov.au

www.portphillip.vic.gov.au/road_permits.htm

Road Opening Request for Final Inspection

Community Amenity Local Law No. 1 Clause 14

Request for Final Reinstatement

Any excavation or opening must be reinstated to Council requirements as per items (7), (9), (10) and (11) of Port Phillip City Council conditions on which a permit to open or obstruct roadways is issued (attached to Permit). The permanent reinstatement can be undertaken by Council if the applicant is unable to. The applicant at a bare minimum must be reinstated to temporary measures once the permit expires or when the safety precautions are removed.
Any opening within the City of Port Phillip must be back filled with crushed rock, compacted and finished with cold mix as a temporary measure until full reinstatement is completed by the applicant. If the applicant submits this application (Request for Final Inspection) without fully reinstating the surface to the original material being concrete, bluestone or asphalt and to Council requirements, the cost of shall be deducted from the security bond.

How have you reinstated the Road Opening?					
Permanent reinstatement (to original standard)		Temporary reinstatement (less than original standard)			
What material has been used in your reinstatement?					
Crushed and compacted rock (temporary)		Finished with asphalt cold mix (temporary			
Concrete (permanent)		Asphalt hot mix (permanent)		Bluestone (permanent)	
NOTE: If you have reinstated to less than the original quality and material or not to Council standards the reinstatement will be performed by Council's Infrastructure Services and the applicant will be debited or invoiced for the difference. The work will be inspected and final reinstatement (if required) will be undertaken by Council within 28 days on receipt of this form.					

Applicant's Name: .....

Applicant's Signature: ..... **Date:** .....

How to Apply

Submit this application form to: City Permits, City of Port Phillip, Private Bag No. 3, PO St Kilda VIC 3182
Or email a scan to devpermits@portphillip.vic.gov.au or fax to 9536 2745.

Further Information

Contact City Permits on 9209 6216 or devpermits@portphillip.vic.gov.au

Privacy Statement: The personal information requested on this form is being collected by the council for purposes of assessment in accordance with Community Amenity Local Law No. 1, Clause 14. The personal information will be used solely by the council for that primary purpose or directly related purposes. The applicant understands that the personal information provided is for the purpose of considering the application for an Asset Protection Permit and that he or she may apply to the council for access to the information. Requests for access and or correction should be made to Freedom of Information & Privacy Officer Governance & Engagement Department, City of Port Phillip.

Our enquiries counter at St Kilda Town Hall
is open from 8.30am to 5.00pm Monday to Friday
T: 9209 6216 F: 9536 2745 E: devpermits@portphillip.vic.gov.au

www.portphillip.vic.gov.au/road_permits.htm

Enquiries:
Email: devpermits@portphillip.vic.gov.au
Phone: 9209 6216
Mail: Private Bag No. 3, PO ST KILDA VIC 3182

CITY OF PORT PHILLIP
ABN 21 762 977 945

14 October 2015

AECOM
9/8 Exhibition St
MELBOURNE VIC 3000

ROAD OPENING PERMIT
206/2015/RO
Issued Under Community Amenity Local Law No: 1 (Clause 14)

This permit has been approved and issued subject to the following conditions and the permit holder shall be held to have agreed to such conditions and to have accepted any liability or responsibility thereby imposed.

Site of Works: Prohasky Street, all of street, PORT MELBOURNE

Description of Works: Bore holes for groundwater sampling.(MW2)

Permit Valid From: 10am 14 October 2015 **To:** 6 November 2015

In addition to complying with any relevant requirements in the Local Law No. 1, Community Amenity the following conditions apply to the activity or use:

Standard Conditions:

1. All works associated with the road opening including the set-up and removal of necessary signs and barriers may be taken **14 October and 6 November 2015** between Monday to Friday **7am to 5pm** and Saturday **9am to 3pm**. Obstructions to traffic flow are not permitted outside of this period including setting up or removal of the infrastructure.

2. To amend the dates of this licence requires a written request to be received by the City Permits by 5pm, while the permit is still valid. Once a permit has expired it cannot be re-used or amended.

3. A maximum of two (2) amendments to re-schedule the dates of this permit can be considered prior to incurring additional fees.

4. An absolute minimum width of 1.5 metres must be maintained for safe pedestrian access. Pedestrian safety must be maintained at all times by the appopriate use of bollards and tape. On both approaches to the works, the following signs must be clearly displayed and in place during the works;

    a) Pedestrian arrow signs
    a) Pedestrians Watch Your Step or,
    b) Pedestrian Use Other Footpath

5. All traffic treatments must be installed in accordance with any Traffic Management Plan submitted to Council and maintained during the works.

6. Signage must be visible and must not obstruct sightlines, designated pedestrian footpaths and crossovers/accesses. If on-street parking spaces are required to be used, only the spaces clearly specified on the

plan can be used for that purpose.

7. Accredited Traffic Control Officers must be present to manage traffic flow during a partial or full road closure. Traffic Control Officers must also assist pedestrians and cyclists as required.

8. If vehicular traffic flow is affected by the works, emergency services, including, Fire Brigade, Ambulance and Police must be notified by the permit-holder a minimum of 24 hours prior the commencement of works.

9. To the satisfaction of, and at no cost to Council, the permit-holder must reinstate all assets and infrastructure.

10. City of Port Phillip does not accept any responsibility for accidents, damage or injury to property, participants or third parties that may arise out of this event. There must be public liability insurance for the type of work proposed with an indemnity of not less than $10M, including full indemnity for the City of Port Phillip Council against any claim laid against it either by members of the public or persons engaged in any activities associated with the traffic diversion who, as a result of the diversion, suffer personal injury, property damage or financial loss.

11. The permit-holder must comply with AS 1742.3 2002. Manual of uniform traffic control devices, Part 3 Traffic Control Devices for lane and Road Closures and the relevant Standards Australia Field Guides Part 1. Short term urban works, daytime/night time SAA HB 81.1 & 4 1996.

12. City of Port Phillip reserves the right to amend or revoke the above at any time.

Prior to commencement

13. In addition to the requirement to obtain a Road Opening Permit, further permits may be required for activities on Council land such as Skip Bin, Road Closure, Street Occupation, or Asset Protection. Consents may also be required from VicRoads, utilities and public transport operators. The permit-holder must ensure all relevant permits and approvals have been obtained prior to commencing any works.

14. The permit-holder must provide a minimum of 2 business day's written notification to the occupants of all affected owners, occupiers and businesses affected by the works. The notification must include the following information and a copy forwarded to the City Permits unit, e-mail: devpermits@portphillip.vic.gov.au and must include:-

    a) The nature of the works being performed
    a) The date and hours of works occurring under this permit
    b) Council's permit reference
    c) Contact name and phone number for the permit holder and/or site manager

15. The permit-holder must contact City Permits unit at least 2 business days prior to commencing works, by e-mail: devpermits@portphillip.vic.gov.au, or ph: 03 9209 6216, to organise an inspection with Council's Asset Inspection Officer to determine:

    - the extent of reinstatement works including road pavement, signage and markings
    - the requirement for further inspections,
    - any requirements for the removal, storage and reinstatement of bluestone assets
    - removal and reinstatement of street furniture, (litter bins, public seating and bicycle hoops)

During construction

16. Works that may cause significant delay to traffic and/or public transport services must be scheduled outside peak periods of 7–9am and 4–6pm weekdays unless otherwise permitted with the written consent of Council.

17. Works must be carried out in accordance with '*Road Management Act 2004 Code of Practice Worksite Safety – Traffic Management'* and any approved Traffic Management Plan.

Work execution

18. Without the written consent of the Council the permit-holder must utilise boring techniques when installing underground services. Any piping or cabling work under an existing vehicle crossing must be carried out by boring, unless approval from Council's Asset Inspection Officer has been obtained.

19. If agricultural drains or irrigation pipes are encountered during excavation the permit-holder must carefully replace the pipes to their original position prior to backfilling.

20. The minimum lateral clearance from a drain is 500mm and a vertical clearance of 300mm. If the proposed road opening or any other work interferes with any underground drains, the approval must be obtained from the Council's Assets department prior to the commencement of works.

21. The minimum lateral clearance from a street tree is 2 metres. If the proposed road opening is less than 2 metres, consent must be obtained from Council's Arborist.

22. In the event of cancellation of this permit, the Council reserves the right to reinstate the area at the expense of the permit-holder.

23. Surplus excavated material must be removed from the road reserve daily and the area left in a clean and tidy condition.

24. All finished surfaces must match and be flush with existing surfaces.

25. Within 7 days of completion of the works, the permit holder must submit a request for final inspection to City Permits unit, e-mail: devpermits@portphillip.vic.gov.au.

26. Any damage to Council assets caused by the permit- holder's reinstatement works must be rectified to the satisfaction of Council's Asset Inspection Officer.

27. Failure to restore the road reserve and repair any damage caused to assets will result in Council undertaking the necessary reinstatement works and deducting the cost from the security bond and the remainder refunded. Where costs exceed the security bond amount held, the permit holder will be liable for the excess and charged accordingly.

28. If works are conducted in contravention of this permit, the City of Port Phillip reserves the right to amend or revoke the above at any time.

Reinstatement of footpaths

Asphalt footpaths
Specification for Asphalt Footpath – Refer to Standard Drawing: SD3103

29. The permanent asphalt layer of footpaths must be constructed in accordance with Council's current Standard Drawing.

30. The Bituminous surface at the edges of the trench must be cut with a circular saw.

31. A temporary bituminous surface of premix (cold-mix) minimum depth 75mm must be constructed before the crossing is opened to traffic, unless the permit-holder is completing a permanent reinstatement immediately with hot-mix asphalt.

32. The full width of the footpath must be reinstated. Where only part of a concrete footpath/vehicle crossing panel has been damaged, reinstatement must include the removal and reinstatement of the whole panel.

Concrete footpaths
Specification for Concrete Footpaths – Refer to Standard Drawing: SD3103

33. The permanent concrete layer of footpaths must be constructed in accordance with Council's current Standard Drawing.

34. Concrete footpath areas affected by works will be reinstated in full sections within the surrounding joints unless directed otherwise by Council's Asset Inspection Officer.

35. Existing surface levels must be maintained and the tops of all service pits/junction boxes must be at the footpath surface level.

Reinstatement of road pavements

36. Where the permit-holder or contractor's road opening is less than 1.0 metre from the lip of a channel, the floating section of pavement must be removed and the final surface reinstatement will be from the furthest edge from opening/trench to the lip of channel.

37. All road pavement surfaces must be cut with a circular saw.

Flexible road pavement (Asphalt)
Specification for Flexible Road Pavements – Refer to Standard Drawing SD3103

Rigid Road Pavement (Concrete)

Temporary reinstatements

38. All temporary road reinstatements must be finished with cold-mix (premix asphalt) flush with the existing surfaces unless permanent hot-mix asphalt reinstatement is being completed immediately following the compaction of the pavement surface.

Nature strips

39. All nature strips must be reinstated. Backfilling of nature strips must be completed with natural soil material compacted in 150mm layers, 90% standard compaction to a level 75mm below surface. The remaining backfill must be uncompacted topsoil to 15mm above the surface level and the surface even and seeded to Council's satisfaction. The area must be kept moist until germination has occurred.

Reinstatement of vehicle crossings
Specification for Vehicle Crossings – Refer to Standard Drawing SD4101

40. The vehicle crossing must be constructed in accordance with Council's current Standard Drawing.

41. Concrete vehicle crossings affected by works must be reinstated in full sections (panels) within the surrounding joints unless otherwise directed by Council's 'Asset Inspection Officer'.

42. When reinstating a section/panel, Y16 dowel bars 400mm lengths must be inserted 200mm into the existing concrete surface and spaced 300mm apart.

Kerb and channel
Specification for Concrete Kerb and Channel – Refer to Standard Drawing SD1101
Specification for Bluestone Kerb and Channel – Refer to Standard Drawing SD1102

43. The kerb and channel must be reinstated to the satisfaction of Council's Asset Inspection Officer.

Bluestone pitchers
Specification for Bluestone Pitchers – Refer to Standard Drawing SD3101

44. The bluestone pitcher kerb and channel, and pavement must be reinstated to the satisfaction of Council's Asset Inspection Officer.

Footnotes:

Permitted Construction Hours
Under Council's Local Law No. 1 (Community Amenity), A *builder* requires a permit to carry out building works on a building site other than between 7.00am to 6.00pm Monday to Friday, and 9.00am to 3.00pm Saturday. No works are permitted on a public holiday as defined by the *Public Holidays Act* 1993.

Dial Before You Dig
Neglecting to dial 1100 before excavating can lead to costly disruption to essential services. Dial Before You Dig is a free referral service for information on locating underground utilities.
Ph: 1100
Web: www.1100.com.au

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Ph: 9209 6216
Fx: 9536 2745
Email: devpermits@portphillip.vic.gov.au

Road Opening Request for Final Inspection

Community Amenity Local Law No. 1 Clause 14

This form must be completed within 48 hours of completion of works.
Any security bond refunds will be issued within 20 business days.

Applicant Details			
Site Address:			
Applicant/Business Name:			
Applicant's Postal Address:			
Telephone Number:		Mobile Number:	
E-mail Address:			
ABN:		ACN:	
Road Opening Details			
Road Opening Permit No:	.... / .... / **RO**		
Reason for Permit (tick appropriate box)			
Start & Completion Date of Works:	From: / /	To: / /	

What part of the Road Reserve are your works in?									
Footpath		Nature Strip		Road or Lane		Car Park		Kerb Channel	
Size of Opening:	**m L x m W = m²**								

Did any of the following assets require relocation as a result of the Road Opening?							
Parking Ticket Machine		Street Furniture		Litter Bin		Other (please state)	
The applicant is responsible for all associated costs as a result of the relocation of any Council assets.							

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Road Opening Request for Final Inspection

Community Amenity Local Law No. 1 Clause 14

Request for Final Reinstatement

Any excavation or opening must be reinstated to Council requirements as per items (7), (9), (10) and (11) of Port Phillip City Council conditions on which a permit to open or obstruct roadways is issued (attached to Permit). The permanent reinstatement can be undertaken by Council if the applicant is unable to. The applicant at a bare minimum must be reinstated to temporary measures once the permit expires or when the safety precautions are removed.
Any opening within the City of Port Phillip must be back filled with crushed rock, compacted and finished with cold mix as a temporary measure until full reinstatement is completed by the applicant. If the applicant submits this application (Request for Final Inspection) without fully reinstating the surface to the original material being concrete, bluestone or asphalt and to Council requirements, the cost of shall be deducted from the security bond.

How have you reinstated the Road Opening?					
Permanent reinstatement (to original standard)		Temporary reinstatement (less than original standard)			
What material has been used in your reinstatement?					
Crushed and compacted rock (temporary)		Finished with asphalt cold mix (temporary			
Concrete (permanent)		Asphalt hot mix (permanent)		Bluestone (permanent)	
NOTE: If you have reinstated to less than the original quality and material or not to Council standards the reinstatement will be performed by Council's Infrastructure Services and the applicant will be debited or invoiced for the difference. The work will be inspected and final reinstatement (if required) will be undertaken by Council within 28 days on receipt of this form.					

Applicant's Name: .....

Applicant's Signature: ..... **Date:** .....

How to Apply

Submit this application form to: City Permits, City of Port Phillip, Private Bag No. 3, PO St Kilda VIC 3182
Or email a scan to devpermits@portphillip.vic.gov.au or fax to 9536 2745.

Further Information

Contact City Permits on 9209 6216 or devpermits@portphillip.vic.gov.au

Privacy Statement: The personal information requested on this form is being collected by the council for purposes of assessment in accordance with Community Amenity Local Law No. 1, Clause 14. The personal information will be used solely by the council for that primary purpose or directly related purposes. The applicant understands that the personal information provided is for the purpose of considering the application for an Asset Protection Permit and that he or she may apply to the council for access to the information. Requests for access and or correction should be made to Freedom of Information & Privacy Officer Governance & Engagement Department, City of Port Phillip.

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www.portphillip.vic.gov.au/road_permits.htm

Enquiries:
Email: devpermits@portphillip.vic.gov.au
Phone: 9209 6216
Mail: Private Bag No. 3, PO ST KILDA VIC 3182

CITY OF PORT PHILLIP
ABN 21 762 977 945

27 October 2015

AECOM
9/8 Exhibition Street
MELBOURNE VIC 3000

ROAD OPENING PERMIT
206/2015/RO – Amendment 1
Issued Under Community Amenity Local Law No: 1 (Clause 14)

This permit has been approved and issued subject to the following conditions and the permit holder shall be held to have agreed to such conditions and to have accepted any liability or responsibility thereby imposed.

Site of Works: Prohasky Street, all of street, PORT MELBOURNE VIC 3207, &
Todd Road, all of street, PORT MELBOURNE

Description of Works: Bore holes for groundwater sampling.(MW2)

Permit Valid From: 27 October 2015 **To:** 6 November 2015

In addition to complying with any relevant requirements in the Local Law No. 1, Community Amenity the following conditions apply to the activity or use:

Standard Conditions:

1. All works associated with the road opening including the set-up and removal of necessary signs and barriers may be taken **from 27 October 2015 to 6 November 2015 between 7am to 5pm**. Obstructions to traffic flow are not permitted outside of this period including setting up or removal of the infrastructure.

2. To amend the dates of this licence requires a written request to be received by the City Permits by 5pm, while the permit is still valid. Once a permit has expired it cannot be re-used or amended.

3. A maximum of two (2) amendments to re-schedule the dates of this permit can be considered prior to incurring additional fees.

4. An absolute minimum width of 1.5 metres must be maintained for safe pedestrian access. Pedestrian safety must be maintained at all times by the appopriate use of bollards and tape. On both approaches to the works, the following signs must be clearly displayed and in place during the works;

    a) Pedestrian arrow signs
    a) Pedestrians Watch Your Step or,
    b) Pedestrian Use Other Footpath

5. All traffic treatments must be installed in accordance with any Traffic Management Plan submitted to Council and maintained during the works.

6. Signage must be visible and must not obstruct sightlines, designated pedestrian footpaths and crossovers/accesses. If on-street parking spaces are required to be used, only the spaces clearly specified on the

plan can be used for that purpose.

7. Accredited Traffic Control Officers must be present to manage traffic flow during a partial or full road closure. Traffic Control Officers must also assist pedestrians and cyclists as required.

8. If vehicular traffic flow is affected by the works, emergency services, including, Fire Brigade, Ambulance and Police must be notified by the permit-holder a minimum of 24 hours prior the commencement of works.

9. To the satisfaction of, and at no cost to Council, the permit-holder must reinstate all assets and infrastructure.

10. City of Port Phillip does not accept any responsibility for accidents, damage or injury to property, participants or third parties that may arise out of this event. There must be public liability insurance for the type of work proposed with an indemnity of not less than $10M, including full indemnity for the City of Port Phillip Council against any claim laid against it either by members of the public or persons engaged in any activities associated with the traffic diversion who, as a result of the diversion, suffer personal injury, property damage or financial loss.

11. The permit-holder must comply with AS 1742.3 2002. Manual of uniform traffic control devices, Part 3 Traffic Control Devices for lane and Road Closures and the relevant Standards Australia Field Guides Part 1. Short term urban works, daytime/night time SAA HB 81.1 & 4 1996.

12. City of Port Phillip reserves the right to amend or revoke the above at any time.

Prior to commencement

13. In addition to the requirement to obtain a Road Opening Permit, further permits may be required for activities on Council land such as Skip Bin, Road Closure, Street Occupation, or Asset Protection. Consents may also be required from VicRoads, utilities and public transport operators. The permit-holder must ensure all relevant permits and approvals have been obtained prior to commencing any works.

14. The permit-holder must provide a minimum of 2 business day's written notification to the occupants of all affected owners, occupiers and businesses affected by the works. The notification must include the following information and a copy forwarded to the City Permits unit, e-mail: devpermits@portphillip.vic.gov.au and must include:-

    a) The nature of the works being performed
    a) The date and hours of works occurring under this permit
    b) Council's permit reference
    c) Contact name and phone number for the permit holder and/or site manager

15. The permit-holder must contact City Permits unit at least 2 business days prior to commencing works, by e-mail: devpermits@portphillip.vic.gov.au, or ph: 03 9209 6216, to organise an inspection with Council's Asset Inspection Officer to determine:

    - the extent of reinstatement works including road pavement, signage and markings
    - the requirement for further inspections,
    - any requirements for the removal, storage and reinstatement of bluestone assets
    - removal and reinstatement of street furniture, (litter bins, public seating and bicycle hoops)

During construction

16. Works that may cause significant delay to traffic and/or public transport services must be scheduled outside peak periods of 7–9am and 4–6pm weekdays unless otherwise permitted with the written consent of Council.

17. Works must be carried out in accordance with '*Road Management Act 2004 Code of Practice Worksite Safety – Traffic Management'* and any approved Traffic Management Plan.

Work execution

18. Without the written consent of the Council the permit-holder must utilise boring techniques when installing underground services. Any piping or cabling work under an existing vehicle crossing must be carried out by boring, unless approval from Council's Asset Inspection Officer has been obtained.

19. If agricultural drains or irrigation pipes are encountered during excavation the permit-holder must carefully replace the pipes to their original position prior to backfilling.

20. The minimum lateral clearance from a drain is 500mm and a vertical clearance of 300mm. If the proposed road opening or any other work interferes with any underground drains, the approval must be obtained from the Council's Assets department prior to the commencement of works.

21. The minimum lateral clearance from a street tree is 2 metres. If the proposed road opening is less than 2 metres, consent must be obtained from Council's Arborist.

22. In the event of cancellation of this permit, the Council reserves the right to reinstate the area at the expense of the permit-holder.

23. Surplus excavated material must be removed from the road reserve daily and the area left in a clean and tidy condition.

24. All finished surfaces must match and be flush with existing surfaces.

25. Within 7 days of completion of the works, the permit holder must submit a request for final inspection to City Permits unit, e-mail: devpermits@portphillip.vic.gov.au.

26. Any damage to Council assets caused by the permit- holder's reinstatement works must be rectified to the satisfaction of Council's Asset Inspection Officer.

27. Failure to restore the road reserve and repair any damage caused to assets will result in Council undertaking the necessary reinstatement works and deducting the cost from the security bond and the remainder refunded. Where costs exceed the security bond amount held, the permit holder will be liable for the excess and charged accordingly.

28. If works are conducted in contravention of this permit, the City of Port Phillip reserves the right to amend or revoke the above at any time.

Reinstatement of footpaths

Asphalt footpaths
Specification for Asphalt Footpath – Refer to Standard Drawing: SD3103

29. The permanent asphalt layer of footpaths must be constructed in accordance with Council's current Standard Drawing.

30. The Bituminous surface at the edges of the trench must be cut with a circular saw.

31. A temporary bituminous surface of premix (cold-mix) minimum depth 75mm must be constructed before the crossing is opened to traffic, unless the permit-holder is completing a permanent reinstatement immediately with hot-mix asphalt.

32. The full width of the footpath must be reinstated. Where only part of a concrete footpath/vehicle crossing panel has been damaged, reinstatement must include the removal and reinstatement of the whole panel.

Concrete footpaths
Specification for Concrete Footpaths – Refer to Standard Drawing: SD3103

33. The permanent concrete layer of footpaths must be constructed in accordance with Council's current Standard Drawing.

34. Concrete footpath areas affected by works will be reinstated in full sections within the surrounding joints unless directed otherwise by Council's Asset Inspection Officer.

35. Existing surface levels must be maintained and the tops of all service pits/junction boxes must be at the footpath surface level.

Reinstatement of road pavements

36. Where the permit-holder or contractor's road opening is less than 1.0 metre from the lip of a channel, the floating section of pavement must be removed and the final surface reinstatement will be from the furthest edge from opening/trench to the lip of channel.

37. All road pavement surfaces must be cut with a circular saw.

Flexible road pavement (Asphalt)
Specification for Flexible Road Pavements – Refer to Standard Drawing SD3103

Rigid Road Pavement (Concrete)

Temporary reinstatements

38. All temporary road reinstatements must be finished with cold-mix (premix asphalt) flush with the existing surfaces unless permanent hot-mix asphalt reinstatement is being completed immediately following the compaction of the pavement surface.

Nature strips

39. All nature strips must be reinstated. Backfilling of nature strips must be completed with natural soil material compacted in 150mm layers, 90% standard compaction to a level 75mm below surface. The remaining backfill must be uncompacted topsoil to 15mm above the surface level and the surface even and seeded to Council's satisfaction. The area must be kept moist until germination has occurred.

Reinstatement of vehicle crossings
Specification for Vehicle Crossings – Refer to Standard Drawing SD4101

40. The vehicle crossing must be constructed in accordance with Council's current Standard Drawing.

41. Concrete vehicle crossings affected by works must be reinstated in full sections (panels) within the surrounding joints unless otherwise directed by Council's 'Asset Inspection Officer'.

42. When reinstating a section/panel, Y16 dowel bars 400mm lengths must be inserted 200mm into the existing concrete surface and spaced 300mm apart.

Kerb and channel
Specification for Concrete Kerb and Channel – Refer to Standard Drawing SD1101
Specification for Bluestone Kerb and Channel – Refer to Standard Drawing SD1102

43. The kerb and channel must be reinstated to the satisfaction of Council's Asset Inspection Officer.

Bluestone pitchers
Specification for Bluestone Pitchers – Refer to Standard Drawing SD3101

44. The bluestone pitcher kerb and channel, and pavement must be reinstated to the satisfaction of Council's Asset Inspection Officer.

Footnotes:

Permitted Construction Hours
Under Council's Local Law No. 1 (Community Amenity), A *builder* requires a permit to carry out building works on a building site other than between 7.00am to 6.00pm Monday to Friday, and 9.00am to 3.00pm Saturday. No works are permitted on a public holiday as defined by the *Public Holidays Act* 1993.

Dial Before You Dig
Neglecting to dial 1100 before excavating can lead to costly disruption to essential services. Dial Before You Dig is a free referral service for information on locating underground utilities.
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City Permits
Ph: 9209 6216
Fx: 9536 2745
Email: devpermits@portphillip.vic.gov.au

Road Opening Request for Final Inspection

Community Amenity Local Law No. 1 Clause 14

This form must be completed within 48 hours of completion of works.
Any security bond refunds will be issued within 20 business days.

Applicant Details			
Site Address:			
Applicant/Business Name:			
Applicant's Postal Address:			
Telephone Number:		Mobile Number:	
E-mail Address:			
ABN:		ACN:	
Road Opening Details			
Road Opening Permit No:	.... / .... / **RO**		
Reason for Permit (tick appropriate box)			
Start & Completion Date of Works:	From: / /	To: / /	

What part of the Road Reserve are your works in?									
Footpath		Nature Strip		Road or Lane		Car Park		Kerb Channel	
Size of Opening:	**m L x m W = m²**								

Did any of the following assets require relocation as a result of the Road Opening?							
Parking Ticket Machine		Street Furniture		Litter Bin		Other (please state)	
The applicant is responsible for all associated costs as a result of the relocation of any Council assets.							

Our enquiries counter at St Kilda Town Hall
is open from 8.30am to 5.00pm Monday to Friday
T: 9209 6216 F: 9536 2745 E: devpermits@portphillip.vic.gov.au

www.portphillip.vic.gov.au/road_permits.htm

Road Opening Request for Final Inspection

Community Amenity Local Law No. 1 Clause 14

Request for Final Reinstatement

Any excavation or opening must be reinstated to Council requirements as per items (7), (9), (10) and (11) of Port Phillip City Council conditions on which a permit to open or obstruct roadways is issued (attached to Permit). The permanent reinstatement can be undertaken by Council if the applicant is unable to. The applicant at a bare minimum must be reinstated to temporary measures once the permit expires or when the safety precautions are removed.
Any opening within the City of Port Phillip must be back filled with crushed rock, compacted and finished with cold mix as a temporary measure until full reinstatement is completed by the applicant. If the applicant submits this application (Request for Final Inspection) without fully reinstating the surface to the original material being concrete, bluestone or asphalt and to Council requirements, the cost of shall be deducted from the security bond.

How have you reinstated the Road Opening?					
Permanent reinstatement (to original standard)		Temporary reinstatement (less than original standard)			
What material has been used in your reinstatement?					
Crushed and compacted rock (temporary)		Finished with asphalt cold mix (temporary			
Concrete (permanent)		Asphalt hot mix (permanent)		Bluestone (permanent)	
NOTE: If you have reinstated to less than the original quality and material or not to Council standards the reinstatement will be performed by Council's Infrastructure Services and the applicant will be debited or invoiced for the difference. The work will be inspected and final reinstatement (if required) will be undertaken by Council within 28 days on receipt of this form.					

Applicant's Name: .....

Applicant's Signature: ..... **Date:** .....

How to Apply

Submit this application form to: City Permits, City of Port Phillip, Private Bag No. 3, PO St Kilda VIC 3182
Or email a scan to devpermits@portphillip.vic.gov.au or fax to 9536 2745.

Further Information

Contact City Permits on 9209 6216 or devpermits@portphillip.vic.gov.au

Privacy Statement: The personal information requested on this form is being collected by the council for purposes of assessment in accordance with Community Amenity Local Law No. 1, Clause 14. The personal information will be used solely by the council for that primary purpose or directly related purposes. The applicant understands that the personal information provided is for the purpose of considering the application for an Asset Protection Permit and that he or she may apply to the council for access to the information. Requests for access and or correction should be made to Freedom of Information & Privacy Officer Governance & Engagement Department, City of Port Phillip.

Our enquiries counter at St Kilda Town Hall
is open from 8.30am to 5.00pm Monday to Friday
T: 9209 6216 F: 9536 2745 E: devpermits@portphillip.vic.gov.au

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Enquiries:
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Phone: 9209 6216
Mail: Private Bag No. 3, PO ST KILDA VIC 3182

CITY OF PORT PHILLIP
ABN 21 762 977 945

14 October 2015

AECOM
9/8 Exhibition St
MELBOURNE VIC 3000

ROAD OPENING PERMIT
211/2015/RO
Issued Under Community Amenity Local Law No: 1 (Clause 14)

This permit has been approved and issued subject to the following conditions and the permit holder shall be held to have agreed to such conditions and to have accepted any liability or responsibility thereby imposed.

Site of Works: Williamstown Road, all of street, PORT MELBOURNE

Description of Works: Bore holes for groundwater sampling.(MW6)

Permit Valid From: 10am 14 October 2015 **To:** 6 November 2015

In addition to complying with any relevant requirements in the Local Law No. 1, Community Amenity the following conditions apply to the activity or use:

Standard Conditions:

1. All works associated with the road opening including the set-up and removal of necessary signs and barriers may be taken **14 October and 6 November 2015** between Monday to Friday **7am to 5pm** and Saturday **9am to 3pm**. Obstructions to traffic flow are not permitted outside of this period including setting up or removal of the infrastructure.

2. To amend the dates of this licence requires a written request to be received by the City Permits by 5pm, while the permit is still valid. Once a permit has expired it cannot be re-used or amended.

3. A maximum of two (2) amendments to re-schedule the dates of this permit can be considered prior to incurring additional fees.

4. An absolute minimum width of 1.5 metres must be maintained for safe pedestrian access. Pedestrian safety must be maintained at all times by the appopriate use of bollards and tape. On both approaches to the works, the following signs must be clearly displayed and in place during the works;

    a) Pedestrian arrow signs
    a) Pedestrians Watch Your Step or,
    b) Pedestrian Use Other Footpath

5. All traffic treatments must be installed in accordance with any Traffic Management Plan submitted to Council and maintained during the works.

6. Signage must be visible and must not obstruct sightlines, designated pedestrian footpaths and crossovers/accesses. If on-street parking spaces are required to be used, only the spaces clearly specified on the

plan can be used for that purpose.

7. Accredited Traffic Control Officers must be present to manage traffic flow during a partial or full road closure. Traffic Control Officers must also assist pedestrians and cyclists as required.

8. If vehicular traffic flow is affected by the works, emergency services, including, Fire Brigade, Ambulance and Police must be notified by the permit-holder a minimum of 24 hours prior the commencement of works.

9. To the satisfaction of, and at no cost to Council, the permit-holder must reinstate all assets and infrastructure.

10. City of Port Phillip does not accept any responsibility for accidents, damage or injury to property, participants or third parties that may arise out of this event. There must be public liability insurance for the type of work proposed with an indemnity of not less than $10M, including full indemnity for the City of Port Phillip Council against any claim laid against it either by members of the public or persons engaged in any activities associated with the traffic diversion who, as a result of the diversion, suffer personal injury, property damage or financial loss.

11. The permit-holder must comply with AS 1742.3 2002. Manual of uniform traffic control devices, Part 3 Traffic Control Devices for lane and Road Closures and the relevant Standards Australia Field Guides Part 1. Short term urban works, daytime/night time SAA HB 81.1 & 4 1996.

12. City of Port Phillip reserves the right to amend or revoke the above at any time.

Prior to commencement

13. In addition to the requirement to obtain a Road Opening Permit, further permits may be required for activities on Council land such as Skip Bin, Road Closure, Street Occupation, or Asset Protection. Consents may also be required from VicRoads, utilities and public transport operators. The permit-holder must ensure all relevant permits and approvals have been obtained prior to commencing any works.

14. The permit-holder must provide a minimum of 2 business day's written notification to the occupants of all affected owners, occupiers and businesses affected by the works. The notification must include the following information and a copy forwarded to the City Permits unit, e-mail: devpermits@portphillip.vic.gov.au and must include:-

    a) The nature of the works being performed
    a) The date and hours of works occurring under this permit
    b) Council's permit reference
    c) Contact name and phone number for the permit holder and/or site manager

15. The permit-holder must contact City Permits unit at least 2 business days prior to commencing works, by e-mail: devpermits@portphillip.vic.gov.au, or ph: 03 9209 6216, to organise an inspection with Council's Asset Inspection Officer to determine:

    - the extent of reinstatement works including road pavement, signage and markings
    - the requirement for further inspections,
    - any requirements for the removal, storage and reinstatement of bluestone assets
    - removal and reinstatement of street furniture, (litter bins, public seating and bicycle hoops)

During construction

16. Works that may cause significant delay to traffic and/or public transport services must be scheduled outside peak periods of 7–9am and 4–6pm weekdays unless otherwise permitted with the written consent of Council.

17. Works must be carried out in accordance with '*Road Management Act 2004 Code of Practice Worksite Safety – Traffic Management'* and any approved Traffic Management Plan.

Work execution

18. Without the written consent of the Council the permit-holder must utilise boring techniques when installing underground services. Any piping or cabling work under an existing vehicle crossing must be carried out by boring, unless approval from Council's Asset Inspection Officer has been obtained.

19. If agricultural drains or irrigation pipes are encountered during excavation the permit-holder must carefully replace the pipes to their original position prior to backfilling.

20. The minimum lateral clearance from a drain is 500mm and a vertical clearance of 300mm. If the proposed road opening or any other work interferes with any underground drains, the approval must be obtained from the Council's Assets department prior to the commencement of works.

21. The minimum lateral clearance from a street tree is 2 metres. If the proposed road opening is less than 2 metres, consent must be obtained from Council's Arborist.

22. In the event of cancellation of this permit, the Council reserves the right to reinstate the area at the expense of the permit-holder.

23. Surplus excavated material must be removed from the road reserve daily and the area left in a clean and tidy condition.

24. All finished surfaces must match and be flush with existing surfaces.

25. Within 7 days of completion of the works, the permit holder must submit a request for final inspection to City Permits unit, e-mail: devpermits@portphillip.vic.gov.au.

26. Any damage to Council assets caused by the permit- holder's reinstatement works must be rectified to the satisfaction of Council's Asset Inspection Officer.

27. Failure to restore the road reserve and repair any damage caused to assets will result in Council undertaking the necessary reinstatement works and deducting the cost from the security bond and the remainder refunded. Where costs exceed the security bond amount held, the permit holder will be liable for the excess and charged accordingly.

28. If works are conducted in contravention of this permit, the City of Port Phillip reserves the right to amend or revoke the above at any time.

Reinstatement of footpaths

Asphalt footpaths
Specification for Asphalt Footpath – Refer to Standard Drawing: SD3103

29. The permanent asphalt layer of footpaths must be constructed in accordance with Council's current Standard Drawing.

30. The Bituminous surface at the edges of the trench must be cut with a circular saw.

31. A temporary bituminous surface of premix (cold-mix) minimum depth 75mm must be constructed before the crossing is opened to traffic, unless the permit-holder is completing a permanent reinstatement immediately with hot-mix asphalt.

32. The full width of the footpath must be reinstated. Where only part of a concrete footpath/vehicle crossing panel has been damaged, reinstatement must include the removal and reinstatement of the whole panel.

Concrete footpaths
Specification for Concrete Footpaths – Refer to Standard Drawing: SD3103

33. The permanent concrete layer of footpaths must be constructed in accordance with Council's current Standard Drawing.

34. Concrete footpath areas affected by works will be reinstated in full sections within the surrounding joints unless directed otherwise by Council's Asset Inspection Officer.

35. Existing surface levels must be maintained and the tops of all service pits/junction boxes must be at the footpath surface level.

Reinstatement of road pavements

36. Where the permit-holder or contractor's road opening is less than 1.0 metre from the lip of a channel, the floating section of pavement must be removed and the final surface reinstatement will be from the furthest edge from opening/trench to the lip of channel.

37. All road pavement surfaces must be cut with a circular saw.

Flexible road pavement (Asphalt)
Specification for Flexible Road Pavements – Refer to Standard Drawing SD3103

Rigid Road Pavement (Concrete)

Temporary reinstatements

38. All temporary road reinstatements must be finished with cold-mix (premix asphalt) flush with the existing surfaces unless permanent hot-mix asphalt reinstatement is being completed immediately following the compaction of the pavement surface.

Nature strips

39. All nature strips must be reinstated. Backfilling of nature strips must be completed with natural soil material compacted in 150mm layers, 90% standard compaction to a level 75mm below surface. The remaining backfill must be uncompacted topsoil to 15mm above the surface level and the surface even and seeded to Council's satisfaction. The area must be kept moist until germination has occurred.

Reinstatement of vehicle crossings
Specification for Vehicle Crossings – Refer to Standard Drawing SD4101

40. The vehicle crossing must be constructed in accordance with Council's current Standard Drawing.

41. Concrete vehicle crossings affected by works must be reinstated in full sections (panels) within the surrounding joints unless otherwise directed by Council's 'Asset Inspection Officer'.

42. When reinstating a section/panel, Y16 dowel bars 400mm lengths must be inserted 200mm into the existing concrete surface and spaced 300mm apart.

Kerb and channel
Specification for Concrete Kerb and Channel – Refer to Standard Drawing SD1101
Specification for Bluestone Kerb and Channel – Refer to Standard Drawing SD1102

43. The kerb and channel must be reinstated to the satisfaction of Council's Asset Inspection Officer.

Bluestone pitchers
Specification for Bluestone Pitchers – Refer to Standard Drawing SD3101

44. The bluestone pitcher kerb and channel, and pavement must be reinstated to the satisfaction of Council's Asset Inspection Officer.

Footnotes:

Permitted Construction Hours
Under Council's Local Law No. 1 (Community Amenity), A *builder* requires a permit to carry out building works on a building site other than between 7.00am to 6.00pm Monday to Friday, and 9.00am to 3.00pm Saturday. No works are permitted on a public holiday as defined by the *Public Holidays Act* 1993.

Dial Before You Dig
Neglecting to dial 1100 before excavating can lead to costly disruption to essential services. Dial Before You Dig is a free referral service for information on locating underground utilities.
Ph: 1100
Web: www.1100.com.au

Standard Construction Drawings
http://www.portphillip.vic.gov.au/road_opening_permit.htm

City of Port Phillip Permits Index
http://www.portphillip.vic.gov.au/permits_licenses_index.htm

Contacts / Links

Asset Inspection Officer
Ph: 9209 6590
Fx: 9536 2710
Email: helpassetinspection@portphillip.vic.gov.au

City Permits
Ph: 9209 6216
Fx: 9536 2745
Email: devpermits@portphillip.vic.gov.au

Road Opening Request for Final Inspection

Community Amenity Local Law No. 1 Clause 14

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Applicant Details			
Site Address:			
Applicant/Business Name:			
Applicant's Postal Address:			
Telephone Number:		Mobile Number:	
E-mail Address:			
ABN:		ACN:	
Road Opening Details			
Road Opening Permit No:	.... / .... / **RO**		
Reason for Permit (tick appropriate box)			
Start & Completion Date of Works:	From: / /	To: / /	

What part of the Road Reserve are your works in?									
Footpath		Nature Strip		Road or Lane		Car Park		Kerb Channel	
Size of Opening:	**m L x m W = m²**								

Did any of the following assets require relocation as a result of the Road Opening?							
Parking Ticket Machine		Street Furniture		Litter Bin		Other (please state)	
The applicant is responsible for all associated costs as a result of the relocation of any Council assets.							

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Road Opening Request for Final Inspection

Community Amenity Local Law No. 1 Clause 14

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Any opening within the City of Port Phillip must be back filled with crushed rock, compacted and finished with cold mix as a temporary measure until full reinstatement is completed by the applicant. If the applicant submits this application (Request for Final Inspection) without fully reinstating the surface to the original material being concrete, bluestone or asphalt and to Council requirements, the cost of shall be deducted from the security bond.

How have you reinstated the Road Opening?					
Permanent reinstatement (to original standard)		Temporary reinstatement (less than original standard)			
What material has been used in your reinstatement?					
Crushed and compacted rock (temporary)		Finished with asphalt cold mix (temporary			
Concrete (permanent)		Asphalt hot mix (permanent)		Bluestone (permanent)	
NOTE: If you have reinstated to less than the original quality and material or not to Council standards the reinstatement will be performed by Council's Infrastructure Services and the applicant will be debited or invoiced for the difference. The work will be inspected and final reinstatement (if required) will be undertaken by Council within 28 days on receipt of this form.					

Applicant's Name: .....

Applicant's Signature: ..... **Date:** .....

How to Apply

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CITY OF PORT PHILLIP
ABN 21 762 977 945

14 October 2015

AECOM
9/8 Exhibition St
MELBOURNE VIC 3000

ROAD OPENING PERMIT
212/2015/RO
Issued Under Community Amenity Local Law No: 1 (Clause 14)

This permit has been approved and issued subject to the following conditions and the permit holder shall be held to have agreed to such conditions and to have accepted any liability or responsibility thereby imposed.

Site of Works: Plummer Street, all of street, PORT MELBOURNE

Description of Works: Bore holes for groundwater sampling.(MW7)

Permit Valid From: 10am 14 October 2015 **To:** 6 November 2015

In addition to complying with any relevant requirements in the Local Law No. 1, Community Amenity the following conditions apply to the activity or use:

Standard Conditions:

1. All works associated with the road opening including the set-up and removal of necessary signs and barriers may be taken **14 October and 6 November 2015** between Monday to Friday **7am to 5pm** and Saturday **9am to 3pm**. Obstructions to traffic flow are not permitted outside of this period including setting up or removal of the infrastructure.

2. To amend the dates of this licence requires a written request to be received by the City Permits by 5pm, while the permit is still valid. Once a permit has expired it cannot be re-used or amended.

3. A maximum of two (2) amendments to re-schedule the dates of this permit can be considered prior to incurring additional fees.

4. An absolute minimum width of 1.5 metres must be maintained for safe pedestrian access. Pedestrian safety must be maintained at all times by the appopriate use of bollards and tape. On both approaches to the works, the following signs must be clearly displayed and in place during the works;

    a) Pedestrian arrow signs
    a) Pedestrians Watch Your Step or,
    b) Pedestrian Use Other Footpath

5. All traffic treatments must be installed in accordance with any Traffic Management Plan submitted to Council and maintained during the works.

6. Signage must be visible and must not obstruct sightlines, designated pedestrian footpaths and crossovers/accesses. If on-street parking spaces are required to be used, only the spaces clearly specified on the

plan can be used for that purpose.

7. Accredited Traffic Control Officers must be present to manage traffic flow during a partial or full road closure. Traffic Control Officers must also assist pedestrians and cyclists as required.

8. If vehicular traffic flow is affected by the works, emergency services, including, Fire Brigade, Ambulance and Police must be notified by the permit-holder a minimum of 24 hours prior the commencement of works.

9. To the satisfaction of, and at no cost to Council, the permit-holder must reinstate all assets and infrastructure.

10. City of Port Phillip does not accept any responsibility for accidents, damage or injury to property, participants or third parties that may arise out of this event. There must be public liability insurance for the type of work proposed with an indemnity of not less than $10M, including full indemnity for the City of Port Phillip Council against any claim laid against it either by members of the public or persons engaged in any activities associated with the traffic diversion who, as a result of the diversion, suffer personal injury, property damage or financial loss.

11. The permit-holder must comply with AS 1742.3 2002. Manual of uniform traffic control devices, Part 3 Traffic Control Devices for lane and Road Closures and the relevant Standards Australia Field Guides Part 1. Short term urban works, daytime/night time SAA HB 81.1 & 4 1996.

12. City of Port Phillip reserves the right to amend or revoke the above at any time.

Prior to commencement

13. In addition to the requirement to obtain a Road Opening Permit, further permits may be required for activities on Council land such as Skip Bin, Road Closure, Street Occupation, or Asset Protection. Consents may also be required from VicRoads, utilities and public transport operators. The permit-holder must ensure all relevant permits and approvals have been obtained prior to commencing any works.

14. The permit-holder must provide a minimum of 2 business day's written notification to the occupants of all affected owners, occupiers and businesses affected by the works. The notification must include the following information and a copy forwarded to the City Permits unit, e-mail: devpermits@portphillip.vic.gov.au and must include:-

    a) The nature of the works being performed
    a) The date and hours of works occurring under this permit
    b) Council's permit reference
    c) Contact name and phone number for the permit holder and/or site manager

15. The permit-holder must contact City Permits unit at least 2 business days prior to commencing works, by e-mail: devpermits@portphillip.vic.gov.au, or ph: 03 9209 6216, to organise an inspection with Council's Asset Inspection Officer to determine:

    - the extent of reinstatement works including road pavement, signage and markings
    - the requirement for further inspections,
    - any requirements for the removal, storage and reinstatement of bluestone assets
    - removal and reinstatement of street furniture, (litter bins, public seating and bicycle hoops)

During construction

16. Works that may cause significant delay to traffic and/or public transport services must be scheduled outside peak periods of 7–9am and 4–6pm weekdays unless otherwise permitted with the written consent of Council.

17. Works must be carried out in accordance with '*Road Management Act 2004 Code of Practice Worksite Safety – Traffic Management'* and any approved Traffic Management Plan.

Work execution

18. Without the written consent of the Council the permit-holder must utilise boring techniques when installing underground services. Any piping or cabling work under an existing vehicle crossing must be carried out by boring, unless approval from Council's Asset Inspection Officer has been obtained.

19. If agricultural drains or irrigation pipes are encountered during excavation the permit-holder must carefully replace the pipes to their original position prior to backfilling.

20. The minimum lateral clearance from a drain is 500mm and a vertical clearance of 300mm. If the proposed road opening or any other work interferes with any underground drains, the approval must be obtained from the Council's Assets department prior to the commencement of works.

21. The minimum lateral clearance from a street tree is 2 metres. If the proposed road opening is less than 2 metres, consent must be obtained from Council's Arborist.

22. In the event of cancellation of this permit, the Council reserves the right to reinstate the area at the expense of the permit-holder.

23. Surplus excavated material must be removed from the road reserve daily and the area left in a clean and tidy condition.

24. All finished surfaces must match and be flush with existing surfaces.

25. Within 7 days of completion of the works, the permit holder must submit a request for final inspection to City Permits unit, e-mail: devpermits@portphillip.vic.gov.au.

26. Any damage to Council assets caused by the permit- holder's reinstatement works must be rectified to the satisfaction of Council's Asset Inspection Officer.

27. Failure to restore the road reserve and repair any damage caused to assets will result in Council undertaking the necessary reinstatement works and deducting the cost from the security bond and the remainder refunded. Where costs exceed the security bond amount held, the permit holder will be liable for the excess and charged accordingly.

28. If works are conducted in contravention of this permit, the City of Port Phillip reserves the right to amend or revoke the above at any time.

Reinstatement of footpaths

Asphalt footpaths
Specification for Asphalt Footpath – Refer to Standard Drawing: SD3103

29. The permanent asphalt layer of footpaths must be constructed in accordance with Council's current Standard Drawing.

30. The Bituminous surface at the edges of the trench must be cut with a circular saw.

31. A temporary bituminous surface of premix (cold-mix) minimum depth 75mm must be constructed before the crossing is opened to traffic, unless the permit-holder is completing a permanent reinstatement immediately with hot-mix asphalt.

32. The full width of the footpath must be reinstated. Where only part of a concrete footpath/vehicle crossing panel has been damaged, reinstatement must include the removal and reinstatement of the whole panel.

Concrete footpaths
Specification for Concrete Footpaths – Refer to Standard Drawing: SD3103

33. The permanent concrete layer of footpaths must be constructed in accordance with Council's current Standard Drawing.

34. Concrete footpath areas affected by works will be reinstated in full sections within the surrounding joints unless directed otherwise by Council's Asset Inspection Officer.

35. Existing surface levels must be maintained and the tops of all service pits/junction boxes must be at the footpath surface level.

Reinstatement of road pavements

36. Where the permit-holder or contractor's road opening is less than 1.0 metre from the lip of a channel, the floating section of pavement must be removed and the final surface reinstatement will be from the furthest edge from opening/trench to the lip of channel.

37. All road pavement surfaces must be cut with a circular saw.

Flexible road pavement (Asphalt)
Specification for Flexible Road Pavements – Refer to Standard Drawing SD3103

Rigid Road Pavement (Concrete)

Temporary reinstatements

38. All temporary road reinstatements must be finished with cold-mix (premix asphalt) flush with the existing surfaces unless permanent hot-mix asphalt reinstatement is being completed immediately following the compaction of the pavement surface.

Nature strips

39. All nature strips must be reinstated. Backfilling of nature strips must be completed with natural soil material compacted in 150mm layers, 90% standard compaction to a level 75mm below surface. The remaining backfill must be uncompacted topsoil to 15mm above the surface level and the surface even and seeded to Council's satisfaction. The area must be kept moist until germination has occurred.

Reinstatement of vehicle crossings
Specification for Vehicle Crossings – Refer to Standard Drawing SD4101

40. The vehicle crossing must be constructed in accordance with Council's current Standard Drawing.

41. Concrete vehicle crossings affected by works must be reinstated in full sections (panels) within the surrounding joints unless otherwise directed by Council's 'Asset Inspection Officer'.

42. When reinstating a section/panel, Y16 dowel bars 400mm lengths must be inserted 200mm into the existing concrete surface and spaced 300mm apart.

Kerb and channel
Specification for Concrete Kerb and Channel – Refer to Standard Drawing SD1101
Specification for Bluestone Kerb and Channel – Refer to Standard Drawing SD1102

43. The kerb and channel must be reinstated to the satisfaction of Council's Asset Inspection Officer.

Bluestone pitchers
Specification for Bluestone Pitchers – Refer to Standard Drawing SD3101

44. The bluestone pitcher kerb and channel, and pavement must be reinstated to the satisfaction of Council's Asset Inspection Officer.

Footnotes:

Permitted Construction Hours
Under Council's Local Law No. 1 (Community Amenity), A *builder* requires a permit to carry out building works on a building site other than between 7.00am to 6.00pm Monday to Friday, and 9.00am to 3.00pm Saturday. No works are permitted on a public holiday as defined by the *Public Holidays Act* 1993.

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Road Opening Request for Final Inspection

Community Amenity Local Law No. 1 Clause 14

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Any security bond refunds will be issued within 20 business days.

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Applicant's Postal Address:			
Telephone Number:		Mobile Number:	
E-mail Address:			
ABN:		ACN:	
Road Opening Details			
Road Opening Permit No:	.... / .... / **RO**		
Reason for Permit (tick appropriate box)			
Start & Completion Date of Works:	From: / /	To: / /	

What part of the Road Reserve are your works in?									
Footpath		Nature Strip		Road or Lane		Car Park		Kerb Channel	
Size of Opening:	**m L x m W = m²**								

Did any of the following assets require relocation as a result of the Road Opening?							
Parking Ticket Machine		Street Furniture		Litter Bin		Other (please state)	
The applicant is responsible for all associated costs as a result of the relocation of any Council assets.							

Our enquiries counter at St Kilda Town Hall
is open from 8.30am to 5.00pm Monday to Friday
T: 9209 6216 F: 9536 2745 E: devpermits@portphillip.vic.gov.au

www.portphillip.vic.gov.au/road_permits.htm

Road Opening Request for Final Inspection

Community Amenity Local Law No. 1 Clause 14

Request for Final Reinstatement

Any excavation or opening must be reinstated to Council requirements as per items (7), (9), (10) and (11) of Port Phillip City Council conditions on which a permit to open or obstruct roadways is issued (attached to Permit). The permanent reinstatement can be undertaken by Council if the applicant is unable to. The applicant at a bare minimum must be reinstated to temporary measures once the permit expires or when the safety precautions are removed.
Any opening within the City of Port Phillip must be back filled with crushed rock, compacted and finished with cold mix as a temporary measure until full reinstatement is completed by the applicant. If the applicant submits this application (Request for Final Inspection) without fully reinstating the surface to the original material being concrete, bluestone or asphalt and to Council requirements, the cost of shall be deducted from the security bond.

How have you reinstated the Road Opening?					
Permanent reinstatement (to original standard)		Temporary reinstatement (less than original standard)			
What material has been used in your reinstatement?					
Crushed and compacted rock (temporary)		Finished with asphalt cold mix (temporary			
Concrete (permanent)		Asphalt hot mix (permanent)		Bluestone (permanent)	
NOTE: If you have reinstated to less than the original quality and material or not to Council standards the reinstatement will be performed by Council's Infrastructure Services and the applicant will be debited or invoiced for the difference. The work will be inspected and final reinstatement (if required) will be undertaken by Council within 28 days on receipt of this form.					

Applicant's Name: .....

Applicant's Signature: ..... **Date:** .....

How to Apply

Submit this application form to: City Permits, City of Port Phillip, Private Bag No. 3, PO St Kilda VIC 3182
Or email a scan to devpermits@portphillip.vic.gov.au or fax to 9536 2745.

Further Information

Contact City Permits on 9209 6216 or devpermits@portphillip.vic.gov.au

Privacy Statement: The personal information requested on this form is being collected by the council for purposes of assessment in accordance with Community Amenity Local Law No. 1, Clause 14. The personal information will be used solely by the council for that primary purpose or directly related purposes. The applicant understands that the personal information provided is for the purpose of considering the application for an Asset Protection Permit and that he or she may apply to the council for access to the information. Requests for access and or correction should be made to Freedom of Information & Privacy Officer Governance & Engagement Department, City of Port Phillip.

Our enquiries counter at St Kilda Town Hall
is open from 8.30am to 5.00pm Monday to Friday
T: 9209 6216 F: 9536 2745 E: devpermits@portphillip.vic.gov.au

www.portphillip.vic.gov.au/road_permits.htm

Enquiries:
Email: devpermits@portphillip.vic.gov.au
Phone: 9209 6216
Mail: Private Bag No. 3, PO ST KILDA VIC 3182

CITY OF PORT PHILLIP
ABN 21 762 977 945

14 October 2015

AECOM
9/8 Exhibition St
MELBOURNE VIC 3000

ROAD OPENING PERMIT
216/2015/RO
Issued Under Community Amenity Local Law No: 1 (Clause 14)

This permit has been approved and issued subject to the following conditions and the permit holder shall be held to have agreed to such conditions and to have accepted any liability or responsibility thereby imposed.

Site of Works: Plummer Street, all of street, PORT MELBOURNE

Description of Works: Bore holes for groundwater sampling.(MW9)

Permit Valid From: 10am 14 October 2015 **To:** 6 November 2015

In addition to complying with any relevant requirements in the Local Law No. 1, Community Amenity the following conditions apply to the activity or use:

Standard Conditions:

1. All works associated with the road opening including the set-up and removal of necessary signs and barriers may be taken **14 October and 6 November 2015** between Monday to Friday **7am to 5pm** and Saturday **9am to 3pm**. Obstructions to traffic flow are not permitted outside of this period including setting up or removal of the infrastructure.

2. To amend the dates of this licence requires a written request to be received by the City Permits by 5pm, while the permit is still valid. Once a permit has expired it cannot be re-used or amended.

3. A maximum of two (2) amendments to re-schedule the dates of this permit can be considered prior to incurring additional fees.

4. An absolute minimum width of 1.5 metres must be maintained for safe pedestrian access. Pedestrian safety must be maintained at all times by the appopriate use of bollards and tape. On both approaches to the works, the following signs must be clearly displayed and in place during the works;

    a) Pedestrian arrow signs
    a) Pedestrians Watch Your Step or,
    b) Pedestrian Use Other Footpath

5. All traffic treatments must be installed in accordance with any Traffic Management Plan submitted to Council and maintained during the works.

6. Signage must be visible and must not obstruct sightlines, designated pedestrian footpaths and crossovers/accesses. If on-street parking spaces are required to be used, only the spaces clearly specified on the

plan can be used for that purpose.

7. Accredited Traffic Control Officers must be present to manage traffic flow during a partial or full road closure. Traffic Control Officers must also assist pedestrians and cyclists as required.

8. If vehicular traffic flow is affected by the works, emergency services, including, Fire Brigade, Ambulance and Police must be notified by the permit-holder a minimum of 24 hours prior the commencement of works.

9. To the satisfaction of, and at no cost to Council, the permit-holder must reinstate all assets and infrastructure.

10. City of Port Phillip does not accept any responsibility for accidents, damage or injury to property, participants or third parties that may arise out of this event. There must be public liability insurance for the type of work proposed with an indemnity of not less than $10M, including full indemnity for the City of Port Phillip Council against any claim laid against it either by members of the public or persons engaged in any activities associated with the traffic diversion who, as a result of the diversion, suffer personal injury, property damage or financial loss.

11. The permit-holder must comply with AS 1742.3 2002. Manual of uniform traffic control devices, Part 3 Traffic Control Devices for lane and Road Closures and the relevant Standards Australia Field Guides Part 1. Short term urban works, daytime/night time SAA HB 81.1 & 4 1996.

12. City of Port Phillip reserves the right to amend or revoke the above at any time.

Prior to commencement

13. In addition to the requirement to obtain a Road Opening Permit, further permits may be required for activities on Council land such as Skip Bin, Road Closure, Street Occupation, or Asset Protection. Consents may also be required from VicRoads, utilities and public transport operators. The permit-holder must ensure all relevant permits and approvals have been obtained prior to commencing any works.

14. The permit-holder must provide a minimum of 2 business day's written notification to the occupants of all affected owners, occupiers and businesses affected by the works. The notification must include the following information and a copy forwarded to the City Permits unit, e-mail: devpermits@portphillip.vic.gov.au and must include:-

    a) The nature of the works being performed
    a) The date and hours of works occurring under this permit
    b) Council's permit reference
    c) Contact name and phone number for the permit holder and/or site manager

15. The permit-holder must contact City Permits unit at least 2 business days prior to commencing works, by e-mail: devpermits@portphillip.vic.gov.au, or ph: 03 9209 6216, to organise an inspection with Council's Asset Inspection Officer to determine:

    - the extent of reinstatement works including road pavement, signage and markings
    - the requirement for further inspections,
    - any requirements for the removal, storage and reinstatement of bluestone assets
    - removal and reinstatement of street furniture, (litter bins, public seating and bicycle hoops)

During construction

16. Works that may cause significant delay to traffic and/or public transport services must be scheduled outside peak periods of 7–9am and 4–6pm weekdays unless otherwise permitted with the written consent of Council.

17. Works must be carried out in accordance with '*Road Management Act 2004 Code of Practice Worksite Safety – Traffic Management'* and any approved Traffic Management Plan.

Work execution

18. Without the written consent of the Council the permit-holder must utilise boring techniques when installing underground services. Any piping or cabling work under an existing vehicle crossing must be carried out by boring, unless approval from Council's Asset Inspection Officer has been obtained.

19. If agricultural drains or irrigation pipes are encountered during excavation the permit-holder must carefully replace the pipes to their original position prior to backfilling.

20. The minimum lateral clearance from a drain is 500mm and a vertical clearance of 300mm. If the proposed road opening or any other work interferes with any underground drains, the approval must be obtained from the Council's Assets department prior to the commencement of works.

21. The minimum lateral clearance from a street tree is 2 metres. If the proposed road opening is less than 2 metres, consent must be obtained from Council's Arborist.

22. In the event of cancellation of this permit, the Council reserves the right to reinstate the area at the expense of the permit-holder.

23. Surplus excavated material must be removed from the road reserve daily and the area left in a clean and tidy condition.

24. All finished surfaces must match and be flush with existing surfaces.

25. Within 7 days of completion of the works, the permit holder must submit a request for final inspection to City Permits unit, e-mail: devpermits@portphillip.vic.gov.au.

26. Any damage to Council assets caused by the permit- holder's reinstatement works must be rectified to the satisfaction of Council's Asset Inspection Officer.

27. Failure to restore the road reserve and repair any damage caused to assets will result in Council undertaking the necessary reinstatement works and deducting the cost from the security bond and the remainder refunded. Where costs exceed the security bond amount held, the permit holder will be liable for the excess and charged accordingly.

28. If works are conducted in contravention of this permit, the City of Port Phillip reserves the right to amend or revoke the above at any time.

Reinstatement of footpaths

Asphalt footpaths
Specification for Asphalt Footpath – Refer to Standard Drawing: SD3103

29. The permanent asphalt layer of footpaths must be constructed in accordance with Council's current Standard Drawing.

30. The Bituminous surface at the edges of the trench must be cut with a circular saw.

31. A temporary bituminous surface of premix (cold-mix) minimum depth 75mm must be constructed before the crossing is opened to traffic, unless the permit-holder is completing a permanent reinstatement immediately with hot-mix asphalt.

32. The full width of the footpath must be reinstated. Where only part of a concrete footpath/vehicle crossing panel has been damaged, reinstatement must include the removal and reinstatement of the whole panel.

Concrete footpaths
Specification for Concrete Footpaths – Refer to Standard Drawing: SD3103

33. The permanent concrete layer of footpaths must be constructed in accordance with Council's current Standard Drawing.

34. Concrete footpath areas affected by works will be reinstated in full sections within the surrounding joints unless directed otherwise by Council's Asset Inspection Officer.

35. Existing surface levels must be maintained and the tops of all service pits/junction boxes must be at the footpath surface level.

Reinstatement of road pavements

36. Where the permit-holder or contractor's road opening is less than 1.0 metre from the lip of a channel, the floating section of pavement must be removed and the final surface reinstatement will be from the furthest edge from opening/trench to the lip of channel.

37. All road pavement surfaces must be cut with a circular saw.

Flexible road pavement (Asphalt)
Specification for Flexible Road Pavements – Refer to Standard Drawing SD3103

Rigid Road Pavement (Concrete)

Temporary reinstatements

38. All temporary road reinstatements must be finished with cold-mix (premix asphalt) flush with the existing surfaces unless permanent hot-mix asphalt reinstatement is being completed immediately following the compaction of the pavement surface.

Nature strips

39. All nature strips must be reinstated. Backfilling of nature strips must be completed with natural soil material compacted in 150mm layers, 90% standard compaction to a level 75mm below surface. The remaining backfill must be uncompacted topsoil to 15mm above the surface level and the surface even and seeded to Council's satisfaction. The area must be kept moist until germination has occurred.

Reinstatement of vehicle crossings
Specification for Vehicle Crossings – Refer to Standard Drawing SD4101

40. The vehicle crossing must be constructed in accordance with Council's current Standard Drawing.

41. Concrete vehicle crossings affected by works must be reinstated in full sections (panels) within the surrounding joints unless otherwise directed by Council's 'Asset Inspection Officer'.

42. When reinstating a section/panel, Y16 dowel bars 400mm lengths must be inserted 200mm into the existing concrete surface and spaced 300mm apart.

Kerb and channel
Specification for Concrete Kerb and Channel – Refer to Standard Drawing SD1101
Specification for Bluestone Kerb and Channel – Refer to Standard Drawing SD1102

43. The kerb and channel must be reinstated to the satisfaction of Council's Asset Inspection Officer.

Bluestone pitchers
Specification for Bluestone Pitchers – Refer to Standard Drawing SD3101

44. The bluestone pitcher kerb and channel, and pavement must be reinstated to the satisfaction of Council's Asset Inspection Officer.

Footnotes:

Permitted Construction Hours
Under Council's Local Law No. 1 (Community Amenity), A *builder* requires a permit to carry out building works on a building site other than between 7.00am to 6.00pm Monday to Friday, and 9.00am to 3.00pm Saturday. No works are permitted on a public holiday as defined by the *Public Holidays Act* 1993.

Dial Before You Dig
Neglecting to dial 1100 before excavating can lead to costly disruption to essential services. Dial Before You Dig is a free referral service for information on locating underground utilities.
Ph: 1100
Web: www.1100.com.au

Standard Construction Drawings
http://www.portphillip.vic.gov.au/road_opening_permit.htm

City of Port Phillip Permits Index
http://www.portphillip.vic.gov.au/permits_licenses_index.htm

Contacts / Links

Asset Inspection Officer
Ph: 9209 6590
Fx: 9536 2710
Email: helpassetinspection@portphillip.vic.gov.au

City Permits
Ph: 9209 6216
Fx: 9536 2745
Email: devpermits@portphillip.vic.gov.au

Road Opening Request for Final Inspection

Community Amenity Local Law No. 1 Clause 14

This form must be completed within 48 hours of completion of works.
Any security bond refunds will be issued within 20 business days.

Applicant Details			
Site Address:			
Applicant/Business Name:			
Applicant's Postal Address:			
Telephone Number:		Mobile Number:	
E-mail Address:			
ABN:		ACN:	
Road Opening Details			
Road Opening Permit No:	.... / .... / **RO**		
Reason for Permit (tick appropriate box)			
Start & Completion Date of Works:	From: / /	To: / /	

What part of the Road Reserve are your works in?									
Footpath		Nature Strip		Road or Lane		Car Park		Kerb Channel	
Size of Opening:	**m L x m W = m²**								

Did any of the following assets require relocation as a result of the Road Opening?							
Parking Ticket Machine		Street Furniture		Litter Bin		Other (please state)	
The applicant is responsible for all associated costs as a result of the relocation of any Council assets.							

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Road Opening Request for Final Inspection

Community Amenity Local Law No. 1 Clause 14

Request for Final Reinstatement

Any excavation or opening must be reinstated to Council requirements as per items (7), (9), (10) and (11) of Port Phillip City Council conditions on which a permit to open or obstruct roadways is issued (attached to Permit). The permanent reinstatement can be undertaken by Council if the applicant is unable to. The applicant at a bare minimum must be reinstated to temporary measures once the permit expires or when the safety precautions are removed.
Any opening within the City of Port Phillip must be back filled with crushed rock, compacted and finished with cold mix as a temporary measure until full reinstatement is completed by the applicant. If the applicant submits this application (Request for Final Inspection) without fully reinstating the surface to the original material being concrete, bluestone or asphalt and to Council requirements, the cost of shall be deducted from the security bond.

How have you reinstated the Road Opening?					
Permanent reinstatement (to original standard)		Temporary reinstatement (less than original standard)			
What material has been used in your reinstatement?					
Crushed and compacted rock (temporary)		Finished with asphalt cold mix (temporary			
Concrete (permanent)		Asphalt hot mix (permanent)		Bluestone (permanent)	
NOTE: If you have reinstated to less than the original quality and material or not to Council standards the reinstatement will be performed by Council's Infrastructure Services and the applicant will be debited or invoiced for the difference. The work will be inspected and final reinstatement (if required) will be undertaken by Council within 28 days on receipt of this form.					

Applicant's Name: .....

Applicant's Signature: ..... **Date:** .....

How to Apply

Submit this application form to: City Permits, City of Port Phillip, Private Bag No. 3, PO St Kilda VIC 3182
Or email a scan to devpermits@portphillip.vic.gov.au or fax to 9536 2745.

Further Information

Contact City Permits on 9209 6216 or devpermits@portphillip.vic.gov.au

Privacy Statement: The personal information requested on this form is being collected by the council for purposes of assessment in accordance with Community Amenity Local Law No. 1, Clause 14. The personal information will be used solely by the council for that primary purpose or directly related purposes. The applicant understands that the personal information provided is for the purpose of considering the application for an Asset Protection Permit and that he or she may apply to the council for access to the information. Requests for access and or correction should be made to Freedom of Information & Privacy Officer Governance & Engagement Department, City of Port Phillip.

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www.portphillip.vic.gov.au/road_permits.htm

Enquiries:
Email: devpermits@portphillip.vic.gov.au
Phone: 9209 6216
Mail: Private Bag No. 3, PO ST KILDA VIC 3182

CITY OF PORT PHILLIP
ABN 21 762 977 945

14 October 2015

AECOM
9/8 Exhibition St
MELBOURNE VIC 3000

ROAD OPENING PERMIT
217/2015/RO
Issued Under Community Amenity Local Law No: 1 (Clause 14)

This permit has been approved and issued subject to the following conditions and the permit holder shall be held to have agreed to such conditions and to have accepted any liability or responsibility thereby imposed.

Site of Works: Plummer Street, all of street, PORT MELBOURNE VIC 3207, Graham Street, all of Port Melbourne section, PORT MELBOURNE

Description of Works: Bore holes for groundwater sampling.(MW10)

Permit Valid From: 10am 14 October 2015 **To:** 6 November 2015

In addition to complying with any relevant requirements in the Local Law No. 1, Community Amenity the following conditions apply to the activity or use:

Standard Conditions:

1. All works associated with the road opening including the set-up and removal of necessary signs and barriers may be taken **14 October and 6 November 2015** between Monday to Friday **7am to 5pm** and Saturday **9am to 3pm**. Obstructions to traffic flow are not permitted outside of this period including setting up or removal of the infrastructure.

2. To amend the dates of this licence requires a written request to be received by the City Permits by 5pm, while the permit is still valid. Once a permit has expired it cannot be re-used or amended.

3. A maximum of two (2) amendments to re-schedule the dates of this permit can be considered prior to incurring additional fees.

4. An absolute minimum width of 1.5 metres must be maintained for safe pedestrian access. Pedestrian safety must be maintained at all times by the appopriate use of bollards and tape. On both approaches to the works, the following signs must be clearly displayed and in place during the works;

    a) Pedestrian arrow signs
    a) Pedestrians Watch Your Step or,
    b) Pedestrian Use Other Footpath

5. All traffic treatments must be installed in accordance with any Traffic Management Plan submitted to Council and maintained during the works.

6. Signage must be visible and must not obstruct sightlines, designated pedestrian footpaths and crossovers/accesses. If on-street parking spaces are required to be used, only the spaces clearly specified on the

plan can be used for that purpose.

7. Accredited Traffic Control Officers must be present to manage traffic flow during a partial or full road closure. Traffic Control Officers must also assist pedestrians and cyclists as required.

8. If vehicular traffic flow is affected by the works, emergency services, including, Fire Brigade, Ambulance and Police must be notified by the permit-holder a minimum of 24 hours prior the commencement of works.

9. To the satisfaction of, and at no cost to Council, the permit-holder must reinstate all assets and infrastructure.

10. City of Port Phillip does not accept any responsibility for accidents, damage or injury to property, participants or third parties that may arise out of this event. There must be public liability insurance for the type of work proposed with an indemnity of not less than $10M, including full indemnity for the City of Port Phillip Council against any claim laid against it either by members of the public or persons engaged in any activities associated with the traffic diversion who, as a result of the diversion, suffer personal injury, property damage or financial loss.

11. The permit-holder must comply with AS 1742.3 2002. Manual of uniform traffic control devices, Part 3 Traffic Control Devices for lane and Road Closures and the relevant Standards Australia Field Guides Part 1. Short term urban works, daytime/night time SAA HB 81.1 & 4 1996.

12. City of Port Phillip reserves the right to amend or revoke the above at any time.

Prior to commencement

13. In addition to the requirement to obtain a Road Opening Permit, further permits may be required for activities on Council land such as Skip Bin, Road Closure, Street Occupation, or Asset Protection. Consents may also be required from VicRoads, utilities and public transport operators. The permit-holder must ensure all relevant permits and approvals have been obtained prior to commencing any works.

14. The permit-holder must provide a minimum of 2 business day's written notification to the occupants of all affected owners, occupiers and businesses affected by the works. The notification must include the following information and a copy forwarded to the City Permits unit, e-mail: devpermits@portphillip.vic.gov.au and must include:-

    a) The nature of the works being performed
    a) The date and hours of works occurring under this permit
    b) Council's permit reference
    c) Contact name and phone number for the permit holder and/or site manager

15. The permit-holder must contact City Permits unit at least 2 business days prior to commencing works, by e-mail: devpermits@portphillip.vic.gov.au, or ph: 03 9209 6216, to organise an inspection with Council's Asset Inspection Officer to determine:

    - the extent of reinstatement works including road pavement, signage and markings
    - the requirement for further inspections,
    - any requirements for the removal, storage and reinstatement of bluestone assets
    - removal and reinstatement of street furniture, (litter bins, public seating and bicycle hoops)

During construction

16. Works that may cause significant delay to traffic and/or public transport services must be scheduled outside peak periods of 7–9am and 4–6pm weekdays unless otherwise permitted with the written consent of Council.

17. Works must be carried out in accordance with '*Road Management Act 2004 Code of Practice Worksite Safety – Traffic Management'* and any approved Traffic Management Plan.

Work execution

18. Without the written consent of the Council the permit-holder must utilise boring techniques when installing underground services. Any piping or cabling work under an existing vehicle crossing must be carried out by boring, unless approval from Council's Asset Inspection Officer has been obtained.

19. If agricultural drains or irrigation pipes are encountered during excavation the permit-holder must carefully replace the pipes to their original position prior to backfilling.

20. The minimum lateral clearance from a drain is 500mm and a vertical clearance of 300mm. If the proposed road opening or any other work interferes with any underground drains, the approval must be obtained from the Council's Assets department prior to the commencement of works.

21. The minimum lateral clearance from a street tree is 2 metres. If the proposed road opening is less than 2 metres, consent must be obtained from Council's Arborist.

22. In the event of cancellation of this permit, the Council reserves the right to reinstate the area at the expense of the permit-holder.

23. Surplus excavated material must be removed from the road reserve daily and the area left in a clean and tidy condition.

24. All finished surfaces must match and be flush with existing surfaces.

25. Within 7 days of completion of the works, the permit holder must submit a request for final inspection to City Permits unit, e-mail: devpermits@portphillip.vic.gov.au.

26. Any damage to Council assets caused by the permit- holder's reinstatement works must be rectified to the satisfaction of Council's Asset Inspection Officer.

27. Failure to restore the road reserve and repair any damage caused to assets will result in Council undertaking the necessary reinstatement works and deducting the cost from the security bond and the remainder refunded. Where costs exceed the security bond amount held, the permit holder will be liable for the excess and charged accordingly.

28. If works are conducted in contravention of this permit, the City of Port Phillip reserves the right to amend or revoke the above at any time.

Reinstatement of footpaths

Asphalt footpaths
Specification for Asphalt Footpath – Refer to Standard Drawing: SD3103

29. The permanent asphalt layer of footpaths must be constructed in accordance with Council's current Standard Drawing.

30. The Bituminous surface at the edges of the trench must be cut with a circular saw.

31. A temporary bituminous surface of premix (cold-mix) minimum depth 75mm must be constructed before the crossing is opened to traffic, unless the permit-holder is completing a permanent reinstatement immediately with hot-mix asphalt.

32. The full width of the footpath must be reinstated. Where only part of a concrete footpath/vehicle crossing panel has been damaged, reinstatement must include the removal and reinstatement of the whole panel.

Concrete footpaths
Specification for Concrete Footpaths – Refer to Standard Drawing: SD3103

33. The permanent concrete layer of footpaths must be constructed in accordance with Council's current Standard Drawing.

34. Concrete footpath areas affected by works will be reinstated in full sections within the surrounding joints unless directed otherwise by Council's Asset Inspection Officer.

35. Existing surface levels must be maintained and the tops of all service pits/junction boxes must be at the footpath surface level.

Reinstatement of road pavements

36. Where the permit-holder or contractor's road opening is less than 1.0 metre from the lip of a channel, the floating section of pavement must be removed and the final surface reinstatement will be from the furthest edge from opening/trench to the lip of channel.

37. All road pavement surfaces must be cut with a circular saw.

Flexible road pavement (Asphalt)
Specification for Flexible Road Pavements – Refer to Standard Drawing SD3103

Rigid Road Pavement (Concrete)

Temporary reinstatements

38. All temporary road reinstatements must be finished with cold-mix (premix asphalt) flush with the existing surfaces unless permanent hot-mix asphalt reinstatement is being completed immediately following the compaction of the pavement surface.

Nature strips

39. All nature strips must be reinstated. Backfilling of nature strips must be completed with natural soil material compacted in 150mm layers, 90% standard compaction to a level 75mm below surface. The remaining backfill must be uncompacted topsoil to 15mm above the surface level and the surface even and seeded to Council's satisfaction. The area must be kept moist until germination has occurred.

Reinstatement of vehicle crossings
Specification for Vehicle Crossings – Refer to Standard Drawing SD4101

40. The vehicle crossing must be constructed in accordance with Council's current Standard Drawing.

41. Concrete vehicle crossings affected by works must be reinstated in full sections (panels) within the surrounding joints unless otherwise directed by Council's 'Asset Inspection Officer'.

42. When reinstating a section/panel, Y16 dowel bars 400mm lengths must be inserted 200mm into the existing concrete surface and spaced 300mm apart.

Kerb and channel
Specification for Concrete Kerb and Channel – Refer to Standard Drawing SD1101
Specification for Bluestone Kerb and Channel – Refer to Standard Drawing SD1102

43. The kerb and channel must be reinstated to the satisfaction of Council's Asset Inspection Officer.

Bluestone pitchers
Specification for Bluestone Pitchers – Refer to Standard Drawing SD3101

44. The bluestone pitcher kerb and channel, and pavement must be reinstated to the satisfaction of Council's Asset Inspection Officer.

Footnotes:

Permitted Construction Hours
Under Council's Local Law No. 1 (Community Amenity), A *builder* requires a permit to carry out building works on a building site other than between 7.00am to 6.00pm Monday to Friday, and 9.00am to 3.00pm Saturday. No works are permitted on a public holiday as defined by the *Public Holidays Act* 1993.

Dial Before You Dig
Neglecting to dial 1100 before excavating can lead to costly disruption to essential services. Dial Before You Dig is a free referral service for information on locating underground utilities.
Ph: 1100
Web: www.1100.com.au

Standard Construction Drawings
http://www.portphillip.vic.gov.au/road_opening_permit.htm

City of Port Phillip Permits Index
http://www.portphillip.vic.gov.au/permits_licenses_index.htm

Contacts / Links

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Ph: 9209 6590
Fx: 9536 2710
Email: helpassetinspection@portphillip.vic.gov.au

City Permits
Ph: 9209 6216
Fx: 9536 2745
Email: devpermits@portphillip.vic.gov.au

Road Opening Request for Final Inspection

Community Amenity Local Law No. 1 Clause 14

This form must be completed within 48 hours of completion of works.
Any security bond refunds will be issued within 20 business days.

Applicant Details			
Site Address:			
Applicant/Business Name:			
Applicant's Postal Address:			
Telephone Number:		Mobile Number:	
E-mail Address:			
ABN:		ACN:	
Road Opening Details			
Road Opening Permit No:	.... / .... / **RO**		
Reason for Permit (tick appropriate box)			
Start & Completion Date of Works:	From: / /	To: / /	

What part of the Road Reserve are your works in?									
Footpath		Nature Strip		Road or Lane		Car Park		Kerb Channel	
Size of Opening:	**m L x m W = m²**								

Did any of the following assets require relocation as a result of the Road Opening?							
Parking Ticket Machine		Street Furniture		Litter Bin		Other (please state)	
The applicant is responsible for all associated costs as a result of the relocation of any Council assets.							

Our enquiries counter at St Kilda Town Hall
is open from 8.30am to 5.00pm Monday to Friday
T: 9209 6216 F: 9536 2745 E: devpermits@portphillip.vic.gov.au

www.portphillip.vic.gov.au/road_permits.htm

Road Opening Request for Final Inspection

Community Amenity Local Law No. 1 Clause 14

Request for Final Reinstatement

Any excavation or opening must be reinstated to Council requirements as per items (7), (9), (10) and (11) of Port Phillip City Council conditions on which a permit to open or obstruct roadways is issued (attached to Permit). The permanent reinstatement can be undertaken by Council if the applicant is unable to. The applicant at a bare minimum must be reinstated to temporary measures once the permit expires or when the safety precautions are removed.
Any opening within the City of Port Phillip must be back filled with crushed rock, compacted and finished with cold mix as a temporary measure until full reinstatement is completed by the applicant. If the applicant submits this application (Request for Final Inspection) without fully reinstating the surface to the original material being concrete, bluestone or asphalt and to Council requirements, the cost of shall be deducted from the security bond.

How have you reinstated the Road Opening?					
Permanent reinstatement (to original standard)		Temporary reinstatement (less than original standard)			
What material has been used in your reinstatement?					
Crushed and compacted rock (temporary)		Finished with asphalt cold mix (temporary			
Concrete (permanent)		Asphalt hot mix (permanent)		Bluestone (permanent)	
NOTE: If you have reinstated to less than the original quality and material or not to Council standards the reinstatement will be performed by Council's Infrastructure Services and the applicant will be debited or invoiced for the difference. The work will be inspected and final reinstatement (if required) will be undertaken by Council within 28 days on receipt of this form.					

Applicant's Name: .....

Applicant's Signature: ..... **Date:** .....

How to Apply

Submit this application form to: City Permits, City of Port Phillip, Private Bag No. 3, PO St Kilda VIC 3182
Or email a scan to devpermits@portphillip.vic.gov.au or fax to 9536 2745.

Further Information

Contact City Permits on 9209 6216 or devpermits@portphillip.vic.gov.au

Privacy Statement: The personal information requested on this form is being collected by the council for purposes of assessment in accordance with Community Amenity Local Law No. 1, Clause 14. The personal information will be used solely by the council for that primary purpose or directly related purposes. The applicant understands that the personal information provided is for the purpose of considering the application for an Asset Protection Permit and that he or she may apply to the council for access to the information. Requests for access and or correction should be made to Freedom of Information & Privacy Officer Governance & Engagement Department, City of Port Phillip.

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Mail: Private Bag No. 3, PO ST KILDA VIC 3182

CITY OF PORT PHILLIP
ABN 21 762 977 945

14 October 2015

AECOM
9/8 Exhibition St
MELBOURNE VIC 3000

ROAD OPENING PERMIT
214/2015/RO
Issued Under Community Amenity Local Law No: 1 (Clause 14)

This permit has been approved and issued subject to the following conditions and the permit holder shall be held to have agreed to such conditions and to have accepted any liability or responsibility thereby imposed.

Site of Works: Williamstown Road, all of street, PORT MELBOURNE

Description of Works: Bore holes for groundwater sampling.(MW12)

Permit Valid From: 10am 14 October 2015 **To:** 6 November 2015

In addition to complying with any relevant requirements in the Local Law No. 1, Community Amenity the following conditions apply to the activity or use:

Standard Conditions:

1. All works associated with the road opening including the set-up and removal of necessary signs and barriers may be taken **14 October and 6 November 2015** between Monday to Friday **7am to 5pm** and Saturday **9am to 3pm**. Obstructions to traffic flow are not permitted outside of this period including setting up or removal of the infrastructure.

2. To amend the dates of this licence requires a written request to be received by the City Permits by 5pm, while the permit is still valid. Once a permit has expired it cannot be re-used or amended.

3. A maximum of two (2) amendments to re-schedule the dates of this permit can be considered prior to incurring additional fees.

4. An absolute minimum width of 1.5 metres must be maintained for safe pedestrian access. Pedestrian safety must be maintained at all times by the appopriate use of bollards and tape. On both approaches to the works, the following signs must be clearly displayed and in place during the works;

    a) Pedestrian arrow signs
    a) Pedestrians Watch Your Step or,
    b) Pedestrian Use Other Footpath

5. All traffic treatments must be installed in accordance with any Traffic Management Plan submitted to Council and maintained during the works.

6. Signage must be visible and must not obstruct sightlines, designated pedestrian footpaths and crossovers/accesses. If on-street parking spaces are required to be used, only the spaces clearly specified on the

plan can be used for that purpose.

7. Accredited Traffic Control Officers must be present to manage traffic flow during a partial or full road closure. Traffic Control Officers must also assist pedestrians and cyclists as required.

8. If vehicular traffic flow is affected by the works, emergency services, including, Fire Brigade, Ambulance and Police must be notified by the permit-holder a minimum of 24 hours prior the commencement of works.

9. To the satisfaction of, and at no cost to Council, the permit-holder must reinstate all assets and infrastructure.

10. City of Port Phillip does not accept any responsibility for accidents, damage or injury to property, participants or third parties that may arise out of this event. There must be public liability insurance for the type of work proposed with an indemnity of not less than $10M, including full indemnity for the City of Port Phillip Council against any claim laid against it either by members of the public or persons engaged in any activities associated with the traffic diversion who, as a result of the diversion, suffer personal injury, property damage or financial loss.

11. The permit-holder must comply with AS 1742.3 2002. Manual of uniform traffic control devices, Part 3 Traffic Control Devices for lane and Road Closures and the relevant Standards Australia Field Guides Part 1. Short term urban works, daytime/night time SAA HB 81.1 & 4 1996.

12. City of Port Phillip reserves the right to amend or revoke the above at any time.

Prior to commencement

13. In addition to the requirement to obtain a Road Opening Permit, further permits may be required for activities on Council land such as Skip Bin, Road Closure, Street Occupation, or Asset Protection. Consents may also be required from VicRoads, utilities and public transport operators. The permit-holder must ensure all relevant permits and approvals have been obtained prior to commencing any works.

14. The permit-holder must provide a minimum of 2 business day's written notification to the occupants of all affected owners, occupiers and businesses affected by the works. The notification must include the following information and a copy forwarded to the City Permits unit, e-mail: devpermits@portphillip.vic.gov.au and must include:-

    a) The nature of the works being performed
    a) The date and hours of works occurring under this permit
    b) Council's permit reference
    c) Contact name and phone number for the permit holder and/or site manager

15. The permit-holder must contact City Permits unit at least 2 business days prior to commencing works, by e-mail: devpermits@portphillip.vic.gov.au, or ph: 03 9209 6216, to organise an inspection with Council's Asset Inspection Officer to determine:

    - the extent of reinstatement works including road pavement, signage and markings
    - the requirement for further inspections,
    - any requirements for the removal, storage and reinstatement of bluestone assets
    - removal and reinstatement of street furniture, (litter bins, public seating and bicycle hoops)

During construction

16. Works that may cause significant delay to traffic and/or public transport services must be scheduled outside peak periods of 7–9am and 4–6pm weekdays unless otherwise permitted with the written consent of Council.

17. Works must be carried out in accordance with '*Road Management Act 2004 Code of Practice Worksite Safety – Traffic Management'* and any approved Traffic Management Plan.

Work execution

18. Without the written consent of the Council the permit-holder must utilise boring techniques when installing underground services. Any piping or cabling work under an existing vehicle crossing must be carried out by boring, unless approval from Council's Asset Inspection Officer has been obtained.

19. If agricultural drains or irrigation pipes are encountered during excavation the permit-holder must carefully replace the pipes to their original position prior to backfilling.

20. The minimum lateral clearance from a drain is 500mm and a vertical clearance of 300mm. If the proposed road opening or any other work interferes with any underground drains, the approval must be obtained from the Council's Assets department prior to the commencement of works.

21. The minimum lateral clearance from a street tree is 2 metres. If the proposed road opening is less than 2 metres, consent must be obtained from Council's Arborist.

22. In the event of cancellation of this permit, the Council reserves the right to reinstate the area at the expense of the permit-holder.

23. Surplus excavated material must be removed from the road reserve daily and the area left in a clean and tidy condition.

24. All finished surfaces must match and be flush with existing surfaces.

25. Within 7 days of completion of the works, the permit holder must submit a request for final inspection to City Permits unit, e-mail: devpermits@portphillip.vic.gov.au.

26. Any damage to Council assets caused by the permit- holder's reinstatement works must be rectified to the satisfaction of Council's Asset Inspection Officer.

27. Failure to restore the road reserve and repair any damage caused to assets will result in Council undertaking the necessary reinstatement works and deducting the cost from the security bond and the remainder refunded. Where costs exceed the security bond amount held, the permit holder will be liable for the excess and charged accordingly.

28. If works are conducted in contravention of this permit, the City of Port Phillip reserves the right to amend or revoke the above at any time.

Reinstatement of footpaths

Asphalt footpaths
Specification for Asphalt Footpath – Refer to Standard Drawing: SD3103

29. The permanent asphalt layer of footpaths must be constructed in accordance with Council's current Standard Drawing.

30. The Bituminous surface at the edges of the trench must be cut with a circular saw.

31. A temporary bituminous surface of premix (cold-mix) minimum depth 75mm must be constructed before the crossing is opened to traffic, unless the permit-holder is completing a permanent reinstatement immediately with hot-mix asphalt.

32. The full width of the footpath must be reinstated. Where only part of a concrete footpath/vehicle crossing panel has been damaged, reinstatement must include the removal and reinstatement of the whole panel.

Concrete footpaths
Specification for Concrete Footpaths – Refer to Standard Drawing: SD3103

33. The permanent concrete layer of footpaths must be constructed in accordance with Council's current Standard Drawing.

34. Concrete footpath areas affected by works will be reinstated in full sections within the surrounding joints unless directed otherwise by Council's Asset Inspection Officer.

35. Existing surface levels must be maintained and the tops of all service pits/junction boxes must be at the footpath surface level.

Reinstatement of road pavements

36. Where the permit-holder or contractor's road opening is less than 1.0 metre from the lip of a channel, the floating section of pavement must be removed and the final surface reinstatement will be from the furthest edge from opening/trench to the lip of channel.

37. All road pavement surfaces must be cut with a circular saw.

Flexible road pavement (Asphalt)
Specification for Flexible Road Pavements – Refer to Standard Drawing SD3103

Rigid Road Pavement (Concrete)

Temporary reinstatements

38. All temporary road reinstatements must be finished with cold-mix (premix asphalt) flush with the existing surfaces unless permanent hot-mix asphalt reinstatement is being completed immediately following the compaction of the pavement surface.

Nature strips

39. All nature strips must be reinstated. Backfilling of nature strips must be completed with natural soil material compacted in 150mm layers, 90% standard compaction to a level 75mm below surface. The remaining backfill must be uncompacted topsoil to 15mm above the surface level and the surface even and seeded to Council's satisfaction. The area must be kept moist until germination has occurred.

Reinstatement of vehicle crossings
Specification for Vehicle Crossings – Refer to Standard Drawing SD4101

40. The vehicle crossing must be constructed in accordance with Council's current Standard Drawing.

41. Concrete vehicle crossings affected by works must be reinstated in full sections (panels) within the surrounding joints unless otherwise directed by Council's 'Asset Inspection Officer'.

42. When reinstating a section/panel, Y16 dowel bars 400mm lengths must be inserted 200mm into the existing concrete surface and spaced 300mm apart.

Kerb and channel
Specification for Concrete Kerb and Channel – Refer to Standard Drawing SD1101
Specification for Bluestone Kerb and Channel – Refer to Standard Drawing SD1102

43. The kerb and channel must be reinstated to the satisfaction of Council's Asset Inspection Officer.

Bluestone pitchers
Specification for Bluestone Pitchers – Refer to Standard Drawing SD3101

44. The bluestone pitcher kerb and channel, and pavement must be reinstated to the satisfaction of Council's Asset Inspection Officer.

Footnotes:

Permitted Construction Hours
Under Council's Local Law No. 1 (Community Amenity), A *builder* requires a permit to carry out building works on a building site other than between 7.00am to 6.00pm Monday to Friday, and 9.00am to 3.00pm Saturday. No works are permitted on a public holiday as defined by the *Public Holidays Act* 1993.

Dial Before You Dig
Neglecting to dial 1100 before excavating can lead to costly disruption to essential services. Dial Before You Dig is a free referral service for information on locating underground utilities.
Ph: 1100
Web: www.1100.com.au

Standard Construction Drawings
http://www.portphillip.vic.gov.au/road_opening_permit.htm

City of Port Phillip Permits Index
http://www.portphillip.vic.gov.au/permits_licenses_index.htm

Contacts / Links

Asset Inspection Officer
Ph: 9209 6590
Fx: 9536 2710
Email: helpassetinspection@portphillip.vic.gov.au

City Permits
Ph: 9209 6216
Fx: 9536 2745
Email: devpermits@portphillip.vic.gov.au

Road Opening Request for Final Inspection

Community Amenity Local Law No. 1 Clause 14

This form must be completed within 48 hours of completion of works.
Any security bond refunds will be issued within 20 business days.

Applicant Details			
Site Address:			
Applicant/Business Name:			
Applicant's Postal Address:			
Telephone Number:		Mobile Number:	
E-mail Address:			
ABN:		ACN:	
Road Opening Details			
Road Opening Permit No:	.... / .... / **RO**		
Reason for Permit (tick appropriate box)			
Start & Completion Date of Works:	From: / /	To: / /	

What part of the Road Reserve are your works in?									
Footpath		Nature Strip		Road or Lane		Car Park		Kerb Channel	
Size of Opening:	**m L x m W = m²**								

Did any of the following assets require relocation as a result of the Road Opening?							
Parking Ticket Machine		Street Furniture		Litter Bin		Other (please state)	
The applicant is responsible for all associated costs as a result of the relocation of any Council assets.							

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Request for Final Reinstatement

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Any opening within the City of Port Phillip must be back filled with crushed rock, compacted and finished with cold mix as a temporary measure until full reinstatement is completed by the applicant. If the applicant submits this application (Request for Final Inspection) without fully reinstating the surface to the original material being concrete, bluestone or asphalt and to Council requirements, the cost of shall be deducted from the security bond.

How have you reinstated the Road Opening?					
Permanent reinstatement (to original standard)		Temporary reinstatement (less than original standard)			
What material has been used in your reinstatement?					
Crushed and compacted rock (temporary)		Finished with asphalt cold mix (temporary			
Concrete (permanent)		Asphalt hot mix (permanent)		Bluestone (permanent)	
NOTE: If you have reinstated to less than the original quality and material or not to Council standards the reinstatement will be performed by Council's Infrastructure Services and the applicant will be debited or invoiced for the difference. The work will be inspected and final reinstatement (if required) will be undertaken by Council within 28 days on receipt of this form.					

Applicant's Name: .....

Applicant's Signature: ..... **Date:** .....

How to Apply

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www.portphillip.vic.gov.au/road_permits.htm

CONSENT FOR WORKS

Road Management Act 2004
Road Management (Works and Infrastructure) Regulations 2005

CITY OF MELBOURNE

GPO Box 1603
Melbourne VIC 3001
ABN 55 370 219 287
Hotline (03) 9658 9658
Facsimile (03) 9654 4854
DX210487
ABN 55 370 219 287

Construction Management Group
3rd Floor 240 Little Collins Street
Melbourne Vic 3000

Telephone: 03 9658 9658
After Hours: 03 9658 9774

Consent Number: CW-2015-5821

Attention:
Consent is given for the proposed works subject to the attached general and specific conditions.

Council conditions must be adhered to prior to and/or during proposed works. Failure to comply with Council conditions and requirements of the Road Management Act 2004 will result in this consent being revoked.

Any alterations to this consent will make it null and void.

Property Address:	Lorimer Street, PORT MELBOURNE
Location (if different from property address)	
Applicant:	Aecom Australia Pty Ltd
Address of Applicant:	Level 9, 8 Exhibition St, MELBOURNE VIC 3000
Contact Details:	Averyll - 0499 252 502
Description of Work:	Consent for works issued at 6 locations to assist with drilling & installation of groud water monitoring wells at the subject sites as per sr3102064 # 9450653. sr3118375 Date: 5/10/2015 to 26/10/2015 (Monday to Friday 7.30am to 5.30pm) (Saturday 8am to 3pm) Council ESG Reference: SR 3102064 #9450653 Full traffic management is required to direct pedestrians to a safe route of passage. The site is to be signed and managed in accordance with AS 1742.3 and Vic Roads Worksite Code of Practice. It is the responsibility of the applicant to ensure that all Council assets are reinstated in accordance with Councils current standards and specifications. No-one is to be denied vehicular or pedestrian access to their property. It is the responsibility of the applicant to apply for and obtain TSA reserved parking permits should the occupation of parking bays be required.

Date(s) permitted:

From: 5 Oct 2015 **To:** 26 Oct 2015

Fees/Charges:
The following fees/charges apply to this consent:

Consent for Works Fee	$913.80

Signature of Delegated Officer:  Date: 9 Oct 2015

Mal Smith

NOTE: This consent must be kept on site and produced when required by Council's officers or Victoria Police and is subject to conditions specified being adhered to.

The holder of the consent must comply with the following conditions:

1. The consent holder ("Applicant") is responsible for ensuring the works are carried out in a safe manner, in compliance with these conditions and in accordance with the City of Melbourne Activities Local Law 2009.
2. The consent is not transferable. It must be held on site by the person in charge of the work and be produced on request by an authorised officer or a member of the Victoria Police Force. The consent holder must comply promptly with any notices and instructions.
3. Any variation required to a consent must be submitted to the Council or delegate for endorsement. Change/variation of work must not commence prior to relevant approval being granted in writing by the Council or delegate.
4. Vehicles must not cross any footpath to gain access to the site of the work or project unless vehicular crossing (either temporary or permanent) has been constructed to the approval of the Council or delegate or authorised officer.
5. Every stormwater channel adjacent to the site of work or project will be kept clear of obstruction at all times.
6. Rubbish or building materials must not be left in or on any road or public place.
7. Building materials spilt on to the roadway or the footpath must be removed immediately. Equipment used for transporting or handling building materials must not be washed in or on any road or public place or into any drain. Hoses must not be used for these purposes in or on a road or footpath.
8. Barricades must consist, unless alternative arrangements are approved, of minimum 1 metre height timber or steel rails on stable supporting posts at maximum 4.8 metre centres, continuous around the entire working area. Warning signage must be erected at each end of the barricaded area with the appropriate standard 'Detour', 'Road Closed', arrow etc.
9. Appropriate warning signage and lighting must be erected in accordance with AS1742.3.
10. Any occupation of space within the street environment must not hinder disabled facilities, carparks or access.
11. In regards to any areas or works that require the implementation of public protection, the Relevant Building Surveyor must assess all public protection structures.
12. Any area closed between sunset and sunrise shall be fitted with battery operated flashing lights in accordance with the Council's plans.
13. Unless otherwise stated, this consent must comply with the City of Melbourne's Code of Good Practice for Public Safety and Amenity at Construction Sites.
14. Safe and equitable pedestrian access is required at all times. Pedestrian ramps must be installed where necessary.
15. This consent does not exclude the consent holder from the City of Melbourne's Local Laws or the relevant parking laws.
16. The scheduled works are to be undertaken during the hours stated in this consent, or in a relevant Out of Hours consent.

1) This permit relates to the surface opening of any road within the City of Melbourne and the specific use thereof of any part of a road and reinstatement or reconstruction of any road.

2) When the abovementioned work has been completed, notice thereof must be given to the Council, delegate or authorised officer.

3) Wood blocks, flagging, pitchers, bluestone kerbing or other material required to be replaced must be taken from the site to a location designated by the Council, delegate or authorised officer.

4) The permit holder must ensure that all excavation work is clear of services and is responsible and liable for any damage or alterations to services and any related costs.

NOTE: This consent must be kept on site and produced when required by Council's officers or Victoria Police and is subject to conditions specified being adhered to.

5) All private service connections, ie water, gas, power or other property services must be placed at least 450mm clear depth below surface level or in accordance with the requirements of the Supply Authority and installed at right angles to the building line.

6) Boundary trap and disconnected trap covers which cannot be placed inside the building line must be placed 300mm below the surface of the pavement within 230mm of the building line. No other fittings may be placed in the pavement without the consent of the Council, delegate or authorised officer.

NOTE: This consent must be kept on site and produced when required by Council's officers or Victoria Police and is subject to conditions specified being adhered to.

CITY OF MELBOURNE

GPO Box 1603
Melbourne VIC 3001

Phone 61 3 9658 9658
Fax 61 3 9654 4854
www.melbourne.vic.gov.au

DX210487
ABN 55 370 219 287

Facsimile

Attention	Martt Sheppard - AECOM	Date	30 September 2015
Sender	Michael Norton	File	STT/SLC/00001/P1
Email:	Matthew.Sheppeard@aecom.com.au	Pages:	6
Subject	**LORIMER STREET, PORT MELBOURNE – REQUEST FOR TEMPORARY PARTIAL CLOSURES ON WESTBOUND CARRIAGEWAY FOR GROUND WATER MONITORING WORKS**		

Reference is made to the application by *AECOM Pty Ltd*, for the temporary partial closures on the Lorimer Street westbound carriageway (parking lane), between Ferryman Lane and Swinging Basin Lane (Service Request 3107436 refers).

It is understood that the above partial road closures are required for ground water monitoring works on the south side of Lorimer Street. It is also understood that the works and partial road closures have been **scheduled from Monday 5th through to Monday 12th October 2015**, in accordance with the submitted Traffic Management Plan (TMP) by STA Traffic Management Solutions Pty Ltd.

Firstly, the applicant is required to obtain VicRoads' approval for the above works and partial road closures, as the above sections of Lorimer Street is Arterial and therefore under the care and management of VicRoads. The following conditions are only a guide relating to the Local Roads managed by Council. VicRoads' approval must be obtained and complied with for the above section of Lorimer Street and any other Arterial Roads forming the scope of these works.

City of Melbourne's Engineering Services approval on Arterial Roads ONLY relates to restrictions on pedestrian movement, and restrictions to traffic on Local Roads intersecting with Arterial Roads. Occupation of on road parking spaces on either Arterial or Local Roads must be acquired through the City of Melbourne's Permit Branch as per the 8th condition below.

A check of Engineering Services records has indicated that no other approved road or footpath closures are planned for the area when these works are scheduled.

Engineering Services has reviewed the TMP and offers no objection to the works and the associated partial road closures. This endorsement is subject to compliance with the following conditions:

1. **Although VicRoads will determine the allowable times for the above partial road closures, Engineering Services would support between the hours of 7:30am and 5:30pm on weekdays, between the hours of 8:00am and 5:00pm on Saturday, and between the hours of 10:00am and 5:00pm on Sunday, subject to the agreement that there will be no impact on through traffic for both motorists and cyclists.**

2. **As Transdev Pty Ltd operate services in Lorimer Street, the applicant must contact Michael Selby (0409 360 506) to advise the bus operator should the above works impact on their scheduled bus services or bus stops. A copy of the attached TMP should be submitted to the bus company.**

3. **For temporary closures of on-street bicycle lanes, the TMP must include appropriate road signage and devices to advise cyclists of temporary bicycle lane closures on Lorimer Street. These signs must be placed well in advanced on the approach to the work site, to allow cyclists an opportunity to seek an alternate route, or take extra precautions.**

4. **Additional WATCH FOR CYCLISTS signage should also be included in the TMP, to warn motorists of cyclists whom may choose to ride along the traffic lanes to pass the worksite. A minimum 4.00 metre wide shared lane should be provided past the worksite for both motor vehicles and bicycles.**

5. Suitable pedestrian facilities must be provided and maintained to ensure pedestrians' safety at all times.

6. Qualified traffic controllers must be on-site at all times to supervise the closure, assist pedestrians and assist local traffic around the closure as indicated on the submitted traffic management plans. **Local access and egress must be maintained at all times. Local access and egress must be maintained at all times. Traffic controllers must be placed at both ends of the worksite to ensure safe pedestrian thoroughfare. Under no circumstances should pedestrians be expected to cross Lorimer Street to pass the worksite.**

7. Prior to commencement of the works the applicant must obtain a "road opening", an "out of hours" permit, and a "space occupancy permit", if required, from Council's Supervisor – Site Services 3rd Floor 240 Lt Collins Street, Melbourne (telephone 9658 8489). The applicant must present a copy of this letter when applying for the permit or quote Service Request 3107436 and Docs#9448109-v1.

8. The acquisition of any parking spaces can be arranged with Council's Permits Branch (Attention T.S.A. Officer), on telephone number 9658 9658.

9. **The City of Melbourne may have in-ground parking sensors in this area. The sensors are located in the middle of each parking bay approximately 50mm below the surface. You are required to contact 'Parking & Traffic Compliance Coordinators' on 03 9658 9658 at least 7 days prior to excavating in these areas to arrange for the sensors to be removed. Please note that the approximate location of the sensors will be shown on 'Dial-Before-You-Dig' documentation. Also attached below a link to the CoM website that shows the areas where the sensors are and some background on the new P&T technology being rolled out.**
http://www.melbourne.vic.gov.au/ParkingTransportandRoads/Parking/Pages/ParkingTechnology.aspx

10. **Written notification must be sent to all property occupiers that may be affected by the works and closures in all streets/laneways, including all properties in abutting streets/laneways. All emergency services affected by the works must also be notified as early as possible prior to commencement of works and, demonstrate if necessary (and to Council's satisfaction), that adequate efforts have been made to assist property occupiers.**

11. It is assumed that all TMP(s) supplied to Council by the applicant have been prepared by qualified/experienced engineers (either employed/engaged by the applicant) and comply with all relevant Australian Standards/accepted safety practices. In not objecting to the TMP, the Council is in no way agreeing to or endorsing the precise wording and/or placement of any specific signs, location/number of traffic controllers or any other measures. It is expected that the works are closely monitored at all times by the applicant and that any changes can be made to the TMP(s) as is required due to the prevailing traffic conditions or if safety issues are identified on-site, without the necessity to seek prior consent from Council. Although, at times, Council can highlight possible flaws in the TMP(s) and suggest some remedial actions in order to help achieve better safety outcomes or improve traffic flows, the final decision regarding the precise design of the signage/other measures rests with the applicant.

12. Temporary road diversion barriers, signage, fencing and any other safety measures to be provided and maintained in accordance with AS 1742.3 - 2002 "Traffic Control Devices for Works on Roads" and with the 'Code of Practice' for Worksite Safety – Traffic Management, as stipulated in the Road Management Act 2004. All signs and temporary bollards are to be installed at no cost to Council. After completion of the works, existing conditions shall be reinstated at no cost to Council.

13. Notification should be given to Council's Events Melbourne office on 9658 9750 and Council's Hotline on 9658 9658, twenty four (24) hours prior to commencement of work and upon completion of work.

14. VicRoads Traffic Management Centre (telephone 9855 7510) must be advised of the closure so that it can be recorded on the VicRoads Traffic Information Database and subsequently posted on the VicRoads website.

15. It will be necessary to give prior notice to the following authorities both before and on completion of the works:-

Police	Region 1 - Special Events	9247 5714 / fax 9247 5725
Fire Brigade	Communications Centre	9662 2311
Ambulance	roadclosures@ambulance.vic.gov.au	
Vic Roads	Traffic Management Centre	9855 7510

16. The Council is to be fully indemnified against any claim laid against it either by members of the public or persons engaged in any activities associated with the proposal who, as a result of the closure, suffer personal injury, property damage or financial loss. This is essential given that applicants take on a leadership role with "duty of care" implications for an activity.

17. Noise emanating from the works shall not exceed 10 dB above background noise.

18. On completion of the works, the area should be left clean and tidy.

19. All road and footpath closures must be supervised and maintained at all times.

20. The contractor is not to leave any materials, plant and machinery in statutory "No Stopping" areas, particularly outside the closure times.

21. Caution is to be exercised in proximity of pedestrian crossing points, traffic signals, etc.; in order to maximise visibility at all times.

22. Access must be provided for the servicing of abutting properties, where applicable or suitable arrangements made with the occupiers.

23. This agreement does not constitute any approval from Engineering Services to perform any excavation within either the footpath or adjacent carriageway.

24. All conditions are based on average traffic flows and should unforseen circumstance arise it may be necessary to make amendments to these conditions and / or revoke approval at short notice.

25. All proposed work shall comply with the MCC Parks and Recreation Branch's conditions on 'Protecting Trees' (attached). Should any works be closer than 4.5 metres to the face of any tree, approval for the works must be obtained from Council's Arborist Daniel Tipping, Parks and Urban Design, telephone 9658 8714 (BH) or David Burke, Citywide TreeCare on mobile 0419 145 698 (AH).

The Engineering Services Branch requires the above conditions to form part of the road opening / out of hours / space occupancy permit. For further enquiries, please contact Mr. Kin Poon on telephone 9658 9897.

Michael Norton
Acting Manager - Engineering Services

CoM Ref: DOCS# 9448109-v1
SR 3107436, STT/SLC/00001/P1

cc. Events@melbourne.vic.gov.au
Roy Birch (City of Melbourne)
Dean Robertson (City of Melbourne)
Site Services Branch (City of Melbourne)
Kirstin Coote (City of Melbourne)
Michael Selby (Transdev, email: Michael.selby@transdev.com.au)
John Kanelopoulos (City of Melbourne)
Karen Taranto (Vision Australia, email: Karen.Taranto@visionaustralia.org)
Melbourne.VisitorShuttle@melbourne.vic.gov.au
info@melbournecitysightseeing.com.au
ronald@melbournecitysightseeing.com.au
Skybus Southern Cross Station: southerncross@skybus.com.au)

Attach: Fact Sheet (Tree protection in the City of Melbourne)

CONSENT FOR WORKS

Road Management Act 2004
Road Management (Works and Infrastructure) Regulations 2005

CITY OF MELBOURNE

GPO Box 1603
Melbourne VIC 3001
ABN 55 370 219 287
Hotline (03) 9658 9658
Facsimile (03) 9654 4854
DX210487
ABN 55 370 219 287

Construction Management Group
3rd Floor 240 Little Collins Street
Melbourne Vic 3000

Telephone: 03 9658 9658
After Hours: 03 9658 9774

Consent Number: CW-D-2015-5759 a

Attention:
Consent is given for the proposed works subject to the attached general and specific conditions.

Council conditions must be adhered to prior to and/or during proposed works. Failure to comply with Council conditions and requirements of the Road Management Act 2004 will result in this consent being revoked.

Any alterations to this consent will make it null and void.

Property Address:	Lorimer Street, PORT MELBOURNE
Location (if different from property address)	
Applicant:	Aecom Australia Pty Ltd
Address of Applicant:	Level 9, 8 Exhibition St, MELBOURNE VIC 3000
Contact Details:	Averyll - 0499 252 502
Description of Work:	Consent for works issued at LorimerStreet to assist with installing ground water monitoring works at the subject site. Date: 5/10/2015 to 26/10/10/2015 (Monday to Friday 7.30am to 5.30pm (Saturday 8am to 3pm) Council ESG Reference: SR 3107436# 9448109 sr3118375 Full traffic management is required to direct pedestrians to a safe route of passage. The site is to be signed and managed in accordance with AS 1742.3 and Vic Roads Worksite Code of Practice. It is the responsibility of the applicant to ensure that all Council assets are reinstated in accordance with Councils current standards and specifications. No-one is to be denied vehicular or pedestrian access to their property. It is the responsibility of the applicant to apply for and obtain TSA reserved parking permits should the occupation of parking bays be required.

Date(s) permitted:

From: 5 Oct 2015 **To:** 26 Oct 2015

Fees/Charges:
The following fees/charges apply to this consent:

Consent for Works Fee - Docklands	$152.30

Signature of Delegated Officer:  Date: 9 Oct 2015

Mal Smith

NOTE: This consent must be kept on site and produced when required by Council's officers or Victoria Police and is subject to conditions specified being adhered to.

The holder of the consent must comply with the following conditions:

1. The consent holder ("Applicant") is responsible for ensuring the works are carried out in a safe manner, in compliance with these conditions and in accordance with the City of Melbourne Activities Local Law 2009.
2. The consent is not transferable. It must be held on site by the person in charge of the work and be produced on request by an authorised officer or a member of the Victoria Police Force. The consent holder must comply promptly with any notices and instructions.
3. Any variation required to a consent must be submitted to the Council or delegate for endorsement. Change/variation of work must not commence prior to relevant approval being granted in writing by the Council or delegate.
4. Vehicles must not cross any footpath to gain access to the site of the work or project unless vehicular crossing (either temporary or permanent) has been constructed to the approval of the Council or delegate or authorised officer.
5. Every stormwater channel adjacent to the site of work or project will be kept clear of obstruction at all times.
6. Rubbish or building materials must not be left in or on any road or public place.
7. Building materials spilt on to the roadway or the footpath must be removed immediately. Equipment used for transporting or handling building materials must not be washed in or on any road or public place or into any drain. Hoses must not be used for these purposes in or on a road or footpath.
8. Barricades must consist, unless alternative arrangements are approved, of minimum 1 metre height timber or steel rails on stable supporting posts at maximum 4.8 metre centres, continuous around the entire working area. Warning signage must be erected at each end of the barricaded area with the appropriate standard 'Detour', 'Road Closed', arrow etc.
9. Appropriate warning signage and lighting must be erected in accordance with AS1742.3.
10. Any occupation of space within the street environment must not hinder disabled facilities, carparks or access.
11. In regards to any areas or works that require the implementation of public protection, the Relevant Building Surveyor must assess all public protection structures.
12. Any area closed between sunset and sunrise shall be fitted with battery operated flashing lights in accordance with the Council's plans.
13. Unless otherwise stated, this consent must comply with the City of Melbourne's Code of Good Practice for Public Safety and Amenity at Construction Sites.
14. Safe and equitable pedestrian access is required at all times. Pedestrian ramps must be installed where necessary.
15. This consent does not exclude the consent holder from the City of Melbourne's Local Laws or the relevant parking laws.
16. The scheduled works are to be undertaken during the hours stated in this consent, or in a relevant Out of Hours consent.

1) In the event that any works or activity in the precinct damages coloured concrete panels, the reinstatement of full panels only will be accepted. No part panel replacement will be acceptable.

2) No works are to be carried out within the 3 hour period prior to the commencement of any Etihad Stadium event, or after 16:00hrs, whichever is the earlier, during an Etihad Stadium event, or within a 2 hour period following the completion of any Etihad Stadium event.

3) Unless prior consent is given in writing by the relevant authority, delegate or authorised officer, all private service connections, ie water, gas, power or other property services must be placed at least 450mm clear depth below surface level or in accordance with the requirements of the Supply Authority and installed at right angles to the building line

NOTE: This consent must be kept on site and produced when required by Council's officers or Victoria Police and is subject to conditions specified being adhered to.

4) Boundary trap and disconnected trap covers which cannot be placed inside the building line must be placed 300mm below the surface of the pavement within 230mm of the building line. No other fittings may be placed in the pavement without the consent of the relevant authority, delegate or authorised officer

5) No vehicle is permitted to access any promenade, wharf or plaza within the Docklands precinct without written authority to do so.

6) Vehicle access to promenades, wharf or plazas may only be obtained by the removal of bollards, chains or locks. Bollards, chains or locks may only be removed by an authorised representative of City of Melbourne. No vehicles are permitted to be in motion on any promenade or walkway within the Docklands precinct between 12:00hrs and 14:00hrs

7) Due to load limitations, no items such as vehicles or stages etc are permitted to be erected within 3m of the water's edge along Grand Plaza

8) The number of vehicles permitted to access the promenade or walkway is strictly restricted to XX vehicles at any one time

9) Whilst any vehicle, associated with this permit, is in motion on any walkway or promenade, a traffic controller must be outside of the vehicle to assist with pedestrian and cyclist management

10) Whilst any vehicle, associated with this permit, is in motion on any walkway or promenade, their speed must not exceed 5kph

11) No vehicles are permitted to access any site via the tram reserves without prior approval from Yarra Trams

12) Vehicles at Yarra's Edge are permitted to park on the upper promenade only. Under no circumstances are vehicles allowed to access the lower promenade or the Webb Bridge

13) Vehicles are not to be parked on or driven over the Perspex numbering laid within the promenade

14) Drip trays must be installed under the vehicle whilst it is parked on any promenade or walkway

15) This permit relates to the surface opening of any road within the City of Melbourne and the specific use thereof of any part of a road and reinstatement or reconstruction of any road.

16) When the abovementioned work has been completed, notice thereof must be given to the Council, delegate or authorised officer.

17) Wood blocks, flagging, pitchers, bluestone kerbing or other material required to be replaced must be taken from the site to a location designated by the Council, delegate or authorised officer.

18) The permit holder must ensure that all excavation work is clear of services and is responsible and liable for any damage or alterations to services and any related costs.

19) All private service connections, ie water, gas, power or other property services must be placed at least 450mm clear depth below surface level or in accordance with the requirements of the Supply Authority and installed at right angles to the building line.

20) Boundary trap and disconnected trap covers which cannot be placed inside the building line must be placed 300mm below the surface of the pavement within 230mm of the building line. No other fittings may be placed in the pavement without the consent of the Council, delegate or authorised officer.

NOTE: This consent must be kept on site and produced when required by Council's officers or Victoria Police and is subject to conditions specified being adhered to.

Enquiries:
Email: devpermits@portphillip.vic.gov.au
Phone: 9209 6216
Mail: Private Bag No. 3, PO ST KILDA VIC 3182

CITY OF PORT PHILLIP
ABN 21 762 977 945

14 October 2015

AECOM
9/8 Exhibition St
MELBOURNE VIC 3000

ROAD OPENING PERMIT
238/2015/RO
Issued Under Community Amenity Local Law No: 1 (Clause 14)

This permit has been approved and issued subject to the following conditions and the permit holder shall be held to have agreed to such conditions and to have accepted any liability or responsibility thereby imposed.

Site of Works: Williamstown Road, all of street, PORT MELBOURNE

Description of Works: Bore Holes for Ground Water Monitoring (MW29)

Permit Valid From: 10am 14 October 2015 **To:** 6 November 2015

In addition to complying with any relevant requirements in the Local Law No. 1, Community Amenity the following conditions apply to the activity or use:

Standard Conditions:

1. All works associated with the road opening including the set-up and removal of necessary signs and barriers may be taken **14 October and 6 November 2015** between Monday to Friday **7am to 5pm** and Saturday **9am to 3pm**. Obstructions to traffic flow are not permitted outside of this period including setting up or removal of the infrastructure.

2. To amend the dates of this licence requires a written request to be received by the City Permits by 5pm, while the permit is still valid. Once a permit has expired it cannot be re-used or amended.

3. A maximum of two (2) amendments to re-schedule the dates of this permit can be considered prior to incurring additional fees.

4. An absolute minimum width of 1.5 metres must be maintained for safe pedestrian access. Pedestrian safety must be maintained at all times by the appopriate use of bollards and tape. On both approaches to the works, the following signs must be clearly displayed and in place during the works;

    a) Pedestrian arrow signs
    a) Pedestrians Watch Your Step or,
    b) Pedestrian Use Other Footpath

5. All traffic treatments must be installed in accordance with any Traffic Management Plan submitted to Council and maintained during the works.

6. Signage must be visible and must not obstruct sightlines, designated pedestrian footpaths and crossovers/accesses. If on-street parking spaces are required to be used, only the spaces clearly specified on the

plan can be used for that purpose.

7. Accredited Traffic Control Officers must be present to manage traffic flow during a partial or full road closure. Traffic Control Officers must also assist pedestrians and cyclists as required.

8. If vehicular traffic flow is affected by the works, emergency services, including, Fire Brigade, Ambulance and Police must be notified by the permit-holder a minimum of 24 hours prior the commencement of works.

9. To the satisfaction of, and at no cost to Council, the permit-holder must reinstate all assets and infrastructure.

10. City of Port Phillip does not accept any responsibility for accidents, damage or injury to property, participants or third parties that may arise out of this event. There must be public liability insurance for the type of work proposed with an indemnity of not less than $10M, including full indemnity for the City of Port Phillip Council against any claim laid against it either by members of the public or persons engaged in any activities associated with the traffic diversion who, as a result of the diversion, suffer personal injury, property damage or financial loss.

11. The permit-holder must comply with AS 1742.3 2002. Manual of uniform traffic control devices, Part 3 Traffic Control Devices for lane and Road Closures and the relevant Standards Australia Field Guides Part 1. Short term urban works, daytime/night time SAA HB 81.1 & 4 1996.

12. City of Port Phillip reserves the right to amend or revoke the above at any time.

Prior to commencement

13. In addition to the requirement to obtain a Road Opening Permit, further permits may be required for activities on Council land such as Skip Bin, Road Closure, Street Occupation, or Asset Protection. Consents may also be required from VicRoads, utilities and public transport operators. The permit-holder must ensure all relevant permits and approvals have been obtained prior to commencing any works.

14. The permit-holder must provide a minimum of 2 business day's written notification to the occupants of all affected owners, occupiers and businesses affected by the works. The notification must include the following information and a copy forwarded to the City Permits unit, e-mail: devpermits@portphillip.vic.gov.au and must include:-

    a) The nature of the works being performed
    a) The date and hours of works occurring under this permit
    b) Council's permit reference
    c) Contact name and phone number for the permit holder and/or site manager

15. The permit-holder must contact City Permits unit at least 2 business days prior to commencing works, by e-mail: devpermits@portphillip.vic.gov.au, or ph: 03 9209 6216, to organise an inspection with Council's Asset Inspection Officer to determine:

    - the extent of reinstatement works including road pavement, signage and markings
    - the requirement for further inspections,
    - any requirements for the removal, storage and reinstatement of bluestone assets
    - removal and reinstatement of street furniture, (litter bins, public seating and bicycle hoops)

During construction

16. Works that may cause significant delay to traffic and/or public transport services must be scheduled outside peak periods of 7–9am and 4–6pm weekdays unless otherwise permitted with the written consent of Council.

17. Works must be carried out in accordance with '*Road Management Act 2004 Code of Practice Worksite Safety – Traffic Management'* and any approved Traffic Management Plan.

Work execution

18. Without the written consent of the Council the permit-holder must utilise boring techniques when installing underground services. Any piping or cabling work under an existing vehicle crossing must be carried out by boring, unless approval from Council's Asset Inspection Officer has been obtained.

19. If agricultural drains or irrigation pipes are encountered during excavation the permit-holder must carefully replace the pipes to their original position prior to backfilling.

20. The minimum lateral clearance from a drain is 500mm and a vertical clearance of 300mm. If the proposed road opening or any other work interferes with any underground drains, the approval must be obtained from the Council's Assets department prior to the commencement of works.

21. The minimum lateral clearance from a street tree is 2 metres. If the proposed road opening is less than 2 metres, consent must be obtained from Council's Arborist.

22. In the event of cancellation of this permit, the Council reserves the right to reinstate the area at the expense of the permit-holder.

23. Surplus excavated material must be removed from the road reserve daily and the area left in a clean and tidy condition.

24. All finished surfaces must match and be flush with existing surfaces.

25. Within 7 days of completion of the works, the permit holder must submit a request for final inspection to City Permits unit, e-mail: devpermits@portphillip.vic.gov.au.

26. Any damage to Council assets caused by the permit- holder's reinstatement works must be rectified to the satisfaction of Council's Asset Inspection Officer.

27. Failure to restore the road reserve and repair any damage caused to assets will result in Council undertaking the necessary reinstatement works and deducting the cost from the security bond and the remainder refunded. Where costs exceed the security bond amount held, the permit holder will be liable for the excess and charged accordingly.

28. If works are conducted in contravention of this permit, the City of Port Phillip reserves the right to amend or revoke the above at any time.

Reinstatement of footpaths

Asphalt footpaths
Specification for Asphalt Footpath – Refer to Standard Drawing: SD3103

29. The permanent asphalt layer of footpaths must be constructed in accordance with Council's current Standard Drawing.

30. The Bituminous surface at the edges of the trench must be cut with a circular saw.

31. A temporary bituminous surface of premix (cold-mix) minimum depth 75mm must be constructed before the crossing is opened to traffic, unless the permit-holder is completing a permanent reinstatement immediately with hot-mix asphalt.

32. The full width of the footpath must be reinstated. Where only part of a concrete footpath/vehicle crossing panel has been damaged, reinstatement must include the removal and reinstatement of the whole panel.

Concrete footpaths
Specification for Concrete Footpaths – Refer to Standard Drawing: SD3103

33. The permanent concrete layer of footpaths must be constructed in accordance with Council's current Standard Drawing.

34. Concrete footpath areas affected by works will be reinstated in full sections within the surrounding joints unless directed otherwise by Council's Asset Inspection Officer.

35. Existing surface levels must be maintained and the tops of all service pits/junction boxes must be at the footpath surface level.

Reinstatement of road pavements

36. Where the permit-holder or contractor's road opening is less than 1.0 metre from the lip of a channel, the floating section of pavement must be removed and the final surface reinstatement will be from the furthest edge from opening/trench to the lip of channel.

37. All road pavement surfaces must be cut with a circular saw.

Flexible road pavement (Asphalt)
Specification for Flexible Road Pavements – Refer to Standard Drawing SD3103

Rigid Road Pavement (Concrete)

Temporary reinstatements

38. All temporary road reinstatements must be finished with cold-mix (premix asphalt) flush with the existing surfaces unless permanent hot-mix asphalt reinstatement is being completed immediately following the compaction of the pavement surface.

Nature strips

39. All nature strips must be reinstated. Backfilling of nature strips must be completed with natural soil material compacted in 150mm layers, 90% standard compaction to a level 75mm below surface. The remaining backfill must be uncompacted topsoil to 15mm above the surface level and the surface even and seeded to Council's satisfaction. The area must be kept moist until germination has occurred.

Reinstatement of vehicle crossings
Specification for Vehicle Crossings – Refer to Standard Drawing SD4101

40. The vehicle crossing must be constructed in accordance with Council's current Standard Drawing.

41. Concrete vehicle crossings affected by works must be reinstated in full sections (panels) within the surrounding joints unless otherwise directed by Council's 'Asset Inspection Officer'.

42. When reinstating a section/panel, Y16 dowel bars 400mm lengths must be inserted 200mm into the existing concrete surface and spaced 300mm apart.

Kerb and channel
Specification for Concrete Kerb and Channel – Refer to Standard Drawing SD1101
Specification for Bluestone Kerb and Channel – Refer to Standard Drawing SD1102

43. The kerb and channel must be reinstated to the satisfaction of Council's Asset Inspection Officer.

Bluestone pitchers
Specification for Bluestone Pitchers – Refer to Standard Drawing SD3101

44. The bluestone pitcher kerb and channel, and pavement must be reinstated to the satisfaction of Council's Asset Inspection Officer.

Footnotes:

Permitted Construction Hours
Under Council's Local Law No. 1 (Community Amenity), A *builder* requires a permit to carry out building works on a building site other than between 7.00am to 6.00pm Monday to Friday, and 9.00am to 3.00pm Saturday. No works are permitted on a public holiday as defined by the *Public Holidays Act* 1993.

Dial Before You Dig
Neglecting to dial 1100 before excavating can lead to costly disruption to essential services. Dial Before You Dig is a free referral service for information on locating underground utilities.
Ph: 1100
Web: www.1100.com.au

Standard Construction Drawings
http://www.portphillip.vic.gov.au/road_opening_permit.htm

City of Port Phillip Permits Index
http://www.portphillip.vic.gov.au/permits_licenses_index.htm

Contacts / Links

Asset Inspection Officer
Ph: 9209 6590
Fx: 9536 2710
Email: helpassetinspection@portphillip.vic.gov.au

City Permits
Ph: 9209 6216
Fx: 9536 2745
Email: devpermits@portphillip.vic.gov.au

Road Opening Request for Final Inspection

Community Amenity Local Law No. 1 Clause 14

This form must be completed within 48 hours of completion of works.
Any security bond refunds will be issued within 20 business days.

Applicant Details			
Site Address:			
Applicant/Business Name:			
Applicant's Postal Address:			
Telephone Number:		Mobile Number:	
E-mail Address:			
ABN:		ACN:	
Road Opening Details			
Road Opening Permit No:	.... / .... / **RO**		
Reason for Permit (tick appropriate box)			
Start & Completion Date of Works:	From: / /	To: / /	

What part of the Road Reserve are your works in?									
Footpath		Nature Strip		Road or Lane		Car Park		Kerb Channel	
Size of Opening:	**m L x m W = m²**								

Did any of the following assets require relocation as a result of the Road Opening?							
Parking Ticket Machine		Street Furniture		Litter Bin		Other (please state)	
The applicant is responsible for all associated costs as a result of the relocation of any Council assets.							

Our enquiries counter at St Kilda Town Hall
is open from 8.30am to 5.00pm Monday to Friday
T: 9209 6216 F: 9536 2745 E: devpermits@portphillip.vic.gov.au

www.portphillip.vic.gov.au/road_permits.htm

Road Opening Request for Final Inspection

Community Amenity Local Law No. 1 Clause 14

Request for Final Reinstatement

Any excavation or opening must be reinstated to Council requirements as per items (7), (9), (10) and (11) of Port Phillip City Council conditions on which a permit to open or obstruct roadways is issued (attached to Permit). The permanent reinstatement can be undertaken by Council if the applicant is unable to. The applicant at a bare minimum must be reinstated to temporary measures once the permit expires or when the safety precautions are removed.
Any opening within the City of Port Phillip must be back filled with crushed rock, compacted and finished with cold mix as a temporary measure until full reinstatement is completed by the applicant. If the applicant submits this application (Request for Final Inspection) without fully reinstating the surface to the original material being concrete, bluestone or asphalt and to Council requirements, the cost of shall be deducted from the security bond.

How have you reinstated the Road Opening?					
Permanent reinstatement (to original standard)		Temporary reinstatement (less than original standard)			
What material has been used in your reinstatement?					
Crushed and compacted rock (temporary)		Finished with asphalt cold mix (temporary			
Concrete (permanent)		Asphalt hot mix (permanent)		Bluestone (permanent)	
NOTE: If you have reinstated to less than the original quality and material or not to Council standards the reinstatement will be performed by Council's Infrastructure Services and the applicant will be debited or invoiced for the difference. The work will be inspected and final reinstatement (if required) will be undertaken by Council within 28 days on receipt of this form.					

Applicant's Name: .....

Applicant's Signature: ..... **Date:** .....

How to Apply

Submit this application form to: City Permits, City of Port Phillip, Private Bag No. 3, PO St Kilda VIC 3182
Or email a scan to devpermits@portphillip.vic.gov.au or fax to 9536 2745.

Further Information

Contact City Permits on 9209 6216 or devpermits@portphillip.vic.gov.au

Privacy Statement: The personal information requested on this form is being collected by the council for purposes of assessment in accordance with Community Amenity Local Law No. 1, Clause 14. The personal information will be used solely by the council for that primary purpose or directly related purposes. The applicant understands that the personal information provided is for the purpose of considering the application for an Asset Protection Permit and that he or she may apply to the council for access to the information. Requests for access and or correction should be made to Freedom of Information & Privacy Officer Governance & Engagement Department, City of Port Phillip.

Our enquiries counter at St Kilda Town Hall
is open from 8.30am to 5.00pm Monday to Friday
T: 9209 6216 F: 9536 2745 E: devpermits@portphillip.vic.gov.au

www.portphillip.vic.gov.au/road_permits.htm

Enquiries:
Email: devpermits@portphillip.vic.gov.au
Phone: 9209 6216
Mail: Private Bag No. 3, PO ST KILDA VIC 3182

CITY OF PORT PHILLIP
ABN 21 762 977 945

14 October 2015

AECOM
9/8 Exhibition St
MELBOURNE VIC 3000

ROAD OPENING PERMIT
244/2015/RO
Issued Under Community Amenity Local Law No: 1 (Clause 14)

This permit has been approved and issued subject to the following conditions and the permit holder shall be held to have agreed to such conditions and to have accepted any liability or responsibility thereby imposed.

Site of Works: Normanby Road, all of Sth Melbourne section, SOUTH MELBOURNE

Description of Works: Bore holes for groundwater sampling.(MW33)
Permit to commence from 10am, 14/10/2015

Permit Valid From: 14 October 2015 **To:** 6 November 2015

In addition to complying with any relevant requirements in the Local Law No. 1, Community Amenity the following conditions apply to the activity or use:

Standard Conditions:

1. All works associated with the road opening including the set-up and removal of necessary signs and barriers may be taken **14 October and 6 November 2015** between Monday to Friday **7am to 5pm** and Saturday **9am to 3pm**. Obstructions to traffic flow are not permitted outside of this period including setting up or removal of the infrastructure.

2. To amend the dates of this licence requires a written request to be received by the City Permits by 5pm, while the permit is still valid. Once a permit has expired it cannot be re-used or amended.

3. A maximum of two (2) amendments to re-schedule the dates of this permit can be considered prior to incurring additional fees.

4. An absolute minimum width of 1.5 metres must be maintained for safe pedestrian access. Pedestrian safety must be maintained at all times by the appopriate use of bollards and tape. On both approaches to the works, the following signs must be clearly displayed and in place during the works;

    a) Pedestrian arrow signs
    a) Pedestrians Watch Your Step or,
    b) Pedestrian Use Other Footpath

5. All traffic treatments must be installed in accordance with any Traffic Management Plan submitted to Council and maintained during the works.

6. Signage must be visible and must not obstruct sightlines, designated pedestrian footpaths and crossovers/accesses. If on-street parking spaces are required to be used, only the spaces clearly specified on the plan can be used for that purpose.

7. Accredited Traffic Control Officers must be present to manage traffic flow during a partial or full road closure. Traffic Control Officers must also assist pedestrians and cyclists as required.

8. If vehicular traffic flow is affected by the works, emergency services, including, Fire Brigade, Ambulance and Police must be notified by the permit-holder a minimum of 24 hours prior the commencement of works.

9. To the satisfaction of, and at no cost to Council, the permit-holder must reinstate all assets and infrastructure.

10. City of Port Phillip does not accept any responsibility for accidents, damage or injury to property, participants or third parties that may arise out of this event. There must be public liability insurance for the type of work proposed with an indemnity of not less than $10M, including full indemnity for the City of Port Phillip Council against any claim laid against it either by members of the public or persons engaged in any activities associated with the traffic diversion who, as a result of the diversion, suffer personal injury, property damage or financial loss.

11. The permit-holder must comply with AS 1742.3 2002. Manual of uniform traffic control devices, Part 3 Traffic Control Devices for lane and Road Closures and the relevant Standards Australia Field Guides Part 1. Short term urban works, daytime/night time SAA HB 81.1 & 4 1996.

12. City of Port Phillip reserves the right to amend or revoke the above at any time.

Prior to commencement

13. In addition to the requirement to obtain a Road Opening Permit, further permits may be required for activities on Council land such as Skip Bin, Road Closure, Street Occupation, or Asset Protection. Consents may also be required from VicRoads, utilities and public transport operators. The permit-holder must ensure all relevant permits and approvals have been obtained prior to commencing any works.

14. The permit-holder must provide a minimum of 2 business day's written notification to the occupants of all affected owners, occupiers and businesses affected by the works. The notification must include the following information and a copy forwarded to the City Permits unit, e-mail: devpermits@portphillip.vic.gov.au and must include:-

    a) The nature of the works being performed
    a) The date and hours of works occurring under this permit
    b) Council's permit reference
    c) Contact name and phone number for the permit holder and/or site manager

15. The permit-holder must contact City Permits unit at least 2 business days prior to commencing works, by e-mail: devpermits@portphillip.vic.gov.au, or ph: 03 9209 6216, to organise an inspection with Council's Asset Inspection Officer to determine:

    - the extent of reinstatement works including road pavement, signage and markings
    - the requirement for further inspections,
    - any requirements for the removal, storage and reinstatement of bluestone assets
    - removal and reinstatement of street furniture, (litter bins, public seating and bicycle hoops)

During construction

16. Works that may cause significant delay to traffic and/or public transport services must be scheduled outside peak periods of 7–9am and 4–6pm weekdays unless otherwise permitted with the written consent of Council.

17. Works must be carried out in accordance with '*Road Management Act 2004 Code of Practice Worksite Safety – Traffic Management'* and any approved Traffic Management Plan.

Work execution

18. Without the written consent of the Council the permit-holder must utilise boring techniques when installing underground services. Any piping or cabling work under an existing vehicle crossing must be carried out by boring, unless approval from Council's Asset Inspection Officer has been obtained.

19. If agricultural drains or irrigation pipes are encountered during excavation the permit-holder must carefully replace the pipes to their original position prior to backfilling.

20. The minimum lateral clearance from a drain is 500mm and a vertical clearance of 300mm. If the proposed road opening or any other work interferes with any underground drains, the approval must be obtained from the Council's Assets department prior to the commencement of works.

21. The minimum lateral clearance from a street tree is 2 metres. If the proposed road opening is less than 2 metres, consent must be obtained from Council's Arborist.

22. In the event of cancellation of this permit, the Council reserves the right to reinstate the area at the expense of the permit-holder.

23. Surplus excavated material must be removed from the road reserve daily and the area left in a clean and tidy condition.

24. All finished surfaces must match and be flush with existing surfaces.

25. Within 7 days of completion of the works, the permit holder must submit a request for final inspection to City Permits unit, e-mail: devpermits@portphillip.vic.gov.au.

26. Any damage to Council assets caused by the permit- holder's reinstatement works must be rectified to the satisfaction of Council's Asset Inspection Officer.

27. Failure to restore the road reserve and repair any damage caused to assets will result in Council undertaking the necessary reinstatement works and deducting the cost from the security bond and the remainder refunded. Where costs exceed the security bond amount held, the permit holder will be liable for the excess and charged accordingly.

28. If works are conducted in contravention of this permit, the City of Port Phillip reserves the right to amend or revoke the above at any time.

Reinstatement of footpaths

Asphalt footpaths
Specification for Asphalt Footpath – Refer to Standard Drawing: SD3103

29. The permanent asphalt layer of footpaths must be constructed in accordance with Council's current Standard Drawing.

30. The Bituminous surface at the edges of the trench must be cut with a circular saw.

31. A temporary bituminous surface of premix (cold-mix) minimum depth 75mm must be constructed before the crossing is opened to traffic, unless the permit-holder is completing a permanent reinstatement immediately with hot-mix asphalt.

32. The full width of the footpath must be reinstated. Where only part of a concrete footpath/vehicle crossing panel has been damaged, reinstatement must include the removal and reinstatement of the whole panel.

Concrete footpaths
Specification for Concrete Footpaths – Refer to Standard Drawing: SD3103

33. The permanent concrete layer of footpaths must be constructed in accordance with Council's current Standard Drawing.

34. Concrete footpath areas affected by works will be reinstated in full sections within the surrounding joints unless directed otherwise by Council's Asset Inspection Officer.

35. Existing surface levels must be maintained and the tops of all service pits/junction boxes must be at the footpath surface level.

Reinstatement of road pavements

36. Where the permit-holder or contractor's road opening is less than 1.0 metre from the lip of a channel, the floating section of pavement must be removed and the final surface reinstatement will be from the furthest edge from opening/trench to the lip of channel.

37. All road pavement surfaces must be cut with a circular saw.

Flexible road pavement (Asphalt)
Specification for Flexible Road Pavements – Refer to Standard Drawing SD3103

Rigid Road Pavement (Concrete)

Temporary reinstatements

38. All temporary road reinstatements must be finished with cold-mix (premix asphalt) flush with the existing surfaces unless permanent hot-mix asphalt reinstatement is being completed immediately following the compaction of the pavement surface.

Nature strips

39. All nature strips must be reinstated. Backfilling of nature strips must be completed with natural soil material compacted in 150mm layers, 90% standard compaction to a level 75mm below surface. The remaining backfill must be uncompacted topsoil to 15mm above the surface level and the surface even and seeded to Council's satisfaction. The area must be kept moist until germination has occurred.

Reinstatement of vehicle crossings
Specification for Vehicle Crossings – Refer to Standard Drawing SD4101

40. The vehicle crossing must be constructed in accordance with Council's current Standard Drawing.

41. Concrete vehicle crossings affected by works must be reinstated in full sections (panels) within the surrounding joints unless otherwise directed by Council's 'Asset Inspection Officer'.

42. When reinstating a section/panel, Y16 dowel bars 400mm lengths must be inserted 200mm into the existing concrete surface and spaced 300mm apart.

Kerb and channel
Specification for Concrete Kerb and Channel – Refer to Standard Drawing SD1101
Specification for Bluestone Kerb and Channel – Refer to Standard Drawing SD1102

43. The kerb and channel must be reinstated to the satisfaction of Council's Asset Inspection Officer.

Bluestone pitchers
Specification for Bluestone Pitchers – Refer to Standard Drawing SD3101

44. The bluestone pitcher kerb and channel, and pavement must be reinstated to the satisfaction of Council's Asset Inspection Officer.

Footnotes:

Permitted Construction Hours
Under Council's Local Law No. 1 (Community Amenity), A *builder* requires a permit to carry out building works on a building site other than between 7.00am to 6.00pm Monday to Friday, and 9.00am to 3.00pm Saturday. No works are permitted on a public holiday as defined by the *Public Holidays Act* 1993.

Dial Before You Dig
Neglecting to dial 1100 before excavating can lead to costly disruption to essential services. Dial Before You Dig is a free referral service for information on locating underground utilities.
Ph: 1100
Web: www.1100.com.au

Standard Construction Drawings
http://www.portphillip.vic.gov.au/road_opening_permit.htm

City of Port Phillip Permits Index
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Contacts / Links

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Fx: 9536 2710
Email: helpassetinspection@portphillip.vic.gov.au

City Permits
Ph: 9209 6216
Fx: 9536 2745
Email: devpermits@portphillip.vic.gov.au

Road Opening Request for Final Inspection

Community Amenity Local Law No. 1 Clause 14

This form must be completed within 48 hours of completion of works.
Any security bond refunds will be issued within 20 business days.

Applicant Details			
Site Address:			
Applicant/Business Name:			
Applicant's Postal Address:			
Telephone Number:		Mobile Number:	
E-mail Address:			
ABN:		ACN:	
Road Opening Details			
Road Opening Permit No:	.... / .... / **RO**		
Reason for Permit (tick appropriate box)			
Start & Completion Date of Works:	From: / /	To: / /	

What part of the Road Reserve are your works in?									
Footpath		Nature Strip		Road or Lane		Car Park		Kerb Channel	
Size of Opening:	**m L x m W = m²**								

Did any of the following assets require relocation as a result of the Road Opening?							
Parking Ticket Machine		Street Furniture		Litter Bin		Other (please state)	
The applicant is responsible for all associated costs as a result of the relocation of any Council assets.							

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Road Opening Request for Final Inspection

Community Amenity Local Law No. 1 Clause 14

Request for Final Reinstatement

Any excavation or opening must be reinstated to Council requirements as per items (7), (9), (10) and (11) of Port Phillip City Council conditions on which a permit to open or obstruct roadways is issued (attached to Permit). The permanent reinstatement can be undertaken by Council if the applicant is unable to. The applicant at a bare minimum must be reinstated to temporary measures once the permit expires or when the safety precautions are removed.
Any opening within the City of Port Phillip must be back filled with crushed rock, compacted and finished with cold mix as a temporary measure until full reinstatement is completed by the applicant. If the applicant submits this application (Request for Final Inspection) without fully reinstating the surface to the original material being concrete, bluestone or asphalt and to Council requirements, the cost of shall be deducted from the security bond.

How have you reinstated the Road Opening?					
Permanent reinstatement (to original standard)		Temporary reinstatement (less than original standard)			
What material has been used in your reinstatement?					
Crushed and compacted rock (temporary)		Finished with asphalt cold mix (temporary			
Concrete (permanent)		Asphalt hot mix (permanent)		Bluestone (permanent)	
NOTE: If you have reinstated to less than the original quality and material or not to Council standards the reinstatement will be performed by Council's Infrastructure Services and the applicant will be debited or invoiced for the difference. The work will be inspected and final reinstatement (if required) will be undertaken by Council within 28 days on receipt of this form.					

Applicant's Name: .....

Applicant's Signature: ..... **Date:** .....

How to Apply

Submit this application form to: City Permits, City of Port Phillip, Private Bag No. 3, PO St Kilda VIC 3182
Or email a scan to devpermits@portphillip.vic.gov.au or fax to 9536 2745.

Further Information

Contact City Permits on 9209 6216 or devpermits@portphillip.vic.gov.au

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CITY OF PORT PHILLIP
ABN 21 762 977 945

14 October 2015

AECOM
9/8 Exhibition St
MELBOURNE VIC 3000

ROAD OPENING PERMIT
262/2015/RO
Issued Under Community Amenity Local Law No: 1 (Clause 14)

This permit has been approved and issued subject to the following conditions and the permit holder shall be held to have agreed to such conditions and to have accepted any liability or responsibility thereby imposed.

Site of Works: Montague Street, City Rd to Thistlethwaite St, SOUTH MELBOURNE

Description of Works: Bore holes for groundwater sampling.(MW38)
Permit to commence from 10am, 14/10/2015

Permit Valid From: 14 October 2015 **To:** 6 November 2015

In addition to complying with any relevant requirements in the Local Law No. 1, Community Amenity the following conditions apply to the activity or use:

Standard Conditions:

1. All works associated with the road opening including the set-up and removal of necessary signs and barriers may be taken **14 October and 6 November 2015** between Monday to Friday **7am to 5pm** and Saturday **9am to 3pm**. Obstructions to traffic flow are not permitted outside of this period including setting up or removal of the infrastructure.

2. To amend the dates of this licence requires a written request to be received by the City Permits by 5pm, while the permit is still valid. Once a permit has expired it cannot be re-used or amended.

3. A maximum of two (2) amendments to re-schedule the dates of this permit can be considered prior to incurring additional fees.

4. An absolute minimum width of 1.5 metres must be maintained for safe pedestrian access. Pedestrian safety must be maintained at all times by the appopriate use of bollards and tape. On both approaches to the works, the following signs must be clearly displayed and in place during the works;

    a) Pedestrian arrow signs
    a) Pedestrians Watch Your Step or,
    b) Pedestrian Use Other Footpath

5. All traffic treatments must be installed in accordance with any Traffic Management Plan submitted to Council and maintained during the works.

6. Signage must be visible and must not obstruct sightlines, designated pedestrian footpaths and crossovers/accesses. If on-street parking spaces are required to be used, only the spaces clearly specified on the plan can be used for that purpose.

7. Accredited Traffic Control Officers must be present to manage traffic flow during a partial or full road closure. Traffic Control Officers must also assist pedestrians and cyclists as required.

8. If vehicular traffic flow is affected by the works, emergency services, including, Fire Brigade, Ambulance and Police must be notified by the permit-holder a minimum of 24 hours prior the commencement of works.

9. To the satisfaction of, and at no cost to Council, the permit-holder must reinstate all assets and infrastructure.

10. City of Port Phillip does not accept any responsibility for accidents, damage or injury to property, participants or third parties that may arise out of this event. There must be public liability insurance for the type of work proposed with an indemnity of not less than $10M, including full indemnity for the City of Port Phillip Council against any claim laid against it either by members of the public or persons engaged in any activities associated with the traffic diversion who, as a result of the diversion, suffer personal injury, property damage or financial loss.

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    a) The nature of the works being performed
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15. The permit-holder must contact City Permits unit at least 2 business days prior to commencing works, by e-mail: devpermits@portphillip.vic.gov.au, or ph: 03 9209 6216, to organise an inspection with Council's Asset Inspection Officer to determine:

    - the extent of reinstatement works including road pavement, signage and markings
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Reinstatement of footpaths

Asphalt footpaths
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Rigid Road Pavement (Concrete)

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Reinstatement of vehicle crossings
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40. The vehicle crossing must be constructed in accordance with Council's current Standard Drawing.

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Specification for Bluestone Kerb and Channel – Refer to Standard Drawing SD1102

43. The kerb and channel must be reinstated to the satisfaction of Council's Asset Inspection Officer.

Bluestone pitchers
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Road Opening Request for Final Inspection

Community Amenity Local Law No. 1 Clause 14

This form must be completed within 48 hours of completion of works.
Any security bond refunds will be issued within 20 business days.

Applicant Details			
Site Address:			
Applicant/Business Name:			
Applicant's Postal Address:			
Telephone Number:		Mobile Number:	
E-mail Address:			
ABN:		ACN:	
Road Opening Details			
Road Opening Permit No:	.... / .... / **RO**		
Reason for Permit (tick appropriate box)			
Start & Completion Date of Works:	From: / /	To: / /	

What part of the Road Reserve are your works in?									
Footpath		Nature Strip		Road or Lane		Car Park		Kerb Channel	
Size of Opening:	**m L x m W = m²**								

Did any of the following assets require relocation as a result of the Road Opening?							
Parking Ticket Machine		Street Furniture		Litter Bin		Other (please state)	
The applicant is responsible for all associated costs as a result of the relocation of any Council assets.							

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Road Opening Request for Final Inspection

Community Amenity Local Law No. 1 Clause 14

Request for Final Reinstatement

Any excavation or opening must be reinstated to Council requirements as per items (7), (9), (10) and (11) of Port Phillip City Council conditions on which a permit to open or obstruct roadways is issued (attached to Permit). The permanent reinstatement can be undertaken by Council if the applicant is unable to. The applicant at a bare minimum must be reinstated to temporary measures once the permit expires or when the safety precautions are removed.
Any opening within the City of Port Phillip must be back filled with crushed rock, compacted and finished with cold mix as a temporary measure until full reinstatement is completed by the applicant. If the applicant submits this application (Request for Final Inspection) without fully reinstating the surface to the original material being concrete, bluestone or asphalt and to Council requirements, the cost of shall be deducted from the security bond.

How have you reinstated the Road Opening?					
Permanent reinstatement (to original standard)		Temporary reinstatement (less than original standard)			
What material has been used in your reinstatement?					
Crushed and compacted rock (temporary)		Finished with asphalt cold mix (temporary			
Concrete (permanent)		Asphalt hot mix (permanent)		Bluestone (permanent)	
NOTE: If you have reinstated to less than the original quality and material or not to Council standards the reinstatement will be performed by Council's Infrastructure Services and the applicant will be debited or invoiced for the difference. The work will be inspected and final reinstatement (if required) will be undertaken by Council within 28 days on receipt of this form.					

Applicant's Name: .....

Applicant's Signature: ..... **Date:** .....

How to Apply

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www.portphillip.vic.gov.au/road_permits.htm

From:	Kaytie.Le@roads.vic.gov.au on behalf of MNW_WorksWithinRoadReserve@roads.vic.gov.au
Sent:	Tuesday, 13 October 2015 4:31 PM
To:	Coyne, Averyll
Cc:	Con.Bourmas@roads.vic.gov.au; Erica.Purcell@roads.vic.gov.au
Subject:	Re: Monitoring Wells at various location in Port Melbourne... VicRoads Ref: CM/SER/REQ/S6295
Attachments:	Standard Conditions of Consent - Working in the Road Reserve (v3 - Dec 09).doc

Dear Averyll,

I refer to your application dated 9 October 2015 seeking approval to install groundwater monitoring wells at various locations:
well #7 located at Plummer Street, corner of Smith Street
well #15 located south-west corner of Lorimer Street and Rogers Street
well #33 located south side of Normanby Road, south of Kings Way on ramp to West Gate Freeway
well #38 located east side of Montague Street, south of Thistlewaite Street
well #29 located at Williamstown Road, opposite Southward Avenue
well #12 located north side of Williamtowns Road, west of Beacon Road
well #14 located south side of Lorimer Street, in the traffic island of Ingles Street and Lorimer Steet
well #19 located south side of Lorimer Street, back of kerb, wouth-west of Ferrymans Lane
well # 9 located at Plummer Street, west of Graham Street
well # 6 located north side of Williamstown Road, east of Pye Street
well # 2 located east side of Prohasky Street, south of West Gate Freeway
well # 1 located east side of Todd Road, south from West Gate Out Todd ramp

Well # 10 is located on a council controlled road and is not within VicRoads jurisdiction.

VicRoads does not object to the works proposed subject to the conditions below and in the documents attached to this email.

The Applicant must indemnify for a period of one year from the date of the completion of the works, VicRoads and its Associates from any liability, loss, damage, cost or expense suffered or incurred by VicRoads or its Associates as a result of or in connection with the Works except to the extent that the liability, loss, damage, cost or expense is directly caused by the negligent or unlawful conduct of VicRoads or its Associates.

All aspects of Occupational Health and Safety and Worksite Safety - Traffic Management conditions are to be strictly adhered to.

Reinstatement of linemarking affected by these works must be in extruded thermoplastic and road marking in cold applied plastic.

All sites are to be cleaned and returned to the original condition.

Coring in the road pavement is not permitted.

Any works that maybe within the drip line of the trees must have council approval. Please contact the council's arborist for further details and consent.

A copy of that consent from the council must be available to VicRoads on request.

If the need for steel plates arises the plates must be anchored to the road pavement and the edges bevelled with asphalt and the surface must have a skid resistant coating for wet weather conditions.

Any and all works located within the road reserve for which the Council is the responsible road authority under the Road Management Act (ie in general, those areas located on the arterial road behind the back of kerb must comply with council reinstatement requirements, please contact the relevant council for further information.

Works shall comply with EPA's standards and compliance guidelines for noise in road works and major infrastructure projects (Refer to the EPA website: http://www.epa.vic.gov.au/business-and-industry/guidelines/noise-guidance/road-works).

The Road Management Act 2004, Code Of Practice, Management Of Infrastructure In Road Reserves sections 43 to 47 inclusive requires that the public transport operator/s must be contacted for any works on or affecting a public transport route.

These works cannot proceed until the authorisation to erect any Traffic Control Devices needed to facilitate the work is issued. In the event that your work is exempted from such authorisation, under the Road Safety Traffic Management Regulations 2009, **a Traffic Management Plan/s must be sent to VicRoads Road Operations' Permits and Events Team for further conditions, to approve working times and days for these works, for information and as a further condition under this consent**. All these submissions are to be addressed to email address vicroadsmetromoa@roads.vic.gov.au Please ensure this information is relayed to your traffic management company.

Any and all detector loops that are damaged as a consequence of these works must be repaired. Please contact John Irwin on 9313 1390 for further advice.

After the completion of the works a Notification of Completed Works form must be completed and returned to VicRoads for VicRoads inspection, this does not apply to single power pole swap outs, **(as specified in the Road Management Act 2004 Code of Practice (Management of Road and Utility Infrastructure in Road Reserves)). Please note prior to the commencement of work please notify Con Bourmas on 0411 870 516 the Surveillance Officer responsible to outline the scope of works and to also arrange an inspection of the work site when the job is completed.**

Should there be a change in the scope of works VicRoads must be notified immediately in writing. The notification of changes in the scope of works will be treated as a new submission.

If you have any queries regarding this matter please do not hesitate to call me on Tel: 9313 1305.

Yours sincerely

Kaytie Le
(Application for Consent to Work within Road Reserves)
Maintenance Projects
Metropolitan Operations
North West Metro Region

this means of communication and/or the information contained in and/or attached to this communication. If this communication has been received in error, please contact the person who sent this communication and delete all copies.

COPY OF RECORD IN THE VICTORIAN WATER REGISTER

LICENCE TO CONSTRUCT WORKS

under Section 67 of the Water Act 1989

The information in this copy of record is as recorded at the time of printing. Current information should be obtained by a search of the register. The State of Victoria does not warrant the accuracy or completeness of this information and accepts no responsibility for any subsequent release, publication or reproduction of this information.

This licence does not remove the need to apply for any authorisation or permission necessary under any other Act of Parliament with respect to anything authorised by the works licence.

Water used under this licence is not fit for any use that may involve human consumption, directly or indirectly, without first being properly treated.

This licence is not to be interpreted as an endorsement of the design and/or construction of any works (including dams). The Authority does not accept any responsibility or liability for any suits or actions arising from injury, loss, damage or death to person or property which may arise from the maintenance, existence or use of the works.

Each person named as a licence holder is responsible for ensuring all the conditions of this licence are complied with.

This licence authorises its holders to construct the described works, subject to the conditions.

Licence Holder(s)

EPA VICTORIA of GPO BOX 4395 MELBOURNE VIC 3001

Licence Contact Details

EPA VICTORIA	GPO BOX 4395 MELBOURNE VIC 3001

Licence Details

Expiry date	06 Oct 2016
Status	Active
Authority	Southern Rural Water
Name of waterway or aquifer	NA for construct/decommission
Water system	Unincorporated (GMU)

Summary of Licensed Works

The details in this section are a summary only. They are subject to the conditions specified in this licence.

Works ID	*Works type*	*Use of water*
WRK089403	Bore	Investigation
WRK089404	Bore	Investigation
WRK089405	Bore	Investigation
WRK089406	Bore	Investigation
WRK089407	Bore	Investigation
WRK089408	Bore	Investigation
WRK089409	Bore	Investigation
WRK089410	Bore	Investigation
WRK089411	Bore	Investigation
WRK089412	Bore	Investigation
WRK089413	Bore	Investigation

Description of Licensed Works

WORKS ID WRK089403

Works type	Bore
Works subtype	Drilled bore
Proposed maximum depth	30.000 metres

Works location

Easting	*Northing*	*Zone MGA*
316393.823	5810551.258	Zone 55

Other land description

78 G7

Property address

Location(s) in or near PORT MELBOURNE, Parish: Melbourne South

Description of Licensed Works

WORKS ID WRK089404

Works type	Bore
Works subtype	Drilled bore
Proposed maximum depth	30.000 metres

Works location

Easting	*Northing*	*Zone MGA*
316772.204	5810305.296	Zone 55

Other land description

78 G7

Property address

Location(s) in or near PORT MELBOURNE, Parish: Melbourne South

Description of Licensed Works

WORKS ID WRK089405

Works type	Bore
Works subtype	Drilled bore
Proposed maximum depth	30.000 metres

Works location

Easting	*Northing*	*Zone MGA*
316910.907	5810554.341	Zone 55

Other land description

78 G7

Property address

Location(s) in or near PORT MELBOURNE, Parish: Melbourne South

Description of Licensed Works

WORKS ID WRK089406

Works type	Bore
Works subtype	Drilled bore
Proposed maximum depth	30.000 metres

Works location

Easting	*Northing*	*Zone MGA*
317143.282	5810493.303	Zone 55

Other land description

78 G7

Property address

Location(s) in or near PORT MELBOURNE, Parish: Melbourne South

Description of Licensed Works

WORKS ID WRK089407

Works type	Bore
Works subtype	Drilled bore
Proposed maximum depth	30.000 metres

Works location

Easting	*Northing*	*Zone MGA*
317201.242	5810682.600	Zone 55

Other land description
78 G7

Property address
Location(s) in or near PORT MELBOURNE, Parish: Melbourne South

Description of Licensed Works

WORKS ID WRK089408

Works type	Bore
Works subtype	Drilled bore
Proposed maximum depth	30.000 metres

Works location

Easting	*Northing*	*Zone MGA*
317303.088	5810877.838	Zone 55

Other land description
78 G7

Property address
Location(s) in or near PORT MELBOURNE, Parish: Melbourne South

Description of Licensed Works

WORKS ID WRK089409

Works type	Bore
Works subtype	Drilled bore
Proposed maximum depth	30.000 metres

Works location

Easting	*Northing*	*Zone MGA*
317406.504	5811233.157	Zone 55

Other land description
78 G7

Property address
Location(s) in or near PORT MELBOURNE, Parish: Melbourne South

Description of Licensed Works

WORKS ID WRK089410

Works type	Bore
Works subtype	Drilled bore
Proposed maximum depth	30.000 metres

Works location

Easting	*Northing*	*Zone MGA*
317475.522	5811046.582	Zone 55

Other land description
78 G7

Property address
Location(s) in or near PORT MELBOURNE, Parish: Melbourne South

Description of Licensed Works

WORKS ID WRK089411

Works type	Bore
Works subtype	Drilled bore
Proposed maximum depth	30.000 metres

Works location

Easting	*Northing*	*Zone MGA*
317670.248	5810548.612	Zone 55

Other land description
78 G7

Property address
Location(s) in or near PORT MELBOURNE, Parish: Melbourne South

Description of Licensed Works

WORKS ID WRK089412

Works type	Bore
Works subtype	Drilled bore
Proposed maximum depth	30.000 metres

Works location

Easting	*Northing*	*Zone MGA*
317861.192	5810833.785	Zone 55

Other land description
78 G7

Property address
Location(s) in or near PORT MELBOURNE, Parish: Melbourne South

Description of Licensed Works

WORKS ID WRK089413

Works type	Bore
Works subtype	Drilled bore
Proposed maximum depth	30.000 metres

Works location

Easting	*Northing*	*Zone MGA*
317938.620	5811141.531	Zone 55

Other land description

78 G7

Property address

Location(s) in or near PORT MELBOURNE, Parish: Melbourne South

Related Instruments

Related entitlements	Nil
Related water-use entities	Nil

Application History

Reference	*Type*	*Status*	*Lodged date*	*Approved date*	*Recorded date*
WLI602374	Issue	Approved	06 Oct 2015	06 Oct 2015	

Conditions

Licence WLE063166 is subject to the following conditions:

Siting and construction

1 The bore(s) must be drilled at the location specified in the application approved by the Authority.

2 If after drilling the bore is considered unsatisfactory a replacement bore may be drilled on the land specified in the licence.

Preventing pollution

3 All earthworks must be carried out, and all drilling fluids and waters produced during construction and development must be disposed of, in ways that avoid contaminating native vegetation, waterways, aquifers, the riparian environment, the riverine environment or other people's property.

4 Construction must stop immediately if the Authority reasonably believes that fuel, lubricant, drilling fluid, soil or water produced during construction and development is at risk of being spilled into native vegetation, waterways, aquifers, the riparian environment, the riverine environment or other people's property.

5 The licence holder must construct and maintain bund walls, in accordance with the timeframe, specifications, guidelines or standards prescribed by the Authority, to prevent fuel, lubricant, drilling fluid, soil or water produced during construction and development from being spilled into native vegetation, waterways, aquifers, the riparian environment, the riverine environment or other people's property.

Construction standards

6 The bore(s) must be constructed, and where relevant decommissioned, in accordance with the Minimum Construction Requirements for Water Bores in Australia, Edition 3 or its successor.

Drilling licence and supervision requirements

7 The bore(s) must be constructed by, or under the direct supervision of, a driller licensed under the Water Act 1989 and endorsed as a Class 1, 2, or 3 driller, with appropriate endorsements.

8 If artesian pressure is expected or encountered, then a driller licensed under the Water Act 1989, and endorsed as a class 3 driller, must install casing in the bore(s) to a suitable depth, and in a suitable manner, to prevent its outbreak. A suitable valve must also be fitted to the bore.

Bore completion report

9 A Bore Completion Report must be submitted to the Authority within 28 working days of the bore(s) being completed.

Protecting water resources

10 At the completion of drilling, and before the drilling rig leaves the site, all bore(s) must be decommissioned so as to eliminate physical hazards, conserve aquifer yield, prevent groundwater contamination and prevent the intermingling of desirable and undesirable waters.

11 The bore(s) must be located at least 30 metres from any authority's channel, reserve or easement unless authorised by the Authority.

Protecting water quality

12 Drilling must not exceed the maximum depth.

13 The bore(s) must be constructed so as to prevent aquifer contamination caused by vertical flow outside the casing.

14 If two or more aquifers are encountered, the bore(s) must be constructed to ensure that an impervious seal is made and maintained between each aquifer to prevent aquifer connection through vertical flow outside the casing; under no circumstances are two or more aquifers to be screened within the one bore or in any other manner to allow connection between them.

15 Boreheads must be constructed, to ensure that no flood water, surface runoff or potential subsurface contaminated soakage can enter the bore or bore annulus.

Fees and charges

16 The licence holder must, when requested by the Authority, pay all fees, costs and other charges under the Water Act 1989 in respect of this licence.

END OF COPY OF RECORD

Appendix C

Survey Report

HEADING & ASSOCIATES
Conquering New Boundaries

REF. AECOM- FISHERMENS BEND
1st December 2015

Dear Averyll

Re: Fishermens Bend, Melbourne Victoria

We have completed the survey of the above location during November 2015, and confirm that the report has been emailed to Averyll.Coyne@aecom.com

Co-ordinates and levels have been supplied for 37 of the 38 (*see notes) ground water wells which were identified on the site plan provided.

Should you have any queries regarding this or any other matter please do not hesitate to contact this office.

Regards,

Dominic Martin

Tel: (03) 9916 9130
Fax: (03) 9376 4831
Email: dmartin@headingassociates.com.au

Aecom					
Fishermens Bend Victoria					
DATE: 01/12/2015	MGA 94 Zone 55 Co-ordinates		AHD		
Point ID	East	North	TOC	GATIC	Existing Surface
1	316394.91	5810553.15	2.495	2.564	
2	316883.53	5810836.08	3.968	4.071	4.058
3	317403.56	5811235.00	3.846	3.918	
4	317495.70	5811035.28	3.824	3.887	
`5	317935.75	5811143.34	3.049	3.125	
6	316729.82	5810300.90	2.245	2.338	
7	317194.71	5810680.71	3.086	3.247	3.224
8	317297.92	5810872.76	3.130	3.210	
9	317637.81	5810767.87	3.284	3.405	
10	318065.09	5810906.74	3.100	3.184	
11	317152.82	5810474.06	2.579	2.653	
12	317697.98	5810560.80	2.851	3.014	
13	317901.48	5811689.81	2.400	2.484	
14	318101.04	5811875.97	2.357	2.445	
15	318511.98	5811770.42	1.221	1.299	
16	318174.41	5811683.82	2.477	2.614	
17	318393.83	5811564.62	2.037	2.107	
18	318703.33	5811581.43	0.781	0.866	
19	319006.47	5811598.53	1.557	1.644	
25	318261.47	5811117.54	3.165	3.265	
21	318290.55	5811395.36	2.605	2.692	
22	318533.36	5811478.34	2.021	2.134	
23	318642.63	5811353.20	1.903	2.009	
24	318946.18	5811288.49	1.673	1.742	1.679
20	318101.97	5811275.06	3.415	3.487	
26	318451.65	5811145.19	2.448	2.514	
27	318747.11	5811075.77	2.302	2.372	
28	319063.09	5811183.31	1.619	1.731	1.703
29	318279.19	5810658.74	2.582	2.693	
30	318719.82	5810867.90	2.158	2.231	
31	319277.30	5811331.14	1.487	1.563	1.561
32A*(See Note)	319493.56	5811327.30	1.875	1.971	1.941
32B*(See Note)	319505.47	5811307.78	1.871	1.941	
33	319762.95	5811306.55	2.511	2.626	
34	319678.82	5811135.90	1.098	1.165	
35	320094.53	5811199.72	2.002	1.895	
36	319337.66	5810985.77	1.667	1.733	
37	319483.13	5810855.55	2.235	2.329	
38	319724.09	5810818.18	2.362	2.462	

*LEVELS ARE BASED ON MELBOURNE SOUTH PM 242

MELBOURNE SOUTH PM 242

EASTING	316537.985m
NORTHING	5 810 216.394m
A.H.D RL	1.921m

*Note- Well 32 not located in indicated position, Wells 32A, 32B are in the positions shown below.

Appendix D

Waste Transport Documentation

ENVIRONMENT PROTECTION AUTHORITY VICTORIA
WASTE TRANSPORT CERTIFICATE

1255232

EPA VICTORIA
GPO BOX 4395
MELBOURNE 3001
1300 372 842
1300 EPA VIC
epa.vic.gov.au

PART A
To be completed by the Producer of the Waste

1. Name of Waste Producer: MATHEY DRILLING
Address of Site of Waste Source: 5/8 ROCKLEA DR PORT MELBOURNE
Postcode: 3207
Name of Emergency Contact: S. DULLEWE
Phone: 0433323605

2. Proposed Disposal/Treatment/Storage Facility: TOXFREE
State: VIC

3. Intended Treatment Option: Recycling ☐ Storage ☐ Landfill ☑ Incineration ☐ Energy Recovery ☐ Immobilisation ☐ Chem/Phys Treatment ☐ Biodegradation ☐ Other ☐

4. Description of Waste: DRILLING MUD

5. Waste Form: S | Waste Code: T130 | Hazard Category: | Contaminants: | Waste Origin: 2422
UN Number: 3077 | Class: 9 | Packing Group: | Bulk/No. of Packages: 9
Amount of Waste: 2300 kilograms or cubic metres or litres

I declare that to the best of my knowledge and belief the above information is true and correct.
Name and Position: Adam Kempster
Signature: Kempster Date: 19/10/15

PART B
To be completed by the Waste Transporter

6. Name of Transporter: TOXFREE
Address: 83 DOHERTY RD LAVERTON NORTH
Vehicle No. 1 Registration: 1DIG2G | Transport Permit No.: 111196 | Vehicle No. 2 Registration: | Transport Permit No.:

I acknowledge receipt of the waste described in part A.
Name (in block letters): K ARMSTRONG
Signature: Date: 19/10/15

PART C
To be completed by the Waste Receiver

7. Name of Disposal/Treatment/Storage Facility: TOXFREE AUSTRALIA
Address: 83 Dohertys Road LAVERTON NTH 3026
Licence No.: 9738
Type of Treatment: D15

8. Amount of Waste: 2300 kilograms or cubic metres or litres

9. Are there any discrepancies between the wastes described above and the waste received?
YES ☐ NO ☒ Briefly note discrepancy:

10. Name and address of any other waste receiver to which the waste receiver intends that the waste be transported

11. I hereby acknowledge acceptance of the waste described in part A.
Name:
Signature: Date: 19/10/15

PLEASE USE BLOCK LETTERS

COPY 3 — TO BE RETAINED BY THE PERSON/COMPANY WHO COMPLETED PART C

EPA-F012

COPY 3

ENVIRONMENT PROTECTION AUTHORITY VICTORIA
WASTE TRANSPORT CERTIFICATE

1255233

EPA VICTORIA
GPO BOX 4395
MELBOURNE 3001
1300 372 842
1300 EPA VIC
epa.vic.gov.au

PART A
To be completed by the Producer of the Waste

1. Name of Waste Producer: MATRIX DRILLING
Address of Site of Waste Source: 5/8 ROCKLEA DR PORT MELBOURNE
Postcode: 3207
Name of Emergency Contact: S. DILLEWE
Phone: 0433323605

2. Proposed Disposal/Treatment/Storage Facility: TOXFREE
State: VIC

3. Intended Treatment Option: Recycling ☐ Storage ☑ Landfill ☐ Incineration ☐ Energy Recovery ☐ Immobilisation ☐ Chem/Phys Treatment ☐ Biodegradation ☐ Other ☐

4. Description of Waste: WATER

5. Waste Form: L | Waste Code: L150 | Hazard Category: | Contaminants: | Waste Origin: 2922
UN Number: 3077 | Class: 9 | Packing Group: | Bulk/No. of Packages: 2
Amount of Waste: kilograms: | or cubic metres: | or litres: 400

I declare that to the best of my knowledge and belief the above information is true and correct.
Name and Position: Adam Compston
Signature: [signature] Date: 19/10/15

PLEASE USE BLOCK LETTERS

PART B
To be completed by the Waste Transporter

6. Name of Transporter: TOXFREE
Address: 83 DOHERTYS RD LAVERTON NORTH
Vehicle No. 1 Registration: 1DJ6NG | Transport Permit No.: 111946
Vehicle No. 2 Registration: | Transport Permit No.:

I acknowledge receipt of the waste described in part A.
Name (in block letters): K. ARMSTRONG
Signature: [signature] Date: 19/10/15

PART C
To be completed by the Waste Receiver

7. Name of Disposal/Treatment/Storage Facility:
Licence No.: 9738
Address: TOXFREE AUSTRALIA 83 Dohertys Road LAVERTON NTH 3026
Type of Treatment: D15

8. Amount of Waste: kilograms: 3300 | or cubic metres: | or litres: 460

9. Are there any discrepancies between the wastes described above and the waste received?
YES ☐ NO ☒ Briefly note discrepancy:

10. Name and address of any other waste receiver to which the waste receiver intends that the waste be transported

I hereby acknowledge acceptance of the waste described in part A.
Name: Andy
Signature: [signature] Date: 19/10/15

EPA-F012

COPY 3 — TO BE RETAINED BY THE PERSON/COMPANY WHO COMPLETED PART C

COPY 3

ENVIRONMENT PROTECTION AUTHORITY VICTORIA
WASTE TRANSPORT CERTIFICATE

1253007

EPA VICTORIA
GPO BOX 4395
MELBOURNE 3001
1300 372 842
1300 EPA VIC
epa.vic.gov.au

PART A
To be completed by the Producer of the Waste

1. Name of Waste Producer: MATRIX
Address of Site of Waste Source: 5/8 ROCKLEA DR. PORT MELBOURNE
Postcode: 3207
Name of Emergency Contact: S. DULLEW
Phone: 0433323605

2. Proposed Disposal/Treatment/Storage Facility: TOXFREE
State: VIC

3. Intended Treatment Option: Recycling ☐ Storage ☐ Landfill ☑ Incineration ☐ Energy Recovery ☐ Immobilisation ☐ Chem/Phys Treatment ☐ Biodegradation ☐ Other ☐

4. Description of Waste: DRILLING MUD

5. Waste Form: S | Waste Code: T130 | Hazard Category: | Contaminants: | Waste Origin: 2927
UN Number: 3077 | Class: 9 | Packing Group: III | Bulk/No. of Packages: 2
Amount of Waste: 600 kilograms or ____ cubic metres or ____ litres
I declare that to the best of my knowledge and belief the above information is true and correct.
Name and Position: MATTHEW SHEPPARD/SCIENTIST
Signature: ..... Date: 26/10/15

PLEASE USE BLOCK LETTERS

PART B
To be completed by the Waste Transporter

6. Name of Transporter: TOXFREE
Address: 83 DOHERTYS RD LAVERTON NORTH
Vehicle No. 1 Registration: 1DI6PG | Transport Permit No.: 111196 | Vehicle No. 2 Registration: | Transport Permit No.:
I acknowledge receipt of the waste described in part A.
Name (in block letters): K. ARMSTRONG
Signature: ..... Date: 26/10/15

PART C
To be completed by the Waste Receiver

7. Name of Disposal/Treatment/Storage Facility: TOXFREE AUSTRALIA | Licence No.: 9738
Address: 83 Dohertys Road LAVERTON NTH 3026 | Type of Treatment: D15

8. Amount of Waste: 600 kilograms or ____ cubic metres or ____ litres

9. Are there any discrepancies between the wastes described above and the waste received?
YES ☐ NO ☒ Briefly note discrepancy: .....

10. Name and address of any other waste receiver to which the waste receiver intends that the waste be transported
.....

11. I hereby acknowledge acceptance of the waste described in part A.
Name: Abid
Signature: ..... Date: 26/10/15

EPA-F012

COPY 3 — TO BE RETAINED BY THE PERSON/COMPANY WHO COMPLETED PART C

COPY 3

ENVIRONMENT PROTECTION AUTHORITY VICTORIA
WASTE TRANSPORT CERTIFICATE

1253013

EPA VICTORIA
GPO BOX 4395
MELBOURNE 3001
1300 372 842
1300 EPA VIC
epa.vic.gov.au

PART A
To be completed by the Producer of the Waste

1. Name of Waste Producer: MATRIX DRILLING
Address of Site of Waste Source: 6-8 ROCKLEA DR. PORTMELBOURNE
Postcode: 3027
Name of Emergency Contact: S. DOLLEAGE
Phone: 0433723605

2. Proposed Disposal/Treatment/Storage Facility: TOXFREE
State:

3. Intended Treatment Option: Recycling ☐ Storage ☐ Landfill ☑ Incineration ☐ Energy Recovery ☐ Immobilisation ☐ Chem/Phys Treatment ☐ Biodegradation ☐ Other ☐

4. Description of Waste: DRILLING MUD

5. Waste Form: S | Waste Code: T135 | Hazard Category: | Contaminants: | Waste Origin: 2427
UN Number: 3082 | Class: 9 | Packing Group: | Bulk/No. of Packages: 4
Amount of Waste: 1200 kilograms or cubic metres or litres
I declare that to the best of my knowledge and belief the above information is true and correct.
Name and Position: MATTHEW SHEPHERD / SCIENTIST
Signature ..... Date: 27/10/15

PLEASE USE BLOCK LETTERS

PART B
To be completed by the Waste Transporter

6. Name of Transporter: TOXFREE
Address: 83 DOHERTY RD. LAVERTON NORTH
Vehicle No. 1 Registration: 1DIG19 | Transport Permit No.: 111196 | Vehicle No. 2 Registration: | Transport Permit No.:
I acknowledge receipt of the waste described in part A.
Name (in block letters): T. ARMSTRONG
Signature ..... Date: 27/10/15

PART C
To be completed by the Waste Receiver

7. Name of Disposal/Treatment/Storage Facility: TOXFREE AUSTRALIA
Licence No.: 9738
Address: 83 Dohertys Road LAVERTON NTH 3026
Type of Treatment: D15

8. Amount of Waste: 1200 kilograms or cubic metres or litres

9. Are there any discrepancies between the wastes described above and the waste received?
YES ☐ NO ☒ Briefly note discrepancy:.....

10. Name and address of any other waste receiver to which the waste receiver intends that the waste be transported
.....

11. I hereby acknowledge acceptance of the waste described in part A.
Name: ABDU
Signature ..... Date: 27/10/15

EPA-F012

COPY 3 — TO BE RETAINED BY THE PERSON/COMPANY WHO COMPLETED PART C

COPY 3

ENVIRONMENT PROTECTION AUTHORITY VICTORIA
WASTE TRANSPORT CERTIFICATE

1253014

EPA VICTORIA
GPO BOX 4395
MELBOURNE 3001
1300 372 842
1300 EPA VIC
epa.vic.gov.au

PART A
To be completed by the Producer of the Waste

1. Name of Waste Producer: MATRIX DRILLING
Address of Site of Waste Source: UNIT 5/8 ROCKLEA D-E
PORT MELBOURNE Postcode: 3207
Name of Emergency Contact: SHAUN DULLEVE Phone: 0433323605

2. Proposed Disposal/Treatment/Storage Facility: TOXFREE State: VIC

3. Intended Treatment Option: Recycling ☐ Storage ☐ Landfill ☐ Incineration ☐ Energy Recovery ☐ Immobilisation ☐ Chem/Phys Treatment ☐ Biodegradation ☐ Other ☐

4. Description of Waste: DRILLING MUD

5. Waste Form: S Waste Code: K130 Hazard Category: Contaminants: Waste Origin: 2922
UN Number: 3077 Class: 9 Packing Group: III Bulk/No. of Packages: 2
Amount of Waste: kilograms or 1 cubic metres or litres

I declare that to the best of my knowledge and belief the above information is true and correct.
Name and Position: MATTHEW SHEPPARD ENVIRONMENTAL SCIENTIST
Signature ..... Date: 28 / 10 / 15

PART B
To be completed by the Waste Transporter

6. Name of Transporter: TOXFREE
Address: 83 DOHERTYS RD LAVERTON NTH
Vehicle No. 1 Registration: 2SQ407 Transport Permit No.: 44168 Vehicle No. 2 Registration: Transport Permit No.:

I acknowledge receipt of the waste described in part A.
Name (in block letters): MATTHEW BEZZINA
Signature ..... Date: 28 / 10 / 15

PART C
To be completed by the Waste Receiver

7. Name of Disposal/Treatment/Storage Facility: TOXFREE AUSTRALIA Licence No.: 6738
Address: 83 Dohertys Road LAVERTON NTH 3026 Type of Treatment: D15

8. Amount of Waste: kilograms or 1 cubic metres or litres

9. Are there any discrepancies between the wastes described above and the waste received?
YES ☐ NO ☒ Briefly note discrepancy: .....

10. Name and address of any other waste receiver to which the waste receiver intends that the waste be transported
.....

11. I hereby acknowledge acceptance of the waste described in part A.
Name: ABDU
Signature ..... Date: 28 / 10 / 15

PLEASE USE BLOCK LETTERS

COPY 3 — TO BE RETAINED BY THE PERSON/COMPANY WHO COMPLETED PART C

EPA-F012

COPY 3

ENVIRONMENT PROTECTION AUTHORITY VICTORIA
WASTE TRANSPORT CERTIFICATE

1253015

EPA VICTORIA
GPO BOX 4395
MELBOURNE 3001
1300 372 842
1300 EPA VIC
epa.vic.gov.au

PART A
To be completed by the Producer of the Waste

1. Name of Waste Producer: MATRIX DRILLING
Address of Site of Waste Source: UNIT 5/8 ROCKLEA D-E
PORT MELBOURNE Postcode 3207
Name of Emergency Contact: SHALIN DULGANE Phone 0433323605

2. Proposed Disposal/Treatment/Storage Facility: TOXFREE State VIC

3. Intended Treatment Option: Recycling ☐ Storage ☑ Landfill ☐ Incineration ☐ Energy Recovery ☐ Immobilisation ☐ Chem/Phys Treatment ☐ Biodegradation ☐ Other ☐

4. Description of Waste: DRILLING MUD

5. Waste Form: S Waste Code: T130 Hazard Category: Contaminants: Waste Origin: 2922
UN Number: 3077 Class: 9 • H Packing Group: III Bulk/No. of Packages: 5
Amount of Waste: kilograms or 1.5 cubic metres or litres
I declare that to the best of my knowledge and belief the above information is true and correct.
Name and Position: MATTHEW SHEPHARD SCIENTIST
Signature ..... Date 29 / 10 / 15

PLEASE USE BLOCK LETTERS

PART B
To be completed by the Waste Transporter

6. Name of Transporter: TOXFREE
Address: 83 DOHERTYS RD LAVERTON NORTH
Vehicle No. 1 Registration: 2SQH07 Transport Permit No.: 44168 Vehicle No. 2 Registration: Transport Permit No.:
I acknowledge receipt of the waste described in part A.
Name (in block letters): MATTHEW BEZZINA
Signature ..... Date 29 / 10 / 15

PART C
To be completed by the Waste Receiver

7. Name of Disposal/Treatment/Storage Facility: TOXFREE AUSTRALIA Licence No.: 4738
Address: 83 Dohertys Road LAVERTON NTH 3026 Type of Treatment: D11

8. Amount of Waste: kilograms or 1.5 cubic metres or litres

9. Are there any discrepancies between the wastes described above and the waste received?
YES ☐ NO ☑ Briefly note discrepancy: .....

10. Name and address of any other waste receiver to which the waste receiver intends that the waste be transported
.....

11. I hereby acknowledge acceptance of the waste described in part A.
Name: Abdu
Signature ..... Date 29 / 10 / 15

EPA-F012

COPY 3 – TO BE RETAINED BY THE PERSON/COMPANY WHO COMPLETED PART C

COPY 3

ENVIRONMENT PROTECTION AUTHORITY VICTORIA
WASTE TRANSPORT CERTIFICATE

1253016

EPA VICTORIA
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MELBOURNE 3001
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PART A
To be completed by the Producer of the Waste

1. Name of Waste Producer: MATRIX

Address of Site of Waste Source: S/18 ROCKLEA DR PORT MELBOURNE

Postcode: 3207

Name of Emergency Contact: S. DULLAWE

Phone: 0433323605

2. Proposed Disposal/Treatment/Storage Facility: TOXFREE

State:

3. Intended Treatment Option: Recycling ☐ Storage ☐ Landfill ☑ Incineration ☐ Energy Recovery ☐ Immobilisation ☐ Chem/Phys Treatment ☐ Biodegradation ☐ Other ☐

4. Description of Waste: DRILLING MUD

5. Waste Form: S | Waste Code: 1130 | Hazard Category: | Contaminants: | Waste Origin: 292

UN Number: 3077 | Class: 9 | Packing Group: | Bulk/No. of Packages: 3

Amount of Waste: 900 kilograms or cubic metres or litres

I declare that to the best of my knowledge and belief the above information is true and correct.

Name and Position: MATTHEW EDWARDS SCIENTIST

Signature ..... Date: 30/10/15

PLEASE USE BLOCK LETTERS

PART B
To be completed by the Waste Transporter

6. Name of Transporter: TOXFREE

Address: 83 DOHERTY RD LAVERTON NORTH

Vehicle No. 1 Registration: 1DFGW9 | Transport Permit No.: 11196 | Vehicle No. 2 Registration: | Transport Permit No.:

I acknowledge receipt of the waste described in part A.

Name (in block letters): M. ANNICCHIARICO

Signature ..... Date: 30/10/15

PART C
To be completed by the Waste Receiver

7. Name of Disposal/Treatment/Storage Facility: TOXFREE AUSTRALIA

Licence No.: 9238

Address: 83 Dohertys Road LAVERTON NTH 3026

Type of Treatment: D11

8. Amount of Waste: 900 kilograms or cubic metres or litres

9. Are there any discrepancies between the wastes described above and the waste received?

YES ☐ NO ☒ Briefly note discrepancy: .....

10. Name and address of any other waste receiver to which the waste receiver intends that the waste be transported

.....

11. I hereby acknowledge acceptance of the waste described in part A.

Name: A.L.U

Signature ..... Date: 30/10/15

EPA-F012

COPY 3 — TO BE RETAINED BY THE PERSON/COMPANY WHO COMPLETED PART C

COPY 3

ENVIRONMENT PROTECTION AUTHORITY VICTORIA
WASTE TRANSPORT CERTIFICATE

1253038

EPA VICTORIA
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MELBOURNE 3001
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1300 EPA VIC
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PART A
To be completed by the Producer of the Waste

1. Name of Waste Producer: MATRIX DRILLING
Address of Site of Waste Source: UNIT 5/8 ROCKLEA DR
PORT MELBOURNE Postcode 3207
Name of Emergency Contact: SHALINI DULLENE Phone 0433323605

2. Proposed Disposal/Treatment/Storage Facility: TOXFREE State VIC

3. Intended Treatment Option: Recycling ☐ Storage ☑ Landfill ☐ Incineration ☐ Energy Recovery ☐ Immobilisation ☐ Chem/Phys Treatment ☐ Biodegradation ☐ Other ☐

4. Description of Waste: DRILLING MUD

5. Waste Form: S | Waste Code: T130 | Hazard Category: | Contaminants: | Waste Origin: 2922
UN Number: 3077 | Class: 9 • H | Packing Group: III | Bulk/No. of Packages: 4
Amount of Waste: kilograms or 1 cubic metres or litres

I declare that to the best of my knowledge and belief the above information is true and correct.
Name and Position: SHALINI DULLENE
Signature ..... Date 09 / 11 / 15

PLEASE USE BLOCK LETTERS

PART B
To be completed by the Waste Transporter

6. Name of Transporter: TOXFREE
Address: 83 DOHERTYS RD LAVERTON NTH
Vehicle No. 1 Registration: 2594O7 Transport Permit No.: 44168 Vehicle No. 2 Registration: Transport Permit No.:

I acknowledge receipt of the waste described in part A.
Name (in block letters): MATTHEW BEZZINA
Signature ..... Date 09 / 11 / 15

PART C
To be completed by the Waste Receiver

7. Name of Disposal/Treatment/Storage Facility: TOXFREE AUSTRALIA Licence No.: 9738
Address: 83 Dohertys Road LAVERTON NTH 3026 Type of Treatment: D15

8. Amount of Waste: kilograms or 1 cubic metres or litres

9. Are there any discrepancies between the wastes described above and the waste received?
YES ☐ NO ☒ Briefly note discrepancy: .....

10. Name and address of any other waste receiver to which the waste receiver intends that the waste be transported
.....

11. I hereby acknowledge acceptance of the waste described in part A.
Name: Abdi
Signature ..... Date 09 / 11 / 15

COPY 3 — TO BE RETAINED BY THE PERSON/COMPANY WHO COMPLETED PART C

EPA-F012

COPY 3

ENVIRONMENT PROTECTION AUTHORITY VICTORIA
WASTE TRANSPORT CERTIFICATE

1220062

EPA VICTORIA
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MELBOURNE 3001
1300 372 842
1300 EPA VIC
epa.vic.gov.au

PART A
To be completed by the Producer of the Waste

1. Name of Waste Producer: AECOM AUST
Address of Site of Waste Source: 18 WOODRUFF PORT MELBOURNE
Postcode: 3207
Name of Emergency Contact: E. EGGLESTON
Phone: 0488488523

2. Proposed Disposal/Treatment/Storage Facility: TOXFREE
State: VIC

3. Intended Treatment Option: Recycling ☐ Storage ☑ Landfill ☐ Incineration ☐ Energy Recovery ☐ Immobilisation ☐ Chem/Phys Treatment ☐ Biodegradation ☐ Other ☐

4. Description of Waste: CONTAMINATED WATER

5. Waste Form: L | Waste Code: L150 | Hazard Category: | Contaminants: | Waste Origin: 87.00
UN Number: 3082 | Class: 9 | Packing Group: | Bulk/No. of Packages: 5
Amount of Waste: kilograms | or cubic metres | or 1000 litres

I declare that to the best of my knowledge and belief the above information is true and correct.
Name and Position: E. EGGLESTON
Signature: [signature] Date: 18/12/15

PLEASE USE BLOCK LETTERS

PART B
To be completed by the Waste Transporter

6. Name of Transporter: TOXFREE
Address: 83 DOHERTYS RD LAVERTON NORTH

Vehicle No. 1 Registration	Transport Permit No.	Vehicle No. 2 Registration	Transport Permit No.
DFL69	111196		

I acknowledge receipt of the waste described in part A.
Name (in block letters): K ARMSTRONG
Signature: [signature] Date: 18/12/15

PART C
To be completed by the Waste Receiver

7. Name of Disposal/Treatment/Storage Facility: Licence No.
Address: Type of Treatment

8. Amount of Waste: kilograms | or cubic metres | or litres

9. Are there any discrepancies between the wastes described above and the waste received?
YES ☐ NO ☐ Briefly note discrepancy:.....

10. Name and address of any other waste receiver to which the waste receiver intends that the waste be transported
.....

11. I hereby acknowledge acceptance of the waste described in part A.
Name:
Signature..... Date:

EPA-F012

COPY 2 — TO BE RETAINED BY THE PERSON/COMPANY WHO COMPLETED PART A

COPY 2

Appendix E

Bore Logs

AECOM
Level 45, 80 Collins Street
MELBOURNE VIC 3004
Telephone: 03 9653 1234
Fax: 03 9654 7117

BORING/WELL CONSTRUCTION LOG

GW01

PROJECT NUMBER 60431087
PROJECT NAME FBURA
LOCATION Fishermans Bend
DRILLING METHOD HA/PT/HFA
SAMPLING METHOD PT/Grab
SURFACE ELEVATION
WELL HEAD/TOC
LOGGED BY Oliver Taylor
COMMENTS

DATE 30/10/2015
BLANK
SCREEN 2.5-4.5
GRAVEL PACK 2.0-4.5
SANITARY SEAL/BENTONITE 1.0-2.0
STABILISED WATER LEVEL
GROUND WATER ELEVATION

PID (ppm)	BLOW COUNTS	RECOVERY	SAMPLE NUMBER	ANALYSED	DEPTH (mBGS)	GRAPHIC LOG	LITHOLOGIC DESCRIPTION	CONTACT DEPTH	WELL DIAGRAM
					1		FILL Silty Gravels; moderately dense; brown/grey; moist; petroleum odour; rubble and wood pieces; roots.	1.50	
35			GW01_ 1.5-1.6		2		Silt; soft; dark grey; very moist; petroleum odour; wood pieces; possible creosote.	2.50	
285			GW01_ 2.5-2.6		3		▽ Silt and Clay; dark grey; soft; very moist; petroleum odour; rubble; wood pieces; garbage; possible creosote.	3.50	
280			GW01_ 3.5-3.6		4		Clay; soft; black; saturated; petroleum odour; possible creosote/oil.	4.50	
							Total Depth: 4.50 m		

BORING / WELL CONSTRUCTION LOG FBURA_GINT_BORELOGS.GPJ HLA_SYD.GDT 14/1/16

AECOM
Level 45, 80 Collins Street
MELBOURNE VIC 3004
Telephone: 03 9653 1234
Fax: 03 9654 7117

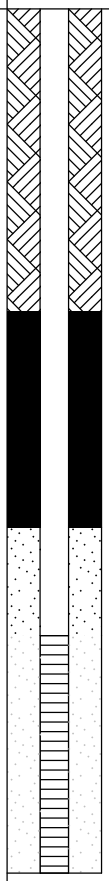
BORING/WELL CONSTRUCTION LOG

GW02

PROJECT NUMBER 60431087
PROJECT NAME FBURA
LOCATION Fishermans Bend
DRILLING METHOD HA/PT/HFA
SAMPLING METHOD PT/Grab
SURFACE ELEVATION
WELL HEAD/TOC
LOGGED BY Matt Sheppard
COMMENTS

DATE 27/10/2015
BLANK
SCREEN 2.9-4.0
GRAVEL PACK 2.4-4.0
SANITARY SEAL/BENTONITE 1.4-2.4
STABILISED WATER LEVEL
GROUND WATER ELEVATION

PID (ppm)	BLOW COUNTS	RECOVERY	SAMPLE NUMBER	ANALYSED	DEPTH (mBGS)	GRAPHIC LOG	LITHOLOGIC DESCRIPTION	CONTACT DEPTH
			GW02_ 0.0-0.1				FILL	0.10
							Road Base; gravel hardstand; Silty Sand; gravels; very dense; dry; no odour.	0.30
								0.40
0			GW02_ 0.5-0.6				Silty Clay; some gravel (<10-15mm); brown; firm; moist (from surfacewater); brick fragments; angular; no odour.	0.80
0			GW02_ 1.0-1.1		1		Silty Clay; grey/green; firm; slightly moist; low plasticity; minor occasional brick fragments; no odour; some gravels.	1.20
0			GW02_ 1.5-1.6				Silty Clay; brown/dark brown mottle; firm; slightly moist; low plasticity; minor gravels (<5-10mm); no odour.	
0.6			GW02_ 1.6-1.7				Silty Clay; light brown; soft; moist; moderate plasticity; siltstone pieces.	
							Silty Clay; dark brown mottle with light brown; stiff; low plasticity, minor gravel (<3mm); very minor/occasional slag; glass fragments.	1.90
0			GW02_ 2.0-2.1		2		Gravel; dense; grey; dry; no odour; crushed rock.	2.00
							Silty Clay; stiff; mottled yellow and brown; dry; no odour.	
0			GW02_ 2.9-3.0		3		Silty Gravely Clay; firm; dark grey and black; saturated; minor solvent odour; rubble; garbage; crushed rock; some organic matter.	3.00
1.6			GW02_ 3.9-4.0		4		Total Depth: 4.00 m	4.00



BORING / WELL CONSTRUCTION LOG FBURA_GINT_BORELOGS.GPJ HLA_SYD.GDT 14/1/16

AECOM
Level 45, 80 Collins Street
MELBOURNE VIC 3004
Telephone: 03 9653 1234
Fax: 03 9654 7117

BORING/WELL CONSTRUCTION LOG

GW03

PROJECT NUMBER 60431087
PROJECT NAME FBURA
LOCATION Fishermans Bend
DRILLING METHOD HA/PT/HFA
SAMPLING METHOD PT/Grab
SURFACE ELEVATION
WELL HEAD/TOC
LOGGED BY Matt Sheppard
COMMENTS

DATE 15/10/2015
BLANK
SCREEN 3.0-4.9
GRAVEL PACK 2.5-4.9
SANITARY SEAL/BENTONITE 2.0-2.5
STABILISED WATER LEVEL
GROUND WATER ELEVATION

PID (ppm)	BLOW COUNTS	RECOVERY	SAMPLE NUMBER	ANALYSED	DEPTH (mBGS)	GRAPHIC LOG	LITHOLOGIC DESCRIPTION	CONTACT DEPTH
					1		FILL Sand; loose; red brown; dry; mostly bricks; no odour.	1.20
							Gravel and Sand; medium grained; coarse grained gravels; grey/brown; hard; no odour.	1.40
0			GW03_ 1.5-1.6				Gravel and Sand; minor brick and concrete components; brown; moist; hard.	
0			GW03_ 2.0-2.1		2			2.60
							Gravel; <20mm, angular.	2.70
							Clayey Sand; light grey; fine to coarse grained; hard (to drill); no odour; slightly moist.	2.80
0			GW03_ 3.0-3.1		3		Silty Sand; black/dark brown; loose; slightly moist; some gravel content that increases with depth.	3.00 3.10
							Silty Sand; black/dark brown; loose; slightly moist; some gravel that increases with depth.	
							Sandy Gravel; grey/dark grey; loose; saturated; angular; no odour; minor occasional brick fragments.	
0			GW03_ 4.0-4.1		4		Refusal @ 4m with push tube - solid auger to 4.9m.	4.00
							Silty Sand; dark grey; fine to medium grained; loose; no odour; moist to wet; minor fill inclusions.	
							Total Depth: 4.90 m	4.90

WELL DIAGRAM

AECOM
Level 45, 80 Collins Street
MELBOURNE VIC 3004
Telephone: 03 9653 1234
Fax: 03 9654 7117

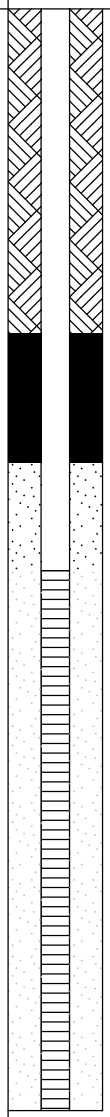
BORING/WELL CONSTRUCTION LOG

GW04

PROJECT NUMBER 60431087
PROJECT NAME FBURA
LOCATION Fishermans Bend
DRILLING METHOD HA/PT/HFA
SAMPLING METHOD PT/Grab
SURFACE ELEVATION
WELL HEAD/TOC
LOGGED BY Nathan Jensen
COMMENTS

DATE 15/10/2015
BLANK
SCREEN 2.6-5.1
GRAVEL PACK 2.1-5.1
SANITARY SEAL/BENTONITE 1.5-2.1
STABILISED WATER LEVEL
GROUND WATER ELEVATION

PID (ppm)	BLOW COUNTS	RECOVERY	SAMPLE NUMBER	ANALYSED	DEPTH (mBGS)	GRAPHIC LOG	LITHOLOGIC DESCRIPTION	CONTACT DEPTH
					1		FILL Sand; loose; red brown; dry; mostly bricks; no odour.	
								1.60
							Sand; loose; dark brown; dry; rubble; concrete; glass; coke; spent oxide; crushed rock; gravel; brick fragments; no odour.	1.80
0			GW04_ 1.9-2.0		2		Silty Sand; dense; dark brown; dry; rubble; coke; spent oxide; crushed rock; gravel; brick fragments; siltstone fragments; no odour.	2.00
								2.20
							Silty gravely Sand; mottled red and brown; moist; rubble; coke; spent oxide; crushed rock; gravel up to 50mm; brick fragments; no odour.	
					3		Sand; moderately dense; mottled orange and brown; becoming saturated with depth; rubble; coke; spent oxide; crushed rock; gravel.	
								3.10
							NATURAL Sand; loose; dark grey; saturated; shell fragments up to 10mm.	3.30
0			GW04_ 3.3-3.4					3.40
							Clay; soft; grey/brown mottled; saturated; high plasticity; no odour.	
					4		Medium grained Sand; moderately dense; pale grey; saturated; shell fragments up to 5mm; some quartz grains; no odour.	
					5			5.10
							Total Depth: 5.10 m	



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MELBOURNE VIC 3004
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Fax: 03 9654 7117

BORING/WELL CONSTRUCTION LOG

GW05

PROJECT NUMBER 60431087
PROJECT NAME FBURA
LOCATION Fishermans Bend
DRILLING METHOD HA/PT/HFA
SAMPLING METHOD PT/Grab
SURFACE ELEVATION
WELL HEAD/TOC
LOGGED BY Matt Sheppard
COMMENTS

DATE 15/10/2015
BLANK
SCREEN 2.5-4.5
GRAVEL PACK 2.0-4.5
SANITARY SEAL/BENTONITE 1.0-2.0
STABILISED WATER LEVEL
GROUND WATER ELEVATION

PID (ppm)	BLOW COUNTS	RECOVERY	SAMPLE NUMBER	ANALYSED	DEPTH (mBGS)	GRAPHIC LOG	LITHOLOGIC DESCRIPTION	CONTACT DEPTH	WELL DIAGRAM
							FILL Gravely Sand; very loose; brown; dry; crushed rock; gravel; no odour.	0.30	
							Gravely Sand; very dense; pale grey; dry; rootlets; crushed rock; no odour.	0.60	
							Medium grained Sand; loose; yellow; dry; no odour.		
					1			1.30	
							Gravely Sand; very dense; greyish; brown; dry; rubble; concrete; crushed rock; no odour.	1.50	
							Silty Sand; fine to coarse grained; light grey/brown; loose to moderately dense; moist; no odour; black charcoal pieces; minor rootlets; angular gravel; bricks (red).	1.90	
0			GW05_2.0-2.1		2		Silt with Gravel (bluestone); black material (possibly ash); saturated; minor wood pieces and brick.		
								2.80	
0			GW05_3.0-3.1		3		Silty Sand; dark grey; fine to medium grained; saturated; no odour.		
0			GW05_3.6-3.7				Clay; grey/green; soft; moderate plasticity; no odour; minor gravel and ash.	3.60 3.80	
0			GW05_4.0-4.1		4		NATURAL Sand (Port Melbourne); pale; fine grained; dense to moderately dense; shell fragments; no odour.		
								4.50	
							Total Depth: 4.50 m		

BORING / WELL CONSTRUCTION LOG FBURA_GINT_BORELOGS.GPJ HLA_SYD.GDT 14/1/16

AECOM
Level 45, 80 Collins Street
MELBOURNE VIC 3004
Telephone: 03 9653 1234
Fax: 03 9654 7117

BORING/WELL CONSTRUCTION LOG

GW06

PROJECT NUMBER 60431087
PROJECT NAME FBURA
LOCATION Fishermans Bend
DRILLING METHOD HA/PT/HFA
SAMPLING METHOD PT/Grab
SURFACE ELEVATION
WELL HEAD/TOC
LOGGED BY Matt Sheppard
COMMENTS

DATE 29/10/2015
BLANK
SCREEN 2.0-4.0
GRAVEL PACK 1.5-4.0
SANITARY SEAL/BENTONITE 0.5-1.5
STABILISED WATER LEVEL
GROUND WATER ELEVATION

PID (ppm)	BLOW COUNTS	RECOVERY	SAMPLE NUMBER	ANALYSED	DEPTH (mBGS)	GRAPHIC LOG	LITHOLOGIC DESCRIPTION	CONTACT DEPTH	WELL DIAGRAM
					1		NATURAL Fine grained Sand; loose; pale brown; dry; no odour.		
3			GW06_1.6-1.7						
0			GW06_1.9-2.0		2		Medium to coarse grained Sand; moderately dense; pale brown; very moist; no odour.	1.80	
								2.30	
							Medium to coarse grained Sand; moderately dense; brown; saturated; no odour; some shell fragments.		
0			GW06_2.9-3.0		3				
0			GW06_3.9-4.0		4		Total Depth: 4.00 m	4.00	

BORING / WELL CONSTRUCTION LOG FBURA_GINT_BORELOGS.GPJ HLA_SYD.GDT 14/1/16

AECOM
Level 45, 80 Collins Street
MELBOURNE VIC 3004
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Fax: 03 9654 7117

BORING/WELL CONSTRUCTION LOG

GW07

PROJECT NUMBER 60431087
PROJECT NAME FBURA
LOCATION Fishermans Bend
DRILLING METHOD HA/PT/HFA
SAMPLING METHOD PT/Grab
SURFACE ELEVATION
WELL HEAD/TOC
LOGGED BY Dug Cunningham
COMMENTS

DATE 16/10/2015
BLANK
SCREEN 3.0-5.5
GRAVEL PACK 2.5-5.5
SANITARY SEAL/BENTONITE 1.5-2.5
STABILISED WATER LEVEL
GROUND WATER ELEVATION

PID (ppm)	BLOW COUNTS	RECOVERY	SAMPLE NUMBER	ANALYSED	DEPTH (mBGS)	GRAPHIC LOG	LITHOLOGIC DESCRIPTION	CONTACT DEPTH	WELL DIAGRAM
					1		FILL Fine grained Sand; loose; dark; grey; dry; no odour.	1.30	
0.1			GW07_ 1.5-1.6				Silty Sand; grey mottle; fine to medium grained; loose; moist; minor organic matter.	1.80	
0.2			GW07_ 1.9-2.0		2		Sand Silt; orange; dry to slightly moist; dense.	1.90	
							NATURAL Fine grained Sand; loose; dry; moisture content increasing from 2.5m bgl; no odour; no inclusions.	2.80	
0.3			GW07_ 3.0-3.1		3		Fine grained Sand; dark grey with occasional black streaks; loose; no odour; moist; saturated with shell fragments.	3.40	
							Fine grained Sand; pale; loose; moist; no odour; saturated with shell fragments.		
0.1			GW07_ 4.0-4.1		4		Fine grained Sand; grey; loose; moist; no odour; saturated with shell fragments.	4.00	
0.0			GW07_ 5.0-5.1		5			5.50	
							Total Depth: 5.50 m		

BORING / WELL CONSTRUCTION LOG FBURA_GINT_BORELOGS.GPJ HLA_SYD.GDT 14/1/16

AECOM
Level 45, 80 Collins Street
MELBOURNE VIC 3004
Telephone: 03 9653 1234
Fax: 03 9654 7117

BORING/WELL CONSTRUCTION LOG

GW08

PROJECT NUMBER 60431087
PROJECT NAME FBURA
LOCATION Fishermans Bend
DRILLING METHOD HA/PT/HFA
SAMPLING METHOD PT/Grab
SURFACE ELEVATION
WELL HEAD/TOC
LOGGED BY Matt Sheppard
COMMENTS

DATE 27/10/2015
BLANK
SCREEN 2.2-4.2
GRAVEL PACK 1.7-4.2
SANITARY SEAL/BENTONITE 0.7-1.7
STABILISED WATER LEVEL
GROUND WATER ELEVATION

PID (ppm)	BLOW COUNTS	RECOVERY	SAMPLE NUMBER	ANALYSED	DEPTH (mBGS)	GRAPHIC LOG	LITHOLOGIC DESCRIPTION	CONTACT DEPTH	WELL DIAGRAM
3.2			GW08_0.2-0.3				FILL Coarse grained Sand; moderately dense; grey brown; dry; no odour; rubble.		
0.3			GW08_0.9-1.0		1				
0			GW08_1.9-2.0		2		NATURAL Fine to medium grained Sand; moderately dense; grey; moist; no odour.	2.00	
0			GW08_2.9-3.0		3		▽	3.00	
0			GW08_3.1-3.2				Fine grained Sand; moderately dense; pale grey; saturated; no odour; some shell fragments.		
0			GW08_3.9-4.0		4			4.20	
							Total Depth: 4.20 m		

AECOM
Level 45, 80 Collins Street
MELBOURNE VIC 3004
Telephone: 03 9653 1234
Fax: 03 9654 7117

BORING/WELL CONSTRUCTION LOG

GW09

PROJECT NUMBER 60431087
PROJECT NAME FBURA
LOCATION Fishermans Bend
DRILLING METHOD HA/PT/HFA
SAMPLING METHOD PT/Grab
SURFACE ELEVATION
WELL HEAD/TOC
LOGGED BY Oliver Taylor
COMMENTS

DATE 30/10/2015
BLANK
SCREEN 3.5-5.5
GRAVEL PACK 3.1-5.5
SANITARY SEAL/BENTONITE 0.5-3.1
STABILISED WATER LEVEL
GROUND WATER ELEVATION

PID (ppm)	BLOW COUNTS	RECOVERY	SAMPLE NUMBER	ANALYSED	DEPTH (mBGS)	GRAPHIC LOG	LITHOLOGIC DESCRIPTION	CONTACT DEPTH
							FILL Sand; loose; grey; dry; rootlets; no odour.	0.30
0.7			GW09_0.4-0.5				Silty Sand; brown; dry; rubble; rootlets; no odour.	0.40
							Sand; loose; pale; brown/pale grey; dry; no odour.	
					1			
								1.50
							Silty Sand; grey; medium grained; dense; moist.	1.60
							Sand; brown/grey; medium to coarse grained; loose; dry; some wood and rubble pieces.	1.80
0			GW09_2.0-21		2		Silty Clay; brown mottled orange; dry; wood pieces; gravel.	2.00
							NATURAL Sand; pale yellow; medium grained; dry; loose.	2.50
							Sand; brown; medium grained; loose; moist.	
								2.80
							Sandy Silt; dark brown; soft; low plasticity; wet.	2.90
0			GW09_3.0-3.1		3		Sand; pale yellow; medium grained; wet; loose.	3.00
							Sand; brown; medium grained; loose; wet.	3.10
							Sand; brown/grey becoming darker grey with depth; coarse grained; loose; becoming saturated with depth; some shell fragments.	
0			GW09_4.0-4.1		4			4.30
							Silty Sand; grey; fine grained; dense; saturated.	
0			GW09_5.0-5.1		5			5.50
							Total Depth: 5.50 m	

WELL DIAGRAM

BORING / WELL CONSTRUCTION LOG FBURA_GINT_BORELOGS.GPJ HLA_SYD.GDT 14/1/16

AECOM
Level 45, 80 Collins Street
MELBOURNE VIC 3004
Telephone: 03 9653 1234
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BORING/WELL CONSTRUCTION LOG

GW10

PROJECT NUMBER 60431087
PROJECT NAME FBURA
LOCATION Fishermans Bend
DRILLING METHOD HA/PT/HFA
SAMPLING METHOD PT/Grab
SURFACE ELEVATION
WELL HEAD/TOC
LOGGED BY Dug Cunningham
COMMENTS

DATE 16/10/2015
BLANK
SCREEN 3.0-5.5
GRAVEL PACK 2.3-5.5
SANITARY SEAL/BENTONITE 1.3-2.3
STABILISED WATER LEVEL
GROUND WATER ELEVATION

PID (ppm)	BLOW COUNTS	RECOVERY	SAMPLE NUMBER	ANALYSED	DEPTH (mBGS)	GRAPHIC LOG	LITHOLOGIC DESCRIPTION	CONTACT DEPTH	WELL DIAGRAM
							ASPHALT	0.10	
							FILL Fine grained Sand; loose; pale grey/yellow; dry; no odour.		
					1				
								1.30	
0			GW10_ 1.5-1.6				Silty Sand; light grey; fine grained; loose; dry to slightly moist; minor organic black streaks; no odour.	1.60	
							NATURAL Sand; pale grey to black/gey mottle; dry to slightly moist; loose; no odour; some rootlets.		
0			GW10_ 2.0-2.1		2			2.05	
							Silty Sand; dark grey/brown; fine grained; loose; no odour.	2.10	
0			GW10_ 2.3-2.4				Silty Sand; orange; moderately dense; slight to some moisture; no odour; no inclusions.	2.40	
							Silty sandy Clay; orange and brown mottle; moist to wet; fine to medium grained; no odour.	2.60	
0			GW10_ 2.9-3.0		3		Sand; light brown; fine to medium grained; loose to moderately dense; wet to saturated; no odour.		
							3.0 - 3.4 m bgl; increasing grain size from medium to coarse grained.	3.40	
							Fine grained Sand; light grey; moderately dense; saturated; no odour; no inclusions; transitioning to coarse grained with depth.		
0			GW10_ 4.0-4.1		4				
0			GW10_ 5.0-5.1		5				
								5.50	
							Total Depth: 5.50 m		

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BORING/WELL CONSTRUCTION LOG

GW11

PROJECT NUMBER 60431087
PROJECT NAME FBURA
LOCATION Fishermans Bend
DRILLING METHOD HA/PT/HFA
SAMPLING METHOD PT/Grab
SURFACE ELEVATION
WELL HEAD/TOC
LOGGED BY Matt Sheppard
COMMENTS

DATE 23/10/2015
BLANK
SCREEN 3.0-5.1
GRAVEL PACK 2.5-5.1
SANITARY SEAL/BENTONITE 2.0-2.5
STABILISED WATER LEVEL
GROUND WATER ELEVATION

PID (ppm)	BLOW COUNTS	RECOVERY	SAMPLE NUMBER	ANALYSED	DEPTH (mBGS)	GRAPHIC LOG	LITHOLOGIC DESCRIPTION	CONTACT DEPTH	WELL DIAGRAM
0.3			GW11_ 0.0-0.1				FILL Fine to medium grained Sand; grey/brown; loose; dry; occasional shell fragments.		
					1			1.50	
							Fine to medium grained Sand; grey/brown; loose; dry; occasional shell fragments.	1.70	
							NATURAL Sand; moderately dense; grey mottled orange; dry; rootlets; no odour.		
					2			2.20	
							Medium grain size clayey Sand; moderately dense; pale grey mottled with orange; moist; no odour.	2.30	
0			GW11_ 2.5-2.6				Medium to coarse grained Sand; moderately dense; red brown; moist; no odour.		
								2.90	
					3		Medium grained Sand; dense; brown grey; becoming saturated with depth; shell fragments up to 30 mm; no odour.		
							▽	3.50	
							Medium grained Sand; dense; pale grey; saturated; shell fragments up to 10mm; no odour.		
					4				
0			GW11_ 4.4-4.5						
0			GW11_ 5.0-5.1		5			5.10	
							Total Depth: 5.10 m		

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BORING/WELL CONSTRUCTION LOG

GW12

PROJECT NUMBER 60431087
PROJECT NAME FBURA
LOCATION Fishermans Bend
DRILLING METHOD HA/PT/HFA
SAMPLING METHOD PT/Grab
SURFACE ELEVATION
WELL HEAD/TOC
LOGGED BY Matt Sheppard
COMMENTS

DATE 29/10/2015
BLANK
SCREEN 2.2-4.2
GRAVEL PACK 1.7-4.2
SANITARY SEAL/BENTONITE 0.7-1.7
STABILISED WATER LEVEL
GROUND WATER ELEVATION

PID (ppm)	BLOW COUNTS	RECOVERY	SAMPLE NUMBER	ANALYSED	DEPTH (mBGS)	GRAPHIC LOG	LITHOLOGIC DESCRIPTION	CONTACT DEPTH	WELL DIAGRAM
							FILL Fine grained Sand; moderately dense; dry; pottery fragment; foundry glass; no odour.		
0.6			GW12_0.9-1.0		1				
0			GW12_1.6-1.7						
0			GW12_1.9-2.0		2			2.10	
							NATURAL Coarse grained Sand; loose; pale brown; slightly moist; no odour.		
								2.80	
0			GW12_2.9-3.0		3		Coarse grained Sand; moderately dense; pale grey; very moist; no odour.	2.90	
							Fine grained Sand; grey; saturated; no odour; some shell fragments.		
0			GW12_3.9-4.0		4			4.20	
							Total Depth: 4.20 m		

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BORING/WELL CONSTRUCTION LOG

GW13

PROJECT NUMBER 60431087
PROJECT NAME FBURA
LOCATION Fishermans Bend
DRILLING METHOD HA/PT/HFA
SAMPLING METHOD PT/Grab
SURFACE ELEVATION
WELL HEAD/TOC
LOGGED BY Matt Sheppard
COMMENTS

DATE 29/10/2015
BLANK
SCREEN 2.2-4.2
GRAVEL PACK 1.7-4.2
SANITARY SEAL/BENTONITE 0.7-1.7
STABILISED WATER LEVEL
GROUND WATER ELEVATION

PID (ppm)	BLOW COUNTS	RECOVERY	SAMPLE NUMBER	ANALYSED	DEPTH (mBGS)	GRAPHIC LOG	LITHOLOGIC DESCRIPTION	CONTACT DEPTH
0			GW13_0.0-0.1				FILL Gravely Sand; dense; dark brown; dry; no odour; rubble; concrete pieces; rootlets; crushed rock.	0.30
0			GW13_0.4-0.5				Gravely Sand; moderately dense; grey; dry; no odour; rubble; crushed rock.	
0			GW13_0.9-1.0		1			1.30
0			GW13_1.4-1.5				NATURAL Fine grained Sand; loose; pale grey; dry; no odour.	1.40 1.50
0			GW13_1.6-1.7				Fine grained Sand; loose; mottled orange and grey; moist; no odour.	1.70
0			GW13_1.9-2.0		2		Medium grained Sand; moderately dense; brown; dry; no odour. Sandy Clay; firm; mottled orange and grey; very moist; no odour. Medium grained Sand; moderately dense; mottled orange and brown; very moist; no odour.	1.80
0			GW13_2.9-3.0		3		Fine grained Sand; moderately dense; pale grey; saturated; no odour.	2.90
0			GW13_3.9-4.0		4			4.20
							Total Depth: 4.20 m	

WELL DIAGRAM

BORING / WELL CONSTRUCTION LOG FBURA_GINT_BORELOGS.GPJ HLA_SYD.GDT 14/1/16

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BORING/WELL CONSTRUCTION LOG

GW14

PROJECT NUMBER 60431087
PROJECT NAME FBURA
LOCATION Fishermans Bend
DRILLING METHOD HA/PT/HFA
SAMPLING METHOD PT/Grab
SURFACE ELEVATION
WELL HEAD/TOC
LOGGED BY Matt Sheppard
COMMENTS

DATE 26/10/2015
BLANK
SCREEN 2.0-4.0
GRAVEL PACK 1.5-4.0
SANITARY SEAL/BENTONITE 0.5-1.5
STABILISED WATER LEVEL
GROUND WATER ELEVATION

PID (ppm)	BLOW COUNTS	RECOVERY	SAMPLE NUMBER	ANALYSED	DEPTH (mBGS)	GRAPHIC LOG	LITHOLOGIC DESCRIPTION	CONTACT DEPTH	WELL DIAGRAM
							NATURAL Coarse grained Sand; loose; pale grey; dry; no odour.		
0			GW14_0.5-0.6						
0			GW14_0.9-1.0		1				
0			GW14_1.5-1.6						
					2		Sandy Clay; soft; dark; grey; moist; organic odour.	2.00	
0			GW14_2.2-2.3				▽ Sand; moderately dense; pale brown; saturated; no odour.	2.30	
0			GW14_2.9-3.0		3			3.00	
0.4			GW14_3.1-3.2				Fine grained Sand; moderately dense; grey; saturated; no odour.		
0			GW14_3.9-4.0		4		Total Depth: 4.00 m	4.00	

BORING / WELL CONSTRUCTION LOG FBURA_GINT_BORELOGS.GPJ HLA_SYD.GDT 14/1/16

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BORING/WELL CONSTRUCTION LOG

GW15

PROJECT NUMBER 60431087
PROJECT NAME FBURA
LOCATION Fishermans Bend
DRILLING METHOD HA/PT/HFA
SAMPLING METHOD PT/Grab
SURFACE ELEVATION
WELL HEAD/TOC
LOGGED BY Oliver Taylor
COMMENTS

DATE 30/10/2015
BLANK
SCREEN 2.5-4.5
GRAVEL PACK 2.0-4.5
SANITARY SEAL/BENTONITE 1.0-2.0
STABILISED WATER LEVEL
GROUND WATER ELEVATION

PID (ppm)	BLOW COUNTS	RECOVERY	SAMPLE NUMBER	ANALYSED	DEPTH (mBGS)	GRAPHIC LOG	LITHOLOGIC DESCRIPTION	CONTACT DEPTH	WELL DIAGRAM
0			GW15_ 0.0-0.1				FILL Clayey gravely Sand; very dense, grey brown; dry; no odour; rubble; concrete pieces; crushed rock.		
0			GW15_ 0.5-0.6					0.70	
0			GW15_ 0.9-1.0		1		Silty Clay; soft; black; dry; pieces of wood; high volume of organic material.		
0			GW15_ 1.7-1.8					1.80	
0			GW15_ 1.8-1.9		2		NATURAL Silty Sand; dense; yellow; moist.		
								2.60	
							Fine grained sandy Silt; soft; grey; very moist; low sulphur odour; rootlets.	2.80	
4			GW15_ 3.0-3.1		3		Coarse grained Sand; dense; grey; very moist; shell fragments.		
1.6			GW15_ 3.3-3.4		4				
								4.50	
							Total Depth: 4.50 m		

BORING / WELL CONSTRUCTION LOG FBURA_GINT_BORELOGS.GPJ HLA_SYD.GDT 14/1/16

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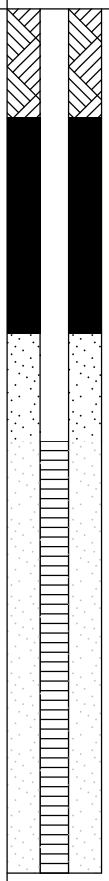
BORING/WELL CONSTRUCTION LOG

GW16

PROJECT NUMBER 60431087
PROJECT NAME FBURA
LOCATION Fishermans Bend
DRILLING METHOD HA/PT/HFA
SAMPLING METHOD PT/Grab
SURFACE ELEVATION
WELL HEAD/TOC
LOGGED BY Matt Sheppard
COMMENTS

DATE 27/10/2015
BLANK
SCREEN 2.0-4.0
GRAVEL PACK 1.5-4.0
SANITARY SEAL/BENTONITE 0.5-1.5
STABILISED WATER LEVEL
GROUND WATER ELEVATION

PID (ppm)	BLOW COUNTS	RECOVERY	SAMPLE NUMBER	ANALYSED	DEPTH (mBGS)	GRAPHIC LOG	LITHOLOGIC DESCRIPTION	CONTACT DEPTH
0			GW16_0.1-0.2				FILL Silty Sand; light brown; fine to coarse grained; dry; minor gravels; angular cobbles; minor brick fragments.	0.30
0			GW16_0.5-0.6				Sandstone lens	0.35
							Silty Sand; grey/brown; fine to medium grained; loose; no odour; dry.	0.80
0			GW16_1.0-1.1		1		Silty Sand; brown; fine to medium grained; loose; dry; no inclusions.	1.00
							Silty Sand; brown; fine to coarse grained; loose; dry; no inclusions.	1.40
0			GW16_1.4-1.5				Silty clayey Sand; brown/red; moderately dense; slightly moist; no inclusions; coarse grained.	1.50
0			GW16_1.9-2.0		2		NATURAL Clayey Sand; very dense; dark brown; dry; no odour.	2.00
0			GW16_2.2-2.3				▽ Fine grained Sand; moderately dense; brown grey; saturated; no odour.	
0.8			GW16_2.9-3.0		3		Fine grained Sand; moderately dense; pale grey; saturated; no odour.	3.00
0			GW16_3.9-4.0		4		Total Depth: 4.00 m	4.00



BORING / WELL CONSTRUCTION LOG FBURA_GINT_BORELOGS.GPJ HLA_SYD.GDT 14/1/16

AECOM
Level 45, 80 Collins Street
MELBOURNE VIC 3004
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BORING/WELL CONSTRUCTION LOG

GW17

PROJECT NUMBER 60431087
PROJECT NAME FBURA
LOCATION Fishermans Bend
DRILLING METHOD HA/PT/HFA
SAMPLING METHOD PT/Grab
SURFACE ELEVATION
WELL HEAD/TOC
LOGGED BY Matt Sheppard
COMMENTS

DATE 29/10/2015
BLANK
SCREEN 1.5-3.0
GRAVEL PACK 1.0-3.0
SANITARY SEAL/BENTONITE 0.0-1.0
STABILISED WATER LEVEL
GROUND WATER ELEVATION

PID (ppm)	BLOW COUNTS	RECOVERY	SAMPLE NUMBER	ANALYSED	DEPTH (mBGS)	GRAPHIC LOG	LITHOLOGIC DESCRIPTION	CONTACT DEPTH
					1		FILL Coarse grained Sand; moderately dense; brown; moist; no odour; crushed rock.	
0			GW17_1.5-1.6					1.60
							NATURAL Sandy Clay; soft; dark brown; very moist; no odour.	1.70 1.80
0			GW17_1.9-2.0		2		Coarse grained Sand; moderately dense; brown; moist; no odour.	
0			GW17_2.2-2.3				Fine grained Sand; moderately dense; mottled orange and brown; slightly moist; no odour.	2.20 2.30
							Sandy Silt; very soft; dark grey; saturated; natural organic odour.	
0			GW17_2.9-3.0		3		Medium grained Sand; moderately dense; pale grey; saturated; no odour.	3.00
							Total Depth: 3.00 m	

WELL DIAGRAM

AECOM
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MELBOURNE VIC 3004
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BORING/WELL CONSTRUCTION LOG

GW18

PROJECT NUMBER 60431087
PROJECT NAME FBURA
LOCATION Fishermans Bend
DRILLING METHOD HA/PT/HFA
SAMPLING METHOD PT/Grab
SURFACE ELEVATION
WELL HEAD/TOC
LOGGED BY Nathan Jensen
COMMENTS

DATE 14/10/2015
BLANK
SCREEN 2.0-4.5
GRAVEL PACK 1.6-4.5
SANITARY SEAL/BENTONITE 1.0-1.6
STABILISED WATER LEVEL
GROUND WATER ELEVATION

PID (ppm)	BLOW COUNTS	RECOVERY	SAMPLE NUMBER	ANALYSED	DEPTH (mBGS)	GRAPHIC LOG	LITHOLOGIC DESCRIPTION	CONTACT DEPTH	WELL DIAGRAM
					1		NATURAL Silty Clay; firm; blue/grey with mottled orange; moist; medium plasticity; natural organic odour.		
0			GW18_ 1.7-1.8				Silty Clay; firm; black/brown; slightly moist; low plasticity; natural organic odour.	1.60 1.80	
					2		Silty Clay; firm; dark brown; very moist; high plasticity; rootlets; sulphur odour.	2.20	
41			GW18_ 2.3-2.4				Sandy Clay; soft; dark brown; saturated; high plasticity; sulphur odour.	2.30	
							Sand; loose; grey; saturated; poorly sorted gravels; quartz up to 2mm; sulphur odour.	2.50	
					3		Silty Clay; dark brown; saturated; very high plasticity; shell fragments up to 5mm; sulphur odour.		
21			GW18_ 3.4-3.5						
					4				
82			GW18_ 4.4-4.5					4.50	
							Total Depth: 4.50 m		

BORING / WELL CONSTRUCTION LOG FBURA_GINT_BORELOGS.GPJ HLA_SYD.GDT 14/1/16

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BORING/WELL CONSTRUCTION LOG

GW19

PROJECT NUMBER 60431087
PROJECT NAME FBURA
LOCATION Fishermans Bend
DRILLING METHOD HA/PT/HFA
SAMPLING METHOD PT/Grab
SURFACE ELEVATION
WELL HEAD/TOC
LOGGED BY Matt Sheppard
COMMENTS

DATE 26/10/2015
BLANK
SCREEN 2.5-5.5
GRAVEL PACK 1.5-5.5
SANITARY SEAL/BENTONITE 0.5-1.5
STABILISED WATER LEVEL
GROUND WATER ELEVATION

PID (ppm)	BLOW COUNTS	RECOVERY	SAMPLE NUMBER	ANALYSED	DEPTH (mBGS)	GRAPHIC LOG	LITHOLOGIC DESCRIPTION	CONTACT DEPTH	WELL DIAGRAM
8			GW19_0.1-0.2				NATURAL Clayey Silt (Coode Island); soft; dark grey; moist; natural organic odour; rootlets.		
0			GW19_1.5-1.6		1				
4			GW19_1.9-2.0		2				
8			GW19_2.9-3.0		3		▽		
2			GW19_3.2-3.3				Clay with fine grained Sand; moderately dense; grey; saturated; no odour.	3.00	
0.4			GW19_3.9-4.0		4		Clayey Silt (Coode Island); soft; dark grey; moist; natural organic odour; rootlets.	3.60	
0			GW19_4.9-5.0		5				
							Total Depth: 5.50 m	5.50	

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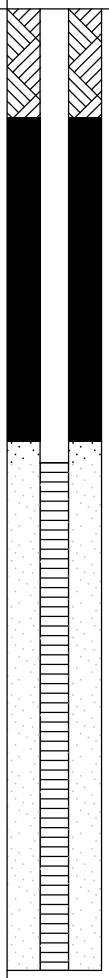
BORING/WELL CONSTRUCTION LOG

GW20

PROJECT NUMBER 60431087
PROJECT NAME FBURA
LOCATION Fishermans Bend
DRILLING METHOD HA/PT/HFA
SAMPLING METHOD PT/Grab
SURFACE ELEVATION
WELL HEAD/TOC
LOGGED BY Oliver Taylor
COMMENTS

DATE 12/10/2015
BLANK
SCREEN 2.0-4.45
GRAVEL PACK 2.1-4.45
SANITARY SEAL/BENTONITE 0.5-2.0
STABILISED WATER LEVEL
GROUND WATER ELEVATION

PID (ppm)	BLOW COUNTS	RECOVERY	SAMPLE NUMBER	ANALYSED	DEPTH (mBGS)	GRAPHIC LOG	LITHOLOGIC DESCRIPTION	CONTACT DEPTH
0			GW20_ 0.0-0.1				FILL Silty Sand; loose; brown; dry; roots; rootlets; crushed rock; gravel; brick; no odour.	
0			GW20_ 0.5-0.6					0.70
							Sand; loose; grey; slightly moist; crushed rock; no odour.	0.80
0			GW20_ 1.0-1.1		1		Sandy Clay; very soft; grey; slightly moist; medium plasticity; rootlets; crushed rock; no odour.	1.30
							Gravely Sand; moderately dense; dark brown; dry; crushed rock; brick; no odour.	1.70
							Gravely Clay; firm; orange mottled with grey; slightly moist; medium plasticity; rubble; crushed rock; gravel; brick; no odour.	
0			GW20_ 2.0-2.1		2			2.30
							NATURAL	2.40
0			GW20_ 2.5-2.6				Clay; stiff; grey mottled with black; dry; high plasticity; no odour.	2.50 2.60
							Sand; very dense; black; moist; natural organic layer/odour.	
					3		Sand; dense; black/grey; very moist; trace silt; no odour.	
							Fine to coarse grained Sand; dense; light grey; moist; shells; orange band @ 3-3.2.	
0			GW20_ 4.0-4.1		4			4.45
							Total Depth: 4.45 m	



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BORING/WELL CONSTRUCTION LOG

GW21

PROJECT NUMBER 60431087
PROJECT NAME FBURA
LOCATION Fishermans Bend
DRILLING METHOD HA/PT/HFA
SAMPLING METHOD PT/Grab
SURFACE ELEVATION
WELL HEAD/TOC
LOGGED BY Dug Cunningham
COMMENTS

DATE 13/10/2015
BLANK
SCREEN 2.5-4.0
GRAVEL PACK 2.0-2.5
SANITARY SEAL/BENTONITE 1.0-2.0
STABILISED WATER LEVEL
GROUND WATER ELEVATION

PID (ppm)	BLOW COUNTS	RECOVERY	SAMPLE NUMBER	ANALYSED	DEPTH (mBGS)	GRAPHIC LOG	LITHOLOGIC DESCRIPTION	CONTACT DEPTH	WELL DIAGRAM
0			GW21_0.0-0.1				FILL Silty Sand; brown, coarse grained; loose and dry; with roots/rootlets; some gravel; (blue/grey asbestos - noted at abandoned location 2m south at 0.5m-1.0m bgl).		
0			GW21_0.5-0.6					0.70	
					1		Silty Sand; light brown moving to grey with depth, coarse grained; loose and dry; some brick fragments and wood towards 2.0m bgl.		
0.2			GW21_2.0-2.1		2		Silty Sand; dark brown; fine grained; no odour; minor iron staining @ 2.15 m bgl; moderately dense.	2.00	
0.1			GW21_2.4-2.5					2.40	
			GW21_2.8-2.9				NATURAL Sand; minor sandy silt lens; dark grey; very moist to wet; dense; minor organic matter.	2.60	
0.3					3		Sand; grey and loose; medium grained; saturated; no odour.		
0.3			GW21_3.4-3.5						
0.4			GW21_4.0-4.1		4		Total Depth: 4.00 m	4.00	

BORING / WELL CONSTRUCTION LOG FBURA_GINT_BORELOGS.GPJ HLA_SYD.GDT 14/1/16

AECOM
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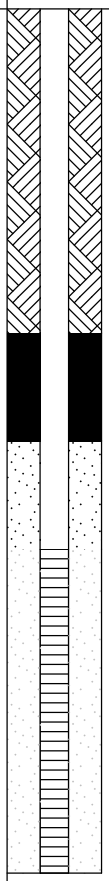
BORING/WELL CONSTRUCTION LOG

GW22

PROJECT NUMBER 60431087
PROJECT NAME FBURA
LOCATION Fishermans Bend
DRILLING METHOD HA/PT/HFA
SAMPLING METHOD PT/Grab
SURFACE ELEVATION
WELL HEAD/TOC
LOGGED BY Dug Cunningham
COMMENTS

DATE 13/10/2015
BLANK
SCREEN 2.5-4.0
GRAVEL PACK 2.0-4.0
SANITARY SEAL/BENTONITE 1.5-2.0
STABILISED WATER LEVEL
GROUND WATER ELEVATION

PID (ppm)	BLOW COUNTS	RECOVERY	SAMPLE NUMBER	ANALYSED	DEPTH (mBGS)	GRAPHIC LOG	LITHOLOGIC DESCRIPTION	CONTACT DEPTH
0			GW22_0.0-0.1				FILL Silty medium grained Sand; loose; dry; some gravel; coke; rootlets; no odour.	
0			GW22_0.5-0.6					0.80
0			GW22_1.0-1.1		1		Silty medium grained Sand; brown with mottled orange; loose; dry; gravel; coke; rootlets; no odour.	1.40
0			GW22_1.5-1.6				NATURAL Coarse grained Sand; light grey; dense; dry; no odour.	1.50
0.5			GW22_2.0-2.1		2		Sand; coarse grained and poorly sorted; dark/light grey mottle; saturated; no odour; minor silt content; moist.	1.80 1.90 2.00
							Silty Sand; dark grey; coarse grained; rounded; poorly sorted; no odour; no inclusions; moist.	2.20
0.2			GW22_2.5-2.6				Clayey silty Sand; coarse grained; light brown; wet - saturated; no inclusions.	2.70
							Silty Sand; very fine grained; grey; loose; saturated; no inslusions.	
0.4			GW22_3.0-3.1		3		Silty Sand; light grey to brown; fine grained; no inclusions; no odour; loose.	3.10
							Silty Sand; grading into sand; light grey to brown; fine grained; no inclusions; no odour; loose.	
							Sand; coarse grained; poorly sorted; no odour; loose; light grey.	
0.6			GW22_4.0-4.1		4		Total Depth: 4.00 m	4.00



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BORING/WELL CONSTRUCTION LOG

GW23

PROJECT NUMBER 60431087
PROJECT NAME FBURA
LOCATION Fishermans Bend
DRILLING METHOD HA/PT/HFA
SAMPLING METHOD PT/Grab
SURFACE ELEVATION
WELL HEAD/TOC
LOGGED BY Dug Cunningham
COMMENTS

DATE 16/10/2015
BLANK
SCREEN 2.5-4.0
GRAVEL PACK 3.0-4.0
SANITARY SEAL/BENTONITE 1.0-1.5
STABILISED WATER LEVEL
GROUND WATER ELEVATION

PID (ppm)	BLOW COUNTS	RECOVERY	SAMPLE NUMBER	ANALYSED	DEPTH (mBGS)	GRAPHIC LOG	LITHOLOGIC DESCRIPTION	CONTACT DEPTH	WELL DIAGRAM
					1		Silty medium grained Sand; loose; dry; some gravel; rootlets; no odour.		
							Silty medium grained Sand; brown with mottled orange; loose; dry; rootlets; no odour.	1.50	
					2				
0			GW23_ 2.3-2.4				NATURAL	2.30	
							Silty Sand; coarse; medium grained; light grey; moist to saturated; moderately dense; no odour.	2.50	
							Coarse grained Sand; poorly sorted; grey; no odour; no inclusions.		
					3		Sand; poorly sorted; grey; medium to coarse grained; no odour; no inclusions; saturated; moderately dense.	3.00	
							Sand; light grey; fine to coarse grained; moderately dense; no odour; no inclusions; saturated.	3.40	
							Refusal @ 4.0m		
					4		Total Depth: 4.00 m	4.00	

BORING / WELL CONSTRUCTION LOG FBURA_GINT_BORELOGS.GPJ HLA_SYD.GDT 14/1/16

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BORING/WELL CONSTRUCTION LOG

GW24

PROJECT NUMBER 60431087
PROJECT NAME FBURA
LOCATION Fishermans Bend
DRILLING METHOD HA/PT/HFA
SAMPLING METHOD PT/Grab
SURFACE ELEVATION
WELL HEAD/TOC
LOGGED BY Dug Cunningham
COMMENTS

DATE 14/10/2015
BLANK
SCREEN 1.2-3.0
GRAVEL PACK 1.0-3.0
SANITARY SEAL/BENTONITE 0.0-1.0
STABILISED WATER LEVEL
GROUND WATER ELEVATION

PID (ppm)	BLOW COUNTS	RECOVERY	SAMPLE NUMBER	ANALYSED	DEPTH (mBGS)	GRAPHIC LOG	LITHOLOGIC DESCRIPTION	CONTACT DEPTH	WELL DIAGRAM
0			GW24_0.0				Grass.	0.05	
							FILL Silty Sand; brown; fine grained; loose; dry; no odour; rootlets; tree roots @ 0.6m; angular basalt pieces (fill) <30mm; becoming slightly moist @ 0.8m.	0.80	
0.4			GW24_0.5				Silty Sand; clay nodules; fine grained; loose; slightly moist; rootlets; no odour.	0.90 1.00	
0			GW24_1.0		1		Sandy Silt; dark brown/red mottle; slightly moist; no odour.	1.20	
0			GW24_1.2				Silty Sand; grey; fine to medium grained; loose; slightly moist; no odour.	1.30 1.50	
1.1			GW24_1.5				Silty Sand; fine to medium grained; loose; minor HC odour.		
0			GW24_1.6				Silty Sand; pale grey; fine grained; loose; moist; no inclusions; HC odour.		
0			GW24_2.0		2		Silty Sand; pale grey; fine grained; loose; moist; no inclusions; HC odour; black staining (HC) @ 1.7-1.8m then pale grey, fine grained; saturated.		
0			GW24_3.0		3		Total Depth: 3.00 m	3.00	

BORING / WELL CONSTRUCTION LOG FBURA_GINT_BORELOGS.GPJ HLA_SYD.GDT 14/1/16

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BORING/WELL CONSTRUCTION LOG

GW25

PROJECT NUMBER 60431087
PROJECT NAME FBURA
LOCATION Fishermans Bend
DRILLING METHOD HA/PT/HFA
SAMPLING METHOD PT/Grab
SURFACE ELEVATION
WELL HEAD/TOC
LOGGED BY Nathan Jensen
COMMENTS

DATE 12/10/2015
BLANK
SCREEN 2.0-5.0
GRAVEL PACK 1.9-5.0
SANITARY SEAL/BENTONITE 0.2-1.9
STABILISED WATER LEVEL
GROUND WATER ELEVATION

PID (ppm)	BLOW COUNTS	RECOVERY	SAMPLE NUMBER	ANALYSED	DEPTH (mBGS)	GRAPHIC LOG	LITHOLOGIC DESCRIPTION	CONTACT DEPTH
0			GW25_0.1-0.2				FILL Silty Sand; very loose; dark brown; dry; roots; rootlets; no odour.	
								0.40
0			GW25_0.5-0.6				Silty Sand; loose; dark brown; moist; rubble; rootlets; crushed rock; clay (clumps); no odour.	
0			GW25_1.0-1.1		1		Gravely Sand; very loose; dark grey; very moist; rootlets; no odour.	1.00
0			GW25_1.5-1.6				Coarse grained Sand; loose; dark brown; moist; rubble; crushed rock; no odour.	1.50
								1.80
							NATURAL	1.90
0			GW25_2.0-2.1		2		Sand; moderately dense; grey; moist; no odour.	2.00
							Coarse grained sand; moist.	2.20
							Coarse grained Sand; moderately dense; brown; moist; no odour.	2.40
0			GW25_2.5-2.6				Clayey Sand; dense; mottled grey and brown; moist; rootlets; no odour.	2.50
							Coarse grained Sand; loose; grey mottled with orange; very moist; no odour.	
					3		Coarse grained Sand; moderately dense; grey; saturated; no odour.	
0			GW25_4.0-4.1		4			
0			GW25_5.0-5.1		5		Total Depth: 5.00 m	5.00

WELL DIAGRAM

BORING / WELL CONSTRUCTION LOG FBURA_GINT_BORELOGS.GPJ HLA_SYD.GDT 14/1/16

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BORING/WELL CONSTRUCTION LOG

GW26

PROJECT NUMBER 60431087
PROJECT NAME FBURA
LOCATION Fishermans Bend
DRILLING METHOD HA/PT/HFA
SAMPLING METHOD PT/Grab
SURFACE ELEVATION
WELL HEAD/TOC
LOGGED BY Nathan Jensen
COMMENTS

DATE 13/10/2015
BLANK
SCREEN 2.0-4.0
GRAVEL PACK 1.8-4.0
SANITARY SEAL/BENTONITE 1.1-1.8
STABILISED WATER LEVEL
GROUND WATER ELEVATION

PID (ppm)	BLOW COUNTS	RECOVERY	SAMPLE NUMBER	ANALYSED	DEPTH (mBGS)	GRAPHIC LOG	LITHOLOGIC DESCRIPTION	CONTACT DEPTH	WELL DIAGRAM
0			GW26_0.0-0.1				FILL Gravely Sand; loose; dark brown; dry; rubble; roots; rootlets; crushed rock; no odour.		
0			GW26_0.5-0.6						
			GW26_1.0-1.1		1				
0			GW26_1.5-1.6				Coarse grained Sand; loose; dark brown mottled with red; very moist; brick inclusions; no odour.	1.50	
								1.80	
0			GW26_1.9-2.0		2		NATURAL Coarse grained silty Sand; loose; grey; very moist; no odour.		
0			GW26_2.1-2.2					2.10	
							Coarse grained Sand; loose; grey; saturated; quartz inclusions; no odour.		
0			GW26_3.0-3.1		3		Medium grained Sand; moderately dense; pale grey; saturated; some shell fragments; no odour.	3.00	
0			GW26_4.0-4.1		4		Total Depth: 4.00 m	4.00	

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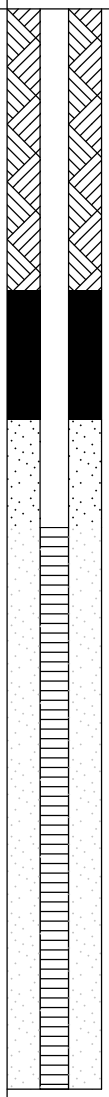
BORING/WELL CONSTRUCTION LOG

GW27

PROJECT NUMBER 60431087
PROJECT NAME FBURA
LOCATION Fishermans Bend
DRILLING METHOD HA/PT/HFA
SAMPLING METHOD PT/Grab
SURFACE ELEVATION
WELL HEAD/TOC
LOGGED BY Nathan Jensen
COMMENTS

DATE 14/10/2015
BLANK
SCREEN 2.4-5.0
GRAVEL PACK 1.9-5.0
SANITARY SEAL/BENTONITE 1.3-1.9
STABILISED WATER LEVEL
GROUND WATER ELEVATION

PID (ppm)	BLOW COUNTS	RECOVERY	SAMPLE NUMBER	ANALYSED	DEPTH (mBGS)	GRAPHIC LOG	LITHOLOGIC DESCRIPTION	CONTACT DEPTH
0			GW27_0.1-0.2				FILL Sand; dense; brown; dry; whole bricks; natural organic odour.	0.10
0			GW27_0.5-0.6				Gravely Sand; loose; red; dry; rubble; concrete; mostly bricks; no odour.	
					1			1.20
							Sand; dense; mottled grey, brown and orange; dry; quartz; brick; no odour.	1.40
							NATURAL Medium grained Sand; dense; brown/grey; slightly moist; no odour.	1.70
0			GW27_1.8-1.9					1.80
					2		Fine to medium grained Sand; moderately dense; brown/grey; slightly moist; no odour.	
							Medium to coarse grained silty Sand; moderately dense; grey mottled with orange; moist; no odour.	
								2.60
							Clayey silty Sand; moderately dense; grey mottled with orange; moist; no odour	
0			GW27_2.9-3.0					2.90
					3		Medium grained Sand; dense; dark grey; saturated; no odour.	3.00
							Medium grained Sand; dense; grey; saturated; slight brown mottling; no odour.	
0			GW27_3.9-4.0		4			
								4.20
							Medium grained Sand; dense; grey; saturated; shell fragments up to 10mm; no odour.	
0			GW27_4.9-5.0		5			5.00
							Total Depth: 5.00 m	



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BORING/WELL CONSTRUCTION LOG

GW28

PROJECT NUMBER 60431087
PROJECT NAME FBURA
LOCATION Fishermans Bend
DRILLING METHOD HA/PT/HFA
SAMPLING METHOD PT/Grab
SURFACE ELEVATION
WELL HEAD/TOC
LOGGED BY Dug Cunningham
COMMENTS

DATE 14/10/2015
BLANK
SCREEN 1.7-2.5
GRAVEL PACK 1.5-2.5
SANITARY SEAL/BENTONITE 1.0-1.5
STABILISED WATER LEVEL
GROUND WATER ELEVATION

PID (ppm)	BLOW COUNTS	RECOVERY	SAMPLE NUMBER	ANALYSED	DEPTH (mBGS)	GRAPHIC LOG	LITHOLOGIC DESCRIPTION	CONTACT DEPTH	WELL DIAGRAM
					1		FILL Silty Sand; pale grey; fine grained; loose; moist; no inclusions; brick pieces; no odour.	1.50	
0.4			GW28_1.6				Silty Sand; fine to coarse grained; loose; moist to saturated; no odour; brick pieces (<3x5mm).	1.60	
							NATURAL		
0.3			GW28_2.0		2		Fine grained Sand (Port Melbourne); grey mottle; loose; saturated; no inclusions; no odour.	2.50	
							Total Depth: 2.50 m		

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BORING/WELL CONSTRUCTION LOG

GW29

PROJECT NUMBER 60431087
PROJECT NAME FBURA
LOCATION Fishermans Bend
DRILLING METHOD HA/PT/HFA
SAMPLING METHOD PT/Grab
SURFACE ELEVATION
WELL HEAD/TOC
LOGGED BY Matt Sheppard
COMMENTS

DATE 26/10/2015
BLANK
SCREEN 2.0-4.0
GRAVEL PACK 1.5-4.0
SANITARY SEAL/BENTONITE 0.5-1.5
STABILISED WATER LEVEL
GROUND WATER ELEVATION

PID (ppm)	BLOW COUNTS	RECOVERY	SAMPLE NUMBER	ANALYSED	DEPTH (mBGS)	GRAPHIC LOG	LITHOLOGIC DESCRIPTION	CONTACT DEPTH	WELL DIAGRAM
					1		FILL Fine grained Sand; loose; pale grey; dry; no odour; slag.		
0.0			GW29_1.5-1.6					1.70	
					2		NATURAL Sandy Clay; firm; dark grey; slightly moist; no odour.	2.00	
							Medium grained Sand; moderately dense; pale yellow mottled with orange; dry; no odour.		
0.0			GW29_2.9-3.0		3	▽		3.00	
0.6			GW29_3.1-3.2				Sand; moderately dense; mottled orange and grey; saturated; no odour.		
								3.50	
							Fine to medium grained Sand; grey; saturated; no odour; some shell fragments.		
0.0			GW29_3.9-4.0		4			4.00	
							Total Depth: 4.00 m		

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BORING/WELL CONSTRUCTION LOG

GW30

PROJECT NUMBER 60431087
PROJECT NAME FBURA
LOCATION Fishermans Bend
DRILLING METHOD HA/PT/HFA
SAMPLING METHOD PT/Grab
SURFACE ELEVATION
WELL HEAD/TOC
LOGGED BY Nathan Jensen
COMMENTS

DATE 13/10/2015
BLANK
SCREEN 2.1-4.5
GRAVEL PACK 1.8-4.5
SANITARY SEAL/BENTONITE 0.6-1.8
STABILISED WATER LEVEL
GROUND WATER ELEVATION

PID (ppm)	BLOW COUNTS	RECOVERY	SAMPLE NUMBER	ANALYSED	DEPTH (mBGS)	GRAPHIC LOG	LITHOLOGIC DESCRIPTION	CONTACT DEPTH	WELL DIAGRAM
0			GW30_0.0-0.1				FILL Silty Sand; loose; dark brown; dry; rubble; rootlets; garbage; gravel; scrap metal; no odour.	0.30	
							Silty Sand; grey; dry; rubble; crushed rock; rubble; crushed rock; brick fragments; no odour.	0.90	
0			GW30_1.0-1.1		1		Silty Sand; moderately dense; grey; slightly moist; rubble; crushed rock; gravel; brick pieces up to 200mm; concrete pieces up to 300mm.	1.50	
							Sand; very loose; dark brown; dry; roots; rootlets; crushed rock; no odour.	1.70	
0			GW30_1.7-1.8				NATURAL	1.80	
					2		Coarse grained Sand; loose; dark; grey; moist; trace silt; no odour.	2.10	
							Very coarse grained Sand; loose; pale grey; moist; no odour.	2.30	
0			GW30_2.5-2.6				Very coarse grained Sand; loose; brown/grey; very moist; quartz inclusion; no odour.	2.50	
							Coarse grained Sand; moderately dense; dark grey and brown; very moist; quartz inclusions; orange staining at depth.	2.70	
					3		Medium grained Sand; moderately dense; pale grey; saturated; no odour.	3.20	
							Fine to medium grained Sand; moderately dense; dark grey; saturated; no odour.	3.40	
0			GW30_3.5-3.6				Clayey Sand; very soft; dark grey; saturated; no odour.		
					4		Fine grained Sand; loose; dark grey; saturated; no odour.		
0			GW30_4.4-4.5					4.50	
							Total Depth: 4.50 m		

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BORING/WELL CONSTRUCTION LOG

GW31

PROJECT NUMBER 60431087
PROJECT NAME FBURA
LOCATION Fishermans Bend
DRILLING METHOD HA/PT/HFA
SAMPLING METHOD PT/Grab
SURFACE ELEVATION
WELL HEAD/TOC
LOGGED BY Matt Sheppard
COMMENTS

DATE 29/10/2015
BLANK
SCREEN 2.5-4.5
GRAVEL PACK 2.0-4.5
SANITARY SEAL/BENTONITE 1.0-2.0
STABILISED WATER LEVEL
GROUND WATER ELEVATION

PID (ppm)	BLOW COUNTS	RECOVERY	SAMPLE NUMBER	ANALYSED	DEPTH (mBGS)	GRAPHIC LOG	LITHOLOGIC DESCRIPTION	CONTACT DEPTH	WELL DIAGRAM
					1		NATURAL Clayey Silt; very soft; dark grey; slightly moist; natural organic odour; rootlets.		
0			GW31_ 1.9-2.0		2				
0			GW31_ 2.9-3.0		3				
0			GW31_ 3.6-3.7					3.60	
0			GW31_ 3.9-4.0		4		Silty Sand; soft; dark grey; very moist; no odour; rootlets; some shell fragments.	3.80	
							Silty Sand; moderately dense; dark grey; saturated; no odour; some shell fragments.		
								4.50	
							Total Depth: 4.50 m		

BORING / WELL CONSTRUCTION LOG FBURA_GINT_BORELOGS.GPJ HLA_SYD.GDT 14/1/16

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BORING/WELL CONSTRUCTION LOG

GW33

PROJECT NUMBER 60431087
PROJECT NAME FBURA
LOCATION Fishermans Bend
DRILLING METHOD HA/PT/HFA
SAMPLING METHOD PT/Grab
SURFACE ELEVATION
WELL HEAD/TOC
LOGGED BY Oliver Taylor
COMMENTS

DATE 30/10/2015
BLANK
SCREEN 2.0-4.0
GRAVEL PACK 1.5-4.0
SANITARY SEAL/BENTONITE 0.5-1.5
STABILISED WATER LEVEL
GROUND WATER ELEVATION

PID (ppm)	BLOW COUNTS	RECOVERY	SAMPLE NUMBER	ANALYSED	DEPTH (mBGS)	GRAPHIC LOG	LITHOLOGIC DESCRIPTION	CONTACT DEPTH	WELL DIAGRAM
0			GW33_0.0-0.1				FILL Sand; brown; dry; no odour; rootlets.	0.30	
0			GW33_0.5-0.6		1		Silty Sand; pale brown; loose; dry.	1.50	
							Gravely Sand; grey brown; dry; no odour; rubble; concrete pieces; crushed rock; roof tiles; basalt cobbles.	1.60	
					2		NATURAL Sandy Clay; dark brown; firm; very moist.	2.30	
0			GW33_2.5-2.6				Silty Sand; black; saturated; gravel inclusions.	2.80	
0			GW33_3.0-3.1		3		Sand; dark grey; dense; saturated.		
0			GW33_3.4-3.5				Coarse grained Sandy Silt; soft; dark grey; saturated; some shell fragments.	3.50	
0					4		Total Depth: 4.00 m	4.00	
0									

BORING / WELL CONSTRUCTION LOG FBURA_GINT_BORELOGS.GPJ HLA_SYD.GDT 14/1/16

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BORING/WELL CONSTRUCTION LOG

GW34

PROJECT NUMBER 60431087
PROJECT NAME FBURA
LOCATION Fishermans Bend
DRILLING METHOD HA/PT/HFA
SAMPLING METHOD PT/Grab
SURFACE ELEVATION
WELL HEAD/TOC
LOGGED BY Nathan Jensen
COMMENTS

DATE 14/10/2015
BLANK
SCREEN 1.7-4.0
GRAVEL PACK 1.4-4.0
SANITARY SEAL/BENTONITE 0.8-1.4
STABILISED WATER LEVEL
GROUND WATER ELEVATION

PID (ppm)	BLOW COUNTS	RECOVERY	SAMPLE NUMBER	ANALYSED	DEPTH (mBGS)	GRAPHIC LOG	LITHOLOGIC DESCRIPTION	CONTACT DEPTH	WELL DIAGRAM
					1		FILL Clayey Sand; moderately dense; dark brown; moist; rubble; coke; spent oxide; crushed rock; gravel; natural organic odour.		
0			GW34_1.5-1.6					1.60	
					2		NATURAL Medium grain Sand; loose; dark grey; saturated; no odour.		
0			GW34_2.2-2.3				Silty Sand; moderately dense; dark grey; saturated; shell fragments up to 15mm; no odour.	2.20	
					3		Sand; loose; dark grey; saturated; shell fragments up to 5mm; organic odour.	2.90	
							Clay; soft; dark grey; saturated; high plasticity; shell fragments up to 5mm: sulphur odour.	3.20	
3			GW34_3.5-3.6						
					4		Clay; firm; dark grey; saturated; very high plasticity; shells fragments up to 5mm; sulphur odour.	3.80 4.00	
							Total Depth: 4.00 m		

BORING / WELL CONSTRUCTION LOG FBURA_GINT_BORELOGS.GPJ HLA_SYD.GDT 14/1/16

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BORING/WELL CONSTRUCTION LOG

GW36

PROJECT NUMBER 60431087
PROJECT NAME FBURA
LOCATION Fishermans Bend
DRILLING METHOD HA/PT/HFA
SAMPLING METHOD PT/Grab
SURFACE ELEVATION
WELL HEAD/TOC
LOGGED BY Nathan Jensen
COMMENTS

DATE 15/10/2015
BLANK
SCREEN 1.3-3.5
GRAVEL PACK 1.0-3.5
SANITARY SEAL/BENTONITE 0.4-1.0
STABILISED WATER LEVEL
GROUND WATER ELEVATION

PID (ppm)	BLOW COUNTS	RECOVERY	SAMPLE NUMBER	ANALYSED	DEPTH (mBGS)	GRAPHIC LOG	LITHOLOGIC DESCRIPTION	CONTACT DEPTH
			GW36_				ASPHALT	0.05
0			0.1-0.2				FILL	0.30
			GW36_				Sand; dense; grey/brown; dry; coke; crushed rock; no odour.	
0.7			0.5-0.6				Gravely Clay; firm; mottled brown and orange; slightly moist; medium plasticity; crushed rock; no odour.	0.80
			GW36_					
1			0.9-1.0		1		NATURAL	1.00
							Clay; firm; mottled grey and orange; slightly moist; medium plasticity; rootlets; rootlets; good structure; no odour.	
			GW36_					
0			1.4-1.5					1.50
			GW36_				Fine grained Sand; moderately dense; pale grey and orange/brown; saturated; no odour.	
0			1.6-1.7					1.80
			GW36_				Sandy Clay; stiff; dark grey; saturated; no odour.	
0			1.9-2.0		2		Clay; very stiff; blue/grey mottled; saturated; low plasticity; no odour.	2.00
							Clayey Sand; dense; dark blue/grey; mottled; saturated; medium plasticity; firm; natural organic odour.	
			GW36_					2.50
0			2.5-2.6				Silty Clay; soft; dark grey; saturated; high plasticity; rootlets; natural organic odour.	
			GW36_					3.00
0			3.0-3.1		3		Medium grained Sand; dark grey; saturated; natural organic odour.	
								3.50
							Total Depth: 3.50 m	

WELL DIAGRAM

AECOM
Level 45, 80 Collins Street
MELBOURNE VIC 3004
Telephone: 03 9653 1234
Fax: 03 9654 7117

BORING/WELL CONSTRUCTION LOG

GW37

PROJECT NUMBER 60431087
PROJECT NAME FBURA
LOCATION Fishermans Bend
DRILLING METHOD HA/PT/HFA
SAMPLING METHOD PT/Grab
SURFACE ELEVATION
WELL HEAD/TOC
LOGGED BY Nathan Jensen
COMMENTS

DATE 14/10/2015
BLANK
SCREEN 4.0-7.0
GRAVEL PACK 3.5-7.0
SANITARY SEAL/BENTONITE 1.5-3.5
STABILISED WATER LEVEL
GROUND WATER ELEVATION

PID (ppm)	BLOW COUNTS	RECOVERY	SAMPLE NUMBER	ANALYSED	DEPTH (mBGS)	GRAPHIC LOG	LITHOLOGIC DESCRIPTION	CONTACT DEPTH	WELL DIAGRAM
0			GW37_0.0-0.1				FILL Silty Sand; grey/brown; loose; fine to medium grained; no odour; dry; rootlets; minor gravel.		
0.1			GW37_0.5-0.6					0.50	
							NATURAL Silty Sand; coarse; light brown; cemented; dense; dry; no odour; turning well graded and pale; becoming moist @ ~1.6m bgl; no inclusions.		
0.1			GW37_1.0-1.1		1				
0			GW37_1.5-1.6					1.80	
							Fine grained Sand; loose; pale; drilling soft @ ~1.8-2m bgl; dry; no odour.		
0			GW37_2.0-2.1		2				
0			GW37_2.6-2.7					2.60	
							Fine grained Sand; loose; pale; turning brown with red mottling with depth; moist.	2.70	
0			GW37_3.0-3.1		3		Sandy Silt (Coode Island); dark grey; soft; moist to wet; no odour; shell fragments.	3.00	
							Silty Gravel; cemented sand; light brown; wet; no odour; no inclusions.		
0			GW37_4.0-4.1		4			4.05	
							Clay (Older Volcanics); grey/brown; stiff; minor vesicular basalt inclusions; low to high plasticity; saturated with depth; no odour.		
0			GW37_5.0-5.1		5	▽			
0			GW37_5.3-5.4					5.30	
							Clay; firm; blue/grey mottled with orange; very moist; high plasticity; rock fragments up to 5mm; no odour.	5.60	
							Clay; very dense; brown/orange mottle; moist; rock fragments up to 40mm; weathered basalt zone; no odour.	5.80 5.90	
0			GW37_6.0-6.1		6		Clayey Sand; very stiff; mottled orange with blue/grey; moist; low plasticity; 2-3mm gravel inclusions; weathered basalt zone; no odour.		
							Silty Sand; very dense; pale orange and grey mottled; very moist; gravels up to 30 mm; weathered basalt zone; no odour.		
0			GW37_6.8-6.9					7.00	

Total Depth: 7.00 m

AECOM
Level 45, 80 Collins Street
MELBOURNE VIC 3004
Telephone: 03 9653 1234
Fax: 03 9654 7117

BORING/WELL CONSTRUCTION LOG

GW38

PROJECT NUMBER 60431087
PROJECT NAME FBURA
LOCATION Fishermans Bend
DRILLING METHOD HA/PT/HFA
SAMPLING METHOD PT/Grab
SURFACE ELEVATION
WELL HEAD/TOC
LOGGED BY Matt Sheppard
COMMENTS

DATE 27/10/2015
BLANK
SCREEN 4.0-7.0
GRAVEL PACK 3.5-7.0
SANITARY SEAL/BENTONITE 2.5-3.5
STABILISED WATER LEVEL
GROUND WATER ELEVATION

PID (ppm)	BLOW COUNTS	RECOVERY	SAMPLE NUMBER	ANALYSED	DEPTH (mBGS)	GRAPHIC LOG	LITHOLOGIC DESCRIPTION	CONTACT DEPTH	WELL DIAGRAM
					1		NATURAL Clay; firm; mottled red brown; dry; no odour.		
0			GW38_1.5-1.6						
0			GW38_1.9-2.0		2				
0.5			GW38_2.9-3.0		3			3.00	
							Clay; stiff; pale grey and mottled orange; dry; no odour; minor basalt fragment inclusions.		
0			GW38_3.9-4.0		4				
0			GW38_5.0-5.1		5		▽	5.00	
							Clay; soft; red brown; saturated; no odour.		
0			GW38_5.9-6.0		6				
0			GW38_6.9-7.0					7.00	

Total Depth: 7.00 m

Appendix F

Calibration Certificates

Equipment Calibration Form

TPS 90-FLMV

Enqip #: 2513

Company: AECOM Australia Pty Ltd

Consultant: Averyll Coyne

PO #: 60431087/1.4

INSTRUMENT IDENTIFICATION

Model Number: 90-FLMV

Serial Number: V1317

Instrument Type: TPS Water Quality Meter

INSPECTION RECORD

Batteries Checked:	PASS	**Date & Time:**	PASS
Electrodes Cleaned/Checked:	PASS	**Temperature:**	PASS

CALIBRATION DETAILS

Sensor	Cal Solution	Value	Reading
pH	Buffer 4.01	4.01 pH	4.01 pH
	Buffer 6.88	6.88 pH	6.88 pH
Redox	Standard ORP	235 mV @ 20 °C	231 mV
O_2	Zero Dissolved Oxygen	0 %	0 %
	Air	100 %	100 %
Conductivity	Zero Conductivity	0.00 mS/cm	0.00 mS/cm
	Standard Conductivity	2.76 mS/cm	2.76 mS/cm

Calibration Successful: YES

Calibrated By: Farzana Moga **Test Date:** 2/11/2015

423 City Road, South Melbourne 3205
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E info@enqip.com.au | **W** www.enqip.com.au

ThermoFisher SCIENTIFIC

The world leader in serving science

RENTALS

Equipment Certification Report – TPS 90FLMV Water Quality Meter

This Water Quality Meter has been performance checked and calibrated as follows:

Sensor	Concentration	Span 1	Span 2	Traceability Lot #	Pass?
pH	pH 6.88 / pH 4.00	6.88pH	4.00pH	MF1250 /MK1078	☑
Conductivity	58.6mS/cm	0.0 mS/cm	58.6mS/cm	NA1873	☑
TDS	36 ppk	0.0 ppk	36.0ppk	MG1713	☑
Dissolved Oxygen	Sodium Sulphite / Air	0.0ppm in Sodium Sulphite	ppm Saturation in Air	497	☑

Check only

Redox (ORP) *	Electrode operability test	240mV +/- 10%	238 mV	NA1568 / NA1569	☑

* This meter uses an Ag/AgCl ORP electrode. To convert readings to SHE (Standard Hydrogen Electrode), add 199mV to the mV reading.

☑ Battery Status 8.0 (min 7.2V)
☑ Electrical Safety Tag attached (AS/NZS 3760)

☑ Temperature 21.7 °C
☐ Electrodes Cleaned and checked

Tag No: 009358

Valid to: 2/11/15

Date: 13th NOV, 2015

Signed: [signature]

Please check that the following items are received and that all items are cleaned and decontaminated before return. A minimum $30 cleaning / service / repair charge may be applied to any unclean or damaged items. Items not returned will be billed for at the full replacement cost.

Sent	Returned	Item
☑	☐	90FLMV Unit. Ops check/Battery status: 8.0V
☑	☐	pH sensor with wetting cap, 5m
☑	☐	Conductivity/TDS/Temperature K=10 sensor, 5m
☑	☐	Dissolved oxygen YSI5739 sensor with wetting cap, 5m
☑	☐	Redox (ORP) sensor with wetting cap, 5m
☑	☐	Power supply 240V to 12V DC 200mA
☑	☐	Instruction Manual
☑	☐	Quick Guide
☑	☐	Syringe with storage solution for pH and ORP sensors
☑	☐	Carry Case
☑	☐	Check to confirm electrical safety (tag must be valid)

Date: 13/11/15

Signed: [signature]

TFS Reference	CM0044284	Return Date:	/ /
Customer Reference	6043108 7	Return Time:	
Equipment ID	90FLMV R	Condition on return:	
Equipment Serial No.			

Equipment Calibration Form
TPS 90-FLMV

Enqip #: 2514
Company: AECOM Australia Pty Ltd
Consultant: Averyll Coyne
PO #: 60431087/1.4

INSTRUMENT IDENTIFICATION

Model Number: 90-FLMV
Serial Number: T8038
Instrument Type: TPS Water Quality Meter

INSPECTION RECORD

Batteries Checked:	PASS	**Date & Time:**	PASS
Electrodes Cleaned/Checked:	PASS	**Temperature:**	PASS

CALIBRATION DETAILS

Sensor	Cal Solution	Value	Reading
pH	Buffer 4.01	4.01 pH	4.01 pH
	Buffer 6.88	6.88 pH	6.88 pH
Redox	Standard ORP	235 mV @ 20 °C	231 mV
O_2	Zero Dissolved Oxygen	0 %	0 %
	Air	100 %	100 %
Conductivity	Zero Conductivity	0.00 mS/cm	0.00 mS/cm
	Standard Conductivity	2.76 mS/cm	2.76 mS/cm

Calibration Successful: YES

Calibrated By: Kaz Svazas **Test Date:** 4/11/2015

enqip
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Appendix G

Well Development Forms

AECOM

CPFO471o (ENV) Site Contamination Analysis Well Development Form

Project Name: FBURA Groundwater Assessment	Project Number: 60431087	Well No: GW01
Recorded / Developed By: Oliver T	Well Type: ☑Monitor ☐Extractor ☐Other:	
Date: 2/11/2015	Well Material: ☑PVC ☐SS ☐Other:	

Well Purging

Well Details	Development Method
Well Diameter (D in mm): ☑50 ☐100 ☐Other:	☑Bailer – Type: ☐PVC ☐SS ☐Teflon ☑Other: Steel to stir up water
Total Depth of Well (TD in m BTOC): 4.35	☑Pump – Type: ☐Submersible ☐Bladder ☑Other: Perasteltic
Water Level Depth (WL in m BTOC): 2.84	Pump Intake Setting (if pump used): 0
Number of bore volumes to be purged (# VOLS)	Depth pump set (m BTOC): 0
☑3 ☐4 ☐5 ☐10 ☐Other:	Screen Interval (m BTOC) Top : 0 Bottom: 0

Anticipated Approximate Purge Volume Calculation

(_____ - _____) x (_____/2)^2 x 0.00314 = _____ _____ x _____ = _____

TD WL D 1 BV (L) BV # VOLS Purge Volume (L)

Start: 8:29 AM Stop: 9:25 AM Elapsed: 56 min Initial depth to water: 2.84
Final depth to water: 2.86

Field Parameter Measurements ☑ **Required** ☐**Not required**

Actual Time	Elapsed minutes	Purge Vol (L)	DO (mg/L)	EC. (µS/cm)	pH	Redox (mV)	Temp (°C)	SWL (m BTOC)	Pump setting (rate)
8:34 AM	8 min	1	0.15	4.95	7.28	-148	18.5	2.84	0
8:42 AM	5 min	2	0	4.9	7.34	-191	18.1	2.87	0
8:47 AM	5 min	4	0	4.98	7.39	-199	18	2.87	0
8:52 AM	5 min	7	0	5	7.41	-202	17.9	2.87	0
8:57 AM	5 min	11	0	4.99	7.39	-202	17.9	2.87	0
9:02 AM	3 min	15	0	5	7.37	-202	17.8	2.87	0
9:05 AM	5 min	16	0	4.92	7.39	-204	17.7	2.86	0
9:10 AM	5 min	20	0	4.95	7.39	-207	17.8	2.86	0
9:15 AM	5 min	23	0	4.96	7.4	-209	17.8	2.86	0
9:20 AM	5 min	26	0	4.95	7.4	-212	17.8	2.86	0
9:25 AM	5 min	29	0	4.97	7.41	-212	17.8	2.86	0
Groundwater equilibrium reached at			± 10%	± 3%	± 0.05	± 10 mV	± 0.2 °C	(3 consecutive measurements)	

Observations at start of development (turbidity, colour, odour, sheen):
High turbidity ; dark black ; petroleum odour ; no sheen

Observations at end of development (turbidity, colour, odour, sheen):
Low-moderate turbidity to clear ; no sheen

Volume of water actually purged during development: 29 L

Discharge water disposal: ☑Drums ☐Sanitary sewer ☐Storm sewer ☐Surface ☐Other:

Other observations / comments:

CPFO471o (ENV) Site Contamination Analysis Well Development Form

Project Name: FBURA	Project Number: 60431087	Well No: GW02
Recorded / Developed By: Tim Martin	Well Type: ☒ Monitor ☐ Extractor ☐ Other	
Date: 5/11/15	Well Material: ☒PVC ☐ SS ☐ Other	

Well Purging

Well Details	**Development Method**
Well Diameter (D in mm): ☒50 ☐100 ☐Other:	☐ Bailer – Type: ☐ PVC ☐ SS ☐ Teflon ☐ Other:
Total Depth of Well (TD in m BTOC): 3.28	☒ Pump – Type: ☐ Submersible ☒ Bladder ☐ Other:
Water Level Depth (WL in m BTOC): 3.92	Pump Intake Setting (if pump used)
Number of bore volumes to be purged (# VOLS)	Depth pump set (m BTOC):
☐ 3 ☐ 4 ☐ 5 ☐ 10 ☐ Other	Screen Interval (m BTOC) Top : Bottom:

Anticipated Approximate Purge Volume Calculation

(_____ - _____) x (_____/2)^2 x 0.00314 = _____ _____ x _____ = _____

TD WL D 1 BV (L) BV # VOLS Purge Volume (L)

Start	**Stop**	**Elapsed**	**Initial depth to water:**	**Final depth to water:**
Time: 9:37	**Time: 10:05**	**Time:**	**3.28/3.92**	**3.28/3.92**

Field Parameter Measurements ☐ **Required** ☐ **Not required**

Actual Time	Elapsed minutes	Purge Vol (L)	DO (mg/L)	EC. (µS/cm)	pH	Redox (mV)	Temp (°C)	SWL (m BTOC)	Pump setting (rate)
9:38		**0.5**	**0.55**	**3340**	**6.76**	**-53**	**18.6**	**3.29**	**350 rpm**
9:45		**4.0**	**0.46**	**3180**	**6.78**	**-80**	**18.5**	**3.28**	**350 rpm**
9:55		**9.0**	**0.03**	**3150**	**6.88**	**-104**	**18.6**	**3.28**	**350 rpm**
10:05		**16.0**	**0.01**	**3200**	**6.82**	**-108**	**18.7**	**3.28**	**350 rpm**
10:15		**25.0**	**0.00**	**3200**	**6.21**	**-104**	**18.8**	**3.28**	**350 rpm**
Groundwater equilibrium reached at			± 10%	± 3%	± 0.05	± 10 mV	± 0.2 °C	(3 consecutive measurements)	

Observations at start of development (turbidity, colour, odour, sheen): Low turbidity, black, natural organic odour, no sheen.

Observations at end of development (turbidity, colour, odour, sheen): Low turbidity, black, natural organic odour, no sheen.

Volume of water actually purged during development:_____25_____ L

Discharge water disposal: ☒ Drums ☐ Sanitary sewer ☐ Storm sewer ☐ Surface ☐ Other:_____

Other observations / comments:

Low to no turbidity, water has natural organic odour and black colour. Steel Bailer hitting casing bottom @ 3.92mbTOC.

CPFO471o (ENV) Site Contamination Analysis Well Development Form

Project Name: FBURA Groundwater Assessment	Project Number: 60431087	Well No: GW03
Recorded / Developed By: Oliver T	Well Type: ☑Monitor ☐Extractor ☐Other:	
Date: 16/10/2015	Well Material: ☑PVC ☐SS ☐Other:	

Well Purging

Well Details	Development Method
Well Diameter (D in mm): ☑50 ☐100 ☐Other:	☑Bailer – Type: ☐PVC ☐SS ☐Teflon ☑Other: Steel to stir up water
Total Depth of Well (TD in m BTOC): 4.69	☑Pump – Type: ☐Submersible ☐Bladder ☑Other: Perasteltic
Water Level Depth (WL in m BTOC): 3.11	Pump Intake Setting (if pump used): 0
Number of bore volumes to be purged (# VOLS)	Depth pump set (m BTOC): 0
☑3 ☐4 ☐5 ☐10 ☐Other:	Screen Interval (m BTOC) Top : 0 Bottom: 0

Anticipated Approximate Purge Volume Calculation

(_____ - _____) x (_____/2)^2 x 0.00314 = _____ _____ x _____ = _____

TD WL D 1 BV (L) BV # VOLS Purge Volume (L)

Start: 9:01 AM Stop: 9:54 AM Elapsed: 53 min Initial depth to water: 3.11
Final depth to water: 3.21

Field Parameter Measurements ☑ **Required** ☐**Not required**

Actual Time	Elapsed minutes	Purge Vol (L)	DO (mg/L)	EC. (µS/cm)	pH	Redox (mV)	Temp (°C)	SWL (m BTOC)	Pump setting (rate)
9:05 AM	4 min	1	1.15	2.07	7.53	-152.9	18.2	3.11	0
9:09 AM	5 min	2	0.83	2.16	7.48	-147.9	19.1	3.14	0
9:14 AM	5 min	5	0.36	2.24	7.47	-158.4	18.8	3.15	0
9:19 AM	5 min	9	0.36	2.26	7.35	-152.1	18.7	3.15	0
9:24 AM	4 min	12	0.34	2.26	7.28	-151.9	18.6	3.16	0
9:28 AM	4 min	15	0	2.25	7.27	-149.6	18.6	3.17	0
9:32 AM	5 min	16	0.15	2.12	7.38	-161	18.9	3.17	0
9:37 AM	5 min	19	0.16	2.21	7.33	-162	18.9	3.22	0
9:42 AM	5 min	23	0.18	2.22	7.31	-151	18.8	3.22	0
9:47 AM	5 min	26	0.17	2.22	7.27	-152	18.7	3.22	0
9:52 AM	5 min	29	0.14	2.21	7.25	-156.3	18.7	3.21	0
Groundwater equilibrium reached at			± 10%	± 3%	± 0.05	± 10 mV	± 0.2 °C	(3 consecutive measurements)	

Observations at start of development (turbidity, colour, odour, sheen):
High turbidity ; dark brown ; odour ; no sheen

Observations at end of development (turbidity, colour, odour, sheen):
Low-moderate turbidity ; clear ; no odour ; no sheen

Volume of water actually purged during development: 28 L

Discharge water disposal: ☑Drums ☐Sanitary sewer ☐Storm sewer ☐Surface ☐Other:

Other observations / comments:

CPFO471o (ENV) Site Contamination Analysis Well Development Form

Project Name: FBURA Groundwater Assessment	Project Number: 60431087	Well No: GW04
Recorded / Developed By: Oliver T	Well Type: ☑Monitor ☐Extractor ☐Other:	
Date: 16/10/2015	Well Material: ☑PVC ☐SS ☐Other:	

Well Purging

Well Details	Development Method
Well Diameter (D in mm): ☑50 ☐100 ☐Other:	☑Bailer – Type: ☐PVC ☐SS ☐Teflon ☑Other: Steel to stir up water
Total Depth of Well (TD in m BTOC): 4.61	☑Pump – Type: ☐Submersible ☐Bladder ☑Other: Perasteltic
Water Level Depth (WL in m BTOC): 3.11	Pump Intake Setting (if pump used): 0
Number of bore volumes to be purged (# VOLS) ☑3 ☐4 ☐5 ☐10 ☐Other:	Depth pump set (m BTOC): 0
	Screen Interval (m BTOC) Top : 0 Bottom: 0

Anticipated Approximate Purge Volume Calculation

(_____ - _____) x (_____/2)^2 x 0.00314 = _____ _____ x _____ = _____

TD WL D 1 BV (L) BV # VOLS Purge Volume (L)

Start: 7:16 AM Stop: 8:42 AM Elapsed: 86 min Initial depth to water: 3.11
Final depth to water: 3.17

Field Parameter Measurements ☑ **Required** ☐**Not required**

Actual Time	Elapsed minutes	Purge Vol (L)	DO (mg/L)	EC. (µS/cm)	pH	Redox (mV)	Temp (°C)	SWL (m BTOC)	Pump setting (rate)
7:20 AM	9 min	1	7	1.32	7.46	-62.7	18.3	3.11	0
7:29 AM	24 min	2	1.12	-65.9	7.28	-70.2	19.3	3.14	0
7:53 AM	5 min	5	0.67	1.02	7.26	62.2	18.7	3.17	0
7:58 AM	5 min	8	1.02	1.03	7.24	-60.2	18.5	3.17	0
8:03 AM	5 min	11	0.74	1.13	7.2	-80.4	18.5	3.17	0
8:08 AM	3 min	14	0.54	1.2	7.19	-94.9	18.5	3.17	0
8:11 AM	5 min	16	1.04	0.45	7.22	-99.5	18.6	3.12	0
8:16 AM	5 min	18	0.29	1.1	7.24	-104	18.7	3.16	0
8:21 AM	5 min	21	1.33	1.08	7.2	-61	18.6	3.16	0
8:26 AM	5 min	23	0.78	1.23	7.2	-76	18.6	3.17	0
8:31 AM	5 min	26	0.88	1.27	7.18	-96.6	18.5	3.17	0
8:36 AM	5 min	28	0.37	1.51	7.19	100.7	18.5	3.17	0
8:41 AM	5 min	31	0.65	1.44	7.19	-98.7	18.5	3.17	0
Groundwater equilibrium reached at			± 10%	± 3%	± 0.05	± 10 mV	± 0.2 °C	(3 consecutive measurements)	

Observations at start of development (turbidity, colour, odour, sheen):
high turbidity ; dark brown ; no odour ; no sheen ;

Observations at end of development (turbidity, colour, odour, sheen):
low-moderate turbidity ; clear ; no odour ; no sheen ;

Volume of water actually purged during development: 31 L

Discharge water disposal: ☑Drums ☐Sanitary sewer ☐Storm sewer ☐Surface ☐Other:

Other observations / comments:

CPFO471o (ENV) Site Contamination Analysis Well Development Form

Project Name: FBURA Groundwater Assessment	Project Number: 60431087	Well No: GW05
Recorded / Developed By: Oliver T	Well Type: ☑Monitor ☐Extractor ☐Other:	
Date: 16/10/2015	Well Material: ☑PVC ☐SS ☐Other:	

Well Purging

Well Details	Development Method
Well Diameter (D in mm): ☑50 ☐100 ☐Other:	☑Bailer – Type: ☐PVC ☐SS ☐Teflon ☑Other: Steel to stir up water
Total Depth of Well (TD in m BTOC): 4.09	☑Pump – Type: ☐Submersible ☐Bladder ☑Other: Perasteltic
Water Level Depth (WL in m BTOC): 2.36	Pump Intake Setting (if pump used): 0
Number of bore volumes to be purged (# VOLS)	Depth pump set (m BTOC): 0
☑3 ☐4 ☐5 ☐10 ☐Other:	Screen Interval (m BTOC) Top : 0 Bottom: 0

Anticipated Approximate Purge Volume Calculation

(_____ - _____) x (_____/2)^2 x 0.00314 = _____ _____ x _____ = _____

TD WL D 1 BV (L) BV # VOLS Purge Volume (L)

Start: 10:42 AM Stop: 11:46 AM Elapsed: 64 min Initial depth to water: 2.36
Final depth to water: 2.59

Field Parameter Measurements ☑ **Required** ☐**Not required**

Actual Time	Elapsed minutes	Purge Vol (L)	DO (mg/L)	EC. (µS/cm)	pH	Redox (mV)	Temp (°C)	SWL (m BTOC)	Pump setting (rate)
10:47 AM	8 min	1	0.34	2.2	7.5	-192	18.4	2.49	0
10:55 AM	5 min	2	0.76	2.28	7.63	-166.4	18.5	2.5	0
11:00 AM	5 min	5	0.66	2.29	7.49	-188.1	18.2	2.52	0
11:05 AM	5 min	9	0.4	2.29	7.45	-159.2	17.9	2.58	0
11:10 AM	5 min	12	0.26	-189.2	7.46	-189.7	17.9	2.6	0
11:15 AM	5 min	15	0.05	2.3	7.4	-193.4	17.9	2.59	0
11:20 AM	5 min	16	0.2	1.73	7.4	-165.9	18.2	2.57	0
11:25 AM	5 min	20	0.19	2.24	7.48	-190.3	17.9	2.59	0
11:30 AM	5 min	23	0.17	2.29	7.43	-187.8	17.9	2.59	0
11:35 AM	5 min	26	0.16	2.3	7.46	-185.7	17.8	2.59	0
11:40 AM	4 min	29	0.12	2.3	7.45	-187.3	17.8	2.59	0
11:44 AM	4 min	32	0.11	2.3	7.45	-184.8	17.7	2.59	0
Groundwater equilibrium reached at			± 10%	± 3%	± 0.05	± 10 mV	± 0.2 °C	(3 consecutive measurements)	

Observations at start of development (turbidity, colour, odour, sheen):
High turbidity ; dark blackish/brown ; no odour ; no sheen

Observations at end of development (turbidity, colour, odour, sheen):
Low-moderate turbidity ; clear ; no odour ; no sheen

Volume of water actually purged during development: 32 L

Discharge water disposal: ☑Drums ☐Sanitary sewer ☐Storm sewer ☐Surface ☐Other:

Other observations / comments:

CPFO471o (ENV) Site Contamination Analysis Well Development Form

Project Name: FBURA Groundwater Assessment	Project Number: 60431087	Well No: GW06
Recorded / Developed By: Oliver T	Well Type: ☑Monitor ☐Extractor ☐Other:	
Date: 2/11/2015	Well Material: ☑PVC ☐SS ☐Other:	

Well Purging

Well Details	Development Method
Well Diameter (D in mm): ☑50 ☐100 ☐Other:	☑Bailer – Type: ☐PVC ☐SS ☐Teflon ☑Other: Steel to stir up water
Total Depth of Well (TD in m BTOC): 4.01	☑Pump – Type: ☐Submersible ☐Bladder ☑Other: Other
Water Level Depth (WL in m BTOC): 1.91	Pump Intake Setting (if pump used): 0
Number of bore volumes to be purged (# VOLS)	Depth pump set (m BTOC): 0
☑3 ☐4 ☐5 ☐10 ☐Other:	Screen Interval (m BTOC) Top : 0 Bottom: 0

Anticipated Approximate Purge Volume Calculation

(_____ - _____) x (_____/2)^2 x 0.00314 = _____ _____ x _____ = _____

TD WL D 1 BV (L) BV # VOLS Purge Volume (L)

Start: 9:46 AM Stop: 10:40 AM Elapsed: 54 min Initial depth to water: 1.91
Final depth to water: 1.93

Field Parameter Measurements ☑ **Required** ☐**Not required**

Actual Time	Elapsed minutes	Purge Vol (L)	DO (mg/L)	EC. (µS/cm)	pH	Redox (mV)	Temp (°C)	SWL (m BTOC)	Pump setting (rate)
9:48 AM	5 min	1	3.02	3.6	7.2	-112	13.6	1.92	0
9:53 AM	5 min	4	0.54	2.66	7.04	-136	13.3	1.93	0
9:58 AM	5 min	8	0.05	2.55	7.05	-142	13.3	1.93	0
10:03 AM	5 min	12	0	2.55	7.03	-142	13.4	1.93	0
10:08 AM	2 min	15	0	2.5	7.04	-141	13.4	1.93	0
10:10 AM	5 min	17	0.07	2.48	7.05	-139	13.6	1.9	0
10:15 AM	5 min	19	0	2.48	7.05	-140	13.6	1.93	0
10:20 AM	5 min	22	0	2.45	7.04	-142	13.4	1.93	0
10:25 AM	5 min	25	0	2.46	7.01	-144	13.4	1.93	0
10:30 AM	5 min	29	0	2.41	7.01	-145	13.4	1.93	0
10:35 AM	5 min	33	0	2.39	7.03	-147	13.4	1.93	0
10:40 AM	5 min	38	0	2.41	7.02	-149	13.4	1.93	0
Groundwater equilibrium reached at			± 10%	± 3%	± 0.05	± 10 mV	± 0.2 °C	(3 consecutive measurements)	

Observations at start of development (turbidity, colour, odour, sheen):
High turbidity ; dark brown/grey ; no odour ; no sheen

Observations at end of development (turbidity, colour, odour, sheen):
Low-moderate turbidity ; light yellow ; no odour ; no sheen

Volume of water actually purged during development: 38 L

Discharge water disposal: ☑Drums ☐Sanitary sewer ☐Storm sewer ☐Surface ☐Other:

Other observations / comments:

CPFO471o (ENV) Site Contamination Analysis Well Development Form

Project Name: FBURA Groundwater Assessment	Project Number: 60431087	Well No: GW07
Recorded / Developed By: Oliver T	Well Type: ☑Monitor ☐Extractor ☐Other:	
Date: 16/10/2015	Well Material: ☑PVC ☐SS ☐Other:	

Well Purging

Well Details	Development Method
Well Diameter (D in mm): ☑50 ☐100 ☐Other:	☑Bailer – Type: ☐PVC ☐SS ☐Teflon ☑Other: Steel to stir up water
Total Depth of Well (TD in m BTOC): 5.19	☑Pump – Type: ☐Submersible ☐Bladder ☑Other: Perasteltic
Water Level Depth (WL in m BTOC): 2.69	Pump Intake Setting (if pump used): 0
Number of bore volumes to be purged (# VOLS)	Depth pump set (m BTOC): 0
☑3 ☐4 ☐5 ☐10 ☐Other:	Screen Interval (m BTOC) Top : 0 Bottom: 0

Anticipated Approximate Purge Volume Calculation

(_____ - _____) x (_____/2)^2 x 0.00314 = _____ _____ x _____ = _____

TD WL D 1 BV (L) BV # VOLS Purge Volume (L)

Start: 12:42 PM Stop: 2:17 PM Elapsed: 95 min Initial depth to water: 2.69
Final depth to water: 2.71

Field Parameter Measurements ☑ **Required** ☐**Not required**

Actual Time	Elapsed minutes	Purge Vol (L)	DO (mg/L)	EC. (µS/cm)	pH	Redox (mV)	Temp (°C)	SWL (m BTOC)	Pump setting (rate)
12:46 PM	12 min	1	1.85	2.19	7.34	-134.7	17.7	2.7	0
12:58 PM	5 min	2	1.3	2.18	7.43	-120.9	18	2.72	0
1:03 PM	5 min	5	0.51	0.96	7.2	-149.4	17.6	2.7	0
1:08 PM	5 min	9	0.25	0.97	7.19	-154.9	17.6	2.7	0
1:13 PM	5 min	12	0.27	0.75	7.17	-146.3	17.6	2.7	0
1:18 PM	7 min	15	0.27	0.73	7.14	-141.9	17.5	2.7	0
1:25 PM	5 min	16	0.7	0.68	7.15	-129.4	18	2.7	0
1:30 PM	5 min	19	0.16	1.05	7.12	-136.7	17.5	2.7	0
1:35 PM	5 min	22	0.17	1.04	7.12	-135.5	17.5	2.71	0
1:40 PM	5 min	25	0.15	0.96	7.09	-133.7	17.5	2.71	0
1:45 PM	5 min	28	0.14	1.28	7.06	-130.5	17.4	2.71	0
1:50 PM	5 min	31	0.11	-128.3	7.06	-127.7	17.4	2.71	0
1:55 PM	5 min	33	0.09	1.29	7.06	-130	17.4	2.71	0
2:00 PM	5 min	35	0.08	1.27	7.06	-136.6	17.3	2.71	0
2:05 PM	6 min	38	0.05	1.21	7.05	-140	17.3	2.71	0
2:11 PM	4 min	40	0.05	1.21	7.05	-141.3	17.3	2.71	0
2:15 PM	4 min	44	0.05	1.2	7.03	-140.6	17.3	2.71	0
Groundwater equilibrium reached at			± 10%	± 3%	± 0.05	± 10 mV	± 0.2 °C	(3 consecutive measurements)	

Observations at start of development (turbidity, colour, odour, sheen):
High turbidity ; dark grey ; no odour ; no sheen

Observations at end of development (turbidity, colour, odour, sheen):
Low-moderate turbidity ; clear – greenish colour ; no odour ; no sheen

Volume of water actually purged during development: 44 L

Discharge water disposal: ☑Drums ☐Sanitary sewer ☐Storm sewer ☐Surface ☐Other:

CPFO471o (ENV) Site Contamination Analysis Well Development Form

Project Name: FBURA Groundwater Assessment	Project Number: 60431087	Well No: GW08
Recorded / Developed By: Oliver T	Well Type: ☑Monitor ☐Extractor ☐Other:	
Date: 2/11/2015	Well Material: ☑PVC ☐SS ☐Other:	

Well Purging

Well Details	Development Method
Well Diameter (D in mm): ☑50 ☐100 ☐Other:	☑Bailer – Type: ☐PVC ☐SS ☐Teflon ☑Other: Steel
Total Depth of Well (TD in m BTOC): 4.2	☑Pump – Type: ☐Submersible ☐Bladder ☑Other:
Water Level Depth (WL in m BTOC): 2.67	Pump Intake Setting (if pump used): 0
Number of bore volumes to be purged (# VOLS)	Depth pump set (m BTOC): 0
☑3 ☐4 ☐5 ☐10 ☐Other:	Screen Interval (m BTOC) Top : 0 Bottom: 0

Anticipated Approximate Purge Volume Calculation

(_____ - _____) x (_____/2)^2 x 0.00314 = _____ _____ x _____ = _____

TD WL D 1 BV (L) BV # VOLS Purge Volume (L)

Start: 11:14 AM Stop: 11:57 AM Elapsed: 43 min Initial depth to water: 2.67
Final depth to water: 2.7

Field Parameter Measurements ☑ **Required** ☐**Not required**

Actual Time	Elapsed minutes	Purge Vol (L)	DO (mg/L)	EC. (µS/cm)	pH	Redox (mV)	Temp (°C)	SWL (m BTOC)	Pump setting (rate)
11:17 AM	5 min	1	1.2	16.14	7.29	-80	15.5	2.69	0
11:22 AM	5 min	4	0.09	13.06	6.99	-57	16.1	2.7	0
11:27 AM	5 min	7	0.06	12.96	6.95	-53	16.1	2.7	0
11:32 AM	5 min	11	0	12.75	6.97	-60	16.1	2.7	0
11:37 AM	5 min	15	0	12.61	6.98	-68	16.1	2.7	0
11:42 AM	5 min	16	0	12.54	6.98	-67	15.8	2.69	0
11:47 AM	5 min	20	0.36	12.57	7	-54	16.2	2.7	0
11:52 AM	5 min	24	0.4	12.65	6.99	-47	16.2	2.7	0
11:57 AM	5 min	28	0.15	12.61	6.99	-53	16.2	2.7	0
Groundwater equilibrium reached at			± 10%	± 3%	± 0.05	± 10 mV	± 0.2 °C	(3 consecutive measurements)	

Observations at start of development (turbidity, colour, odour, sheen):
High turbidity ; dark brown-grey ; no odour ; no sheen

Observations at end of development (turbidity, colour, odour, sheen):
Low turbidity ; light yellow ; no odour ; no sheen

Volume of water actually purged during development: 28 L

Discharge water disposal: ☑Drums ☐Sanitary sewer ☐Storm sewer ☐Surface ☐Other:

Other observations / comments:

CPFO471o (ENV) Site Contamination Analysis Well Development Form

Project Name: FBURA	Project Number: 60431087	Well No: GW09
Recorded / Developed By: Tim Martin	Well Type: ☒ Monitor ☐ Extractor ☐ Other	
Date: 5/11/15	Well Material: ☒PVC ☐ SS ☐ Other	

Well Purging

Well Details	**Development Method**
Well Diameter (D in mm): ☒50 ☐100 ☐Other:	☐ Bailer – Type: ☐ PVC ☐ SS ☐ Teflon ☐ Other:
Total Depth of Well (TD in m BTOC): 2.795	☒ Pump – Type: ☐ Submersible ☒ Bladder ☐ Other:
Water Level Depth (WL in m BTOC): 5.49	Pump Intake Setting (if pump used)
Number of bore volumes to be purged (# VOLS) ☐ 3 ☐ 4 ☐ 5 ☐ 10 ☐ Other	Depth pump set (m BTOC):
	Screen Interval (m BTOC) Top : Bottom:

Anticipated Approximate Purge Volume Calculation

(_____ - _____) x (_____/2)^2 x 0.00314 = _____ _____ x _____ = _____

TD WL D 1 BV (L) BV # VOLS Purge Volume (L)

Start Time: 10:44 **Stop Time:** **Elapsed Time:** **Initial depth to water:** **Final depth to water: 2.82/5.37**

Field Parameter Measurements ☐ **Required** ☐ **Not required**

Actual Time	Elapsed minutes	Purge Vol (L)	DO (mg/L)	EC. (µS/cm)	pH	Redox (mV)	Temp (°C)	SWL (m BTOC)	Pump setting (rate)
10:45		**0.5**	**2.69**	**2149**	**7.21**	**-106**	**18.3**	**2.81**	**350 rpm**
10:55		**2.1**	**0.34**	**1546**	**7.26**	**-120**	**18.4**	**2.85**	**350 rpm**
11:05		**5.0**	**0.20**	**1870**	**7.20**	**-121**	**18.6**	**2.845**	**350 rpm**
11:15		**6.0**	**Line clogging with grey sand, bail till clearer**						
11:25		**25.0**	**0.08**	**1800**	**7.24**	**-116**	**19.2**	**-**	**Steel bailer**
11:35		**49.0**	**0.01**	**1860**	**7.22**	**-110**	**19.9**	**2.82**	**350 rpm**
	Back to pump - TD 5.24								
11:45		**52.0**	**0.02**	**1800**	**7.16**	**-103**	**20.1**	**2.82**	**350 rpm**
11:55		**56.0**	**0.01**	**1796**	**7.20**	**-104**	**20.1**	**2.82**	**350 rpm**
Groundwater equilibrium reached at			± 10%	± 3%	± 0.05	± 10 mV	± 0.2 °C	(3 consecutive measurements)	

Observations at start of development (turbidity, colour, odour, sheen): Grey, high turbidity, no odour, no sheen.

Observations at end of development (turbidity, colour, odour, sheen): Grey, low to moderate turbidity, no odour, no sheen.

Volume of water actually purged during development:_____ L

Discharge water disposal: ☒ Drums ☐ Sanitary sewer ☐ Storm sewer ☐ Surface ☐ Other:_____

Other observations / comments:

Thick sand, TD increasing, pump line getting clogged. Used bailer for a bit, then back to pump.

CPFO471o (ENV) Site Contamination Analysis Well Development Form

Project Name: FBURA	Project Number: 60431087	Well No: GW10
Recorded / Developed By: Tim Martin	Well Type: ☒ Monitor ☐ Extractor ☐ Other	
Date: 5/11/15	Well Material: ☒PVC ☐ SS ☐ Other	

Well Purging

Well Details	**Development Method**
Well Diameter (D in mm): ☒50 ☐100 ☐Other:	☐ Bailer – Type: ☐ PVC ☐ SS ☐ Teflon ☐ Other:
Total Depth of Well (TD in m BTOC): 4.97	☒ Pump – Type: ☐ Submersible ☒ Bladder ☐ Other:
Water Level Depth (WL in m BTOC): 2.77	Pump Intake Setting (if pump used)
Number of bore volumes to be purged (# VOLS) ☐ 3 ☐ 4 ☐ 5 ☐ 10 ☐ Other	Depth pump set (m BTOC):
	Screen Interval (m BTOC) Top : Bottom:

Anticipated Approximate Purge Volume Calculation

(_____ - _____) x (_____/2)^2 x 0.00314 = _____ _____ x _____ = _____

TD WL D 1 BV (L) BV # VOLS Purge Volume (L)

Start Time: 15:00 **Stop Time: 16:00** **Elapsed Time:** **Initial depth to water:** **Final depth to water: 2.92/5.00**

Field Parameter Measurements ☐ **Required** ☐ **Not required**

Actual Time	Elapsed minutes	Purge Vol (L)	DO (mg/L)	EC. (µS/cm)	pH	Redox (mV)	Temp (°C)	SWL (m BTOC)	Pump setting (rate)
15:01			**-**	**600**	**6.70**	**0**	**18.4**	**~ 2.21**	**350 rpm**
15:10		**4**	**0.80**	**625**	**6.60**	**-2**	**18.3**	**~ 2.21**	**350 rpm**
15:20		**8**	**0.51**	**674**	**6.69**	**-6**	**18.3**	**~ 2.21**	**350 rpm**
15:30		**16**	**0.52**	**860**	**6.84**	**-18**	**18.7**	**~ 2.21**	**350 rpm**
15:40		**24**	**0.53**	**763**	**6.88**	**-21**	**18.8**	**~ 2.21**	**350 rpm**
15:50		**30**	**0.53**	**869**	**6.89**	**-22**	**18.9**	**~ 2.21**	**350 rpm**
16:00		**35**	**0.54**	**874**	**6.90**	**-24**	**18.9**	**~ 2.21**	**350 rpm**
Groundwater equilibrium reached at			± 10%	± 3%	± 0.05	± 10 mV	± 0.2 °C	(3 consecutive measurements)	

Observations at start of development (turbidity, colour, odour, sheen): Brown, high turbidity, no odour, no sheen.

Observations at end of development (turbidity, colour, odour, sheen): Light brown, low turbidity, no odour, no sheen.

Volume of water actually purged during development:_____ L

Discharge water disposal: ☐ Drums ☐ Sanitary sewer ☐ Storm sewer ☐ Surface ☐ Other:_____

Other observations / comments:

There was a large storm 2:10-3:00pm before developing. Potential rainwater influence on conductivity.

CPFO471o (ENV) Site Contamination Analysis Well Development Form

Project Name: FBURA	Project Number:	Well No: GW11
Recorded / Developed By: Matt Sheppard	Well Type: ☐ Monitor ☐ Extractor ☐ Other	
Date: 6/11/15	Well Material: ☐PVC ☐ SS ☐ Other	

Well Purging

Well Details	**Development Method**
Well Diameter (D in mm): ☒50 ☐100 ☐Other:	☐ Bailer – Type: ☐ PVC ☐ SS ☐ Teflon ☐ Other:
Total Depth of Well (TD in m BTOC):	☒ Pump – Type: ☐ Submersible ☒ Bladder ☐ Other:
Water Level Depth (WL in m BTOC): 2.13	Pump Intake Setting (if pump used)
Number of bore volumes to be purged (# VOLS)	Depth pump set (m BTOC):
☐ 3 ☐ 4 ☐ 5 ☐ 10 ☐ Other	Screen Interval (m BTOC) Top : Bottom:

Anticipated Approximate Purge Volume Calculation

(_____ - _____) x (_____/2)^2 x 0.00314 = _____ _____ x _____ = _____

TD WL D 1 BV (L) BV # VOLS Purge Volume (L)

Start Time: **Stop Time:** **Elapsed Time:** **Initial depth to water:** **Final depth to water:**

Field Parameter Measurements ☐ **Required** ☐ **Not required**

Actual Time	Elapsed minutes	Purge Vol (L)	DO (mg/L)	EC. (µS/cm)	pH	Redox (mV)	Temp (°C)	SWL (m BTOC)	Pump setting (rate)
7:40	**0**		**2.79**	**941**	**7.2**	**16.3**	**18.1**	**2.141**	
7:50	**10**		**0.15**	**1339**	**7.5**	**-18**	**17.5**	**2.141**	
8:00	**20**		**0.26**	**800**	**7.55**	**-48**	**17.5**	**2.141**	
8:10	**30**		**0.60**	**818**	**7.52**	**-49**	**17.5**	**2.141**	
8:20	**40**		**0.56**	**744**	**7.55**	**-50**	**17.5**	**2.141**	
8:30	**50**	**222**	**0.19**	**734**	**7.52**	**-63**	**17.4**	**2.141**	
8:40	**60**		**0**	**709**	**7.53**	**-85**	**17.4**	**2.141**	
8:50	**70**		**0**	**680**	**7.53**	**-100**	**17.4**	**2.141**	
9:00	**80**		**0**	**670**	**7.53**	**-109**	**17.4**	**2.141**	
9:10	**90**	**452**	**0**	**652**	**7.81**	**-117**	**17.4**	**2.141**	
Groundwater equilibrium reached at			± 10%	± 3%	± 0.05	± 10 mV	± 0.2 °C	(3 consecutive measurements)	

Observations at start of development (turbidity, colour, odour, sheen): Grey, turbid, no odour, no sheen.

Observations at end of development (turbidity, colour, odour, sheen): Clear

Volume of water actually purged during development:_____ **L**

Discharge water disposal: ☐ Drums ☐ Sanitary sewer ☐ Storm sewer ☐ Surface ☐ Other:_____

Other observations / comments:

Surged every 10 mins, flow cell cleared every 10 mins _____

CPFO471o (ENV) Site Contamination Analysis Well Development Form

Project Name: FBURA Groundwater Assessment	Project Number: 60431087	Well No: GW12
Recorded / Developed By: Oliver T	Well Type: ☑Monitor ☐Extractor ☐Other:	
Date: 2/11/2015	Well Material: ☑PVC ☐SS ☐Other:	

Well Purging

Well Details	Development Method
Well Diameter (D in mm): ☑50 ☐100 ☐Other:	☑Bailer – Type: ☐PVC ☐SS ☐Teflon ☑Other: Steel
Total Depth of Well (TD in m BTOC): 4.06	☑Pump – Type: ☐Submersible ☐Bladder ☑Other: Other
Water Level Depth (WL in m BTOC): 2.70	Pump Intake Setting (if pump used): 0
Number of bore volumes to be purged (# VOLS)	Depth pump set (m BTOC): 0
☑3 ☐4 ☐5 ☐10 ☐Other:	Screen Interval (m BTOC) Top : 0 Bottom: 0

Anticipated Approximate Purge Volume Calculation

(_____ - _____) x (_____/2)^2 x 0.00314 = _____ _____ x _____ = _____

TD WL D 1 BV (L) BV # VOLS Purge Volume (L)

Start: 12:14 PM Stop: 1:03 PM Elapsed: 49 min Initial depth to water: 2.7
Final depth to water: 2.72

Field Parameter Measurements ☑ **Required** ☐**Not required**

Actual Time	Elapsed minutes	Purge Vol (L)	DO (mg/L)	EC. (µS/cm)	pH	Redox (mV)	Temp (°C)	SWL (m BTOC)	Pump setting (rate)
12:19 PM	5 min	1	0.87	15.71	7.18	-24	12.4	2.71	0
12:24 PM	5 min	4	0	15.58	6.97	-42	12.2	2.71	0
12:29 PM	6 min	7	0	15.12	6.99	-49	12.2	2.7	0
12:35 PM	5 min	9	0	14.74	7	-56	12.2	2.7	0
12:40 PM	5 min	11	0	14.57	7.01	-56	12.2	2.7	0
12:45 PM	3 min	15	0	14.38	7.02	-59	12.2	2.7	0
12:48 PM	5 min	16	0.16	15.16	7	-60	12.1	2.7	0
12:53 PM	5 min	20	0.36	15.67	7.06	-73	12.3	2.72	0
12:58 PM	5 min	23	0.41	15.71	7.02	-72	12.2	2.72	0
1:03 PM	5 min	26	0.15	15.74	7	-73	12.2	2.72	0
Groundwater equilibrium reached at			± 10%	± 3%	± 0.05	± 10 mV	± 0.2 °C	(3 consecutive measurements)	

Observations at start of development (turbidity, colour, odour, sheen):
High turbidity ; dark grey ; no odour ; no sheen

Observations at end of development (turbidity, colour, odour, sheen):
Low turbidity ; clear ; no odour ; no sheen

Volume of water actually purged during development: 26 L

Discharge water disposal: ☑Drums ☐Sanitary sewer ☐Storm sewer ☐Surface ☐Other:

Other observations / comments:

CPFO471o (ENV) Site Contamination Analysis Well Development Form

Project Name: FBURA	Project Number: 60431087	Well No: GW13
Recorded / Developed By: Matt Sheppard	Well Type: ☐ Monitor ☐ Extractor ☐ Other	
Date: 4/11/15	Well Material: ☐PVC ☐ SS ☐ Other	

Well Purging

Well Details	**Development Method**
Well Diameter (D in mm): ☒50 ☐100 ☐Other:	☐ Bailer – Type: ☐ PVC ☐ SS ☐ Teflon ☐ Other:
Total Depth of Well (TD in m BTOC): 3.85	☒ Pump – Type: ☐ Submersible ☒ Bladder ☐ Other:
Water Level Depth (WL in m BTOC): 2.43	Pump Intake Setting (if pump used)
Number of bore volumes to be purged (# VOLS)	Depth pump set (m BTOC):
☐ 3 ☐ 4 ☐ 5 ☐ 10 ☐ Other	Screen Interval (m BTOC) Top : Bottom:

Anticipated Approximate Purge Volume Calculation

(_____ - _____) x (_____/2)^2 x 0.00314 = _____ _____ x _____ = _____

TD WL D 1 BV (L) BV # VOLS Purge Volume (L)

Start Time: **Stop Time:** **Elapsed Time:** **Initial depth to water:** **Final depth to water:**

Field Parameter Measurements ☐ **Required** ☐ **Not required**

Actual Time	Elapsed minutes	Purge Vol (L)	DO (mg/L)	EC. (µS/cm)	pH	Redox (mV)	Temp (°C)	SWL (m BTOC)	Pump setting (rate)
9:50	**0**		**1.87**	**878**	**6.51**	**-14**	**14.2**	**2.479**	
9:55	**5**		**0.21**	**890**	**6.80**	**-11**	**13.9**	**2.479**	
10:00	**10**		**0.04**	**898**	**6.85**	**-37**	**14.1**	**2.479**	**Resurged**
10:05	**15**		**0**	**903**	**6.90**	**-40**	**13.9**	**2.479**	
10:10	**20**		**0**	**910**	**6.91**	**-53**	**14.1**	**2.479**	**Resurged**
10:15	**25**		**0**	**727**	**6.94**	**-59**	**13.9**	**2.479**	**Resurged**
10:20	**30**		**0**	**499**	**6.94**	**-64**	**14.3**	**2.479**	
10:25	**35**		**0**	**313**	**6.94**	**-67**	**14.3**	**2.479**	**Resurged**
10:30	**40**	**20**	**0**	**524**	**6.94**	**-64**	**14.4**	**2.479**	
10:35	**45**		**0**	**406**	**6.94**	**-70**	**14.3**	**2.479**	**Resurged**
10:50	**60**	**30**	**0**	**340**	**6.97**	**-70**	**13.7**	**2.479**	**Resurged @ 10:45**
11:05	**75**	**40**	**0**	**368**	**6.91**	**-73**	**13.9**	**2.479**	
11:10	**80**		**0.47**	**894**	**6.93**	**-48**	**13.7**	**24.79**	**Resurged**
11:15	**85**		**0.48**	**887**	**6.94**	**-35**	**13.9**	**2.479**	
11:20	**90**		**0.37**	**890**	**6.91**	**-39**	**13.8**	**2.479**	**Resurged**
11:25	**95**	**60**	**0.54**	**882**	**6.97**	**-35**	**14.1**	**2.479**	
Groundwater equilibrium reached at			± 10%	± 3%	± 0.05	± 10 mV	± 0.2 °C	(3 consecutive measurements)	

Observations at start of development (turbidity, colour, odour, sheen): Very turbid, no odour, no sheen.

Observations at end of development (turbidity, colour, odour, sheen): Less turbid, no odour, no sheen.

Volume of water actually purged during development:_____60_____ L

Discharge water disposal: ☐ Drums ☐ Sanitary sewer ☐ Storm sewer ☐ Surface ☐ Other:_____

Other observations / comments:

Flow cell full of sand, emptied @ 11:05_____

CPFO471o (ENV) Site Contamination Analysis Well Development Form

Project Name: FBURA	Project Number: 60431087	Well No: GW14
Recorded / Developed By: Matt Sheppard	Well Type: ☒ Monitor ☐ Extractor ☐ Other	
Date: 4/11/15	Well Material: ☒PVC ☐ SS ☐ Other	

Well Purging

Well Details	**Development Method**
Well Diameter (D in mm): ☒50 ☐100 ☐Other:	☐ Bailer – Type: ☐ PVC ☐ SS ☐ Teflon ☐ Other:
Total Depth of Well (TD in m BTOC):	☒ Pump – Type: ☐ Submersible ☒ Bladder ☐ Other:
Water Level Depth (WL in m BTOC): 2.17	Pump Intake Setting (if pump used)
Number of bore volumes to be purged (# VOLS)	Depth pump set (m BTOC):
☐ 3 ☐ 4 ☐ 5 ☐ 10 ☐ Other	Screen Interval (m BTOC) Top : Bottom:

Anticipated Approximate Purge Volume Calculation

(_____ - _____) x (_____/2)^2 x 0.00314 = _____ _____ x _____ = _____

TD WL D 1 BV (L) BV # VOLS Purge Volume (L)

Start Time: **Stop Time:** **Elapsed Time:** **Initial depth to water:** **Final depth to water:**

Field Parameter Measurements ☐ **Required** ☐ **Not required**

Actual Time	Elapsed minutes	Purge Vol (L)	DO (mg/L)	EC. (µS/cm)	pH	Redox (mV)	Temp (°C)	SWL (m BTOC)	Pump setting (rate)
13:35	**0**		**0**	**409**	**6.45**	**-102**	**17.8**	**2.405**	
13:45	**10**		**0**	**373**	**6.73**	**-101**	**18.8**	**2.315**	
13:55	**20**		**0**	**346**	**6.62**	**-86**	**17.5**	**2.345**	
14:05	**30**		**0**	**297**	**6.58**	**-98**	**17.4**	**2.330**	
14:15	**40**	**20**	**0**	**296**	**6.51**	**-77**	**17.5**	**2.335**	
14:25	**50**		**0**	**279**	**6.76**	**-69**	**17.6**	**2.335**	
14:35	**60**		**0**	**263**	**6.78**	**-77**	**17.2**	**2.335**	
14:45	**70**		**0**	**265**	**6.75**	**-71**	**17.4**	**2.335**	
14:55	**80**	**37**	**0**	**259**	**6.75**	**-64**	**17.4**	**2.335**	
Groundwater equilibrium reached at			± 10%	± 3%	± 0.05	± 10 mV	± 0.2 °C	(3 consecutive measurements)	

Observations at start of development (turbidity, colour, odour, sheen): Very turbid, grey, no odour, no sheen.

_____

Observations at end of development (turbidity, colour, odour, sheen):

_____

Volume of water actually purged during development:_____37_____ L

Discharge water disposal: ☐ Drums ☐ Sanitary sewer ☐ Storm sewer ☐ Surface ☐ Other:_____

Other observations / comments:

Surged @ ~10 min intervals, cleared flow cell @ ~10min intervals._____

_____

CPFO471o (ENV) Site Contamination Analysis Well Development Form

Project Name: FBURA	Project Number: 60431087	Well No: GW15
Recorded / Developed By: Matt Sheppard	Well Type: ☒ Monitor ☐ Extractor ☐ Other	
Date: 4/11/15	Well Material: ☒PVC ☐ SS ☐ Other	

Well Purging

Well Details	**Development Method**
Well Diameter (D in mm): ☒50 ☐100 ☐Other:	☐ Bailer – Type: ☐ PVC ☐ SS ☐ Teflon ☐ Other:
Total Depth of Well (TD in m BTOC):	☒ Pump – Type: ☐ Submersible ☒ Bladder ☐ Other:
Water Level Depth (WL in m BTOC): 1.84	Pump Intake Setting (if pump used)
Number of bore volumes to be purged (# VOLS)	Depth pump set (m BTOC):
☐ 3 ☐ 4 ☐ 5 ☐ 10 ☐ Other	Screen Interval (m BTOC) Top : Bottom:

Anticipated Approximate Purge Volume Calculation

(_____ - _____) x (_____/2)^2 x 0.00314 = _____ _____ x _____ = _____

TD WL D 1 BV (L) BV # VOLS Purge Volume (L)

Start Time: **Stop Time:** **Elapsed Time:** **Initial depth to water:** **Final depth to water:**

Field Parameter Measurements ☐ **Required** ☐ **Not required**

Actual Time	Elapsed minutes	Purge Vol (L)	DO (mg/L)	EC. (mS/cm)	pH	Redox (mV)	Temp (°C)	SWL (m BTOC)	Pump setting (rate)
15:15	**0**		**2.55**	**27.1**	**6.69**	**-34**	**25**	**2.715**	
15:20	**5**		**0**	**29.9**	**6.64**	**-34**	**25**	**2.773**	
15:25	**10**		**0**	**29.8**	**6.59**	**-30**	**25**	**2.815**	
15:30	**15**		**0**	**29.9**	**6.60**	**-18**	**N/A**	**2.850**	
15:35	**20**		**0**	**29.8**	**6.61**	**-18**	**N/A**	**2.965**	
15:40	**25**		**0**	**29.8**	**6.64**	**-27**	**N/A**	**3.010**	
15:50	**35**		**0**	**30**	**6.67**	**-30**	**N/A**	**3.100**	
15:55	**40**		**0**	**29.34**	**6.73**	**-40**	**N/A**	**3.200**	
16:00	**45**	**8**	**0**	**30**	**6.74**	**-45**	**N/A**	**3.220**	
Groundwater equilibrium reached at			± 10%	± 3%	± 0.05	± 10 mV	± 0.2 °C	(3 consecutive measurements)	

Observations at start of development (turbidity, colour, odour, sheen): Clear, slight greenish yellow, natural organic odour.

Observations at end of development (turbidity, colour, odour, sheen):

Volume of water actually purged during development:_____8_____ L

Discharge water disposal: ☐ Drums ☐ Sanitary sewer ☐ Storm sewer ☐ Surface ☐ Other:_____

Other observations / comments:

No surging required, no sediment in the water._____

CPFO471o (ENV) Site Contamination Analysis Well Development Form

Project Name: FBURA	Project Number: 60431087	Well No: GW16
Recorded / Developed By: Matt Sheppard	Well Type: ☒ Monitor ☐ Extractor ☐ Other	
Date: 4/11/15	Well Material: ☒PVC ☐ SS ☐ Other	

Well Purging

Well Details	**Development Method**
Well Diameter (D in mm): ☒50 ☐100 ☐Other:	☐ Bailer – Type: ☐ PVC ☐ SS ☐ Teflon ☐ Other:
Total Depth of Well (TD in m BTOC):	☒ Pump – Type: ☐ Submersible ☒ Bladder ☐ Other:
Water Level Depth (WL in m BTOC): 2.298	Pump Intake Setting (if pump used)
Number of bore volumes to be purged (# VOLS) ☐ 3 ☐ 4 ☐ 5 ☐ 10 ☐ Other	Depth pump set (m BTOC): Screen Interval (m BTOC) Top : Bottom:

Anticipated Approximate Purge Volume Calculation

(_____ - _____) x (_____/2)^2 x 0.00314 = _____ _____ x _____ = _____

TD WL D 1 BV (L) BV # VOLS Purge Volume (L)

Start Time: **Stop Time:** **Elapsed Time:** **Initial depth to water:** **Final depth to water:**

Field Parameter Measurements ☐ **Required** ☐ **Not required**

Actual Time	Elapsed minutes	Purge Vol (L)	DO (mg/L)	EC. (µS/cm)	pH	Redox (mV)	Temp (°C)	SWL (m BTOC)	Pump setting (rate)
11:50	**0**		**1.14**	**1417**	**6.77**	**-34**	**25**	**2.380**	
12:00	**10**		**0.87**	**1381**	**6.74**	**-40**	**25**	**2.380**	
12:10	**20**		**0**	**1292**	**6.68**	**-51**	**25**	**2.380**	
12:20	**30**		**0**	**1244**	**6.70**	**-46**	**25**	**2.380**	
12:30	**40**		**0**	**1229**	**6.68**	**-47**	**25**	**2.380**	
12:40	**50**	**25**	**0**	**1185**	**6.60**	**-42**	**25**	**2.380**	
12:50	**60**		**0**	**1158**	**6.67**	**-35**	**25**	**2.380**	
13:00	**70**	**35**	**0.01**	**1152**	**6.66**	**-33**	**25**	**2.380**	
Groundwater equilibrium reached at			± 10%	± 3%	± 0.05	± 10 mV	± 0.2 °C	(3 consecutive measurements)	

Observations at start of development (turbidity, colour, odour, sheen):

_____

Observations at end of development (turbidity, colour, odour, sheen):

_____

Volume of water actually purged during development:_____**35**_____ **L**

Discharge water disposal: ☐ Drums ☐ Sanitary sewer ☐ Storm sewer ☐ Surface ☐ Other:_____

Other observations / comments:

Resurged every 10 mins, clear flow cell every 10 mins._____

_____

_____

_____

CPFO471o (ENV) Site Contamination Analysis Well Development Form

Project Name: FBURA	Project Number: 60431087	Well No: GW17
Recorded / Developed By: Matt Sheppard	Well Type: ☒ Monitor ☐ Extractor ☐ Other	
Date: 6/11/15	Well Material: ☒PVC ☐ SS ☐ Other	

Well Purging

Well Details	**Development Method**
Well Diameter (D in mm): ☒50 ☐100 ☐Other:	☐ Bailer – Type: ☐ PVC ☐ SS ☐ Teflon ☐ Other:
Total Depth of Well (TD in m BTOC):	☒ Pump – Type: ☐ Submersible ☒ Bladder ☐ Other:
Water Level Depth (WL in m BTOC): 2.365	Pump Intake Setting (if pump used)
Number of bore volumes to be purged (# VOLS)	Depth pump set (m BTOC):
☐ 3 ☐ 4 ☐ 5 ☐ 10 ☐ Other	Screen Interval (m BTOC) Top : Bottom:

Anticipated Approximate Purge Volume Calculation

(_____ - _____) x (_____/2)^2 x 0.00314 = _____ _____ x _____ = _____

TD WL D 1 BV (L) BV # VOLS Purge Volume (L)

Start Time: **Stop Time:** **Elapsed Time:** **Initial depth to water:** **Final depth to water:**

Field Parameter Measurements ☐ **Required** ☐ **Not required**

Actual Time	Elapsed minutes	Purge Vol (L)	DO (mg/L)	EC. (µS/cm)	pH	Redox (mV)	Temp (°C)	SWL (m BTOC)	Pump setting (rate)
9:35	**0**		**3.46**	**905**	**6.58**	**12**	**19.4**	**2.435**	
9:45	**10**		**0.14**	**880**	**6.54**	**-20**	**19.5**	**2.420**	
9:55	**20**		**0.71**	**1022**	**6.63**	**-12**	**19.6**	**2.425**	
10:05	**30**	**10**	**0**	**981**	**6.65**	**-18**	**19.6**	**2.425**	
10:15	**40**		**0.09**	**986**	**6.67**	**-49**	**19.5**	**2.425**	
10:25	**50**		**0.07**	**971**	**6.67**	**-59**	**19.5**	**2.425**	
10:35	**60**	**20**	**0.05**	**979**	**6.67**	**-60**	**19.6**	**2.425**	
Groundwater equilibrium reached at			± 10%	± 3%	± 0.05	± 10 mV	± 0.2 °C	(3 consecutive measurements)	

Observations at start of development (turbidity, colour, odour, sheen): Moderate turbidity, grey, no odour, no sheen.

Observations at end of development (turbidity, colour, odour, sheen): Clear.

Volume of water actually purged during development:_____20_____ L

Discharge water disposal: ☐ Drums ☐ Sanitary sewer ☐ Storm sewer ☐ Surface ☐ Other:_____

Other observations / comments:

CPFO471o (ENV) Site Contamination Analysis Well Development Form

Project Name: FBURA Groundwater Assessment	Project Number: 60431087	Well No: GW18
Recorded / Developed By: Oliver T	Well Type: ☑Monitor ☐Extractor ☐Other:	
Date: 15/10/2015	Well Material: ☑PVC ☐SS ☐Other:	

Well Purging

Well Details	Development Method
Well Diameter (D in mm): ☑50 ☐100 ☐Other:	☑Bailer – Type: ☐PVC ☐SS ☐Teflon ☑Other: Steel to stir up water
Total Depth of Well (TD in m BTOC): 4.50	☑Pump – Type: ☐Submersible ☐Bladder ☑Other: Perasteltic
Water Level Depth (WL in m BTOC): 1.56	Pump Intake Setting (if pump used): 0
Number of bore volumes to be purged (# VOLS) ☑3 ☐4 ☐5 ☐10 ☐Other:	Depth pump set (m BTOC): 0
	Screen Interval (m BTOC) Top : 0 Bottom: 0

Anticipated Approximate Purge Volume Calculation

(_____ - _____) x (_____/2)^2 x 0.00314 = _____ _____ x _____ = _____

TD WL D 1 BV (L) BV # VOLS Purge Volume (L)

Start: 2:07 PM Stop: 3:36 PM Elapsed: 89 min Initial depth to water: 1.56
Final depth to water: 2.57

Field Parameter Measurements ☑ **Required** ☐**Not required**

Actual Time	Elapsed minutes	Purge Vol (L)	DO (mg/L)	EC. (µS/cm)	pH	Redox (mV)	Temp (°C)	SWL (m BTOC)	Pump setting (rate)
2:12 PM	5 min	1	0	24.93	7.27	-148.6	18.7	1.72	0
2:17 PM	5 min	2	3.07	28.06	7.5	-191.6	19.2	2.02	0
2:22 PM	5 min	5	4.5	28.18	7.22	-269.5	19.2	2.12	0
2:27 PM	5 min	9	0.21	30.96	7.06	-320.1	19	2.19	0
2:32 PM	5 min	12	0.13	31.74	7.03	-335.9	19	2.22	0
2:37 PM	5 min	15	0.09	31.62	7.04	-350.1	18.8	2.26	0
2:42 PM	3 min	18	0.08	31.74	7.03	-355.3	19	2.35	0
2:45 PM	5 min	19	0.59	31.79	6.97	-328	23.3	2.27	0
2:50 PM	5 min	22	0.31	30.4	7.23	-343.6	24	2.25	0
2:55 PM	4 min	25	0	30.41	7.18	-356.9	20.1	2.28	0
2:59 PM	5 min	28	0.08	33.25	6.97	-360	20.1	2.31	0
3:04 PM	6 min	32	0.08	33.45	6.95	-360.6	19.6	2.39	0
3:10 PM	4 min	35	0.9	33.68	6.92	33.75	19.3	2.43	0
3:14 PM	6 min	38	0	34.02	6.9	-361.4	19.5	2.47	0
3:20 PM	5 min	42	0.07	34.2	6.87	-361.7	19.4	2.5	0
3:25 PM	4 min	45	0.07	34.58	6.86	-362.1	19	2.52	0
3:29 PM	6 min	49	0.07	34.81	6.87	-362.3	19.5	2.55	0
3:35 PM	6 min	52	0.12	34.91	6.87	-365.5	19.3	2.57	0
Groundwater equilibrium reached at			± 10%	± 3%	± 0.05	± 10 mV	± 0.2 °C	(3 consecutive measurements)	

Observations at start of development (turbidity, colour, odour, sheen):
High turbidity ; dark grey ; no sheen

Observations at end of development (turbidity, colour, odour, sheen):
Low-moderate turbidity ; light greenish, yellow ; possible sulfuric odour ; no sheen

Volume of water actually purged during development: 52 L

Discharge water disposal: ☑Drums ☐Sanitary sewer ☐Storm sewer ☐Surface ☐Other:

Other observations / comments:

CPFO471o (ENV) Site Contamination Analysis Well Development Form

Project Name: FBURA	Project Number: 60431087	Well No: GW19
Recorded / Developed By: Matt Sheppard	Well Type: ☒ Monitor ☐ Extractor ☐ Other	
Date: 4/11/15	Well Material: ☒PVC ☐ SS ☐ Other	

Well Purging

Well Details	**Development Method**
Well Diameter (D in mm): ☒50 ☐100 ☐Other:	☐ Bailer – Type: ☐ PVC ☐ SS ☐ Teflon ☐ Other:
Total Depth of Well (TD in m BTOC):	☒ Pump – Type: ☐ Submersible ☒ Bladder ☐ Other:
Water Level Depth (WL in m BTOC): 2.345	Pump Intake Setting (if pump used)
Number of bore volumes to be purged (# VOLS)	Depth pump set (m BTOC):
☐ 3 ☐ 4 ☐ 5 ☐ 10 ☐ Other	Screen Interval (m BTOC) Top : Bottom:

Anticipated Approximate Purge Volume Calculation

(_____ - _____) x (_____/2)^2 x 0.00314 = _____ _____ x _____ = _____

TD WL D 1 BV (L) BV # VOLS Purge Volume (L)

Start Time: **Stop Time:** **Elapsed Time:** **Initial depth to water:** **Final depth to water:**

Field Parameter Measurements ☐ **Required** ☐ **Not required**

Actual Time	Elapsed minutes	Purge Vol (L)	DO (mg/L)	EC. (mS/cm)	pH	Redox (mV)	Temp (°C)	SWL (m BTOC)	Pump setting (rate)
16:40	**0**		**3.38**	**29.9**	**6.65**	**-20**	**19.9**	**3.520**	
16:45	**5**		**0.96**	**29.7**	**6.66**	**-21**	**19.3**	**4.005**	
16:50	**10**		**0.86**	**29.4**	**6.60**	**-22**	**19.8**	**4.200**	
DRY									**Surged**
17:05	**25**		**2.01**	**28.6**	**6.87**	**-38**	**20.5**	**4.770**	
17:20	**40**	**2**	**2.74**	**29.6**	**6.94**	**-52**	**20.6**	**4.765**	
Groundwater equilibrium reached at			± 10%	± 3%	± 0.05	± 10 mV	± 0.2 °C	(3 consecutive measurements)	

Observations at start of development (turbidity, colour, odour, sheen): Dark grey, moderate turbidity, natural organic odour, no sheen.

_____

Observations at end of development (turbidity, colour, odour, sheen):

_____

Volume of water actually purged during development:_____ **L**

Discharge water disposal: ☐ Drums ☐ Sanitary sewer ☐ Storm sewer ☐ Surface ☐ Other:_____

Other observations / comments:

Pump turned off @ 16:50 when well went dry._____

Pump turned off @ 17:05 when well went dry._____

_____

AECOM

CPFO471o (ENV) Site Contamination Analysis Well Development Form

Project Name: FBURA Groundwater Assessment	Project Number: 60431087	Well No: GW20
Recorded / Developed By: Oliver T	Well Type: ☑Monitor ☐Extractor ☐Other:	
Date: 14/10/2015	Well Material: ☑PVC ☐SS ☐Other:	

Well Purging

Well Details	Development Method
Well Diameter (D in mm): ☑50 ☐100 ☐Other:	☑Bailer – Type: ☐PVC ☐SS ☐Teflon ☑Other: Steel to stir up well
Total Depth of Well (TD in m BTOC): 4.15	☑Pump – Type: ☐Submersible ☐Bladder ☑Other: Peristaltic
Water Level Depth (WL in m BTOC): 2.92	Pump Intake Setting (if pump used): 0
Number of bore volumes to be purged (# VOLS) ☑3 ☐4 ☐5 ☐10 ☐Other:	Depth pump set (m BTOC): 0
	Screen Interval (m BTOC) Top : 0 Bottom: 0

Anticipated Approximate Purge Volume Calculation

(_____ - _____) x (_____/2)^2 x 0.00314 = _____ _____ x _____ = _____

TD WL D 1 BV (L) BV # VOLS Purge Volume (L)

Start: 9:54 AM Stop: 10:34 AM Elapsed: 40 min Initial depth to water: 2.92
Final depth to water: 2.94

Field Parameter Measurements ☑ **Required** ☐**Not required**

Actual Time	Elapsed minutes	Purge Vol (L)	DO (mg/L)	EC. (µS/cm)	pH	Redox (mV)	Temp (°C)	SWL (m BTOC)	Pump setting (rate)
9:57 AM	6 min	1	1.9	2.5	7.22	-40.8	19.4	2.89	0
10:03 AM	4 min	2	1.22	1.59	7.2	-20.2	19.9	2.96	0
10:07 AM	4 min	5	2.14	1.6	7.11	-7.3	19.6	2.97	0
10:11 AM	4 min	8	0.87	1.7	19.4	-40.2	19.4	2.97	0
10:15 AM	5 min	14	0.64	1.97	7.14	-51.7	19.4	2.96	0
10:20 AM	5 min	15	0.85	1.67	7.14	-63	20.2	2.96	0
10:25 AM	4 min	18	1.44	1.67	7.1	-72.7	19.8	2.97	0
10:29 AM	2 min	22	0.66	1.77	7.15	-71.6	19.6	2.97	0
10:31 AM	2 min	23	0.64	1.71	7.18	-73.7	19.5	2.97	0
Groundwater equilibrium reached at			± 10%	± 3%	± 0.05	± 10 mV	± 0.2 °C	(3 consecutive measurements)	

Observations at start of development (turbidity, colour, odour, sheen):
High turbidity ; dark brown-grey ; no odour ; no sheen

Observations at end of development (turbidity, colour, odour, sheen):
Low-moderate turbidity ; light yellow ; no odour ; no sheen

Volume of water actually purged during development: 23 L

Discharge water disposal: ☑Drums ☐Sanitary sewer ☐Storm sewer ☐Surface ☐Other:

Other observations / comments:

CPFO471o (ENV) Site Contamination Analysis Well Development Form

Project Name: FBURA Groundwater Assessment	Project Number: 60431087	Well No: GW21
Recorded / Developed By: Oliver T	Well Type: ☑Monitor ☐Extractor ☐Other:	
Date: 14/10/2015	Well Material: ☑PVC ☐SS ☐Other:	

Well Purging

Well Details	Development Method
Well Diameter (D in mm): ☑50 ☐100 ☐Other:	☑Bailer – Type: ☐PVC ☐SS ☐Teflon ☑Other: Steel to stir up water
Total Depth of Well (TD in m BTOC): 3.91	☑Pump – Type: ☐Submersible ☐Bladder ☑Other: Peristaltic
Water Level Depth (WL in m BTOC): 2.51	Pump Intake Setting (if pump used): 0
Number of bore volumes to be purged (# VOLS) ☑3 ☐4 ☐5 ☐10 ☐Other:	Depth pump set (m BTOC): 0
	Screen Interval (m BTOC) Top : 0 Bottom: 0

Anticipated Approximate Purge Volume Calculation

(_____ - _____) x (_____/2)^2 x 0.00314 = _____ _____ x _____ = _____

TD WL D 1 BV (L) BV # VOLS Purge Volume (L)

Start: 12:43 PM Stop: 1:31 PM Elapsed: 48 min Initial depth to water: 2.51
Final depth to water: 2.56

Field Parameter Measurements ☑ **Required** ☐**Not required**

Actual Time	Elapsed minutes	Purge Vol (L)	DO (mg/L)	EC. (µS/cm)	pH	Redox (mV)	Temp (°C)	SWL (m BTOC)	Pump setting (rate)
12:47 PM	8 min	1	2.65	1.08	7.02	-57.3	18.8	2.57	0
12:55 PM	5 min	2	0.43	0.9	6.96	31.9	19.2	2.55	0
1:00 PM	5 min	5	0.87	0.98	6.91	41.8	18.5	2.57	0
1:05 PM	5 min	8	0.42	0.98	6.88	-41.8	18.2	2.58	0
1:10 PM	5 min	11	0.29	0.98	6.85	-51	18.2	2.58	0
1:15 PM	3 min	14	0.17	0.97	6.83	-54.5	18.2	2.56	0
1:18 PM	5 min	15	0.53	1.08	6.83	-51.5	191	2.56	0
1:23 PM	4 min	20	0.69	0.93	6.89	-42.9	18.9	2.56	0
1:27 PM	4 min	24	0.78	1.05	6.88	-36.9	18.6	2.56	0
Groundwater equilibrium reached at			± 10%	± 3%	± 0.05	± 10 mV	± 0.2 °C	(3 consecutive measurements)	

Observations at start of development (turbidity, colour, odour, sheen):
High turbidity ; dark grey ; no odour ; no sheen

Observations at end of development (turbidity, colour, odour, sheen):
Moderate turbidity ; light grey ; no odour ; no sheen

Volume of water actually purged during development: 24 L

Discharge water disposal: ☑Drums ☐Sanitary sewer ☐Storm sewer ☐Surface ☐Other:

Other observations / comments:

CPFO471o (ENV) Site Contamination Analysis Well Development Form

Project Name: FBURA Groundwater Assessment	Project Number: 60431087	Well No: GW22
Recorded / Developed By: Oliver T	Well Type: ☑Monitor ☐Extractor ☐Other:	
Date: 14/10/2015	Well Material: ☑PVC ☐SS ☐Other:	

Well Purging

Well Details	Development Method
Well Diameter (D in mm): ☑50 ☐100 ☐Other:	☑Bailer – Type: ☐PVC ☐SS ☐Teflon ☑Other: Steel to stir up water
Total Depth of Well (TD in m BTOC): 3.62	☑Pump – Type: ☐Submersible ☐Bladder ☑Other: Peristetic
Water Level Depth (WL in m BTOC): 2.41	Pump Intake Setting (if pump used): 0
Number of bore volumes to be purged (# VOLS)	Depth pump set (m BTOC): 0
☑3 ☐4 ☐5 ☐10 ☐Other:	Screen Interval (m BTOC) Top : 0 Bottom: 0

Anticipated Approximate Purge Volume Calculation

(_____ - _____) x (_____/2)^2 x 0.00314 = _____ _____ x _____ = _____

TD WL D 1 BV (L) BV # VOLS Purge Volume (L)

Start: 3:27 PM Stop: 4:27 PM Elapsed: 60 min Initial depth to water: 2.41
Final depth to water: 2.42

Field Parameter Measurements ☑ **Required** ☐**Not required**

Actual Time	Elapsed minutes	Purge Vol (L)	DO (mg/L)	EC. (µS/cm)	pH	Redox (mV)	Temp (°C)	SWL (m BTOC)	Pump setting (rate)
3:30 PM	9 min	1	4	1.59	5.97	36.7	19.5	2.4	0
3:39 PM	5 min	2	11.46	1.64	6.1	42	19.6	2.43	0
3:44 PM	5 min	5	0	1.64	6.19	26.9	19.2	2.42	0
3:49 PM	4 min	8	0	1.63	6.24	19.3	18.9	2.42	0
3:53 PM	6 min	12	0	1.62	6.27	9.5	19.3	2.42	0
3:59 PM	5 min	15	0	1.57	6.23	-1.6	18.9	2.42	0
4:04 PM	5 min	16	0	1.53	6.13	23.4	19.8	2.41	0
4:09 PM	5 min	19	0	1.49	6.12	35	19.5	2.42	0
4:14 PM	6 min	22	0	1.41	6.09	34.2	19.5	2.42	0
4:20 PM	4 min	25	0	1.38	6.06	27	19.4	2.42	0
4:24 PM	4 min	28	0	1.37	6.03	16.6	19.2	2.42	0
Groundwater equilibrium reached at			± 10%	± 3%	± 0.05	± 10 mV	± 0.2 °C	(3 consecutive measurements)	

Observations at start of development (turbidity, colour, odour, sheen):
High turbidity ; dark grey ; no odour ; no sheen

Observations at end of development (turbidity, colour, odour, sheen):
High-moderate turbidity ; light yellowish-brown ; no odour ; no sheen

Volume of water actually purged during development: 28 L

Discharge water disposal: ☑Drums ☐Sanitary sewer ☐Storm sewer ☐Surface ☐Other:

Other observations / comments:

CPFO471o (ENV) Site Contamination Analysis Well Development Form

Project Name: FBURA Groundwater Assessment	Project Number: 60431087	Well No: GW23
Recorded / Developed By: Oliver T	Well Type: ☑Monitor ☐Extractor ☐Other:	
Date: 2/11/2015	Well Material: ☑PVC ☐SS ☐Other:	

Well Purging

Well Details	Development Method
Well Diameter (D in mm): ☑50 ☐100 ☐Other:	☑Bailer – Type: ☐PVC ☐SS ☐Teflon ☑Other: Steel to stir up water
Total Depth of Well (TD in m BTOC): 4.12	☑Pump – Type: ☐Submersible ☐Bladder ☑Other:
Water Level Depth (WL in m BTOC): 2.37	Pump Intake Setting (if pump used): 0
Number of bore volumes to be purged (# VOLS)	Depth pump set (m BTOC): 0
☑3 ☐4 ☐5 ☐10 ☐Other:	Screen Interval (m BTOC) Top : 0 Bottom: 0

Anticipated Approximate Purge Volume Calculation

(_____ - _____) x (_____/2)^2 x 0.00314 = _____ _____ x _____ = _____

TD WL D 1 BV (L) BV # VOLS Purge Volume (L)

Start: 1:33 PM Stop: 2:24 PM Elapsed: 51 min Initial depth to water: 2.37
Final depth to water: 2.37

Field Parameter Measurements ☑ **Required** ☐**Not required**

Actual Time	Elapsed minutes	Purge Vol (L)	DO (mg/L)	EC. (µS/cm)	pH	Redox (mV)	Temp (°C)	SWL (m BTOC)	Pump setting (rate)
1:38 PM	5 min	1	4.6	20.99	6.97	-8	3.8	2.38	0
1:43 PM	5 min	3	1.17	2.14	6.27	12	1.7	2.38	0
1:48 PM	5 min	7	0.15	22.48	6.24	4	-1.6	2.37	0
1:53 PM	5 min	11	0	22.6	6.24	-3	-1.8	2.37	0
1:58 PM	3 min	15	0	22.54	6.23	-7	-1.9	2.37	0
2:01 PM	5 min	16	0	22.54	6.21	-5	-2.3	2.38	0
2:06 PM	3 min	20	2.09	2.3	6.18	15	-2	2.37	0
2:09 PM	5 min	23	0.78	2.3	6.18	13	-2	2.37	0
2:14 PM	5 min	26	0	2.34	6.19	4	-2	2.38	0
2:19 PM	5 min	29	0	2.37	6.2	-2	-2.1	2.37	0
2:24 PM	5 min	32	0	2.35	6.2	-5	-2.1	2.37	0
Groundwater equilibrium reached at			± 10%	± 3%	± 0.05	± 10 mV	± 0.2 °C	(3 consecutive measurements)	

Observations at start of development (turbidity, colour, odour, sheen):
High turbidity ; dark brown, grey ; no odour ; no sheen

Observations at end of development (turbidity, colour, odour, sheen):
Low turbidity ; clear ; no odour ; no sheen

Volume of water actually purged during development: 32 L

Discharge water disposal: ☑Drums ☐Sanitary sewer ☐Storm sewer ☐Surface ☐Other:

Other observations / comments:

CPFO471o (ENV) Site Contamination Analysis Well Development Form

Project Name: FBURA Groundwater Assessment	Project Number: 60431087	Well No: GW24
Recorded / Developed By: Oliver T	Well Type: ☑Monitor ☐Extractor ☐Other:	
Date: 15/10/2015	Well Material: ☑PVC ☐SS ☐Other:	

Well Purging

Well Details	Development Method
Well Diameter (D in mm): ☑50 ☐100 ☐Other:	☑Bailer – Type: ☐PVC ☐SS ☐Teflon ☑Other: Steel to stir up water
Total Depth of Well (TD in m BTOC): 3.41	☑Pump – Type: ☐Submersible ☐Bladder ☑Other: Perastelic
Water Level Depth (WL in m BTOC): 1.59	Pump Intake Setting (if pump used): 0
Number of bore volumes to be purged (# VOLS)	Depth pump set (m BTOC): 0
☑3 ☐4 ☐5 ☐10 ☐Other:	Screen Interval (m BTOC) Top : 0 Bottom: 0

Anticipated Approximate Purge Volume Calculation

(_____ - _____) x (_____/2)^2 x 0.00314 = _____ _____ x _____ = _____

TD WL D 1 BV (L) BV # VOLS Purge Volume (L)

Start: 7:10 AM Stop: 8:10 AM Elapsed: 60 min Initial depth to water: 1.59
Final depth to water: 1.9

Field Parameter Measurements ☑ **Required** ☐**Not required**

Actual Time	Elapsed minutes	Purge Vol (L)	DO (mg/L)	EC. (µS/cm)	pH	Redox (mV)	Temp (°C)	SWL (m BTOC)	Pump setting (rate)
7:14 AM	6 min	1	1.65	4.39	6.39	-41	16.5	1.53	0
7:20 AM	5 min	2	0.95	4.51	6.61	-43.7	16.7	1.72	0
7:25 AM	5 min	5	0.41	4.34	6.56	-59.6	16.6	1.84	0
7:30 AM	5 min	9	0.33	3.92	6.5	-82.7	16.5	1.87	0
7:35 AM	5 min	15	0.16	3.79	6.48	-90.3	16.6	1.88	0
7:40 AM	4 min	16	0.5	3.81	6.52	-97.8	16.7	1.79	0
7:44 AM	5 min	20	0.04	3.54	6.57	-88.4	16.8	1.87	0
7:49 AM	6 min	23	0.06	3.58	6.51	-93.9	16.7	1.89	0
7:55 AM	5 min	26	0.05	3.54	6.51	-97.1	16.7	1.9	0
8:00 AM	5 min	29	0.03	3.42	6.51	-99.4	16.7	1.9	0
8:05 AM	3 min	31	0.03	3.37	6.51	-100.8	16.7	1.9	0
8:08 AM	3 min	33	0.02	3.38	6.52	-101.4	16.7	1.9	0
Groundwater equilibrium reached at			± 10%	± 3%	± 0.05	± 10 mV	± 0.2 °C	(3 consecutive measurements)	

Observations at start of development (turbidity, colour, odour, sheen):
High turbidity ; dark grey ; no sheen

Observations at end of development (turbidity, colour, odour, sheen):
Low-moderate turbidity ; light yellow ; hydrocarbon odour ; no sheen

Volume of water actually purged during development: 33 L

Discharge water disposal: ☑Drums ☐Sanitary sewer ☐Storm sewer ☐Surface ☐Other:

Other observations / comments:

CPFO471o (ENV) Site Contamination Analysis Well Development Form

Project Name: FBURA Groundwater Assessment	Project Number: 60431087	Well No: GW25
Recorded / Developed By: Oliver T	Well Type: ☑Monitor ☐Extractor ☐Other:	
Date: 14/10/2015	Well Material: ☑PVC ☐SS ☐Other:	

Well Purging

Well Details	Development Method
Well Diameter (D in mm): ☑50 ☐100 ☐Other:	☑Bailer – Type: ☐PVC ☐SS ☐Teflon ☑Other: Steel
Total Depth of Well (TD in m BTOC): 4.67	☑Pump – Type: ☐Submersible ☐Bladder ☑Other: Peristaltic
Water Level Depth (WL in m BTOC): 2.94	Pump Intake Setting (if pump used): 0
Number of bore volumes to be purged (# VOLS)	Depth pump set (m BTOC): 4.5
☑3 ☐4 ☐5 ☐10 ☐Other:	Screen Interval (m BTOC) Top : 0 Bottom: 0

Anticipated Approximate Purge Volume Calculation

(_____ - _____) x (_____/2)^2 x 0.00314 = _____ _____ x _____ = _____

TD WL D 1 BV (L) BV # VOLS Purge Volume (L)

Start: 8:20 AM Stop: 9:30 AM Elapsed: 70 min Initial depth to water: 2.94
Final depth to water: 2.97

Field Parameter Measurements ☑ **Required** ☐**Not required**

Actual Time	Elapsed minutes	Purge Vol (L)	DO (mg/L)	EC. (µS/cm)	pH	Redox (mV)	Temp (°C)	SWL (m BTOC)	Pump setting (rate)
8:20 AM	7 min	1	1.8	2.6	7.05	-0.9	18.4	2.95	4.5
8:27 AM	6 min	5	3.3	2.66	6.87	-27.2	18.7	2.95	4.5
8:33 AM	9 min	6	1.35	2.79	6.89	-58.3	18.8	2.93	4.5
8:42 AM	4 min	7	4.1	2.55	7.05	-106.7	19.4	2.95	4.5
8:46 AM	4 min	10	2.5	1.92	7.03	-122	19.3	2.95	4.5
8:50 AM	5 min	13	0.14	1.87	7.04	-124.6	19.2	2.95	4.5
8:55 AM	4 min	15	0.12	2.03	7.05	-124.3	19.3	2.96	4.5
8:59 AM	8 min	18	2.08	2.87	7.05	-69.7	19.5	2.94	4.5
9:07 AM	5 min	24	0.88	2.74	7.03	-12.4	19.5	2.97	4.5
9:12 AM	4 min	26	18.4	0.81	6.97	-42.4	19.3	2.97	4.5
9:16 AM	6 min	29	7.1	0.84	6.97	-61.6	19.2	2.97	4.5
9:22 AM	4 min	32	7.7	1.99	6.97	-67.7	19.2	2.97	4.5
9:26 AM	2 min	35	6.3	1.97	6.98	-70.8	19.2	2.97	4.5
9:28 AM	2 min	37	6.8	1.95	6.98	-70.3	19.3	2.97	4.5
Groundwater equilibrium reached at			± 10%	± 3%	± 0.05	± 10 mV	± 0.2 °C	(3 consecutive measurements)	

Observations at start of development (turbidity, colour, odour, sheen):
High-moderate turbidity ; light yellow ; odour ; no sheen

Observations at end of development (turbidity, colour, odour, sheen):
Low-moderate turbidity ; light yellow ; no odour ; no sheen

Volume of water actually purged during development: 37 L

Discharge water disposal: ☑Drums ☐Sanitary sewer ☐Storm sewer ☐Surface ☐Other:

Other observations / comments:

CPFO471o (ENV) Site Contamination Analysis Well Development Form

Project Name: FBURA Groundwater Assessment	Project Number: 60431087	Well No: GW26
Recorded / Developed By: Oliver T	Well Type: ☑Monitor ☐Extractor ☐Other:	
Date: 14/10/2015	Well Material: ☑PVC ☐SS ☐Other:	

Well Purging

Well Details	Development Method
Well Diameter (D in mm): ☑50 ☐100 ☐Other:	☑Bailer – Type: ☐PVC ☐SS ☐Teflon ☑Other: Steel to stir up well
Total Depth of Well (TD in m BTOC): 3.67	☑Pump – Type: ☐Submersible ☐Bladder ☑Other: Peristaltic
Water Level Depth (WL in m BTOC): 2.58	Pump Intake Setting (if pump used): 0
Number of bore volumes to be purged (# VOLS) ☑3 ☐4 ☐5 ☐10 ☐Other:	Depth pump set (m BTOC): 0
	Screen Interval (m BTOC) Top : 0 Bottom: 0

Anticipated Approximate Purge Volume Calculation

(_____ - _____) x (_____/2)^2 x 0.00314 = _____ _____ x _____ = _____

TD WL D 1 BV (L) BV # VOLS Purge Volume (L)

Start: 11:03 AM Stop: 12:00 PM Elapsed: 57 min Initial depth to water: 2.58
Final depth to water: 2.59

Field Parameter Measurements ☑ **Required** ☐**Not required**

Actual Time	Elapsed minutes	Purge Vol (L)	DO (mg/L)	EC. (µS/cm)	pH	Redox (mV)	Temp (°C)	SWL (m BTOC)	Pump setting (rate)
11:07 AM	6 min	1	4.58	1.27	7.49	40.2	18	2.56	0
11:13 AM	7 min	2	4.87	0.53	7.07	44.3	19.7	2.63	0
11:20 AM	5 min	5	4.71	0.6	6.75	51.1	18.5	2.64	0
11:25 AM	5 min	8	3.49	0.85	6.67	47.8	18.3	2.64	0
11:30 AM	5 min	11	3.1	0.84	6.62	44.5	18.3	2.64	0
11:35 AM	5 min	14	2.7	0.85	6.6	42.6	18.1	2.64	0
11:40 AM	5 min	15	3.61	0.84	6.59	39.6	20.5	2.57	0
11:45 AM	5 min	17	0.53	0.83	6.72	15.9	19.7	2.59	0
11:50 AM	4 min	18	0.36	0.83	6.75	12.3	19.7	2.59	0
11:54 AM	4 min	19	0.29	0.85	6.76	10.1	19.5	2.59	0
11:58 AM	4 min	20	0.26	0.8	6.77	8.4	19.5	2.59	0
Groundwater equilibrium reached at			± 10%	± 3%	± 0.05	± 10 mV	± 0.2 °C	(3 consecutive measurements)	

Observations at start of development (turbidity, colour, odour, sheen):
High turbidity ; dark grey ; no odour ; no sheen

Observations at end of development (turbidity, colour, odour, sheen):
Low-moderate turbidity ; light yellow ; no odour ; no sheen

Volume of water actually purged during development: 20 L

Discharge water disposal: ☑Drums ☐Sanitary sewer ☐Storm sewer ☐Surface ☐Other:

Other observations / comments:

CPFO471o (ENV) Site Contamination Analysis Well Development Form

Project Name: FBURA Groundwater Assessment	Project Number: 60431087	Well No: GW27
Recorded / Developed By: Oliver T	Well Type: ☑Monitor ☐Extractor ☐Other:	
Date: 15/10/2015	Well Material: ☑PVC ☐SS ☐Other:	

Well Purging

Well Details	Development Method
Well Diameter (D in mm): ☑50 ☐100 ☐Other:	☑Bailer – Type: ☐PVC ☐SS ☐Teflon ☑Other: Steel bailer to stir up well
Total Depth of Well (TD in m BTOC): 5.07	☑Pump – Type: ☐Submersible ☐Bladder ☑Other: Peristelic
Water Level Depth (WL in m BTOC): 3.33	Pump Intake Setting (if pump used): 0
Number of bore volumes to be purged (# VOLS) ☑3 ☐4 ☐5 ☐10 ☐Other:	Depth pump set (m BTOC): 0
	Screen Interval (m BTOC) Top : 0 Bottom: 0

Anticipated Approximate Purge Volume Calculation

(_____ - _____) x (_____/2)^2 x 0.00314 = _____ _____ x _____ = _____

TD WL D 1 BV (L) BV # VOLS Purge Volume (L)

Start: 10:01 AM Stop: 11:24 AM Elapsed: 83 min Initial depth to water: 3.33
Final depth to water: 3.34

Field Parameter Measurements ☑ **Required** ☐**Not required**

Actual Time	Elapsed minutes	Purge Vol (L)	DO (mg/L)	EC. (µS/cm)	pH	Redox (mV)	Temp (°C)	SWL (m BTOC)	Pump setting (rate)
10:04 AM	24 min	1	0.53	1.29	6.83	-52.8	18.1	3.32	0
10:28 AM	7 min	2	0.93	1.63	6.92	-65.4	19.6	3.34	0
10:35 AM	5 min	5	1.17	1.61	6.68	-67.7	19.1	3.34	0
10:40 AM	5 min	8	0.93	1.55	6.68	-65.5	19.3	3.34	0
10:45 AM	5 min	11	0.65	1.54	6.67	-67.4	19	3.34	0
10:50 AM	4 min	14	0.8	1.47	6.68	-65	19.6	3.34	0
10:54 AM	5 min	15	1.7	1.5	6.67	-66.2	20.8	3.31	0
10:59 AM	5 min	19	0.14	1.82	6.7	-81.9	20.1	3.34	0
11:04 AM	5 min	22	0.07	1.85	6.74	-87.1	19.8	3.34	0
11:09 AM	5 min	25	0.04	1.85	6.72	-89.8	20.1	3.34	0
11:14 AM	5 min	28	0.06	1.84	6.72	-91.4	20.2	3.34	0
11:19 AM	4 min	31	0.03	1.82	6.72	-91.5	19.9	3.34	0
11:23 AM	4 min	34	0.05	1.82	6.72	-91.7	20	3.34	0
Groundwater equilibrium reached at			± 10%	± 3%	± 0.05	± 10 mV	± 0.2 °C	(3 consecutive measurements)	

Observations at start of development (turbidity, colour, odour, sheen):
High turbidity ; dark grey ; no odour ; no sheen

Observations at end of development (turbidity, colour, odour, sheen):
Low turbidity ; clear ; no odour ; no sheen

Volume of water actually purged during development: 34 L

Discharge water disposal: ☑Drums ☐Sanitary sewer ☐Storm sewer ☐Surface ☐Other:

Other observations / comments:

CPFO471o (ENV) Site Contamination Analysis Well Development Form

Project Name: FBURA Groundwater Assessment	Project Number: 60431087	Well No: Gw28
Recorded / Developed By: Oliver T	Well Type: ☑Monitor ☐Extractor ☐Other:	
Date: 15/10/2015	Well Material: ☑PVC ☐SS ☐Other:	

Well Purging

Well Details	Development Method
Well Diameter (D in mm): ☑50 ☐100 ☐Other:	☑Bailer – Type: ☐PVC ☐SS ☐Teflon ☑Other: Steel to stir up water
Total Depth of Well (TD in m BTOC): 2.44	☐Pump – Type: ☐Submersible ☐Bladder ☑Other:
Water Level Depth (WL in m BTOC): 1.54	Pump Intake Setting (if pump used): 0
Number of bore volumes to be purged (# VOLS)	Depth pump set (m BTOC): 0
☑3 ☐4 ☐5 ☐10 ☐Other:	Screen Interval (m BTOC) Top : 0 Bottom: 0

Anticipated Approximate Purge Volume Calculation

(_____ - _____) x (_____/2)^2 x 0.00314 = _____ _____ x _____ = _____

TD WL D 1 BV (L) BV # VOLS Purge Volume (L)

Start: 8:45 AM Stop: 9:28 AM Elapsed: 43 min Initial depth to water: 1.54
Final depth to water:

Field Parameter Measurements ☑ **Required** ☐**Not required**

Actual Time	Elapsed minutes	Purge Vol (L)	DO (mg/L)	EC. (µS/cm)	pH	Redox (mV)	Temp (°C)	SWL (m BTOC)	Pump setting (rate)
8:49 AM	15 min	1	0	2.51	7.45	2.51	17.3	1.66	0
9:04 AM	24 min	2	0	2.41	7.24	-46.4	19.2	1.71	0
9:28 AM	24 min	7	0	1.47	7.63	-133.7	18.5	2.1	0
Groundwater equilibrium reached at			± 10%	± 3%	± 0.05	± 10 mV	± 0.2 °C	(3 consecutive measurements)	

Observations at start of development (turbidity, colour, odour, sheen):

Observations at end of development (turbidity, colour, odour, sheen):

Volume of water actually purged during development: 7 L

Discharge water disposal: ☑Drums ☐Sanitary sewer ☐Storm sewer ☐Surface ☐Other:

Other observations / comments:

Disposable Bailer used as too silty to pump. Recharge very slow had to wait for recharge to come back and finish development at seperate times

CPFO471o (ENV) Site Contamination Analysis Well Development Form

Project Name: FBURA	Project Number: 60430187	Well No: GW29
Recorded / Developed By: Matt Sheppard	Well Type: ☒ Monitor ☐ Extractor ☐ Other	
Date: 6/11/15	Well Material: ☒PVC ☐ SS ☐ Other	

Well Purging

Well Details	**Development Method**
Well Diameter (D in mm): ☒50 ☐100 ☐Other:	☐ Bailer – Type: ☐ PVC ☐ SS ☐ Teflon ☐ Other:
Total Depth of Well (TD in m BTOC):	☒ Pump – Type: ☐ Submersible ☒ Bladder ☐ Other:
Water Level Depth (WL in m BTOC): 2.89	Pump Intake Setting (if pump used)
Number of bore volumes to be purged (# VOLS)	Depth pump set (m BTOC):
☐ 3 ☐ 4 ☐ 5 ☐ 10 ☐ Other	Screen Interval (m BTOC) Top : Bottom:

Anticipated Approximate Purge Volume Calculation

(_____ - _____) x (_____/2)^2 x 0.00314 = _____ _____ x _____ = _____

TD WL D 1 BV (L) BV # VOLS Purge Volume (L)

Start Time: **Stop Time:** **Elapsed Time:** **Initial depth to water:** **Final depth to water:**

Field Parameter Measurements ☐ **Required** ☐ **Not required**

Actual Time	Elapsed minutes	Purge Vol (L)	DO (mg/L)	EC. (µS/cm)	pH	Redox (mV)	Temp (°C)	SWL (m BTOC)	Pump setting (rate)
10:55	**0**		**15.3**	**1298**	**7.05**	**-42**	**18.7**	**2.960**	
11:05	**10**		**0.13**	**1285**	**7.08**	**-67**	**18.3**	**2.960**	
11:15	**20**		**0.26**	**1293**	**7.03**	**-56**	**18.3**	**2.960**	
11:25	**30**		**0.14**	**1293**	**7.03**	**-57**	**18.3**	**2.960**	
11:35	**40**		**0.40**	**1312**	**7.01**	**-60**	**18.3**	**2.960**	
11:45	**50**	**20**	**0.25**	**1269**	**7.01**	**-67**	**18.3**	**2.960**	
11:55	**60**		**0.27**	**1278**	**7.01**	**-68**	**18.3**	**2.960**	
12:05	**70**	**27**	**0.18**	**1300**	**7.00**	**-75**	**18.3**	**2.960**	
Groundwater equilibrium reached at			± 10%	± 3%	± 0.05	± 10 mV	± 0.2 °C	(3 consecutive measurements)	

Observations at start of development (turbidity, colour, odour, sheen): Greyish brown, moderate turbidity, no odour, no sheen.

Observations at end of development (turbidity, colour, odour, sheen):

Volume of water actually purged during development:_____27_____ L

Discharge water disposal: ☐ Drums ☐ Sanitary sewer ☐ Storm sewer ☐ Surface ☐ Other:_____

Other observations / comments:

CPFO471o (ENV) Site Contamination Analysis Well Development Form

Project Name: FBURA Groundwater Assessment	Project Number: 60431087	Well No: GW30
Recorded / Developed By: Oliver T	Well Type: ☑Monitor ☐Extractor ☐Other:	
Date: 14/10/2015	Well Material: ☑PVC ☐SS ☐Other:	

Well Purging

Well Details	Development Method
Well Diameter (D in mm): ☑50 ☐100 ☐Other:	☑Bailer – Type: ☐PVC ☐SS ☐Teflon ☑Other: Steel to stir up water
Total Depth of Well (TD in m BTOC): 3.78	☑Pump – Type: ☐Submersible ☐Bladder ☑Other: Peristaltic
Water Level Depth (WL in m BTOC): 2.66	Pump Intake Setting (if pump used): 0
Number of bore volumes to be purged (# VOLS) ☑3 ☐4 ☐5 ☐10 ☐Other:	Depth pump set (m BTOC): 0
	Screen Interval (m BTOC) Top : 0 Bottom: 0

Anticipated Approximate Purge Volume Calculation

(_____ - _____) x (_____/2)^2 x 0.00314 = _____ _____ x _____ = _____

TD WL D 1 BV (L) BV # VOLS Purge Volume (L)

Start: 2:00 PM Stop: 3:01 PM Elapsed: 61 min Initial depth to water: 2.66
Final depth to water: 2.71

Field Parameter Measurements ☑ **Required** ☐**Not required**

Actual Time	Elapsed minutes	Purge Vol (L)	DO (mg/L)	EC. (µS/cm)	pH	Redox (mV)	Temp (°C)	SWL (m BTOC)	Pump setting (rate)
2:02 PM	7 min	0	1.96	1.44	6.09	70.6	20.4	2.65	0
2:09 PM	5 min	2	1.05	1.51	5.8	71.5	19.9	2.72	0
2:14 PM	4 min	5	1.84	1.48	5.72	71	19.3	2.74	0
2:18 PM	5 min	9	0.8	1.47	5.64	46.1	18.9	2.74	0
2:23 PM	5 min	11	0.61	1.48	5.64	43.3	18.8	2.74	0
2:28 PM	10 min	15	0.54	1.47	5.64	40.4	18.8	2.74	0
2:38 PM	5 min	17	1.09	1.57	5.63	52.2	20.4	2.68	0
2:43 PM	4 min	19	3.84	1.48	5.7	70.4	19.4	2.71	0
2:47 PM	5 min	20	1.98	1.47	5.72	63.3	19.3	2.72	0
2:52 PM	5 min	23	1.36	1.48	5.71	55.4	19.8	2.72	0
2:57 PM	2 min	25	1.43	1.47	5.69	58.3	19.7	2.71	0
2:59 PM	2 min	26	1.29	1.47	5.67	59.3	19.8	2.71	0
Groundwater equilibrium reached at			± 10%	± 3%	± 0.05	± 10 mV	± 0.2 °C	(3 consecutive measurements)	

Observations at start of development (turbidity, colour, odour, sheen):
High turbidity ; dark grey ; no odour ; no sheen

Observations at end of development (turbidity, colour, odour, sheen):
Low-moderate turbidity ; light yellow ; no odour ; no sheen

Volume of water actually purged during development: 26 L

Discharge water disposal: ☑Drums ☐Sanitary sewer ☐Storm sewer ☐Surface ☐Other:

Other observations / comments:

CPFO471o (ENV) Site Contamination Analysis Well Development Form

Project Name: FBURA	Project Number: 60431087	Well No: GW31
Recorded / Developed By: Matt Sheppard	Well Type: ☒ Monitor ☐ Extractor ☐ Other	
Date: 6/11/15	Well Material: ☒PVC ☐ SS ☐ Other	

Well Purging

Well Details	**Development Method**
Well Diameter (D in mm): ☒50 ☐100 ☐Other:	☐ Bailer – Type: ☐ PVC ☐ SS ☐ Teflon ☐ Other:
Total Depth of Well (TD in m BTOC):	☒ Pump – Type: ☐ Submersible ☒ Bladder ☐ Other:
Water Level Depth (WL in m BTOC): 1.525	Pump Intake Setting (if pump used)
Number of bore volumes to be purged (# VOLS)	Depth pump set (m BTOC):
☐ 3 ☐ 4 ☐ 5 ☐ 10 ☐ Other	Screen Interval (m BTOC) Top : Bottom:

Anticipated Approximate Purge Volume Calculation

(_____ - _____) x (_____/2)^2 x 0.00314 = _____ _____ x _____ = _____

TD WL D 1 BV (L) BV # VOLS Purge Volume (L)

Start Time: **Stop Time:** **Elapsed Time:** **Initial depth to water:** **Final depth to water:**

Field Parameter Measurements ☐ **Required** ☐ **Not required**

Actual Time	Elapsed minutes	Purge Vol (L)	DO (mg/L)	EC. (mS/cm)	pH	Redox (mV)	Temp (°C)	SWL (m BTOC)	Pump setting (rate)
12:40	**0**		**0.36**	**12.38**	**6.44**	**-13**	**17.9**	**1.770**	
12:50	**10**		**0.03**	**12.15**	**6.48**	**-38**	**17.7**	**1.785**	
13:00	**20**		**0**	**11.18**	**6.51**	**-53**	**17.7**	**1.800**	
13:10	**30**		**0**	**10.21**	**6.51**	**-63**	**17.6**	**1.830**	
13:20	**40**	**20**	**0**	**9.84**	**6.53**	**-68**	**17.6**	**1.800**	
13:30	**50**		**0**	**9.88**	**6.53**	**-73**	**17.7**	**1.800**	
13:40	**60**		**0**	**9.81**	**6.51**	**-73**	**17.6**	**1.800**	
13:50	**70**		**0**	**9.78**	**6.53**	**-63**	**17.6**	**1.800**	
14:00	**80**	**30**	**0**	**9.62**	**6.521**	**-73**	**16.6**	**1.800**	
Groundwater equilibrium reached at			± 10%	± 3%	± 0.05	± 10 mV	± 0.2 °C	(3 consecutive measurements)	

Observations at start of development (turbidity, colour, odour, sheen): Grey, very turbid, no odour, no sheen.

Observations at end of development (turbidity, colour, odour, sheen):

Volume of water actually purged during development:_____30_____ L

Discharge water disposal: ☐ Drums ☐ Sanitary sewer ☐ Storm sewer ☐ Surface ☐ Other:_____

Other observations / comments:

Surged and cleared flow cell @ 10 min intervals._____

CPFO471o (ENV) Site Contamination Analysis Well Development Form

Project Name: FBURA	Project Number: 60431087	Well No: GW33
Recorded / Developed By: Matt Sheppard	Well Type: ☒ Monitor ☐ Extractor ☐ Other	
Date: 6/11/15	Well Material: ☒PVC ☐ SS ☐ Other	

Well Purging

Well Details	**Development Method**
Well Diameter (D in mm): ☒50 ☐100 ☐Other:	☐ Bailer – Type: ☐ PVC ☐ SS ☐ Teflon ☐ Other:
Total Depth of Well (TD in m BTOC):	☒ Pump – Type: ☐ Submersible ☒ Bladder ☐ Other:
Water Level Depth (WL in m BTOC): 2.035	Pump Intake Setting (if pump used)
Number of bore volumes to be purged (# VOLS)	Depth pump set (m BTOC):
☐ 3 ☐ 4 ☐ 5 ☐ 10 ☐ Other	Screen Interval (m BTOC) Top : Bottom:

Anticipated Approximate Purge Volume Calculation

(_____ - _____) x (_____/2)^2 x 0.00314 = _____ _____ x _____ = _____

TD WL D 1 BV (L) BV # VOLS Purge Volume (L)

Start Time: **Stop Time:** **Elapsed Time:** **Initial depth to water:** **Final depth to water:**

Field Parameter Measurements ☐ **Required** ☐ **Not required**

Actual Time	Elapsed minutes	Purge Vol (L)	DO (mg/L)	EC. (µS/cm)	pH	Redox (mV)	Temp (°C)	SWL (m BTOC)	Pump setting (rate)
14:25	**0**		**1.23**	**1415**	**7.22**	**-121**	**19.8**	**2.400**	
14:35	**10**		**0.1**	**1413**	**7.19**	**-146**	**20.2**	**2.420**	
14:45	**20**		**0.17**	**1113**	**7.17**	**-127**	**20.1**	**2.400**	
14:55	**30**		**0.02**	**1138**	**7.14**	**-131**	**20.2**	**2.400**	
15:05	**40**		**0**	**1158**	**7.12**	**-138**	**20.7**	**2.400**	
15:15	**50**		**0**	**1095**	**7.12**	**-141**	**20.2**	**2.400**	
15:25	**60**	**15**	**0**	**1158**	**7.11**	**-139**	**20.7**	**2.400**	
Groundwater equilibrium reached at			± 10%	± 3%	± 0.05	± 10 mV	± 0.2 °C	(3 consecutive measurements)	

Observations at start of development (turbidity, colour, odour, sheen): Low turbidity, grey, no odour, no sheen.

_____

Observations at end of development (turbidity, colour, odour, sheen):

_____

Volume of water actually purged during development:_____ **L**

Discharge water disposal: ☐ Drums ☐ Sanitary sewer ☐ Storm sewer ☐ Surface ☐ Other:_____

Other observations / comments:

Surge @ 10 min intervals._____

_____

AECOM

Project Name: FBURA Groundwater Assessment	Project Number: 60431087	Well No: GW34
Recorded / Developed By: Oliver T	Well Type: ☑Monitor ☐Extractor ☐Other:	
Date: 15/10/2015	Well Material: ☑PVC ☐SS ☐Other:	

Well Purging

Well Details	**Development Method**
Well Diameter (D in mm): ☑50 ☐100 ☐Other:	☑Bailer – Type: ☐PVC ☐SS ☐Teflon ☑Other: Steel to stir up water
Total Depth of Well (TD in m BTOC): 4.03	☑Pump – Type: ☐Submersible ☐Bladder ☑Other: Peristaltic
Water Level Depth (WL in m BTOC): 1.73	Pump Intake Setting (if pump used): 0
Number of bore volumes to be purged (# VOLS) ☑3 ☐4 ☐5 ☐10 ☐Other:	Depth pump set (m BTOC): 0
	Screen Interval (m BTOC) Top : 0 Bottom: 0

Anticipated Approximate Purge Volume Calculation

(_____ - _____) x (_____/2)^2 x 0.00314 = _____ _____ x _____ = _____

TD WL D 1 BV (L) BV # VOLS Purge Volume (L)

Start: 12:02 PM Stop: 1:16 PM Elapsed: 74 min Initial depth to water: 1.73
Final depth to water: 2.39

Field Parameter Measurements ☑ **Required** ☐**Not required**

Actual Time	Elapsed minutes	Purge Vol (L)	DO (mg/L)	EC. (µS/cm)	pH	Redox (mV)	Temp (°C)	SWL (m BTOC)	Pump setting (rate)
12:06 PM	4 min	1	3.2	2.27	7.39	2.7	22.5	1.76	0
12:10 PM	5 min	2	2.18	2.5	7.35	-62.8	20.6	1.84	0
12:15 PM	4 min	5	3.82	2.14	7.63	-11.3	20.5	1.91	0
12:19 PM	6 min	9	5.33	1.94	7.71	-30.4	20.4	2.1	0
12:25 PM	5 min	12	3.67	1.96	7.6	-80.4	19.9	2.21	0
12:30 PM	5 min	15	2.72	1.96	7.51	1.96	20	2.31	0
12:35 PM	5 min	16	2.15	2.54	7.34	-64	20.9	2.1	0
12:40 PM	5 min	20	3.9	2.16	7.44	-21.5	20.5	2.3	0
12:45 PM	5 min	24	3.77	2.24	7.38	-84.4	20	2.37	0
12:50 PM	5 min	27	30.2	2.34	7.31	-108.5	19.8	2.4	0
12:55 PM	5 min	30	1.87	2.45	7.25	-119.7	20.2	2.4	0
1:00 PM	5 min	34	1.28	2.5	7.22	-127.5	20.2	2.39	0
1:05 PM	4 min	37	0.98	2.54	7.22	-134.4	20.2	2.39	0
1:09 PM	5 min	40	0.72	2.59	7.21	-139	20.3	2.39	0
1:14 PM	5 min	43	0.66	2.62	7.21	-143.4	20.4	2.39	0
Groundwater equilibrium reached at			± 10%	± 3%	± 0.05	± 10 mV	± 0.2 °C	(3 consecutive measurements)	

Observations at start of development (turbidity, colour, odour, sheen):
High turbidity ; dark grey ; no odour ; no sheen

Observations at end of development (turbidity, colour, odour, sheen):
Low-moderate turbidity ; light yellow ; natural organic odour ; no sheen

Volume of water actually purged during development: 43 L

Discharge water disposal: ☑Drums ☐Sanitary sewer ☐Storm sewer ☐Surface ☐Other:

Other observations / comments:

CPFO471o (ENV) Site Contamination Analysis Well Development Form

Project Name: FBURA	Project Number: 60431087	Well No: GW35
Recorded / Developed By: Matt Sheppard	Well Type: ☒ Monitor ☐ Extractor ☐ Other	
Date: 6/11/15	Well Material: ☒PVC ☐ SS ☐ Other	

Well Purging

Well Details	**Development Method**
Well Diameter (D in mm): ☒50 ☐100 ☐Other:	☐ Bailer – Type: ☐ PVC ☐ SS ☐ Teflon ☐ Other:
Total Depth of Well (TD in m BTOC):	☒ Pump – Type: ☐ Submersible ☒ Bladder ☐ Other:
Water Level Depth (WL in m BTOC): 2.010	Pump Intake Setting (if pump used)
Number of bore volumes to be purged (# VOLS)	Depth pump set (m BTOC):
☐ 3 ☐ 4 ☐ 5 ☐ 10 ☐ Other	Screen Interval (m BTOC) Top : Bottom:

Anticipated Approximate Purge Volume Calculation

(_____ - _____) x (_____/2)^2 x 0.00314 = _____ _____ x _____ = _____

TD WL D 1 BV (L) BV # VOLS Purge Volume (L)

Start Time: **Stop Time:** **Elapsed Time:** **Initial depth to water:** **Final depth to water:**

Field Parameter Measurements ☐ **Required** ☐ **Not required**

Actual Time	Elapsed minutes	Purge Vol (L)	DO (mg/L)	EC. (µS/cm)	pH	Redox (mV)	Temp (°C)	SWL (m BTOC)	Pump setting (rate)
15:50	**0**		**3.04**	**4.07**	**6.33**	**21**	**19.5**	**2.550**	
15:55	**5**		**0.98**	**4.13**	**6.32**	**5**	**19.3**	**2.620**	
16:00	**10**		**0.72**	**4.09**	**6.33**	**-12**	**19.3**	**2.545**	
16:05	**15**		**0.28**	**4.10**	**6.34**	**-30**	**19.2**	**2.640**	
16:15	**25**		**0.06**	**4.02**	**6.37**	**-44**	**19.0**	**2.550**	
16:20	**30**		**0**	**4.00**	**6.39**	**-45**	**18.9**	**2.555**	
16:25	**35**		**0**	**3.96**	**6.40**	**-43**	**18.8**	**2.555**	
16:30	**40**	**7**	**0**	**3.91**	**6.41**	**-41**	**18.8**	**2.555**	
Groundwater equilibrium reached at			± 10%	± 3%	± 0.05	± 10 mV	± 0.2 °C	(3 consecutive measurements)	

Observations at start of development (turbidity, colour, odour, sheen): Transparent brown, slight natural organic odour.

Observations at end of development (turbidity, colour, odour, sheen): Clear

Volume of water actually purged during development:_____7_____ L

Discharge water disposal: ☐ Drums ☐ Sanitary sewer ☐ Storm sewer ☐ Surface ☐ Other:_____

Other observations / comments:

CPFO471o (ENV) Site Contamination Analysis Well Development Form

Project Name: FBURA Groundwater Assessment	Project Number: 60431087	Well No: GW36
Recorded / Developed By: Oliver T	Well Type: ☑Monitor ☐Extractor ☐Other:	
Date: 15/10/2015	Well Material: ☑PVC ☐SS ☐Other:	

Well Purging

Well Details	Development Method
Well Diameter (D in mm): ☑50 ☐100 ☐Other:	☑ Bailer – Type: ☐ PVC ☐ SS ☐ Teflon ☑ Other: Steel
Total Depth of Well (TD in m BTOC): 3.5	☑Pump – Type: ☑Submersible ☐Bladder ☐Other:
Water Level Depth (WL in m BTOC): 2.62	Pump Intake Setting (if pump used): 0
Number of bore volumes to be purged (# VOLS) ☑3 ☐4 ☐5 ☐10 ☐Other:	Depth pump set (m BTOC): 0
	Screen Interval (m BTOC) Top : 0 Bottom: 0

Anticipated Approximate Purge Volume Calculation

(_____ - _____) x (_____/2)^2 x 0.00314 = _____ _____ x _____ = _____

TD WL D 1 BV (L) BV # VOLS Purge Volume (L)

Start: 4:10 PM Stop: 5:04 PM Elapsed: 54 min Initial depth to water: 2.62
Final depth to water: 3.5

Field Parameter Measurements ☑ **Required** ☐**Not required**

Actual Time	Elapsed minutes	Purge Vol (L)	DO (mg/L)	EC. (µS/cm)	pH	Redox (mV)	Temp (°C)	SWL (m BTOC)	Pump setting (rate)
4:13 PM	4 min	1	14	21.8	8.3	-190.1	20.1	2.66	0
4:17 PM	5 min	2	4.05	3.65	8.2	-258.9	20.7	2.7	0
4:22 PM	5 min	5	65.2	0.6	8.2	-219	20.8	2.93	0
4:27 PM	5 min	8	2.83	0.7	7.36	-210.2	20.1	3.08	0
4:32 PM	5 min	11	1.2	0.87	7.63	-210.6	19.3	3.17	0
4:37 PM	5 min	14	0.59	0.98	7.51	-214.8	19.1	3.24	0
4:42 PM	4 min	17	0.5	1.01	7.45	-214.4	18.8	3.27	0
4:46 PM	6 min	20	4.9	1.02	7.4	-212	18.8	3.32	0
4:52 PM	4 min	23	0.67	1.04	7.37	-194.8	18.8	3.35	0
4:56 PM	6 min	26	2.25	1.06	7.35	-182.2	18.8	2.4	0
5:02 PM	6 min	29	2.7	1.06	7.41	1.06	18.7	3.5	0
Groundwater equilibrium reached at			± 10%	± 3%	± 0.05	± 10 mV	± 0.2 °C	(3 consecutive measurements)	

Observations at start of development (turbidity, colour, odour, sheen):
High turbidity ; dark grey ; no odour ; no sheen

Observations at end of development (turbidity, colour, odour, sheen):
Moderate turbidity ; light grey ; no odour ; no sheen

Volume of water actually purged during development: 29 L

Discharge water disposal: ☑Drums ☐Sanitary sewer ☐Storm sewer ☐Surface ☐Other:

Other observations / comments:

Bailer only used once on this well to stir up water. Water cleared

CPFO471o (ENV) Site Contamination Analysis Well Development Form

Project Name: FBURA	Project Number: 60431087	Well No: GW37
Recorded / Developed By: Tim Martin	Well Type: ☒ Monitor ☐ Extractor ☐ Other	
Date: 5/11/15	Well Material: ☒PVC ☐ SS ☐ Other	

Well Purging

Well Details	**Development Method**
Well Diameter (D in mm): ☒50 ☐100 ☐Other:	☐ Bailer – Type: ☐ PVC ☐ SS ☐ Teflon ☐ Other:
Total Depth of Well (TD in m BTOC): 6.98	☒ Pump – Type: ☐ Submersible ☒ Bladder ☐ Other:
Water Level Depth (WL in m BTOC): 2.841	Pump Intake Setting (if pump used)
Number of bore volumes to be purged (# VOLS)	Depth pump set (m BTOC):
☐ 3 ☐ 4 ☐ 5 ☐ 10 ☐ Other	Screen Interval (m BTOC) Top : Bottom:

Anticipated Approximate Purge Volume Calculation

(_____ - _____) x (_____/2)^2 x 0.00314 = _____ _____ x _____ = _____

TD WL D 1 BV (L) BV # VOLS Purge Volume (L)

Start Time: 13:00 **Stop Time:** **Elapsed Time:** **Initial depth to water:** **Final depth to water:**

Field Parameter Measurements ☐ **Required** ☐ **Not required**

Actual Time	Elapsed minutes	Purge Vol (L)	DO (mg/L)	EC. (µS/cm)	pH	Redox (mV)	Temp (°C)	SWL (m BTOC)	Pump setting (rate)
13:11		**0.5**	**1.96**	**1224**	**7.23**	**30**	**19.0**	**3.41**	**350 rpm**
13:21		**4.5**	**2.81**	**1253**	**7.18**	**33**	**18.8**	**3.96**	**200 rpm**
13:31		**8.0**	**2.74**	**1230**	**7.24**	**36**	**18.9**	**4.06**	**350 rpm**
13:41		**14.0**	**1.49**	**1238**	**7.22**	**41**	**18.6**	**4.08**	**350 rpm**
13:51		**22.0**	**1.57**	**1246**	**7.22**	**42**	**18.5**	**4.10**	**350 rpm**
14:00		**29.0**	**1.50**	**1250**	**7.21**	**44**	**18.5**	**4.10**	**350 rpm**
Groundwater equilibrium reached at			± 10%	± 3%	± 0.05	± 10 mV	± 0.2 °C	(3 consecutive measurements)	

Observations at start of development (turbidity, colour, odour, sheen): Light brown, low turbidity, no odour, sheen.

Observations at end of development (turbidity, colour, odour, sheen): Light brown to clear, low to no turbidity, no odour, no sheen.

Volume of water actually purged during development:_____29_____ L

Discharge water disposal: ☐ Drums ☐ Sanitary sewer ☐ Storm sewer ☐ Surface ☐ Other:_____

Other observations / comments:

Lots of white PVC cuttings in well clogging line at start._____

CPFO471o (ENV) Site Contamination Analysis Well Development Form

Project Name: FBURA	Project Number: 60431087	Well No: GW38
Recorded / Developed By: Tim Martin	Well Type: ☒ Monitor ☐ Extractor ☐ Other	
Date: 5/11/15	Well Material: ☒PVC ☐ SS ☐ Other	

Well Purging

Well Details	**Development Method**
Well Diameter (D in mm): ☒50 ☐100 ☐Other:	☐ Bailer – Type: ☐ PVC ☐ SS ☐ Teflon ☐ Other:
Total Depth of Well (TD in m BTOC): 6.73	☒ Pump – Type: ☐ Submersible ☒ Bladder ☐ Other:
Water Level Depth (WL in m BTOC): 3.478	Pump Intake Setting (if pump used)
Number of bore volumes to be purged (# VOLS)	Depth pump set (m BTOC):
☐ 3 ☐ 4 ☐ 5 ☐ 10 ☐ Other	Screen Interval (m BTOC) Top : Bottom:

Anticipated Approximate Purge Volume Calculation

(_____ - _____) x (_____/2)^2 x 0.00314 = _____ _____ x _____ = _____

TD WL D 1 BV (L) BV # VOLS Purge Volume (L)

Start Time: 8:00	**Stop Time: 9:10**	**Elapsed Time:**	**Initial depth to water: 3.478/6.73**	**Final depth to water: 4.430/6.83**

Field Parameter Measurements ☐ **Required** ☐ **Not required**

Actual Time	Elapsed minutes	Purge Vol (L)	DO (mg/L)	EC. (µS/cm)	pH	Redox (mV)	Temp (°C)	SWL (m BTOC)	Pump setting (rate)
8:00			**2.06**	**5290**	**7.51**	**123**	**19.2**	**3.71**	**Fast**
8:10		**8**	**1.26**	**5080**	**7.62**	**117**	**19.4**	**4.09**	**350 rpm**
8:20		**13**	**0.69**	**5080**	**7.70**	**114**	**19.3**	**4.07**	**350 rpm**
8:30		**20**	**0.40**	**5090**	**7.72**	**118**	**19.4**	**4.21**	**350 rpm**
8:40		**28**	**0.36**	**5070**	**7.72**	**108**	**19.5**	**4.26**	**350 rpm**
8:50		**36**	**0.51**	**5090**	**7.67**	**106**	**19.4**	**4.32**	**350 rpm**
9:00		**45**	**0.60**	**5080**	**7.69**	**107**	**19.4**	**4.46**	**350 rpm**
9:10		**53**	**0.59**	**5070**	**7.69**	**106**	**19.5**	**4.44**	**350 rpm**
Groundwater equilibrium reached at			± 10%	± 3%	± 0.05	± 10 mV	± 0.2 °C	(3 consecutive measurements)	

Observations at start of development (turbidity, colour, odour, sheen): No odour, no sheen, moderate to low turbidity, brown.

Observations at end of development (turbidity, colour, odour, sheen): No odour, no sheen, low turbidity, brown.

Volume of water actually purged during development:_____53_____ L

Discharge water disposal: ☐ Drums ☐ Sanitary sewer ☐ Storm sewer ☐ Surface ☐ Other:_____

Other observations / comments:

Low to moderate recharge ~1cm/5sec_____

Appendix H

Groundwater Gauging Forms

Site Contamination Analysis – Water Level Data Sheet

Project Name: FBURA	Instrument Model:
Project Number: 60431087	
Recorded By: Oliver Taylor	
Date:16 Nov 2015	

Bore Id	Time	Depth to Water 1st Reading	Depth to Water 2nd Reading	Depth to Water 3rd Reading	Stick Up	Total Depth of Well	Depth to Product	Comments
GW02	8:15	3.235						
GW01	8:20	2.910						
GW06	8:29	1.904						
GW11	8:41	2.12						
GW07	8:46	2.635						
GW08	8:58	2.629						
GW03	9:05	3.04						
GW04	9:11	3.55						
GW09	9:19	2.76						
GW05	9:32	2.33						
GW10	9:42	2.698						
GW12	9:54	2.635						
GW29	10:04	2.845						
GW20	10:13	3.84*						
GW25	10:19	2.865						
GW26	10:24	2.475						
GW21	10:33	2.445						
GW13	10:48	2.28						
GW16	10:55	2.193						
GW14	11:03	1.933						
GW35	11:15	2.137						

*Based on the data collected in the groundwater sampling event undertaken during the same week of gauging, it appears that the SWL gauged at location GW20 (above) on 16 Nov 2015 is likely to be a reading error. Please note that AECOM has therefore used the gauging data collected during sampling from GW20 when calculating the groundwater elevation.

Site Contamination Analysis – Water Level Data Sheet

Project Name: FBURA	Instrument Model:
Project Number: 60431087	
Recorded By: Zach O'Connor	
Date:16 Nov 2015	

Bore Id	Time	Depth to Water 1st Reading	Depth to Water 2nd Reading	Depth to Water 3rd Reading	Stick Up	Total Depth of Well	Depth to Product	Comments
GW38	8:30	3.537						
GW37	8:37	2.864						
GW34	8:51	1.593						
GW36	9:07	2.647						
GW33	9:18	2.347						
GW31	9:38	1.664						
GW28	9:47	1.433						
GW24	9:55	1.375						
GW22	10:02	2.369						
GW23	10:06	2.303						
GW27	10:17	3.192						
GW30	10:21	2.699						
GW18	10:36	1.511						
GW15	10:41	0.940						
GW19	10:52	1.015						
GW17	11:04	2.363						
GW32	11:30	2.282						

Appendix I

Groundwater Sampling Forms

CPFO471o (ENV) Site Contamination Analysis Well Sampling Form

Project Name: FBURA Groundwater Assessment	Project Number: 60431087	Well No: GW01
Recorded / Developed By: Oliver T	Well Type: ☑Monitor ☐Extractor ☐Other:	
Date: 20/11/2015	Well Material: ☑PVC ☐SS ☐Other:	

Well Purging

Well Details	**Development Method**
Well Diameter (D in mm): ☑50 ☐100 ☐Other:	☐Bailer – Type: ☐PVC ☐SS ☐Teflon ☑Other:
Total Depth of Well (TD in m BTOC): 4.37	☑Pump – Type: ☐Submersible ☑Bladder ☐Other:
Water Level Depth (WL in m BTOC): 2.95	Pump Intake Setting (if pump used):
Number of bore volumes to be purged (# VOLS)	Depth pump set (m BTOC):
☐3 ☐4 ☐5 ☐10 ☑Other: 0	Screen Interval (m BTOC) Top : 0 Bottom: 0

Anticipated Approximate Purge Volume Calculation

(_____ - _____) x (_____/2)^2 x 0.00314 = _____ _____ x _____ = _____

TD WL D 1 BV (L) BV # VOLS Purge Volume (L)

Start: 9:24 AM Stop: 9:47 AM Elapsed: 23 min Initial depth to water: 2.95
Final depth to water: 1.94

Field Parameter Measurements ☑ **Required** ☐**Not required**

Actual Time	Elapsed minutes	Purge Vol (L)	DO (mg/L)	EC. (mS/cm)	pH	Redox (mV)	Temp (°C)	SWL (m BTOC)	Pump setting (rate)
9:26 AM	6 min	0.5	5.79	3.38	7.41	-126	18.6	1.92	3.8
9:32 AM	6 min	2	0.16	3.42	7.43	-151	18.5	1.92	3.8
9:38 AM	3 min	4	0.03	3.43	7.45	-155	18.4	1.94	3.8
9:41 AM	3 min	5	0.01	3.45	7.45	-154	18.4	1.94	3.8
9:44 AM	3 min	5.5	0	3.45	7.45	-155	18.4	1.94	3.8
9:47 AM	3 min	6	0.06	3.45	7.45	-155	18.4	1.94	3.8
Groundwater equilibrium reached at			± 10%	± 3%	± 0.05	± 10 mV	± 0.2 °C	(3 consecutive measurements)	

Observations at start of development (turbidity, colour, odour, sheen):
High turbidity ; dark black ; no odour ; no sheen

Observations at end of development (turbidity, colour, odour, sheen):
Low-moderate turbidity ; light yellow ; no odour ; no sheen

Volume of water actually purged during development: 6 L

Discharge water disposal: ☑Drums ☐Sanitary sewer ☐Storm sewer ☐Surface ☐Other:

Other observations / comments:

CPFO471o (ENV) Site Contamination Analysis Well Sampling Form

Project Name: FBURA Groundwater Assessment	Project Number: 60431087	Well No: GW02
Recorded / Developed By: Oliver T	Well Type: ☑Monitor ☐Extractor ☐Other:	
Date: 20/11/2015	Well Material: ☑PVC ☐SS ☐Other:	

Well Purging

Well Details	**Development Method**
Well Diameter (D in mm): ☑50 ☐100 ☐Other:	☐Bailer – Type: ☐PVC ☐SS ☐Teflon ☑Other:
Total Depth of Well (TD in m BTOC): 3.91	☑Pump – Type: ☐Submersible ☑Bladder ☐Other:
Water Level Depth (WL in m BTOC): 3.23	Pump Intake Setting (if pump used):
Number of bore volumes to be purged (# VOLS)	Depth pump set (m BTOC):
☐3 ☐4 ☐5 ☐10 ☑Other: 0	Screen Interval (m BTOC) Top : 0 Bottom: 0

Anticipated Approximate Purge Volume Calculation

(_____ - _____) x (_____/2)^2 x 0.00314 = _____ _____ x _____ = _____

TD WL D 1 BV (L) BV # VOLS Purge Volume (L)

Start: 10:26 AM Stop: 10:50 AM Elapsed: 24 min Initial depth to water: 3.23
Final depth to water: 3.24

Field Parameter Measurements ☑ **Required** ☐**Not required**

Actual Time	Elapsed minutes	Purge Vol (L)	DO (mg/L)	EC. (mS/cm)	pH	Redox (mV)	Temp (°C)	SWL (m BTOC)	Pump setting (rate)
10:29 AM	6 min	0.5	2.63	2.25	6.9	-106	18	3.24	3.4
10:35 AM	6 min	1.5	0.92	2.18	6.88	-115	17.9	3.24	3.4
10:41 AM	3 min	3.5	0.46	2.19	6.88	-123	17.9	3.24	3.4
10:44 AM	3 min	4.5	0.26	2.18	6.88	-124	17.9	3.24	3.4
10:47 AM	3 min	5.5	0.28	2.19	6.88	-125	17.9	3.24	3.4
10:50 AM	3 min	6.5	0.23	2.19	6.89	-124	18	3.24	3.4
Groundwater equilibrium reached at			± 10%	± 3%	± 0.05	± 10 mV	± 0.2 °C	(3 consecutive measurements)	

Observations at start of development (turbidity, colour, odour, sheen):
high turbidity ; light brown ; no odour ; no sheen ;

Observations at end of development (turbidity, colour, odour, sheen):

Volume of water actually purged during development: 6.5 L

Discharge water disposal: ☑Drums ☐Sanitary sewer ☐Storm sewer ☐Surface ☐Other:

Other observations / comments:

CPFO471o (ENV) Site Contamination Analysis Well Sampling Form

Project Name: FBURA Groundwater Assessment	Project Number: 60431087	Well No: GW03
Recorded / Developed By: Oliver T	Well Type: ☑Monitor ☐Extractor ☐Other:	
Date: 19/11/2015	Well Material: ☑PVC ☐SS ☐Other:	

Well Purging

Well Details	**Development Method**
Well Diameter (D in mm): ☑50 ☐100 ☐Other:	☐Bailer – Type: ☐PVC ☐SS ☐Teflon ☑Other:
Total Depth of Well (TD in m BTOC): 4.65	☑Pump – Type: ☐Submersible ☑Bladder ☐Other:
Water Level Depth (WL in m BTOC): 3.04	Pump Intake Setting (if pump used):
Number of bore volumes to be purged (# VOLS)	Depth pump set (m BTOC):
☐3 ☐4 ☐5 ☐10 ☑Other: 0	Screen Interval (m BTOC) Top : 0 Bottom: 0

Anticipated Approximate Purge Volume Calculation

(_____ - _____) x (_____/2)^2 x 0.00314 = _____ _____ x _____ = _____

TD WL D 1 BV (L) BV # VOLS Purge Volume (L)

Start: 12:08 PM Stop: 12:29 PM Elapsed: 21 min Initial depth to water: 3.04
Final depth to water: 3.08

Field Parameter Measurements ☑ **Required** ☐**Not required**

Actual Time	Elapsed minutes	Purge Vol (L)	DO (mg/L)	EC. (µS/cm)	pH	Redox (mV)	Temp (°C)	SWL (m BTOC)	Pump setting (rate)
12:10 PM	7 min	0.5	0.51	2091	7.3	-133	20.1	2.08	4.1
12:17 PM	6 min	2	0.02	2154	6.96	-112	19.3	2.08	4.1
12:23 PM	3 min	4	0.06	2162	6.88	-103	19.2	2.08	4.1
12:26 PM	3 min	5	0.05	2159	6.87	-105	19.1	2.08	4.1
12:29 PM	3 min	6	0.06	2156	6.86	-105	19.1	2.08	4.1
Groundwater equilibrium reached at			± 10%	± 3%	± 0.05	± 10 mV	± 0.2 °C	(3 consecutive measurements)	

Observations at start of development (turbidity, colour, odour, sheen):
High turbidity ; dark grey ; no odour ; no sheen

Observations at end of development (turbidity, colour, odour, sheen):
Moderate turbidity ; grey ; no odour ; no sheen

Volume of water actually purged during development: 6 L

Discharge water disposal: ☑Drums ☐Sanitary sewer ☐Storm sewer ☐Surface ☐Other:

Other observations / comments:

CPFO471o (ENV) Site Contamination Analysis Well Sampling Form

Project Name: FBURA Groundwater Assessment	Project Number: 60431087	Well No: GW04
Recorded / Developed By: Oliver T	Well Type: ☑Monitor ☐Extractor ☐Other:	
Date: 19/11/2015	Well Material: ☑PVC ☐SS ☐Other:	

Well Purging

Well Details	**Development Method**
Well Diameter (D in mm): ☑50 ☐100 ☐Other:	☐Bailer – Type: ☐PVC ☐SS ☐Teflon ☑Other:
Total Depth of Well (TD in m BTOC): 4.86	☑Pump – Type: ☐Submersible ☑Bladder ☐Other:
Water Level Depth (WL in m BTOC): 3.05	Pump Intake Setting (if pump used):
Number of bore volumes to be purged (# VOLS)	Depth pump set (m BTOC):
☐3 ☐4 ☐5 ☐10 ☑Other: 0	Screen Interval (m BTOC) Top : 0 Bottom: 0

Anticipated Approximate Purge Volume Calculation

(_____ - _____) x (_____/2)^2 x 0.00314 = _____ _____ x _____ = _____

TD WL D 1 BV (L) BV # VOLS Purge Volume (L)

Start: 11:07 AM Stop: 11:35 AM Elapsed: 28 min Initial depth to water: 3.05
Final depth to water: 3.06

Field Parameter Measurements ☑ **Required** ☐**Not required**

Actual Time	Elapsed minutes	Purge Vol (L)	DO (mg/L)	EC. (µS/cm)	pH	Redox (mV)	Temp (°C)	SWL (m BTOC)	Pump setting (rate)
11:14 AM	6 min	0.5	2.3	1240	6.43	32	22.6	3.06	4.3
11:20 AM	6 min	2	1.1	1318	6.17	56	20.2	3.06	4.3
11:26 AM	3 min	4	0.91	1315	6.08	73	20	3.06	4.3
11:29 AM	3 min	5	0.73	1311	6.04	79	20.1	3.06	4.3
11:32 AM	3 min	6	0.69	1303	6.02	80	20.1	3.06	4.3
11:35 AM	3 min	7	0.71	1300	6.03	82	20	3.06	4.3
Groundwater equilibrium reached at			± 10%	± 3%	± 0.05	± 10 mV	± 0.2 °C	(3 consecutive measurements)	

Observations at start of development (turbidity, colour, odour, sheen):
High turbidity ; light brown ; no odour ; no sheen

Observations at end of development (turbidity, colour, odour, sheen):

Volume of water actually purged during development: 7 L

Discharge water disposal: ☑Drums ☐Sanitary sewer ☐Storm sewer ☐Surface ☐Other:

Other observations / comments:

CPFO471o (ENV) Site Contamination Analysis Well Sampling Form

Project Name: FBURA Groundwater Assessment	Project Number: 60431087	Well No: GW05
Recorded / Developed By:	Well Type: ☑Monitor ☐Extractor ☐Other:	
Date: 20/11/2015	Well Material: ☑PVC ☐SS ☐Other:	

Well Purging

Well Details	**Development Method**
Well Diameter (D in mm): ☑50 ☐100 ☐Other:	☐Bailer – Type: ☐PVC ☐SS ☐Teflon ☑Other:
Total Depth of Well (TD in m BTOC): 3.2	☑Pump – Type: ☐Submersible ☐Bladder ☑Other: Peristaltic
Water Level Depth (WL in m BTOC): 2.33	Pump Intake Setting (if pump used):
Number of bore volumes to be purged (# VOLS)	Depth pump set (m BTOC):
☐3 ☐4 ☐5 ☐10 ☑Other: 0	Screen Interval (m BTOC) Top : 0 Bottom: 0

Anticipated Approximate Purge Volume Calculation

(_____ - _____) x (_____/2)^2 x 0.00314 = _____ _____ x _____ = _____

TD WL D 1 BV (L) BV # VOLS Purge Volume (L)

Start: 9:25 AM **Stop: 9:46 AM** **Elapsed: 21 min** **Initial depth to water: 2.33**
Final depth to water:

Field Parameter Measurements ☑ **Required** ☐**Not required**

Actual Time	Elapsed minutes	Purge Vol (L)	DO (mg/L)	EC. (mS/cm)	pH	Redox (mV)	Temp (°C)	SWL (m BTOC)	Pump setting (rate)
9:28 AM	3 min	0.5	1.41	2.23	7.56	-159	18.2	2.39	0
9:31 AM	3 min	1	0.66	2.20	7.56	-164	18.1	2.37	0
9:34 AM	3 min	1.5	0.3	2.19	7.56	-168	18.1	2.38	0
9:37 AM	3 min	2	0.14	2.17	7.55	-164	18.1	2.38	0
9:40 AM	3 min	2.5	0.13	2.17	7.54	-158	18.1	2.38	0
9:43 AM	3 min	3	0.12	2.16	7.54	-164	18.1	2.38	0
9:46 AM	3 min	3.5	0.12	2.16	7.56	-159	18.1	2.38	0
Groundwater equilibrium reached at			± 10%	± 3%	± 0.05	± 10 mV	± 0.2 °C	(3 consecutive measurements)	

Observations at start of development (turbidity, colour, odour, sheen):
Low-moderate turbidity ; light yellowish, brown ; no odour ; no sheen

Observations at end of development (turbidity, colour, odour, sheen):

Volume of water actually purged during development: 3.5 L

Discharge water disposal: ☑Drums ☐Sanitary sewer ☐Storm sewer ☐Surface ☐Other:

Other observations / comments:

CPFO471o (ENV) Site Contamination Analysis Well Sampling Form

Project Name: FBURA Groundwater Assessment	Project Number: 60431087	Well No: GW05-Resampled
Recorded / Developed By: Zach O	Well Type: ☑Monitor ☐Extractor ☐Other:	
Date: 18/11/2015	Well Material: ☑PVC ☐SS ☐Other:	

Well Purging

Well Details	Development Method
Well Diameter (D in mm): ☑50 ☐100 ☐Other:	☐Bailer – Type: ☐PVC ☐SS ☐Teflon ☑Other:
Total Depth of Well (TD in m BTOC): 4.2	☑Pump – Type: ☑Submersible ☐Bladder ☐Other:
Water Level Depth (WL in m BTOC): 2.32	Pump Intake Setting (if pump used):
Number of bore volumes to be purged (# VOLS)	Depth pump set (m BTOC):
☐3 ☐4 ☐5 ☐10 ☑Other: 0	Screen Interval (m BTOC) Top : 0 Bottom: 0

Anticipated Approximate Purge Volume Calculation

(_____ - _____) x (_____/2)^2 x 0.00314 = _____ _____ x _____ = _____

TD WL D 1 BV (L) BV # VOLS Purge Volume (L)

Start: 1:39 PM Stop: 2:08 PM Elapsed: 29 min Initial depth to water: 2.32
Final depth to water: 2.38

Field Parameter Measurements ☑ **Required** ☐**Not required**

Actual Time	Elapsed minutes	Purge Vol (L)	DO (mg/L)	EC. (µS/cm)	pH	Redox (mV)	Temp (°C)	SWL (m BTOC)	Pump setting (rate)
1:42 PM	5 min	0.6	1.32	2138	7.45	-143	20.2	2.39	0
1:47 PM	3 min	1.5	0.3	2157	7.45	-167	19.5	2.38	0
1:50 PM	3 min	2	0.23	2151	7.44	-165	19.4	2.38	0
1:53 PM	3 min	2	0.19	2150	7.43	-166	19.3	2.37	0
1:56 PM	3 min	2.5	0.12	2148	7.42	-167	19.2	2.37	0
1:59 PM	4 min	3	0.09	2145	7.4	-168	19.2	2.36	0
2:03 PM	4 min	3.5	0.09	2145	7.38	-168	19.1	2.37	0
2:07 PM	4 min	4	0.08	2146	7.36	-176	19.1	2.38	0
Groundwater equilibrium reached at			± 10%	± 3%	± 0.05	± 10 mV	± 0.2 °C	(3 consecutive measurements)	

Observations at start of development (turbidity, colour, odour, sheen):
High turbidity ; dark grey ; no odour ; no sheen

Observations at end of development (turbidity, colour, odour, sheen):
Low-moderate turbidity ; light greyish, brown ; no odour ; no sheen

Volume of water actually purged during development: 4 L

Discharge water disposal: ☑Drums ☐Sanitary sewer ☐Storm sewer ☐Surface ☐Other:

Other observations / comments:

AECOM

CPFO471o (ENV) Site Contamination Analysis Well Sampling Form

Project Name: FBURA Groundwater Assessment	Project Number: 60431087	Well No: GW06
Recorded / Developed By: Oliver T	Well Type: ☑Monitor ☐Extractor ☐Other:	
Date: 20/11/2015	Well Material: ☑PVC ☐SS ☐Other:	

Well Purging

Well Details	Development Method
Well Diameter (D in mm): ☑50 ☐100 ☐Other:	☐Bailer – Type: ☐PVC ☐SS ☐Teflon ☑Other:
Total Depth of Well (TD in m BTOC): 4.01	☑Pump – Type: ☐Submersible ☑Bladder ☐Other:
Water Level Depth (WL in m BTOC): 1.91	Pump Intake Setting (if pump used):
Number of bore volumes to be purged (# VOLS)	Depth pump set (m BTOC):
☐3 ☐4 ☐5 ☐10 ☑Other: 0	Screen Interval (m BTOC) Top : 0 Bottom: 0

Anticipated Approximate Purge Volume Calculation

(_____ - _____) x (_____/2)^2 x 0.00314 = _____ _____ x _____ = _____

TD WL D 1 BV (L) BV # VOLS Purge Volume (L)

Start: 8:04 AM Stop: 8:27 AM Elapsed: 23 min Initial depth to water: 1.91
Final depth to water: 1.92

Field Parameter Measurements ☑ **Required** ☐**Not required**

Actual Time	Elapsed minutes	Purge Vol (L)	DO (mg/L)	EC. (mS/cm)	pH	Redox (mV)	Temp (°C)	SWL (m BTOC)	Pump setting (rate)
8:06 AM	6 min	0.5	5	2.75	7.05	-91	16.9	1.92	3.5
8:12 AM	6 min	2	3.5	-	6.79	-83	16.4	1.92	3.5
8:18 AM	3 min	4	3.3	2.70	6.71	-85	16.2	1.92	3.5
8:21 AM	3 min	5	2.93	2.71	6.72	-88	16.2	1.92	3.5
8:24 AM	3 min	6	2.87	2.69	6.72	-91	16.2	1.92	3.5
8:27 AM	3 min	7	2.75	2.69	6.72	-95	16.2	1.92	3.5
Groundwater equilibrium reached at			± 10%	± 3%	± 0.05	± 10 mV	± 0.2 °C	(3 consecutive measurements)	

Observations at start of development (turbidity, colour, odour, sheen):
Low-moderate turbidity ; dark brown ; no odour ; no sheen

Observations at end of development (turbidity, colour, odour, sheen):
High-moderate turbidity ; orange, brown ; no odour ; no sheen

Volume of water actually purged during development: 7 L

Discharge water disposal: ☑Drums ☐Sanitary sewer ☐Storm sewer ☐Surface ☐Other:

Other observations / comments:

CPFO471o (ENV) Site Contamination Analysis Well Sampling Form

Project Name: FBURA Groundwater Assessment	Project Number: 60431087	Well No: GW07
Recorded / Developed By: Oliver T	Well Type: ☑Monitor ☐Extractor ☐Other:	
Date: 19/11/2015	Well Material: ☑PVC ☐SS ☐Other:	

Well Purging

Well Details	**Development Method**
Well Diameter (D in mm): ☑50 ☐100 ☐Other:	☐Bailer – Type: ☐PVC ☐SS ☐Teflon ☑Other:
Total Depth of Well (TD in m BTOC): 5.42	☑Pump – Type: ☐Submersible ☑Bladder ☐Other:
Water Level Depth (WL in m BTOC): 2.65	Pump Intake Setting (if pump used):
Number of bore volumes to be purged (# VOLS)	Depth pump set (m BTOC):
☐3 ☐4 ☑5 ☐10 ☐Other:	Screen Interval (m BTOC) Top : 0 Bottom: 0

Anticipated Approximate Purge Volume Calculation

(_____ - _____) x (_____/2)^2 x 0.00314 = _____ _____ x _____ = _____

TD WL D 1 BV (L) BV # VOLS Purge Volume (L)

Start: 2:39 PM Stop: 2:59 PM Elapsed: 20 min Initial depth to water: 2.65
Final depth to water: 2.65

Field Parameter Measurements ☑ **Required** ☐**Not required**

Actual Time	Elapsed minutes	Purge Vol (L)	DO (mg/L)	EC. (µS/cm)	pH	Redox (mV)	Temp (°C)	SWL (m BTOC)	Pump setting (rate)
2:39 PM	6 min	0.5	2.3	2043	7.09	-99	20.7	2.65	4.5
2:45 PM	7 min	2	0.84	2115	7.07	-117	19.5	2.65	4.5
2:52 PM	4 min	4	0.37	2105	7.07	-121	19.1	2.65	4.5
2:56 PM	3 min	4.5	0.33	2100	7.08	-118	19.2	2.65	4.5
2:59 PM	3 min	5	0.27	2101	7.07	-119	19.1	2.65	4.5
Groundwater equilibrium reached at			± 10%	± 3%	± 0.05	± 10 mV	± 0.2 °C	(3 consecutive measurements)	

Observations at start of development (turbidity, colour, odour, sheen):
High turbidity ; dark grey ; no odour ; no sheen

Observations at end of development (turbidity, colour, odour, sheen):
Low-moderate turbidity ; light yellow, brown ; no odour ; no sheen

Volume of water actually purged during development: 5 L

Discharge water disposal: ☑Drums ☐Sanitary sewer ☐Storm sewer ☐Surface ☐Other:

Other observations / comments:

CPFO471o (ENV) Site Contamination Analysis Well Sampling Form

Project Name: FBURA Groundwater Assessment	Project Number: 60431087	Well No: GW08
Recorded / Developed By: Oliver T	Well Type: ☑Monitor ☐Extractor ☐Other:	
Date: 2/11/2015	Well Material: ☑PVC ☐SS ☐Other:	

Well Purging

Well Details	Development Method
Well Diameter (D in mm): ☑50 ☐100 ☐Other:	☑Bailer – Type: ☐PVC ☐SS ☐Teflon ☑Other: Steel
Total Depth of Well (TD in m BTOC): 4.2	☑Pump – Type: ☐Submersible ☐Bladder ☑Other:
Water Level Depth (WL in m BTOC): 2.67	Pump Intake Setting (if pump used): 0
Number of bore volumes to be purged (# VOLS)	Depth pump set (m BTOC): 0
☑3 ☐4 ☐5 ☐10 ☐Other:	Screen Interval (m BTOC) Top : 0 Bottom: 0

Anticipated Approximate Purge Volume Calculation

(_____ - _____) x (_____/2)^2 x 0.00314 = _____ _____ x _____ = _____

TD WL D 1 BV (L) BV # VOLS Purge Volume (L)

Start: 11:14 AM Stop: 11:57 AM Elapsed: 43 min Initial depth to water: 2.67
Final depth to water: 2.7

Field Parameter Measurements ☑ **Required** ☐**Not required**

Actual Time	Elapsed minutes	Purge Vol (L)	DO (mg/L)	EC. (µS/cm)	pH	Redox (mV)	Temp (°C)	SWL (m BTOC)	Pump setting (rate)
11:17 AM	5 min	1	1.2	16.14	7.29	-80	15.5	2.69	0
11:22 AM	5 min	4	0.09	13.06	6.99	-57	16.1	2.7	0
11:27 AM	5 min	7	0.06	12.96	6.95	-53	16.1	2.7	0
11:32 AM	5 min	11	0	12.75	6.97	-60	16.1	2.7	0
11:37 AM	5 min	15	0	12.61	6.98	-68	16.1	2.7	0
11:42 AM	5 min	16	0	12.54	6.98	-67	15.8	2.69	0
11:47 AM	5 min	20	0.36	12.57	7	-54	16.2	2.7	0
11:52 AM	5 min	24	0.4	12.65	6.99	-47	16.2	2.7	0
11:57 AM	5 min	28	0.15	12.61	6.99	-53	16.2	2.7	0
Groundwater equilibrium reached at			± 10%	± 3%	± 0.05	± 10 mV	± 0.2 °C	(3 consecutive measurements)	

Observations at start of development (turbidity, colour, odour, sheen):
high turbidity ; dark brown, grey ; no odour ; no sheen ;

Observations at end of development (turbidity, colour, odour, sheen):
low turbidity ; light yellow ; no odour ; no sheen ;

Volume of water actually purged during development: 28 L

Discharge water disposal: ☑Drums ☐Sanitary sewer ☐Storm sewer ☐Surface ☐Other:

Other observations / comments:

CPFO471o (ENV) Site Contamination Analysis Well Sampling Form

Project Name: FBURA Groundwater Assessment	Project Number: 60431087	Well No: GW09
Recorded / Developed By: Oliver T	Well Type: ☑Monitor ☐Extractor ☐Other:	
Date: 19/11/2015	Well Material: ☑PVC ☐SS ☐Other:	

Well Purging

Well Details	Development Method
Well Diameter (D in mm): ☑50 ☐100 ☐Other:	☐Bailer – Type: ☐PVC ☐SS ☐Teflon ☑Other:
Total Depth of Well (TD in m BTOC): 5.52	☑Pump – Type: ☐Submersible ☑Bladder ☐Other:
Water Level Depth (WL in m BTOC): 2.78	Pump Intake Setting (if pump used):
Number of bore volumes to be purged (# VOLS)	Depth pump set (m BTOC):
☐3 ☐4 ☐5 ☐10 ☑Other: 0	Screen Interval (m BTOC) Top : 0 Bottom: 0

Anticipated Approximate Purge Volume Calculation

(_____ - _____) x (_____/2)^2 x 0.00314 = _____ _____ x _____ = _____

TD WL D 1 BV (L) BV # VOLS Purge Volume (L)

Start: 1:27 PM Stop: 1:53 PM Elapsed: 26 min Initial depth to water: 2.78
Final depth to water: 2.78

Field Parameter Measurements ☑ **Required** ☐**Not required**

Actual Time	Elapsed minutes	Purge Vol (L)	DO (mg/L)	EC. (µS/cm)	pH	Redox (mV)	Temp (°C)	SWL (m BTOC)	Pump setting (rate)
1:29 PM	6 min	0.5	4.44	1766	7.15	-125	20.6	2.78	5
1:35 PM	6 min	2	3.1	2004	7.11	-150	19	2.78	5
1:41 PM	3 min	4	2.28	1988	7.03	-145	18.6	2.78	5
1:44 PM	3 min	5	2.06	1992	7.06	-147	18.4	2.78	5
1:47 PM	3 min	6	1.76	1981	7.06	-147	18.3	2.78	5
1:50 PM	3 min	7	1.69	1972	7.07	-148	18.3	2.78	5
1:53 PM	3 min	8	1.56	1972	7.09	-150	18.3	2.78	5
Groundwater equilibrium reached at			± 10%	± 3%	± 0.05	± 10 mV	± 0.2 °C	(3 consecutive measurements)	

Observations at start of development (turbidity, colour, odour, sheen):
High-moderate turbidity ; dark brown ; no odour ; no sheen

Observations at end of development (turbidity, colour, odour, sheen):
Low-moderate turbidity ; light brown ; no odour ; no sheen

Volume of water actually purged during development: 8 L

Discharge water disposal: ☑Drums ☐Sanitary sewer ☐Storm sewer ☐Surface ☐Other:

Other observations / comments:

AECOM

CPFO471o (ENV) Site Contamination Analysis Well Sampling Form

Project Name: FBURA Groundwater Assessment	Project Number: 60431087	Well No: GW10
Recorded / Developed By:	Well Type: ☑Monitor ☐Extractor ☐Other:	
Date: 18/11/2015	Well Material: ☑PVC ☐SS ☐Other:	

Well Purging

Well Details	Development Method
Well Diameter (D in mm): ☑50 ☐100 ☐Other:	☐Bailer – Type: ☐PVC ☐SS ☐Teflon ☑Other:
Total Depth of Well (TD in m BTOC): 4.6	☑Pump – Type: ☑Submersible ☐Bladder ☐Other:
Water Level Depth (WL in m BTOC): 2.71	Pump Intake Setting (if pump used):
Number of bore volumes to be purged (# VOLS)	Depth pump set (m BTOC): 0
☐3 ☐4 ☐5 ☐10 ☑Other: 0	Screen Interval (m BTOC) Top : 0 Bottom: 0

Anticipated Approximate Purge Volume Calculation

(_____ - _____) x (_____/2)^2 x 0.00314 = _____ _____ x _____ = _____

TD WL D 1 BV (L) BV # VOLS Purge Volume (L)

Start: 2:51 PM Stop: 3:23 PM Elapsed: 32 min Initial depth to water: 2.71
Final depth to water:

Field Parameter Measurements ☑ **Required** ☐**Not required**

Actual Time	Elapsed minutes	Purge Vol (L)	DO (mg/L)	EC. (µS/cm)	pH	Redox (mV)	Temp (°C)	SWL (m BTOC)	Pump setting (rate)
2:54 PM	3 min	0.5	1.41	936	6.54	-48	19	2.71	0
2:57 PM	3 min	1	1.04	929	6.38	-27	18.5	2.72	0
3:00 PM	3 min	1.5	0.88	917	6.22	-10	18.3	2.72	0
3:03 PM	3 min	2	0.79	906	6.10	2	18.1	2.73	0
3:06 PM	3 min	2.5	0.77	902	6.07	6	18.1	2.72	0
3:09 PM	3 min	3.5	0.68	902	6.00	8	18	2.73	0
3:12 PM	3 min	4	0.63	897	5.99	10	18	2.71	0
3:15 PM	3 min	4.5	0.59	899	5.98	4	18	2.72	0
3:18 PM	3 min	5.5	0.57	898	5.97	3	18	2.73	0
Groundwater equilibrium reached at			± 10%	± 3%	± 0.05	± 10 mV	± 0.2 °C	(3 consecutive measurements)	

Observations at start of development (turbidity, colour, odour, sheen):

Observations at end of development (turbidity, colour, odour, sheen):
low turbidity ; light clear, brownish ; no odour ; no sheen ;

Volume of water actually purged during development: 5.5 L

Discharge water disposal: ☐Drums ☐Sanitary sewer ☐Storm sewer ☐Surface ☑Other:

Other observations / comments:

CPFO471o (ENV) Site Contamination Analysis Well Sampling Form

Project Name: FBURA Groundwater Assessment	Project Number: 60431087	Well No: GW11
Recorded / Developed By: Oliver T	Well Type: ☑Monitor ☐Extractor ☐Other:	
Date: 19/11/2015	Well Material: ☑PVC ☐SS ☐Other:	

Well Purging

Well Details	**Development Method**
Well Diameter (D in mm): ☑50 ☐100 ☐Other:	☐Bailer – Type: ☐PVC ☐SS ☐Teflon ☑Other:
Total Depth of Well (TD in m BTOC): 4.44	☑Pump – Type: ☐Submersible ☑Bladder ☐Other:
Water Level Depth (WL in m BTOC): 2.14	Pump Intake Setting (if pump used):
Number of bore volumes to be purged (# VOLS)	Depth pump set (m BTOC):
☑3 ☐4 ☐5 ☐10 ☐Other:	Screen Interval (m BTOC) Top : 0 Bottom: 0

Anticipated Approximate Purge Volume Calculation

(_____ - _____) x (_____/2)^2 x 0.00314 = _____ _____ x _____ = _____

TD WL D 1 BV (L) BV # VOLS Purge Volume (L)

Start: 7:29 AM Stop: 7:54 AM Elapsed: 25 min Initial depth to water: 2.14
Final depth to water: 2.13

Field Parameter Measurements ☑ **Required** ☐**Not required**

Actual Time	Elapsed minutes	Purge Vol (L)	DO (mg/L)	EC. (µS/cm)	pH	Redox (mV)	Temp (°C)	SWL (m BTOC)	Pump setting (rate)
7:30 AM	6 min	0.5	4.56	444	6.57	-45	19.7	2.13	3.9
7:36 AM	6 min	2	2.05	785	7.23	-197	17.6	2.13	3.9
7:42 AM	3 min	4	1.22	719	7.33	-201	17.5	2.13	3.9
7:45 AM	3 min	5	0.99	783	7.36	-202	17.5	2.13	3.9
7:48 AM	3 min	6	0.75	790	7.38	-201	17.4	2.13	3.9
7:51 AM	3 min	7	0.65	785	7.39	-202	17.4	2.13	3.9
7:54 AM	3 min	8	0.62	788	7.39	-202	17.4	2.13	3.9
Groundwater equilibrium reached at			± 10%	± 3%	± 0.05	± 10 mV	± 0.2 °C	(3 consecutive measurements)	

Observations at start of development (turbidity, colour, odour, sheen):
Low-moderate turbidity ; light yellow ; no odour ; no sheen

Observations at end of development (turbidity, colour, odour, sheen):
Low-moderate turbidity ; light yellow ; no odour ; no sheen

Volume of water actually purged during development: 8 L

Discharge water disposal: ☑Drums ☐Sanitary sewer ☐Storm sewer ☐Surface ☐Other:

Other observations / comments:

AECOM

CPFO471o (ENV) Site Contamination Analysis Well Sampling Form

Project Name: FBURA Groundwater Assessment	Project Number: 60431087	Well No: GW12
Recorded / Developed By: Oliver T	Well Type: ☑Monitor ☐Extractor ☐Other:	
Date: 19/11/2015	Well Material: ☑PVC ☐SS ☐Other:	

Well Purging

Well Details	Development Method
Well Diameter (D in mm): ☑50 ☐100 ☐Other:	☐Bailer – Type: ☐PVC ☐SS ☐Teflon ☑Other:
Total Depth of Well (TD in m BTOC): 4.14	☑Pump – Type: ☐Submersible ☑Bladder ☐Other:
Water Level Depth (WL in m BTOC): 2.64	Pump Intake Setting (if pump used):
Number of bore volumes to be purged (# VOLS)	Depth pump set (m BTOC):
☐3 ☐4 ☐5 ☐10 ☑Other: 0	Screen Interval (m BTOC) Top : 0 Bottom: 0

Anticipated Approximate Purge Volume Calculation

(_____ - _____) x (_____/2)^2 x 0.00314 = _____ _____ x _____ = _____

TD WL D 1 BV (L) BV # VOLS Purge Volume (L)

Start: 9:45 AM Stop: 10:04 AM Elapsed: 19 min Initial depth to water: 2.64
Final depth to water: 2.65

Field Parameter Measurements ☑ **Required** ☐**Not required**

Actual Time	Elapsed minutes	Purge Vol (L)	DO (mg/L)	EC. (µS/cm)	pH	Redox (mV)	Temp (°C)	SWL (m BTOC)	Pump setting (rate)
9:47 AM	5 min	0.5	1.63	1991	6.68	-58	21.7	2.65	3.6
9:52 AM	6 min	2	0.43	2011	6.73	-69	19.7	2.65	3.6
9:58 AM	3 min	4	0.26	2018	6.74	-93	19.1	2.65	3.6
10:01 AM	3 min	5	0.19	2014	6.75	-100	18.9	2.65	3.6
10:04 AM	3 min	6	0.18	2013	6.76	-102	18.9	2.65	3.6
Groundwater equilibrium reached at			± 10%	± 3%	± 0.05	± 10 mV	± 0.2 °C	(3 consecutive measurements)	

Observations at start of development (turbidity, colour, odour, sheen):
High turbidity ; dark brown ; no odour ; no sheen

Observations at end of development (turbidity, colour, odour, sheen):
Low-moderate turbidity ; light yellow ; no odour ; no sheen

Volume of water actually purged during development: 6 L

Discharge water disposal: ☑Drums ☐Sanitary sewer ☐Storm sewer ☐Surface ☐Other:

Other observations / comments:

CPFO471o (ENV) Site Contamination Analysis Well Sampling Form

Project Name: FBURA Groundwater Assessment	Project Number: 60431087	Well No: GW13
Recorded / Developed By: Oliver T	Well Type: ☑Monitor ☐Extractor ☐Other:	
Date: 18/11/2015	Well Material: ☑PVC ☐SS ☐Other:	

Well Purging

Well Details	Development Method
Well Diameter (D in mm): ☑50 ☐100 ☐Other:	☐Bailer – Type: ☐PVC ☐SS ☐Teflon ☑Other:
Total Depth of Well (TD in m BTOC): 3.58	☑Pump – Type: ☐Submersible ☑Bladder ☐Other:
Water Level Depth (WL in m BTOC): 2.29	Pump Intake Setting (if pump used):
Number of bore volumes to be purged (# VOLS)	Depth pump set (m BTOC):
☐3 ☐4 ☐5 ☐10 ☑Other: 0	Screen Interval (m BTOC) Top : 0 Bottom: 0

Anticipated Approximate Purge Volume Calculation

(_____ - _____) x (_____/2)^2 x 0.00314 = _____ _____ x _____ = _____

TD WL D 1 BV (L) BV # VOLS Purge Volume (L)

Start: 12:57 PM Stop: 1:23 PM Elapsed: 26 min Initial depth to water: 2.29
Final depth to water: 2.3

Field Parameter Measurements ☑ **Required** ☐**Not required**

Actual Time	Elapsed minutes	Purge Vol (L)	DO (mg/L)	EC. (µS/cm)	pH	Redox (mV)	Temp (°C)	SWL (m BTOC)	Pump setting (rate)
12:59 PM	6 min	0.5	2.4	980	6.84	-22	20.6	2.3	3
1:05 PM	5 min	2	1.2	779	6.36	27	18.9	2.3	3
1:10 PM	4 min	3.5	0.85	706	6.28	41	18.6	2.3	3
1:14 PM	3 min	4	0.7	701	6.24	45	18.4	2.3	3
1:17 PM	3 min	4.5	0.6	911	6.18	51	18.3	2.3	3
1:20 PM	3 min	5	0.5	897	6.19	52	18.3	2.3	3
1:23 PM	3 min	5.5	0.48	891	6.20	50	18.4	2.3	3
Groundwater equilibrium reached at			± 10%	± 3%	± 0.05	± 10 mV	± 0.2 °C	(3 consecutive measurements)	

Observations at start of development (turbidity, colour, odour, sheen):
High turbidity ; dark brown ; no odour ; no sheen

Observations at end of development (turbidity, colour, odour, sheen):
Low-moderate turbidity ; light yellow ; no odour ; no sheen

Volume of water actually purged during development: 5.5 L

Discharge water disposal: ☑Drums ☐Sanitary sewer ☐Storm sewer ☐Surface ☐Other:

Other observations / comments:

CPFO471o (ENV) Site Contamination Analysis Well Sampling Form

Project Name: FBURA Groundwater Assessment	Project Number: 60431087	Well No: GW13-Resampled
Recorded / Developed By: Zach O	Well Type: ☑Monitor ☐Extractor ☐Other:	
Date: 20/11/2015	Well Material: ☑PVC ☐SS ☐Other:	

Well Purging

Well Details	Development Method
Well Diameter (D in mm): ☑50 ☐100 ☐Other:	☐Bailer – Type: ☐PVC ☐SS ☐Teflon ☑Other:
Total Depth of Well (TD in m BTOC): 3.5	☑Pump – Type: ☐Submersible ☐Bladder ☑Other: Peristaltic
Water Level Depth (WL in m BTOC): 2.31	Pump Intake Setting (if pump used):
Number of bore volumes to be purged (# VOLS)	Depth pump set (m BTOC):
☑3 ☐4 ☐5 ☐10 ☐Other:	Screen Interval (m BTOC) Top : 0 Bottom: 0

Anticipated Approximate Purge Volume Calculation

(_____ - _____) x (_____/2)^2 x 0.00314 = _____ _____ x _____ = _____

TD WL D 1 BV (L) BV # VOLS Purge Volume (L)

Start: 8:20 AM Stop: 8:45 AM Elapsed: 25 min Initial depth to water: 2.31
Final depth to water:

Field Parameter Measurements ☑ **Required** ☐**Not required**

Actual Time	Elapsed minutes	Purge Vol (L)	DO (mg/L)	EC. (µS/cm)	pH	Redox (mV)	Temp (°C)	SWL (m BTOC)	Pump setting (rate)
8:23 AM	3 min	0.5	0.97	1565	7.25	-53	17.5	2.33	0
8:26 AM	3 min	1	0.7	1325	7.24	-51	17.3	2.33	0
8:29 AM	4 min	1.5	0.6	1060	7.21	-61	17.2	2.33	0
8:33 AM	3 min	2	0.44	1041	7.2	-71	17.2	2.33	0
8:36 AM	3 min	2.5	0.37	1019	7.16	-90	17.2	2.33	0
8:39 AM	3 min	3	0.3	1008	7.15	-94	17.1	2.33	0
8:42 AM	3 min	3.5	0.31	1003	7.13	-100	17.1	2.33	0
8:45 AM	3 min	4	0.32	1000	7.12	-101	17.1	2.33	0
Groundwater equilibrium reached at			± 10%	± 3%	± 0.05	± 10 mV	± 0.2 °C	(3 consecutive measurements)	

Observations at start of development (turbidity, colour, odour, sheen):
Moderate turbidity ; light yellowish brown ; no odour ; no sheen

Observations at end of development (turbidity, colour, odour, sheen):

Volume of water actually purged during development: 4 L

Discharge water disposal: ☑Drums ☐Sanitary sewer ☐Storm sewer ☐Surface ☐Other:

Other observations / comments:

CPFO471o (ENV) Site Contamination Analysis Well Sampling Form

Project Name: FBURA Groundwater Assessment	Project Number: 60431087	Well No: GW14
Recorded / Developed By: Oliver T	Well Type: ☑Monitor ☐Extractor ☐Other:	
Date: 17/11/2015	Well Material: ☑PVC ☐SS ☐Other:	

Well Purging

Well Details	Development Method
Well Diameter (D in mm): ☑50 ☐100 ☐Other:	☐Bailer – Type: ☐PVC ☐SS ☐Teflon ☑Other:
Total Depth of Well (TD in m BTOC): 3.28	☑Pump – Type: ☐Submersible ☑Bladder ☐Other:
Water Level Depth (WL in m BTOC): 1.94	Pump Intake Setting (if pump used):
Number of bore volumes to be purged (# VOLS)	Depth pump set (m BTOC):
☐3 ☐4 ☐5 ☐10 ☑Other: 0	Screen Interval (m BTOC) Top : 0 Bottom: 0

Anticipated Approximate Purge Volume Calculation

(_____ - _____) x (_____/2)^2 x 0.00314 = _____ _____ x _____ = _____

TD WL D 1 BV (L) BV # VOLS Purge Volume (L)

Start: 2:03 PM Stop: 2:29 PM Elapsed: 26 min Initial depth to water: 1.94
Final depth to water: 2

Field Parameter Measurements ☑ **Required** ☐**Not required**

Actual Time	Elapsed minutes	Purge Vol (L)	DO (mg/L)	EC. (µS/cm)	pH	Redox (mV)	Temp (°C)	SWL (m BTOC)	Pump setting (rate)
2:04 PM	6 min	0.5	6.58	555	7.08	3	25.2	1.96	2.8
2:10 PM	6 min	2	4.96	274	5.73	116	22.2	2	2.8
2:16 PM	3 min	4	4.39	269	5.6	141	22.6	2	2.8
2:19 PM	3 min	5	4.31	252	5.58	150	22.5	2	2.8
2:22 PM	3 min	5.5	4.07	245	5.54	154	22.5	2	2.8
2:25 PM	3 min	6	3.84	244	5.57	159	22.5	2	2.8
2:28 PM	3 min	7	4.16	241	5.58	167	22.1	2	2.8
Groundwater equilibrium reached at			± 10%	± 3%	± 0.05	± 10 mV	± 0.2 °C	(3 consecutive measurements)	

Observations at start of development (turbidity, colour, odour, sheen):
High turbidity ; dark redish, brown ; no odour ; no sheen

Observations at end of development (turbidity, colour, odour, sheen):
Moderate turbidity ; brown ; no odour ; no sheen

Volume of water actually purged during development: 7 L

Discharge water disposal: ☑Drums ☐Sanitary sewer ☐Storm sewer ☐Surface ☐Other:

Other observations / comments:

CPFO471o (ENV) Site Contamination Analysis Well Sampling Form

Project Name: FBURA Groundwater Assessment	Project Number: 60431087	Well No: GW15
Recorded / Developed By: Zach O	Well Type: ☑Monitor ☐Extractor ☐Other:	
Date: 17/11/2015	Well Material: ☑PVC ☐SS ☐Other:	

Well Purging

Well Details	**Development Method**
Well Diameter (D in mm): ☑50 ☐100 ☐Other:	☐Bailer – Type: ☐PVC ☐SS ☐Teflon ☑Other:
Total Depth of Well (TD in m BTOC): 4.5	☑Pump – Type: ☑Submersible ☐Bladder ☐Other:
Water Level Depth (WL in m BTOC): 0.95	Pump Intake Setting (if pump used):
Number of bore volumes to be purged (# VOLS)	Depth pump set (m BTOC):
☑3 ☐4 ☐5 ☐10 ☐Other:	Screen Interval (m BTOC) Top : 0 Bottom: 0

Anticipated Approximate Purge Volume Calculation

(_____ - _____) x (_____/2)^2 x 0.00314 = _____ _____ x _____ = _____

TD WL D 1 BV (L) BV # VOLS Purge Volume (L)

Start: 2:03 PM Stop: 3:02 PM Elapsed: 59 min Initial depth to water: 0.95
Final depth to water:

Field Parameter Measurements ☑ **Required** ☐**Not required**

Actual Time	Elapsed minutes	Purge Vol (L)	DO (mg/L)	EC. (mS/cm)	pH	Redox (mV)	Temp (°C)	SWL (m BTOC)	Pump setting (rate)
2:07 PM	3 min	0.6	1.51	33.7	6.63	-251	20.4	1.51	0
2:10 PM	4 min	1.2	1.08	34.6	6.62	-266	20.6	1.72	0
2:14 PM	6 min	1.8	0.78	34.4	6.62	-271	20.9	1.94	0
2:20 PM	8 min	2.2	0.46	36.1	6.62	-275	21.8	2.02	0
2:28 PM	5 min	3.5	0.25	35.9	6.63	-273	22.5	2.1	0
2:33 PM	5 min	4	0.21	36.7	6.63	-268	22.5	2.13	0
2:38 PM	5 min	4.4	0.14	36.7	6.64	-266	22.5	2.17	0
2:43 PM	4 min	4.8	0.04	35.3	6.65	-240	22.7	2.22	0
2:47 PM	3 min	5.2	0.03	36.9	6.65	-235	22.6	2.22	0
2:50 PM	3 min	5.2	0.02	23.9	6.65	-224	22.6	2.23	0
Groundwater equilibrium reached at			± 10%	± 3%	± 0.05	± 10 mV	± 0.2 °C	(3 consecutive measurements)	

Observations at start of development (turbidity, colour, odour, sheen):
Low-moderate turbidity ; light brownish, yellow ; no odour ; no sheen

Observations at end of development (turbidity, colour, odour, sheen):

Volume of water actually purged during development: 5.2 L

Discharge water disposal: ☑Drums ☐Sanitary sewer ☐Storm sewer ☐Surface ☐Other:

Other observations / comments:

Pump setting lowered to 13.5/1.5 after 4 min
Sampling bucket in sun
Pump setting reduced to 2CPM, 29/1 after 15 min
Slow recharge

CPFO471o (ENV) Site Contamination Analysis Well Sampling Form

Project Name: FBURA Groundwater Assessment	Project Number: 60431087	Well No: GW16
Recorded / Developed By: Oliver T	Well Type: ☑Monitor ☐Extractor ☐Other:	
Date: 17/11/2015	Well Material: ☑PVC ☐SS ☐Other:	

Well Purging

Well Details	**Development Method**
Well Diameter (D in mm): ☑50 ☐100 ☐Other:	☐Bailer – Type: ☐PVC ☐SS ☐Teflon ☑Other:
Total Depth of Well (TD in m BTOC): 3.19	☑Pump – Type: ☐Submersible ☑Bladder ☐Other:
Water Level Depth (WL in m BTOC): 2.2	Pump Intake Setting (if pump used):
Number of bore volumes to be purged (# VOLS)	Depth pump set (m BTOC):
☐3 ☐4 ☐5 ☐10 ☑Other: 0	Screen Interval (m BTOC) Top : 0 Bottom: 0

Anticipated Approximate Purge Volume Calculation

(_____ - _____) x (_____/2)^2 x 0.00314 = _____ _____ x _____ = _____

TD WL D 1 BV (L) BV # VOLS Purge Volume (L)

Start: 3:07 PM Stop: 3:28 PM Elapsed: 21 min Initial depth to water: 2.2
Final depth to water: 2.24

Field Parameter Measurements ☑ **Required** ☐**Not required**

Actual Time	Elapsed minutes	Purge Vol (L)	DO (mg/L)	EC. (µS/cm)	pH	Redox (mV)	Temp (°C)	SWL (m BTOC)	Pump setting (rate)
3:09 PM	6 min	0.5	2.66	1089	6.71	-53	24.7	2.23	2.8
3:15 PM	6 min	2	1.36	1223	6.68	-57	21.8	2.24	2.8
3:21 PM	3 min	3	0.72	1236	6.7	-67	21.6	2.24	2.8
3:24 PM	2 min	4	0.67	1219	6.71	-71	21.6	2.24	2.8
3:26 PM	2 min	4.5	0.6	1222	6.71	-74	21.6	2.24	2.8
Groundwater equilibrium reached at			± 10%	± 3%	± 0.05	± 10 mV	± 0.2 °C	(3 consecutive measurements)	

Observations at start of development (turbidity, colour, odour, sheen):
High-moderate turbidity ; brown ; no odour ; no sheen

Observations at end of development (turbidity, colour, odour, sheen):
Low-moderate turbidity ; light yellow ; no odour ; no sheen ;

Volume of water actually purged during development: 4.5 L

Discharge water disposal: ☑Drums ☐Sanitary sewer ☐Storm sewer ☐Surface ☐Other:

Other observations / comments:

CPFO471o (ENV) Site Contamination Analysis Well Sampling Form

Project Name: FBURA Groundwater Assessment	Project Number: 60431087	Well No: GW17
Recorded / Developed By: Oliver T	Well Type: ☑Monitor ☐Extractor ☐Other:	
Date: 18/11/2015	Well Material: ☑PVC ☐SS ☐Other:	

Well Purging

Well Details	Development Method
Well Diameter (D in mm): ☑50 ☐100 ☐Other:	☐Bailer – Type: ☐PVC ☐SS ☐Teflon ☑Other:
Total Depth of Well (TD in m BTOC): 2.94	☑Pump – Type: ☐Submersible ☑Bladder ☐Other:
Water Level Depth (WL in m BTOC): 2.38	Pump Intake Setting (if pump used):
Number of bore volumes to be purged (# VOLS)	Depth pump set (m BTOC):
☐3 ☐4 ☐5 ☐10 ☑Other: 0	Screen Interval (m BTOC) Top : 0 Bottom: 0

Anticipated Approximate Purge Volume Calculation

(_____ - _____) x (_____/2)^2 x 0.00314 = _____ _____ x _____ = _____

TD WL D 1 BV (L) BV # VOLS Purge Volume (L)

Start: 7:36 AM Stop: 8:01 AM Elapsed: 25 min Initial depth to water: 2.38
Final depth to water: 2.38

Field Parameter Measurements ☑ **Required** ☐**Not required**

Actual Time	Elapsed minutes	Purge Vol (L)	DO (mg/L)	EC. (µS/cm)	pH	Redox (mV)	Temp (°C)	SWL (m BTOC)	Pump setting (rate)
7:41 AM	6 min	0.5	7.7	1277	6.52	23	18.8	2.38	3.45
7:47 AM	5 min	1	6.86	1359	6.5	-46	18.8	2.38	3.45
7:52 AM	3 min	1.5	6.38	1385	6.5	-111	18.9	2.38	3.45
7:55 AM	3 min	2	6.17	1402	6.5	-123	19	2.38	3.45
7:58 AM	3 min	2.5	6.08	1419	6.5	-132	19.1	2.38	3.45
8:01 AM	3 min	3	6.02	1421	6.51	-136	19.1	2.38	3.45
Groundwater equilibrium reached at			± 10%	± 3%	± 0.05	± 10 mV	± 0.2 °C	(3 consecutive measurements)	

Observations at start of development (turbidity, colour, odour, sheen):
High-moderate turbidity ; dark yellowish, brown ; no odour ; no sheen

Observations at end of development (turbidity, colour, odour, sheen):
Low-moderate turbidity ; light brown ; petroleum odour ; no sheen

Volume of water actually purged during development: 3 L

Discharge water disposal: ☑Drums ☐Sanitary sewer ☐Storm sewer ☐Surface ☐Other:

Other observations / comments:

CPFO471o (ENV) Site Contamination Analysis Well Sampling Form

Project Name: FBURA	Project Number: 60431087	Well No: GW17- resampled
Recorded / Developed By: Matt Sheppard	Well Type: ☒ Monitor ☐ Extractor ☐ Other	
Date: 23/11/15	Well Material: ☒PVC ☐ SS ☐ Other	

Well Purging

Well Details	**Development Method**
Well Diameter (D in mm): ☒50 ☐100 ☐Other:	☐ Bailer – Type: ☐ PVC ☐ SS ☐ Teflon ☐ Other:
Total Depth of Well (TD in m BTOC):	☒ Pump – Type: ☐ Submersible ☒ Bladder ☐ Other:
Water Level Depth (WL in m BTOC): 2.390	Pump Intake Setting (if pump used)
Number of bore volumes to be purged (# VOLS)	Depth pump set (m BTOC):
☐ 3 ☐ 4 ☐ 5 ☐ 10 ☐ Other	Screen Interval (m BTOC) Top : Bottom:

Anticipated Approximate Purge Volume Calculation

(_____ - _____) x (_____/2)^2 x 0.00314 = _____ _____ x _____ = _____

TD WL D 1 BV (L) BV # VOLS Purge Volume (L)

Start Time: **Stop Time:** **Elapsed Time:** **Initial depth to water:** **Final depth to water:**

Field Parameter Measurements ☐ **Required** ☐ **Not required**

Actual Time	Elapsed minutes	Purge Vol (L)	DO (mg/L)	EC. (µS/cm)	pH	Redox (mV)	Temp (°C)	SWL (m BTOC)	Pump setting (rate)
9:15	**0**		**0.86**	**1380**	**6.53**	**-10**	**18.7**	**2.430**	
9:20	**5**		**0.27**	**1403**	**6.62**	**-146**	**19.1**	**2.415**	
9:25	**10**		**0.23**	**1404**	**6.64**	**-163**	**19.2**	**2.415**	
9:30	**15**		**0.21**	**1404**	**6.64**	**-167**	**19.1**	**2.415**	
9:35	**20**		**0.18**	**1399**	**6.64**	**-168**	**19.2**	**2.415**	
9:40	**25**		**0.17**	**1396**	**6.64**	**-168**	**19.1**	**2.415**	
9:45	**30**	**10**	**0.19**	**1390**	**6.64**	**-168**	**19.1**	**2.415**	
Groundwater equilibrium reached at			± 10%	± 3%	± 0.05	± 10 mV	± 0.2 °C	(3 consecutive measurements)	

Observations at start of development (turbidity, colour, odour, sheen): Transparent black, slight natural odour, no sheen.

Observations at end of development (turbidity, colour, odour, sheen): Clear, no odour, no sheen

Volume of water actually purged during development:_____ L

Discharge water disposal: ☒ Drums ☐ Sanitary sewer ☐ Storm sewer ☐ Surface ☐ Other:_____

Other observations / comments:

Sample: QCK Trip Blank

Level logger removed @ ~9:10 (R26675) – GW17

CPFO471o (ENV) Site Contamination Analysis Well Sampling Form

Project Name: FBURA Groundwater Assessment	Project Number: 60431087	Well No: GW18
Recorded / Developed By: Oliver T	Well Type: ☑Monitor ☐Extractor ☐Other:	
Date: 19/11/2015	Well Material: ☑PVC ☐SS ☐Other:	

Well Purging

Well Details	**Development Method**
Well Diameter (D in mm): ☐50 ☐100 ☑Other: 0	☐Bailer – Type: ☐PVC ☐SS ☐Teflon ☑Other:
Total Depth of Well (TD in m BTOC): 4.22	☑Pump – Type: ☐Submersible ☑Bladder ☐Other:
Water Level Depth (WL in m BTOC): 2.94	Pump Intake Setting (if pump used):
Number of bore volumes to be purged (# VOLS)	Depth pump set (m BTOC):
☐3 ☐4 ☐5 ☐10 ☑Other: 0	Screen Interval (m BTOC) Top : 0 Bottom: 0

Anticipated Approximate Purge Volume Calculation

(_____ - _____) x (_____/2)^2 x 0.00314 = _____ _____ x _____ = _____

TD WL D 1 BV (L) BV # VOLS Purge Volume (L)

Start: 8:24 AM Stop: 8:53 AM Elapsed: 29 min Initial depth to water: 2.94
Final depth to water: 2.64

Field Parameter Measurements ☑ **Required** ☐**Not required**

Actual Time	Elapsed minutes	Purge Vol (L)	DO (mg/L)	EC. (µS/cm)	pH	Redox (mV)	Temp (°C)	SWL (m BTOC)	Pump setting (rate)
8:26 AM	6 min	0.5	1.51	1360	6.87	-12	19.7	2.64	3.8
8:32 AM	6 min	2	0.29	1393	6.68	-16	18.4	2.64	3.8
8:38 AM	3 min	4	0.25	1391	6.65	-49	18.4	2.64	3.8
8:41 AM	3 min	5	0.22	1392	6.66	-75	18.4	2.64	3.8
8:44 AM	3 min	5.5	0.17	1393	6.66	-92	18.3	2.64	3.8
8:47 AM	3 min	6	0.12	1391	6.68	-110	18.4	2.64	3.8
8:50 AM	3 min	7	0.16	1392	6.69	-116	18.4	2.64	3.8
8:53 AM	3 min	8	0.13	1393	6.7	-123	18.4	2.64	3.8
Groundwater equilibrium reached at			± 10%	± 3%	± 0.05	± 10 mV	± 0.2 °C	(3 consecutive measurements)	

Observations at start of development (turbidity, colour, odour, sheen):
High-moderate turbidity ; dark brown ; no odour ; no sheen

Observations at end of development (turbidity, colour, odour, sheen):
Low-moderate turbidity ; light yellow ; no odour ; no sheen

Volume of water actually purged during development: 8 L

Discharge water disposal: ☑Drums ☐Sanitary sewer ☐Storm sewer ☐Surface ☐Other:

Other observations / comments:

CPFO471o (ENV) Site Contamination Analysis Well Sampling Form

Project Name: FBURA Groundwater Assessment	Project Number: 60431087	Well No: GW18-Resampled
Recorded / Developed By: Oliver T	Well Type: ☑Monitor ☐Extractor ☐Other:	
Date: 17/11/2015	Well Material: ☑PVC ☐SS ☐Other:	

Well Purging

Well Details	Development Method
Well Diameter (D in mm): ☑50 ☐100 ☐Other:	☐Bailer – Type: ☐PVC ☐SS ☐Teflon ☑Other:
Total Depth of Well (TD in m BTOC): 4.46	☑Pump – Type: ☐Submersible ☑Bladder ☐Other:
Water Level Depth (WL in m BTOC): 1.52	Pump Intake Setting (if pump used):
Number of bore volumes to be purged (# VOLS)	Depth pump set (m BTOC):
☐3 ☐4 ☐5 ☐10 ☑Other: 0	Screen Interval (m BTOC) Top : 0 Bottom: 0

Anticipated Approximate Purge Volume Calculation

(_____ - _____) x (_____/2)^2 x 0.00314 = _____ _____ x _____ = _____

TD WL D 1 BV (L) BV # VOLS Purge Volume (L)

Start: 10:58 AM Stop: 11:18 AM Elapsed: 20 min Initial depth to water: 1.52
Final depth to water: 1.77

Field Parameter Measurements ☑ **Required** ☐**Not required**

Actual Time	Elapsed minutes	Purge Vol (L)	DO (mg/L)	EC. (mS/cm)	pH	Redox (mV)	Temp (°C)	SWL (m BTOC)	Pump setting (rate)
11:00 AM	6 min	0.5	5.2	35.3	6.98	-288	22.7	1.66	3.9
11:06 AM	6 min	2	0.29	36.6	6.92	-32	19.9	1.76	3.9
11:12 AM	3 min	4	0.03	35.3	6.84	-337	20.3	1.77	3.9
11:15 AM	3 min	5	0	35.4	6.84	-340	20.4	1.77	3.9
11:18 AM	3 min	6	0	35.6	6.84	-342	20.5	1.77	3.9
Groundwater equilibrium reached at			± 10%	± 3%	± 0.05	± 10 mV	± 0.2 °C	(3 consecutive measurements)	

Observations at start of development (turbidity, colour, odour, sheen):
High turbidity ; dark grey ; sulphurous odour ; no sheen

Observations at end of development (turbidity, colour, odour, sheen):
Moderate turbidity ; light yellow ; sulphurous odour ; no sheen

Volume of water actually purged during development: 6 L

Discharge water disposal: ☑Drums ☐Sanitary sewer ☐Storm sewer ☐Surface ☐Other:

Other observations / comments:

CPFO471o (ENV) Site Contamination Analysis Well Sampling Form

Project Name: FBURA Groundwater Assessment	Project Number: 60431087	Well No: GW19
Recorded / Developed By: Oliver T	Well Type: ☑Monitor ☐Extractor ☐Other:	
Date: 17/11/2015	Well Material: ☑PVC ☐SS ☐Other:	

Well Purging

Well Details	**Development Method**
Well Diameter (D in mm): ☑50 ☐100 ☐Other:	☐Bailer – Type: ☐PVC ☐SS ☐Teflon ☑Other:
Total Depth of Well (TD in m BTOC): 5.19	☑Pump – Type: ☐Submersible ☑Bladder ☐Other:
Water Level Depth (WL in m BTOC): 0.99	Pump Intake Setting (if pump used):
Number of bore volumes to be purged (# VOLS)	Depth pump set (m BTOC):
☐3 ☐4 ☐5 ☐10 ☑Other: 0	Screen Interval (m BTOC) Top : 0 Bottom: 0

Anticipated Approximate Purge Volume Calculation

(_____ - _____) x (_____/2)^2 x 0.00314 = _____ _____ x _____ = _____

TD WL D 1 BV (L) BV # VOLS Purge Volume (L)

Start: 9:48 AM Stop: 10:17 AM Elapsed: 29 min Initial depth to water: 0.99
Final depth to water: 2.95

Field Parameter Measurements ☑ **Required** ☐**Not required**

Actual Time	Elapsed minutes	Purge Vol (L)	DO (mg/L)	EC. (mS/cm)	pH	Redox (mV)	Temp (°C)	SWL (m BTOC)	Pump setting (rate)
9:49 AM	6 min	0.5	5.08	30.6	6.62	-110	18.8	1.15	4.7
9:55 AM	6 min	1.5	4.2	33	6.59	-112	17.9	1.88	4.7
10:01 AM	3 min	2.5	3.77	31.9	6.59	-95	18	2.43	4.7
10:04 AM	3 min	2.75	2.85	31.4	6.59	-85	18.1	2.7	4.7
10:07 AM	3 min	3	0.34	31.2	6.59	-79	18.2	2.8	4.7
10:10 AM	3 min	3.25	0.11	31	6.59	-75	18.4	2.95	4.7
10:13 AM	3 min	3.5	0.17	30.8	6.59	-69	18.7	2.95	4.7
10:16 AM	3 min	3.5	0.12	30.8	6.59	-67	18.8	2.95	4.7
Groundwater equilibrium reached at			± 10%	± 3%	± 0.05	± 10 mV	± 0.2 °C	(3 consecutive measurements)	

Observations at start of development (turbidity, colour, odour, sheen):

Moderate turbidity ; dark yellow, brown ; no odour ; no sheen

Observations at end of development (turbidity, colour, odour, sheen):

Volume of water actually purged during development: 3.5 L

Discharge water disposal: ☑Drums ☐Sanitary sewer ☐Storm sewer ☐Surface ☐Other:

Other observations / comments:

Very slow recharge

AECOM

CPFO471o (ENV) Site Contamination Analysis Well Sampling Form

Project Name: FBURA Groundwater Assessment	Project Number: 60431087	Well No: GW19-Resampled
Recorded / Developed By: Zach O	Well Type: ☑Monitor ☐Extractor ☐Other:	
Date: 20/11/2015	Well Material: ☑PVC ☐SS ☐Other:	

Well Purging

Well Details	Development Method
Well Diameter (D in mm): ☑50 ☐100 ☐Other:	☐Bailer – Type: ☐PVC ☐SS ☐Teflon ☑Other:
Total Depth of Well (TD in m BTOC): 5.2	☑Pump – Type: ☐Submersible ☐Bladder ☑Other:
Water Level Depth (WL in m BTOC): 1.02	Pump Intake Setting (if pump used):
Number of bore volumes to be purged (# VOLS)	Depth pump set (m BTOC):
☐3 ☐4 ☐5 ☐10 ☑Other: 0	Screen Interval (m BTOC) Top : 0 Bottom: 0

Anticipated Approximate Purge Volume Calculation

(_____ - _____) x (_____/2)^2 x 0.00314 = _____ _____ x _____ = _____

TD WL D 1 BV (L) BV # VOLS Purge Volume (L)

Start: 7:40 AM **Stop: 8:08 AM** **Elapsed: 28 min** **Initial depth to water: 1.02**
Final depth to water:

Field Parameter Measurements ☑ **Required** ☐**Not required**

Actual Time	Elapsed minutes	Purge Vol (L)	DO (mg/L)	EC. (mS/cm)	pH	Redox (mV)	Temp (°C)	SWL (m BTOC)	Pump setting (rate)
7:43 AM	3 min	0.5	1.29	23.8	6.43	-171	17.3	1.43	0
7:46 AM	3 min	1	0.64	29.1	6.44	-159	17.3	1.54	0
7:49 AM	3 min	1.5	0.38	28.2	6.43	-138	17.2	1.53	0
7:52 AM	3 min	2	0.32	28.0	6.42	-121	17.1	1.56	0
7:55 AM	3 min	2.5	0.33	27.9	6.42	-118	17.1	1.58	0
7:58 AM	3 min	3	0.31	27.8	6.41	-120	17.1	1.57	0
Groundwater equilibrium reached at			± 10%	± 3%	± 0.05	± 10 mV	± 0.2 °C	(3 consecutive measurements)	

Observations at start of development (turbidity, colour, odour, sheen):
Moderate turbidity ; light brown ; no odour ; no sheen

Observations at end of development (turbidity, colour, odour, sheen):

Volume of water actually purged during development: 3 L

Discharge water disposal: ☑Drums ☐Sanitary sewer ☐Storm sewer ☐Surface ☐Other:

Other observations / comments:

DO units in ppm
EC units in mS

CPFO471o (ENV) Site Contamination Analysis Well Sampling Form

Project Name: FBURA Groundwater Assessment	Project Number: 60431087	Well No: GW20
Recorded / Developed By: Oliver T	Well Type: ☑Monitor ☐Extractor ☐Other:	
Date: 18/11/2015	Well Material: ☑PVC ☐SS ☐Other:	

Well Purging

Well Details	**Development Method**
Well Diameter (D in mm): ☑50 ☐100 ☐Other:	☐Bailer – Type: ☐PVC ☐SS ☐Teflon ☑Other:
Total Depth of Well (TD in m BTOC): 4.3	☑Pump – Type: ☐Submersible ☑Bladder ☐Other:
Water Level Depth (WL in m BTOC): 2.85	Pump Intake Setting (if pump used):
Number of bore volumes to be purged (# VOLS)	Depth pump set (m BTOC):
☐3 ☐4 ☐5 ☐10 ☑Other: 0	Screen Interval (m BTOC) Top : 0 Bottom: 0

Anticipated Approximate Purge Volume Calculation

(_____ - _____) x (_____/2)^2 x 0.00314 = _____ _____ x _____ = _____

TD WL D 1 BV (L) BV # VOLS Purge Volume (L)

Start: 1:59 PM Stop: 2:16 PM Elapsed: 17 min Initial depth to water: 2.85
Final depth to water: 2.86

Field Parameter Measurements ☑ **Required** ☐**Not required**

Actual Time	Elapsed minutes	Purge Vol (L)	DO (mg/L)	EC. (mS/cm)	pH	Redox (mV)	Temp (°C)	SWL (m BTOC)	Pump setting (rate)
2:01 PM	6 min	0.5	2.23	2.39	7.23	-102	20.8	2.86	3.8
2:07 PM	6 min	2	0.24	2.43	7.24	-108	19.8	2.86	3.8
2:13 PM	3 min	3.5	0.16	2.45	7.23	-109	19.8	2.86	3.8
2:16 PM	3 min	4	0.15	2.45	7.24	-109	19.8	2.86	3.8
Groundwater equilibrium reached at			± 10%	± 3%	± 0.05	± 10 mV	± 0.2 °C	(3 consecutive measurements)	

Observations at start of development (turbidity, colour, odour, sheen):
High turbidity ; brown ; no odour ; no sheen ;

Observations at end of development (turbidity, colour, odour, sheen):

Volume of water actually purged during development: 4 L

Discharge water disposal: ☑Drums ☐Sanitary sewer ☐Storm sewer ☐Surface ☐Other:

Other observations / comments:

CPFO471o (ENV) Site Contamination Analysis Well Sampling Form

Project Name: FBURA Groundwater Assessment	Project Number: 60431087	Well No: GW20-Resampled
Recorded / Developed By: Zach O	Well Type: ☑Monitor ☐Extractor ☐Other:	
Date: 19/11/2015	Well Material: ☑PVC ☐SS ☐Other:	

Well Purging

Well Details	**Development Method**
Well Diameter (D in mm): ☑50 ☐100 ☐Other:	☐Bailer – Type: ☐PVC ☐SS ☐Teflon ☑Other:
Total Depth of Well (TD in m BTOC): 4.2	☑Pump – Type: ☐Submersible ☐Bladder ☑Other: Peristaltic
Water Level Depth (WL in m BTOC): 2.87	Pump Intake Setting (if pump used):
Number of bore volumes to be purged (# VOLS)	Depth pump set (m BTOC):
☐3 ☐4 ☐5 ☐10 ☑Other: 0	Screen Interval (m BTOC) Top : 0 Bottom: 0

Anticipated Approximate Purge Volume Calculation

(_____ - _____) x (_____/2)^2 x 0.00314 = _____ _____ x _____ = _____

TD WL D 1 BV (L) BV # VOLS Purge Volume (L)

Start: 4:47 PM **Stop: 5:08 PM** **Elapsed: 21 min** **Initial depth to water: 2.87**
Final depth to water: 2.89

Field Parameter Measurements ☑ **Required** ☐**Not required**

Actual Time	Elapsed minutes	Purge Vol (L)	DO (mg/L)	EC. (mS/cm)	pH	Redox (mV)	Temp (°C)	SWL (m BTOC)	Pump setting (rate)
4:50 PM	3 min	0.5	1.4	2.42	7.17	-109	21	2.88	3.8
4:53 PM	3 min	1	0.6	2.45	7.15	-114	19.9	2.89	3.8
4:56 PM	3 min	1.5	0.21	2.44	7.07	-119	19.7	2.89	3.8
4:59 PM	3 min	2	0.2	2.44	7.04	-119	19.7	2.89	3.8
5:02 PM	4 min	2.5	0.18	2.43	7.02	-120	19.7	2.89	3.8
5:06 PM	4 min	3	0.18	2.43	7.02	-121	19.6	2.89	3.8
Groundwater equilibrium reached at			± 10%	± 3%	± 0.05	± 10 mV	± 0.2 °C	(3 consecutive measurements)	

Observations at start of development (turbidity, colour, odour, sheen):

Observations at end of development (turbidity, colour, odour, sheen):

Volume of water actually purged during development: 3 L

Discharge water disposal: ☑Drums ☐Sanitary sewer ☐Storm sewer ☐Surface ☐Other:

Other observations / comments:

AECOM

CPFO471o (ENV) Site Contamination Analysis Well Sampling Form

Project Name: FBURA Groundwater Assessment	Project Number: 60431087	Well No: GW21
Recorded / Developed By: Oliver T	Well Type: ☑Monitor ☐Extractor ☐Other:	
Date: 18/11/2015	Well Material: ☑PVC ☐SS ☐Other:	

Well Purging

Well Details	Development Method
Well Diameter (D in mm): ☑50 ☐100 ☐Other:	☐Bailer – Type: ☐PVC ☐SS ☐Teflon ☑Other:
Total Depth of Well (TD in m BTOC): 3.92	☑Pump – Type: ☐Submersible ☑Bladder ☐Other:
Water Level Depth (WL in m BTOC): 2.46	Pump Intake Setting (if pump used):
Number of bore volumes to be purged (# VOLS)	Depth pump set (m BTOC):
☐3 ☐4 ☐5 ☐10 ☑Other: 0	Screen Interval (m BTOC) Top : 0 Bottom: 0

Anticipated Approximate Purge Volume Calculation

(_____ - _____) x (_____/2)^2 x 0.00314 = _____ _____ x _____ = _____

TD WL D 1 BV (L) BV # VOLS Purge Volume (L)

Start: 8:41 AM Stop: 9:10 AM Elapsed: 29 min Initial depth to water: 2.46
Final depth to water: 2.47

Field Parameter Measurements ☑ **Required** ☐**Not required**

Actual Time	Elapsed minutes	Purge Vol (L)	DO (mg/L)	EC. (µS/cm)	pH	Redox (mV)	Temp (°C)	SWL (m BTOC)	Pump setting (rate)
8:42 AM	5 min	0.5	4.14	1026	6.52	-39	17.4	2.47	3.4
8:47 AM	5 min	2	2.71	1023	6.52	-102	17.3	2.47	3.4
8:52 AM	5 min	4	2.03	1015	6.52	-128	17.3	2.47	3.4
8:57 AM	5 min	6	1.69	1029	6.52	-128	17.3	2.47	3.4
9:02 AM	5 min	8	1.39	1048	6.53	-129	17.2	2.47	3.4
9:07 AM	3 min	10	0.29	1029	6.53	-130	17.3	2.47	3.4
9:10 AM	3 min	11	0.23	1034	6.53	-129	17.3	2.47	3.4
Groundwater equilibrium reached at			± 10%	± 3%	± 0.05	± 10 mV	± 0.2 °C	(3 consecutive measurements)	

Observations at start of development (turbidity, colour, odour, sheen):
High-moderate turbidity ; dark brown ; no odour ; no sheen

Observations at end of development (turbidity, colour, odour, sheen):
Low-moderate turbidity ; light brown ; no odour ; no sheen ;

Volume of water actually purged during development: 11 L

Discharge water disposal: ☑Drums ☐Sanitary sewer ☐Storm sewer ☐Surface ☐Other:

Other observations / comments:

QC01- duplicate
QC02- triplicate

CPFO471o (ENV) Site Contamination Analysis Well Sampling Form

Project Name: FBURA Groundwater Assessment	Project Number: 60431087	Well No: GW22
Recorded / Developed By: Zach O	Well Type: ☑Monitor ☐Extractor ☐Other:	
Date: 18/11/2015	Well Material: ☑PVC ☐SS ☐Other:	

Well Purging

Well Details	Development Method
Well Diameter (D in mm): ☑50 ☐100 ☐Other:	☐Bailer – Type: ☐PVC ☐SS ☐Teflon ☑Other:
Total Depth of Well (TD in m BTOC): 3.7	☑Pump – Type: ☑Submersible ☐Bladder ☐Other:
Water Level Depth (WL in m BTOC): 2.38	Pump Intake Setting (if pump used):
Number of bore volumes to be purged (# VOLS)	Depth pump set (m BTOC):
☐3 ☐4 ☐5 ☐10 ☑Other: 0	Screen Interval (m BTOC) Top : 0 Bottom: 0

Anticipated Approximate Purge Volume Calculation

(_____ - _____) x (_____/2)^2 x 0.00314 = _____ _____ x _____ = _____

TD WL D 1 BV (L) BV # VOLS Purge Volume (L)

Start: 9:11 AM **Stop: 9:54 AM** **Elapsed: 43 min** **Initial depth to water: 2.38**
Final depth to water:

Field Parameter Measurements ☑ **Required** ☐**Not required**

Actual Time	Elapsed minutes	Purge Vol (L)	DO (mg/L)	EC. (µS/cm)	pH	Redox (mV)	Temp (°C)	SWL (m BTOC)	Pump setting (rate)
9:15 AM	4 min	0.6	2.56	553	5.37	105	18	2.38	0
9:19 AM	4 min	1.2	1.93	563	5.44	110	18.2	2.38	0
9:23 AM	4 min	1.8	1.65	566	5.48	113	18.1	2.38	0
9:27 AM	5 min	2.4	1.36	604	5.54	110	18.1	2.38	0
9:32 AM	5 min	3	1.15	671	5.65	103	18.4	2.38	0
9:37 AM	4 min	3.6	0.92	731	5.71	93	18.5	2.38	0
9:41 AM	4 min	4.2	0.73	792	5.74	79	18.4	2.38	0
9:45 AM	3 min	4.8	0.13	854	5.77	49	18.4	2.39	0
9:48 AM	3 min	5.5	0.07	882	5.78	26	18.4	2.38	0
9:51 AM	3 min	6	0.06	899	5.79	14	18.3	2.38	0
9:54 AM	3 min	6.5	0.06	897	5.8	16	18.3	2.38	0
Groundwater equilibrium reached at			± 10%	± 3%	± 0.05	± 10 mV	± 0.2 °C	(3 consecutive measurements)	

Observations at start of development (turbidity, colour, odour, sheen):
High turbidity ; dark brownish, grey ; no odour ; no sheen

Observations at end of development (turbidity, colour, odour, sheen):

Volume of water actually purged during development: 6.5 L

Discharge water disposal: ☑Drums ☐Sanitary sewer ☐Storm sewer ☐Surface ☐Other:

Other observations / comments:

Pump setting CPM4 13/2

CPFO471o (ENV) Site Contamination Analysis Well Sampling Form

Project Name: FBURA Groundwater Assessment	Project Number: 60431087	Well No: GW22- resampled
Recorded / Developed By: Matt Sheppard	Well Type: ☑Monitor ☐Extractor ☐Other:	
Date: 23/11/2015	Well Material: ☑PVC ☐SS ☐Other:	

Well Purging

Well Details	Development Method
Well Diameter (D in mm): ☑50 ☐100 ☐Other:	☑Bailer – Type: ☐PVC ☐SS ☐Teflon ☑Other: Steel to stir up water
Total Depth of Well (TD in m BTOC):	☑Pump – Type: ☐Submersible ☐Bladder ☑Other: Peristetic
Water Level Depth (WL in m BTOC): 2.385	Pump Intake Setting (if pump used): 0
Number of bore volumes to be purged (# VOLS) ☑3 ☐4 ☐5 ☐10 ☐Other:	Depth pump set (m BTOC): 0
	Screen Interval (m BTOC) Top : 0 Bottom: 0

Anticipated Approximate Purge Volume Calculation

(_____ - _____) x (_____/2)^2 x 0.00314 = _____ _____ x _____ = _____

TD WL D 1 BV (L) BV # VOLS Purge Volume (L)

Start: **Stop:** **Elapsed:** **Initial depth to water:**
Final depth to water:

Field Parameter Measurements ☑ **Required** ☐**Not required**

Actual Time	Elapsed minutes	Purge Vol (L)	DO (mg/L)	EC. (µS/cm)	pH	Redox (mV)	Temp (°C)	SWL (m BTOC)	Pump setting (rate)
8:10	0		1.29	748	5.42	76	17.7	2.395	0
8:15	5		0.29	746	5.50	70	17.8	2.395	0
8:20	10		0.16	845	5.58	62	17.9	2.395	0
8:25	15		0.13	885	5.64	49	17.9	2.395	0
8:30	20		0.11	919	5.68	34	17.8	2.395	0
8:35	25		0.11	945	5.70	13	17.8	2.395	0
8:40	30		0.11	958	5.72	13	17.8	2.395	0
8:45	35		0.10	964	5.73	10	17.9	2.395	0
8:50	40		0.10	968	5.75	20	18.0	2.395	0
8:55	45	~8	0.10	940	5.76	22	18.0	2.395	0
Groundwater equilibrium reached at			± 10%	± 3%	± 0.05	± 10 mV	± 0.2 °C	(3 consecutive measurements)	

Observations at start of development (turbidity, colour, odour, sheen):
Dark grey, no odour, no sheen, moderate turbidity.

Observations at end of development (turbidity, colour, odour, sheen):
Clear, no odour, no sheen.

Volume of water actually purged during development:

Discharge water disposal: ☑Drums ☐Sanitary sewer ☐Storm sewer ☐Surface ☐Other:

Other observations / comments:

Level logger removed @ 8:06 (R25258) – GW22

CPFO471o (ENV) Site Contamination Analysis Well Sampling Form

Project Name: FBURA Groundwater Assessment	Project Number: 60431087	Well No: GW23
Recorded / Developed By: Zach O	Well Type: ☑Monitor ☐Extractor ☐Other:	
Date: 17/11/2015	Well Material: ☑PVC ☐SS ☐Other:	

Well Purging

Well Details	**Development Method**
Well Diameter (D in mm): ☑50 ☐100 ☐Other:	☐Bailer – Type: ☐PVC ☐SS ☐Teflon ☑Other:
Total Depth of Well (TD in m BTOC): 0	☑Pump – Type: ☑Submersible ☐Bladder ☐Other:
Water Level Depth (WL in m BTOC): 2.27	Pump Intake Setting (if pump used):
Number of bore volumes to be purged (# VOLS)	Depth pump set (m BTOC):
☐3 ☐4 ☐5 ☐10 ☑Other: 0	Screen Interval (m BTOC) Top : 0 Bottom: 0

Anticipated Approximate Purge Volume Calculation

(_____ - _____) x (_____/2)^2 x 0.00314 = _____ _____ x _____ = _____

TD WL D 1 BV (L) BV # VOLS Purge Volume (L)

Start: 3:42 PM **Stop: 4:07 PM** **Elapsed: 25 min** **Initial depth to water: 2.27**
Final depth to water:

Field Parameter Measurements ☑ **Required** ☐**Not required**

Actual Time	Elapsed minutes	Purge Vol (L)	DO (mg/L)	EC. (mS/cm)	pH	Redox (mV)	Temp (°C)	SWL (m BTOC)	Pump setting (rate)
3:47 PM	4 min	1	0.31	2.37	6.24	-37	19.9	2.28	0
3:51 PM	3 min	1.5	0.06	2.47	6.24	-38	19.1	2.28	0
3:54 PM	4 min	2	0.02	2.54	6.2	-39	18.7	2.28	0
3:58 PM	4 min	2.5	0.01	2.56	6.17	-44	18.7	2.28	0
4:02 PM	5 min	3	0.01	2.58	6.11	-44	19	2.28	0
4:07 PM	5 min	4	0.03	2.56	6.14	-50	18.9	2.29	0
Groundwater equilibrium reached at			± 10%	± 3%	± 0.05	± 10 mV	± 0.2 °C	(3 consecutive measurements)	

Observations at start of development (turbidity, colour, odour, sheen):
High turbidity ; dark blackish, grey ; no odour ; no sheen

Observations at end of development (turbidity, colour, odour, sheen):
Low turbidity ; light grey ; no odour ; no sheen

Volume of water actually purged during development: 4 L

Discharge water disposal: ☑Drums ☐Sanitary sewer ☐Storm sewer ☐Surface ☐Other:

Other observations / comments:

Pump setting 13.5/1.5

AECOM

CPFO471o (ENV) Site Contamination Analysis Well Sampling Form

Project Name: FBURA Groundwater Assessment	Project Number: 60431087	Well No: GW24
Recorded / Developed By: Zach O	Well Type: ☑Monitor ☐Extractor ☐Other:	
Date: 17/11/2015	Well Material: ☑PVC ☐SS ☐Other:	

Well Purging

Well Details	**Development Method**
Well Diameter (D in mm): ☑50 ☐100 ☐Other:	☐Bailer – Type: ☐PVC ☐SS ☐Teflon ☑Other:
Total Depth of Well (TD in m BTOC): 0	☑Pump – Type: ☑Submersible ☐Bladder ☐Other:
Water Level Depth (WL in m BTOC): 1.41	Pump Intake Setting (if pump used):
Number of bore volumes to be purged (# VOLS)	Depth pump set (m BTOC):
☐3 ☐4 ☐5 ☐10 ☑Other: 0	Screen Interval (m BTOC) Top : 0 Bottom: 0

Anticipated Approximate Purge Volume Calculation

(_____ - _____) x (_____/2)^2 x 0.00314 = _____ _____ x _____ = _____

TD WL D 1 BV (L) BV # VOLS Purge Volume (L)

Start: 10:37 AM Stop: 11:05 AM Elapsed: 28 min Initial depth to water: 1.41
Final depth to water:

Field Parameter Measurements ☑ **Required** ☐**Not required**

Actual Time	Elapsed minutes	Purge Vol (L)	DO (mg/L)	EC. (mS/cm)	pH	Redox (mV)	Temp (°C)	SWL (m BTOC)	Pump setting (rate)
10:40 AM	4 min	0.6	0.99	4.35	6.64	-159	19.6	1.46	0
10:44 AM	4 min	1.2	0.22	3.67	6.66	-185	19.1	1.47	0
10:48 AM	4 min	1.8	0.09	3.39	6.64	-193	19.1	1.48	0
10:52 AM	4 min	2.4	0.02	3.35	6.61	-194	19	1.48	0
10:56 AM	5 min	3	0.02	3.33	6.6	-192	19	1.48	0
11:01 AM	4 min	3.6	0.03	3.22	6.58	-191	19	1.46	0
11:05 AM	4 min	4.2	0.02	3.16	6.57	-191	19	1.48	0
Groundwater equilibrium reached at			± 10%	± 3%	± 0.05	± 10 mV	± 0.2 °C	(3 consecutive measurements)	

Observations at start of development (turbidity, colour, odour, sheen):
High-moderate turbidity ; dark brownish, grey ; no odour ; no sheen

Observations at end of development (turbidity, colour, odour, sheen):

Volume of water actually purged during development: 4.2 L

Discharge water disposal: ☑Drums ☐Sanitary sewer ☐Storm sewer ☐Surface ☐Other:

Other observations / comments:

Pump setting 13.5/1.5

CPFO471o (ENV) Site Contamination Analysis Well Sampling Form

Project Name: FBURA Groundwater Assessment	Project Number: 60431087	Well No: GW25
Recorded / Developed By: Oliver T	Well Type: ☑Monitor ☐Extractor ☐Other:	
Date: 18/11/2015	Well Material: ☑PVC ☐SS ☐Other:	

Well Purging

Well Details	**Development Method**
Well Diameter (D in mm): ☑50 ☐100 ☐Other:	☐Bailer – Type: ☐PVC ☐SS ☐Teflon ☑Other:
Total Depth of Well (TD in m BTOC): 4.97	☑Pump – Type: ☐Submersible ☑Bladder ☐Other:
Water Level Depth (WL in m BTOC): 2.88	Pump Intake Setting (if pump used):
Number of bore volumes to be purged (# VOLS)	Depth pump set (m BTOC):
☐3 ☐4 ☐5 ☐10 ☑Other: 0	Screen Interval (m BTOC) Top : 0 Bottom: 0

Anticipated Approximate Purge Volume Calculation

(_____ - _____) x (_____/2)^2 x 0.00314 = _____ _____ x _____ = _____

TD WL D 1 BV (L) BV # VOLS Purge Volume (L)

Start: 10:13 AM Stop: 10:33 AM Elapsed: 20 min Initial depth to water: 2.88
Final depth to water: 2.88

Field Parameter Measurements ☑ **Required** ☐**Not required**

Actual Time	Elapsed minutes	Purge Vol (L)	DO (mg/L)	EC. (mS/cm)	pH	Redox (mV)	Temp (°C)	SWL (m BTOC)	Pump setting (rate)
10:15 AM	6 min	0.5	2.01	2.77	6.96	-83	20.4	2.88	4.5
10:21 AM	6 min	2	0.36	2.79	6.99	-97	20.5	2.88	4.5
10:27 AM	3 min	4	0.25	2.81	7.01	-100	20.7	2.88	4.5
10:30 AM	3 min	5	0.2	2.80	7.01	-101	20.7	2.88	4.5
10:33 AM	3 min	5.5	0.18	2.81	7.02	-102	20.5	2.88	4.5
Groundwater equilibrium reached at			± 10%	± 3%	± 0.05	± 10 mV	± 0.2 °C	(3 consecutive measurements)	

Observations at start of development (turbidity, colour, odour, sheen):
High-moderate turbidity ; brown ; no odour ; no sheen

Observations at end of development (turbidity, colour, odour, sheen):

Volume of water actually purged during development: 5.5 L

Discharge water disposal: ☑Drums ☐Sanitary sewer ☐Storm sewer ☐Surface ☐Other:

Other observations / comments:

CPFO471o (ENV) Site Contamination Analysis Well Sampling Form

Project Name: FBURA Groundwater Assessment	Project Number: 60431087	Well No: GW25 - resampled
Recorded / Developed By: Matt Sheppard	Well Type: ☑Monitor ☐Extractor ☐Other:	
Date: 23/11/2015	Well Material: ☑PVC ☐SS ☐Other:	

Well Purging

Well Details	Development Method
Well Diameter (D in mm): ☑50 ☐100 ☐Other:	☑Bailer – Type: ☐PVC ☐SS ☐Teflon ☑Other: Steel
Total Depth of Well (TD in m BTOC):	☑Pump – Type: ☐Submersible ☐Bladder ☑Other: Peristaltic
Water Level Depth (WL in m BTOC): 2.905	Pump Intake Setting (if pump used): 0
Number of bore volumes to be purged (# VOLS)	Depth pump set (m BTOC):
☑3 ☐4 ☐5 ☐10 ☐Other:	Screen Interval (m BTOC) Top : 0 Bottom: 0

Anticipated Approximate Purge Volume Calculation

(_____ - _____) x (_____/2)^2 x 0.00314 = _____ _____ x _____ = _____

TD WL D 1 BV (L) BV # VOLS Purge Volume (L)

Start: Stop: Elapsed: Initial depth to water:
Final depth to water:

Field Parameter Measurements ☑ **Required** ☐**Not required**

Actual Time	Elapsed minutes	Purge Vol (L)	DO (mg/L)	EC. (mS/cm)	pH	Redox (mV)	Temp (°C)	SWL (m BTOC)	Pump setting (rate)
10:45	0		1.13	2.86	7.02	-115	19.4	2.915	
10:50	5		0.14	2.76	6.98	-111	19.8	2.915	
10:55	10		0.09	2.80	7.02	-111	19.9	2.915	
11:00	15		0.07	2.80	7.12	-109	19.8	2.915	
11:05	20		0.07	2.77	7.03	-111	19.6	2.915	
11:10	25		0.07	2.79	7.04	-113	19.7	2.915	
11:15	30	~8	0.10	2.80	7.03	-110	19.9	2.915	
Groundwater equilibrium reached at			± 10%	± 3%	± 0.05	± 10 mV	± 0.2 °C	(3 consecutive measurements)	

Observations at start of development (turbidity, colour, odour, sheen):
Transparent dark grey, no odour, no sheen.

Observations at end of development (turbidity, colour, odour, sheen):
Clear, no odour, no sheen.

Volume of water actually purged during development:

Discharge water disposal: ☑Drums ☐Sanitary sewer ☐Storm sewer ☐Surface ☐Other:

Other observations / comments:

Level logger removed @ 10:40 (R23932) – GW25

AECOM

CPFO471o (ENV) Site Contamination Analysis Well Sampling Form

Project Name: FBURA Groundwater Assessment	Project Number: 60431087	Well No: GW26
Recorded / Developed By: Zach O	Well Type: ☑Monitor ☐Extractor ☐Other:	
Date: 19/11/2015	Well Material: ☑PVC ☐SS ☐Other:	

Well Purging

Well Details	**Development Method**
Well Diameter (D in mm): ☑50 ☐100 ☐Other:	☐Bailer – Type: ☐PVC ☐SS ☐Teflon ☑Other:
Total Depth of Well (TD in m BTOC): 3.5	☑Pump – Type: ☐Submersible ☐Bladder ☑Other: Peristaltic
Water Level Depth (WL in m BTOC): 2.53	Pump Intake Setting (if pump used):
Number of bore volumes to be purged (# VOLS)	Depth pump set (m BTOC):
☐3 ☐4 ☐5 ☐10 ☑Other: 0	Screen Interval (m BTOC) Top : 0 Bottom: 0

Anticipated Approximate Purge Volume Calculation

(_____ - _____) x (_____/2)^2 x 0.00314 = _____ _____ x _____ = _____

TD WL D 1 BV (L) BV # VOLS Purge Volume (L)

Start: 3:20 PM Stop: 3:41 PM Elapsed: 21 min Initial depth to water: 2.53
Final depth to water: 2.57

Field Parameter Measurements ☑ **Required** ☐**Not required**

Actual Time	Elapsed minutes	Purge Vol (L)	DO (mg/L)	EC. (µS/cm)	pH	Redox (mV)	Temp (°C)	SWL (m BTOC)	Pump setting (rate)
3:23 PM	3 min	0.5	2.1	1467	6.46	-7	21.6	2.57	0
3:26 PM	3 min	1	1.77	1458	6.27	16	19.7	2.57	0
3:29 PM	3 min	1.5	1.48	1465	6.17	22	19.1	2.57	0
3:32 PM	3 min	2	1.13	1492	6.08	28	18.9	2.57	0
3:35 PM	3 min	2.5	1.06	1495	6.04	30	18.9	2.57	0
3:38 PM	3 min	3	0.99	1496	6.03	31	18.9	2.57	0
3:41 PM	3 min	3.5	0.95	1501	6.02	34	18.9	2.57	0
Groundwater equilibrium reached at			± 10%	± 3%	± 0.05	± 10 mV	± 0.2 °C	(3 consecutive measurements)	

Observations at start of development (turbidity, colour, odour, sheen):

Observations at end of development (turbidity, colour, odour, sheen):

Volume of water actually purged during development: 3.5 L

Discharge water disposal: ☑Drums ☐Sanitary sewer ☐Storm sewer ☐Surface ☐Other:

Other observations / comments:

CPFO471o (ENV) Site Contamination Analysis Well Sampling Form

Project Name: FBURA Groundwater Assessment	Project Number: 60431087	Well No: GW26-Resampled
Recorded / Developed By: Oliver T	Well Type: ☑Monitor ☐Extractor ☐Other:	
Date: 18/11/2015	Well Material: ☑PVC ☐SS ☐Other:	

Well Purging

Well Details	Development Method
Well Diameter (D in mm): ☑50 ☐100 ☐Other:	☐Bailer – Type: ☐PVC ☐SS ☐Teflon ☑Other:
Total Depth of Well (TD in m BTOC): 3.76	☑Pump – Type: ☐Submersible ☑Bladder ☐Other:
Water Level Depth (WL in m BTOC): 2.49	Pump Intake Setting (if pump used):
Number of bore volumes to be purged (# VOLS)	Depth pump set (m BTOC):
☐3 ☐4 ☐5 ☐10 ☑Other: 0	Screen Interval (m BTOC) Top : 0 Bottom: 0

Anticipated Approximate Purge Volume Calculation

(_____ - _____) x (_____/2)^2 x 0.00314 = _____ _____ x _____ = _____

TD WL D 1 BV (L) BV # VOLS Purge Volume (L)

Start: 2:46 PM Stop: 3:09 PM Elapsed: 23 min Initial depth to water: 2.49
Final depth to water: 2.54

Field Parameter Measurements ☑ **Required** ☐**Not required**

Actual Time	Elapsed minutes	Purge Vol (L)	DO (mg/L)	EC. (µS/cm)	pH	Redox (mV)	Temp (°C)	SWL (m BTOC)	Pump setting (rate)
2:48 PM	6 min	0.5	2.97	1323	6.44	60	20.2	2.54	3.3
2:54 PM	6 min	2	1.53	1306	6.26	77	19.1	2.54	3.3
3:00 PM	3 min	3.5	1.05	1397	6.25	78	19.1	2.54	3.3
3:03 PM	3 min	4.5	0.86	1430	6.25	79	18.9	2.54	3.3
3:06 PM	3 min	5	0.95	1443	6.25	80	18.9	2.54	3.3
3:09 PM	3 min	5.5	0.96	1454	6.26	80	18.7	2.54	3.3
Groundwater equilibrium reached at			± 10%	± 3%	± 0.05	± 10 mV	± 0.2 °C	(3 consecutive measurements)	

Observations at start of development (turbidity, colour, odour, sheen):
High turbidity ; dark yellow, orange ; no odour ; no sheen

Observations at end of development (turbidity, colour, odour, sheen):
Moderate turbidity ; light yellow, orange ; no odour ; no sheen

Volume of water actually purged during development: 5.5 L

Discharge water disposal: ☑Drums ☐Sanitary sewer ☐Storm sewer ☐Surface ☐Other:

Other observations / comments:

CPFO471o (ENV) Site Contamination Analysis Well Sampling Form

Project Name: FBURA Groundwater Assessment	Project Number: 60431087	Well No: GW27
Recorded / Developed By: Zach O	Well Type: ☑Monitor ☐Extractor ☐Other:	
Date: 18/11/2015	Well Material: ☑PVC ☐SS ☐Other:	

Well Purging

Well Details	**Development Method**
Well Diameter (D in mm): ☑50 ☐100 ☐Other:	☐Bailer – Type: ☐PVC ☐SS ☐Teflon ☑Other:
Total Depth of Well (TD in m BTOC): 0	☑Pump – Type: ☑Submersible ☐Bladder ☐Other:
Water Level Depth (WL in m BTOC): 3.2	Pump Intake Setting (if pump used):
Number of bore volumes to be purged (# VOLS)	Depth pump set (m BTOC):
☐3 ☐4 ☐5 ☐10 ☑Other: 0	Screen Interval (m BTOC) Top : 0 Bottom: 0

Anticipated Approximate Purge Volume Calculation

(_____ - _____) x (_____/2)^2 x 0.00314 = _____ _____ x _____ = _____

TD WL D 1 BV (L) BV # VOLS Purge Volume (L)

Start: 7:38 AM **Stop: 8:16 AM** **Elapsed: 38 min** **Initial depth to water: 3.2**
Final depth to water:

Field Parameter Measurements ☑ **Required** ☐**Not required**

Actual Time	Elapsed minutes	Purge Vol (L)	DO (mg/L)	EC. (µS/cm)	pH	Redox (mV)	Temp (°C)	SWL (m BTOC)	Pump setting (rate)
7:42 AM	4 min	0.6	1.33	746	5.88	61	17.9	3.2	0
7:46 AM	5 min	1.2	0.59	763	5.88	47	17.9	3.2	0
7:51 AM	3 min	1.8	0.34	775	5.9	31	17.9	3.21	0
7:54 AM	4 min	2.4	0.29	800	5.9	24	17.9	3.2	0
7:58 AM	4 min	3	0.26	967	5.91	18	17.9	3.2	0
8:02 AM	4 min	3.6	0.23	1059	5.9	13	17.9	3.21	0
8:06 AM	3 min	4.2	0.23	1109	5.91	9	17.9	3.2	0
8:09 AM	3 min	4.8	0.2	1134	5.91	10	17.9	3.2	0
Groundwater equilibrium reached at			± 10%	± 3%	± 0.05	± 10 mV	± 0.2 °C	(3 consecutive measurements)	

Observations at start of development (turbidity, colour, odour, sheen):
High turbidity ; brownish, grey ; no odour ; no sheen

Observations at end of development (turbidity, colour, odour, sheen):
Low turbidity ; light clear, greyish ; no odour ; no sheen

Volume of water actually purged during development: 4.8 L

Discharge water disposal: ☑Drums ☐Sanitary sewer ☐Storm sewer ☐Surface ☐Other:

Other observations / comments:

AECOM

CPFO471o (ENV) Site Contamination Analysis Well Sampling Form

Project Name: FBURA Groundwater Assessment	Project Number: 60431087	Well No: GW28
Recorded / Developed By: Zach O	Well Type: ☑Monitor ☐Extractor ☐Other:	
Date: 17/11/2015	Well Material: ☑PVC ☐SS ☐Other:	

Well Purging

Well Details	Development Method
Well Diameter (D in mm): ☑50 ☐100 ☐Other:	☐Bailer – Type: ☐PVC ☐SS ☐Teflon ☑Other:
Total Depth of Well (TD in m BTOC): 0	☑Pump – Type: ☑Submersible ☐Bladder ☐Other:
Water Level Depth (WL in m BTOC): 1.44	Pump Intake Setting (if pump used):
Number of bore volumes to be purged (# VOLS)	Depth pump set (m BTOC):
☑3 ☐4 ☐5 ☐10 ☐Other:	Screen Interval (m BTOC) Top : 0 Bottom: 0

Anticipated Approximate Purge Volume Calculation

(_____ - _____) x (_____/2)^2 x 0.00314 = _____ _____ x _____ = _____

TD WL D 1 BV (L) BV # VOLS Purge Volume (L)

Start: 9:11 AM Stop: 10:00 AM Elapsed: 49 min Initial depth to water: 1.44
Final depth to water: 1.55

Field Parameter Measurements ☑ **Required** ☐**Not required**

Actual Time	Elapsed minutes	Purge Vol (L)	DO (mg/L)	EC. (µS/cm)	pH	Redox (mV)	Temp (°C)	SWL (m BTOC)	Pump setting (rate)
9:14 AM	5 min	0.8	4.14	2188	7.06	-158	18.7	1.55	0
9:19 AM	4 min	1.4	3.61	2040	6.98	-143	18.8	1.52	0
9:23 AM	5 min	1.8	3.29	1972	6.94	-146	19	1.5	0
9:28 AM	3 min	2.2	2.73	1945	6.91	-156	19.1	1.51	0
9:31 AM	5 min	2.6	2.29	1923	6.86	-172	18.7	1.54	0
9:36 AM	4 min	3	1.93	1846	6.79	-178	18.6	1.54	0
9:40 AM	3 min	0	1.69	1817	6.77	-181	18.7	1.52	0
9:43 AM	3 min	3.4	0.6	1798	6.76	-184	18.9	1.54	0
9:46 AM	5 min	3.6	0.5	1802	6.76	-184	19	1.52	0
9:51 AM	4 min	4.5	0.41	1801	6.77	-184	19.1	1.52	0
9:55 AM	4 min	5	0.42	1809	6.78	-183	19.1	1.52	0
9:59 AM	4 min	5.4	0.39	1817	6.79	-184	19.1	1.55	0
Groundwater equilibrium reached at			± 10%	± 3%	± 0.05	± 10 mV	± 0.2 °C	(3 consecutive measurements)	

Observations at start of development (turbidity, colour, odour, sheen):
High-moderate turbidity ; dark blackish, grey ; no odour ; no sheen

Observations at end of development (turbidity, colour, odour, sheen):
Low turbidity ; light grey ; no odour ; no sheen

Volume of water actually purged during development: 5.4 L

Discharge water disposal: ☑Drums ☐Sanitary sewer ☐Storm sewer ☐Surface ☐Other:

Other observations / comments:

Pump setting 13/2
Changed to 19/1 after 15 min
Slow recharge

AECOM

CPFO471o (ENV) Site Contamination Analysis Well Sampling Form

Project Name: FBURA Groundwater Assessment	Project Number: 60431087	Well No: GW29
Recorded / Developed By: Oliver T	Well Type: ☑Monitor ☐Extractor ☐Other:	
Date: 18/11/2015	Well Material: ☑PVC ☐SS ☐Other:	

Well Purging

Well Details	**Development Method**
Well Diameter (D in mm): ☑50 ☐100 ☐Other:	☐Bailer – Type: ☐PVC ☐SS ☐Teflon ☑Other:
Total Depth of Well (TD in m BTOC): 3.9	☑Pump – Type: ☐Submersible ☑Bladder ☐Other:
Water Level Depth (WL in m BTOC): 2.85	Pump Intake Setting (if pump used):
Number of bore volumes to be purged (# VOLS)	Depth pump set (m BTOC):
☐3 ☐4 ☐5 ☐10 ☑Other: 0	Screen Interval (m BTOC) Top : 0 Bottom: 0

Anticipated Approximate Purge Volume Calculation

(_____ - _____) x (_____/2)^2 x 0.00314 = _____ _____ x _____ = _____

TD WL D 1 BV (L) BV # VOLS Purge Volume (L)

Start: 11:15 AM Stop: 11:34 AM Elapsed: 19 min Initial depth to water: 2.85
Final depth to water: 2.89

Field Parameter Measurements ☑ **Required** ☐**Not required**

Actual Time	Elapsed minutes	Purge Vol (L)	DO (mg/L)	EC. (µS/cm)	pH	Redox (mV)	Temp (°C)	SWL (m BTOC)	Pump setting (rate)
11:16 AM	6 min	0.5	1.36	1510	7.03	-63	20.1	2.89	3.3
11:22 AM	6 min	2	0.43	1473	6.97	-96	18.8	2.89	3.3
11:28 AM	3 min	4	0.34	1475	6.96	-129	18.5	2.89	3.3
11:31 AM	3 min	5	0.29	1484	6.96	-134	18.4	2.89	3.3
11:34 AM	3 min	5.5	0.22	1470	6.95	-137	18.4	2.89	3.3
Groundwater equilibrium reached at			± 10%	± 3%	± 0.05	± 10 mV	± 0.2 °C	(3 consecutive measurements)	

Observations at start of development (turbidity, colour, odour, sheen):
High turbidity ; light brown ; no odour ; no sheen

Observations at end of development (turbidity, colour, odour, sheen):

Volume of water actually purged during development: 5.5 L

Discharge water disposal: ☑Drums ☐Sanitary sewer ☐Storm sewer ☐Surface ☐Other:

Other observations / comments:

CPFO471o (ENV) Site Contamination Analysis Well Sampling Form

Project Name: FBURA	Project Number: 60430187	Well No: GW29 - resampled
Recorded / Developed By: Matt Sheppard	Well Type: ☒ Monitor ☐ Extractor ☐ Other	
Date: 23/11/15	Well Material: ☒PVC ☐ SS ☐ Other	

Well Purging

Well Details	**Development Method**
Well Diameter (D in mm): ☒50 ☐100 ☐Other:	☐ Bailer – Type: ☐ PVC ☐ SS ☐ Teflon ☐ Other:
Total Depth of Well (TD in m BTOC):	☒ Pump – Type: ☐ Submersible ☒ Bladder ☐ Other:
Water Level Depth (WL in m BTOC): 2.905	Pump Intake Setting (if pump used)
Number of bore volumes to be purged (# VOLS)	Depth pump set (m BTOC):
☐ 3 ☐ 4 ☐ 5 ☐ 10 ☐ Other	Screen Interval (m BTOC) Top : Bottom:

Anticipated Approximate Purge Volume Calculation

(_____ - _____) x (_____/2)^2 x 0.00314 = _____ _____ x _____ = _____

TD WL D 1 BV (L) BV # VOLS Purge Volume (L)

Start Time: **Stop Time:** **Elapsed Time:** **Initial depth to water:** **Final depth to water:**

Field Parameter Measurements ☐ **Required** ☐ **Not required**

Actual Time	Elapsed minutes	Purge Vol (L)	DO (mg/L)	EC. (µS/cm)	pH	Redox (mV)	Temp (°C)	SWL (m BTOC)	Pump setting (rate)
11:40	**0**		**2.27**	**1059**	**7.16**	**-93**	**20.6**	**2.905**	
11:45	**5**		**0.37**	**1454**	**7.02**	**-143**	**19.4**	**2.915**	
11:50	**10**		**0.31**	**1456**	**7.04**	**-153**	**21.0**	**2.875**	
11:55	**15**		**0.29**	**1459**	**7.00**	**-171**	**20.7**	**2.875**	
12:00	**20**		**0.26**	**1475**	**7.00**	**-174**	**20.4**	**2.875**	
12:05	**25**		**0.31**	**1418**	**7.02**	**-172**	**18.5**	**2.875**	
12:10	**30**		**0.28**	**1434**	**6.98**	**-181**	**18.6**	**2.876**	
Groundwater equilibrium reached at			± 10%	± 3%	± 0.05	± 10 mV	± 0.2 °C	(3 consecutive measurements)	

Observations at start of development (turbidity, colour, odour, sheen): Transparent light grey, no odour, no sheen.

Observations at end of development (turbidity, colour, odour, sheen): Clear, no odour, no sheen.

Volume of water actually purged during development:_____ L

Discharge water disposal: ☐ Drums ☐ Sanitary sewer ☐ Storm sewer ☐ Surface ☐ Other:_____

Other observations / comments:

Level logger removed @11:31 (R26181) – GW29

CPFO471o (ENV) Site Contamination Analysis Well Sampling Form

Project Name: FBURA Groundwater Assessment	Project Number: 60431087	Well No: GW30
Recorded / Developed By: Zach O	Well Type: ☑Monitor ☐Extractor ☐Other:	
Date: 18/11/2015	Well Material: ☑PVC ☐SS ☐Other:	

Well Purging

Well Details	Development Method
Well Diameter (D in mm): ☐50 ☐100 ☑Other: 0	☐Bailer – Type: ☐PVC ☐SS ☐Teflon ☑Other:
Total Depth of Well (TD in m BTOC): 4.1	☑Pump – Type: ☑Submersible ☐Bladder ☐Other:
Water Level Depth (WL in m BTOC): 2.71	Pump Intake Setting (if pump used):
Number of bore volumes to be purged (# VOLS)	Depth pump set (m BTOC):
☐3 ☐4 ☐5 ☐10 ☑Other: 0	Screen Interval (m BTOC) Top : 0 Bottom: 0

Anticipated Approximate Purge Volume Calculation

(_____ - _____) x (_____/2)^2 x 0.00314 = _____ _____ x _____ = _____

TD WL D 1 BV (L) BV # VOLS Purge Volume (L)

Start: 10:42 AM Stop: 11:19 AM Elapsed: 37 min Initial depth to water: 2.71
Final depth to water:

Field Parameter Measurements ☑ **Required** ☐**Not required**

Actual Time	Elapsed minutes	Purge Vol (L)	DO (mg/L)	EC. (µS/cm)	pH	Redox (mV)	Temp (°C)	SWL (m BTOC)	Pump setting (rate)
10:46 AM	3 min	0.6	1.98	1304	5.32	19	19.6	2.73	0
10:49 AM	3 min	1.1	1.15	1330	5.08	31	19.3	2.73	0
10:52 AM	3 min	1.6	0.85	1336	5.03	21	19.1	2.73	0
10:55 AM	3 min	2.1	0.59	1337	5	2	19	2.72	0
10:58 AM	3 min	2.6	0.44	1342	4.98	-13	18.8	2.73	0
11:01 AM	3 min	0	0.36	1342	4.98	-19	18.8	2.73	0
11:04 AM	3 min	3.6	0.34	1339	4.97	-23	18.8	2.74	0
11:07 AM	3 min	4.1	0.21	1336	4.95	-25	18.8	2.73	0
11:10 AM	3 min	4.6	0.14	1333	4.94	-28	18.7	2.73	0
11:13 AM	3 min	5.1	0.09	1334	4.91	-31	18.6	2.73	0
11:16 AM	3 min	5.6	0.09	1333	4.89	-33	18.6	2.72	0
11:19 AM	3 min	6.1	0.08	1338	4.88	-34	18.6	2.73	0
Groundwater equilibrium reached at			± 10%	± 3%	± 0.05	± 10 mV	± 0.2 °C	(3 consecutive measurements)	

Observations at start of development (turbidity, colour, odour, sheen):
High turbidity ; dark brownish, grey ; no odour ; no sheen

Observations at end of development (turbidity, colour, odour, sheen):
Moderate turbidity ; greyish, brown ; no odour ; no sheen

Volume of water actually purged during development: 6.1 L

Discharge water disposal: ☑Drums ☐Sanitary sewer ☐Storm sewer ☐Surface ☐Other:

Other observations / comments:

Pump setting CPM4 13/2

CPFO471o (ENV) Site Contamination Analysis Well Sampling Form

Project Name: FBURA Groundwater Assessment	Project Number: 60431087	Well No: GW30 - resampled
Recorded / Developed By: Matt Sheppard	Well Type: ☑Monitor ☐Extractor ☐Other:	
Date: 23/11/2015	Well Material: ☑PVC ☐SS ☐Other:	

Well Purging

Well Details	Development Method
Well Diameter (D in mm): ☑50 ☐100 ☐Other:	☑Bailer – Type: ☐PVC ☐SS ☐Teflon ☑Other: Steel to stir up water
Total Depth of Well (TD in m BTOC):	☑Pump – Type: ☐Submersible ☐Bladder ☑Other: Peristaltic
Water Level Depth (WL in m BTOC): 2.710	Pump Intake Setting (if pump used): 0
Number of bore volumes to be purged (# VOLS) ☑3 ☐4 ☐5 ☐10 ☐Other:	Depth pump set (m BTOC): 0
	Screen Interval (m BTOC) Top : 0 Bottom: 0

Anticipated Approximate Purge Volume Calculation

(_____ - _____) x (_____/2)^2 x 0.00314 = _____ _____ x _____ = _____

TD WL D 1 BV (L) BV # VOLS Purge Volume (L)

Start: Stop: Elapsed: Initial depth to water:
Final depth to water:

Field Parameter Measurements ☑ **Required** ☐**Not required**

Actual Time	Elapsed minutes	Purge Vol (L)	DO (mg/L)	EC. (µS/cm)	pH	Redox (mV)	Temp (°C)	SWL (m BTOC)	Pump setting (rate)
7:15	0		1.36	1351	5.24	112	17.7	2.755	
7:20	5		0.67	1305	5.21	91	17.8	2.760	
7:25	10		0.53	1303	5.20	-19	17.6	2.750	
7:30	15		0.44	1298	5.19	-53	17.6	2.745	
7:35	20		0.42	1292	5.20	-74	17.7	2.750	
7:40	25		0.41	1293	5.19	-82	17.7	2.750	
7:45	30		0.41	1292	5.20	-82	17.8	2.750	
7:50	35	6	0.37	1288	5.21	-83	17.7	2.750	
Groundwater equilibrium reached at			± 10%	± 3%	± 0.05	± 10 mV	± 0.2 °C	(3 consecutive measurements)	

Observations at start of development (turbidity, colour, odour, sheen):
Grey, slight turbidity, slight natural organic odour, no sheen.

Observations at end of development (turbidity, colour, odour, sheen):
Clear, no odour, no sheen.

Volume of water actually purged during development:

Discharge water disposal: ☑Drums ☐Sanitary sewer ☐Storm sewer ☐Surface ☐Other:

Other observations / comments:

Level logger removed @ 7:00 (R26667)

CPFO471o (ENV) Site Contamination Analysis Well Sampling Form

Project Name: FBURA Groundwater Assessment	Project Number: 60431087	Well No: GW31
Recorded / Developed By: Oliver T	Well Type: ☑Monitor ☐Extractor ☐Other:	
Date: 17/11/2015	Well Material: ☑PVC ☐SS ☐Other:	

Well Purging

Well Details	Development Method
Well Diameter (D in mm): ☑50 ☐100 ☐Other:	☐Bailer – Type: ☐PVC ☐SS ☐Teflon ☑Other:
Total Depth of Well (TD in m BTOC): 4.17	☑Pump – Type: ☐Submersible ☑Bladder ☐Other:
Water Level Depth (WL in m BTOC): 1.58	Pump Intake Setting (if pump used):
Number of bore volumes to be purged (# VOLS)	Depth pump set (m BTOC):
☐3 ☐4 ☐5 ☐10 ☑Other: 0	Screen Interval (m BTOC) Top : 0 Bottom: 0

Anticipated Approximate Purge Volume Calculation

(_____ - _____) x (_____/2)^2 x 0.00314 = _____ _____ x _____ = _____

TD WL D 1 BV (L) BV # VOLS Purge Volume (L)

Start: 8:46 AM Stop: 9:14 AM Elapsed: 28 min Initial depth to water: 1.58
Final depth to water: 1.75

Field Parameter Measurements ☑ **Required** ☐**Not required**

Actual Time	Elapsed minutes	Purge Vol (L)	DO (mg/L)	EC. (mS/cm)	pH	Redox (mV)	Temp (°C)	SWL (m BTOC)	Pump setting (rate)
8:49 AM	6 min	0.5	5.27	9.88	6.36	-45	19.9	1.72	3.6
8:55 AM	6 min	1	2.31	10.34	6.39	-90	18.7	1.75	3.6
9:01 AM	3 min	1.5	1.55	10.71	6.43	-130	18.8	1.75	3.6
9:04 AM	3 min	2	1.31	10.8	6.43	-139	18.7	1.75	3.6
9:07 AM	3 min	2.5	1.15	10.84	6.44	-142	18.7	1.75	3.6
9:10 AM	3 min	3	1.05	10.85	6.45	-144	18.7	1.75	3.6
9:13 AM	3 min	3.5	1.02	10.91	6.44	-145	18.6	1.75	3.6
Groundwater equilibrium reached at			± 10%	± 3%	± 0.05	± 10 mV	± 0.2 °C	(3 consecutive measurements)	

Observations at start of development (turbidity, colour, odour, sheen):
High-moderate turbidity ; dark brown ; no odour ; no sheen

Observations at end of development (turbidity, colour, odour, sheen):
Moderate turbidity ; brown ; no odour ; no sheen ;

Volume of water actually purged during development: 3.5 L

Discharge water disposal: ☑Drums ☐Sanitary sewer ☐Storm sewer ☐Surface ☐Other:

Other observations / comments:

CPFO471o (ENV) Site Contamination Analysis Well Sampling Form

Project Name: FBURA Groundwater Assessment	Project Number: 60431087	Well No: GW31-Resampled
Recorded / Developed By: Zach O	Well Type: ☑Monitor ☐Extractor ☐Other:	
Date: 19/11/2015	Well Material: ☑PVC ☐SS ☐Other:	

Well Purging

Well Details	**Development Method**
Well Diameter (D in mm): ☐50 ☐100 ☑Other: 0	☐Bailer – Type: ☐PVC ☐SS ☐Teflon ☑Other:
Total Depth of Well (TD in m BTOC):	☑Pump – Type: ☐Submersible ☐Bladder ☑Other: Peristaltic
Water Level Depth (WL in m BTOC): 1.59	Pump Intake Setting (if pump used):
Number of bore volumes to be purged (# VOLS)	Depth pump set (m BTOC):
☐3 ☐4 ☐5 ☐10 ☑Other: 0	Screen Interval (m BTOC) Top : 0 Bottom: 0

Anticipated Approximate Purge Volume Calculation

(_____ - _____) x (_____/2)^2 x 0.00314 = _____ _____ x _____ = _____

TD WL D 1 BV (L) BV # VOLS Purge Volume (L)

Start: 2:58 PM **Stop: 2:13 PM** **Elapsed: -45 min** **Initial depth to water: 1.59**
Final depth to water:

Field Parameter Measurements ☑ **Required** ☐**Not required**

Actual Time	Elapsed minutes	Purge Vol (L)	DO (mg/L)	EC. (mS/cm)	pH	Redox (mV)	Temp (°C)	SWL (m BTOC)	Pump setting (rate)
2:01 PM	3 min	0.5	0.82	9.3	6.33	-115	20.2	1.62	0
2:04 PM	3 min	1	0.45	9.49	6.31	-116	18.9	1.65	0
2:07 PM	3 min	1.5	0.2	9.56	6.26	-127	18.7	1.63	0
2:10 PM	3 min	2	0.17	9.6	6.23	-141	18.6	1.67	0
2:13 PM	0 min	2.5	0.16	9.7	6.25	-148	18.4	1.67	0
2:13 PM	0 min	3	0.16	9.84	6.29	-153	18.5	1.67	0
Groundwater equilibrium reached at			± 10%	± 3%	± 0.05	± 10 mV	± 0.2 °C	(3 consecutive measurements)	

Observations at start of development (turbidity, colour, odour, sheen):

Observations at end of development (turbidity, colour, odour, sheen):

Volume of water actually purged during development: 3 L

Discharge water disposal: ☑Drums ☐Sanitary sewer ☐Storm sewer ☐Surface ☐Other:

Other observations / comments:

CPFO471o (ENV) Site Contamination Analysis Well Sampling Form

Project Name: FBURA Groundwater Assessment	Project Number: 60431087	Well No: GW32
Recorded / Developed By: Zach O	Well Type: ☑Monitor ☐Extractor ☐Other:	
Date: 19/11/2015	Well Material: ☑PVC ☐SS ☐Other:	

Well Purging

Well Details	**Development Method**
Well Diameter (D in mm): ☐50 ☐100 ☑Other: <50	☐Bailer – Type: ☐PVC ☐SS ☐Teflon ☑Other:
Total Depth of Well (TD in m BTOC): 0	☑Pump – Type: ☐Submersible ☐Bladder ☑Other: Peristaltic
Water Level Depth (WL in m BTOC): 3.49	Pump Intake Setting (if pump used):
Number of bore volumes to be purged (# VOLS)	Depth pump set (m BTOC):
☐3 ☐4 ☐5 ☐10 ☑Other: 0	Screen Interval (m BTOC) Top : 0 Bottom: 0

Anticipated Approximate Purge Volume Calculation

(_____ - _____) x (_____/2)^2 x 0.00314 = _____ _____ x _____ = _____

TD WL D 1 BV (L) BV # VOLS Purge Volume (L)

Start: 11:53 AM Stop: 12:20 PM Elapsed: 27 min Initial depth to water: 3.49
Final depth to water:

Field Parameter Measurements ☑ **Required** ☐**Not required**

Actual Time	Elapsed minutes	Purge Vol (L)	DO (mg/L)	EC. (mS/cm)	pH	Redox (mV)	Temp (°C)	SWL (m BTOC)	Pump setting (rate)
11:56 AM	3 min	0.5	2.2	11.27	6.39	-220	22.9	2.67	3.8
11:59 AM	3 min	1	0.81	11.62	6.45	-266	22	2.65	3.8
12:02 PM	3 min	1.5	0.3	12.36	6.46	-296	21.3	0	3.8
12:05 PM	0 min	2	0.12	13.2	6.48	-320	21	3.68	3.8
12:05 PM	3 min	2.5	1	13.7	6.52	-330	20.9	0	3.8
12:08 PM	3 min	0	0.09	14.07	6.55	-329	20.8	0	3.8
12:11 PM	3 min	0	0.07	14.19	6.56	-331	20.8	2.69	3.8
12:14 PM	3 min	4	0.04	14.31	6.57	-328	20.8	2.69	3.8
12:17 PM	3 min	4.5	0.01	14.43	6.59	-328	20.8	2.69	3.8
12:20 PM	3 min	5	0.01	14.61	6.6	-330	20.8	3.7	3.8
Groundwater equilibrium reached at			± 10%	± 3%	± 0.05	± 10 mV	± 0.2 °C	(3 consecutive measurements)	

Observations at start of development (turbidity, colour, odour, sheen):
Low turbidity ; light clear, brownish ; no odour ; no sheen

Observations at end of development (turbidity, colour, odour, sheen):

Volume of water actually purged during development: 5 L

Discharge water disposal: ☑Drums ☐Sanitary sewer ☐Storm sewer ☐Surface ☐Other:

Other observations / comments:

EC in mS

CPFO471o (ENV) Site Contamination Analysis Well Sampling Form

Project Name: FBURA Groundwater Assessment	Project Number: 60431087	Well No: MW33
Recorded / Developed By: Zach O	Well Type: ☑Monitor ☐Extractor ☐Other:	
Date: 16/11/2015	Well Material: ☑PVC ☐SS ☐Other:	

Well Purging

Well Details	**Development Method**
Well Diameter (D in mm): ☑50 ☐100 ☐Other:	☐Bailer – Type: ☐PVC ☐SS ☐Teflon ☑Other:
Total Depth of Well (TD in m BTOC): 5	☑Pump – Type: ☑Submersible ☐Bladder ☐Other:
Water Level Depth (WL in m BTOC): 2.34	Pump Intake Setting (if pump used):
Number of bore volumes to be purged (# VOLS)	Depth pump set (m BTOC):
☑3 ☐4 ☐5 ☐10 ☐Other:	Screen Interval (m BTOC) Top : 0 Bottom: 0

Anticipated Approximate Purge Volume Calculation

(_____ - _____) x (_____/2)^2 x 0.00314 = _____ _____ x _____ = _____

TD WL D 1 BV (L) BV # VOLS Purge Volume (L)

Start: 2:28 PM Stop: 2:52 PM Elapsed: 24 min Initial depth to water: 2.34
Final depth to water:

Field Parameter Measurements ☑ **Required** ☐**Not required**

Actual Time	Elapsed minutes	Purge Vol (L)	DO (mg/L)	EC. (µS/cm)	pH	Redox (mV)	Temp (°C)	SWL (m BTOC)	Pump setting (rate)
2:28 PM	4 min	0.5	1.4	1810	7.05	-100	21.4	2.39	0
2:32 PM	5 min	1.2	0.55	1638	7.07	-121	20.5	3.41	0
2:37 PM	5 min	2.5	0.28	1584	7.08	-138	20.2	2.43	0
2:42 PM	3 min	3	0.15	1579	7.04	-147	20.2	2.42	0
2:45 PM	4 min	3	0.09	1579	7.01	-152	20.1	2.43	0
2:49 PM	3 min	3.5	0.08	1579	6.99	-152	20.2	2.42	0
2:52 PM	3 min	5.5	0.1	1583	6.99	-154	20.2	2.41	0
Groundwater equilibrium reached at			± 10%	± 3%	± 0.05	± 10 mV	± 0.2 °C	(3 consecutive measurements)	

Observations at start of development (turbidity, colour, odour, sheen):
High turbidity ; dark brownish, grey ; no odour ; no sheen

Observations at end of development (turbidity, colour, odour, sheen):
Low-moderate turbidity ; light clear, greyish ; no odour ; no sheen

Volume of water actually purged during development: 5.5 L

Discharge water disposal: ☑Drums ☐Sanitary sewer ☐Storm sewer ☐Surface ☐Other:

Other observations / comments:

Pump rate reduced at second parameter reading to 14/1.5

CPFO471o (ENV) Site Contamination Analysis Well Sampling Form

Project Name: FBURA Groundwater Assessment	Project Number: 60431087	Well No: GW33-Resampled
Recorded / Developed By: Zach O	Well Type: ☑Monitor ☐Extractor ☐Other:	
Date: 19/11/2015	Well Material: ☑PVC ☐SS ☐Other:	

Well Purging

Well Details	Development Method
Well Diameter (D in mm): ☑50 ☐100 ☐Other:	☐Bailer – Type: ☐PVC ☐SS ☐Teflon ☑Other:
Total Depth of Well (TD in m BTOC): 0	☑Pump – Type: ☐Submersible ☐Bladder ☑Other:
Water Level Depth (WL in m BTOC): 0	Pump Intake Setting (if pump used):
Number of bore volumes to be purged (# VOLS)	Depth pump set (m BTOC):
☐3 ☐4 ☐5 ☐10 ☑Other: 0	Screen Interval (m BTOC) Top : 0 Bottom: 0

Anticipated Approximate Purge Volume Calculation

(_____ - _____) x (_____/2)^2 x 0.00314 = _____ _____ x _____ = _____

TD WL D 1 BV (L) BV # VOLS Purge Volume (L)

Start: 1:01 PM Stop: 1:17 PM Elapsed: 16 min Initial depth to water: 0
Final depth to water:

Field Parameter Measurements ☑ **Required** ☐**Not required**

Actual Time	Elapsed minutes	Purge Vol (L)	DO (mg/L)	EC. (µS/cm)	pH	Redox (mV)	Temp (°C)	SWL (m BTOC)	Pump setting (rate)
1:01 PM	3 min	1	0.46	1832	7.29	-177	21.1	2.44	0
1:04 PM	3 min	1.5	0.13	1717	7.28	-182	20.9	2.44	0
1:07 PM	2 min	2	0.04	1595	7.26	-185	20.7	2.44	0
1:09 PM	1 min	3.5	0.2	1581	7.23	-186	20.7	2.46	0
1:10 PM	3 min	0	0.02	1583	7.24	-186	20.7	2.46	0
1:13 PM	45 min	3	0.03	1581	7.24	-185	20.7	-	0
1:58 PM	45 min	0.5	0.72	1914	7.29	-175	21.2	2.43	0
Groundwater equilibrium reached at			± 10%	± 3%	± 0.05	± 10 mV	± 0.2 °C	(3 consecutive measurements)	

Observations at start of development (turbidity, colour, odour, sheen):

Observations at end of development (turbidity, colour, odour, sheen):

Volume of water actually purged during development: 0.5 L

Discharge water disposal: ☐Drums ☐Sanitary sewer ☐Storm sewer ☐Surface ☑Other:

Other observations / comments:

CPFO471o (ENV) Site Contamination Analysis Well Sampling Form

Project Name: FBURA Groundwater Assessment	Project Number: 60431087	Well No: GW34
Recorded / Developed By: Oliver T	Well Type: ☑Monitor ☐Extractor ☐Other:	
Date: 16/11/2015	Well Material: ☑PVC ☐SS ☐Other:	

Well Purging

Well Details	Development Method
Well Diameter (D in mm): ☑50 ☐100 ☐Other:	☑Bailer – Type: ☑PVC ☐SS ☐Teflon ☐Other:
Total Depth of Well (TD in m BTOC): 4.02	☑Pump – Type: ☐Submersible ☑Bladder ☐Other:
Water Level Depth (WL in m BTOC): 1.59	Pump Intake Setting (if pump used):
Number of bore volumes to be purged (# VOLS)	Depth pump set (m BTOC):
☐3 ☐4 ☐5 ☐10 ☑Other: 0	Screen Interval (m BTOC) Top : 0 Bottom: 0

Anticipated Approximate Purge Volume Calculation

(_____ - _____) x (_____/2)^2 x 0.00314 = _____ _____ x _____ = _____

TD WL D 1 BV (L) BV # VOLS Purge Volume (L)

Start: 1:58 PM Stop: 2:17 PM Elapsed: 19 min Initial depth to water: 1.59
Final depth to water: 1.77

Field Parameter Measurements ☑ **Required** ☐**Not required**

Actual Time	Elapsed minutes	Purge Vol (L)	DO (mg/L)	EC. (mS/cm)	pH	Redox (mV)	Temp (°C)	SWL (m BTOC)	Pump setting (rate)
1:59 PM	3 min	0.5	2.56	2.46	7.03	-239	22.2	1.75	3.5
2:02 PM	6 min	1.5	0.51	4.16	7.00	-266	21.3	2.75	3.5
2:08 PM	3 min	2	0.27	4.21	6.87	-265	21.2	1.78	3.5
2:11 PM	3 min	2.5	0.19	4.18	6.8	-263	21.3	1.78	3.5
2:14 PM	3 min	3	0.17	4.20	6.78	-263	21.3	1.77	3.5
2:17 PM	3 min	3.5	0.15	4.15	6.74	-264	21.2	1.77	3.5
Groundwater equilibrium reached at			± 10%	± 3%	± 0.05	± 10 mV	± 0.2 °C	(3 consecutive measurements)	

Observations at start of development (turbidity, colour, odour, sheen):
High turbidity ; dark grey ; no odour ; no sheen

Observations at end of development (turbidity, colour, odour, sheen):
Moderate turbidity ; light yellow ; no odour ; no sheen

Volume of water actually purged during development: 3.5 L

Discharge water disposal: ☑Drums ☐Sanitary sewer ☐Storm sewer ☐Surface ☐Other:

Other observations / comments:

CPFO471o (ENV) Site Contamination Analysis Well Sampling Form

Project Name: FBURA Groundwater Assessment	Project Number: 60431087	Well No: GW34-Resampled
Recorded / Developed By: Zach O	Well Type: ☑Monitor ☐Extractor ☐Other:	
Date: 19/11/2015	Well Material: ☑PVC ☐SS ☐Other:	

Well Purging

Well Details	Development Method
Well Diameter (D in mm): ☑50 ☐100 ☐Other:	☐Bailer – Type: ☐PVC ☐SS ☐Teflon ☑Other:
Total Depth of Well (TD in m BTOC): 0	☑Pump – Type: ☐Submersible ☐Bladder ☑Other: Peristaltic
Water Level Depth (WL in m BTOC): 1.8	Pump Intake Setting (if pump used):
Number of bore volumes to be purged (# VOLS)	Depth pump set (m BTOC):
☐3 ☐4 ☐5 ☐10 ☑Other: 0	Screen Interval (m BTOC) Top : 0 Bottom: 0

Anticipated Approximate Purge Volume Calculation

(_____ - _____) x (_____/2)^2 x 0.00314 = _____ _____ x _____ = _____

TD WL D 1 BV (L) BV # VOLS Purge Volume (L)

Start: 1:26 PM Stop: 1:41 PM Elapsed: 15 min Initial depth to water: 1.8
Final depth to water:

Field Parameter Measurements ☑ **Required** ☐**Not required**

Actual Time	Elapsed minutes	Purge Vol (L)	DO (mg/L)	EC. (mS/cm)	pH	Redox (mV)	Temp (°C)	SWL (m BTOC)	Pump setting (rate)
1:29 PM	3 min	0.5	0.62	2.90	7.17	-295	20.9	2.82	0
1:32 PM	3 min	1	0.16	3.02	7.22	-311	20.4	2.83	0
1:35 PM	3 min	1.5	0.08	3.04	7.2	-309	20.2	2.83	0
1:38 PM	3 min	2	0.09	3.04	7.17	-303	20.2	2.83	0
1:41 PM	3 min	3	0.08	3.04	7.18	-303	20.2	2.84	0
Groundwater equilibrium reached at			± 10%	± 3%	± 0.05	± 10 mV	± 0.2 °C	(3 consecutive measurements)	

Observations at start of development (turbidity, colour, odour, sheen):

Observations at end of development (turbidity, colour, odour, sheen):

Volume of water actually purged during development: 3 L

Discharge water disposal: ☑Drums ☐Sanitary sewer ☐Storm sewer ☐Surface ☐Other:

Other observations / comments:

EC units in mS

AECOM

CPFO471o (ENV) Site Contamination Analysis Well Sampling Form

Project Name: FBURA Groundwater Assessment	Project Number: 60431087	Well No: GW35
Recorded / Developed By: Oliver T	Well Type: ☑Monitor ☐Extractor ☐Other:	
Date: 17/11/2015	Well Material: ☑PVC ☐SS ☐Other:	

Well Purging

Well Details	Development Method
Well Diameter (D in mm): ☑50 ☐100 ☐Other:	☐Bailer – Type: ☐PVC ☐SS ☐Teflon ☑Other:
Total Depth of Well (TD in m BTOC): 4.01	☑Pump – Type: ☐Submersible ☑Bladder ☐Other:
Water Level Depth (WL in m BTOC): 2.12	Pump Intake Setting (if pump used):
Number of bore volumes to be purged (# VOLS)	Depth pump set (m BTOC):
☐3 ☐4 ☐5 ☐10 ☑Other: 0	Screen Interval (m BTOC) Top : 0 Bottom: 0

Anticipated Approximate Purge Volume Calculation

(_____ - _____) x (_____/2)^2 x 0.00314 = _____ _____ x _____ = _____

TD WL D 1 BV (L) BV # VOLS Purge Volume (L)

Start: 7:40 AM Stop: 8:02 AM Elapsed: 22 min Initial depth to water: 2.12
Final depth to water: 2.28

Field Parameter Measurements ☑ **Required** ☐**Not required**

Actual Time	Elapsed minutes	Purge Vol (L)	DO (mg/L)	EC. (mS/cm)	pH	Redox (mV)	Temp (°C)	SWL (m BTOC)	Pump setting (rate)
7:44 AM	6 min	0.5	2.3	2.83	6.39	-151	19.7	2.25	3.5
7:50 AM	6 min	1.5	0.75	4.12	6.37	-157	19.1	2.38	3.5
7:56 AM	3 min	2	0.53	4.07	6.4	-156	19.2	2.38	3.5
7:59 AM	3 min	2.5	0.49	4.06	6.41	-154	19.2	2.38	3.5
8:02 AM	3 min	3	0.47	4.04	6.41	-154	19.2	2.28	3.5
Groundwater equilibrium reached at			± 10%	± 3%	± 0.05	± 10 mV	± 0.2 °C	(3 consecutive measurements)	

Observations at start of development (turbidity, colour, odour, sheen):
Low-moderate turbidity ; light clear, greyish ; no odour ; no sheen

Observations at end of development (turbidity, colour, odour, sheen):
Moderate turbidity ; brown ; no odour ; no sheen

Volume of water actually purged during development: 3 L

Discharge water disposal: ☑Drums ☐Sanitary sewer ☐Storm sewer ☐Surface ☐Other:

Other observations / comments:

CPFO471o (ENV) Site Contamination Analysis Well Sampling Form

Project Name: FBURA Groundwater Assessment	Project Number: 60431087	Well No: GW35-Resampled
Recorded / Developed By: Zach O	Well Type: ☑Monitor ☐Extractor ☐Other:	
Date: 20/11/2015	Well Material: ☑PVC ☐SS ☐Other:	

Well Purging

Well Details	**Development Method**
Well Diameter (D in mm): ☑50 ☐100 ☐Other:	☐Bailer – Type: ☐PVC ☐SS ☐Teflon ☑Other:
Total Depth of Well (TD in m BTOC): 4	☑Pump – Type: ☑Submersible ☐Bladder ☐Other:
Water Level Depth (WL in m BTOC): 2.16	Pump Intake Setting (if pump used):
Number of bore volumes to be purged (# VOLS)	Depth pump set (m BTOC):
☑3 ☐4 ☐5 ☐10 ☐Other:	Screen Interval (m BTOC) Top : 0 Bottom: 0

Anticipated Approximate Purge Volume Calculation

(_____ - _____) x (_____/2)^2 x 0.00314 = _____ _____ x _____ = _____

TD WL D 1 BV (L) BV # VOLS Purge Volume (L)

Start: 11:16 AM Stop: 11:47 AM Elapsed: 31 min Initial depth to water: 2.16
Final depth to water:

Field Parameter Measurements ☑ **Required** ☐**Not required**

Actual Time	Elapsed minutes	Purge Vol (L)	DO (mg/L)	EC. (mS/cm)	pH	Redox (mV)	Temp (°C)	SWL (m BTOC)	Pump setting (rate)
11:19 AM	3 min	0.5	2.3	4.3	6.48	-49	19.3	2.33	0
11:22 AM	3 min	1	1.8	4.34	6.46	-55	19.1	2.33	0
11:25 AM	4 min	1.5	1.77	4.34	6.46	-72	19.1	2.34	0
11:29 AM	3 min	2	1.4	4.36	6.44	-94	19	2.34	0
11:32 AM	3 min	3	0.9	4.36	6.43	-112	18.9	2.37	0
11:35 AM	3 min	3.5	0.7	4.37	6.42	-126	18.9	2.37	0
11:38 AM	3 min	3.5	0.51	4.34	6.4	-142	19.1	2.37	0
11:41 AM	3 min	4	0.38	4.37	6.41	-140	19.2	2.38	0
11:44 AM	3 min	4.5	3.7	4.35	6.42	-138	19.2	2.38	0
11:47 AM	3 min	5	0.36	4.34	6.42	-133	19.1	0	0
Groundwater equilibrium reached at			± 10%	± 3%	± 0.05	± 10 mV	± 0.2 °C	(3 consecutive measurements)	

Observations at start of development (turbidity, colour, odour, sheen):

Moderate turbidity ; light yellowish, brown ; no odour ; no sheen

Observations at end of development (turbidity, colour, odour, sheen):

Volume of water actually purged during development: 5 L

Discharge water disposal: ☑Drums ☐Sanitary sewer ☐Storm sewer ☐Surface ☐Other:

Other observations / comments:

Micro purge set at CPM4 1.5/13.5

CPFO471o (ENV) Site Contamination Analysis Well Sampling Form

Project Name: FBURA Groundwater Assessment	Project Number: 60431087	Well No: MW36
Recorded / Developed By: Zach O	Well Type: ☑Monitor ☐Extractor ☐Other:	
Date: 16/11/2015	Well Material: ☑PVC ☐SS ☐Other:	

Well Purging

Well Details	**Development Method**
Well Diameter (D in mm): ☑50 ☐100 ☐Other:	☐Bailer – Type: ☐PVC ☐SS ☐Teflon ☑Other:
Total Depth of Well (TD in m BTOC):	☑Pump – Type: ☑Submersible ☐Bladder ☐Other:
Water Level Depth (WL in m BTOC): 2.63	Pump Intake Setting (if pump used):
Number of bore volumes to be purged (# VOLS)	Depth pump set (m BTOC):
☑3 ☐4 ☐5 ☐10 ☐Other:	Screen Interval (m BTOC) Top : 0 Bottom: 0

Anticipated Approximate Purge Volume Calculation

(_____ - _____) x (_____/2)^2 x 0.00314 = _____ _____ x _____ = _____

TD WL D 1 BV (L) BV # VOLS Purge Volume (L)

Start: 3:23 PM Stop: 4:00 PM Elapsed: 37 min Initial depth to water: 2.63
Final depth to water:

Field Parameter Measurements ☑ **Required** ☐**Not required**

Actual Time	Elapsed minutes	Purge Vol (L)	DO (mg/L)	EC. (µS/cm)	pH	Redox (mV)	Temp (°C)	SWL (m BTOC)	Pump setting (rate)
3:34 PM	4 min	1.5	2.48	990	6.68	-10	18	2.71	0
3:38 PM	3 min	2	1.19	946	6.52	-17	17.5	2.86	0
3:41 PM	4 min	3	0.64	971	6.5	-33	17.4	2.91	0
3:45 PM	4 min	4	0.29	994	6.52	-43	17.4	2.97	0
3:49 PM	4 min	4	0.82	1023	6.57	-79	17.4	3.01	0
3:53 PM	3 min	4.5	0.88	1034	6.56	-106	17.3	3.04	0
3:56 PM	4 min	5.2	0.75	1040	6.58	-115	17.3	3.06	0
4:00 PM	4 min	6	0.73	1042	6.58	-126	17.3	3.06	0
Groundwater equilibrium reached at			± 10%	± 3%	± 0.05	± 10 mV	± 0.2 °C	(3 consecutive measurements)	

Observations at start of development (turbidity, colour, odour, sheen):
High-moderate turbidity ; dark greyish, brown ; no odour ; no sheen

Observations at end of development (turbidity, colour, odour, sheen):
High-moderate turbidity ; light yellowish, brown ; no odour ; no sheen ;

Volume of water actually purged during development: 6 L

Discharge water disposal: ☐Drums ☐Sanitary sewer ☐Storm sewer ☐Surface ☑Other:

Other observations / comments:

CPFO471o (ENV) Site Contamination Analysis Well Sampling Form

Project Name: FBURA Groundwater Assessment	Project Number: 60431087	Well No: GW37
Recorded / Developed By: Oliver T	Well Type: ☑Monitor ☐Extractor ☐Other:	
Date: 16/11/2015	Well Material: ☑PVC ☐SS ☐Other:	

Well Purging

Well Details	**Development Method**
Well Diameter (D in mm): ☑50 ☐100 ☐Other:	☐Bailer – Type: ☐PVC ☐SS ☐Teflon ☑Other:
Total Depth of Well (TD in m BTOC): 6.98	☑Pump – Type: ☐Submersible ☑Bladder ☐Other:
Water Level Depth (WL in m BTOC): 2.85	Pump Intake Setting (if pump used):
Number of bore volumes to be purged (# VOLS)	Depth pump set (m BTOC):
☐3 ☐4 ☐5 ☐10 ☑Other: 0	Screen Interval (m BTOC) Top : 0 Bottom: 0

Anticipated Approximate Purge Volume Calculation

(_____ - _____) x (_____/2)^2 x 0.00314 = _____ _____ x _____ = _____

TD WL D 1 BV (L) BV # VOLS Purge Volume (L)

Start: 2:56 PM Stop: 3:18 PM Elapsed: 22 min Initial depth to water: 2.85
Final depth to water: 2.29

Field Parameter Measurements ☑ **Required** ☐**Not required**

Actual Time	Elapsed minutes	Purge Vol (L)	DO (mg/L)	EC. (mS/cm)	pH	Redox (mV)	Temp (°C)	SWL (m BTOC)	Pump setting (rate)
2:58 PM	3 min	0.5	3.38	-	7.08	-38	20.4	2.99	6.5
3:01 PM	5 min	1	2.82	-	7.09	-38	19.7	3.13	6.5
3:06 PM	3 min	1.5	2.28	-	7.11	-34	20.5	3.22	6.5
3:09 PM	2 min	1.75	2.17	-	7.13	-32	20.9	3.29	6.5
3:11 PM	3 min	2	2.06	-	7.13	-27	21	2.29	6.5
3:14 PM	3 min	2.25	2.04	-	7.14	-22	21.2	2.29	6.5
3:17 PM	3 min	2.5	2	-	7.14	-19	21.2	2.29	6.5
Groundwater equilibrium reached at			± 10%	± 3%	± 0.05	± 10 mV	± 0.2 °C	(3 consecutive measurements)	

Observations at start of development (turbidity, colour, odour, sheen):
Low turbidity ; clear ; no odour ; no sheen

Observations at end of development (turbidity, colour, odour, sheen):
Low turbidity ; clear ; no odour ; no sheen

Volume of water actually purged during development: 2.5 L

Discharge water disposal: ☑Drums ☐Sanitary sewer ☐Storm sewer ☐Surface ☐Other:

Other observations / comments:

AECOM

CPFO471o (ENV) Site Contamination Analysis Well Sampling Form

Project Name: FBURA Groundwater Assessment	Project Number: 60431087	Well No: GW37-Resampled
Recorded / Developed By: Zach O	Well Type: ☑Monitor ☐Extractor ☐Other:	
Date: 19/11/2015	Well Material: ☑PVC ☐SS ☐Other:	

Well Purging

Well Details	**Development Method**
Well Diameter (D in mm): ☑50 ☐100 ☐Other:	☐Bailer – Type: ☐PVC ☐SS ☐Teflon ☑Other:
Total Depth of Well (TD in m BTOC): 7	☐Pump – Type: ☐Submersible ☐Bladder ☑Other:
Water Level Depth (WL in m BTOC): 2.86	Pump Intake Setting (if pump used):
Number of bore volumes to be purged (# VOLS)	Depth pump set (m BTOC):
☐3 ☐4 ☐5 ☐10 ☑Other: 0	Screen Interval (m BTOC) Top : 0 Bottom: 0

Anticipated Approximate Purge Volume Calculation

(_____ - _____) x (_____/2)^2 x 0.00314 = _____ _____ x _____ = _____

TD WL D 1 BV (L) BV # VOLS Purge Volume (L)

Start: 2:28 PM **Stop: 2:49 PM** **Elapsed: 21 min** **Initial depth to water: 2.86**
Final depth to water:

Field Parameter Measurements ☑ **Required** ☐**Not required**

Actual Time	Elapsed minutes	Purge Vol (L)	DO (mg/L)	EC. (µS/cm)	pH	Redox (mV)	Temp (°C)	SWL (m BTOC)	Pump setting (rate)
2:31 PM	3 min	0.5	1.6	-	6.79	-95	20.7	3.17	0
2:34 PM	3 min	1	1.14	-	7.07	-101	19.8	3.36	0
2:37 PM	3 min	1.5	1	2175	7.1	-98	19.8	3.18	0
2:40 PM	3 min	2	1.01	1827	7.25	-91	19.3	3.09	0
2:43 PM	3 min	2.5	0.99	1667	7.23	-81	19	0	0
2:46 PM	3 min	3	1	1660	7.25	-79	19	3.09	0
2:49 PM	3 min	3	1.02	1669	7.25	-80	18.9	0	0
Groundwater equilibrium reached at			± 10%	± 3%	± 0.05	± 10 mV	± 0.2 °C	(3 consecutive measurements)	

Observations at start of development (turbidity, colour, odour, sheen):

Observations at end of development (turbidity, colour, odour, sheen):

Volume of water actually purged during development: 3 L

Discharge water disposal: ☐Drums ☐Sanitary sewer ☐Storm sewer ☐Surface ☑Other:

Other observations / comments:

DO in ppm
EC in uS

CPFO471o (ENV) Site Contamination Analysis Well Sampling Form

Project Name: FBURA Groundwater Assessment	Project Number: 60431087	Well No: GW38
Recorded / Developed By: Zach O	Well Type: ☑Monitor ☐Extractor ☐Other:	
Date: 17/11/2015	Well Material: ☑PVC ☐SS ☐Other:	

Well Purging

Well Details	**Development Method**
Well Diameter (D in mm): ☑50 ☐100 ☐Other:	☐Bailer – Type: ☐PVC ☐SS ☐Teflon ☑Other:
Total Depth of Well (TD in m BTOC):	☑Pump – Type: ☑Submersible ☐Bladder ☐Other:
Water Level Depth (WL in m BTOC): 3.5	Pump Intake Setting (if pump used):
Number of bore volumes to be purged (# VOLS)	Depth pump set (m BTOC):
☑3 ☐4 ☐5 ☐10 ☐Other:	Screen Interval (m BTOC) Top : 0 Bottom: 0

Anticipated Approximate Purge Volume Calculation

(_____ - _____) x (_____/2)^2 x 0.00314 = _____ _____ x _____ = _____

TD WL D 1 BV (L) BV # VOLS Purge Volume (L)

Start: 7:46 AM **Stop: 8:17 AM** **Elapsed: 31 min** **Initial depth to water: 3.5**
Final depth to water:

Field Parameter Measurements ☑ **Required** ☐**Not required**

Actual Time	Elapsed minutes	Purge Vol (L)	DO (mg/L)	EC. (mS/cm)	pH	Redox (mV)	Temp (°C)	SWL (m BTOC)	Pump setting (rate)
7:49 AM	3 min	0.5	3.13	5.29	7.52	242	19.3	3.52	0
7:52 AM	4 min	1.5	1.53	5.47	7.51	230	18.9	-	0
7:56 AM	3 min	2.5	1.07	5.49	7.51	224	18.9	3.57	0
7:59 AM	4 min	3.5	0.9	5.49	7.52	221	19	3.59	0
8:03 AM	4 min	4	0.72	5.47	7.53	217	19.1	3.55	0
8:07 AM	4 min	4.5	0.64	5.51	7.54	210	19.2	3.59	0
8:11 AM	3 min	5	0.55	5.49	7.55	205	19.1	3.54	0
8:14 AM	3 min	5.5	0.53	5.44	7.55	195	19	3.58	0
8:17 AM	3 min	6	0.51	5.44	7.55	191	18.9	3.59	0
Groundwater equilibrium reached at			± 10%	± 3%	± 0.05	± 10 mV	± 0.2 °C	(3 consecutive measurements)	

Observations at start of development (turbidity, colour, odour, sheen):
High-moderate turbidity ; light brown ; no odour ; no sheen

Observations at end of development (turbidity, colour, odour, sheen):
Low-moderate turbidity ; light yellowish, brown ; no odour ; no sheen

Volume of water actually purged during development: 6 L

Discharge water disposal: ☑Drums ☐Sanitary sewer ☐Storm sewer ☐Surface ☐Other:

Other observations / comments:

EC units in mS

Appendix J

Laboratory Transcripts

ALS Environmental

CERTIFICATE OF ANALYSIS

Work Order	: **EM1517153**	Page	: 1 of 30
Client	: **AECOM Australia Pty Ltd**	Laboratory	: Environmental Division Melbourne
Contact	: MS AVERYLL COYNE	Contact	: Carol Walsh
Address	: LEVEL 9 8 EXHIBITION ST MELBOURNE VIC 3000	Address	: 4 Westall Rd Springvale VIC Australia 3171
E-mail	: averyll.coyne@aecom.com	E-mail	: carol.walsh@alsglobal.com
Telephone	: +61 03 9653 1234	Telephone	: +61-3-8549 9608
Facsimile	: +61 03 9654 7117	Facsimile	: +61-3-8549 9601
Project	: 60431087	QC Level	: NEPM 2013 B3 & ALS QC Standard
Order number	: 60431087 1.4	Date Samples Received	: 17-Nov-2015 15:10
C-O-C number	: ----	Date Analysis Commenced	: 18-Nov-2015
Sampler	: OLIVER TAYLOR, ZACHARY OCONNOR	Issue Date	: 26-Nov-2015 15:47
Site	: FBURA		
		No. of samples received	: 18
Quote number	: ----	No. of samples analysed	: 18

This report supersedes any previous report(s) with this reference. Results apply to the sample(s) as submitted.

This Certificate of Analysis contains the following information:

- General Comments
- Analytical Results

NATA Accredited Laboratory 825

Accredited for compliance with ISO/IEC 17025.

Signatories

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

Signatories	*Position*	*Accreditation Category*
Chris Lemaitre	Non-Metals Team Leader	Melbourne Inorganics
Dilani Fernando	Senior Inorganic Chemist	Melbourne Inorganics
Xing Lin	Senior Organic Chemist	Melbourne Organics

General Comments

The analytical procedures used by the Environmental Division have been developed from established internationally recognized procedures such as those published by the USEPA, APHA, AS and NEPM. In house developed procedures are employed in the absence of documented standards or by 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.

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.

- EK071G:EM1517233_011 Poor matrix spike recovery for Reactive Phosphorus as P due to sample matrix. Confirmed by re-extraction and re-analysis.
- TDS by method EA-015 may bias high for EM1517153 # 1 due to the presence of fine particulate matter, which may pass through the prescribed GF/C paper.
- Ionic balances were calculated using: major anions - chloride, alkalinity and sulfate; and major cations - calcium, magnesium, potassium and sodium.
- ED045G: The presence of thiocyanate can positively contribute to the chloride result, thereby may bias results higher than expected. Results should be scrutinised accordingly.
- EP074 Particular sample (EM-1517153-004) shows minor positive hit. Confirmed by re-analysis.
- Benzo(a)pyrene Toxicity Equivalent Quotient (TEQ) 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.

Analytical Results

Sub-Matrix: WATER (Matrix: WATER)				Client sample ID	GW35	GW38	GW24	GW28	GW31
				Client sampling date / time	[17-Nov-2015]	[17-Nov-2015]	[17-Nov-2015]	[17-Nov-2015]	[17-Nov-2015]
Compound	CAS Number	LOR	Unit		EM1517153-001	EM1517153-002	EM1517153-003	EM1517153-004	EM1517153-005
					Result	Result	Result	Result	Result
EA005P: pH by PC Titrator									
pH Value	----	0.01	pH Unit		7.08	8.11	7.01	7.29	6.69
EA015: Total Dissolved Solids dried at 180 ± 5 °C									
Total Dissolved Solids @180°C	----	10	mg/L		3760	3680	1780	1200	6860
ED037P: Alkalinity by PC Titrator									
Hydroxide Alkalinity as CaCO3	DMO-210-001	1	mg/L		<1	<1	<1	<1	<1
Carbonate Alkalinity as CaCO3	3812-32-6	1	mg/L		<1	<1	<1	<1	<1
Bicarbonate Alkalinity as CaCO3	71-52-3	1	mg/L		487	918	644	914	574
Total Alkalinity as CaCO3	----	1	mg/L		487	918	644	914	574
ED041G: Sulfate (Turbidimetric) as SO4 2- by DA									
Sulfate as SO4 - Turbidimetric	14808-79-8	1	mg/L		2110	931	18	9	1340
ED043: Total Oxidised Sulfur as SO4 2-									
Total Oxidised Sulfur as SO4 2-	----	1	mg/L		2200	1030	23	11	1380
ED045G: Chloride by Discrete Analyser									
Chloride	16887-00-6	1	mg/L		161	817	647	104	3250
ED093F: Dissolved Major Cations									
Calcium	7440-70-2	1	mg/L		510	8	83	80	496
Magnesium	7439-95-4	1	mg/L		192	24	59	43	259
Sodium	7440-23-5	1	mg/L		401	1250	416	233	1620
Potassium	7440-09-7	1	mg/L		41	25	35	28	81
EG020F: Dissolved Metals by ICP-MS									
Aluminium	7429-90-5	0.01	mg/L		<0.01	0.01	0.04	0.02	<0.01
Arsenic	7440-38-2	0.001	mg/L		0.002	0.004	0.007	0.009	0.003
Cadmium	7440-43-9	0.0001	mg/L		<0.0001	<0.0001	<0.0001	<0.0001	<0.0001
Chromium	7440-47-3	0.001	mg/L		<0.001	<0.001	0.003	0.001	<0.001
Copper	7440-50-8	0.001	mg/L		<0.001	0.004	<0.001	0.001	<0.001
Nickel	7440-02-0	0.001	mg/L		0.087	0.026	0.021	0.020	0.024
Lead	7439-92-1	0.001	mg/L		<0.001	<0.001	<0.001	<0.001	<0.001
Zinc	7440-66-6	0.005	mg/L		0.007	<0.005	0.006	0.012	0.016
Manganese	7439-96-5	0.001	mg/L		1.30	0.042	0.441	0.354	0.610
Selenium	7782-49-2	0.01	mg/L		<0.01	<0.01	<0.01	<0.01	<0.01
Iron	7439-89-6	0.05	mg/L		16.6	<0.05	13.7	4.28	49.8
EG020T: Total Metals by ICP-MS									
Aluminium	7429-90-5	0.01	mg/L		----	----	----	----	----
Arsenic	7440-38-2	0.001	mg/L		----	----	----	----	----

Analytical Results

Sub-Matrix: WATER (Matrix: WATER)				Client sample ID	GW35	GW38	GW24	GW28	GW31
				Client sampling date / time	[17-Nov-2015]	[17-Nov-2015]	[17-Nov-2015]	[17-Nov-2015]	[17-Nov-2015]
Compound	CAS Number	LOR	Unit		EM1517153-001	EM1517153-002	EM1517153-003	EM1517153-004	EM1517153-005
					Result	Result	Result	Result	Result
EG020T: Total Metals by ICP-MS - Continued									
Cadmium	7440-43-9	0.0001	mg/L		----	----	----	----	----
Chromium	7440-47-3	0.001	mg/L		----	----	----	----	----
Copper	7440-50-8	0.001	mg/L		----	----	----	----	----
Nickel	7440-02-0	0.001	mg/L		----	----	----	----	----
Lead	7439-92-1	0.001	mg/L		----	----	----	----	----
Zinc	7440-66-6	0.005	mg/L		----	----	----	----	----
Manganese	7439-96-5	0.001	mg/L		----	----	----	----	----
Selenium	7782-49-2	0.01	mg/L		----	----	----	----	----
Iron	7439-89-6	0.05	mg/L		----	----	----	----	----
EG035F: Dissolved Mercury by FIMS									
Mercury	7439-97-6	0.0001	mg/L		<0.0001	<0.0001	<0.0001	<0.0001	<0.0001
EG035T: Total Recoverable Mercury by FIMS									
Mercury	7439-97-6	0.0001	mg/L		----	----	----	----	----
EK040P: Fluoride by PC Titrator									
Fluoride	16984-48-8	0.1	mg/L		**0.2**	**1.7**	**0.7**	**0.7**	**0.3**
EK055G: Ammonia as N by Discrete Analyser									
Ammonia as N	7664-41-7	0.01	mg/L		**7.22**	**0.10**	**13.2**	**9.00**	**3.96**
EK057G: Nitrite as N by Discrete Analyser									
Nitrite as N	14797-65-0	0.01	mg/L		<0.01	**0.04**	<0.01	**0.02**	<0.01
EK058G: Nitrate as N by Discrete Analyser									
Nitrate as N	14797-55-8	0.01	mg/L		**0.07**	**1.78**	**0.05**	**0.02**	**0.02**
EK059G: Nitrite plus Nitrate as N (NOx) by Discrete Analyser									
Nitrite + Nitrate as N	----	0.01	mg/L		**0.07**	**1.82**	**0.05**	**0.04**	**0.02**
EK071G: Reactive Phosphorus as P by discrete analyser									
Reactive Phosphorus as P	14265-44-2	0.01	mg/L		<0.01	**0.22**	**0.27**	<0.01	<0.01
EN055: Ionic Balance									
Total Anions	----	0.01	meq/L		**58.2**	**60.8**	**31.5**	**21.4**	**131**
Total Cations	----	0.01	meq/L		**59.7**	**57.4**	**28.0**	**18.4**	**119**
Ionic Balance	----	0.01	%		**1.31**	**2.91**	**5.91**	**7.57**	**4.98**
EP005: Total Organic Carbon (TOC)									
Total Organic Carbon	----	1	mg/L		----	**9**	**30**	**25**	----
EP074A: Monocyclic Aromatic Hydrocarbons									
Benzene	71-43-2	1	µg/L		----	<1	**22**	**14**	----

Analytical Results

Sub-Matrix: WATER (Matrix: WATER)				Client sample ID	GW35	GW38	GW24	GW28	GW31
				Client sampling date / time	[17-Nov-2015]	[17-Nov-2015]	[17-Nov-2015]	[17-Nov-2015]	[17-Nov-2015]
Compound	CAS Number	LOR	Unit		EM1517153-001	EM1517153-002	EM1517153-003	EM1517153-004	EM1517153-005
					Result	Result	Result	Result	Result
EP074A: Monocyclic Aromatic Hydrocarbons - Continued									
Toluene	108-88-3	1	µg/L		----	<1	4	7	----
Ethylbenzene	100-41-4	1	µg/L		----	<1	<1	<1	----
meta- & para-Xylene	108-38-3 106-42-3	1	µg/L		----	<1	7	2	----
Styrene	100-42-5	1	µg/L		----	<1	<1	<1	----
ortho-Xylene	95-47-6	1	µg/L		----	<1	2	<1	----
Isopropylbenzene	98-82-8	1	µg/L		----	<1	7	<1	----
n-Propylbenzene	103-65-1	1	µg/L		----	<1	3	<1	----
1.3.5-Trimethylbenzene	108-67-8	1	µg/L		----	<1	1	<1	----
sec-Butylbenzene	135-98-8	1	µg/L		----	<1	<1	<1	----
1.2.4-Trimethylbenzene	95-63-6	1	µg/L		----	<1	2	<1	----
tert-Butylbenzene	98-06-6	1	µg/L		----	<1	<1	<1	----
p-Isopropyltoluene	99-87-6	1	µg/L		----	<1	<1	<1	----
n-Butylbenzene	104-51-8	1	µg/L		----	<1	<1	<1	----
EP074B: Oxygenated Compounds									
2-Propanone (Acetone)	67-64-1	10	µg/L		----	<10	<10	10	----
Vinyl Acetate	108-05-4	10	µg/L		----	<10	<10	<10	----
2-Butanone (MEK)	78-93-3	10	µg/L		----	<10	<10	<10	----
4-Methyl-2-pentanone (MIBK)	108-10-1	10	µg/L		----	<10	<10	<10	----
2-Hexanone (MBK)	591-78-6	10	µg/L		----	<10	<10	<10	----
EP074C: Sulfonated Compounds									
Carbon disulfide	75-15-0	1	µg/L		----	<1	<1	1	----
EP074D: Fumigants									
2.2-Dichloropropane	594-20-7	1	µg/L		----	<1	<1	<1	----
1.2-Dichloropropane	78-87-5	1	µg/L		----	<1	<1	<1	----
cis-1.3-Dichloropropylene	10061-01-5	2	µg/L		----	<2	<2	<2	----
trans-1.3-Dichloropropylene	10061-02-6	2	µg/L		----	<2	<2	<2	----
1.2-Dibromoethane (EDB)	106-93-4	1	µg/L		----	<1	<1	<1	----
EP074E: Halogenated Aliphatic Compounds									
Dichlorodifluoromethane	75-71-8	10	µg/L		----	<10	<10	<10	----
Chloromethane	74-87-3	10	µg/L		----	<10	<10	<10	----
Vinyl chloride	75-01-4	10	µg/L		----	<10.0	<10.0	<10.0	----
Bromomethane	74-83-9	10	µg/L		----	<10	<10	<10	----
Chloroethane	75-00-3	10	µg/L		----	<10	<10	<10	----
Trichlorofluoromethane	75-69-4	10	µg/L		----	<10	<10	<10	----

Analytical Results

Sub-Matrix: WATER (Matrix: WATER)				Client sample ID	GW35	GW38	GW24	GW28	GW31
				Client sampling date / time	[17-Nov-2015]	[17-Nov-2015]	[17-Nov-2015]	[17-Nov-2015]	[17-Nov-2015]
Compound	CAS Number	LOR	Unit		EM1517153-001	EM1517153-002	EM1517153-003	EM1517153-004	EM1517153-005
					Result	Result	Result	Result	Result
EP074E: Halogenated Aliphatic Compounds - Continued									
1.1-Dichloroethene	75-35-4	1	µg/L		----	<1	<1	<1	----
Iodomethane	74-88-4	1	µg/L		----	<1	<1	<1	----
Methylene chloride	75-09-2	5	µg/L		----	<5	<5	<5	----
trans-1.2-Dichloroethene	156-60-5	1	µg/L		----	<1	<1	<1	----
1.1-Dichloroethane	75-34-3	1	µg/L		----	<1	<1	<1	----
cis-1.2-Dichloroethene	156-59-2	1	µg/L		----	<1	<1	<1	----
1.1.1-Trichloroethane	71-55-6	1	µg/L		----	<1	<1	<1	----
1.1-Dichloropropylene	563-58-6	1	µg/L		----	<1	<1	<1	----
Carbon Tetrachloride	56-23-5	1	µg/L		----	<1	<1	<1	----
1.2-Dichloroethane	107-06-2	1	µg/L		----	<1	<1	<1	----
Trichloroethene	79-01-6	1	µg/L		----	<1	<1	<1	----
Dibromomethane	74-95-3	1	µg/L		----	<1	<1	<1	----
1.1.2-Trichloroethane	79-00-5	1	µg/L		----	<1	<1	<1	----
1.3-Dichloropropane	142-28-9	1	µg/L		----	<1	<1	<1	----
Tetrachloroethene	127-18-4	1	µg/L		----	<1	<1	<1	----
1.1.1.2-Tetrachloroethane	630-20-6	1	µg/L		----	<1	<1	<1	----
trans-1.4-Dichloro-2-butene	110-57-6	1	µg/L		----	<1	<1	<1	----
cis-1.4-Dichloro-2-butene	1476-11-5	1	µg/L		----	<1	<1	<1	----
1.1.2.2-Tetrachloroethane	79-34-5	1	µg/L		----	<1	<1	<1	----
1.2.3-Trichloropropane	96-18-4	1	µg/L		----	<1	<1	<1	----
Pentachloroethane	76-01-7	1	µg/L		----	<1	<1	<1	----
1.2-Dibromo-3-chloropropane	96-12-8	1	µg/L		----	<1	<1	<1	----
Hexachlorobutadiene	87-68-3	1	µg/L		----	<1.0	<1.0	<1.0	----
EP074F: Halogenated Aromatic Compounds									
Chlorobenzene	108-90-7	1	µg/L		----	<1	<1	<1	----
Bromobenzene	108-86-1	1	µg/L		----	<1	<1	<1	----
2-Chlorotoluene	95-49-8	1	µg/L		----	<1	<1	<1	----
4-Chlorotoluene	106-43-4	1	µg/L		----	<1	<1	<1	----
1.3-Dichlorobenzene	541-73-1	1	µg/L		----	<1	<1	<1	----
1.4-Dichlorobenzene	106-46-7	1	µg/L		----	<1.0	<1.0	<1.0	----
1.2-Dichlorobenzene	95-50-1	1	µg/L		----	<1	<1	<1	----
1.2.4-Trichlorobenzene	120-82-1	1	µg/L		----	<1	<1	<1	----
1.2.3-Trichlorobenzene	87-61-6	1	µg/L		----	<1	<1	<1	----
EP074G: Trihalomethanes									

Analytical Results

Sub-Matrix: WATER (Matrix: WATER)				Client sample ID	GW35	GW38	GW24	GW28	GW31
				Client sampling date / time	[17-Nov-2015]	[17-Nov-2015]	[17-Nov-2015]	[17-Nov-2015]	[17-Nov-2015]
Compound	CAS Number	LOR	Unit		EM1517153-001	EM1517153-002	EM1517153-003	EM1517153-004	EM1517153-005
					Result	Result	Result	Result	Result
EP074G: Trihalomethanes - Continued									
Chloroform	67-66-3	1	µg/L		----	<1	<1	<1	----
Bromodichloromethane	75-27-4	1	µg/L		----	<1	<1	<1	----
Dibromochloromethane	124-48-1	1	µg/L		----	<1	<1	<1	----
Bromoform	75-25-2	1	µg/L		----	<1	<1	<1	----
EP074H: Naphthalene									
Naphthalene	91-20-3	5	µg/L		----	<5	<5	<5	----
EP075(SIM)B: Polynuclear Aromatic Hydrocarbons									
Naphthalene	91-20-3	1	µg/L		<1.0	<1.0	**1.9**	<1.0	<1.0
Acenaphthylene	208-96-8	1	µg/L		<1.0	<1.0	<1.0	<1.0	<1.0
Acenaphthene	83-32-9	1	µg/L		<1.0	<1.0	**1.5**	<1.0	<1.0
Fluorene	86-73-7	1	µg/L		<1.0	<1.0	<1.0	<1.0	<1.0
Phenanthrene	85-01-8	1	µg/L		<1.0	<1.0	<1.0	<1.0	<1.0
Anthracene	120-12-7	1	µg/L		<1.0	<1.0	<1.0	<1.0	<1.0
Fluoranthene	206-44-0	1	µg/L		<1.0	<1.0	<1.0	<1.0	<1.0
Pyrene	129-00-0	1	µg/L		<1.0	<1.0	<1.0	<1.0	<1.0
Benz(a)anthracene	56-55-3	1	µg/L		<1.0	<1.0	<1.0	<1.0	<1.0
Chrysene	218-01-9	1	µg/L		<1.0	<1.0	<1.0	<1.0	<1.0
Benzo(b+j)fluoranthene	205-99-2 205-82-3	1	µg/L		<1.0	<1.0	<1.0	<1.0	<1.0
Benzo(k)fluoranthene	207-08-9	1	µg/L		<1.0	<1.0	<1.0	<1.0	<1.0
Benzo(a)pyrene	50-32-8	0.5	µg/L		<0.5	<0.5	<0.5	<0.5	<0.5
Indeno(1.2.3.cd)pyrene	193-39-5	1	µg/L		<1.0	<1.0	<1.0	<1.0	<1.0
Dibenz(a.h)anthracene	53-70-3	1	µg/L		<1.0	<1.0	<1.0	<1.0	<1.0
Benzo(g.h.i)perylene	191-24-2	1	µg/L		<1.0	<1.0	<1.0	<1.0	<1.0
^ Sum of polycyclic aromatic hydrocarbons	----	0.5	µg/L		<0.5	<0.5	**3.4**	<0.5	<0.5
^ Benzo(a)pyrene TEQ (zero)	----	0.5	µg/L		<0.5	<0.5	<0.5	<0.5	<0.5
EP080/071: Total Petroleum Hydrocarbons									
C6 - C9 Fraction	----	20	µg/L		----	<20	**60**	**20**	----
C10 - C14 Fraction	----	50	µg/L		----	<50	**360**	<50	----
C10 - C14 Fraction	----	50	µg/L		<50	----	----	----	<50
C15 - C28 Fraction	----	100	µg/L		----	<100	**280**	**160**	----
C15 - C28 Fraction	----	100	µg/L		**110**	----	----	----	<100
C29 - C36 Fraction	----	50	µg/L		----	<50	<50	<50	----
C29 - C36 Fraction	----	50	µg/L		<50	----	----	----	<50
^ C10 - C36 Fraction (sum)	----	50	µg/L		----	<50	**640**	**160**	----

Analytical Results

Sub-Matrix: WATER (Matrix: WATER)				Client sample ID	GW35	GW38	GW24	GW28	GW31
				Client sampling date / time	[17-Nov-2015]	[17-Nov-2015]	[17-Nov-2015]	[17-Nov-2015]	[17-Nov-2015]
Compound	CAS Number	LOR	Unit		EM1517153-001	EM1517153-002	EM1517153-003	EM1517153-004	EM1517153-005
					Result	Result	Result	Result	Result
EP080/071: Total Petroleum Hydrocarbons - Continued									
^ C10 - C36 Fraction (sum)	----	50	µg/L		110	----	----	----	<50
EP080/071: Total Recoverable Hydrocarbons - NEPM 2013 Fractions									
C6 - C10 Fraction	C6_C10	20	µg/L		----	<20	80	20	----
^ C6 - C10 Fraction minus BTEX (F1)	C6_C10-BTEX	20	µg/L		----	<20	50	<20	----
>C10 - C16 Fraction	----	100	µg/L		----	<100	380	<100	----
>C10 - C16 Fraction	----	100	µg/L		<100	----	----	----	<100
>C16 - C34 Fraction	----	100	µg/L		----	<100	190	160	----
>C16 - C34 Fraction	----	100	µg/L		100	----	----	----	<100
>C34 - C40 Fraction	----	100	µg/L		----	<100	<100	<100	----
>C34 - C40 Fraction	----	100	µg/L		<100	----	----	----	<100
^ >C10 - C40 Fraction (sum)	----	100	µg/L		----	<100	570	160	----
^ >C10 - C40 Fraction (sum)	----	100	µg/L		100	----	----	----	<100
^ >C10 - C16 Fraction minus Naphthalene (F2)	----	100	µg/L		----	<100	380	<100	----
EP080: BTEXN									
Benzene	71-43-2	1	µg/L		----	<1	21	10	----
Toluene	108-88-3	2	µg/L		----	<2	4	5	----
Ethylbenzene	100-41-4	2	µg/L		----	<2	<2	<2	----
meta- & para-Xylene	108-38-3 106-42-3	2	µg/L		----	<2	8	<2	----
ortho-Xylene	95-47-6	2	µg/L		----	<2	<2	<2	----
^ Total Xylenes	1330-20-7	2	µg/L		----	<2	8	<2	----
^ Sum of BTEX	----	1	µg/L		----	<1	33	15	----
Naphthalene	91-20-3	5	µg/L		----	<5	<5	<5	----
EP074S: VOC Surrogates									
1.2-Dichloroethane-D4	17060-07-0	1	%		----	117	108	110	----
Toluene-D8	2037-26-5	1	%		----	111	111	116	----
4-Bromofluorobenzene	460-00-4	1	%		----	101	112	106	----
EP075(SIM)S: Phenolic Compound Surrogates									
Phenol-d6	13127-88-3	1	%		29.9	27.0	22.8	28.0	30.4
2-Chlorophenol-D4	93951-73-6	1	%		63.2	53.0	41.2	58.6	62.9
2.4.6-Tribromophenol	118-79-6	1	%		50.2	34.6	48.5	45.1	43.8
EP075(SIM)T: PAH Surrogates									
2-Fluorobiphenyl	321-60-8	1	%		74.6	64.4	61.0	68.0	71.1

Analytical Results

Sub-Matrix: WATER (Matrix: WATER)				Client sample ID	GW35	GW38	GW24	GW28	GW31
				Client sampling date / time	[17-Nov-2015]	[17-Nov-2015]	[17-Nov-2015]	[17-Nov-2015]	[17-Nov-2015]
Compound	CAS Number	LOR	Unit		EM1517153-001	EM1517153-002	EM1517153-003	EM1517153-004	EM1517153-005
					Result	Result	Result	Result	Result
EP075(SIM)T: PAH Surrogates - Continued									
Anthracene-d10	1719-06-8	1	%		**82.9**	**78.1**	**75.9**	**78.6**	**81.9**
4-Terphenyl-d14	1718-51-0	1	%		**75.8**	**66.3**	**74.4**	**71.6**	**72.4**
EP080S: TPH(V)/BTEX Surrogates									
1.2-Dichloroethane-D4	17060-07-0	2	%		**----**	**112**	**106**	**100**	**----**
Toluene-D8	2037-26-5	2	%		**----**	**99.2**	**106**	**72.9**	**----**
4-Bromofluorobenzene	460-00-4	2	%		**----**	**89.3**	**105**	**78.8**	**----**

Analytical Results

Sub-Matrix: WATER (Matrix: WATER)				Client sample ID	GW18	GW19	QCA	QCB	QCD
				Client sampling date / time	[17-Nov-2015]	[17-Nov-2015]	[16-Nov-2015]	[16-Nov-2015]	[16-Nov-2015]
Compound	CAS Number	LOR	Unit		EM1517153-006	EM1517153-007	EM1517153-008	EM1517153-009	EM1517153-011
					Result	Result	Result	Result	Result
EA005P: pH by PC Titrator									
pH Value	----	0.01	pH Unit		7.30	6.97	----	----	----
EA015: Total Dissolved Solids dried at 180 ± 5 °C									
Total Dissolved Solids @180°C	----	10	mg/L		23500	21400	----	----	----
ED037P: Alkalinity by PC Titrator									
Hydroxide Alkalinity as CaCO3	DMO-210-001	1	mg/L		<1	<1	----	----	----
Carbonate Alkalinity as CaCO3	3812-32-6	1	mg/L		<1	<1	----	----	----
Bicarbonate Alkalinity as CaCO3	71-52-3	1	mg/L		3070	2460	----	----	----
Total Alkalinity as CaCO3	----	1	mg/L		3070	2460	----	----	----
ED041G: Sulfate (Turbidimetric) as SO4 2- by DA									
Sulfate as SO4 - Turbidimetric	14808-79-8	1	mg/L		435	10	----	----	----
ED043: Total Oxidised Sulfur as SO4 2-									
Total Oxidised Sulfur as SO4 2-	----	1	mg/L		495	171	----	----	----
ED045G: Chloride by Discrete Analyser									
Chloride	16887-00-6	1	mg/L		12200	10500	----	----	----
ED093F: Dissolved Major Cations									
Calcium	7440-70-2	1	mg/L		355	258	----	----	----
Magnesium	7439-95-4	1	mg/L		975	843	----	----	----
Sodium	7440-23-5	1	mg/L		6770	5330	----	----	----
Potassium	7440-09-7	1	mg/L		182	158	----	----	----
EG020F: Dissolved Metals by ICP-MS									
Aluminium	7429-90-5	0.01	mg/L		0.03	0.03	----	----	----
Arsenic	7440-38-2	0.001	mg/L		0.023	0.004	----	----	----
Cadmium	7440-43-9	0.0001	mg/L		<0.0001	<0.0001	----	----	----
Chromium	7440-47-3	0.001	mg/L		0.012	0.014	----	----	----
Copper	7440-50-8	0.001	mg/L		<0.001	0.002	----	----	----
Nickel	7440-02-0	0.001	mg/L		0.004	0.087	----	----	----
Lead	7439-92-1	0.001	mg/L		<0.001	<0.001	----	----	----
Zinc	7440-66-6	0.005	mg/L		<0.005	0.070	----	----	----
Manganese	7439-96-5	0.001	mg/L		0.094	0.581	----	----	----
Selenium	7782-49-2	0.01	mg/L		<0.01	<0.01	----	----	----
Iron	7439-89-6	0.05	mg/L		<0.05	28.3	----	----	----
EG020T: Total Metals by ICP-MS									
Aluminium	7429-90-5	0.01	mg/L		----	----	<0.01	<0.01	<0.01
Arsenic	7440-38-2	0.001	mg/L		----	----	<0.001	<0.001	<0.001

Analytical Results

Sub-Matrix: WATER (Matrix: WATER)				Client sample ID	GW18	GW19	QCA	QCB	QCD
				Client sampling date / time	[17-Nov-2015]	[17-Nov-2015]	[16-Nov-2015]	[16-Nov-2015]	[16-Nov-2015]
Compound	CAS Number	LOR	Unit		EM1517153-006	EM1517153-007	EM1517153-008	EM1517153-009	EM1517153-011
					Result	Result	Result	Result	Result
EG020T: Total Metals by ICP-MS - Continued									
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
Nickel	7440-02-0	0.001	mg/L		----	----	<0.001	<0.001	<0.001
Lead	7439-92-1	0.001	mg/L		----	----	<0.001	<0.001	<0.001
Zinc	7440-66-6	0.005	mg/L		----	----	<0.005	<0.005	<0.005
Manganese	7439-96-5	0.001	mg/L		----	----	<0.001	<0.001	<0.001
Selenium	7782-49-2	0.01	mg/L		----	----	<0.01	<0.01	<0.01
Iron	7439-89-6	0.05	mg/L		----	----	<0.05	<0.05	<0.05
EG035F: Dissolved Mercury by FIMS									
Mercury	7439-97-6	0.0001	mg/L		<0.0001	<0.0001	----	----	----
EG035T: Total Recoverable Mercury by FIMS									
Mercury	7439-97-6	0.0001	mg/L		----	----	<0.0001	<0.0001	<0.0001
EK040P: Fluoride by PC Titrator									
Fluoride	16984-48-8	0.1	mg/L		**0.7**	**0.6**	----	----	----
EK055G: Ammonia as N by Discrete Analyser									
Ammonia as N	7664-41-7	0.01	mg/L		**30.5**	**35.2**	----	----	----
EK057G: Nitrite as N by Discrete Analyser									
Nitrite as N	14797-65-0	0.01	mg/L		<0.01	<0.01	----	----	----
EK058G: Nitrate as N by Discrete Analyser									
Nitrate as N	14797-55-8	0.01	mg/L		**0.07**	**0.02**	----	----	----
EK059G: Nitrite plus Nitrate as N (NOx) by Discrete Analyser									
Nitrite + Nitrate as N	----	0.01	mg/L		**0.07**	**0.02**	----	----	----
EK071G: Reactive Phosphorus as P by discrete analyser									
Reactive Phosphorus as P	14265-44-2	0.01	mg/L		**3.47**	**0.01**	----	----	----
EN055: Ionic Balance									
Total Anions	----	0.01	meq/L		**414**	**346**	----	----	----
Total Cations	----	0.01	meq/L		**397**	**318**	----	----	----
Ionic Balance	----	0.01	%		**2.17**	**4.15**	----	----	----
EP005: Total Organic Carbon (TOC)									
Total Organic Carbon	----	1	mg/L		**91**	----	----	----	----
EP074A: Monocyclic Aromatic Hydrocarbons									
Benzene	71-43-2	1	µg/L		<1	----	----	----	----

Analytical Results

Sub-Matrix: WATER (Matrix: WATER)				Client sample ID	GW18	GW19	QCA	QCB	QCD
				Client sampling date / time	[17-Nov-2015]	[17-Nov-2015]	[16-Nov-2015]	[16-Nov-2015]	[16-Nov-2015]
Compound	CAS Number	LOR	Unit		EM1517153-006	EM1517153-007	EM1517153-008	EM1517153-009	EM1517153-011
					Result	Result	Result	Result	Result
EP074A: Monocyclic Aromatic Hydrocarbons - Continued									
Toluene	108-88-3	1	µg/L		<1	----	----	----	----
Ethylbenzene	100-41-4	1	µg/L		<1	----	----	----	----
meta- & para-Xylene	108-38-3 106-42-3	1	µg/L		<1	----	----	----	----
Styrene	100-42-5	1	µg/L		<1	----	----	----	----
ortho-Xylene	95-47-6	1	µg/L		<1	----	----	----	----
Isopropylbenzene	98-82-8	1	µg/L		<1	----	----	----	----
n-Propylbenzene	103-65-1	1	µg/L		<1	----	----	----	----
1.3.5-Trimethylbenzene	108-67-8	1	µg/L		<1	----	----	----	----
sec-Butylbenzene	135-98-8	1	µg/L		<1	----	----	----	----
1.2.4-Trimethylbenzene	95-63-6	1	µg/L		<1	----	----	----	----
tert-Butylbenzene	98-06-6	1	µg/L		<1	----	----	----	----
p-Isopropyltoluene	99-87-6	1	µg/L		<1	----	----	----	----
n-Butylbenzene	104-51-8	1	µg/L		<1	----	----	----	----
EP074B: Oxygenated Compounds									
2-Propanone (Acetone)	67-64-1	10	µg/L		<10	----	----	----	----
Vinyl Acetate	108-05-4	10	µg/L		<10	----	----	----	----
2-Butanone (MEK)	78-93-3	10	µg/L		<10	----	----	----	----
4-Methyl-2-pentanone (MIBK)	108-10-1	10	µg/L		<10	----	----	----	----
2-Hexanone (MBK)	591-78-6	10	µg/L		<10	----	----	----	----
EP074C: Sulfonated Compounds									
Carbon disulfide	75-15-0	1	µg/L		5	----	----	----	----
EP074D: Fumigants									
2.2-Dichloropropane	594-20-7	1	µg/L		<1	----	----	----	----
1.2-Dichloropropane	78-87-5	1	µg/L		<1	----	----	----	----
cis-1.3-Dichloropropylene	10061-01-5	2	µg/L		<2	----	----	----	----
trans-1.3-Dichloropropylene	10061-02-6	2	µg/L		<2	----	----	----	----
1.2-Dibromoethane (EDB)	106-93-4	1	µg/L		<1	----	----	----	----
EP074E: Halogenated Aliphatic Compounds									
Dichlorodifluoromethane	75-71-8	10	µg/L		<10	----	----	----	----
Chloromethane	74-87-3	10	µg/L		<10	----	----	----	----
Vinyl chloride	75-01-4	10	µg/L		<10.0	----	----	----	----
Bromomethane	74-83-9	10	µg/L		<10	----	----	----	----
Chloroethane	75-00-3	10	µg/L		<10	----	----	----	----
Trichlorofluoromethane	75-69-4	10	µg/L		<10	----	----	----	----

Analytical Results

Sub-Matrix: WATER (Matrix: WATER)				Client sample ID	GW18	GW19	QCA	QCB	QCD
				Client sampling date / time	[17-Nov-2015]	[17-Nov-2015]	[16-Nov-2015]	[16-Nov-2015]	[16-Nov-2015]
Compound	CAS Number	LOR	Unit		EM1517153-006	EM1517153-007	EM1517153-008	EM1517153-009	EM1517153-011
					Result	Result	Result	Result	Result
EP074E: Halogenated Aliphatic Compounds - Continued									
1.1-Dichloroethene	75-35-4	1	µg/L		<1	----	----	----	----
Iodomethane	74-88-4	1	µg/L		<1	----	----	----	----
Methylene chloride	75-09-2	5	µg/L		<5	----	----	----	----
trans-1.2-Dichloroethene	156-60-5	1	µg/L		<1	----	----	----	----
1.1-Dichloroethane	75-34-3	1	µg/L		<1	----	----	----	----
cis-1.2-Dichloroethene	156-59-2	1	µg/L		<1	----	----	----	----
1.1.1-Trichloroethane	71-55-6	1	µg/L		<1	----	----	----	----
1.1-Dichloropropylene	563-58-6	1	µg/L		<1	----	----	----	----
Carbon Tetrachloride	56-23-5	1	µg/L		<1	----	----	----	----
1.2-Dichloroethane	107-06-2	1	µg/L		<1	----	----	----	----
Trichloroethene	79-01-6	1	µg/L		<1	----	----	----	----
Dibromomethane	74-95-3	1	µg/L		<1	----	----	----	----
1.1.2-Trichloroethane	79-00-5	1	µg/L		<1	----	----	----	----
1.3-Dichloropropane	142-28-9	1	µg/L		<1	----	----	----	----
Tetrachloroethene	127-18-4	1	µg/L		<1	----	----	----	----
1.1.1.2-Tetrachloroethane	630-20-6	1	µg/L		<1	----	----	----	----
trans-1.4-Dichloro-2-butene	110-57-6	1	µg/L		<1	----	----	----	----
cis-1.4-Dichloro-2-butene	1476-11-5	1	µg/L		<1	----	----	----	----
1.1.2.2-Tetrachloroethane	79-34-5	1	µg/L		<1	----	----	----	----
1.2.3-Trichloropropane	96-18-4	1	µg/L		<1	----	----	----	----
Pentachloroethane	76-01-7	1	µg/L		<1	----	----	----	----
1.2-Dibromo-3-chloropropane	96-12-8	1	µg/L		<1	----	----	----	----
Hexachlorobutadiene	87-68-3	1	µg/L		<1.0	----	----	----	----
EP074F: Halogenated Aromatic Compounds									
Chlorobenzene	108-90-7	1	µg/L		<1	----	----	----	----
Bromobenzene	108-86-1	1	µg/L		<1	----	----	----	----
2-Chlorotoluene	95-49-8	1	µg/L		<1	----	----	----	----
4-Chlorotoluene	106-43-4	1	µg/L		<1	----	----	----	----
1.3-Dichlorobenzene	541-73-1	1	µg/L		<1	----	----	----	----
1.4-Dichlorobenzene	106-46-7	1	µg/L		<1.0	----	----	----	----
1.2-Dichlorobenzene	95-50-1	1	µg/L		<1	----	----	----	----
1.2.4-Trichlorobenzene	120-82-1	1	µg/L		<1	----	----	----	----
1.2.3-Trichlorobenzene	87-61-6	1	µg/L		<1	----	----	----	----
EP074G: Trihalomethanes									

Analytical Results

Sub-Matrix: WATER (Matrix: WATER)				Client sample ID	GW18	GW19	QCA	QCB	QCD
				Client sampling date / time	[17-Nov-2015]	[17-Nov-2015]	[16-Nov-2015]	[16-Nov-2015]	[16-Nov-2015]
Compound	CAS Number	LOR	Unit		EM1517153-006	EM1517153-007	EM1517153-008	EM1517153-009	EM1517153-011
					Result	Result	Result	Result	Result
EP074G: Trihalomethanes - Continued									
Chloroform	67-66-3	1	µg/L		<1	----	----	----	----
Bromodichloromethane	75-27-4	1	µg/L		<1	----	----	----	----
Dibromochloromethane	124-48-1	1	µg/L		<1	----	----	----	----
Bromoform	75-25-2	1	µg/L		<1	----	----	----	----
EP074H: Naphthalene									
Naphthalene	91-20-3	5	µg/L		<5	----	----	----	----
EP075(SIM)B: Polynuclear Aromatic Hydrocarbons									
Naphthalene	91-20-3	1	µg/L		<1.0	<1.0	----	----	----
Acenaphthylene	208-96-8	1	µg/L		<1.0	<1.0	----	----	----
Acenaphthene	83-32-9	1	µg/L		<1.0	<1.0	----	----	----
Fluorene	86-73-7	1	µg/L		<1.0	<1.0	----	----	----
Phenanthrene	85-01-8	1	µg/L		<1.0	<1.0	----	----	----
Anthracene	120-12-7	1	µg/L		<1.0	<1.0	----	----	----
Fluoranthene	206-44-0	1	µg/L		<1.0	<1.0	----	----	----
Pyrene	129-00-0	1	µg/L		<1.0	<1.0	----	----	----
Benz(a)anthracene	56-55-3	1	µg/L		<1.0	<1.0	----	----	----
Chrysene	218-01-9	1	µg/L		<1.0	<1.0	----	----	----
Benzo(b+j)fluoranthene	205-99-2 205-82-3	1	µg/L		<1.0	<1.0	----	----	----
Benzo(k)fluoranthene	207-08-9	1	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	µg/L		<1.0	<1.0	----	----	----
Dibenz(a.h)anthracene	53-70-3	1	µg/L		<1.0	<1.0	----	----	----
Benzo(g.h.i)perylene	191-24-2	1	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	<20	<20
C10 - C14 Fraction	----	50	µg/L		**190**	----	<50	<50	<50
C10 - C14 Fraction	----	50	µg/L		----	<50	----	----	----
C15 - C28 Fraction	----	100	µg/L		**220**	----	<100	<100	<100
C15 - C28 Fraction	----	100	µg/L		----	**230**	----	----	----
C29 - C36 Fraction	----	50	µg/L		<50	----	<50	<50	<50
C29 - C36 Fraction	----	50	µg/L		----	**60**	----	----	----
^ C10 - C36 Fraction (sum)	----	50	µg/L		**410**	----	<50	<50	<50

Analytical Results

Sub-Matrix: WATER (Matrix: WATER)				Client sample ID	GW18	GW19	QCA	QCB	QCD
				Client sampling date / time	[17-Nov-2015]	[17-Nov-2015]	[16-Nov-2015]	[16-Nov-2015]	[16-Nov-2015]
Compound	CAS Number	LOR	Unit		EM1517153-006	EM1517153-007	EM1517153-008	EM1517153-009	EM1517153-011
					Result	Result	Result	Result	Result
EP080/071: Total Petroleum Hydrocarbons - Continued									
^ C10 - C36 Fraction (sum)	----	50	µg/L		----	290	----	----	----
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		220	----	<100	<100	<100
>C10 - C16 Fraction	----	100	µg/L		----	<100	----	----	----
>C16 - C34 Fraction	----	100	µg/L		210	----	<100	<100	<100
>C16 - C34 Fraction	----	100	µg/L		----	260	----	----	----
>C34 - C40 Fraction	----	100	µg/L		<100	----	<100	<100	<100
>C34 - C40 Fraction	----	100	µg/L		----	<100	----	----	----
^ >C10 - C40 Fraction (sum)	----	100	µg/L		430	----	<100	<100	<100
^ >C10 - C40 Fraction (sum)	----	100	µg/L		----	260	----	----	----
^ >C10 - C16 Fraction minus Naphthalene (F2)	----	100	µg/L		220	----	<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	1330-20-7	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
EP074S: VOC Surrogates									
1.2-Dichloroethane-D4	17060-07-0	1	%		90.8	----	----	----	----
Toluene-D8	2037-26-5	1	%		107	----	----	----	----
4-Bromofluorobenzene	460-00-4	1	%		110	----	----	----	----
EP075(SIM)S: Phenolic Compound Surrogates									
Phenol-d6	13127-88-3	1	%		31.7	24.4	----	----	----
2-Chlorophenol-D4	93951-73-6	1	%		59.2	50.9	----	----	----
2.4.6-Tribromophenol	118-79-6	1	%		46.4	39.9	----	----	----
EP075(SIM)T: PAH Surrogates									
2-Fluorobiphenyl	321-60-8	1	%		37.3	59.0	----	----	----

Analytical Results

Sub-Matrix: WATER (Matrix: WATER)				Client sample ID	GW18	GW19	QCA	QCB	QCD
				Client sampling date / time	[17-Nov-2015]	[17-Nov-2015]	[16-Nov-2015]	[16-Nov-2015]	[16-Nov-2015]
Compound	CAS Number	LOR	Unit		EM1517153-006	EM1517153-007	EM1517153-008	EM1517153-009	EM1517153-011
					Result	Result	Result	Result	Result
EP075(SIM)T: PAH Surrogates - Continued									
Anthracene-d10	1719-06-8	1	%		**75.8**	**70.8**	**----**	**----**	**----**
4-Terphenyl-d14	1718-51-0	1	%		**74.2**	**64.3**	**----**	**----**	**----**
EP080S: TPH(V)/BTEX Surrogates									
1.2-Dichloroethane-D4	17060-07-0	2	%		**89.2**	**----**	**101**	**105**	**104**
Toluene-D8	2037-26-5	2	%		**102**	**----**	**80.0**	**89.8**	**91.6**
4-Bromofluorobenzene	460-00-4	2	%		**104**	**----**	**80.1**	**85.1**	**84.1**

Analytical Results

Sub-Matrix: WATER (Matrix: WATER)				Client sample ID	QCE	QCF	QCG	QCH	GW36
				Client sampling date / time	[17-Nov-2015]	[17-Nov-2015]	[17-Nov-2015]	[17-Nov-2015]	[16-Nov-2015]
Compound	CAS Number	LOR	Unit		EM1517153-012	EM1517153-013	EM1517153-014	EM1517153-015	EM1517153-016
					Result	Result	Result	Result	Result
EA005P: pH by PC Titrator									
pH Value	----	0.01	pH Unit		----	----	----	----	**7.55**
EA015: Total Dissolved Solids dried at 180 ± 5 °C									
Total Dissolved Solids @180°C	----	10	mg/L		----	----	----	----	**724**
ED037P: Alkalinity by PC Titrator									
Hydroxide Alkalinity as CaCO3	DMO-210-001	1	mg/L		----	----	----	----	<1
Carbonate Alkalinity as CaCO3	3812-32-6	1	mg/L		----	----	----	----	<1
Bicarbonate Alkalinity as CaCO3	71-52-3	1	mg/L		----	----	----	----	**525**
Total Alkalinity as CaCO3	----	1	mg/L		----	----	----	----	**525**
ED041G: Sulfate (Turbidimetric) as SO4 2- by DA									
Sulfate as SO4 - Turbidimetric	14808-79-8	1	mg/L		----	----	----	----	**30**
ED043: Total Oxidised Sulfur as SO4 2-									
Total Oxidised Sulfur as SO4 2-	----	1	mg/L		----	----	----	----	**63**
ED045G: Chloride by Discrete Analyser									
Chloride	16887-00-6	1	mg/L		----	----	----	----	**35**
ED093F: Dissolved Major Cations									
Calcium	7440-70-2	1	mg/L		----	----	----	----	**52**
Magnesium	7439-95-4	1	mg/L		----	----	----	----	**38**
Sodium	7440-23-5	1	mg/L		----	----	----	----	**108**
Potassium	7440-09-7	1	mg/L		----	----	----	----	**22**
EG020F: Dissolved Metals by ICP-MS									
Aluminium	7429-90-5	0.01	mg/L		----	----	----	----	**0.03**
Arsenic	7440-38-2	0.001	mg/L		----	----	----	----	**0.004**
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
Nickel	7440-02-0	0.001	mg/L		----	----	----	----	**0.013**
Lead	7439-92-1	0.001	mg/L		----	----	----	----	**0.011**
Zinc	7440-66-6	0.005	mg/L		----	----	----	----	**0.020**
Manganese	7439-96-5	0.001	mg/L		----	----	----	----	**0.548**
Selenium	7782-49-2	0.01	mg/L		----	----	----	----	<0.01
Iron	7439-89-6	0.05	mg/L		----	----	----	----	**6.53**
EG020T: Total Metals by ICP-MS									
Aluminium	7429-90-5	0.01	mg/L		<0.01	<0.01	<0.01	----	----
Arsenic	7440-38-2	0.001	mg/L		<0.001	<0.001	<0.001	----	----

Analytical Results

Sub-Matrix: WATER (Matrix: WATER)				Client sample ID	QCE	QCF	QCG	QCH	GW36
				Client sampling date / time	[17-Nov-2015]	[17-Nov-2015]	[17-Nov-2015]	[17-Nov-2015]	[16-Nov-2015]
Compound	CAS Number	LOR	Unit		EM1517153-012	EM1517153-013	EM1517153-014	EM1517153-015	EM1517153-016
					Result	Result	Result	Result	Result
EG020T: Total Metals by ICP-MS - Continued									
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	----	----
Nickel	7440-02-0	0.001	mg/L		<0.001	<0.001	<0.001	----	----
Lead	7439-92-1	0.001	mg/L		<0.001	<0.001	<0.001	----	----
Zinc	7440-66-6	0.005	mg/L		<0.005	<0.005	<0.005	----	----
Manganese	7439-96-5	0.001	mg/L		<0.001	<0.001	<0.001	----	----
Selenium	7782-49-2	0.01	mg/L		<0.01	<0.01	<0.01	----	----
Iron	7439-89-6	0.05	mg/L		<0.05	<0.05	<0.05	----	----
EG035F: Dissolved Mercury by FIMS									
Mercury	7439-97-6	0.0001	mg/L		----	----	----	----	<0.0001
EG035T: Total Recoverable Mercury by FIMS									
Mercury	7439-97-6	0.0001	mg/L		<0.0001	<0.0001	<0.0001	----	----
EK040P: Fluoride by PC Titrator									
Fluoride	16984-48-8	0.1	mg/L		----	----	----	----	1.1
EK055G: Ammonia as N by Discrete Analyser									
Ammonia as N	7664-41-7	0.01	mg/L		----	----	----	----	2.01
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		----	----	----	----	0.04
EK059G: Nitrite plus Nitrate as N (NOx) by Discrete Analyser									
Nitrite + Nitrate as N	----	0.01	mg/L		----	----	----	----	0.04
EK071G: Reactive Phosphorus as P by discrete analyser									
Reactive Phosphorus as P	14265-44-2	0.01	mg/L		----	----	----	----	0.05
EN055: Ionic Balance									
Total Anions	----	0.01	meq/L		----	----	----	----	12.1
Total Cations	----	0.01	meq/L		----	----	----	----	11.0
Ionic Balance	----	0.01	%		----	----	----	----	4.87
EP005: Total Organic Carbon (TOC)									
Total Organic Carbon	----	1	mg/L		----	----	----	----	50
EP074A: Monocyclic Aromatic Hydrocarbons									
Benzene	71-43-2	1	µg/L		----	----	----	----	<1

Analytical Results

Sub-Matrix: WATER (Matrix: WATER)				Client sample ID	QCE	QCF	QCG	QCH	GW36
				Client sampling date / time	[17-Nov-2015]	[17-Nov-2015]	[17-Nov-2015]	[17-Nov-2015]	[16-Nov-2015]
Compound	CAS Number	LOR	Unit		EM1517153-012	EM1517153-013	EM1517153-014	EM1517153-015	EM1517153-016
					Result	Result	Result	Result	Result
EP074A: Monocyclic Aromatic Hydrocarbons - Continued									
Toluene	108-88-3	1	µg/L		----	----	----	----	<1
Ethylbenzene	100-41-4	1	µg/L		----	----	----	----	<1
meta- & para-Xylene	108-38-3 106-42-3	1	µg/L		----	----	----	----	<1
Styrene	100-42-5	1	µg/L		----	----	----	----	<1
ortho-Xylene	95-47-6	1	µg/L		----	----	----	----	<1
Isopropylbenzene	98-82-8	1	µg/L		----	----	----	----	<1
n-Propylbenzene	103-65-1	1	µg/L		----	----	----	----	<1
1.3.5-Trimethylbenzene	108-67-8	1	µg/L		----	----	----	----	<1
sec-Butylbenzene	135-98-8	1	µg/L		----	----	----	----	<1
1.2.4-Trimethylbenzene	95-63-6	1	µg/L		----	----	----	----	<1
tert-Butylbenzene	98-06-6	1	µg/L		----	----	----	----	<1
p-Isopropyltoluene	99-87-6	1	µg/L		----	----	----	----	<1
n-Butylbenzene	104-51-8	1	µg/L		----	----	----	----	<1
EP074B: Oxygenated Compounds									
2-Propanone (Acetone)	67-64-1	10	µg/L		----	----	----	----	<10
Vinyl Acetate	108-05-4	10	µg/L		----	----	----	----	<10
2-Butanone (MEK)	78-93-3	10	µg/L		----	----	----	----	<10
4-Methyl-2-pentanone (MIBK)	108-10-1	10	µg/L		----	----	----	----	<10
2-Hexanone (MBK)	591-78-6	10	µg/L		----	----	----	----	<10
EP074C: Sulfonated Compounds									
Carbon disulfide	75-15-0	1	µg/L		----	----	----	----	<1
EP074D: Fumigants									
2.2-Dichloropropane	594-20-7	1	µg/L		----	----	----	----	<1
1.2-Dichloropropane	78-87-5	1	µg/L		----	----	----	----	<1
cis-1.3-Dichloropropylene	10061-01-5	2	µg/L		----	----	----	----	<2
trans-1.3-Dichloropropylene	10061-02-6	2	µg/L		----	----	----	----	<2
1.2-Dibromoethane (EDB)	106-93-4	1	µg/L		----	----	----	----	<1
EP074E: Halogenated Aliphatic Compounds									
Dichlorodifluoromethane	75-71-8	10	µg/L		----	----	----	----	<10
Chloromethane	74-87-3	10	µg/L		----	----	----	----	<10
Vinyl chloride	75-01-4	10	µg/L		----	----	----	----	<10.0
Bromomethane	74-83-9	10	µg/L		----	----	----	----	<10
Chloroethane	75-00-3	10	µg/L		----	----	----	----	<10
Trichlorofluoromethane	75-69-4	10	µg/L		----	----	----	----	<10

Analytical Results

Sub-Matrix: WATER (Matrix: WATER)				Client sample ID	QCE	QCF	QCG	QCH	GW36
				Client sampling date / time	[17-Nov-2015]	[17-Nov-2015]	[17-Nov-2015]	[17-Nov-2015]	[16-Nov-2015]
Compound	CAS Number	LOR	Unit		EM1517153-012	EM1517153-013	EM1517153-014	EM1517153-015	EM1517153-016
					Result	Result	Result	Result	Result
EP074E: Halogenated Aliphatic Compounds - Continued									
1.1-Dichloroethene	75-35-4	1	µg/L		----	----	----	----	<1
Iodomethane	74-88-4	1	µg/L		----	----	----	----	<1
Methylene chloride	75-09-2	5	µg/L		----	----	----	----	<5
trans-1.2-Dichloroethene	156-60-5	1	µg/L		----	----	----	----	<1
1.1-Dichloroethane	75-34-3	1	µg/L		----	----	----	----	<1
cis-1.2-Dichloroethene	156-59-2	1	µg/L		----	----	----	----	<1
1.1.1-Trichloroethane	71-55-6	1	µg/L		----	----	----	----	<1
1.1-Dichloropropylene	563-58-6	1	µg/L		----	----	----	----	<1
Carbon Tetrachloride	56-23-5	1	µg/L		----	----	----	----	<1
1.2-Dichloroethane	107-06-2	1	µg/L		----	----	----	----	<1
Trichloroethene	79-01-6	1	µg/L		----	----	----	----	<1
Dibromomethane	74-95-3	1	µg/L		----	----	----	----	<1
1.1.2-Trichloroethane	79-00-5	1	µg/L		----	----	----	----	<1
1.3-Dichloropropane	142-28-9	1	µg/L		----	----	----	----	<1
Tetrachloroethene	127-18-4	1	µg/L		----	----	----	----	<1
1.1.1.2-Tetrachloroethane	630-20-6	1	µg/L		----	----	----	----	<1
trans-1.4-Dichloro-2-butene	110-57-6	1	µg/L		----	----	----	----	<1
cis-1.4-Dichloro-2-butene	1476-11-5	1	µg/L		----	----	----	----	<1
1.1.2.2-Tetrachloroethane	79-34-5	1	µg/L		----	----	----	----	<1
1.2.3-Trichloropropane	96-18-4	1	µg/L		----	----	----	----	<1
Pentachloroethane	76-01-7	1	µg/L		----	----	----	----	<1
1.2-Dibromo-3-chloropropane	96-12-8	1	µg/L		----	----	----	----	<1
Hexachlorobutadiene	87-68-3	1	µg/L		----	----	----	----	<1.0
EP074F: Halogenated Aromatic Compounds									
Chlorobenzene	108-90-7	1	µg/L		----	----	----	----	<1
Bromobenzene	108-86-1	1	µg/L		----	----	----	----	<1
2-Chlorotoluene	95-49-8	1	µg/L		----	----	----	----	<1
4-Chlorotoluene	106-43-4	1	µg/L		----	----	----	----	<1
1.3-Dichlorobenzene	541-73-1	1	µg/L		----	----	----	----	<1
1.4-Dichlorobenzene	106-46-7	1	µg/L		----	----	----	----	<1.0
1.2-Dichlorobenzene	95-50-1	1	µg/L		----	----	----	----	<1
1.2.4-Trichlorobenzene	120-82-1	1	µg/L		----	----	----	----	<1
1.2.3-Trichlorobenzene	87-61-6	1	µg/L		----	----	----	----	<1
EP074G: Trihalomethanes									

Analytical Results

Sub-Matrix: WATER (Matrix: WATER)				Client sample ID	QCE	QCF	QCG	QCH	GW36
				Client sampling date / time	[17-Nov-2015]	[17-Nov-2015]	[17-Nov-2015]	[17-Nov-2015]	[16-Nov-2015]
Compound	CAS Number	LOR	Unit		EM1517153-012	EM1517153-013	EM1517153-014	EM1517153-015	EM1517153-016
					Result	Result	Result	Result	Result
EP074G: Trihalomethanes - Continued									
Chloroform	67-66-3	1	µg/L		----	----	----	----	<1
Bromodichloromethane	75-27-4	1	µg/L		----	----	----	----	<1
Dibromochloromethane	124-48-1	1	µg/L		----	----	----	----	<1
Bromoform	75-25-2	1	µg/L		----	----	----	----	<1
EP074H: Naphthalene									
Naphthalene	91-20-3	5	µg/L		----	----	----	----	<5
EP075(SIM)B: Polynuclear Aromatic Hydrocarbons									
Naphthalene	91-20-3	1	µg/L		----	----	----	----	<1.0
Acenaphthylene	208-96-8	1	µg/L		----	----	----	----	<1.0
Acenaphthene	83-32-9	1	µg/L		----	----	----	----	<1.0
Fluorene	86-73-7	1	µg/L		----	----	----	----	<1.0
Phenanthrene	85-01-8	1	µg/L		----	----	----	----	<1.0
Anthracene	120-12-7	1	µg/L		----	----	----	----	<1.0
Fluoranthene	206-44-0	1	µg/L		----	----	----	----	<1.0
Pyrene	129-00-0	1	µg/L		----	----	----	----	<1.0
Benz(a)anthracene	56-55-3	1	µg/L		----	----	----	----	<1.0
Chrysene	218-01-9	1	µg/L		----	----	----	----	<1.0
Benzo(b+j)fluoranthene	205-99-2 205-82-3	1	µg/L		----	----	----	----	<1.0
Benzo(k)fluoranthene	207-08-9	1	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	µg/L		----	----	----	----	<1.0
Dibenz(a.h)anthracene	53-70-3	1	µg/L		----	----	----	----	<1.0
Benzo(g.h.i)perylene	191-24-2	1	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	<20	<20	<20	<20
C10 - C14 Fraction	----	50	µg/L		<50	<50	<50	----	<50
C10 - C14 Fraction	----	50	µg/L		----	----	----	----	----
C15 - C28 Fraction	----	100	µg/L		<100	<100	<100	----	<100
C15 - C28 Fraction	----	100	µg/L		----	----	----	----	----
C29 - C36 Fraction	----	50	µg/L		<50	<50	<50	----	<50
C29 - C36 Fraction	----	50	µg/L		----	----	----	----	----
^ C10 - C36 Fraction (sum)	----	50	µg/L		<50	<50	<50	----	<50

Analytical Results

Sub-Matrix: WATER (Matrix: WATER)				Client sample ID	QCE	QCF	QCG	QCH	GW36
				Client sampling date / time	[17-Nov-2015]	[17-Nov-2015]	[17-Nov-2015]	[17-Nov-2015]	[16-Nov-2015]
Compound	CAS Number	LOR	Unit		EM1517153-012	EM1517153-013	EM1517153-014	EM1517153-015	EM1517153-016
					Result	Result	Result	Result	Result
EP080/071: Total Petroleum Hydrocarbons - Continued									
^ C10 - C36 Fraction (sum)	----	50	µg/L		----	----	----	----	----
EP080/071: Total Recoverable Hydrocarbons - NEPM 2013 Fractions									
C6 - C10 Fraction	C6_C10	20	µg/L		<20	<20	<20	<20	<20
^ C6 - C10 Fraction minus BTEX (F1)	C6_C10-BTEX	20	µg/L		<20	<20	<20	<20	<20
>C10 - C16 Fraction	----	100	µg/L		<100	<100	<100	----	<100
>C10 - C16 Fraction	----	100	µg/L		----	----	----	----	----
>C16 - C34 Fraction	----	100	µg/L		<100	<100	<100	----	<100
>C16 - C34 Fraction	----	100	µg/L		----	----	----	----	----
>C34 - C40 Fraction	----	100	µg/L		<100	<100	<100	----	<100
>C34 - C40 Fraction	----	100	µg/L		----	----	----	----	----
^ >C10 - C40 Fraction (sum)	----	100	µg/L		<100	<100	<100	----	<100
^ >C10 - C40 Fraction (sum)	----	100	µg/L		----	----	----	----	----
^ >C10 - C16 Fraction minus Naphthalene (F2)	----	100	µg/L		<100	<100	<100	----	<100
EP080: BTEXN									
Benzene	71-43-2	1	µg/L		<1	<1	<1	<1	<1
Toluene	108-88-3	2	µg/L		<2	<2	<2	<2	<2
Ethylbenzene	100-41-4	2	µg/L		<2	<2	<2	<2	<2
meta- & para-Xylene	108-38-3 106-42-3	2	µg/L		<2	<2	<2	<2	<2
ortho-Xylene	95-47-6	2	µg/L		<2	<2	<2	<2	<2
^ Total Xylenes	1330-20-7	2	µg/L		<2	<2	<2	<2	<2
^ Sum of BTEX	----	1	µg/L		<1	<1	<1	<1	<1
Naphthalene	91-20-3	5	µg/L		<5	<5	<5	<5	<5
EP074S: VOC Surrogates									
1.2-Dichloroethane-D4	17060-07-0	1	%		----	----	----	----	112
Toluene-D8	2037-26-5	1	%		----	----	----	----	103
4-Bromofluorobenzene	460-00-4	1	%		----	----	----	----	95.8
EP075(SIM)S: Phenolic Compound Surrogates									
Phenol-d6	13127-88-3	1	%		----	----	----	----	30.5
2-Chlorophenol-D4	93951-73-6	1	%		----	----	----	----	63.8
2.4.6-Tribromophenol	118-79-6	1	%		----	----	----	----	44.4
EP075(SIM)T: PAH Surrogates									
2-Fluorobiphenyl	321-60-8	1	%		----	----	----	----	70.0

Analytical Results

Sub-Matrix: WATER (Matrix: WATER)				Client sample ID	QCE	QCF	QCG	QCH	GW36
				Client sampling date / time	[17-Nov-2015]	[17-Nov-2015]	[17-Nov-2015]	[17-Nov-2015]	[16-Nov-2015]
Compound	CAS Number	LOR	Unit		EM1517153-012	EM1517153-013	EM1517153-014	EM1517153-015	EM1517153-016
					Result	Result	Result	Result	Result
EP075(SIM)T: PAH Surrogates - Continued									
Anthracene-d10	1719-06-8	1	%		----	----	----	----	**81.8**
4-Terphenyl-d14	1718-51-0	1	%		----	----	----	----	**73.4**
EP080S: TPH(V)/BTEX Surrogates									
1.2-Dichloroethane-D4	17060-07-0	2	%		**98.4**	**103**	**91.6**	**110**	**107**
Toluene-D8	2037-26-5	2	%		**73.9**	**95.6**	**63.8**	**96.6**	**92.0**
4-Bromofluorobenzene	460-00-4	2	%		**75.8**	**86.7**	**67.6**	**86.6**	**84.3**

Analytical Results

Sub-Matrix: WATER (Matrix: WATER)				Client sample ID	GW33	GW34	GW37	----	----
				Client sampling date / time	[16-Nov-2015]	[16-Nov-2015]	[16-Nov-2015]	----	----
Compound	CAS Number	LOR	Unit		EM1517153-017	EM1517153-018	EM1517153-019	--------	--------
					Result	Result	Result	Result	Result
EA005P: pH by PC Titrator									
pH Value	----	0.01	pH Unit		7.63	7.19	7.76	----	----
EA015: Total Dissolved Solids dried at 180 ± 5 °C									
Total Dissolved Solids @180°C	----	10	mg/L		837	2760	914	----	----
ED037P: Alkalinity by PC Titrator									
Hydroxide Alkalinity as CaCO3	DMO-210-001	1	mg/L		<1	<1	<1	----	----
Carbonate Alkalinity as CaCO3	3812-32-6	1	mg/L		<1	<1	<1	----	----
Bicarbonate Alkalinity as CaCO3	71-52-3	1	mg/L		774	598	613	----	----
Total Alkalinity as CaCO3	----	1	mg/L		774	598	613	----	----
ED041G: Sulfate (Turbidimetric) as SO4 2- by DA									
Sulfate as SO4 - Turbidimetric	14808-79-8	1	mg/L		2	196	141	----	----
ED043: Total Oxidised Sulfur as SO4 2-									
Total Oxidised Sulfur as SO4 2-	----	1	mg/L		<10	238	----	----	----
ED045G: Chloride by Discrete Analyser									
Chloride	16887-00-6	1	mg/L		94	977	22	----	----
ED093F: Dissolved Major Cations									
Calcium	7440-70-2	1	mg/L		133	87	14	----	----
Magnesium	7439-95-4	1	mg/L		72	95	22	----	----
Sodium	7440-23-5	1	mg/L		55	627	248	----	----
Potassium	7440-09-7	1	mg/L		23	44	24	----	----
EG020F: Dissolved Metals by ICP-MS									
Aluminium	7429-90-5	0.01	mg/L		0.01	0.01	0.02	----	----
Arsenic	7440-38-2	0.001	mg/L		0.015	0.003	0.002	----	----
Cadmium	7440-43-9	0.0001	mg/L		<0.0001	<0.0001	<0.0001	----	----
Chromium	7440-47-3	0.001	mg/L		<0.001	0.005	<0.001	----	----
Copper	7440-50-8	0.001	mg/L		0.001	<0.001	0.002	----	----
Nickel	7440-02-0	0.001	mg/L		0.004	0.009	0.014	----	----
Lead	7439-92-1	0.001	mg/L		0.002	<0.001	<0.001	----	----
Zinc	7440-66-6	0.005	mg/L		0.013	<0.005	0.014	----	----
Manganese	7439-96-5	0.001	mg/L		0.359	0.083	0.109	----	----
Selenium	7782-49-2	0.01	mg/L		<0.01	<0.01	<0.01	----	----
Iron	7439-89-6	0.05	mg/L		21.7	0.18	<0.05	----	----
EG020T: Total Metals by ICP-MS									
Aluminium	7429-90-5	0.01	mg/L		----	----	----	----	----
Arsenic	7440-38-2	0.001	mg/L		----	----	----	----	----

Analytical Results

Sub-Matrix: WATER (Matrix: WATER)				Client sample ID	GW33	GW34	GW37	----	----
				Client sampling date / time	[16-Nov-2015]	[16-Nov-2015]	[16-Nov-2015]	----	----
Compound	CAS Number	LOR	Unit		EM1517153-017	EM1517153-018	EM1517153-019	--------	--------
					Result	Result	Result	Result	Result
EG020T: Total Metals by ICP-MS - Continued									
Cadmium	7440-43-9	0.0001	mg/L		----	----	----	----	----
Chromium	7440-47-3	0.001	mg/L		----	----	----	----	----
Copper	7440-50-8	0.001	mg/L		----	----	----	----	----
Nickel	7440-02-0	0.001	mg/L		----	----	----	----	----
Lead	7439-92-1	0.001	mg/L		----	----	----	----	----
Zinc	7440-66-6	0.005	mg/L		----	----	----	----	----
Manganese	7439-96-5	0.001	mg/L		----	----	----	----	----
Selenium	7782-49-2	0.01	mg/L		----	----	----	----	----
Iron	7439-89-6	0.05	mg/L		----	----	----	----	----
EG035F: Dissolved Mercury by FIMS									
Mercury	7439-97-6	0.0001	mg/L		<0.0001	<0.0001	<0.0001	----	----
EG035T: Total Recoverable Mercury by FIMS									
Mercury	7439-97-6	0.0001	mg/L		----	----	----	----	----
EK040P: Fluoride by PC Titrator									
Fluoride	16984-48-8	0.1	mg/L		**0.2**	**0.5**	**1.0**	----	----
EK055G: Ammonia as N by Discrete Analyser									
Ammonia as N	7664-41-7	0.01	mg/L		**9.35**	**8.50**	**0.09**	----	----
EK057G: Nitrite as N by Discrete Analyser									
Nitrite as N	14797-65-0	0.01	mg/L		<0.01	<0.01	**0.48**	----	----
EK058G: Nitrate as N by Discrete Analyser									
Nitrate as N	14797-55-8	0.01	mg/L		**0.04**	**0.04**	**0.21**	----	----
EK059G: Nitrite plus Nitrate as N (NOx) by Discrete Analyser									
Nitrite + Nitrate as N	----	0.01	mg/L		**0.04**	**0.04**	**0.69**	----	----
EK071G: Reactive Phosphorus as P by discrete analyser									
Reactive Phosphorus as P	14265-44-2	0.01	mg/L		<0.01	**0.66**	<0.01	----	----
EN055: Ionic Balance									
Total Anions	----	0.01	meq/L		**18.2**	**43.6**	**15.8**	----	----
Total Cations	----	0.01	meq/L		**15.5**	**40.6**	**13.9**	----	----
Ionic Balance	----	0.01	%		**7.76**	**3.62**	**6.42**	----	----
EP005: Total Organic Carbon (TOC)									
Total Organic Carbon	----	1	mg/L		----	----	----	----	----
EP074A: Monocyclic Aromatic Hydrocarbons									
Benzene	71-43-2	1	µg/L		----	----	----	----	----

Analytical Results

Sub-Matrix: WATER (Matrix: WATER)				Client sample ID	GW33	GW34	GW37	----	----
				Client sampling date / time	[16-Nov-2015]	[16-Nov-2015]	[16-Nov-2015]	----	----
Compound	CAS Number	LOR	Unit		EM1517153-017	EM1517153-018	EM1517153-019	--------	--------
					Result	Result	Result	Result	Result
EP074A: Monocyclic Aromatic Hydrocarbons - Continued									
Toluene	108-88-3	1	µg/L		----	----	----	----	----
Ethylbenzene	100-41-4	1	µg/L		----	----	----	----	----
meta- & para-Xylene	108-38-3 106-42-3	1	µg/L		----	----	----	----	----
Styrene	100-42-5	1	µg/L		----	----	----	----	----
ortho-Xylene	95-47-6	1	µg/L		----	----	----	----	----
Isopropylbenzene	98-82-8	1	µg/L		----	----	----	----	----
n-Propylbenzene	103-65-1	1	µg/L		----	----	----	----	----
1.3.5-Trimethylbenzene	108-67-8	1	µg/L		----	----	----	----	----
sec-Butylbenzene	135-98-8	1	µg/L		----	----	----	----	----
1.2.4-Trimethylbenzene	95-63-6	1	µg/L		----	----	----	----	----
tert-Butylbenzene	98-06-6	1	µg/L		----	----	----	----	----
p-Isopropyltoluene	99-87-6	1	µg/L		----	----	----	----	----
n-Butylbenzene	104-51-8	1	µg/L		----	----	----	----	----
EP074B: Oxygenated Compounds									
2-Propanone (Acetone)	67-64-1	10	µg/L		----	----	----	----	----
Vinyl Acetate	108-05-4	10	µg/L		----	----	----	----	----
2-Butanone (MEK)	78-93-3	10	µg/L		----	----	----	----	----
4-Methyl-2-pentanone (MIBK)	108-10-1	10	µg/L		----	----	----	----	----
2-Hexanone (MBK)	591-78-6	10	µg/L		----	----	----	----	----
EP074C: Sulfonated Compounds									
Carbon disulfide	75-15-0	1	µg/L		----	----	----	----	----
EP074D: Fumigants									
2.2-Dichloropropane	594-20-7	1	µg/L		----	----	----	----	----
1.2-Dichloropropane	78-87-5	1	µg/L		----	----	----	----	----
cis-1.3-Dichloropropylene	10061-01-5	2	µg/L		----	----	----	----	----
trans-1.3-Dichloropropylene	10061-02-6	2	µg/L		----	----	----	----	----
1.2-Dibromoethane (EDB)	106-93-4	1	µg/L		----	----	----	----	----
EP074E: Halogenated Aliphatic Compounds									
Dichlorodifluoromethane	75-71-8	10	µg/L		----	----	----	----	----
Chloromethane	74-87-3	10	µg/L		----	----	----	----	----
Vinyl chloride	75-01-4	10	µg/L		----	----	----	----	----
Bromomethane	74-83-9	10	µg/L		----	----	----	----	----
Chloroethane	75-00-3	10	µg/L		----	----	----	----	----
Trichlorofluoromethane	75-69-4	10	µg/L		----	----	----	----	----

Analytical Results

Sub-Matrix: WATER (Matrix: WATER)				Client sample ID	GW33	GW34	GW37	----	----
				Client sampling date / time	[16-Nov-2015]	[16-Nov-2015]	[16-Nov-2015]	----	----
Compound	CAS Number	LOR	Unit		EM1517153-017	EM1517153-018	EM1517153-019	--------	--------
					Result	Result	Result	Result	Result
EP074E: Halogenated Aliphatic Compounds - Continued									
1.1-Dichloroethene	75-35-4	1	µg/L		----	----	----	----	----
Iodomethane	74-88-4	1	µg/L		----	----	----	----	----
Methylene chloride	75-09-2	5	µg/L		----	----	----	----	----
trans-1.2-Dichloroethene	156-60-5	1	µg/L		----	----	----	----	----
1.1-Dichloroethane	75-34-3	1	µg/L		----	----	----	----	----
cis-1.2-Dichloroethene	156-59-2	1	µg/L		----	----	----	----	----
1.1.1-Trichloroethane	71-55-6	1	µg/L		----	----	----	----	----
1.1-Dichloropropylene	563-58-6	1	µg/L		----	----	----	----	----
Carbon Tetrachloride	56-23-5	1	µg/L		----	----	----	----	----
1.2-Dichloroethane	107-06-2	1	µg/L		----	----	----	----	----
Trichloroethene	79-01-6	1	µg/L		----	----	----	----	----
Dibromomethane	74-95-3	1	µg/L		----	----	----	----	----
1.1.2-Trichloroethane	79-00-5	1	µg/L		----	----	----	----	----
1.3-Dichloropropane	142-28-9	1	µg/L		----	----	----	----	----
Tetrachloroethene	127-18-4	1	µg/L		----	----	----	----	----
1.1.1.2-Tetrachloroethane	630-20-6	1	µg/L		----	----	----	----	----
trans-1.4-Dichloro-2-butene	110-57-6	1	µg/L		----	----	----	----	----
cis-1.4-Dichloro-2-butene	1476-11-5	1	µg/L		----	----	----	----	----
1.1.2.2-Tetrachloroethane	79-34-5	1	µg/L		----	----	----	----	----
1.2.3-Trichloropropane	96-18-4	1	µg/L		----	----	----	----	----
Pentachloroethane	76-01-7	1	µg/L		----	----	----	----	----
1.2-Dibromo-3-chloropropane	96-12-8	1	µg/L		----	----	----	----	----
Hexachlorobutadiene	87-68-3	1	µg/L		----	----	----	----	----
EP074F: Halogenated Aromatic Compounds									
Chlorobenzene	108-90-7	1	µg/L		----	----	----	----	----
Bromobenzene	108-86-1	1	µg/L		----	----	----	----	----
2-Chlorotoluene	95-49-8	1	µg/L		----	----	----	----	----
4-Chlorotoluene	106-43-4	1	µg/L		----	----	----	----	----
1.3-Dichlorobenzene	541-73-1	1	µg/L		----	----	----	----	----
1.4-Dichlorobenzene	106-46-7	1	µg/L		----	----	----	----	----
1.2-Dichlorobenzene	95-50-1	1	µg/L		----	----	----	----	----
1.2.4-Trichlorobenzene	120-82-1	1	µg/L		----	----	----	----	----
1.2.3-Trichlorobenzene	87-61-6	1	µg/L		----	----	----	----	----
EP074G: Trihalomethanes									

Analytical Results

Sub-Matrix: WATER (Matrix: WATER)				Client sample ID	GW33	GW34	GW37	----	----
				Client sampling date / time	[16-Nov-2015]	[16-Nov-2015]	[16-Nov-2015]	----	----
Compound	CAS Number	LOR	Unit		EM1517153-017	EM1517153-018	EM1517153-019	--------	--------
					Result	Result	Result	Result	Result
EP074G: Trihalomethanes - Continued									
Chloroform	67-66-3	1	µg/L		----	----	----	----	----
Bromodichloromethane	75-27-4	1	µg/L		----	----	----	----	----
Dibromochloromethane	124-48-1	1	µg/L		----	----	----	----	----
Bromoform	75-25-2	1	µg/L		----	----	----	----	----
EP074H: Naphthalene									
Naphthalene	91-20-3	5	µg/L		----	----	----	----	----
EP075(SIM)B: Polynuclear Aromatic Hydrocarbons									
Naphthalene	91-20-3	1	µg/L		<1.0	<1.0	<1.0	----	----
Acenaphthylene	208-96-8	1	µg/L		<1.0	<1.0	<1.0	----	----
Acenaphthene	83-32-9	1	µg/L		<1.0	<1.0	<1.0	----	----
Fluorene	86-73-7	1	µg/L		<1.0	<1.0	<1.0	----	----
Phenanthrene	85-01-8	1	µg/L		<1.0	<1.0	<1.0	----	----
Anthracene	120-12-7	1	µg/L		<1.0	<1.0	<1.0	----	----
Fluoranthene	206-44-0	1	µg/L		<1.0	<1.0	<1.0	----	----
Pyrene	129-00-0	1	µg/L		<1.0	<1.0	<1.0	----	----
Benz(a)anthracene	56-55-3	1	µg/L		<1.0	<1.0	<1.0	----	----
Chrysene	218-01-9	1	µg/L		<1.0	<1.0	<1.0	----	----
Benzo(b+j)fluoranthene	205-99-2 205-82-3	1	µg/L		<1.0	<1.0	<1.0	----	----
Benzo(k)fluoranthene	207-08-9	1	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	µg/L		<1.0	<1.0	<1.0	----	----
Dibenz(a.h)anthracene	53-70-3	1	µg/L		<1.0	<1.0	<1.0	----	----
Benzo(g.h.i)perylene	191-24-2	1	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	----	----	----
C10 - C14 Fraction	----	50	µg/L		----	<50	----	----	----
C10 - C14 Fraction	----	50	µg/L		<50	----	<50	----	----
C15 - C28 Fraction	----	100	µg/L		----	<100	----	----	----
C15 - C28 Fraction	----	100	µg/L		<100	----	<100	----	----
C29 - C36 Fraction	----	50	µg/L		----	<50	----	----	----
C29 - C36 Fraction	----	50	µg/L		<50	----	<50	----	----
^ C10 - C36 Fraction (sum)	----	50	µg/L		----	<50	----	----	----

Analytical Results

Sub-Matrix: WATER (Matrix: WATER)				Client sample ID	GW33	GW34	GW37	----	----
				Client sampling date / time	[16-Nov-2015]	[16-Nov-2015]	[16-Nov-2015]	----	----
Compound	CAS Number	LOR	Unit		EM1517153-017	EM1517153-018	EM1517153-019	--------	--------
					Result	Result	Result	Result	Result
EP080/071: Total Petroleum Hydrocarbons - Continued									
^ C10 - C36 Fraction (sum)	----	50	µg/L		<50	----	<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	----	----	----
>C10 - C16 Fraction	----	100	µg/L		<100	----	<100	----	----
>C16 - C34 Fraction	----	100	µg/L		----	<100	----	----	----
>C16 - C34 Fraction	----	100	µg/L		<100	----	<100	----	----
>C34 - C40 Fraction	----	100	µg/L		----	<100	----	----	----
>C34 - C40 Fraction	----	100	µg/L		<100	----	<100	----	----
^ >C10 - C40 Fraction (sum)	----	100	µg/L		----	<100	----	----	----
^ >C10 - C40 Fraction (sum)	----	100	µg/L		<100	----	<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	1330-20-7	2	µg/L		----	<2	----	----	----
^ Sum of BTEX	----	1	µg/L		----	<1	----	----	----
Naphthalene	91-20-3	5	µg/L		----	<5	----	----	----
EP074S: VOC Surrogates									
1.2-Dichloroethane-D4	17060-07-0	1	%		----	----	----	----	----
Toluene-D8	2037-26-5	1	%		----	----	----	----	----
4-Bromofluorobenzene	460-00-4	1	%		----	----	----	----	----
EP075(SIM)S: Phenolic Compound Surrogates									
Phenol-d6	13127-88-3	1	%		28.4	31.8	29.7	----	----
2-Chlorophenol-D4	93951-73-6	1	%		61.0	65.3	64.4	----	----
2.4.6-Tribromophenol	118-79-6	1	%		43.1	47.3	42.3	----	----
EP075(SIM)T: PAH Surrogates									
2-Fluorobiphenyl	321-60-8	1	%		75.5	73.7	76.4	----	----

Analytical Results

Sub-Matrix: WATER (Matrix: WATER)				Client sample ID	GW33	GW34	GW37	----	----
				Client sampling date / time	[16-Nov-2015]	[16-Nov-2015]	[16-Nov-2015]	----	----
Compound	CAS Number	LOR	Unit		EM1517153-017	EM1517153-018	EM1517153-019	--------	--------
					Result	Result	Result	Result	Result
EP075(SIM)T: PAH Surrogates - Continued									
Anthracene-d10	1719-06-8	1	%		**83.3**	**85.3**	**90.4**	**----**	**----**
4-Terphenyl-d14	1718-51-0	1	%		**75.4**	**77.9**	**78.0**	**----**	**----**
EP080S: TPH(V)/BTEX Surrogates									
1.2-Dichloroethane-D4	17060-07-0	2	%		**----**	**105**	**----**	**----**	**----**
Toluene-D8	2037-26-5	2	%		**----**	**105**	**----**	**----**	**----**
4-Bromofluorobenzene	460-00-4	2	%		**----**	**100**	**----**	**----**	**----**

ALS Environmental

QUALITY CONTROL REPORT

Work Order	: **EM1517153**	Page	: 1 of 17
Client	: **AECOM Australia Pty Ltd**	Laboratory	: Environmental Division Melbourne
Contact	: MS AVERYLL COYNE	Contact	: Carol Walsh
Address	: LEVEL 9 8 EXHIBITION ST MELBOURNE VIC 3000	Address	: 4 Westall Rd Springvale VIC Australia 3171
E-mail	: averyll.coyne@aecom.com	E-mail	: carol.walsh@alsglobal.com
Telephone	: +61 03 9653 1234	Telephone	: +61-3-8549 9608
Facsimile	: +61 03 9654 7117	Facsimile	: +61-3-8549 9601
Project	: 60431087	QC Level	: NEPM 2013 B3 & ALS QC Standard
Order number	: 60431087 1.4	Date Samples Received	: 17-Nov-2015
C-O-C number	: ----	Date Analysis Commenced	: 18-Nov-2015
Sampler	: OLIVER TAYLOR, ZACHARY OCONNOR	Issue Date	: 26-Nov-2015
Site	: FBURA	No. of samples received	: 18
Quote number	: ----	No. of samples analysed	: 18

This report supersedes any previous report(s) with this reference. Results apply to the sample(s) as submitted.

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

NATA WORLD RECOGNISED ACCREDITATION

NATA Accredited Laboratory 825

Accredited for compliance with ISO/IEC 17025.

Signatories

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

Signatories	*Position*	*Accreditation Category*
Chris Lemaitre	Non-Metals Team Leader	Melbourne Inorganics
Dilani Fernando	Senior Inorganic Chemist	Melbourne Inorganics
Xing Lin	Senior Organic Chemist	Melbourne Organics

General Comments

The analytical procedures used by the Environmental Division have been developed from established internationally recognized procedures such as those published by the USEPA, APHA, AS and NEPM. In house developed procedures are employed in the absence of documented standards or by 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

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	*Client sample ID*	*Method: Compound*	*CAS Number*	*LOR*	*Unit*	*Original Result*	*Duplicate Result*	*RPD (%)*	*Recovery Limits (%)*
EA005P: pH by PC Titrator (QC Lot: 281043)									
EM1517153-002	GW38	EA005-P: pH Value	----	0.01	pH Unit	8.11	8.12	0.123	0% - 20%
EM1517153-019	GW37	EA005-P: pH Value	----	0.01	pH Unit	7.76	7.76	0.00	0% - 20%
EA015: Total Dissolved Solids dried at 180 ± 5 °C (QC Lot: 283976)									
EM1517147-005	Anonymous	EA015H: Total Dissolved Solids @180°C	----	10	mg/L	162	154	5.06	0% - 50%
EM1517153-004	GW28	EA015H: Total Dissolved Solids @180°C	----	10	mg/L	1200	1280	6.31	0% - 20%
ED037P: Alkalinity by PC Titrator (QC Lot: 281042)									
EM1517151-002	Anonymous	ED037-P: Bicarbonate Alkalinity as CaCO3	71-52-3	1	mg/L	61	50	19.2	0% - 20%
		ED037-P: Carbonate Alkalinity as CaCO3	3812-32-6	1	mg/L	<1	<1	0.00	No Limit
		ED037-P: Hydroxide Alkalinity as CaCO3	DMO-210-001	1	mg/L	<1	<1	0.00	No Limit
		ED037-P: Total Alkalinity as CaCO3	----	1	mg/L	61	50	19.2	0% - 20%
EM1517153-002	GW38	ED037-P: Bicarbonate Alkalinity as CaCO3	71-52-3	1	mg/L	918	920	0.141	0% - 20%
		ED037-P: Carbonate Alkalinity as CaCO3	3812-32-6	1	mg/L	<1	<1	0.00	No Limit
		ED037-P: Hydroxide Alkalinity as CaCO3	DMO-210-001	1	mg/L	<1	<1	0.00	No Limit
		ED037-P: Total Alkalinity as CaCO3	----	1	mg/L	918	920	0.141	0% - 20%
ED037P: Alkalinity by PC Titrator (QC Lot: 281044)									
EM1517153-019	GW37	ED037-P: Bicarbonate Alkalinity as CaCO3	71-52-3	1	mg/L	613	603	1.55	0% - 20%
		ED037-P: Carbonate Alkalinity as CaCO3	3812-32-6	1	mg/L	<1	<1	0.00	No Limit
		ED037-P: Hydroxide Alkalinity as CaCO3	DMO-210-001	1	mg/L	<1	<1	0.00	No Limit
		ED037-P: Total Alkalinity as CaCO3	----	1	mg/L	613	603	1.55	0% - 20%
EM1517157-011	Anonymous	ED037-P: Bicarbonate Alkalinity as CaCO3	71-52-3	1	mg/L	410	408	0.555	0% - 20%
		ED037-P: Carbonate Alkalinity as CaCO3	3812-32-6	1	mg/L	<1	<1	0.00	No Limit
		ED037-P: Hydroxide Alkalinity as CaCO3	DMO-210-001	1	mg/L	<1	<1	0.00	No Limit
		ED037-P: Total Alkalinity as CaCO3	----	1	mg/L	410	408	0.555	0% - 20%
ED041G: Sulfate (Turbidimetric) as SO4 2- by DA (QC Lot: 283237)									
EM1517153-001	GW35	ED041G: Sulfate as SO4 - Turbidimetric	14808-79-8	1	mg/L	2110	2100	0.810	0% - 20%
EM1517153-018	GW34	ED041G: Sulfate as SO4 - Turbidimetric	14808-79-8	1	mg/L	196	194	1.11	0% - 20%
ED043: Total Oxidised Sulfur as SO4 2- (QC Lot: 285906)									
EM1517153-001	GW35	ED043: Total Oxidised Sulfur as SO4 2-	----	1	mg/L	2200	2300	4.34	0% - 20%
EM1517153-018	GW34	ED043: Total Oxidised Sulfur as SO4 2-	----	1	mg/L	238	240	0.919	0% - 20%
ED045G: Chloride by Discrete Analyser (QC Lot: 283238)									
EM1517153-001	GW35	ED045G: Chloride	16887-00-6	1	mg/L	161	161	0.00	0% - 20%
EM1517153-018	GW34	ED045G: Chloride	16887-00-6	1	mg/L	977	977	0.00	0% - 20%
ED093F: Dissolved Major Cations (QC Lot: 282741)									
EM1517153-003	GW24	ED093F: Calcium	7440-70-2	1	mg/L	83	82	0.00	0% - 20%

Sub-Matrix: **WATER**

				Laboratory Duplicate (DUP) Report					
Laboratory sample ID	*Client sample ID*	*Method: Compound*	*CAS Number*	*LOR*	*Unit*	*Original Result*	*Duplicate Result*	*RPD (%)*	*Recovery Limits (%)*
ED093F: Dissolved Major Cations (QC Lot: 282741) - continued									
EM1517153-003	GW24	ED093F: Magnesium	7439-95-4	1	mg/L	59	59	0.00	0% - 20%
		ED093F: Potassium	7440-09-7	1	mg/L	35	35	0.00	0% - 20%
		ED093F: Sodium	7440-23-5	1	mg/L	416	410	1.39	0% - 20%
EM1517151-006	Anonymous	ED093F: Calcium	7440-70-2	1	mg/L	257	251	2.43	0% - 20%
		ED093F: Magnesium	7439-95-4	1	mg/L	170	166	1.94	0% - 20%
		ED093F: Potassium	7440-09-7	1	mg/L	46	46	0.00	0% - 20%
		ED093F: Sodium	7440-23-5	1	mg/L	1570	1560	0.893	0% - 20%
EG020F: Dissolved Metals by ICP-MS (QC Lot: 282742)									
EM1517151-010	Anonymous	EG020A-F: Cadmium	7440-43-9	0.0001	mg/L	0.0005	0.0005	0.00	No Limit
		EG020A-F: Arsenic	7440-38-2	0.001	mg/L	0.012	0.011	0.00	0% - 50%
		EG020A-F: Chromium	7440-47-3	0.001	mg/L	<0.001	<0.001	0.00	No Limit
		EG020A-F: Copper	7440-50-8	0.001	mg/L	0.284	0.288	1.34	0% - 20%
		EG020A-F: Lead	7439-92-1	0.001	mg/L	<0.001	<0.001	0.00	No Limit
		EG020A-F: Manganese	7439-96-5	0.001	mg/L	4.92	4.33	12.6	0% - 20%
		EG020A-F: Nickel	7440-02-0	0.001	mg/L	0.006	0.008	21.9	No Limit
		EG020A-F: Zinc	7440-66-6	0.005	mg/L	0.016	0.016	0.00	No Limit
		EG020A-F: Aluminium	7429-90-5	0.01	mg/L	0.01	<0.01	0.00	No Limit
		EG020A-F: Selenium	7782-49-2	0.01	mg/L	0.02	0.03	0.00	No Limit
		EG020A-F: Iron	7439-89-6	0.05	mg/L	<0.05	<0.05	0.00	No Limit
EM1517151-006	Anonymous	EG020A-F: Cadmium	7440-43-9	0.0001	mg/L	<0.0001	<0.0001	0.00	No Limit
		EG020A-F: Arsenic	7440-38-2	0.001	mg/L	<0.001	<0.001	0.00	No Limit
		EG020A-F: Chromium	7440-47-3	0.001	mg/L	<0.001	<0.001	0.00	No Limit
		EG020A-F: Copper	7440-50-8	0.001	mg/L	<0.001	<0.001	0.00	No Limit
		EG020A-F: Lead	7439-92-1	0.001	mg/L	<0.001	<0.001	0.00	No Limit
		EG020A-F: Manganese	7439-96-5	0.001	mg/L	0.408	0.391	4.18	0% - 20%
		EG020A-F: Nickel	7440-02-0	0.001	mg/L	0.005	0.004	0.00	No Limit
		EG020A-F: Zinc	7440-66-6	0.005	mg/L	0.010	0.009	0.00	No Limit
		EG020A-F: Aluminium	7429-90-5	0.01	mg/L	<0.01	<0.01	0.00	No Limit
		EG020A-F: Selenium	7782-49-2	0.01	mg/L	<0.01	<0.01	0.00	No Limit
		EG020A-F: Iron	7439-89-6	0.05	mg/L	1.73	1.65	4.82	0% - 20%
EG020T: Total Metals by ICP-MS (QC Lot: 284267)									
EM1517151-006	Anonymous	EG020A-T: Cadmium	7440-43-9	0.0001	mg/L	<0.0001	<0.0001	0.00	No Limit
		EG020A-T: Arsenic	7440-38-2	0.001	mg/L	<0.001	<0.001	0.00	No Limit
		EG020A-T: Chromium	7440-47-3	0.001	mg/L	<0.001	0.001	0.00	No Limit
		EG020A-T: Copper	7440-50-8	0.001	mg/L	0.012	0.012	0.00	0% - 50%
		EG020A-T: Lead	7439-92-1	0.001	mg/L	0.002	0.002	0.00	No Limit
		EG020A-T: Manganese	7439-96-5	0.001	mg/L	0.357	0.344	3.67	0% - 20%
		EG020A-T: Nickel	7440-02-0	0.001	mg/L	0.006	0.005	0.00	No Limit
		EG020A-T: Zinc	7440-66-6	0.005	mg/L	<0.005	0.008	44.7	No Limit
		EG020A-T: Aluminium	7429-90-5	0.01	mg/L	0.06	0.07	0.00	No Limit

Sub-Matrix: **WATER**

				Laboratory Duplicate (DUP) Report					
Laboratory sample ID	Client sample ID	Method: Compound	CAS Number	LOR	Unit	Original Result	Duplicate Result	RPD (%)	Recovery Limits (%)
EG020T: Total Metals by ICP-MS (QC Lot: 284267) - continued									
EM1517151-006	Anonymous	EG020A-T: Selenium	7782-49-2	0.01	mg/L	<0.01	<0.01	0.00	No Limit
		EG020A-T: Iron	7439-89-6	0.05	mg/L	1.32	1.29	2.41	0% - 20%
EM1517157-004	Anonymous	EG020A-T: Cadmium	7440-43-9	0.0001	mg/L	<0.0001	<0.0001	0.00	No Limit
		EG020A-T: Arsenic	7440-38-2	0.001	mg/L	0.002	0.002	0.00	No Limit
		EG020A-T: Chromium	7440-47-3	0.001	mg/L	<0.001	<0.001	0.00	No Limit
		EG020A-T: Copper	7440-50-8	0.001	mg/L	0.004	0.004	0.00	No Limit
		EG020A-T: Lead	7439-92-1	0.001	mg/L	0.001	<0.001	0.00	No Limit
		EG020A-T: Manganese	7439-96-5	0.001	mg/L	0.003	0.003	0.00	No Limit
		EG020A-T: Nickel	7440-02-0	0.001	mg/L	0.001	<0.001	0.00	No Limit
		EG020A-T: Zinc	7440-66-6	0.005	mg/L	<0.005	<0.005	0.00	No Limit
		EG020A-T: Aluminium	7429-90-5	0.01	mg/L	0.03	0.02	0.00	No Limit
		EG020A-T: Selenium	7782-49-2	0.01	mg/L	<0.01	<0.01	0.00	No Limit
		EG020A-T: Iron	7439-89-6	0.05	mg/L	<0.05	<0.05	0.00	No Limit
EG035F: Dissolved Mercury by FIMS (QC Lot: 282739)									
EM1517118-002	Anonymous	EG035F: Mercury	7439-97-6	0.0001	mg/L	<0.0001	<0.0001	0.00	No Limit
EM1517118-011	Anonymous	EG035F: Mercury	7439-97-6	0.0001	mg/L	<0.0001	<0.0001	0.00	No Limit
EG035F: Dissolved Mercury by FIMS (QC Lot: 282743)									
EM1517153-006	GW18	EG035F: Mercury	7439-97-6	0.0001	mg/L	<0.0001	<0.0001	0.00	No Limit
EG035T: Total Recoverable Mercury by FIMS (QC Lot: 282796)									
EM1517104-066	Anonymous	EG035T: Mercury	7439-97-6	0.0001	mg/L	<0.0001	<0.0001	0.00	No Limit
EM1517157-015	Anonymous	EG035T: Mercury	7439-97-6	0.0001	mg/L	<0.0001	<0.0001	0.00	No Limit
EK040P: Fluoride by PC Titrator (QC Lot: 284167)									
EM1517153-002	GW38	EK040P: Fluoride	16984-48-8	0.1	mg/L	1.7	1.8	0.00	0% - 50%
EM1517176-021	Anonymous	EK040P: Fluoride	16984-48-8	0.1	mg/L	0.8	0.8	0.00	No Limit
EK055G: Ammonia as N by Discrete Analyser (QC Lot: 283967)									
EM1517153-001	GW35	EK055G: Ammonia as N	7664-41-7	0.01	mg/L	7.22	7.29	0.959	0% - 20%
EM1517153-018	GW34	EK055G: Ammonia as N	7664-41-7	0.01	mg/L	8.50	8.26	2.84	0% - 20%
EK057G: Nitrite as N by Discrete Analyser (QC Lot: 283239)									
EM1517153-001	GW35	EK057G: Nitrite as N	14797-65-0	0.01	mg/L	<0.01	<0.01	0.00	No Limit
EM1517153-018	GW34	EK057G: Nitrite as N	14797-65-0	0.01	mg/L	<0.01	<0.01	0.00	No Limit
EK059G: Nitrite plus Nitrate as N (NOx) by Discrete Analyser (QC Lot: 281008)									
EM1516959-065	Anonymous	EK059G: Nitrite + Nitrate as N	----	0.01	mg/L	0.01	0.01	0.00	No Limit
EM1517153-004	GW28	EK059G: Nitrite + Nitrate as N	----	0.01	mg/L	0.04	0.04	0.00	No Limit
EK071G: Reactive Phosphorus as P by discrete analyser (QC Lot: 283240)									
EM1517153-001	GW35	EK071G: Reactive Phosphorus as P	14265-44-2	0.01	mg/L	<0.01	<0.01	0.00	No Limit
EM1517153-018	GW34	EK071G: Reactive Phosphorus as P	14265-44-2	0.01	mg/L	0.66	0.68	2.56	0% - 20%
EP005: Total Organic Carbon (TOC) (QC Lot: 282049)									
EM1517153-002	GW38	EP005: Total Organic Carbon	----	1	mg/L	9	9	0.00	No Limit

Sub-Matrix: **WATER**

				Laboratory Duplicate (DUP) Report					
Laboratory sample ID	*Client sample ID*	*Method: Compound*	*CAS Number*	*LOR*	*Unit*	*Original Result*	*Duplicate Result*	*RPD (%)*	*Recovery Limits (%)*
EP005: Total Organic Carbon (TOC) (QC Lot: 282049) - continued									
EM1517187-003	Anonymous	EP005: Total Organic Carbon	----	1	mg/L	22	23	0.00	0% - 20%
EP074A: Monocyclic Aromatic Hydrocarbons (QC Lot: 281802)									
EM1517153-002	GW38	EP074-WF: 1.2.4-Trimethylbenzene	95-63-6	1	µg/L	<1	<1	0.00	No Limit
		EP074-WF: 1.3.5-Trimethylbenzene	108-67-8	1	µg/L	<1	<1	0.00	No Limit
		EP074-WF: Benzene	71-43-2	1	µg/L	<1	<1	0.00	No Limit
		EP074-WF: Ethylbenzene	100-41-4	1	µg/L	<1	<1	0.00	No Limit
		EP074-WF: Isopropylbenzene	98-82-8	1	µg/L	<1	<1	0.00	No Limit
		EP074-WF: meta- & para-Xylene	108-38-3 106-42-3	1	µg/L	<1	<1	0.00	No Limit
		EP074-WF: n-Butylbenzene	104-51-8	1	µg/L	<1	<1	0.00	No Limit
		EP074-WF: n-Propylbenzene	103-65-1	1	µg/L	<1	<1	0.00	No Limit
		EP074-WF: ortho-Xylene	95-47-6	1	µg/L	<1	<1	0.00	No Limit
		EP074-WF: p-Isopropyltoluene	99-87-6	1	µg/L	<1	<1	0.00	No Limit
		EP074-WF: sec-Butylbenzene	135-98-8	1	µg/L	<1	<1	0.00	No Limit
		EP074-WF: Styrene	100-42-5	1	µg/L	<1	<1	0.00	No Limit
		EP074-WF: tert-Butylbenzene	98-06-6	1	µg/L	<1	<1	0.00	No Limit
		EP074-WF: Toluene	108-88-3	1	µg/L	<1	<1	0.00	No Limit
EP074B: Oxygenated Compounds (QC Lot: 281802)									
EM1517153-002	GW38	EP074-WF: 2-Butanone (MEK)	78-93-3	10	µg/L	<10	<10	0.00	No Limit
		EP074-WF: 2-Hexanone (MBK)	591-78-6	10	µg/L	<10	<10	0.00	No Limit
		EP074-WF: 2-Propanone (Acetone)	67-64-1	10	µg/L	<10	<10	0.00	No Limit
		EP074-WF: 4-Methyl-2-pentanone (MIBK)	108-10-1	10	µg/L	<10	<10	0.00	No Limit
		EP074-WF: Vinyl Acetate	108-05-4	10	µg/L	<10	<10	0.00	No Limit
EP074C: Sulfonated Compounds (QC Lot: 281802)									
EM1517153-002	GW38	EP074-WF: Carbon disulfide	75-15-0	1	µg/L	<1	<1	0.00	No Limit
EP074D: Fumigants (QC Lot: 281802)									
EM1517153-002	GW38	EP074-WF: 1.2-Dibromoethane (EDB)	106-93-4	1	µg/L	<1	<1	0.00	No Limit
		EP074-WF: 1.2-Dichloropropane	78-87-5	1	µg/L	<1	<1	0.00	No Limit
		EP074-WF: 2.2-Dichloropropane	594-20-7	1	µg/L	<1	<1	0.00	No Limit
		EP074-WF: cis-1.3-Dichloropropylene	10061-01-5	2	µg/L	<2	<2	0.00	No Limit
		EP074-WF: trans-1.3-Dichloropropylene	10061-02-6	2	µg/L	<2	<2	0.00	No Limit
EP074E: Halogenated Aliphatic Compounds (QC Lot: 281802)									
EM1517153-002	GW38	EP074-WF: Vinyl chloride	75-01-4	0.2	µg/L	<10.0	<10.0	0.00	No Limit
		EP074-WF: Hexachlorobutadiene	87-68-3	0.5	µg/L	<1.0	<1.0	0.00	No Limit
		EP074-WF: 1.1.1.2-Tetrachloroethane	630-20-6	1	µg/L	<1	<1	0.00	No Limit
		EP074-WF: 1.1.1-Trichloroethane	71-55-6	1	µg/L	<1	<1	0.00	No Limit
		EP074-WF: 1.1.2.2-Tetrachloroethane	79-34-5	1	µg/L	<1	<1	0.00	No Limit
		EP074-WF: 1.1.2-Trichloroethane	79-00-5	1	µg/L	<1	<1	0.00	No Limit
		EP074-WF: 1.1-Dichloroethane	75-34-3	1	µg/L	<1	<1	0.00	No Limit

Sub-Matrix: **WATER**

				Laboratory Duplicate (DUP) Report					
Laboratory sample ID	*Client sample ID*	*Method: Compound*	*CAS Number*	*LOR*	*Unit*	*Original Result*	*Duplicate Result*	*RPD (%)*	*Recovery Limits (%)*
EP074E: Halogenated Aliphatic Compounds (QC Lot: 281802) - continued									
EM1517153-002	GW38	EP074-WF: 1.1-Dichloroethene	75-35-4	1	µg/L	<1	<1	0.00	No Limit
		EP074-WF: 1.1-Dichloropropylene	563-58-6	1	µg/L	<1	<1	0.00	No Limit
		EP074-WF: 1.2.3-Trichloropropane	96-18-4	1	µg/L	<1	<1	0.00	No Limit
		EP074-WF: 1.2-Dibromo-3-chloropropane	96-12-8	1	µg/L	<1	<1	0.00	No Limit
		EP074-WF: 1.2-Dichloroethane	107-06-2	1	µg/L	<1	<1	0.00	No Limit
		EP074-WF: 1.3-Dichloropropane	142-28-9	1	µg/L	<1	<1	0.00	No Limit
		EP074-WF: Carbon Tetrachloride	56-23-5	1	µg/L	<1	<1	0.00	No Limit
		EP074-WF: cis-1.2-Dichloroethene	156-59-2	1	µg/L	<1	<1	0.00	No Limit
		EP074-WF: cis-1.4-Dichloro-2-butene	1476-11-5	1	µg/L	<1	<1	0.00	No Limit
		EP074-WF: Dibromomethane	74-95-3	1	µg/L	<1	<1	0.00	No Limit
		EP074-WF: Iodomethane	74-88-4	1	µg/L	<1	<1	0.00	No Limit
		EP074-WF: Pentachloroethane	76-01-7	1	µg/L	<1	<1	0.00	No Limit
		EP074-WF: Tetrachloroethene	127-18-4	1	µg/L	<1	<1	0.00	No Limit
		EP074-WF: trans-1.2-Dichloroethene	156-60-5	1	µg/L	<1	<1	0.00	No Limit
		EP074-WF: trans-1.4-Dichloro-2-butene	110-57-6	1	µg/L	<1	<1	0.00	No Limit
		EP074-WF: Trichloroethene	79-01-6	1	µg/L	<1	<1	0.00	No Limit
		EP074-WF: Bromomethane	74-83-9	10	µg/L	<10	<10	0.00	No Limit
		EP074-WF: Chloroethane	75-00-3	10	µg/L	<10	<10	0.00	No Limit
		EP074-WF: Chloromethane	74-87-3	10	µg/L	<10	<10	0.00	No Limit
		EP074-WF: Dichlorodifluoromethane	75-71-8	10	µg/L	<10	<10	0.00	No Limit
		EP074-WF: Trichlorofluoromethane	75-69-4	10	µg/L	<10	<10	0.00	No Limit
		EP074-WF: Methylene chloride	75-09-2	2	µg/L	<5	<5	0.00	No Limit
EP074F: Halogenated Aromatic Compounds (QC Lot: 281802)									
EM1517153-002	GW38	EP074-WF: 1.4-Dichlorobenzene	106-46-7	0.1	µg/L	<1.0	<1.0	0.00	No Limit
		EP074-WF: 1.2.3-Trichlorobenzene	87-61-6	1	µg/L	<1	<1	0.00	No Limit
		EP074-WF: 1.2.4-Trichlorobenzene	120-82-1	1	µg/L	<1	<1	0.00	No Limit
		EP074-WF: 1.2-Dichlorobenzene	95-50-1	1	µg/L	<1	<1	0.00	No Limit
		EP074-WF: 1.3-Dichlorobenzene	541-73-1	1	µg/L	<1	<1	0.00	No Limit
		EP074-WF: 2-Chlorotoluene	95-49-8	1	µg/L	<1	<1	0.00	No Limit
		EP074-WF: 4-Chlorotoluene	106-43-4	1	µg/L	<1	<1	0.00	No Limit
		EP074-WF: Bromobenzene	108-86-1	1	µg/L	<1	<1	0.00	No Limit
		EP074-WF: Chlorobenzene	108-90-7	1	µg/L	<1	<1	0.00	No Limit
EP074G: Trihalomethanes (QC Lot: 281802)									
EM1517153-002	GW38	EP074-WF: Bromodichloromethane	75-27-4	1	µg/L	<1	<1	0.00	No Limit
		EP074-WF: Bromoform	75-25-2	1	µg/L	<1	<1	0.00	No Limit
		EP074-WF: Chloroform	67-66-3	1	µg/L	<1	<1	0.00	No Limit
		EP074-WF: Dibromochloromethane	124-48-1	1	µg/L	<1	<1	0.00	No Limit
EP074H: Naphthalene (QC Lot: 281802)									
EM1517153-002	GW38	EP074-WF: Naphthalene	91-20-3	5	µg/L	<5	<5	0.00	No Limit

Sub-Matrix: **WATER**

				Laboratory Duplicate (DUP) Report					
Laboratory sample ID	*Client sample ID*	*Method: Compound*	*CAS Number*	*LOR*	*Unit*	*Original Result*	*Duplicate Result*	*RPD (%)*	*Recovery Limits (%)*
EP080/071: Total Petroleum Hydrocarbons (QC Lot: 281803)									
EM1517153-015	QCH	EP080: C6 - C9 Fraction	----	20	µg/L	<20	<20	0.00	No Limit
EM1517153-002	GW38	EP080: C6 - C9 Fraction	----	20	µg/L	<20	<20	0.00	No Limit
EP080/071: Total Petroleum Hydrocarbons (QC Lot: 281811)									
EM1517022-001	Anonymous	EP080: C6 - C9 Fraction	----	20	µg/L	<20	<20	0.00	No Limit
EM1517118-013	Anonymous	EP080: C6 - C9 Fraction	----	20	µg/L	<20	<20	0.00	No Limit
EP080/071: Total Recoverable Hydrocarbons - NEPM 2013 Fractions (QC Lot: 281803)									
EM1517153-015	QCH	EP080: C6 - C10 Fraction	C6_C10	20	µg/L	<20	<20	0.00	No Limit
EM1517153-002	GW38	EP080: C6 - C10 Fraction	C6_C10	20	µg/L	<20	<20	0.00	No Limit
EP080/071: Total Recoverable Hydrocarbons - NEPM 2013 Fractions (QC Lot: 281811)									
EM1517022-001	Anonymous	EP080: C6 - C10 Fraction	C6_C10	20	µg/L	<20	<20	0.00	No Limit
EM1517118-013	Anonymous	EP080: C6 - C10 Fraction	C6_C10	20	µg/L	30	30	0.00	No Limit
EP080: BTEXN (QC Lot: 281803)									
EM1517153-015	QCH	EP080: Benzene	71-43-2	1	µg/L	<1	<1	0.00	No Limit
		EP080: Ethylbenzene	100-41-4	2	µg/L	<2	<2	0.00	No Limit
		EP080: meta- & para-Xylene	108-38-3 106-42-3	2	µg/L	<2	<2	0.00	No Limit
		EP080: ortho-Xylene	95-47-6	2	µg/L	<2	<2	0.00	No Limit
		EP080: Toluene	108-88-3	2	µg/L	<2	<2	0.00	No Limit
		EP080: Naphthalene	91-20-3	5	µg/L	<5	<5	0.00	No Limit
EM1517153-002	GW38	EP080: Benzene	71-43-2	1	µg/L	<1	<1	0.00	No Limit
		EP080: Ethylbenzene	100-41-4	2	µg/L	<2	<2	0.00	No Limit
		EP080: meta- & para-Xylene	108-38-3 106-42-3	2	µg/L	<2	<2	0.00	No Limit
		EP080: ortho-Xylene	95-47-6	2	µg/L	<2	<2	0.00	No Limit
		EP080: Toluene	108-88-3	2	µg/L	<2	<2	0.00	No Limit
		EP080: Naphthalene	91-20-3	5	µg/L	<5	<5	0.00	No Limit
EP080: BTEXN (QC Lot: 281811)									
EM1517022-001	Anonymous	EP080: Benzene	71-43-2	1	µg/L	<1	<1	0.00	No Limit
		EP080: Ethylbenzene	100-41-4	2	µg/L	<2	<2	0.00	No Limit
		EP080: meta- & para-Xylene	108-38-3 106-42-3	2	µg/L	<2	<2	0.00	No Limit
		EP080: ortho-Xylene	95-47-6	2	µg/L	<2	<2	0.00	No Limit
		EP080: Toluene	108-88-3	2	µg/L	<2	<2	0.00	No Limit
		EP080: Naphthalene	91-20-3	5	µg/L	<5	<5	0.00	No Limit
EM1517118-013	Anonymous	EP080: Benzene	71-43-2	1	µg/L	<1	<1	0.00	No Limit
		EP080: Ethylbenzene	100-41-4	2	µg/L	<2	<2	0.00	No Limit
		EP080: meta- & para-Xylene	108-38-3 106-42-3	2	µg/L	<2	<2	0.00	No Limit
		EP080: ortho-Xylene	95-47-6	2	µg/L	<2	<2	0.00	No Limit

Sub-Matrix: **WATER**

				Laboratory Duplicate (DUP) Report					
Laboratory sample ID	*Client sample ID*	*Method: Compound*	*CAS Number*	*LOR*	*Unit*	*Original Result*	*Duplicate Result*	*RPD (%)*	*Recovery Limits (%)*
EP080: BTEXN (QC Lot: 281811) - continued									
EM1517118-013	Anonymous	EP080: Toluene	108-88-3	2	µg/L	<2	<2	0.00	No Limit
		EP080: Naphthalene	91-20-3	5	µg/L	<5	<5	0.00	No Limit

Method Blank (MB) and Laboratory Control Spike (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 (%)	Recovery Limits (%)	
Method: Compound	CAS Number	LOR	Unit	Result	Concentration	LCS	Low	High
EA015: Total Dissolved Solids dried at 180 ± 5 °C (QCLot: 283976)								
EA015H: Total Dissolved Solids @180°C	----	10	mg/L	<10	2000 mg/L	101	97	105
				<10	293 mg/L	98.6	97	105
ED037P: Alkalinity by PC Titrator (QCLot: 281042)								
ED037-P: Total Alkalinity as CaCO3	----	----	mg/L	----	200 mg/L	100	90	110
ED037P: Alkalinity by PC Titrator (QCLot: 281044)								
ED037-P: Total Alkalinity as CaCO3	----	----	mg/L	----	200 mg/L	99.0	90	110
ED041G: Sulfate (Turbidimetric) as SO4 2- by DA (QCLot: 283237)								
ED041G: Sulfate as SO4 - Turbidimetric	14808-79-8	1	mg/L	<1	25 mg/L	107	90	116
				<1	100 mg/L	107	80	120
ED043: Total Oxidised Sulfur as SO4 2- (QCLot: 285906)								
ED043: Total Oxidised Sulfur as SO4 2-	----	1	mg/L	<10	500 mg/L	109	87	121
ED045G: Chloride by Discrete Analyser (QCLot: 283238)								
ED045G: Chloride	16887-00-6	1	mg/L	<1	10 mg/L	95.1	89	117
				<1	1000 mg/L	103	92	112
ED093F: Dissolved Major Cations (QCLot: 282741)								
ED093F: Calcium	7440-70-2	1	mg/L	<1	5 mg/L	103	92	108
ED093F: Magnesium	7439-95-4	1	mg/L	<1	5 mg/L	102	92	108
ED093F: Potassium	7440-09-7	1	mg/L	<1	50 mg/L	100	89	107
ED093F: Sodium	7440-23-5	1	mg/L	<1	50 mg/L	99.1	89	107
EG020F: Dissolved Metals by ICP-MS (QCLot: 282742)								
EG020A-F: Aluminium	7429-90-5	0.01	mg/L	<0.01	0.5 mg/L	101	93	105
EG020A-F: Arsenic	7440-38-2	0.001	mg/L	<0.001	0.1 mg/L	101	94	108
EG020A-F: Cadmium	7440-43-9	0.0001	mg/L	<0.0001	0.1 mg/L	98.0	86	108
EG020A-F: Chromium	7440-47-3	0.001	mg/L	<0.001	0.1 mg/L	97.6	86	110
EG020A-F: Copper	7440-50-8	0.001	mg/L	<0.001	0.1 mg/L	92.7	87	107
EG020A-F: Iron	7439-89-6	0.05	mg/L	<0.05	0.5 mg/L	99.7	94	106
EG020A-F: Lead	7439-92-1	0.001	mg/L	<0.001	0.1 mg/L	96.7	87	109
EG020A-F: Manganese	7439-96-5	0.001	mg/L	<0.001	0.1 mg/L	94.9	87	109
EG020A-F: Nickel	7440-02-0	0.001	mg/L	<0.001	0.1 mg/L	97.3	87	109
EG020A-F: Selenium	7782-49-2	0.01	mg/L	<0.01	0.1 mg/L	93.1	87	109
EG020A-F: Zinc	7440-66-6	0.005	mg/L	<0.005	0.1 mg/L	101	87	107
EG020T: Total Metals by ICP-MS (QCLot: 284267)								
EG020A-T: Aluminium	7429-90-5	0.01	mg/L	<0.01	0.5 mg/L	105	100	108

Sub-Matrix: **WATER**

Method: Compound	CAS Number	LOR	Unit	Method Blank (MB) Report: Result	Laboratory Control Spike (LCS) Report: Spike Concentration	Spike Recovery (%): LCS	Recovery Limits (%): Low	Recovery Limits (%): High
EG020T: Total Metals by ICP-MS (QCLot: 284267) - continued								
EG020A-T: Arsenic	7440-38-2	0.001	mg/L	<0.001	0.1 mg/L	99.5	94	116
EG020A-T: Cadmium	7440-43-9	0.0001	mg/L	<0.0001	0.1 mg/L	102	90	110
EG020A-T: Chromium	7440-47-3	0.001	mg/L	<0.001	0.1 mg/L	105	90	110
EG020A-T: Copper	7440-50-8	0.001	mg/L	<0.001	0.1 mg/L	98.8	91	109
EG020A-T: Iron	7439-89-6	0.05	mg/L	<0.05	0.5 mg/L	107	99	109
EG020A-T: Lead	7439-92-1	0.001	mg/L	<0.001	0.1 mg/L	104	91	111
EG020A-T: Manganese	7439-96-5	0.001	mg/L	<0.001	0.1 mg/L	100	91	111
EG020A-T: Nickel	7440-02-0	0.001	mg/L	<0.001	0.1 mg/L	100	91	111
EG020A-T: Selenium	7782-49-2	0.01	mg/L	<0.01	0.1 mg/L	94.6	86	110
EG020A-T: Zinc	7440-66-6	0.005	mg/L	<0.005	0.1 mg/L	96.0	91	109
EG035F: Dissolved Mercury by FIMS (QCLot: 282739)								
EG035F: Mercury	7439-97-6	0.0001	mg/L	<0.0001	0.01 mg/L	98.4	83	117
EG035F: Dissolved Mercury by FIMS (QCLot: 282743)								
EG035F: Mercury	7439-97-6	0.0001	mg/L	<0.0001	0.01 mg/L	91.0	83	117
EG035T: Total Recoverable Mercury by FIMS (QCLot: 282796)								
EG035T: Mercury	7439-97-6	0.0001	mg/L	<0.0001	0.01 mg/L	108	87	113
EK040P: Fluoride by PC Titrator (QCLot: 284167)								
EK040P: Fluoride	16984-48-8	0.1	mg/L	<0.1	5 mg/L	95.6	89	111
EK055G: Ammonia as N by Discrete Analyser (QCLot: 283967)								
EK055G: Ammonia as N	7664-41-7	0.01	mg/L	<0.01	1 mg/L	107	80	115
EK057G: Nitrite as N by Discrete Analyser (QCLot: 283239)								
EK057G: Nitrite as N	14797-65-0	0.01	mg/L	<0.01	0.5 mg/L	102	92	108
EK059G: Nitrite plus Nitrate as N (NOx) by Discrete Analyser (QCLot: 281008)								
EK059G: Nitrite + Nitrate as N	----	0.01	mg/L	<0.01	0.5 mg/L	108	91	117
EK071G: Reactive Phosphorus as P by discrete analyser (QCLot: 283240)								
EK071G: Reactive Phosphorus as P	14265-44-2	0.01	mg/L	<0.01	0.5 mg/L	99.2	94	108
EP005: Total Organic Carbon (TOC) (QCLot: 282049)								
EP005: Total Organic Carbon	----	1	mg/L	<1	100 mg/L	92.2	86	112
EP074A: Monocyclic Aromatic Hydrocarbons (QCLot: 281802)								
EP074-WF: 1.2.4-Trimethylbenzene	95-63-6	1	µg/L	<1	20 µg/L	97.7	77	109
EP074-WF: 1.3.5-Trimethylbenzene	108-67-8	1	µg/L	<1	20 µg/L	98.2	77	109
EP074-WF: Benzene	71-43-2	1	µg/L	<1	20 µg/L	101	81	119
EP074-WF: Ethylbenzene	100-41-4	1	µg/L	<1	20 µg/L	99.3	78	118
EP074-WF: Isopropylbenzene	98-82-8	1	µg/L	<1	20 µg/L	97.9	77	117
EP074-WF: meta- & para-Xylene	108-38-3 106-42-3	1	µg/L	<1	40 µg/L	97.2	78	118
EP074-WF: n-Butylbenzene	104-51-8	1	µg/L	<1	20 µg/L	92.4	65	111

Sub-Matrix: **WATER**

Method: Compound	CAS Number	LOR	Unit	Method Blank (MB) Report	Laboratory Control Spike (LCS) Report			
					Spike	Spike Recovery (%)	Recovery Limits (%)	
				Result	Concentration	LCS	Low	High
EP074A: Monocyclic Aromatic Hydrocarbons (QCLot: 281802) - continued								
EP074-WF: n-Propylbenzene	103-65-1	1	µg/L	<1	20 µg/L	95.1	74	110
EP074-WF: ortho-Xylene	95-47-6	1	µg/L	<1	20 µg/L	102	82	118
EP074-WF: p-Isopropyltoluene	99-87-6	1	µg/L	<1	20 µg/L	92.8	73	113
EP074-WF: sec-Butylbenzene	135-98-8	1	µg/L	<1	20 µg/L	97.2	76	110
EP074-WF: Styrene	100-42-5	1	µg/L	<1	20 µg/L	95.2	78	118
EP074-WF: tert-Butylbenzene	98-06-6	1	µg/L	<1	20 µg/L	96.3	78	110
EP074-WF: Toluene	108-88-3	1	µg/L	<1	20 µg/L	102	81	121
EP074B: Oxygenated Compounds (QCLot: 281802)								
EP074-WF: 2-Butanone (MEK)	78-93-3	10	µg/L	<10	200 µg/L	108	71	131
EP074-WF: 2-Hexanone (MBK)	591-78-6	10	µg/L	<10	200 µg/L	113	75	129
EP074-WF: 2-Propanone (Acetone)	67-64-1	10	µg/L	<10	200 µg/L	113	69	151
EP074-WF: 4-Methyl-2-pentanone (MIBK)	108-10-1	10	µg/L	<10	200 µg/L	109	72	132
EP074-WF: Vinyl Acetate	108-05-4	10	µg/L	<10	200 µg/L	105	65	129
EP074C: Sulfonated Compounds (QCLot: 281802)								
EP074-WF: Carbon disulfide	75-15-0	1	µg/L	<1	20 µg/L	100	53	123
EP074D: Fumigants (QCLot: 281802)								
EP074-WF: 1.2-Dibromoethane (EDB)	106-93-4	1	µg/L	<1	20 µg/L	103	81	115
EP074-WF: 1.2-Dichloropropane	78-87-5	1	µg/L	<1	20 µg/L	102	80	118
EP074-WF: 2.2-Dichloropropane	594-20-7	1	µg/L	<1	20 µg/L	100	69	115
EP074-WF: cis-1.3-Dichloropropylene	10061-01-5	2	µg/L	<2	20 µg/L	99.5	72	110
EP074-WF: trans-1.3-Dichloropropylene	10061-02-6	2	µg/L	<2	20 µg/L	100	70	108
EP074E: Halogenated Aliphatic Compounds (QCLot: 281802)								
EP074-WF: 1.1.1.2-Tetrachloroethane	630-20-6	1	µg/L	<1	20 µg/L	98.9	75	107
EP074-WF: 1.1.1-Trichloroethane	71-55-6	1	µg/L	<1	20 µg/L	100	75	113
EP074-WF: 1.1.2.2-Tetrachloroethane	79-34-5	1	µg/L	<1	20 µg/L	108	85	121
EP074-WF: 1.1.2-Trichloroethane	79-00-5	1	µg/L	<1	20 µg/L	106	85	117
EP074-WF: 1.1-Dichloroethane	75-34-3	1	µg/L	<1	20 µg/L	103	76	120
EP074-WF: 1.1-Dichloroethene	75-35-4	1	µg/L	<1	20 µg/L	103	68	122
EP074-WF: 1.1-Dichloropropylene	563-58-6	1	µg/L	<1	20 µg/L	99.6	73	117
EP074-WF: 1.2.3-Trichloropropane	96-18-4	1	µg/L	<1	20 µg/L	108	84	118
EP074-WF: 1.2-Dibromo-3-chloropropane	96-12-8	1	µg/L	<1	20 µg/L	103	64	114
EP074-WF: 1.2-Dichloroethane	107-06-2	1	µg/L	<1	20 µg/L	104	81	119
EP074-WF: 1.3-Dichloropropane	142-28-9	1	µg/L	<1	20 µg/L	101	85	117
EP074-WF: Bromomethane	74-83-9	10	µg/L	<10	200 µg/L	59.5	52	128
EP074-WF: Carbon Tetrachloride	56-23-5	1	µg/L	<1	20 µg/L	97.0	66	110
EP074-WF: Chloroethane	75-00-3	10	µg/L	<10	200 µg/L	108	67	127
EP074-WF: Chloromethane	74-87-3	10	µg/L	<10	200 µg/L	85.9	66	138
EP074-WF: cis-1.2-Dichloroethene	156-59-2	1	µg/L	<1	20 µg/L	105	82	118

Sub-Matrix: **WATER**

Method: Compound	CAS Number	LOR	Unit	Method Blank (MB) Report	Laboratory Control Spike (LCS) Report			
					Spike	Spike Recovery (%)	Recovery Limits (%)	
				Result	Concentration	LCS	Low	High
EP074E: Halogenated Aliphatic Compounds (QCLot: 281802) - continued								
EP074-WF: cis-1.4-Dichloro-2-butene	1476-11-5	1	µg/L	<1	20 µg/L	94.2	51	109
EP074-WF: Dibromomethane	74-95-3	1	µg/L	<1	20 µg/L	104	80	116
EP074-WF: Dichlorodifluoromethane	75-71-8	10	µg/L	<10	200 µg/L	104	61	137
EP074-WF: Hexachlorobutadiene	87-68-3	0.5	µg/L	<0.5	20 µg/L	96.8	64	118
EP074-WF: Iodomethane	74-88-4	1	µg/L	<1	20 µg/L	57.3	26	119
EP074-WF: Methylene chloride	75-09-2	2	µg/L	<2	20 µg/L	126	52	184
EP074-WF: Pentachloroethane	76-01-7	1	µg/L	<1	20 µg/L	96.3	52	126
EP074-WF: Tetrachloroethene	127-18-4	1	µg/L	<1	20 µg/L	94.3	74	116
EP074-WF: trans-1.2-Dichloroethene	156-60-5	1	µg/L	<1	20 µg/L	104	69	123
EP074-WF: trans-1.4-Dichloro-2-butene	110-57-6	1	µg/L	<1	20 µg/L	107	64	118
EP074-WF: Trichloroethene	79-01-6	1	µg/L	<1	20 µg/L	99.9	76	118
EP074-WF: Trichlorofluoromethane	75-69-4	10	µg/L	<10	200 µg/L	106	70	124
EP074-WF: Vinyl chloride	75-01-4	0.2	µg/L	<0.2	200 µg/L	94.6	60	138
EP074F: Halogenated Aromatic Compounds (QCLot: 281802)								
EP074-WF: 1.2.3-Trichlorobenzene	87-61-6	1	µg/L	<1	20 µg/L	95.0	78	116
EP074-WF: 1.2.4-Trichlorobenzene	120-82-1	1	µg/L	<1	20 µg/L	90.9	68	112
EP074-WF: 1.2-Dichlorobenzene	95-50-1	1	µg/L	<1	20 µg/L	98.7	83	113
EP074-WF: 1.3-Dichlorobenzene	541-73-1	1	µg/L	<1	20 µg/L	97.2	78	112
EP074-WF: 1.4-Dichlorobenzene	106-46-7	0.1	µg/L	<0.1	20 µg/L	98.5	78	116
EP074-WF: 2-Chlorotoluene	95-49-8	1	µg/L	<1	20 µg/L	100	79	111
EP074-WF: 4-Chlorotoluene	106-43-4	1	µg/L	<1	20 µg/L	99.0	77	111
EP074-WF: Bromobenzene	108-86-1	1	µg/L	<1	20 µg/L	101	71	117
EP074-WF: Chlorobenzene	108-90-7	1	µg/L	<1	20 µg/L	101	82	116
EP074G: Trihalomethanes (QCLot: 281802)								
EP074-WF: Bromodichloromethane	75-27-4	1	µg/L	<1	20 µg/L	102	75	112
EP074-WF: Bromoform	75-25-2	1	µg/L	<1	20 µg/L	95.2	62	106
EP074-WF: Chloroform	67-66-3	1	µg/L	<1	20 µg/L	104	83	115
EP074-WF: Dibromochloromethane	124-48-1	1	µg/L	<1	20 µg/L	99.6	68	108
EP074H: Naphthalene (QCLot: 281802)								
EP074-WF: Naphthalene	91-20-3	5	µg/L	<5	20 µg/L	95.8	82	116
EP075(SIM)B: Polynuclear Aromatic Hydrocarbons (QCLot: 281059)								
EP075(SIM): Acenaphthene	83-32-9	1	µg/L	<1.0	5 µg/L	84.1	46	120
EP075(SIM): Acenaphthylene	208-96-8	1	µg/L	<1.0	5 µg/L	81.6	40	124
EP075(SIM): Anthracene	120-12-7	1	µg/L	<1.0	5 µg/L	73.8	53	127
EP075(SIM): Benz(a)anthracene	56-55-3	1	µg/L	<1.0	5 µg/L	82.8	52	136
EP075(SIM): Benzo(a)pyrene	50-32-8	0.5	µg/L	<0.5	5 µg/L	87.0	55	133
EP075(SIM): Benzo(b+j)fluoranthene	205-99-2 205-82-3	1	µg/L	<1.0	5 µg/L	76.2	48	142

Sub-Matrix: **WATER**

Method: Compound	CAS Number	LOR	Unit	Method Blank (MB) Report	Laboratory Control Spike (LCS) Report			
					Spike	Spike Recovery (%)	Recovery Limits (%)	
				Result	Concentration	LCS	Low	High
EP075(SIM)B: Polynuclear Aromatic Hydrocarbons (QCLot: 281059) - continued								
EP075(SIM): Benzo(g.h.i)perylene	191-24-2	1	µg/L	<1.0	5 µg/L	85.9	52	142
EP075(SIM): Benzo(k)fluoranthene	207-08-9	1	µg/L	<1.0	5 µg/L	102	54	134
EP075(SIM): Chrysene	218-01-9	1	µg/L	<1.0	5 µg/L	80.9	54	132
EP075(SIM): Dibenz(a.h)anthracene	53-70-3	1	µg/L	<1.0	5 µg/L	87.2	52	142
EP075(SIM): Fluoranthene	206-44-0	1	µg/L	<1.0	5 µg/L	84.3	56	130
EP075(SIM): Fluorene	86-73-7	1	µg/L	<1.0	5 µg/L	83.4	47	125
EP075(SIM): Indeno(1.2.3.cd)pyrene	193-39-5	1	µg/L	<1.0	5 µg/L	87.7	49	143
EP075(SIM): Naphthalene	91-20-3	1	µg/L	<1.0	5 µg/L	75.3	39	115
EP075(SIM): Phenanthrene	85-01-8	1	µg/L	<1.0	5 µg/L	83.9	55	125
EP075(SIM): Pyrene	129-00-0	1	µg/L	<1.0	5 µg/L	85.0	56	132
EP080/071: Total Petroleum Hydrocarbons (QCLot: 281060)								
EP071: C10 - C14 Fraction	----	50	µg/L	<50	3980 µg/L	73.8	53	123
EP071: C15 - C28 Fraction	----	100	µg/L	<100	17006 µg/L	85.6	57	133
EP071: C29 - C36 Fraction	----	50	µg/L	<50	8662 µg/L	82.1	55	141
EP080/071: Total Petroleum Hydrocarbons (QCLot: 281061)								
EP071-SV: C10 - C14 Fraction	----	50	µg/L	<50	3980 µg/L	73.8	56	120
EP071-SV: C10 - C36 Fraction (sum)	----	50	µg/L	<50	----	----	----	----
EP071-SV: C15 - C28 Fraction	----	100	µg/L	<100	17006 µg/L	85.6	58	134
EP071-SV: C29 - C36 Fraction	----	50	µg/L	<50	8662 µg/L	82.1	53	143
EP080/071: Total Petroleum Hydrocarbons (QCLot: 281803)								
EP080: C6 - C9 Fraction	----	20	µg/L	<20	360 µg/L	94.9	67	127
EP080/071: Total Petroleum Hydrocarbons (QCLot: 281811)								
EP080: C6 - C9 Fraction	----	20	µg/L	<20	360 µg/L	96.2	67	127
EP080/071: Total Recoverable Hydrocarbons - NEPM 2013 Fractions (QCLot: 281060)								
EP071: >C10 - C16 Fraction	----	100	µg/L	<100	5753 µg/L	84.6	54	122
EP071: >C16 - C34 Fraction	----	100	µg/L	<100	24516 µg/L	79.3	56	132
EP071: >C34 - C40 Fraction	----	100	µg/L	<100	828 µg/L	98.6	51	137
EP080/071: Total Recoverable Hydrocarbons - NEPM 2013 Fractions (QCLot: 281061)								
EP071-SV: >C10 - C16 Fraction	----	100	µg/L	<100	5753 µg/L	84.6	56	120
EP071-SV: >C10 - C40 Fraction (sum)	----	100	µg/L	<100	----	----	----	----
EP071-SV: >C16 - C34 Fraction	----	100	µg/L	<100	24516 µg/L	79.3	53	149
EP071-SV: >C34 - C40 Fraction	----	100	µg/L	<100	828 µg/L	98.6	49	143
EP080/071: Total Recoverable Hydrocarbons - NEPM 2013 Fractions (QCLot: 281803)								
EP080: C6 - C10 Fraction	C6_C10	20	µg/L	<20	450 µg/L	93.9	65	125
EP080/071: Total Recoverable Hydrocarbons - NEPM 2013 Fractions (QCLot: 281811)								
EP080: C6 - C10 Fraction	C6_C10	20	µg/L	<20	450 µg/L	95.6	65	125
EP080: BTEXN (QCLot: 281803)								

Sub-Matrix: **WATER**

Method: Compound	CAS Number	LOR	Unit	Method Blank (MB) Report: Result	Laboratory Control Spike (LCS) Report: Spike Concentration	Spike Recovery (%): LCS	Recovery Limits (%): Low	Recovery Limits (%): High
EP080: BTEXN (QCLot: 281803) - continued								
EP080: Benzene	71-43-2	1	µg/L	<1	20 µg/L	105	76	120
EP080: Ethylbenzene	100-41-4	2	µg/L	<2	20 µg/L	93.2	72	124
EP080: meta- & para-Xylene	108-38-3 106-42-3	2	µg/L	<2	40 µg/L	94.0	72	130
EP080: Naphthalene	91-20-3	5	µg/L	<5	5 µg/L	93.1	71	129
EP080: ortho-Xylene	95-47-6	2	µg/L	<2	20 µg/L	96.1	75	127
EP080: Toluene	108-88-3	2	µg/L	<2	20 µg/L	96.6	76	124
EP080: BTEXN (QCLot: 281811)								
EP080: Benzene	71-43-2	1	µg/L	<1	20 µg/L	97.3	76	120
EP080: Ethylbenzene	100-41-4	2	µg/L	<2	20 µg/L	100	72	124
EP080: meta- & para-Xylene	108-38-3 106-42-3	2	µg/L	<2	40 µg/L	104	72	130
EP080: Naphthalene	91-20-3	5	µg/L	<5	5 µg/L	103	71	129
EP080: ortho-Xylene	95-47-6	2	µg/L	<2	20 µg/L	105	75	127
EP080: Toluene	108-88-3	2	µg/L	<2	20 µg/L	102	76	124

Matrix Spike (MS) Report

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

Sub-Matrix: **WATER**

Laboratory sample ID	Client sample ID	Method: Compound	CAS Number	Matrix Spike (MS) Report: Spike Concentration	SpikeRecovery(%): MS	Recovery Limits (%): Low	Recovery Limits (%): High
ED041G: Sulfate (Turbidimetric) as SO4 2- by DA (QCLot: 283237)							
EM1517153-002	GW38	ED041G: Sulfate as SO4 - Turbidimetric	14808-79-8	10 mg/L	# Not Determined	70	130
ED043: Total Oxidised Sulfur as SO4 2- (QCLot: 285906)							
EM1517153-002	GW38	ED043: Total Oxidised Sulfur as SO4 2-	----	500 mg/L	112	70	130
ED045G: Chloride by Discrete Analyser (QCLot: 283238)							
EM1517153-002	GW38	ED045G: Chloride	16887-00-6	400 mg/L	82.1	70	130
EG020F: Dissolved Metals by ICP-MS (QCLot: 282742)							
EM1517151-006	Anonymous	EG020A-F: Arsenic	7440-38-2	0.2 mg/L	110	85	131
		EG020A-F: Cadmium	7440-43-9	0.05 mg/L	98.4	81	133
		EG020A-F: Chromium	7440-47-3	0.2 mg/L	97.2	71	135
		EG020A-F: Copper	7440-50-8	0.2 mg/L	91.7	76	130
		EG020A-F: Lead	7439-92-1	0.2 mg/L	87.7	75	133
		EG020A-F: Manganese	7439-96-5	0.2 mg/L	70.0	64	134
		EG020A-F: Nickel	7440-02-0	0.2 mg/L	92.5	73	131

Sub-Matrix: **WATER**

				Matrix Spike (MS) Report			
				Spike	SpikeRecovery(%)	Recovery Limits (%)	
Laboratory sample ID	Client sample ID	Method: Compound	CAS Number	Concentration	MS	Low	High
EG020F: Dissolved Metals by ICP-MS (QCLot: 282742) - continued							
EM1517151-006	Anonymous	EG020A-F: Zinc	7440-66-6	0.2 mg/L	89.0	75	131
EG020T: Total Metals by ICP-MS (QCLot: 284267)							
EM1517151-005	Anonymous	EG020A-T: Arsenic	7440-38-2	1 mg/L	97.8	82	118
		EG020A-T: Cadmium	7440-43-9	0.25 mg/L	90.1	75	129
		EG020A-T: Chromium	7440-47-3	1 mg/L	88.2	80	118
		EG020A-T: Copper	7440-50-8	1 mg/L	91.8	81	115
		EG020A-T: Lead	7439-92-1	1 mg/L	87.1	83	121
		EG020A-T: Manganese	7439-96-5	1 mg/L	103	73	123
		EG020A-T: Nickel	7440-02-0	1 mg/L	88.0	80	118
		EG020A-T: Zinc	7440-66-6	1 mg/L	93.6	74	116
EG035F: Dissolved Mercury by FIMS (QCLot: 282739)							
EM1517118-003	Anonymous	EG035F: Mercury	7439-97-6	0.01 mg/L	100	70	120
EG035F: Dissolved Mercury by FIMS (QCLot: 282743)							
EM1517153-007	GW19	EG035F: Mercury	7439-97-6	0.01 mg/L	102	70	120
EG035T: Total Recoverable Mercury by FIMS (QCLot: 282796)							
EM1517136-002	Anonymous	EG035T: Mercury	7439-97-6	0.01 mg/L	# Not Determined	70	130
EK040P: Fluoride by PC Titrator (QCLot: 284167)							
EM1517153-003	GW24	EK040P: Fluoride	16984-48-8	5 mg/L	87.6	70	130
EK055G: Ammonia as N by Discrete Analyser (QCLot: 283967)							
EM1517153-002	GW38	EK055G: Ammonia as N	7664-41-7	1 mg/L	76.0	70	130
EK057G: Nitrite as N by Discrete Analyser (QCLot: 283239)							
EM1517153-002	GW38	EK057G: Nitrite as N	14797-65-0	0.5 mg/L	85.9	80	114
EK059G: Nitrite plus Nitrate as N (NOx) by Discrete Analyser (QCLot: 281008)							
EM1516959-066	Anonymous	EK059G: Nitrite + Nitrate as N	----	0.5 mg/L	122	70	130
EK071G: Reactive Phosphorus as P by discrete analyser (QCLot: 283240)							
EM1517153-002	GW38	EK071G: Reactive Phosphorus as P	14265-44-2	0.5 mg/L	86.0	79	123
EP005: Total Organic Carbon (TOC) (QCLot: 282049)							
EM1517153-003	GW24	EP005: Total Organic Carbon	----	100 mg/L	93.6	80	114
EP074A: Monocyclic Aromatic Hydrocarbons (QCLot: 281802)							
EM1517153-004	GW28	EP074-WF: Benzene	71-43-2	20 µg/L	# 120	76	128
		EP074-WF: Toluene	108-88-3	20 µg/L	# 124	72	132
EP074E: Halogenated Aliphatic Compounds (QCLot: 281802)							
EM1517153-004	GW28	EP074-WF: 1.1-Dichloroethene	75-35-4	20 µg/L	# 116	63	129
		EP074-WF: Trichloroethene	79-01-6	20 µg/L	# 116	64	126

Sub-Matrix: **WATER**

				Matrix Spike (MS) Report			
				Spike	SpikeRecovery(%)	Recovery Limits (%)	
Laboratory sample ID	Client sample ID	Method: Compound	CAS Number	Concentration	MS	Low	High
EP074F: Halogenated Aromatic Compounds (QCLot: 281802)							
EM1517153-004	GW28	EP074-WF: Chlorobenzene	108-90-7	20 µg/L	# 117	81	119
EP080/071: Total Petroleum Hydrocarbons (QCLot: 281803)							
EM1517153-004	GW28	EP080: C6 - C9 Fraction	----	280 µg/L	88.6	43	125
EP080/071: Total Petroleum Hydrocarbons (QCLot: 281811)							
EM1517022-002	Anonymous	EP080: C6 - C9 Fraction	----	280 µg/L	83.5	43	125
EP080/071: Total Recoverable Hydrocarbons - NEPM 2013 Fractions (QCLot: 281803)							
EM1517153-004	GW28	EP080: C6 - C10 Fraction	C6_C10	330 µg/L	84.8	44	122
EP080/071: Total Recoverable Hydrocarbons - NEPM 2013 Fractions (QCLot: 281811)							
EM1517022-002	Anonymous	EP080: C6 - C10 Fraction	C6_C10	330 µg/L	85.6	44	122
EP080: BTEXN (QCLot: 281803)							
EM1517153-004	GW28	EP080: Benzene	71-43-2	20 µg/L	# 133	68	130
		EP080: Toluene	108-88-3	20 µg/L	112	72	132
EP080: BTEXN (QCLot: 281811)							
EM1517022-002	Anonymous	EP080: Benzene	71-43-2	20 µg/L	100	68	130
		EP080: Toluene	108-88-3	20 µg/L	103	72	132

ALS Environmental

QA/QC Compliance Assessment to assist with Quality Review

Work Order	: **EM1517153**	Page	: 1 of 14
Client	: **AECOM Australia Pty Ltd**	Laboratory	: Environmental Division Melbourne
Contact	: MS AVERYLL COYNE	Telephone	: +61-3-8549 9608
Project	: 60431087	Date Samples Received	: 17-Nov-2015
Site	: FBURA	Issue Date	: 26-Nov-2015
Sampler	: OLIVER TAYLOR, ZACHARY OCONNOR	No. of samples received	: 18
Order number	: 60431087 1.4	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.**
- **Matrix Spike outliers exist - please see following pages for full details.**
- **Surrogate recovery outliers exist for all regular sample matrices - please see following pages for full details.**

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 : Quality Control Samples

Duplicates, Method Blanks, Laboratory Control Samples and Matrix Spikes

Matrix: **WATER**

Compound Group Name	Laboratory Sample ID	Client Sample ID	Analyte	CAS Number	Data	Limits	Comment
Matrix Spike (MS) Recoveries							
ED041G: Sulfate (Turbidimetric) as SO4 2- by DA	EM1517153--002	GW38	**Sulfate as SO4 - Turbidimetric**	14808-79-8	Not Determined	----	**MS recovery not determined, background level greater than or equal to 4x spike level.**
EG035T: Total Recoverable Mercury by FIMS	EM1517136--002	Anonymous	**Mercury**	7439-97-6	Not Determined	----	**MS recovery not determined, background level greater than or equal to 4x spike level.**
EP074E: Halogenated Aliphatic Compounds	EM1517153--004	GW28	**1.1-Dichloroethene**	75-35-4	116 %	63-129%	**Recovery greater than upper control limit**
EP080: BTEXN	EM1517153--004	GW28	**Benzene**	71-43-2	133 %	68-130%	**Recovery greater than upper data quality objective**

Regular Sample Surrogates

Sub-Matrix: **WATER**

Compound Group Name	Laboratory Sample ID	Client Sample ID	Analyte	CAS Number	Data	Limits	Comment
Samples Submitted							
EP080S: TPH(V)/BTEX Surrogates	EM1517153-014	QCG	**Toluene-D8**	2037-26-5	63.8 %	70-125 %	**Recovery less than lower data quality objective**
EP080S: TPH(V)/BTEX Surrogates	EM1517153-014	QCG	**4-Bromofluorobenzene**	460-00-4	67.6 %	71-129 %	**Recovery less than lower data quality objective**

Outliers : Analysis Holding Time Compliance

Matrix: **WATER**

Method / Container / Client Sample ID(s)	Extraction / Preparation			Analysis		
	Date extracted	Due for extraction	Days overdue	Date analysed	Due for analysis	Days overdue
EA005P: pH by PC Titrator						
Clear Plastic Bottle - Natural						
GW36, GW33, GW34, GW37	----	----	----	18-Nov-2015	16-Nov-2015	**2**
Clear Plastic Bottle - Natural						
GW35, GW38, GW24, GW28, GW31, GW18, GW19	----	----	----	18-Nov-2015	17-Nov-2015	**1**
EK057G: Nitrite as N by Discrete Analyser						
Clear Plastic Bottle - Natural						
GW36, GW33, GW34, GW37	----	----	----	19-Nov-2015	18-Nov-2015	**1**
EK071G: Reactive Phosphorus as P by discrete analyser						

Matrix: **WATER**

Method / Container / Client Sample ID(s)	Extraction / Preparation: Date extracted	Extraction / Preparation: Due for extraction	Extraction / Preparation: Days overdue	Analysis: Date analysed	Analysis: Due for analysis	Analysis: Days overdue
EK071G: Reactive Phosphorus as P by discrete analyser - Analysis Holding Time Compliance						
Clear Plastic Bottle - Natural						
GW36, GW33, GW34, GW37	----	----	----	19-Nov-2015	18-Nov-2015	**1**

Outliers : Frequency of Quality Control Samples

Matrix: **WATER**

Quality Control Sample Type / Method	Count: QC	Count: Regular	Rate (%): Actual	Rate (%): Expected	Quality Control Specification
Laboratory Duplicates (DUP)					
PAH/Phenols (GC/MS - SIM)	0	13	0.00	10.00	NEPM 2013 B3 & ALS QC Standard
TRH - Semivolatile Fraction	0	14	0.00	10.00	NEPM 2013 B3 & ALS QC Standard
TRH - Semivolatile Fractions Only	0	5	0.00	10.00	NEPM 2013 B3 & ALS QC Standard
Matrix Spikes (MS)					
PAH/Phenols (GC/MS - SIM)	0	13	0.00	5.00	NEPM 2013 B3 & ALS QC Standard
TRH - Semivolatile Fraction	0	14	0.00	5.00	NEPM 2013 B3 & ALS QC Standard
TRH - Semivolatile Fractions Only	0	5	0.00	5.00	NEPM 2013 B3 & ALS QC Standard

Analysis Holding Time Compliance

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: Date extracted	Extraction / Preparation: Due for extraction	Extraction / Preparation: Evaluation	Analysis: Date analysed	Analysis: Due for analysis	Analysis: Evaluation
EA005P: pH by PC Titrator							
Clear Plastic Bottle - Natural (EA005-P)							
GW36, GW33, GW34, GW37	**16-Nov-2015**	**----**	----	----	**18-Nov-2015**	16-Nov-2015	×
Clear Plastic Bottle - Natural (EA005-P)							
GW35, GW38, GW24, GW28, GW31, GW18, GW19	**17-Nov-2015**	**----**	----	----	**18-Nov-2015**	17-Nov-2015	×

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
EA015: Total Dissolved Solids dried at 180 ± 5 °C							
Clear Plastic Bottle - Natural (EA015H) GW36, GW33, GW34, GW37	**16-Nov-2015**	**----**	----	----	**20-Nov-2015**	23-Nov-2015	✓
Clear Plastic Bottle - Natural (EA015H) GW35, GW38, GW24, GW28, GW31, GW18, GW19	**17-Nov-2015**	**----**	----	----	**20-Nov-2015**	24-Nov-2015	✓
ED037P: Alkalinity by PC Titrator							
Clear Plastic Bottle - Natural (ED037-P) GW36, GW33, GW34, GW37	**16-Nov-2015**	**----**	----	----	**18-Nov-2015**	30-Nov-2015	✓
Clear Plastic Bottle - Natural (ED037-P) GW35, GW38, GW24, GW28, GW31, GW18, GW19	**17-Nov-2015**	**----**	----	----	**18-Nov-2015**	01-Dec-2015	✓
ED041G: Sulfate (Turbidimetric) as SO4 2- by DA							
Clear Plastic Bottle - Natural (ED041G) GW36, GW33, GW34, GW37	**16-Nov-2015**	**----**	----	----	**20-Nov-2015**	14-Dec-2015	✓
Clear Plastic Bottle - Natural (ED041G) GW35, GW38, GW24, GW28, GW31, GW18, GW19	**17-Nov-2015**	**----**	----	----	**20-Nov-2015**	15-Dec-2015	✓
ED043: Total Oxidised Sulfur as SO4 2-							
Clear Plastic Bottle - Natural (ED043) GW36, GW33, GW34	**16-Nov-2015**	**23-Nov-2015**	14-Dec-2015	✓	**24-Nov-2015**	14-Dec-2015	✓
Clear Plastic Bottle - Natural (ED043) GW35, GW38, GW24, GW28, GW31, GW18, GW19	**17-Nov-2015**	**23-Nov-2015**	15-Dec-2015	✓	**24-Nov-2015**	15-Dec-2015	✓

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
ED045G: Chloride by Discrete Analyser							
Clear Plastic Bottle - Natural (ED045G)							
GW36, GW33, GW34, GW37	**16-Nov-2015**	**----**	----	----	**20-Nov-2015**	14-Dec-2015	✓
Clear Plastic Bottle - Natural (ED045G)							
GW35, GW38, GW24, GW28, GW31, GW18, GW19	**17-Nov-2015**	**----**	----	----	**20-Nov-2015**	15-Dec-2015	✓
ED093F: Dissolved Major Cations							
Clear Plastic Bottle - Nitric Acid; Filtered (ED093F)							
GW36, GW33, GW34, GW37	**16-Nov-2015**	**----**	----	----	**19-Nov-2015**	14-Dec-2015	✓
Clear Plastic Bottle - Nitric Acid; Filtered (ED093F)							
GW35, GW38, GW24, GW28, GW31, GW18, GW19	**17-Nov-2015**	**----**	----	----	**19-Nov-2015**	15-Dec-2015	✓
EG020F: Dissolved Metals by ICP-MS							
Clear Plastic Bottle - Nitric Acid; Filtered (EG020A-F)							
GW36, GW33, GW34, GW37	**16-Nov-2015**	**----**	----	----	**24-Nov-2015**	14-May-2016	✓
Clear Plastic Bottle - Nitric Acid; Filtered (EG020A-F)							
GW35, GW38, GW24, GW28, GW31, GW18, GW19	**17-Nov-2015**	**----**	----	----	**24-Nov-2015**	15-May-2016	✓
EG020T: Total Metals by ICP-MS							
Clear Plastic Bottle - Nitric Acid; Unfiltered (EG020A-T)							
QCA, QCB, QCD	**16-Nov-2015**	**20-Nov-2015**	14-May-2016	✓	**23-Nov-2015**	14-May-2016	✓
Clear Plastic Bottle - Nitric Acid; Unfiltered (EG020A-T)							
QCE, QCF, QCG	**17-Nov-2015**	**20-Nov-2015**	15-May-2016	✓	**23-Nov-2015**	15-May-2016	✓
EG035F: Dissolved Mercury by FIMS							
Clear Plastic Bottle - Nitric Acid; Filtered (EG035F)							
GW36, GW33, GW34, GW37	**16-Nov-2015**	**----**	----	----	**20-Nov-2015**	14-Dec-2015	✓
Clear Plastic Bottle - Nitric Acid; Filtered (EG035F)							
GW35, GW38, GW24, GW28, GW31, GW18, GW19	**17-Nov-2015**	**----**	----	----	**20-Nov-2015**	15-Dec-2015	✓

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
EG035T: Total Recoverable Mercury by FIMS							
Clear Plastic Bottle - Nitric Acid; Unfiltered (EG035T)							
QCA, QCB, QCD	**16-Nov-2015**	**----**	----	----	**19-Nov-2015**	14-Dec-2015	✓
Clear Plastic Bottle - Nitric Acid; Unfiltered (EG035T)							
QCE, QCF, QCG	**17-Nov-2015**	**----**	----	----	**19-Nov-2015**	15-Dec-2015	✓
EK040P: Fluoride by PC Titrator							
Clear Plastic Bottle - Natural (EK040P)							
GW36, GW33, GW34, GW37	**16-Nov-2015**	**----**	----	----	**20-Nov-2015**	14-Dec-2015	✓
Clear Plastic Bottle - Natural (EK040P)							
GW35, GW38, GW24, GW28, GW31, GW18, GW19	**17-Nov-2015**	**----**	----	----	**20-Nov-2015**	15-Dec-2015	✓
EK055G: Ammonia as N by Discrete Analyser							
Clear Plastic Bottle - Sulfuric Acid (EK055G)							
GW36, GW33, GW34, GW37	**16-Nov-2015**	**----**	----	----	**23-Nov-2015**	14-Dec-2015	✓
Clear Plastic Bottle - Sulfuric Acid (EK055G)							
GW35, GW38, GW24, GW28, GW31, GW18, GW19	**17-Nov-2015**	**----**	----	----	**23-Nov-2015**	15-Dec-2015	✓
EK057G: Nitrite as N by Discrete Analyser							
Clear Plastic Bottle - Natural (EK057G)							
GW36, GW33, GW34, GW37	**16-Nov-2015**	**----**	----	----	**19-Nov-2015**	18-Nov-2015	×
Clear Plastic Bottle - Natural (EK057G)							
GW35, GW38, GW24, GW28, GW31, GW18, GW19	**17-Nov-2015**	**----**	----	----	**19-Nov-2015**	19-Nov-2015	✓
EK059G: Nitrite plus Nitrate as N (NOx) by Discrete Analyser							
Clear Plastic Bottle - Sulfuric Acid (EK059G)							
GW36, GW33, GW34, GW37	**16-Nov-2015**	**----**	----	----	**18-Nov-2015**	14-Dec-2015	✓
Clear Plastic Bottle - Sulfuric Acid (EK059G)							
GW35, GW38, GW24, GW28, GW31, GW18, GW19	**17-Nov-2015**	**----**	----	----	**18-Nov-2015**	15-Dec-2015	✓

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
EK071G: Reactive Phosphorus as P by discrete analyser							
Clear Plastic Bottle - Natural (EK071G)							
GW36, GW33, GW34, GW37	**16-Nov-2015**	**----**	----	----	**19-Nov-2015**	18-Nov-2015	×
Clear Plastic Bottle - Natural (EK071G)							
GW35, GW38, GW24, GW28, GW31, GW18, GW19	**17-Nov-2015**	**----**	----	----	**19-Nov-2015**	19-Nov-2015	✓
EP005: Total Organic Carbon (TOC)							
Amber TOC Vial - Sulfuric Acid (EP005)							
GW38, GW28	**17-Nov-2015**	**----**	----	----	**18-Nov-2015**	15-Dec-2015	✓
Amber VOC Vial - Sulfuric Acid (EP005)							
GW36	**16-Nov-2015**	**----**	----	----	**18-Nov-2015**	14-Dec-2015	✓
Amber VOC Vial - Sulfuric Acid (EP005)							
GW24, GW18	**17-Nov-2015**	**----**	----	----	**18-Nov-2015**	15-Dec-2015	✓
EP080/071: Total Petroleum Hydrocarbons							
Amber Glass Bottle - Unpreserved (EP071)							
QCA, QCB, QCD, GW36, GW34	**16-Nov-2015**	**18-Nov-2015**	23-Nov-2015	✓	**19-Nov-2015**	28-Dec-2015	✓
Amber Glass Bottle - Unpreserved (EP071)							
GW38, GW24, GW28, GW18, QCE, QCF, QCG	**17-Nov-2015**	**18-Nov-2015**	24-Nov-2015	✓	**19-Nov-2015**	28-Dec-2015	✓
EP080/071: Total Petroleum Hydrocarbons							
Amber Glass Bottle - Unpreserved (EP071-SV)							
GW33, GW37	**16-Nov-2015**	**18-Nov-2015**	23-Nov-2015	✓	**19-Nov-2015**	28-Dec-2015	✓
Amber Glass Bottle - Unpreserved (EP071-SV)							
GW35, GW31, GW19	**17-Nov-2015**	**18-Nov-2015**	24-Nov-2015	✓	**19-Nov-2015**	28-Dec-2015	✓
EP074E: Halogenated Aliphatic Compounds							
Amber VOC Vial - Sulfuric Acid (EP074-WF)							
GW36	**16-Nov-2015**	**19-Nov-2015**	30-Nov-2015	✓	**20-Nov-2015**	30-Nov-2015	✓
Amber VOC Vial - Sulfuric Acid (EP074-WF)							
GW38, GW24, GW28, GW18	**17-Nov-2015**	**19-Nov-2015**	01-Dec-2015	✓	**20-Nov-2015**	01-Dec-2015	✓

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
EP075(SIM)B: Polynuclear Aromatic Hydrocarbons							
Amber Glass Bottle - Unpreserved (EP075(SIM))							
GW36, GW33, GW34, GW37	**16-Nov-2015**	**18-Nov-2015**	23-Nov-2015	✓	**19-Nov-2015**	28-Dec-2015	✓
Amber Glass Bottle - Unpreserved (EP075(SIM))							
GW35, GW38, GW24, GW28, GW31, GW18, GW19	**17-Nov-2015**	**18-Nov-2015**	24-Nov-2015	✓	**19-Nov-2015**	28-Dec-2015	✓
EP080/071: Total Petroleum Hydrocarbons							
Amber VOC Vial - Sulfuric Acid (EP080)							
QCA, QCB, QCD, GW36, GW34	**16-Nov-2015**	**19-Nov-2015**	30-Nov-2015	✓	**20-Nov-2015**	30-Nov-2015	✓
Amber VOC Vial - Sulfuric Acid (EP080)							
GW38, GW24, GW28, GW18, QCE, QCF, QCG, QCH	**17-Nov-2015**	**19-Nov-2015**	01-Dec-2015	✓	**20-Nov-2015**	01-Dec-2015	✓

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)							
Alkalinity by PC Titrator	ED037-P	2	20	**10.00**	**10.00**	✓	NEPM 2013 B3 & ALS QC Standard
Ammonia as N by Discrete analyser	EK055G	2	20	**10.00**	**10.00**	✓	NEPM 2013 B3 & ALS QC Standard
Chloride by Discrete Analyser	ED045G	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	19	**10.53**	**10.00**	✓	NEPM 2013 B3 & ALS QC Standard
Fluoride by PC Titrator	EK040P	2	20	**10.00**	**10.00**	✓	NEPM 2013 B3 & ALS QC Standard
Major Cations - Dissolved	ED093F	2	20	**10.00**	**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	20	**10.00**	**10.00**	✓	NEPM 2013 B3 & ALS QC Standard
PAH/Phenols (GC/MS - SIM)	EP075(SIM)	0	13	**0.00**	**10.00**	×	NEPM 2013 B3 & ALS QC Standard
pH by PC Titrator	EA005-P	2	20	**10.00**	**10.00**	✓	NEPM 2013 B3 & ALS QC Standard
Reactive Phosphorus as P-By Discrete Analyser	EK071G	2	20	**10.00**	**10.00**	✓	NEPM 2013 B3 & ALS QC Standard
Sulfate (Turbidimetric) as SO4 2- by Discrete Analyser	ED041G	2	20	**10.00**	**10.00**	✓	NEPM 2013 B3 & ALS QC Standard
Total Dissolved Solids (High Level)	EA015H	2	19	**10.53**	**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-MS - Suite A	EG020A-T	2	20	**10.00**	**10.00**	✓	NEPM 2013 B3 & ALS QC Standard
Total Organic Carbon	EP005	2	19	**10.53**	**10.00**	✓	NEPM 2013 B3 & ALS QC Standard
Total Oxidised Sulfur as SO4 2-	ED043	2	12	**16.67**	**10.00**	✓	NEPM 2013 B3 & ALS QC Standard
TRH - Semivolatile Fraction	EP071	0	14	**0.00**	**10.00**	×	NEPM 2013 B3 & ALS QC Standard
TRH - Semivolatile Fractions Only	EP071-SV	0	5	**0.00**	**10.00**	×	NEPM 2013 B3 & ALS QC Standard
TRH Volatiles/BTEX	EP080	2	18	**11.11**	**10.00**	✓	NEPM 2013 B3 & ALS QC Standard
Volatile Organic Compounds WF Detection Limits	EP074-WF	1	8	**12.50**	**10.00**	✓	NEPM 2013 B3 & ALS QC Standard
Laboratory Control Samples (LCS)							
Alkalinity by PC Titrator	ED037-P	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
Chloride by Discrete Analyser	ED045G	2	20	**10.00**	**10.00**	✓	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	19	**5.26**	**5.00**	✓	NEPM 2013 B3 & ALS QC Standard
Fluoride by PC Titrator	EK040P	1	20	**5.00**	**5.00**	✓	NEPM 2013 B3 & ALS QC Standard
Major Cations - Dissolved	ED093F	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
Nitrite as N by Discrete Analyser	EK057G	1	20	**5.00**	**5.00**	✓	NEPM 2013 B3 & ALS QC Standard
PAH/Phenols (GC/MS - SIM)	EP075(SIM)	1	13	**7.69**	**5.00**	✓	NEPM 2013 B3 & ALS QC Standard
Reactive Phosphorus as P-By Discrete Analyser	EK071G	1	20	**5.00**	**5.00**	✓	NEPM 2013 B3 & ALS QC Standard
Sulfate (Turbidimetric) as SO4 2- by Discrete Analyser	ED041G	2	20	**10.00**	**10.00**	✓	NEPM 2013 B3 & ALS QC Standard
Total Dissolved Solids (High Level)	EA015H	2	19	**10.53**	**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 Control Samples (LCS) - Continued							
Total Mercury by FIMS	EG035T	1	20	**5.00**	**5.00**	✓	NEPM 2013 B3 & ALS QC Standard
Total Metals by ICP-MS - Suite A	EG020A-T	1	20	**5.00**	**5.00**	✓	NEPM 2013 B3 & ALS QC Standard
Total Organic Carbon	EP005	1	19	**5.26**	**5.00**	✓	NEPM 2013 B3 & ALS QC Standard
Total Oxidised Sulfur as SO4 2-	ED043	1	12	**8.33**	**5.00**	✓	NEPM 2013 B3 & ALS QC Standard
TRH - Semivolatile Fraction	EP071	1	14	**7.14**	**5.00**	✓	NEPM 2013 B3 & ALS QC Standard
TRH - Semivolatile Fractions Only	EP071-SV	1	5	**20.00**	**5.00**	✓	NEPM 2013 B3 & ALS QC Standard
TRH Volatiles/BTEX	EP080	1	18	**5.56**	**5.00**	✓	NEPM 2013 B3 & ALS QC Standard
Volatile Organic Compounds WF Detection Limits	EP074-WF	1	8	**12.50**	**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
Chloride by Discrete Analyser	ED045G	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	19	**5.26**	**5.00**	✓	NEPM 2013 B3 & ALS QC Standard
Fluoride by PC Titrator	EK040P	1	20	**5.00**	**5.00**	✓	NEPM 2013 B3 & ALS QC Standard
Major Cations - Dissolved	ED093F	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
Nitrite as N by Discrete Analyser	EK057G	1	20	**5.00**	**5.00**	✓	NEPM 2013 B3 & ALS QC Standard
PAH/Phenols (GC/MS - SIM)	EP075(SIM)	1	13	**7.69**	**5.00**	✓	NEPM 2013 B3 & ALS QC Standard
Reactive Phosphorus as P-By Discrete Analyser	EK071G	1	20	**5.00**	**5.00**	✓	NEPM 2013 B3 & ALS QC Standard
Sulfate (Turbidimetric) as SO4 2- by Discrete Analyser	ED041G	1	20	**5.00**	**5.00**	✓	NEPM 2013 B3 & ALS QC Standard
Total Dissolved Solids (High Level)	EA015H	1	19	**5.26**	**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-MS - Suite A	EG020A-T	1	20	**5.00**	**5.00**	✓	NEPM 2013 B3 & ALS QC Standard
Total Organic Carbon	EP005	1	19	**5.26**	**5.00**	✓	NEPM 2013 B3 & ALS QC Standard
Total Oxidised Sulfur as SO4 2-	ED043	1	12	**8.33**	**5.00**	✓	NEPM 2013 B3 & ALS QC Standard
TRH - Semivolatile Fraction	EP071	1	14	**7.14**	**5.00**	✓	NEPM 2013 B3 & ALS QC Standard
TRH - Semivolatile Fractions Only	EP071-SV	1	5	**20.00**	**5.00**	✓	NEPM 2013 B3 & ALS QC Standard
TRH Volatiles/BTEX	EP080	1	18	**5.56**	**5.00**	✓	NEPM 2013 B3 & ALS QC Standard
Volatile Organic Compounds WF Detection Limits	EP074-WF	1	8	**12.50**	**5.00**	✓	NEPM 2013 B3 & ALS QC Standard
Matrix Spikes (MS)							
Ammonia as N by Discrete analyser	EK055G	1	20	**5.00**	**5.00**	✓	NEPM 2013 B3 & ALS QC Standard
Chloride by Discrete Analyser	ED045G	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	19	**5.26**	**5.00**	✓	NEPM 2013 B3 & ALS QC Standard
Fluoride by PC Titrator	EK040P	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
Nitrite as N by Discrete Analyser	EK057G	1	20	**5.00**	**5.00**	✓	NEPM 2013 B3 & ALS QC Standard
PAH/Phenols (GC/MS - SIM)	EP075(SIM)	0	13	**0.00**	**5.00**	×	NEPM 2013 B3 & ALS QC Standard
Reactive Phosphorus as P-By Discrete Analyser	EK071G	1	20	**5.00**	**5.00**	✓	NEPM 2013 B3 & ALS QC Standard
Sulfate (Turbidimetric) as SO4 2- by Discrete Analyser	ED041G	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.

Quality Control Sample Type		Count		Rate (%)			Quality Control Specification
Analytical Methods	*Method*	*QC*	*Regular*	***Actual***	***Expected***	*Evaluation*	
Matrix Spikes (MS) - Continued							
Total Mercury by FIMS	EG035T	1	20	**5.00**	**5.00**	✓	NEPM 2013 B3 & ALS QC Standard
Total Metals by ICP-MS - Suite A	EG020A-T	1	20	**5.00**	**5.00**	✓	NEPM 2013 B3 & ALS QC Standard
Total Organic Carbon	EP005	1	19	**5.26**	**5.00**	✓	NEPM 2013 B3 & ALS QC Standard
Total Oxidised Sulfur as SO4 2-	ED043	1	12	**8.33**	**5.00**	✓	NEPM 2013 B3 & ALS QC Standard
TRH - Semivolatile Fraction	EP071	0	14	**0.00**	**5.00**	×	NEPM 2013 B3 & ALS QC Standard
TRH - Semivolatile Fractions Only	EP071-SV	0	5	**0.00**	**5.00**	×	NEPM 2013 B3 & ALS QC Standard
TRH Volatiles/BTEX	EP080	1	18	**5.56**	**5.00**	✓	NEPM 2013 B3 & ALS QC Standard
Volatile Organic Compounds WF Detection Limits	EP074-WF	1	8	**12.50**	**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 by PC Titrator	EA005-P	WATER	In house: Referenced to APHA 4500 H+ B. This procedure determines pH of water samples by automated ISE. This method is compliant with NEPM (2013) Schedule B(3)
Total Dissolved Solids (High Level)	EA015H	WATER	In house: Referenced to APHA 2540C. A gravimetric procedure that determines the amount of `filterable` residue in an aqueous sample. A well-mixed sample is filtered through a glass fibre filter (1.2um). The filtrate is evaporated to dryness and dried to constant weight at 180+/-5C. This method is compliant with NEPM (2013) Schedule B(3)
Alkalinity by PC Titrator	ED037-P	WATER	In house: Referenced to APHA 2320 B This procedure determines alkalinity by automated measurement (e.g. PC Titrate) using pH 4.5 for indicating the total alkalinity end-point. This method is compliant with NEPM (2013) Schedule B(3)
Sulfate (Turbidimetric) as SO4 2- by Discrete Analyser	ED041G	WATER	In house: Referenced to APHA 4500-SO4. Dissolved sulfate is determined in a 0.45um filtered sample. Sulfate ions are converted to a barium sulfate suspension in an acetic acid medium with barium chloride. Light absorbance of the BaSO4 suspension is measured by a photometer and the SO4-2 concentration is determined by comparison of the reading with a standard curve. This method is compliant with NEPM (2013) Schedule B(3)
Total Oxidised Sulfur as SO4 2-	ED043	WATER	In-house. The sample is treated with Peroxide to convert all Sulfur species to Sulfate. Sulfate in the sample can then be determined by ICPAES and reported as TOS as SO4 2-.
Chloride by Discrete Analyser	ED045G	WATER	In house: Referenced to APHA 4500 Cl - G.The thiocyanate ion is liberated from mercuric thiocyanate through sequestration of mercury by the chloride ion to form non-ionised mercuric chloride.in the presence of ferric ions the librated thiocynate forms highly-coloured ferric thiocynate which is measured at 480 nm APHA 21st edition seal method 2 017-1-L april 2003
Major Cations - Dissolved	ED093F	WATER	In house: Referenced to APHA 3120 and 3125; USEPA SW 846 - 6010 and 6020; Cations are determined by either ICP-AES or ICP-MS techniques. This method is compliant with NEPM (2013) Schedule B(3) Sodium Adsorption Ratio is calculated from Ca, Mg and Na which determined by ALS in house method QWI-EN/ED093F. This method is compliant with NEPM (2013) Schedule B(3) Hardness parameters are calculated based on APHA 2340 B. This method is compliant with NEPM (2013) Schedule B(3)
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 0.45 um 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.
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.

Analytical Methods	Method	Matrix	Method Descriptions
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 0.45 um 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 (2013) Schedule B(3)
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 (2013) Schedule B(3)
Fluoride by PC Titrator	EK040P	WATER	In house: Referenced to APHA 4500 F--C CDTA is added to the sample to provide a uniform ionic strength background, adjust pH, and break up complexes. Fluoride concentration is determined by either manual or automatic ISE measurement. This method is compliant with NEPM (2013) 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 (2013) 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 (2013) 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 (2013) 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 (2013) Schedule B(3)
Reactive Phosphorus as P-By Discrete Analyser	EK071G	WATER	In house: Referenced to APHA 4500-P F Ammonium molybdate and potassium antimonyl tartrate reacts in acid medium with othophosphate to form a heteropoly acid -phosphomolybdic acid - which is reduced to intensely coloured molybdenum blue by ascorbic acid. Quantification is by Discrete Analyser. This method is compliant with NEPM (2013) Schedule B(3)
Ionic Balance by PCT DA and Turbi SO4 DA	EN055 - PG	WATER	In house: Referenced to APHA 1030F. This method is compliant with NEPM (2013) Schedule B(3)
Total Organic Carbon	EP005	WATER	In house: Referenced to APHA 5310 B, The automated TOC analyzer determines Total and Inorganic Carbon by IR cell. TOC is calculated as the difference. This method is compliant with NEPM (2013) Schedule B(3)
TRH - Semivolatile Fraction	EP071	WATER	USEPA SW 846 - 8015A 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 (2013) Schedule B(3)
TRH - Semivolatile Fractions Only	EP071-SV	WATER	USEPA SW 846 - 8015A 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 NEPM (2013) Schedule B(3)
Volatile Organic Compounds WF Detection Limits	EP074-WF	WATER	USEPA SW 846 - 8260B Water samples are directly purged prior to analysis by Capillary GC/MS and quantification is by comparison against an established 5 point calibration curve. This method is compliant with NEPM (2013) Schedule B(3)

Analytical Methods	Method	Matrix	Method Descriptions
PAH/Phenols (GC/MS - SIM)	EP075(SIM)	WATER	USEPA SW 846 - 8270D 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 (2013) Schedule B(3)
TRH Volatiles/BTEX	EP080	WATER	USEPA SW 846 - 8260B 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 (2013) Schedule B(3)

Preparation Methods	Method	Matrix	Method Descriptions
Total Oxidisable Sulfur as SO4 2- Prep	ED043-PR	WATER	In - House
Digestion for Total Recoverable Metals	EN25	WATER	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 (2013) Schedule B(3)

AECOM. L9, 8 Exhibition St.

URS - CHAIN OF CUSTODY

SCANNED

ADDRESS:	URS Australia 1 Southbank Blvd Southbank, VIC 3006	LABORATORY: ALS ADDRESS: 4 Westall Rd Springvale VIC 3171	All results to be provided in MrEd format email address: [redacted] Averyll.coyne@aecom.com Zachary.Oconnor@aecom.com
PHONE NO:	03 8699 7500	PHONE NO: 03 8549 9600	PURCHASE ORDER NUMBER:
FAX NO:	03 8699 7550	FAX NO: 03 8549 9601	FOR LABORATORY USE ONLY
PROJECT NAME:	FBURA	PROJECT MANAGER: Averyll Coyne	
PROJECT NO:	60431087	SAMPLERS: Z.O'Connor, O.Tayb SIGNED:	

COMMENTS: Refer quote Quote Number - ME/543/15

ANALYSIS REQUIRED

LAB ID	SAMPLE ID	DATE	MATRIX	SITE	LOCATION	CONTAINER TYPE & PRESERVATIVE	TOTAL NUMBER OF CONTAINERS	Metals (1)	TRH (C6 - C40)	TDS, pH, TOC	Ammonia as N & Nitrate	VOX 1 SOx	Major Anions + Cations	BTEXN	VOC (71)	PAH	TPH (C6-C9)	HOLD
1	GW35	17/11	water	FBURA	GW35			X	X	X		X	X			X		
2	GW38				GW38			X	X	X		X	X	X	X	X		
3	GW24				GW24			X	X	X		X	X	X	X	X		
4	GW28				GW28			X	X	X		X	X	X	X	X		
5	GW31				GW31			X	X	X		X	X			X		
6	GW18				GW18			X	X	X		X	X			X		
7	GW19				GW19			X	X	X		X	X			X		
8	QCA	16/11						X	X					X				
9	QCB							X	X					X				
10 not received R.T.	QCC													X			X	
11	QCD							X	X					X				
12	QCE	17/11						X	X					X				
13	QCF							X	X					X				
14	QCG							X	X					X				
15	QCH													X			X	
16	GW36	16/11			GW36			X	X	X		X	X			X		
17	GW33				GW33			X	X	X		X	X			X		
18	GW34				GW34			X	X	X		X	X			X		
19	GW37				GW37			X	X	X		X	X			X		
							0	0	0	0	0	0	0	0			6	0

Samples sent to lab for: Micro Nitrate BOD pH Colour Turbidity RP

Custody Seal ? Y N NA
Samples Cold ? Y N NA
Comments:

RELINQUISHED BY: Z. O'Connor
DATE: 17/11/15 TIME:
RECEIVED BY:
DATE: TIME: (AM)

17/11 15:10

Environmental Division
Melbourne
Work Order Reference
EM1517153

Telephone : + 61-3-8549 9600

Bottle; VH = HCl Preserved Vial; P = Plastic Bottle; N = Nitric Acid Preserved; S = Sulphuric Acid
Hydroxide Preserved; B = Sterile Bottle; Z = Zinc Acetate Preserved; E = EDTA Preserved; O = Other

PLEASE SIGN AND FAX TO URS UPON RECEIPT Ferrous Iron (#2,3,4,9,16&17)

Date 17/11 S-D

R.T. 17/11/15

From: O'Connor, Zachary [mailto:Zachary.OConnor@aecom.com]
Sent: Tuesday, 17 November 2015 9:35 PM
To: Carol Walsh
Cc: Coyne, Averyll
Subject: FW: CoC for ALS Workorder : EM1517153 | Overall Description: FBURA

Hi Carol,

Could I please add BTEXN and VOC analysis to GW18 and GW36?

Cheers,
Zach.

From: Coyne, Averyll
Sent: Thursday, 19 November 2015 11:58 AM
To: 'carol.walsh@alsglobal.com'
Cc: O'Connor, Zachary
Subject: RE: CoC for ALS Workorder : EM1517153 | Overall Description: FBURA

Hi Carol,

Please add TOC to the following samples:

GW38
GW24
GW28
GW18
GW36

Please let me know ASAP if you do not have enough groundwater to undertake this analysis.

Kind Regards
Averyll

Averyll Coyne
Principal Environmental Scientist
D +61 3 9653 8072 M +61 499 252 502
Averyll.Coyne@aecom.com

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Level 9, 8 Exhibition Street, Melbourne, VIC 3000
T +61 3 9653 1234 F +61 3 9654 7117
aecom.com

From: Coyne, Averyll
Sent: Thursday, 19 November 2015 11:01 AM
To: carol.walsh@alsglobal.com
Cc: O'Connor, Zachary
Subject: RE: CoC for ALS Workorder : EM1517153 | Overall Description: FBURA
Importance: High

Hi Carol,

Please find attached amendments to the COC for batch EM1517153.

You will receive more samples today. I will provide you with a COC for these additional samples shortly.

Kind Regards
Averyll

Averyll Coyne
Principal Environmental Scientist
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ALS Environmental

CERTIFICATE OF ANALYSIS

Work Order	: **EM1517312**	Page	: 1 of 30
Client	: **AECOM Australia Pty Ltd**	Laboratory	: Environmental Division Melbourne
Contact	: MS AVERYLL COYNE	Contact	: Carol Walsh
Address	: LEVEL 9 8 EXHIBITION ST MELBOURNE VIC 3000	Address	: 4 Westall Rd Springvale VIC Australia 3171
E-mail	: averyll.coyne@aecom.com	E-mail	: carol.walsh@alsglobal.com
Telephone	: +61 03 9653 1234	Telephone	: +61-3-8549 9608
Facsimile	: +61 03 9654 7117	Facsimile	: +61-3-8549 9601
Project	: 60431087	QC Level	: NEPM 2013 B3 & ALS QC Standard
Order number	: 60431087 1.4	Date Samples Received	: 19-Nov-2015 11:35
C-O-C number	: ----	Date Analysis Commenced	: 19-Nov-2015
Sampler	: OLIVER TAYLOR, ZACHARY OCONNOR	Issue Date	: 26-Nov-2015 18:22
Site	:		
		No. of samples received	: 21
Quote number	: ----	No. of samples analysed	: 19

This report supersedes any previous report(s) with this reference. Results apply to the sample(s) as submitted.

This Certificate of Analysis contains the following information:

- General Comments
- Analytical Results

NATA Accredited Laboratory 825

Accredited for compliance with ISO/IEC 17025.

Signatories

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

Signatories	*Position*	*Accreditation Category*
Dilani Fernando	Senior Inorganic Chemist	Melbourne Inorganics
Eric Chau	Metals Team Leader	Melbourne Inorganics
Herman Lin	Laboratory Manager	Melbourne Inorganics
Nancy Wang	Senior Semivolatile Instrument Chemist	Melbourne Organics

General Comments

The analytical procedures used by the Environmental Division have been developed from established internationally recognized procedures such as those published by the USEPA, APHA, AS and NEPM. In house developed procedures are employed in the absence of documented standards or by 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.

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.

- TDS by method EA-015 may bias high for #1, #12, #13, #15 due to the presence of fine particulate matter, which may pass through the prescribed GF/C paper.
- Ionic balances were calculated using: major anions - chloride, alkalinity and sulfate; and major cations - calcium, magnesium, potassium and sodium.
- EP074: Particular sample (EM-1517312-001) shows minor hit of Chloroform. Confirmed by re-analysis.
- Benzo(a)pyrene Toxicity Equivalent Quotient (TEQ) 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.

Analytical Results

Sub-Matrix: WATER (Matrix: WATER)				Client sample ID	GW14	GW16	GW15	GW23	GW17
				Client sampling date / time	[17-Nov-2015]	[17-Nov-2015]	[17-Nov-2015]	[17-Nov-2015]	[18-Nov-2015]
Compound	CAS Number	LOR	Unit		EM1517312-001	EM1517312-002	EM1517312-003	EM1517312-004	EM1517312-005
					Result	Result	Result	Result	Result
EA005P: pH by PC Titrator									
pH Value	----	0.01	pH Unit		6.19	7.38	7.38	6.97	7.19
EA015: Total Dissolved Solids dried at 180 ± 5 °C									
Total Dissolved Solids @180°C	----	10	mg/L		336	881	30300	1860	1020
ED037P: Alkalinity by PC Titrator									
Hydroxide Alkalinity as CaCO3	DMO-210-001	1	mg/L		<1	<1	<1	<1	<1
Carbonate Alkalinity as CaCO3	3812-32-6	1	mg/L		<1	<1	<1	<1	<1
Bicarbonate Alkalinity as CaCO3	71-52-3	1	mg/L		85	352	2790	173	350
Total Alkalinity as CaCO3	----	1	mg/L		85	352	2790	173	350
ED041G: Sulfate (Turbidimetric) as SO4 2- by DA									
Sulfate as SO4 - Turbidimetric	14808-79-8	1	mg/L		13	224	528	594	281
ED043: Total Oxidised Sulfur as SO4 2-									
Total Oxidised Sulfur as SO4 2-	----	1	mg/L		18	225	468	677	306
ED045G: Chloride by Discrete Analyser									
Chloride	16887-00-6	1	mg/L		16	34	12100	398	83
ED093F: Dissolved Major Cations									
Calcium	7440-70-2	1	mg/L		24	127	319	202	127
Magnesium	7439-95-4	1	mg/L		4	38	1200	54	30
Sodium	7440-23-5	1	mg/L		16	67	7680	279	139
Potassium	7440-09-7	1	mg/L		3	24	209	25	14
EG020F: Dissolved Metals by ICP-MS									
Aluminium	7429-90-5	0.01	mg/L		0.06	0.03	0.15	0.06	0.03
Arsenic	7440-38-2	0.001	mg/L		0.005	0.014	0.076	0.003	0.004
Cadmium	7440-43-9	0.0001	mg/L		<0.0001	<0.0001	<0.0001	<0.0001	<0.0001
Chromium	7440-47-3	0.001	mg/L		<0.001	<0.001	0.012	0.002	0.002
Copper	7440-50-8	0.001	mg/L		0.002	<0.001	0.001	0.002	<0.001
Nickel	7440-02-0	0.001	mg/L		0.054	0.045	0.204	0.030	0.042
Lead	7439-92-1	0.001	mg/L		<0.001	<0.001	<0.001	<0.001	<0.001
Zinc	7440-66-6	0.005	mg/L		0.020	0.091	<0.005	0.154	<0.005
Manganese	7439-96-5	0.001	mg/L		0.002	0.304	0.408	0.293	0.329
Selenium	7782-49-2	0.01	mg/L		<0.01	<0.01	<0.01	<0.01	<0.01
Iron	7439-89-6	0.05	mg/L		0.05	3.87	0.98	10.8	1.61
EG020T: Total Metals by ICP-MS									
Aluminium	7429-90-5	0.01	mg/L		----	----	----	----	----
Arsenic	7440-38-2	0.001	mg/L		----	----	----	----	----

Analytical Results

Sub-Matrix: WATER (Matrix: WATER)				Client sample ID	GW14	GW16	GW15	GW23	GW17
				Client sampling date / time	[17-Nov-2015]	[17-Nov-2015]	[17-Nov-2015]	[17-Nov-2015]	[18-Nov-2015]
Compound	CAS Number	LOR	Unit		EM1517312-001	EM1517312-002	EM1517312-003	EM1517312-004	EM1517312-005
					Result	Result	Result	Result	Result
EG020T: Total Metals by ICP-MS - Continued									
Cadmium	7440-43-9	0.0001	mg/L		----	----	----	----	----
Chromium	7440-47-3	0.001	mg/L		----	----	----	----	----
Copper	7440-50-8	0.001	mg/L		----	----	----	----	----
Nickel	7440-02-0	0.001	mg/L		----	----	----	----	----
Lead	7439-92-1	0.001	mg/L		----	----	----	----	----
Zinc	7440-66-6	0.005	mg/L		----	----	----	----	----
Manganese	7439-96-5	0.001	mg/L		----	----	----	----	----
Selenium	7782-49-2	0.01	mg/L		----	----	----	----	----
Iron	7439-89-6	0.05	mg/L		----	----	----	----	----
EG035F: Dissolved Mercury by FIMS									
Mercury	7439-97-6	0.0001	mg/L		<0.0001	<0.0001	<0.0001	<0.0001	<0.0001
EG035T: Total Recoverable Mercury by FIMS									
Mercury	7439-97-6	0.0001	mg/L		----	----	----	----	----
EK040P: Fluoride by PC Titrator									
Fluoride	16984-48-8	0.1	mg/L		**0.5**	**0.6**	**0.5**	**0.3**	**0.4**
EK055G: Ammonia as N by Discrete Analyser									
Ammonia as N	7664-41-7	0.01	mg/L		**0.02**	**0.39**	**47.0**	**1.81**	**1.09**
EK057G: Nitrite as N by Discrete Analyser									
Nitrite as N	14797-65-0	0.01	mg/L		<0.01	<0.01	**0.49**	<0.01	<0.01
EK058G: Nitrate as N by Discrete Analyser									
Nitrate as N	14797-55-8	0.01	mg/L		**0.05**	**0.03**	**16.4**	**0.05**	**0.03**
EK059G: Nitrite plus Nitrate as N (NOx) by Discrete Analyser									
Nitrite + Nitrate as N	----	0.01	mg/L		**0.05**	**0.03**	**16.9**	**0.05**	**0.03**
EK071G: Reactive Phosphorus as P by discrete analyser									
Reactive Phosphorus as P	14265-44-2	0.01	mg/L		**0.18**	**0.02**	**1.51**	<0.01	**0.02**
EN055: Ionic Balance									
Total Anions	----	0.01	meq/L		**2.42**	**12.6**	**408**	**27.0**	**15.2**
Total Cations	----	0.01	meq/L		**2.30**	**13.0**	**454**	**27.3**	**15.2**
Ionic Balance	----	0.01	%		**2.55**	**1.32**	**5.32**	**0.47**	**0.08**
EP005: Total Organic Carbon (TOC)									
Total Organic Carbon	----	1	mg/L		**3**	**13**	**96**	<1	----
EP074A: Monocyclic Aromatic Hydrocarbons									
Benzene	71-43-2	1	µg/L		<1	<1	----	----	----

Analytical Results

Sub-Matrix: WATER (Matrix: WATER)				Client sample ID	GW14	GW16	GW15	GW23	GW17
				Client sampling date / time	[17-Nov-2015]	[17-Nov-2015]	[17-Nov-2015]	[17-Nov-2015]	[18-Nov-2015]
Compound	CAS Number	LOR	Unit		EM1517312-001	EM1517312-002	EM1517312-003	EM1517312-004	EM1517312-005
					Result	Result	Result	Result	Result
EP074A: Monocyclic Aromatic Hydrocarbons - Continued									
Toluene	108-88-3	1	µg/L		<1	<1	----	----	----
Ethylbenzene	100-41-4	1	µg/L		<1	<1	----	----	----
meta- & para-Xylene	108-38-3 106-42-3	1	µg/L		<1	<1	----	----	----
Styrene	100-42-5	1	µg/L		<1	<1	----	----	----
ortho-Xylene	95-47-6	1	µg/L		<1	<1	----	----	----
Isopropylbenzene	98-82-8	1	µg/L		<1	<1	----	----	----
n-Propylbenzene	103-65-1	1	µg/L		<1	<1	----	----	----
1.3.5-Trimethylbenzene	108-67-8	1	µg/L		<1	<1	----	----	----
sec-Butylbenzene	135-98-8	1	µg/L		<1	<1	----	----	----
1.2.4-Trimethylbenzene	95-63-6	1	µg/L		<1	<1	----	----	----
tert-Butylbenzene	98-06-6	1	µg/L		<1	<1	----	----	----
p-Isopropyltoluene	99-87-6	1	µg/L		<1	<1	----	----	----
n-Butylbenzene	104-51-8	1	µg/L		<1	<1	----	----	----
EP074B: Oxygenated Compounds									
2-Propanone (Acetone)	67-64-1	10	µg/L		<10	<10	----	----	----
Vinyl Acetate	108-05-4	10	µg/L		<10	<10	----	----	----
2-Butanone (MEK)	78-93-3	10	µg/L		<10	<10	----	----	----
4-Methyl-2-pentanone (MIBK)	108-10-1	10	µg/L		<10	<10	----	----	----
2-Hexanone (MBK)	591-78-6	10	µg/L		<10	<10	----	----	----
EP074C: Sulfonated Compounds									
Carbon disulfide	75-15-0	1	µg/L		<1	<1	----	----	----
EP074D: Fumigants									
2.2-Dichloropropane	594-20-7	1	µg/L		<1	<1	----	----	----
1.2-Dichloropropane	78-87-5	1	µg/L		<1	<1	----	----	----
cis-1.3-Dichloropropylene	10061-01-5	2	µg/L		<2	<2	----	----	----
trans-1.3-Dichloropropylene	10061-02-6	2	µg/L		<2	<2	----	----	----
1.2-Dibromoethane (EDB)	106-93-4	1	µg/L		<1	<1	----	----	----
EP074E: Halogenated Aliphatic Compounds									
Dichlorodifluoromethane	75-71-8	10	µg/L		<10	<10	----	----	----
Chloromethane	74-87-3	10	µg/L		<10	<10	----	----	----
Vinyl chloride	75-01-4	10	µg/L		<10.0	<10.0	----	----	----
Bromomethane	74-83-9	10	µg/L		<10	<10	----	----	----
Chloroethane	75-00-3	10	µg/L		<10	<10	----	----	----
Trichlorofluoromethane	75-69-4	10	µg/L		<10	<10	----	----	----

Analytical Results

Sub-Matrix: WATER (Matrix: WATER)				Client sample ID	GW14	GW16	GW15	GW23	GW17
				Client sampling date / time	[17-Nov-2015]	[17-Nov-2015]	[17-Nov-2015]	[17-Nov-2015]	[18-Nov-2015]
Compound	CAS Number	LOR	Unit		EM1517312-001	EM1517312-002	EM1517312-003	EM1517312-004	EM1517312-005
					Result	Result	Result	Result	Result
EP074E: Halogenated Aliphatic Compounds - Continued									
1.1-Dichloroethene	75-35-4	1	µg/L		<1	<1	----	----	----
Iodomethane	74-88-4	1	µg/L		<1	<1	----	----	----
Methylene chloride	75-09-2	5	µg/L		<5	<5	----	----	----
trans-1.2-Dichloroethene	156-60-5	1	µg/L		<1	<1	----	----	----
1.1-Dichloroethane	75-34-3	1	µg/L		<1	<1	----	----	----
cis-1.2-Dichloroethene	156-59-2	1	µg/L		<1	<1	----	----	----
1.1.1-Trichloroethane	71-55-6	1	µg/L		<1	<1	----	----	----
1.1-Dichloropropylene	563-58-6	1	µg/L		<1	<1	----	----	----
Carbon Tetrachloride	56-23-5	1	µg/L		<1	<1	----	----	----
1.2-Dichloroethane	107-06-2	1	µg/L		<1	<1	----	----	----
Trichloroethene	79-01-6	1	µg/L		<1	<1	----	----	----
Dibromomethane	74-95-3	1	µg/L		<1	<1	----	----	----
1.1.2-Trichloroethane	79-00-5	1	µg/L		<1	<1	----	----	----
1.3-Dichloropropane	142-28-9	1	µg/L		<1	<1	----	----	----
Tetrachloroethene	127-18-4	1	µg/L		<1	<1	----	----	----
1.1.1.2-Tetrachloroethane	630-20-6	1	µg/L		<1	<1	----	----	----
trans-1.4-Dichloro-2-butene	110-57-6	1	µg/L		<1	<1	----	----	----
cis-1.4-Dichloro-2-butene	1476-11-5	1	µg/L		<1	<1	----	----	----
1.1.2.2-Tetrachloroethane	79-34-5	1	µg/L		<1	<1	----	----	----
1.2.3-Trichloropropane	96-18-4	1	µg/L		<1	<1	----	----	----
Pentachloroethane	76-01-7	1	µg/L		<1	<1	----	----	----
1.2-Dibromo-3-chloropropane	96-12-8	1	µg/L		<1	<1	----	----	----
Hexachlorobutadiene	87-68-3	1	µg/L		<1.0	<1.0	----	----	----
EP074F: Halogenated Aromatic Compounds									
Chlorobenzene	108-90-7	1	µg/L		<1	<1	----	----	----
Bromobenzene	108-86-1	1	µg/L		<1	<1	----	----	----
2-Chlorotoluene	95-49-8	1	µg/L		<1	<1	----	----	----
4-Chlorotoluene	106-43-4	1	µg/L		<1	<1	----	----	----
1.3-Dichlorobenzene	541-73-1	1	µg/L		<1	<1	----	----	----
1.4-Dichlorobenzene	106-46-7	1	µg/L		<1.0	<1.0	----	----	----
1.2-Dichlorobenzene	95-50-1	1	µg/L		<1	<1	----	----	----
1.2.4-Trichlorobenzene	120-82-1	1	µg/L		<1	<1	----	----	----
1.2.3-Trichlorobenzene	87-61-6	1	µg/L		<1	<1	----	----	----
EP074G: Trihalomethanes									

Analytical Results

Sub-Matrix: WATER (Matrix: WATER)				Client sample ID	GW14	GW16	GW15	GW23	GW17
				Client sampling date / time	[17-Nov-2015]	[17-Nov-2015]	[17-Nov-2015]	[17-Nov-2015]	[18-Nov-2015]
Compound	CAS Number	LOR	Unit		EM1517312-001	EM1517312-002	EM1517312-003	EM1517312-004	EM1517312-005
					Result	Result	Result	Result	Result
EP074G: Trihalomethanes - Continued									
Chloroform	67-66-3	1	µg/L		**2**	<1	----	----	----
Bromodichloromethane	75-27-4	1	µg/L		<1	<1	----	----	----
Dibromochloromethane	124-48-1	1	µg/L		<1	<1	----	----	----
Bromoform	75-25-2	1	µg/L		<1	<1	----	----	----
EP074H: Naphthalene									
Naphthalene	91-20-3	5	µg/L		<5	<5	----	----	----
EP075(SIM)B: Polynuclear Aromatic Hydrocarbons									
Naphthalene	91-20-3	1	µg/L		<1.0	<1.0	<1.0	<1.0	<1.0
Acenaphthylene	208-96-8	1	µg/L		<1.0	<1.0	<1.0	<1.0	<1.0
Acenaphthene	83-32-9	1	µg/L		<1.0	<1.0	<1.0	<1.0	<1.0
Fluorene	86-73-7	1	µg/L		<1.0	<1.0	<1.0	<1.0	<1.0
Phenanthrene	85-01-8	1	µg/L		<1.0	<1.0	<1.0	<1.0	<1.0
Anthracene	120-12-7	1	µg/L		<1.0	<1.0	<1.0	<1.0	<1.0
Fluoranthene	206-44-0	1	µg/L		<1.0	<1.0	<1.0	<1.0	<1.0
Pyrene	129-00-0	1	µg/L		<1.0	<1.0	<1.0	<1.0	<1.0
Benz(a)anthracene	56-55-3	1	µg/L		<1.0	<1.0	<1.0	<1.0	<1.0
Chrysene	218-01-9	1	µg/L		<1.0	<1.0	<1.0	<1.0	<1.0
Benzo(b+j)fluoranthene	205-99-2 205-82-3	1	µg/L		<1.0	<1.0	<1.0	<1.0	<1.0
Benzo(k)fluoranthene	207-08-9	1	µg/L		<1.0	<1.0	<1.0	<1.0	<1.0
Benzo(a)pyrene	50-32-8	0.5	µg/L		<0.5	<0.5	<0.5	<0.5	<0.5
Indeno(1.2.3.cd)pyrene	193-39-5	1	µg/L		<1.0	<1.0	<1.0	<1.0	<1.0
Dibenz(a.h)anthracene	53-70-3	1	µg/L		<1.0	<1.0	<1.0	<1.0	<1.0
Benzo(g.h.i)perylene	191-24-2	1	µg/L		<1.0	<1.0	<1.0	<1.0	<1.0
^ Sum of polycyclic aromatic hydrocarbons	----	0.5	µg/L		<0.5	<0.5	<0.5	<0.5	<0.5
^ Benzo(a)pyrene TEQ (zero)	----	0.5	µg/L		<0.5	<0.5	<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	**80**	<50	----
C10 - C14 Fraction	----	50	µg/L		----	----	----	----	**60**
C15 - C28 Fraction	----	100	µg/L		<100	<100	**190**	<100	----
C15 - C28 Fraction	----	100	µg/L		----	----	----	----	<100
C29 - C36 Fraction	----	50	µg/L		<50	<50	<50	<50	----
C29 - C36 Fraction	----	50	µg/L		----	----	----	----	<50
^ C10 - C36 Fraction (sum)	----	50	µg/L		<50	<50	**270**	<50	----

Analytical Results

Sub-Matrix: WATER (Matrix: WATER)				Client sample ID	GW14	GW16	GW15	GW23	GW17
				Client sampling date / time	[17-Nov-2015]	[17-Nov-2015]	[17-Nov-2015]	[17-Nov-2015]	[18-Nov-2015]
Compound	CAS Number	LOR	Unit		EM1517312-001	EM1517312-002	EM1517312-003	EM1517312-004	EM1517312-005
					Result	Result	Result	Result	Result
EP080/071: Total Petroleum Hydrocarbons - Continued									
^ C10 - C36 Fraction (sum)	----	50	µg/L		----	----	----	----	60
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	<100	----
>C10 - C16 Fraction	----	100	µg/L		----	----	----	----	<100
>C16 - C34 Fraction	----	100	µg/L		<100	<100	190	<100	----
>C16 - C34 Fraction	----	100	µg/L		----	----	----	----	<100
>C34 - C40 Fraction	----	100	µg/L		<100	<100	<100	<100	----
>C34 - C40 Fraction	----	100	µg/L		----	----	----	----	<100
^ >C10 - C40 Fraction (sum)	----	100	µg/L		<100	<100	190	<100	----
^ >C10 - C40 Fraction (sum)	----	100	µg/L		----	----	----	----	<100
^ >C10 - C16 Fraction minus Naphthalene (F2)	----	100	µg/L		<100	<100	<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	1330-20-7	2	µg/L		----	----	<2	<2	----
^ Sum of BTEX	----	1	µg/L		----	----	<1	<1	----
Naphthalene	91-20-3	5	µg/L		----	----	<5	<5	----
EP074S: VOC Surrogates									
1.2-Dichloroethane-D4	17060-07-0	1	%		103	108	----	----	----
Toluene-D8	2037-26-5	1	%		102	106	----	----	----
4-Bromofluorobenzene	460-00-4	1	%		92.9	94.5	----	----	----
EP075(SIM)S: Phenolic Compound Surrogates									
Phenol-d6	13127-88-3	1	%		27.8	29.8	25.1	25.6	26.7
2-Chlorophenol-D4	93951-73-6	1	%		63.8	70.1	58.8	60.5	61.1
2.4.6-Tribromophenol	118-79-6	1	%		39.3	45.6	47.2	40.0	44.2
EP075(SIM)T: PAH Surrogates									
2-Fluorobiphenyl	321-60-8	1	%		66.9	78.8	65.6	60.7	62.2

Analytical Results

Sub-Matrix: WATER (Matrix: WATER)				Client sample ID	GW14	GW16	GW15	GW23	GW17
				Client sampling date / time	[17-Nov-2015]	[17-Nov-2015]	[17-Nov-2015]	[17-Nov-2015]	[18-Nov-2015]
Compound	CAS Number	LOR	Unit		EM1517312-001	EM1517312-002	EM1517312-003	EM1517312-004	EM1517312-005
					Result	Result	Result	Result	Result
EP075(SIM)T: PAH Surrogates - Continued									
Anthracene-d10	1719-06-8	1	%		**86.2**	**97.8**	**81.4**	**80.7**	**84.8**
4-Terphenyl-d14	1718-51-0	1	%		**76.2**	**87.8**	**77.5**	**71.8**	**80.0**
EP080S: TPH(V)/BTEX Surrogates									
1.2-Dichloroethane-D4	17060-07-0	2	%		**100.0**	**105**	**100**	**95.8**	**----**
Toluene-D8	2037-26-5	2	%		**100**	**104**	**107**	**97.4**	**----**
4-Bromofluorobenzene	460-00-4	2	%		**94.2**	**95.4**	**98.7**	**94.0**	**----**

Analytical Results

Sub-Matrix: WATER (Matrix: WATER)				Client sample ID	GW21	QC01	GW25	GW29	GW13
				Client sampling date / time	[18-Nov-2015]	[18-Nov-2015]	[18-Nov-2015]	[18-Nov-2015]	[18-Nov-2015]
Compound	CAS Number	LOR	Unit		EM1517312-006	EM1517312-007	EM1517312-008	EM1517312-009	EM1517312-010
					Result	Result	Result	Result	Result
EA005P: pH by PC Titrator									
pH Value	----	0.01	pH Unit		7.09	7.09	7.47	7.51	6.67
EA015: Total Dissolved Solids dried at 180 ± 5 °C									
Total Dissolved Solids @180°C	----	10	mg/L		787	733	2200	1060	751
ED037P: Alkalinity by PC Titrator									
Hydroxide Alkalinity as CaCO3	DMO-210-001	1	mg/L		<1	<1	<1	<1	<1
Carbonate Alkalinity as CaCO3	3812-32-6	1	mg/L		<1	<1	<1	<1	<1
Bicarbonate Alkalinity as CaCO3	71-52-3	1	mg/L		222	224	605	396	343
Total Alkalinity as CaCO3	----	1	mg/L		222	224	605	396	343
ED041G: Sulfate (Turbidimetric) as SO4 2- by DA									
Sulfate as SO4 - Turbidimetric	14808-79-8	1	mg/L		230	227	944	233	151
ED043: Total Oxidised Sulfur as SO4 2-									
Total Oxidised Sulfur as SO4 2-	----	1	mg/L		266	242	1030	238	172
ED045G: Chloride by Discrete Analyser									
Chloride	16887-00-6	1	mg/L		36	36	69	88	20
ED093F: Dissolved Major Cations									
Calcium	7440-70-2	1	mg/L		102	102	273	176	111
Magnesium	7439-95-4	1	mg/L		23	23	139	28	29
Sodium	7440-23-5	1	mg/L		79	80	194	105	54
Potassium	7440-09-7	1	mg/L		6	6	34	10	12
EG020F: Dissolved Metals by ICP-MS									
Aluminium	7429-90-5	0.01	mg/L		0.01	<0.01	0.04	0.03	0.03
Arsenic	7440-38-2	0.001	mg/L		0.006	0.006	0.006	0.006	0.004
Cadmium	7440-43-9	0.0001	mg/L		<0.0001	<0.0001	<0.0001	<0.0001	<0.0001
Chromium	7440-47-3	0.001	mg/L		0.002	0.001	<0.001	<0.001	<0.001
Copper	7440-50-8	0.001	mg/L		<0.001	<0.001	<0.001	<0.001	0.002
Nickel	7440-02-0	0.001	mg/L		0.015	0.015	0.015	0.012	0.020
Lead	7439-92-1	0.001	mg/L		<0.001	<0.001	<0.001	<0.001	0.001
Zinc	7440-66-6	0.005	mg/L		<0.005	<0.005	0.010	0.010	0.028
Manganese	7439-96-5	0.001	mg/L		0.202	0.199	0.739	0.108	0.082
Selenium	7782-49-2	0.01	mg/L		<0.01	<0.01	<0.01	<0.01	<0.01
Iron	7439-89-6	0.05	mg/L		11.8	11.5	13.9	5.54	0.83
EG020T: Total Metals by ICP-MS									
Aluminium	7429-90-5	0.01	mg/L		----	----	----	----	----
Arsenic	7440-38-2	0.001	mg/L		----	----	----	----	----

Analytical Results

Sub-Matrix: WATER (Matrix: WATER)				Client sample ID	GW21	QC01	GW25	GW29	GW13
				Client sampling date / time	[18-Nov-2015]	[18-Nov-2015]	[18-Nov-2015]	[18-Nov-2015]	[18-Nov-2015]
Compound	CAS Number	LOR	Unit		EM1517312-006	EM1517312-007	EM1517312-008	EM1517312-009	EM1517312-010
					Result	Result	Result	Result	Result
EG020T: Total Metals by ICP-MS - Continued									
Cadmium	7440-43-9	0.0001	mg/L		----	----	----	----	----
Chromium	7440-47-3	0.001	mg/L		----	----	----	----	----
Copper	7440-50-8	0.001	mg/L		----	----	----	----	----
Nickel	7440-02-0	0.001	mg/L		----	----	----	----	----
Lead	7439-92-1	0.001	mg/L		----	----	----	----	----
Zinc	7440-66-6	0.005	mg/L		----	----	----	----	----
Manganese	7439-96-5	0.001	mg/L		----	----	----	----	----
Selenium	7782-49-2	0.01	mg/L		----	----	----	----	----
Iron	7439-89-6	0.05	mg/L		----	----	----	----	----
EG035F: Dissolved Mercury by FIMS									
Mercury	7439-97-6	0.0001	mg/L		<0.0001	<0.0001	<0.0001	<0.0001	<0.0001
EG035T: Total Recoverable Mercury by FIMS									
Mercury	7439-97-6	0.0001	mg/L		----	----	----	----	----
EK040P: Fluoride by PC Titrator									
Fluoride	16984-48-8	0.1	mg/L		**0.5**	**0.5**	**0.4**	**0.2**	**0.6**
EK055G: Ammonia as N by Discrete Analyser									
Ammonia as N	7664-41-7	0.01	mg/L		**0.64**	**0.58**	**4.71**	**0.19**	**0.11**
EK057G: Nitrite as N by Discrete Analyser									
Nitrite as N	14797-65-0	0.01	mg/L		<0.01	<0.01	<0.01	**0.02**	<0.01
EK058G: Nitrate as N by Discrete Analyser									
Nitrate as N	14797-55-8	0.01	mg/L		**0.02**	**0.02**	**0.02**	**0.29**	**0.57**
EK059G: Nitrite plus Nitrate as N (NOx) by Discrete Analyser									
Nitrite + Nitrate as N	----	0.01	mg/L		**0.02**	**0.02**	**0.02**	**0.31**	**0.57**
EK071G: Reactive Phosphorus as P by discrete analyser									
Reactive Phosphorus as P	14265-44-2	0.01	mg/L		<0.01	<0.01	<0.01	<0.01	<0.01
EN055: Ionic Balance									
Total Anions	----	0.01	meq/L		**10.2**	**10.2**	**33.7**	**15.2**	**10.6**
Total Cations	----	0.01	meq/L		**10.6**	**10.6**	**34.4**	**15.9**	**10.6**
Ionic Balance	----	0.01	%		**1.60**	**1.92**	**1.00**	**2.15**	**0.10**
EP005: Total Organic Carbon (TOC)									
Total Organic Carbon	----	1	mg/L		**9**	**10**	----	----	----
EP074A: Monocyclic Aromatic Hydrocarbons									
Benzene	71-43-2	1	µg/L		<1	<1	----	----	----

Analytical Results

Sub-Matrix: WATER (Matrix: WATER)				Client sample ID	GW21	QC01	GW25	GW29	GW13
				Client sampling date / time	[18-Nov-2015]	[18-Nov-2015]	[18-Nov-2015]	[18-Nov-2015]	[18-Nov-2015]
Compound	CAS Number	LOR	Unit		EM1517312-006	EM1517312-007	EM1517312-008	EM1517312-009	EM1517312-010
					Result	Result	Result	Result	Result
EP074A: Monocyclic Aromatic Hydrocarbons - Continued									
Toluene	108-88-3	1	µg/L		<1	<1	----	----	----
Ethylbenzene	100-41-4	1	µg/L		<1	<1	----	----	----
meta- & para-Xylene	108-38-3 106-42-3	1	µg/L		<1	<1	----	----	----
Styrene	100-42-5	1	µg/L		<1	<1	----	----	----
ortho-Xylene	95-47-6	1	µg/L		<1	<1	----	----	----
Isopropylbenzene	98-82-8	1	µg/L		<1	<1	----	----	----
n-Propylbenzene	103-65-1	1	µg/L		<1	<1	----	----	----
1.3.5-Trimethylbenzene	108-67-8	1	µg/L		<1	<1	----	----	----
sec-Butylbenzene	135-98-8	1	µg/L		<1	<1	----	----	----
1.2.4-Trimethylbenzene	95-63-6	1	µg/L		<1	<1	----	----	----
tert-Butylbenzene	98-06-6	1	µg/L		<1	<1	----	----	----
p-Isopropyltoluene	99-87-6	1	µg/L		<1	<1	----	----	----
n-Butylbenzene	104-51-8	1	µg/L		<1	<1	----	----	----
EP074B: Oxygenated Compounds									
2-Propanone (Acetone)	67-64-1	10	µg/L		<10	<10	----	----	----
Vinyl Acetate	108-05-4	10	µg/L		<10	<10	----	----	----
2-Butanone (MEK)	78-93-3	10	µg/L		<10	<10	----	----	----
4-Methyl-2-pentanone (MIBK)	108-10-1	10	µg/L		<10	<10	----	----	----
2-Hexanone (MBK)	591-78-6	10	µg/L		<10	<10	----	----	----
EP074C: Sulfonated Compounds									
Carbon disulfide	75-15-0	1	µg/L		<1	<1	----	----	----
EP074D: Fumigants									
2.2-Dichloropropane	594-20-7	1	µg/L		<1	<1	----	----	----
1.2-Dichloropropane	78-87-5	1	µg/L		<1	<1	----	----	----
cis-1.3-Dichloropropylene	10061-01-5	2	µg/L		<2	<2	----	----	----
trans-1.3-Dichloropropylene	10061-02-6	2	µg/L		<2	<2	----	----	----
1.2-Dibromoethane (EDB)	106-93-4	1	µg/L		<1	<1	----	----	----
EP074E: Halogenated Aliphatic Compounds									
Dichlorodifluoromethane	75-71-8	10	µg/L		<10	<10	----	----	----
Chloromethane	74-87-3	10	µg/L		<10	<10	----	----	----
Vinyl chloride	75-01-4	10	µg/L		<10.0	<10.0	----	----	----
Bromomethane	74-83-9	10	µg/L		<10	<10	----	----	----
Chloroethane	75-00-3	10	µg/L		<10	<10	----	----	----
Trichlorofluoromethane	75-69-4	10	µg/L		<10	<10	----	----	----

Analytical Results

Sub-Matrix: WATER (Matrix: WATER)				Client sample ID	GW21	QC01	GW25	GW29	GW13
				Client sampling date / time	[18-Nov-2015]	[18-Nov-2015]	[18-Nov-2015]	[18-Nov-2015]	[18-Nov-2015]
Compound	CAS Number	LOR	Unit		EM1517312-006	EM1517312-007	EM1517312-008	EM1517312-009	EM1517312-010
					Result	Result	Result	Result	Result
EP074E: Halogenated Aliphatic Compounds - Continued									
1.1-Dichloroethene	75-35-4	1	µg/L		<1	<1	----	----	----
Iodomethane	74-88-4	1	µg/L		<1	<1	----	----	----
Methylene chloride	75-09-2	5	µg/L		<5	<5	----	----	----
trans-1.2-Dichloroethene	156-60-5	1	µg/L		<1	<1	----	----	----
1.1-Dichloroethane	75-34-3	1	µg/L		<1	<1	----	----	----
cis-1.2-Dichloroethene	156-59-2	1	µg/L		<1	<1	----	----	----
1.1.1-Trichloroethane	71-55-6	1	µg/L		<1	<1	----	----	----
1.1-Dichloropropylene	563-58-6	1	µg/L		<1	<1	----	----	----
Carbon Tetrachloride	56-23-5	1	µg/L		<1	<1	----	----	----
1.2-Dichloroethane	107-06-2	1	µg/L		<1	<1	----	----	----
Trichloroethene	79-01-6	1	µg/L		<1	<1	----	----	----
Dibromomethane	74-95-3	1	µg/L		<1	<1	----	----	----
1.1.2-Trichloroethane	79-00-5	1	µg/L		<1	<1	----	----	----
1.3-Dichloropropane	142-28-9	1	µg/L		<1	<1	----	----	----
Tetrachloroethene	127-18-4	1	µg/L		<1	<1	----	----	----
1.1.1.2-Tetrachloroethane	630-20-6	1	µg/L		<1	<1	----	----	----
trans-1.4-Dichloro-2-butene	110-57-6	1	µg/L		<1	<1	----	----	----
cis-1.4-Dichloro-2-butene	1476-11-5	1	µg/L		<1	<1	----	----	----
1.1.2.2-Tetrachloroethane	79-34-5	1	µg/L		<1	<1	----	----	----
1.2.3-Trichloropropane	96-18-4	1	µg/L		<1	<1	----	----	----
Pentachloroethane	76-01-7	1	µg/L		<1	<1	----	----	----
1.2-Dibromo-3-chloropropane	96-12-8	1	µg/L		<1	<1	----	----	----
Hexachlorobutadiene	87-68-3	1	µg/L		<1.0	<1.0	----	----	----
EP074F: Halogenated Aromatic Compounds									
Chlorobenzene	108-90-7	1	µg/L		<1	<1	----	----	----
Bromobenzene	108-86-1	1	µg/L		<1	<1	----	----	----
2-Chlorotoluene	95-49-8	1	µg/L		<1	<1	----	----	----
4-Chlorotoluene	106-43-4	1	µg/L		<1	<1	----	----	----
1.3-Dichlorobenzene	541-73-1	1	µg/L		<1	<1	----	----	----
1.4-Dichlorobenzene	106-46-7	1	µg/L		<1.0	<1.0	----	----	----
1.2-Dichlorobenzene	95-50-1	1	µg/L		<1	<1	----	----	----
1.2.4-Trichlorobenzene	120-82-1	1	µg/L		<1	<1	----	----	----
1.2.3-Trichlorobenzene	87-61-6	1	µg/L		<1	<1	----	----	----
EP074G: Trihalomethanes									

Analytical Results

Sub-Matrix: WATER (Matrix: WATER)				Client sample ID	GW21	QC01	GW25	GW29	GW13
				Client sampling date / time	[18-Nov-2015]	[18-Nov-2015]	[18-Nov-2015]	[18-Nov-2015]	[18-Nov-2015]
Compound	CAS Number	LOR	Unit		EM1517312-006	EM1517312-007	EM1517312-008	EM1517312-009	EM1517312-010
					Result	Result	Result	Result	Result
EP074G: Trihalomethanes - Continued									
Chloroform	67-66-3	1	µg/L		<1	<1	----	----	----
Bromodichloromethane	75-27-4	1	µg/L		<1	<1	----	----	----
Dibromochloromethane	124-48-1	1	µg/L		<1	<1	----	----	----
Bromoform	75-25-2	1	µg/L		<1	<1	----	----	----
EP074H: Naphthalene									
Naphthalene	91-20-3	5	µg/L		<5	<5	----	----	----
EP075(SIM)B: Polynuclear Aromatic Hydrocarbons									
Naphthalene	91-20-3	1	µg/L		<1.0	<1.0	<1.0	<1.0	<1.0
Acenaphthylene	208-96-8	1	µg/L		<1.0	<1.0	<1.0	<1.0	<1.0
Acenaphthene	83-32-9	1	µg/L		<1.0	<1.0	<1.0	<1.0	<1.0
Fluorene	86-73-7	1	µg/L		<1.0	<1.0	<1.0	<1.0	<1.0
Phenanthrene	85-01-8	1	µg/L		<1.0	<1.0	<1.0	<1.0	<1.0
Anthracene	120-12-7	1	µg/L		<1.0	<1.0	<1.0	<1.0	<1.0
Fluoranthene	206-44-0	1	µg/L		<1.0	<1.0	<1.0	<1.0	<1.0
Pyrene	129-00-0	1	µg/L		<1.0	<1.0	<1.0	<1.0	<1.0
Benz(a)anthracene	56-55-3	1	µg/L		<1.0	<1.0	<1.0	<1.0	<1.0
Chrysene	218-01-9	1	µg/L		<1.0	<1.0	<1.0	<1.0	<1.0
Benzo(b+j)fluoranthene	205-99-2 205-82-3	1	µg/L		<1.0	<1.0	<1.0	<1.0	<1.0
Benzo(k)fluoranthene	207-08-9	1	µg/L		<1.0	<1.0	<1.0	<1.0	<1.0
Benzo(a)pyrene	50-32-8	0.5	µg/L		<0.5	<0.5	<0.5	<0.5	<0.5
Indeno(1.2.3.cd)pyrene	193-39-5	1	µg/L		<1.0	<1.0	<1.0	<1.0	<1.0
Dibenz(a.h)anthracene	53-70-3	1	µg/L		<1.0	<1.0	<1.0	<1.0	<1.0
Benzo(g.h.i)perylene	191-24-2	1	µg/L		<1.0	<1.0	<1.0	<1.0	<1.0
^ Sum of polycyclic aromatic hydrocarbons	----	0.5	µg/L		<0.5	<0.5	<0.5	<0.5	<0.5
^ Benzo(a)pyrene TEQ (zero)	----	0.5	µg/L		<0.5	<0.5	<0.5	<0.5	<0.5
EP080/071: Total Petroleum Hydrocarbons									
C6 - C9 Fraction	----	20	µg/L		<20	<20	----	----	----
C10 - C14 Fraction	----	50	µg/L		**70**	<50	----	----	----
C10 - C14 Fraction	----	50	µg/L		----	----	<50	**50**	<50
C15 - C28 Fraction	----	100	µg/L		**170**	<100	----	----	----
C15 - C28 Fraction	----	100	µg/L		----	----	<100	<100	<100
C29 - C36 Fraction	----	50	µg/L		<50	<50	----	----	----
C29 - C36 Fraction	----	50	µg/L		----	----	<50	<50	<50
^ C10 - C36 Fraction (sum)	----	50	µg/L		**240**	<50	----	----	----

Analytical Results

Sub-Matrix: WATER (Matrix: WATER)				Client sample ID	GW21	QC01	GW25	GW29	GW13
				Client sampling date / time	[18-Nov-2015]	[18-Nov-2015]	[18-Nov-2015]	[18-Nov-2015]	[18-Nov-2015]
Compound	CAS Number	LOR	Unit		EM1517312-006	EM1517312-007	EM1517312-008	EM1517312-009	EM1517312-010
					Result	Result	Result	Result	Result
EP080/071: Total Petroleum Hydrocarbons - Continued									
^ 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	----	----	----
^ C6 - C10 Fraction minus BTEX (F1)	C6_C10-BTEX	20	µg/L		<20	<20	----	----	----
>C10 - C16 Fraction	----	100	µg/L		<100	<100	----	----	----
>C10 - C16 Fraction	----	100	µg/L		----	----	<100	<100	<100
>C16 - C34 Fraction	----	100	µg/L		160	<100	----	----	----
>C16 - C34 Fraction	----	100	µg/L		----	----	<100	<100	<100
>C34 - C40 Fraction	----	100	µg/L		<100	<100	----	----	----
>C34 - C40 Fraction	----	100	µg/L		----	----	<100	<100	<100
^ >C10 - C40 Fraction (sum)	----	100	µg/L		160	<100	----	----	----
^ >C10 - C40 Fraction (sum)	----	100	µg/L		----	----	<100	<100	<100
^ >C10 - C16 Fraction minus Naphthalene (F2)	----	100	µg/L		<100	<100	----	----	----
EP080: BTEXN									
Benzene	71-43-2	1	µg/L		----	----	----	----	----
Toluene	108-88-3	2	µg/L		----	----	----	----	----
Ethylbenzene	100-41-4	2	µg/L		----	----	----	----	----
meta- & para-Xylene	108-38-3 106-42-3	2	µg/L		----	----	----	----	----
ortho-Xylene	95-47-6	2	µg/L		----	----	----	----	----
^ Total Xylenes	1330-20-7	2	µg/L		----	----	----	----	----
^ Sum of BTEX	----	1	µg/L		----	----	----	----	----
Naphthalene	91-20-3	5	µg/L		----	----	----	----	----
EP074S: VOC Surrogates									
1.2-Dichloroethane-D4	17060-07-0	1	%		100	101	----	----	----
Toluene-D8	2037-26-5	1	%		99.8	101	----	----	----
4-Bromofluorobenzene	460-00-4	1	%		89.2	91.6	----	----	----
EP075(SIM)S: Phenolic Compound Surrogates									
Phenol-d6	13127-88-3	1	%		27.7	23.4	26.3	27.1	28.5
2-Chlorophenol-D4	93951-73-6	1	%		62.4	50.8	59.4	55.3	62.2
2.4.6-Tribromophenol	118-79-6	1	%		44.5	46.2	39.7	38.2	41.3
EP075(SIM)T: PAH Surrogates									
2-Fluorobiphenyl	321-60-8	1	%		60.3	52.4	64.7	56.4	65.9

Analytical Results

Sub-Matrix: WATER (Matrix: WATER)				Client sample ID	GW21	QC01	GW25	GW29	GW13
				Client sampling date / time	[18-Nov-2015]	[18-Nov-2015]	[18-Nov-2015]	[18-Nov-2015]	[18-Nov-2015]
Compound	CAS Number	LOR	Unit		EM1517312-006	EM1517312-007	EM1517312-008	EM1517312-009	EM1517312-010
					Result	Result	Result	Result	Result
EP075(SIM)T: PAH Surrogates - Continued									
Anthracene-d10	1719-06-8	1	%		**86.4**	**90.3**	**84.0**	**77.2**	**86.8**
4-Terphenyl-d14	1718-51-0	1	%		**80.7**	**91.1**	**75.4**	**72.6**	**83.4**
EP080S: TPH(V)/BTEX Surrogates									
1.2-Dichloroethane-D4	17060-07-0	2	%		**97.2**	**98.1**	**----**	**----**	**----**
Toluene-D8	2037-26-5	2	%		**98.3**	**99.8**	**----**	**----**	**----**
4-Bromofluorobenzene	460-00-4	2	%		**90.5**	**92.7**	**----**	**----**	**----**

Analytical Results

Sub-Matrix: WATER (Matrix: WATER)				Client sample ID	GW20	GW26	GW22	GW27	GW30
				Client sampling date / time	[18-Nov-2015]	[18-Nov-2015]	[18-Nov-2015]	[18-Nov-2015]	[18-Nov-2015]
Compound	CAS Number	LOR	Unit		EM1517312-011	EM1517312-012	EM1517312-013	EM1517312-014	EM1517312-015
					Result	Result	Result	Result	Result
EA005P: pH by PC Titrator									
pH Value	----	0.01	pH Unit		7.70	6.89	6.14	8.05	5.26
EA015: Total Dissolved Solids dried at 180 ± 5 °C									
Total Dissolved Solids @180°C	----	10	mg/L		1740	1360	819	1040	1170
ED037P: Alkalinity by PC Titrator									
Hydroxide Alkalinity as CaCO3	DMO-210-001	1	mg/L		<1	<1	<1	<1	<1
Carbonate Alkalinity as CaCO3	3812-32-6	1	mg/L		<1	<1	<1	<1	<1
Bicarbonate Alkalinity as CaCO3	71-52-3	1	mg/L		700	114	58	256	33
Total Alkalinity as CaCO3	----	1	mg/L		700	114	58	256	33
ED041G: Sulfate (Turbidimetric) as SO4 2- by DA									
Sulfate as SO4 - Turbidimetric	14808-79-8	1	mg/L		484	648	266	395	593
ED043: Total Oxidised Sulfur as SO4 2-									
Total Oxidised Sulfur as SO4 2-	----	1	mg/L		558	713	320	467	701
ED045G: Chloride by Discrete Analyser									
Chloride	16887-00-6	1	mg/L		113	15	81	31	31
ED093F: Dissolved Major Cations									
Calcium	7440-70-2	1	mg/L		240	276	61	123	143
Magnesium	7439-95-4	1	mg/L		78	25	28	30	29
Sodium	7440-23-5	1	mg/L		217	32	89	144	64
Potassium	7440-09-7	1	mg/L		24	8	10	8	9
EG020F: Dissolved Metals by ICP-MS									
Aluminium	7429-90-5	0.01	mg/L		0.04	0.03	0.30	0.11	0.21
Arsenic	7440-38-2	0.001	mg/L		0.007	0.003	0.010	<0.001	0.007
Cadmium	7440-43-9	0.0001	mg/L		<0.0001	<0.0001	0.0001	<0.0001	<0.0001
Chromium	7440-47-3	0.001	mg/L		<0.001	0.001	0.007	0.001	0.012
Copper	7440-50-8	0.001	mg/L		<0.001	<0.001	<0.001	<0.001	<0.001
Nickel	7440-02-0	0.001	mg/L		0.022	0.047	0.031	0.016	0.029
Lead	7439-92-1	0.001	mg/L		<0.001	<0.001	0.004	<0.001	<0.001
Zinc	7440-66-6	0.005	mg/L		0.014	1.05	0.284	0.017	0.054
Manganese	7439-96-5	0.001	mg/L		0.233	0.462	0.215	0.542	0.250
Selenium	7782-49-2	0.01	mg/L		<0.01	<0.01	<0.01	<0.01	<0.01
Iron	7439-89-6	0.05	mg/L		4.80	0.72	11.7	20.1	50.6
EG020T: Total Metals by ICP-MS									
Aluminium	7429-90-5	0.01	mg/L		----	----	----	----	----
Arsenic	7440-38-2	0.001	mg/L		----	----	----	----	----

Analytical Results

Sub-Matrix: WATER (Matrix: WATER)				Client sample ID	GW20	GW26	GW22	GW27	GW30
				Client sampling date / time	[18-Nov-2015]	[18-Nov-2015]	[18-Nov-2015]	[18-Nov-2015]	[18-Nov-2015]
Compound	CAS Number	LOR	Unit		EM1517312-011	EM1517312-012	EM1517312-013	EM1517312-014	EM1517312-015
					Result	Result	Result	Result	Result
EG020T: Total Metals by ICP-MS - Continued									
Cadmium	7440-43-9	0.0001	mg/L		----	----	----	----	----
Chromium	7440-47-3	0.001	mg/L		----	----	----	----	----
Copper	7440-50-8	0.001	mg/L		----	----	----	----	----
Nickel	7440-02-0	0.001	mg/L		----	----	----	----	----
Lead	7439-92-1	0.001	mg/L		----	----	----	----	----
Zinc	7440-66-6	0.005	mg/L		----	----	----	----	----
Manganese	7439-96-5	0.001	mg/L		----	----	----	----	----
Selenium	7782-49-2	0.01	mg/L		----	----	----	----	----
Iron	7439-89-6	0.05	mg/L		----	----	----	----	----
EG035F: Dissolved Mercury by FIMS									
Mercury	7439-97-6	0.0001	mg/L		<0.0001	<0.0001	<0.0001	<0.0001	<0.0001
EG035T: Total Recoverable Mercury by FIMS									
Mercury	7439-97-6	0.0001	mg/L		----	----	----	----	----
EK040P: Fluoride by PC Titrator									
Fluoride	16984-48-8	0.1	mg/L		**0.8**	**0.3**	**0.2**	**0.5**	<0.1
EK055G: Ammonia as N by Discrete Analyser									
Ammonia as N	7664-41-7	0.01	mg/L		**5.80**	**0.31**	**1.00**	**0.54**	**0.86**
EK057G: Nitrite as N by Discrete Analyser									
Nitrite as N	14797-65-0	0.01	mg/L		**0.02**	**0.04**	<0.01	<0.01	<0.01
EK058G: Nitrate as N by Discrete Analyser									
Nitrate as N	14797-55-8	0.01	mg/L		<0.01	**0.27**	**0.06**	**0.02**	**0.02**
EK059G: Nitrite plus Nitrate as N (NOx) by Discrete Analyser									
Nitrite + Nitrate as N	----	0.01	mg/L		**0.02**	**0.31**	**0.06**	**0.02**	**0.02**
EK071G: Reactive Phosphorus as P by discrete analyser									
Reactive Phosphorus as P	14265-44-2	0.01	mg/L		<0.01	<0.01	<0.01	<0.01	**0.02**
EN055: Ionic Balance									
Total Anions	----	0.01	meq/L		**27.2**	**16.2**	**8.98**	**14.2**	**13.9**
Total Cations	----	0.01	meq/L		**28.4**	**17.4**	**9.48**	**15.1**	**12.5**
Ionic Balance	----	0.01	%		**2.15**	**3.72**	**2.67**	**2.94**	**5.06**
EP005: Total Organic Carbon (TOC)									
Total Organic Carbon	----	1	mg/L		----	----	----	**5**	----
EP074A: Monocyclic Aromatic Hydrocarbons									
Benzene	71-43-2	1	µg/L		----	----	----	<1	----

Analytical Results

Sub-Matrix: WATER (Matrix: WATER)				Client sample ID	GW20	GW26	GW22	GW27	GW30
				Client sampling date / time	[18-Nov-2015]	[18-Nov-2015]	[18-Nov-2015]	[18-Nov-2015]	[18-Nov-2015]
Compound	CAS Number	LOR	Unit		EM1517312-011	EM1517312-012	EM1517312-013	EM1517312-014	EM1517312-015
					Result	Result	Result	Result	Result
EP074A: Monocyclic Aromatic Hydrocarbons - Continued									
Toluene	108-88-3	1	µg/L		----	----	----	<1	----
Ethylbenzene	100-41-4	1	µg/L		----	----	----	<1	----
meta- & para-Xylene	108-38-3 106-42-3	1	µg/L		----	----	----	<1	----
Styrene	100-42-5	1	µg/L		----	----	----	<1	----
ortho-Xylene	95-47-6	1	µg/L		----	----	----	<1	----
Isopropylbenzene	98-82-8	1	µg/L		----	----	----	<1	----
n-Propylbenzene	103-65-1	1	µg/L		----	----	----	<1	----
1.3.5-Trimethylbenzene	108-67-8	1	µg/L		----	----	----	<1	----
sec-Butylbenzene	135-98-8	1	µg/L		----	----	----	<1	----
1.2.4-Trimethylbenzene	95-63-6	1	µg/L		----	----	----	<1	----
tert-Butylbenzene	98-06-6	1	µg/L		----	----	----	<1	----
p-Isopropyltoluene	99-87-6	1	µg/L		----	----	----	<1	----
n-Butylbenzene	104-51-8	1	µg/L		----	----	----	<1	----
EP074B: Oxygenated Compounds									
2-Propanone (Acetone)	67-64-1	10	µg/L		----	----	----	<10	----
Vinyl Acetate	108-05-4	10	µg/L		----	----	----	<10	----
2-Butanone (MEK)	78-93-3	10	µg/L		----	----	----	<10	----
4-Methyl-2-pentanone (MIBK)	108-10-1	10	µg/L		----	----	----	<10	----
2-Hexanone (MBK)	591-78-6	10	µg/L		----	----	----	<10	----
EP074C: Sulfonated Compounds									
Carbon disulfide	75-15-0	1	µg/L		----	----	----	<1	----
EP074D: Fumigants									
2.2-Dichloropropane	594-20-7	1	µg/L		----	----	----	<1	----
1.2-Dichloropropane	78-87-5	1	µg/L		----	----	----	<1	----
cis-1.3-Dichloropropylene	10061-01-5	2	µg/L		----	----	----	<2	----
trans-1.3-Dichloropropylene	10061-02-6	2	µg/L		----	----	----	<2	----
1.2-Dibromoethane (EDB)	106-93-4	1	µg/L		----	----	----	<1	----
EP074E: Halogenated Aliphatic Compounds									
Dichlorodifluoromethane	75-71-8	10	µg/L		----	----	----	<10	----
Chloromethane	74-87-3	10	µg/L		----	----	----	<10	----
Vinyl chloride	75-01-4	10	µg/L		----	----	----	<10.0	----
Bromomethane	74-83-9	10	µg/L		----	----	----	<10	----
Chloroethane	75-00-3	10	µg/L		----	----	----	<10	----
Trichlorofluoromethane	75-69-4	10	µg/L		----	----	----	<10	----

Analytical Results

Sub-Matrix: WATER (Matrix: WATER)				Client sample ID	GW20	GW26	GW22	GW27	GW30
				Client sampling date / time	[18-Nov-2015]	[18-Nov-2015]	[18-Nov-2015]	[18-Nov-2015]	[18-Nov-2015]
Compound	CAS Number	LOR	Unit		EM1517312-011	EM1517312-012	EM1517312-013	EM1517312-014	EM1517312-015
					Result	Result	Result	Result	Result
EP074E: Halogenated Aliphatic Compounds - Continued									
1.1-Dichloroethene	75-35-4	1	µg/L		----	----	----	<1	----
Iodomethane	74-88-4	1	µg/L		----	----	----	<1	----
Methylene chloride	75-09-2	5	µg/L		----	----	----	<5	----
trans-1.2-Dichloroethene	156-60-5	1	µg/L		----	----	----	<1	----
1.1-Dichloroethane	75-34-3	1	µg/L		----	----	----	<1	----
cis-1.2-Dichloroethene	156-59-2	1	µg/L		----	----	----	<1	----
1.1.1-Trichloroethane	71-55-6	1	µg/L		----	----	----	<1	----
1.1-Dichloropropylene	563-58-6	1	µg/L		----	----	----	<1	----
Carbon Tetrachloride	56-23-5	1	µg/L		----	----	----	<1	----
1.2-Dichloroethane	107-06-2	1	µg/L		----	----	----	<1	----
Trichloroethene	79-01-6	1	µg/L		----	----	----	<1	----
Dibromomethane	74-95-3	1	µg/L		----	----	----	<1	----
1.1.2-Trichloroethane	79-00-5	1	µg/L		----	----	----	<1	----
1.3-Dichloropropane	142-28-9	1	µg/L		----	----	----	<1	----
Tetrachloroethene	127-18-4	1	µg/L		----	----	----	<1	----
1.1.1.2-Tetrachloroethane	630-20-6	1	µg/L		----	----	----	<1	----
trans-1.4-Dichloro-2-butene	110-57-6	1	µg/L		----	----	----	<1	----
cis-1.4-Dichloro-2-butene	1476-11-5	1	µg/L		----	----	----	<1	----
1.1.2.2-Tetrachloroethane	79-34-5	1	µg/L		----	----	----	<1	----
1.2.3-Trichloropropane	96-18-4	1	µg/L		----	----	----	<1	----
Pentachloroethane	76-01-7	1	µg/L		----	----	----	<1	----
1.2-Dibromo-3-chloropropane	96-12-8	1	µg/L		----	----	----	<1	----
Hexachlorobutadiene	87-68-3	1	µg/L		----	----	----	<1.0	----
EP074F: Halogenated Aromatic Compounds									
Chlorobenzene	108-90-7	1	µg/L		----	----	----	<1	----
Bromobenzene	108-86-1	1	µg/L		----	----	----	<1	----
2-Chlorotoluene	95-49-8	1	µg/L		----	----	----	<1	----
4-Chlorotoluene	106-43-4	1	µg/L		----	----	----	<1	----
1.3-Dichlorobenzene	541-73-1	1	µg/L		----	----	----	<1	----
1.4-Dichlorobenzene	106-46-7	1	µg/L		----	----	----	<1.0	----
1.2-Dichlorobenzene	95-50-1	1	µg/L		----	----	----	<1	----
1.2.4-Trichlorobenzene	120-82-1	1	µg/L		----	----	----	<1	----
1.2.3-Trichlorobenzene	87-61-6	1	µg/L		----	----	----	<1	----
EP074G: Trihalomethanes									

Analytical Results

Sub-Matrix: WATER (Matrix: WATER)				Client sample ID	GW20	GW26	GW22	GW27	GW30
				Client sampling date / time	[18-Nov-2015]	[18-Nov-2015]	[18-Nov-2015]	[18-Nov-2015]	[18-Nov-2015]
Compound	CAS Number	LOR	Unit		EM1517312-011	EM1517312-012	EM1517312-013	EM1517312-014	EM1517312-015
					Result	Result	Result	Result	Result
EP074G: Trihalomethanes - Continued									
Chloroform	67-66-3	1	µg/L		----	----	----	<1	----
Bromodichloromethane	75-27-4	1	µg/L		----	----	----	<1	----
Dibromochloromethane	124-48-1	1	µg/L		----	----	----	<1	----
Bromoform	75-25-2	1	µg/L		----	----	----	<1	----
EP074H: Naphthalene									
Naphthalene	91-20-3	5	µg/L		----	----	----	<5	----
EP075(SIM)B: Polynuclear Aromatic Hydrocarbons									
Naphthalene	91-20-3	1	µg/L		<1.0	<1.0	<1.0	<1.0	<1.0
Acenaphthylene	208-96-8	1	µg/L		<1.0	<1.0	<1.0	<1.0	<1.0
Acenaphthene	83-32-9	1	µg/L		<1.0	<1.0	<1.0	<1.0	<1.0
Fluorene	86-73-7	1	µg/L		<1.0	<1.0	<1.0	<1.0	<1.0
Phenanthrene	85-01-8	1	µg/L		<1.0	<1.0	<1.0	<1.0	<1.0
Anthracene	120-12-7	1	µg/L		<1.0	<1.0	<1.0	<1.0	<1.0
Fluoranthene	206-44-0	1	µg/L		<1.0	<1.0	<1.0	<1.0	<1.0
Pyrene	129-00-0	1	µg/L		<1.0	<1.0	<1.0	<1.0	<1.0
Benz(a)anthracene	56-55-3	1	µg/L		<1.0	<1.0	<1.0	<1.0	<1.0
Chrysene	218-01-9	1	µg/L		<1.0	<1.0	<1.0	<1.0	<1.0
Benzo(b+j)fluoranthene	205-99-2 205-82-3	1	µg/L		<1.0	<1.0	<1.0	<1.0	<1.0
Benzo(k)fluoranthene	207-08-9	1	µg/L		<1.0	<1.0	<1.0	<1.0	<1.0
Benzo(a)pyrene	50-32-8	0.5	µg/L		<0.5	<0.5	<0.5	<0.5	<0.5
Indeno(1.2.3.cd)pyrene	193-39-5	1	µg/L		<1.0	<1.0	<1.0	<1.0	<1.0
Dibenz(a.h)anthracene	53-70-3	1	µg/L		<1.0	<1.0	<1.0	<1.0	<1.0
Benzo(g.h.i)perylene	191-24-2	1	µg/L		<1.0	<1.0	<1.0	<1.0	<1.0
^ Sum of polycyclic aromatic hydrocarbons	----	0.5	µg/L		<0.5	<0.5	<0.5	<0.5	<0.5
^ Benzo(a)pyrene TEQ (zero)	----	0.5	µg/L		<0.5	<0.5	<0.5	<0.5	<0.5
EP080/071: Total Petroleum Hydrocarbons									
C6 - C9 Fraction	----	20	µg/L		----	----	----	<20	----
C10 - C14 Fraction	----	50	µg/L		----	----	----	<50	----
C10 - C14 Fraction	----	50	µg/L		<50	<50	**110**	----	**50**
C15 - C28 Fraction	----	100	µg/L		----	----	----	<100	----
C15 - C28 Fraction	----	100	µg/L		<100	<100	<100	----	**200**
C29 - C36 Fraction	----	50	µg/L		----	----	----	<50	----
C29 - C36 Fraction	----	50	µg/L		<50	<50	<50	----	<50
^ C10 - C36 Fraction (sum)	----	50	µg/L		----	----	----	<50	----

Analytical Results

Sub-Matrix: WATER (Matrix: WATER)				Client sample ID	GW20	GW26	GW22	GW27	GW30
				Client sampling date / time	[18-Nov-2015]	[18-Nov-2015]	[18-Nov-2015]	[18-Nov-2015]	[18-Nov-2015]
Compound	CAS Number	LOR	Unit		EM1517312-011	EM1517312-012	EM1517312-013	EM1517312-014	EM1517312-015
					Result	Result	Result	Result	Result
EP080/071: Total Petroleum Hydrocarbons - Continued									
^ C10 - C36 Fraction (sum)	----	50	µg/L		<50	<50	**110**	----	**250**
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	----
>C10 - C16 Fraction	----	100	µg/L		<100	<100	<100	----	<100
>C16 - C34 Fraction	----	100	µg/L		----	----	----	<100	----
>C16 - C34 Fraction	----	100	µg/L		<100	<100	**100**	----	**220**
>C34 - C40 Fraction	----	100	µg/L		----	----	----	<100	----
>C34 - C40 Fraction	----	100	µg/L		<100	<100	<100	----	<100
^ >C10 - C40 Fraction (sum)	----	100	µg/L		----	----	----	<100	----
^ >C10 - C40 Fraction (sum)	----	100	µg/L		<100	<100	**100**	----	**220**
^ >C10 - C16 Fraction minus Naphthalene (F2)	----	100	µg/L		----	----	----	<100	----
EP080: BTEXN									
Benzene	71-43-2	1	µg/L		----	----	----	----	----
Toluene	108-88-3	2	µg/L		----	----	----	----	----
Ethylbenzene	100-41-4	2	µg/L		----	----	----	----	----
meta- & para-Xylene	108-38-3 106-42-3	2	µg/L		----	----	----	----	----
ortho-Xylene	95-47-6	2	µg/L		----	----	----	----	----
^ Total Xylenes	1330-20-7	2	µg/L		----	----	----	----	----
^ Sum of BTEX	----	1	µg/L		----	----	----	----	----
Naphthalene	91-20-3	5	µg/L		----	----	----	----	----
EP074S: VOC Surrogates									
1.2-Dichloroethane-D4	17060-07-0	1	%		----	----	----	**112**	----
Toluene-D8	2037-26-5	1	%		----	----	----	**102**	----
4-Bromofluorobenzene	460-00-4	1	%		----	----	----	**90.5**	----
EP075(SIM)S: Phenolic Compound Surrogates									
Phenol-d6	13127-88-3	1	%		**27.9**	**29.0**	**19.8**	**27.7**	**27.3**
2-Chlorophenol-D4	93951-73-6	1	%		**59.1**	**66.9**	**39.4**	**59.8**	**62.0**
2.4.6-Tribromophenol	118-79-6	1	%		**43.1**	**41.6**	**28.4**	**39.0**	**47.1**
EP075(SIM)T: PAH Surrogates									
2-Fluorobiphenyl	321-60-8	1	%		**64.1**	**74.5**	**37.2**	**64.2**	**68.4**

Analytical Results

Sub-Matrix: WATER (Matrix: WATER)				Client sample ID	GW20	GW26	GW22	GW27	GW30
				Client sampling date / time	[18-Nov-2015]	[18-Nov-2015]	[18-Nov-2015]	[18-Nov-2015]	[18-Nov-2015]
Compound	CAS Number	LOR	Unit		EM1517312-011	EM1517312-012	EM1517312-013	EM1517312-014	EM1517312-015
					Result	Result	Result	Result	Result
EP075(SIM)T: PAH Surrogates - Continued									
Anthracene-d10	1719-06-8	1	%		**90.7**	**95.6**	**64.2**	**87.3**	**83.8**
4-Terphenyl-d14	1718-51-0	1	%		**85.0**	**82.9**	**57.5**	**79.0**	**85.0**
EP080S: TPH(V)/BTEX Surrogates									
1.2-Dichloroethane-D4	17060-07-0	2	%		**----**	**----**	**----**	**109**	**----**
Toluene-D8	2037-26-5	2	%		**----**	**----**	**----**	**100**	**----**
4-Bromofluorobenzene	460-00-4	2	%		**----**	**----**	**----**	**91.8**	**----**

Analytical Results

Sub-Matrix: WATER (Matrix: WATER)				Client sample ID	GW05	GW10	QC03	QCF	----
				Client sampling date / time	[18-Nov-2015]	[18-Nov-2015]	[18-Nov-2015]	[17-Nov-2015]	----
Compound	CAS Number	LOR	Unit		EM1517312-016	EM1517312-017	EM1517312-018	EM1517312-020	--------
					Result	Result	Result	Result	Result
EA005P: pH by PC Titrator									
pH Value	----	0.01	pH Unit		7.80	6.64	----	----	----
EA015: Total Dissolved Solids dried at 180 ± 5 °C									
Total Dissolved Solids @180°C	----	10	mg/L		1330	642	----	----	----
ED037P: Alkalinity by PC Titrator									
Hydroxide Alkalinity as CaCO3	DMO-210-001	1	mg/L		<1	<1	----	----	----
Carbonate Alkalinity as CaCO3	3812-32-6	1	mg/L		<1	<1	----	----	----
Bicarbonate Alkalinity as CaCO3	71-52-3	1	mg/L		1020	236	----	----	----
Total Alkalinity as CaCO3	----	1	mg/L		1020	236	----	----	----
ED041G: Sulfate (Turbidimetric) as SO4 2- by DA									
Sulfate as SO4 - Turbidimetric	14808-79-8	1	mg/L		5	157	----	----	----
ED043: Total Oxidised Sulfur as SO4 2-									
Total Oxidised Sulfur as SO4 2-	----	1	mg/L		19	156	----	----	----
ED045G: Chloride by Discrete Analyser									
Chloride	16887-00-6	1	mg/L		138	33	----	----	----
ED093F: Dissolved Major Cations									
Calcium	7440-70-2	1	mg/L		87	83	----	----	----
Magnesium	7439-95-4	1	mg/L		98	27	----	----	----
Sodium	7440-23-5	1	mg/L		208	58	----	----	----
Potassium	7440-09-7	1	mg/L		50	10	----	----	----
EG020F: Dissolved Metals by ICP-MS									
Aluminium	7429-90-5	0.01	mg/L		<0.01	0.02	0.11	----	----
Arsenic	7440-38-2	0.001	mg/L		0.001	0.007	<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	0.002	<0.001	----	----
Copper	7440-50-8	0.001	mg/L		<0.001	0.002	<0.001	----	----
Nickel	7440-02-0	0.001	mg/L		0.009	0.009	0.019	----	----
Lead	7439-92-1	0.001	mg/L		<0.001	<0.001	<0.001	----	----
Zinc	7440-66-6	0.005	mg/L		0.015	0.062	0.019	----	----
Manganese	7439-96-5	0.001	mg/L		0.264	0.066	0.558	----	----
Selenium	7782-49-2	0.01	mg/L		<0.01	<0.01	<0.01	----	----
Iron	7439-89-6	0.05	mg/L		2.24	4.92	24.1	----	----
EG020T: Total Metals by ICP-MS									
Aluminium	7429-90-5	0.01	mg/L		----	----	----	<0.01	----
Arsenic	7440-38-2	0.001	mg/L		----	----	----	<0.001	----

Analytical Results

Sub-Matrix: WATER (Matrix: WATER)				Client sample ID	GW05	GW10	QC03	QCF	----
				Client sampling date / time	[18-Nov-2015]	[18-Nov-2015]	[18-Nov-2015]	[17-Nov-2015]	----
Compound	CAS Number	LOR	Unit		EM1517312-016	EM1517312-017	EM1517312-018	EM1517312-020	--------
					Result	Result	Result	Result	Result
EG020T: Total Metals by ICP-MS - Continued									
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	----
Nickel	7440-02-0	0.001	mg/L		----	----	----	<0.001	----
Lead	7439-92-1	0.001	mg/L		----	----	----	<0.001	----
Zinc	7440-66-6	0.005	mg/L		----	----	----	<0.005	----
Manganese	7439-96-5	0.001	mg/L		----	----	----	<0.001	----
Selenium	7782-49-2	0.01	mg/L		----	----	----	<0.01	----
Iron	7439-89-6	0.05	mg/L		----	----	----	<0.05	----
EG035F: Dissolved Mercury by FIMS									
Mercury	7439-97-6	0.0001	mg/L		<0.0001	<0.0001	<0.0001	----	----
EG035T: Total Recoverable Mercury by FIMS									
Mercury	7439-97-6	0.0001	mg/L		----	----	----	<0.0001	----
EK040P: Fluoride by PC Titrator									
Fluoride	16984-48-8	0.1	mg/L		**0.5**	**0.4**	----	----	----
EK055G: Ammonia as N by Discrete Analyser									
Ammonia as N	7664-41-7	0.01	mg/L		**5.52**	**0.24**	**0.55**	----	----
EK057G: Nitrite as N by Discrete Analyser									
Nitrite as N	14797-65-0	0.01	mg/L		<0.01	<0.01	----	----	----
EK058G: Nitrate as N by Discrete Analyser									
Nitrate as N	14797-55-8	0.01	mg/L		**0.05**	**0.16**	----	----	----
EK059G: Nitrite plus Nitrate as N (NOx) by Discrete Analyser									
Nitrite + Nitrate as N	----	0.01	mg/L		**0.05**	**0.16**	----	----	----
EK071G: Reactive Phosphorus as P by discrete analyser									
Reactive Phosphorus as P	14265-44-2	0.01	mg/L		<0.01	<0.01	----	----	----
EN055: Ionic Balance									
Total Anions	----	0.01	meq/L		**24.4**	**8.91**	----	----	----
Total Cations	----	0.01	meq/L		**22.7**	**9.14**	----	----	----
Ionic Balance	----	0.01	%		**3.51**	**1.26**	----	----	----
EP005: Total Organic Carbon (TOC)									
Total Organic Carbon	----	1	mg/L		----	**10**	**5**	----	----
EP074A: Monocyclic Aromatic Hydrocarbons									
Benzene	71-43-2	1	µg/L		----	<1	<1	----	----

Analytical Results

Sub-Matrix: WATER (Matrix: WATER)				Client sample ID	GW05	GW10	QC03	QCF	----
				Client sampling date / time	[18-Nov-2015]	[18-Nov-2015]	[18-Nov-2015]	[17-Nov-2015]	----
Compound	CAS Number	LOR	Unit		EM1517312-016	EM1517312-017	EM1517312-018	EM1517312-020	--------
					Result	Result	Result	Result	Result
EP074A: Monocyclic Aromatic Hydrocarbons - Continued									
Toluene	108-88-3	1	µg/L		----	<1	<1	----	----
Ethylbenzene	100-41-4	1	µg/L		----	<1	<1	----	----
meta- & para-Xylene	108-38-3 106-42-3	1	µg/L		----	<1	<1	----	----
Styrene	100-42-5	1	µg/L		----	<1	<1	----	----
ortho-Xylene	95-47-6	1	µg/L		----	<1	<1	----	----
Isopropylbenzene	98-82-8	1	µg/L		----	<1	<1	----	----
n-Propylbenzene	103-65-1	1	µg/L		----	<1	<1	----	----
1.3.5-Trimethylbenzene	108-67-8	1	µg/L		----	<1	<1	----	----
sec-Butylbenzene	135-98-8	1	µg/L		----	<1	<1	----	----
1.2.4-Trimethylbenzene	95-63-6	1	µg/L		----	<1	<1	----	----
tert-Butylbenzene	98-06-6	1	µg/L		----	<1	<1	----	----
p-Isopropyltoluene	99-87-6	1	µg/L		----	<1	<1	----	----
n-Butylbenzene	104-51-8	1	µg/L		----	<1	<1	----	----
EP074B: Oxygenated Compounds									
2-Propanone (Acetone)	67-64-1	10	µg/L		----	<10	<10	----	----
Vinyl Acetate	108-05-4	10	µg/L		----	<10	<10	----	----
2-Butanone (MEK)	78-93-3	10	µg/L		----	<10	<10	----	----
4-Methyl-2-pentanone (MIBK)	108-10-1	10	µg/L		----	<10	<10	----	----
2-Hexanone (MBK)	591-78-6	10	µg/L		----	<10	<10	----	----
EP074C: Sulfonated Compounds									
Carbon disulfide	75-15-0	1	µg/L		----	<1	<1	----	----
EP074D: Fumigants									
2.2-Dichloropropane	594-20-7	1	µg/L		----	<1	<1	----	----
1.2-Dichloropropane	78-87-5	1	µg/L		----	<1	<1	----	----
cis-1.3-Dichloropropylene	10061-01-5	2	µg/L		----	<2	<2	----	----
trans-1.3-Dichloropropylene	10061-02-6	2	µg/L		----	<2	<2	----	----
1.2-Dibromoethane (EDB)	106-93-4	1	µg/L		----	<1	<1	----	----
EP074E: Halogenated Aliphatic Compounds									
Dichlorodifluoromethane	75-71-8	10	µg/L		----	<10	<10	----	----
Chloromethane	74-87-3	10	µg/L		----	<10	<10	----	----
Vinyl chloride	75-01-4	10	µg/L		----	<10.0	<10.0	----	----
Bromomethane	74-83-9	10	µg/L		----	<10	<10	----	----
Chloroethane	75-00-3	10	µg/L		----	<10	<10	----	----
Trichlorofluoromethane	75-69-4	10	µg/L		----	<10	<10	----	----

Analytical Results

Sub-Matrix: WATER (Matrix: WATER)				Client sample ID	GW05	GW10	QC03	QCF	----
				Client sampling date / time	[18-Nov-2015]	[18-Nov-2015]	[18-Nov-2015]	[17-Nov-2015]	----
Compound	CAS Number	LOR	Unit		EM1517312-016	EM1517312-017	EM1517312-018	EM1517312-020	--------
					Result	Result	Result	Result	Result
EP074E: Halogenated Aliphatic Compounds - Continued									
1.1-Dichloroethene	75-35-4	1	µg/L		----	<1	<1	----	----
Iodomethane	74-88-4	1	µg/L		----	<1	<1	----	----
Methylene chloride	75-09-2	5	µg/L		----	<5	<5	----	----
trans-1.2-Dichloroethene	156-60-5	1	µg/L		----	<1	<1	----	----
1.1-Dichloroethane	75-34-3	1	µg/L		----	<1	<1	----	----
cis-1.2-Dichloroethene	156-59-2	1	µg/L		----	<1	<1	----	----
1.1.1-Trichloroethane	71-55-6	1	µg/L		----	<1	<1	----	----
1.1-Dichloropropylene	563-58-6	1	µg/L		----	<1	<1	----	----
Carbon Tetrachloride	56-23-5	1	µg/L		----	<1	<1	----	----
1.2-Dichloroethane	107-06-2	1	µg/L		----	<1	<1	----	----
Trichloroethene	79-01-6	1	µg/L		----	<1	<1	----	----
Dibromomethane	74-95-3	1	µg/L		----	<1	<1	----	----
1.1.2-Trichloroethane	79-00-5	1	µg/L		----	<1	<1	----	----
1.3-Dichloropropane	142-28-9	1	µg/L		----	<1	<1	----	----
Tetrachloroethene	127-18-4	1	µg/L		----	<1	<1	----	----
1.1.1.2-Tetrachloroethane	630-20-6	1	µg/L		----	<1	<1	----	----
trans-1.4-Dichloro-2-butene	110-57-6	1	µg/L		----	<1	<1	----	----
cis-1.4-Dichloro-2-butene	1476-11-5	1	µg/L		----	<1	<1	----	----
1.1.2.2-Tetrachloroethane	79-34-5	1	µg/L		----	<1	<1	----	----
1.2.3-Trichloropropane	96-18-4	1	µg/L		----	<1	<1	----	----
Pentachloroethane	76-01-7	1	µg/L		----	<1	<1	----	----
1.2-Dibromo-3-chloropropane	96-12-8	1	µg/L		----	<1	<1	----	----
Hexachlorobutadiene	87-68-3	1	µg/L		----	<1.0	<1.0	----	----
EP074F: Halogenated Aromatic Compounds									
Chlorobenzene	108-90-7	1	µg/L		----	<1	<1	----	----
Bromobenzene	108-86-1	1	µg/L		----	<1	<1	----	----
2-Chlorotoluene	95-49-8	1	µg/L		----	<1	<1	----	----
4-Chlorotoluene	106-43-4	1	µg/L		----	<1	<1	----	----
1.3-Dichlorobenzene	541-73-1	1	µg/L		----	<1	<1	----	----
1.4-Dichlorobenzene	106-46-7	1	µg/L		----	<1.0	<1.0	----	----
1.2-Dichlorobenzene	95-50-1	1	µg/L		----	<1	<1	----	----
1.2.4-Trichlorobenzene	120-82-1	1	µg/L		----	<1	<1	----	----
1.2.3-Trichlorobenzene	87-61-6	1	µg/L		----	<1	<1	----	----
EP074G: Trihalomethanes									

Analytical Results

Sub-Matrix: WATER (Matrix: WATER)				Client sample ID	GW05	GW10	QC03	QCF	----
				Client sampling date / time	[18-Nov-2015]	[18-Nov-2015]	[18-Nov-2015]	[17-Nov-2015]	----
Compound	CAS Number	LOR	Unit		EM1517312-016	EM1517312-017	EM1517312-018	EM1517312-020	--------
					Result	Result	Result	Result	Result
EP074G: Trihalomethanes - Continued									
Chloroform	67-66-3	1	µg/L		----	<1	<1	----	----
Bromodichloromethane	75-27-4	1	µg/L		----	<1	<1	----	----
Dibromochloromethane	124-48-1	1	µg/L		----	<1	<1	----	----
Bromoform	75-25-2	1	µg/L		----	<1	<1	----	----
EP074H: Naphthalene									
Naphthalene	91-20-3	5	µg/L		----	<5	<5	----	----
EP075(SIM)B: Polynuclear Aromatic Hydrocarbons									
Naphthalene	91-20-3	1	µg/L		<1.0	<1.0	<1.0	----	----
Acenaphthylene	208-96-8	1	µg/L		<1.0	<1.0	<1.0	----	----
Acenaphthene	83-32-9	1	µg/L		<1.0	<1.0	<1.0	----	----
Fluorene	86-73-7	1	µg/L		<1.0	<1.0	<1.0	----	----
Phenanthrene	85-01-8	1	µg/L		<1.0	<1.0	<1.0	----	----
Anthracene	120-12-7	1	µg/L		<1.0	<1.0	<1.0	----	----
Fluoranthene	206-44-0	1	µg/L		<1.0	<1.0	<1.0	----	----
Pyrene	129-00-0	1	µg/L		<1.0	<1.0	<1.0	----	----
Benz(a)anthracene	56-55-3	1	µg/L		<1.0	<1.0	<1.0	----	----
Chrysene	218-01-9	1	µg/L		<1.0	<1.0	<1.0	----	----
Benzo(b+j)fluoranthene	205-99-2 205-82-3	1	µg/L		<1.0	<1.0	<1.0	----	----
Benzo(k)fluoranthene	207-08-9	1	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	µg/L		<1.0	<1.0	<1.0	----	----
Dibenz(a.h)anthracene	53-70-3	1	µg/L		<1.0	<1.0	<1.0	----	----
Benzo(g.h.i)perylene	191-24-2	1	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		----	<50	<50	<50	----
C10 - C14 Fraction	----	50	µg/L		**80**	----	----	----	----
C15 - C28 Fraction	----	100	µg/L		----	<100	<100	<100	----
C15 - C28 Fraction	----	100	µg/L		**330**	----	----	----	----
C29 - C36 Fraction	----	50	µg/L		----	<50	<50	<50	----
C29 - C36 Fraction	----	50	µg/L		**160**	----	----	----	----
^ C10 - C36 Fraction (sum)	----	50	µg/L		----	<50	<50	<50	----

Analytical Results

Sub-Matrix: WATER (Matrix: WATER)				Client sample ID	GW05	GW10	QC03	QCF	----
				Client sampling date / time	[18-Nov-2015]	[18-Nov-2015]	[18-Nov-2015]	[17-Nov-2015]	----
Compound	CAS Number	LOR	Unit		EM1517312-016	EM1517312-017	EM1517312-018	EM1517312-020	--------
					Result	Result	Result	Result	Result
EP080/071: Total Petroleum Hydrocarbons - Continued									
^ C10 - C36 Fraction (sum)	----	50	µg/L		570	----	----	----	----
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	----
>C10 - C16 Fraction	----	100	µg/L		----	<100	<100	<100	----
>C10 - C16 Fraction	----	100	µg/L		<100	----	----	----	----
>C16 - C34 Fraction	----	100	µg/L		----	<100	<100	<100	----
>C16 - C34 Fraction	----	100	µg/L		440	----	----	----	----
>C34 - C40 Fraction	----	100	µg/L		----	<100	<100	<100	----
>C34 - C40 Fraction	----	100	µg/L		<100	----	----	----	----
^ >C10 - C40 Fraction (sum)	----	100	µg/L		----	<100	<100	<100	----
^ >C10 - C40 Fraction (sum)	----	100	µg/L		440	----	----	----	----
^ >C10 - C16 Fraction minus Naphthalene (F2)	----	100	µg/L		----	<100	<100	<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	1330-20-7	2	µg/L		----	----	----	<2	----
^ Sum of BTEX	----	1	µg/L		----	----	----	<1	----
Naphthalene	91-20-3	5	µg/L		----	----	----	<5	----
EP074S: VOC Surrogates									
1.2-Dichloroethane-D4	17060-07-0	1	%		----	101	109	----	----
Toluene-D8	2037-26-5	1	%		----	101	103	----	----
4-Bromofluorobenzene	460-00-4	1	%		----	90.8	90.7	----	----
EP075(SIM)S: Phenolic Compound Surrogates									
Phenol-d6	13127-88-3	1	%		23.8	26.6	26.8	----	----
2-Chlorophenol-D4	93951-73-6	1	%		46.1	61.0	60.5	----	----
2.4.6-Tribromophenol	118-79-6	1	%		42.8	44.5	42.8	----	----
EP075(SIM)T: PAH Surrogates									
2-Fluorobiphenyl	321-60-8	1	%		56.8	67.0	68.5	----	----

Analytical Results

Sub-Matrix: WATER (Matrix: WATER)				Client sample ID	GW05	GW10	QC03	QCF	----
				Client sampling date / time	[18-Nov-2015]	[18-Nov-2015]	[18-Nov-2015]	[17-Nov-2015]	----
Compound	CAS Number	LOR	Unit		EM1517312-016	EM1517312-017	EM1517312-018	EM1517312-020	--------
					Result	Result	Result	Result	Result
EP075(SIM)T: PAH Surrogates - Continued									
Anthracene-d10	1719-06-8	1	%		**77.2**	**86.9**	**85.4**	**----**	**----**
4-Terphenyl-d14	1718-51-0	1	%		**71.5**	**82.9**	**75.0**	**----**	**----**
EP080S: TPH(V)/BTEX Surrogates									
1.2-Dichloroethane-D4	17060-07-0	2	%		**----**	**97.8**	**106**	**90.5**	**----**
Toluene-D8	2037-26-5	2	%		**----**	**99.5**	**101**	**103**	**----**
4-Bromofluorobenzene	460-00-4	2	%		**----**	**92.1**	**92.0**	**94.0**	**----**

ALS Environmental

QUALITY CONTROL REPORT

Work Order	: **EM1517312**	Page	: 1 of 16
Client	: **AECOM Australia Pty Ltd**	Laboratory	: Environmental Division Melbourne
Contact	: MS AVERYLL COYNE	Contact	: Carol Walsh
Address	: LEVEL 9 8 EXHIBITION ST MELBOURNE VIC 3000	Address	: 4 Westall Rd Springvale VIC Australia 3171
E-mail	: averyll.coyne@aecom.com	E-mail	: carol.walsh@alsglobal.com
Telephone	: +61 03 9653 1234	Telephone	: +61-3-8549 9608
Facsimile	: +61 03 9654 7117	Facsimile	: +61-3-8549 9601
Project	: 60431087	QC Level	: NEPM 2013 B3 & ALS QC Standard
Order number	: 60431087 1.4	Date Samples Received	: 19-Nov-2015
C-O-C number	: ----	Date Analysis Commenced	: 19-Nov-2015
Sampler	: OLIVER TAYLOR, ZACHARY OCONNOR	Issue Date	: 26-Nov-2015
Site	:	No. of samples received	: 21
Quote number	: ----	No. of samples analysed	: 19

This report supersedes any previous report(s) with this reference. Results apply to the sample(s) as submitted.

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

NATA WORLD RECOGNISED ACCREDITATION

NATA Accredited Laboratory 825

Accredited for compliance with ISO/IEC 17025.

Signatories

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

Signatories	*Position*	*Accreditation Category*
Dilani Fernando	Senior Inorganic Chemist	Melbourne Inorganics
Eric Chau	Metals Team Leader	Melbourne Inorganics
Herman Lin	Laboratory Manager	Melbourne Inorganics
Nancy Wang	Senior Semivolatile Instrument Chemist	Melbourne Organics

General Comments

The analytical procedures used by the Environmental Division have been developed from established internationally recognized procedures such as those published by the USEPA, APHA, AS and NEPM. In house developed procedures are employed in the absence of documented standards or by 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

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	*Client sample ID*	*Method: Compound*	*CAS Number*	*LOR*	*Unit*	*Original Result*	*Duplicate Result*	*RPD (%)*	*Recovery Limits (%)*
EA005P: pH by PC Titrator (QC Lot: 286184)									
EM1517310-001	Anonymous	EA005-P: pH Value	----	0.01	pH Unit	4.87	4.88	0.205	0% - 20%
EM1517312-002	GW16	EA005-P: pH Value	----	0.01	pH Unit	7.38	7.37	0.136	0% - 20%
EA005P: pH by PC Titrator (QC Lot: 286186)									
EM1517326-005	Anonymous	EA005-P: pH Value	----	0.01	pH Unit	7.68	7.64	0.522	0% - 20%
EM1517312-012	GW26	EA005-P: pH Value	----	0.01	pH Unit	6.89	6.83	0.875	0% - 20%
EA015: Total Dissolved Solids dried at 180 ± 5 °C (QC Lot: 287235)									
EM1517262-003	Anonymous	EA015H: Total Dissolved Solids @180°C	----	10	mg/L	1440	1440	0.139	0% - 20%
EM1517287-002	Anonymous	EA015H: Total Dissolved Solids @180°C	----	10	mg/L	6900	6910	0.217	0% - 20%
EA015: Total Dissolved Solids dried at 180 ± 5 °C (QC Lot: 287236)									
EM1517312-005	GW17	EA015H: Total Dissolved Solids @180°C	----	10	mg/L	1020	1010	0.887	0% - 20%
EM1517312-014	GW27	EA015H: Total Dissolved Solids @180°C	----	10	mg/L	1040	1050	1.05	0% - 20%
ED037P: Alkalinity by PC Titrator (QC Lot: 286185)									
EM1517312-002	GW16	ED037-P: Bicarbonate Alkalinity as CaCO3	71-52-3	1	mg/L	352	359	2.19	0% - 20%
		ED037-P: Carbonate Alkalinity as CaCO3	3812-32-6	1	mg/L	<1	<1	0.00	No Limit
		ED037-P: Hydroxide Alkalinity as CaCO3	DMO-210-001	1	mg/L	<1	<1	0.00	No Limit
		ED037-P: Total Alkalinity as CaCO3	----	1	mg/L	352	359	2.19	0% - 20%
EM1517312-012	GW26	ED037-P: Bicarbonate Alkalinity as CaCO3	71-52-3	1	mg/L	114	114	0.00	0% - 20%
		ED037-P: Carbonate Alkalinity as CaCO3	3812-32-6	1	mg/L	<1	<1	0.00	No Limit
		ED037-P: Hydroxide Alkalinity as CaCO3	DMO-210-001	1	mg/L	<1	<1	0.00	No Limit
		ED037-P: Total Alkalinity as CaCO3	----	1	mg/L	114	114	0.00	0% - 20%
ED041G: Sulfate (Turbidimetric) as SO4 2- by DA (QC Lot: 285098)									
EM1517312-001	GW14	ED041G: Sulfate as SO4 - Turbidimetric	14808-79-8	1	mg/L	13	12	0.00	0% - 50%
EM1517312-010	GW13	ED041G: Sulfate as SO4 - Turbidimetric	14808-79-8	1	mg/L	151	151	0.00	0% - 20%
ED043: Total Oxidised Sulfur as SO4 2- (QC Lot: 288187)									
EM1517312-001	GW14	ED043: Total Oxidised Sulfur as SO4 2-	----	1	mg/L	18	17	0.00	No Limit
EM1517312-010	GW13	ED043: Total Oxidised Sulfur as SO4 2-	----	1	mg/L	172	157	9.37	0% - 50%
ED045G: Chloride by Discrete Analyser (QC Lot: 285099)									
EM1517312-001	GW14	ED045G: Chloride	16887-00-6	1	mg/L	16	16	0.00	0% - 50%
EM1517312-010	GW13	ED045G: Chloride	16887-00-6	1	mg/L	20	20	0.00	0% - 20%
ED093F: Dissolved Major Cations (QC Lot: 285913)									
EM1517312-002	GW16	ED093F: Calcium	7440-70-2	1	mg/L	127	127	0.00	0% - 20%
		ED093F: Magnesium	7439-95-4	1	mg/L	38	38	0.00	0% - 20%
		ED093F: Potassium	7440-09-7	1	mg/L	24	23	0.00	0% - 20%
		ED093F: Sodium	7440-23-5	1	mg/L	67	67	0.00	0% - 20%

Sub-Matrix: **WATER**

				Laboratory Duplicate (DUP) Report					
Laboratory sample ID	*Client sample ID*	*Method: Compound*	*CAS Number*	*LOR*	*Unit*	*Original Result*	*Duplicate Result*	*RPD (%)*	*Recovery Limits (%)*
ED093F: Dissolved Major Cations (QC Lot: 285913) - continued									
EM1517312-010	GW13	ED093F: Calcium	7440-70-2	1	mg/L	111	111	0.00	0% - 20%
		ED093F: Magnesium	7439-95-4	1	mg/L	29	28	0.00	0% - 20%
		ED093F: Potassium	7440-09-7	1	mg/L	12	12	0.00	0% - 50%
		ED093F: Sodium	7440-23-5	1	mg/L	54	54	0.00	0% - 20%
EG020F: Dissolved Metals by ICP-MS (QC Lot: 285915)									
EM1517312-001	GW14	EG020A-F: Cadmium	7440-43-9	0.0001	mg/L	<0.0001	<0.0001	0.00	No Limit
		EG020A-F: Arsenic	7440-38-2	0.001	mg/L	0.005	0.004	0.00	No Limit
		EG020A-F: Chromium	7440-47-3	0.001	mg/L	<0.001	<0.001	0.00	No Limit
		EG020A-F: Copper	7440-50-8	0.001	mg/L	0.002	0.002	0.00	No Limit
		EG020A-F: Lead	7439-92-1	0.001	mg/L	<0.001	<0.001	0.00	No Limit
		EG020A-F: Manganese	7439-96-5	0.001	mg/L	0.002	0.002	0.00	No Limit
		EG020A-F: Nickel	7440-02-0	0.001	mg/L	0.054	0.055	2.32	0% - 20%
		EG020A-F: Zinc	7440-66-6	0.005	mg/L	0.020	0.019	6.94	No Limit
		EG020A-F: Aluminium	7429-90-5	0.01	mg/L	0.06	0.06	0.00	No Limit
		EG020A-F: Selenium	7782-49-2	0.01	mg/L	<0.01	<0.01	0.00	No Limit
		EG020A-F: Iron	7439-89-6	0.05	mg/L	0.05	0.06	0.00	No Limit
EM1517312-010	GW13	EG020A-F: Cadmium	7440-43-9	0.0001	mg/L	<0.0001	<0.0001	0.00	No Limit
		EG020A-F: Arsenic	7440-38-2	0.001	mg/L	0.004	0.005	0.00	No Limit
		EG020A-F: Chromium	7440-47-3	0.001	mg/L	<0.001	<0.001	0.00	No Limit
		EG020A-F: Copper	7440-50-8	0.001	mg/L	0.002	0.002	0.00	No Limit
		EG020A-F: Lead	7439-92-1	0.001	mg/L	0.001	0.001	0.00	No Limit
		EG020A-F: Manganese	7439-96-5	0.001	mg/L	0.082	0.085	2.72	0% - 20%
		EG020A-F: Nickel	7440-02-0	0.001	mg/L	0.020	0.021	0.00	0% - 20%
		EG020A-F: Zinc	7440-66-6	0.005	mg/L	0.028	0.026	6.53	No Limit
		EG020A-F: Aluminium	7429-90-5	0.01	mg/L	0.03	0.04	0.00	No Limit
		EG020A-F: Selenium	7782-49-2	0.01	mg/L	<0.01	<0.01	0.00	No Limit
		EG020A-F: Iron	7439-89-6	0.05	mg/L	0.83	0.82	0.00	0% - 50%
EG020F: Dissolved Metals by ICP-MS (QC Lot: 288052)									
EM1517043-001	Anonymous	EG020A-F: Cadmium	7440-43-9	0.0001	mg/L	<0.0001	<0.0001	0.00	No Limit
		EG020A-F: Arsenic	7440-38-2	0.001	mg/L	0.001	0.001	0.00	No Limit
		EG020A-F: Chromium	7440-47-3	0.001	mg/L	<0.001	0.001	0.00	No Limit
		EG020A-F: Copper	7440-50-8	0.001	mg/L	0.002	0.002	0.00	No Limit
		EG020A-F: Lead	7439-92-1	0.001	mg/L	<0.001	<0.001	0.00	No Limit
		EG020A-F: Manganese	7439-96-5	0.001	mg/L	0.004	0.004	0.00	No Limit
		EG020A-F: Nickel	7440-02-0	0.001	mg/L	0.036	0.037	0.00	0% - 20%
		EG020A-F: Zinc	7440-66-6	0.005	mg/L	0.015	0.014	0.00	No Limit
		EG020A-F: Aluminium	7429-90-5	0.01	mg/L	<0.01	0.04	112	No Limit
		EG020A-F: Selenium	7782-49-2	0.01	mg/L	<0.01	<0.01	0.00	No Limit
		EG020A-F: Iron	7439-89-6	0.05	mg/L	<0.05	<0.05	0.00	No Limit
EM1517220-005	Anonymous	EG020A-F: Cadmium	7440-43-9	0.0001	mg/L	0.0019	0.0013	40.8	0% - 50%

Sub-Matrix: **WATER**

				Laboratory Duplicate (DUP) Report					
Laboratory sample ID	*Client sample ID*	*Method: Compound*	*CAS Number*	*LOR*	*Unit*	*Original Result*	*Duplicate Result*	*RPD (%)*	*Recovery Limits (%)*
EG020F: Dissolved Metals by ICP-MS (QC Lot: 288052) - continued									
EM1517220-005	Anonymous	EG020A-F: Arsenic	7440-38-2	0.001	mg/L	0.028	0.028	0.00	0% - 20%
		EG020A-F: Chromium	7440-47-3	0.001	mg/L	0.003	0.003	0.00	No Limit
		EG020A-F: Copper	7440-50-8	0.001	mg/L	0.014	0.015	0.00	0% - 50%
		EG020A-F: Lead	7439-92-1	0.001	mg/L	0.134	0.144	6.78	0% - 20%
		EG020A-F: Manganese	7439-96-5	0.001	mg/L	2.74	3.20	15.6	0% - 20%
		EG020A-F: Nickel	7440-02-0	0.001	mg/L	0.175	0.182	3.82	0% - 20%
		EG020A-F: Zinc	7440-66-6	0.005	mg/L	4.46	4.68	4.99	0% - 20%
		EG020A-F: Aluminium	7429-90-5	0.01	mg/L	14.1	14.4	1.93	0% - 20%
		EG020A-F: Selenium	7782-49-2	0.01	mg/L	0.04	0.04	0.00	No Limit
		EG020A-F: Iron	7439-89-6	0.05	mg/L	40.7	43.2	5.88	0% - 20%
EG020T: Total Metals by ICP-MS (QC Lot: 288879)									
EM1517284-008	Anonymous	EG020A-T: Cadmium	7440-43-9	0.0001	mg/L	<0.0002	0.0003	48.9	No Limit
		EG020A-T: Arsenic	7440-38-2	0.001	mg/L	0.012	0.012	0.00	No Limit
		EG020A-T: Chromium	7440-47-3	0.001	mg/L	<0.002	0.004	72.0	No Limit
		EG020A-T: Copper	7440-50-8	0.001	mg/L	<0.002	0.004	52.2	No Limit
		EG020A-T: Lead	7439-92-1	0.001	mg/L	<0.002	<0.002	0.00	No Limit
		EG020A-T: Manganese	7439-96-5	0.001	mg/L	0.266	0.283	6.34	0% - 20%
		EG020A-T: Nickel	7440-02-0	0.001	mg/L	<0.002	<0.002	0.00	No Limit
		EG020A-T: Zinc	7440-66-6	0.005	mg/L	<0.010	<0.010	0.00	No Limit
		EG020A-T: Aluminium	7429-90-5	0.01	mg/L	0.20	0.16	20.5	No Limit
		EG020A-T: Selenium	7782-49-2	0.01	mg/L	<0.02	<0.02	0.00	No Limit
		EG020A-T: Iron	7439-89-6	0.05	mg/L	0.86	1.03	17.6	0% - 50%
EM1517284-001	Anonymous	EG020A-T: Cadmium	7440-43-9	0.0001	mg/L	<0.0002	0.0004	51.1	No Limit
		EG020A-T: Arsenic	7440-38-2	0.001	mg/L	0.004	0.004	0.00	No Limit
		EG020A-T: Chromium	7440-47-3	0.001	mg/L	<0.002	<0.002	0.00	No Limit
		EG020A-T: Copper	7440-50-8	0.001	mg/L	<0.002	<0.002	0.00	No Limit
		EG020A-T: Lead	7439-92-1	0.001	mg/L	<0.002	<0.002	0.00	No Limit
		EG020A-T: Manganese	7439-96-5	0.001	mg/L	0.527	0.503	4.57	0% - 20%
		EG020A-T: Nickel	7440-02-0	0.001	mg/L	<0.002	<0.002	0.00	No Limit
		EG020A-T: Zinc	7440-66-6	0.005	mg/L	0.014	0.012	11.8	No Limit
		EG020A-T: Aluminium	7429-90-5	0.01	mg/L	0.09	0.13	34.7	No Limit
		EG020A-T: Selenium	7782-49-2	0.01	mg/L	<0.02	<0.02	0.00	No Limit
		EG020A-T: Iron	7439-89-6	0.05	mg/L	2.59	2.54	2.00	0% - 20%
EG035F: Dissolved Mercury by FIMS (QC Lot: 285914)									
EM1517312-001	GW14	EG035F: Mercury	7439-97-6	0.0001	mg/L	<0.0001	<0.0001	0.00	No Limit
EM1517312-010	GW13	EG035F: Mercury	7439-97-6	0.0001	mg/L	<0.0001	<0.0001	0.00	No Limit
EG035F: Dissolved Mercury by FIMS (QC Lot: 288054)									
EM1517384-002	Anonymous	EG035F: Mercury	7439-97-6	0.0001	mg/L	<0.0001	<0.0001	0.00	No Limit
EM1517220-005	Anonymous	EG035F: Mercury	7439-97-6	0.0001	mg/L	<0.0001	<0.0001	0.00	No Limit

Sub-Matrix: **WATER**

				Laboratory Duplicate (DUP) Report					
Laboratory sample ID	*Client sample ID*	*Method: Compound*	*CAS Number*	*LOR*	*Unit*	*Original Result*	*Duplicate Result*	*RPD (%)*	*Recovery Limits (%)*
EG035T: Total Recoverable Mercury by FIMS (QC Lot: 287457)									
EM1517256-001	Anonymous	EG035T: Mercury	7439-97-6	0.0001	mg/L	<0.0001	<0.0001	0.00	No Limit
EM1517267-001	Anonymous	EG035T: Mercury	7439-97-6	0.0001	mg/L	<0.0001	<0.0001	0.00	No Limit
EK040P: Fluoride by PC Titrator (QC Lot: 286182)									
EM1517279-003	Anonymous	EK040P: Fluoride	16984-48-8	0.1	mg/L	<0.1	<0.1	0.00	No Limit
EM1517312-002	GW16	EK040P: Fluoride	16984-48-8	0.1	mg/L	0.6	0.6	0.00	No Limit
EK040P: Fluoride by PC Titrator (QC Lot: 286187)									
EM1517326-005	Anonymous	EK040P: Fluoride	16984-48-8	0.1	mg/L	0.2	0.2	0.00	No Limit
EM1517312-012	GW26	EK040P: Fluoride	16984-48-8	0.1	mg/L	0.3	0.3	0.00	No Limit
EK055G: Ammonia as N by Discrete Analyser (QC Lot: 285847)									
EM1517312-001	GW14	EK055G: Ammonia as N	7664-41-7	0.01	mg/L	0.02	0.03	0.00	No Limit
EM1517312-010	GW13	EK055G: Ammonia as N	7664-41-7	0.01	mg/L	0.11	0.10	10.6	0% - 50%
EK057G: Nitrite as N by Discrete Analyser (QC Lot: 285100)									
EM1517312-001	GW14	EK057G: Nitrite as N	14797-65-0	0.01	mg/L	<0.01	<0.01	0.00	No Limit
EM1517312-010	GW13	EK057G: Nitrite as N	14797-65-0	0.01	mg/L	<0.01	<0.01	0.00	No Limit
EK059G: Nitrite plus Nitrate as N (NOx) by Discrete Analyser (QC Lot: 285846)									
EM1517312-001	GW14	EK059G: Nitrite + Nitrate as N	----	0.01	mg/L	0.05	0.06	0.00	No Limit
EM1517312-010	GW13	EK059G: Nitrite + Nitrate as N	----	0.01	mg/L	0.57	0.56	2.24	0% - 20%
EK071G: Reactive Phosphorus as P by discrete analyser (QC Lot: 285101)									
EM1517312-001	GW14	EK071G: Reactive Phosphorus as P	14265-44-2	0.01	mg/L	0.18	0.17	0.00	0% - 50%
EM1517312-010	GW13	EK071G: Reactive Phosphorus as P	14265-44-2	0.01	mg/L	<0.01	<0.01	0.00	No Limit
EP005: Total Organic Carbon (TOC) (QC Lot: 289127)									
EM1517215-001	Anonymous	EP005: Total Organic Carbon	----	1	mg/L	5	5	0.00	No Limit
EM1517284-007	Anonymous	EP005: Total Organic Carbon	----	1	mg/L	4	4	0.00	No Limit
EP005: Total Organic Carbon (TOC) (QC Lot: 289128)									
EM1517312-017	GW10	EP005: Total Organic Carbon	----	1	mg/L	10	9	0.00	No Limit
EP074A: Monocyclic Aromatic Hydrocarbons (QC Lot: 287387)									
EM1517312-001	GW14	EP074-WF: 1.2.4-Trimethylbenzene	95-63-6	1	µg/L	<1	<1	0.00	No Limit
		EP074-WF: 1.3.5-Trimethylbenzene	108-67-8	1	µg/L	<1	<1	0.00	No Limit
		EP074-WF: Benzene	71-43-2	1	µg/L	<1	<1	0.00	No Limit
		EP074-WF: Ethylbenzene	100-41-4	1	µg/L	<1	<1	0.00	No Limit
		EP074-WF: Isopropylbenzene	98-82-8	1	µg/L	<1	<1	0.00	No Limit
		EP074-WF: meta- & para-Xylene	108-38-3 106-42-3	1	µg/L	<1	<1	0.00	No Limit
		EP074-WF: n-Butylbenzene	104-51-8	1	µg/L	<1	<1	0.00	No Limit
		EP074-WF: n-Propylbenzene	103-65-1	1	µg/L	<1	<1	0.00	No Limit
		EP074-WF: ortho-Xylene	95-47-6	1	µg/L	<1	<1	0.00	No Limit
		EP074-WF: p-Isopropyltoluene	99-87-6	1	µg/L	<1	<1	0.00	No Limit
		EP074-WF: sec-Butylbenzene	135-98-8	1	µg/L	<1	<1	0.00	No Limit

Sub-Matrix: **WATER**

				Laboratory Duplicate (DUP) Report					
Laboratory sample ID	*Client sample ID*	*Method: Compound*	*CAS Number*	*LOR*	*Unit*	*Original Result*	*Duplicate Result*	*RPD (%)*	*Recovery Limits (%)*
EP074A: Monocyclic Aromatic Hydrocarbons (QC Lot: 287387) - continued									
EM1517312-001	GW14	EP074-WF: Styrene	100-42-5	1	µg/L	<1	<1	0.00	No Limit
		EP074-WF: tert-Butylbenzene	98-06-6	1	µg/L	<1	<1	0.00	No Limit
		EP074-WF: Toluene	108-88-3	1	µg/L	<1	<1	0.00	No Limit
EP074B: Oxygenated Compounds (QC Lot: 287387)									
EM1517312-001	GW14	EP074-WF: 2-Butanone (MEK)	78-93-3	10	µg/L	<10	<10	0.00	No Limit
		EP074-WF: 2-Hexanone (MBK)	591-78-6	10	µg/L	<10	<10	0.00	No Limit
		EP074-WF: 2-Propanone (Acetone)	67-64-1	10	µg/L	<10	<10	0.00	No Limit
		EP074-WF: 4-Methyl-2-pentanone (MIBK)	108-10-1	10	µg/L	<10	<10	0.00	No Limit
		EP074-WF: Vinyl Acetate	108-05-4	10	µg/L	<10	<10	0.00	No Limit
EP074C: Sulfonated Compounds (QC Lot: 287387)									
EM1517312-001	GW14	EP074-WF: Carbon disulfide	75-15-0	1	µg/L	<1	<1	0.00	No Limit
EP074D: Fumigants (QC Lot: 287387)									
EM1517312-001	GW14	EP074-WF: 1.2-Dibromoethane (EDB)	106-93-4	1	µg/L	<1	<1	0.00	No Limit
		EP074-WF: 1.2-Dichloropropane	78-87-5	1	µg/L	<1	<1	0.00	No Limit
		EP074-WF: 2.2-Dichloropropane	594-20-7	1	µg/L	<1	<1	0.00	No Limit
		EP074-WF: cis-1.3-Dichloropropylene	10061-01-5	2	µg/L	<2	<2	0.00	No Limit
		EP074-WF: trans-1.3-Dichloropropylene	10061-02-6	2	µg/L	<2	<2	0.00	No Limit
EP074E: Halogenated Aliphatic Compounds (QC Lot: 287387)									
EM1517312-001	GW14	EP074-WF: Vinyl chloride	75-01-4	0.2	µg/L	<10.0	<10.0	0.00	No Limit
		EP074-WF: Hexachlorobutadiene	87-68-3	0.5	µg/L	<1.0	<1.0	0.00	No Limit
		EP074-WF: 1.1.1.2-Tetrachloroethane	630-20-6	1	µg/L	<1	<1	0.00	No Limit
		EP074-WF: 1.1.1-Trichloroethane	71-55-6	1	µg/L	<1	<1	0.00	No Limit
		EP074-WF: 1.1.2.2-Tetrachloroethane	79-34-5	1	µg/L	<1	<1	0.00	No Limit
		EP074-WF: 1.1.2-Trichloroethane	79-00-5	1	µg/L	<1	<1	0.00	No Limit
		EP074-WF: 1.1-Dichloroethane	75-34-3	1	µg/L	<1	<1	0.00	No Limit
		EP074-WF: 1.1-Dichloroethene	75-35-4	1	µg/L	<1	<1	0.00	No Limit
		EP074-WF: 1.1-Dichloropropylene	563-58-6	1	µg/L	<1	<1	0.00	No Limit
		EP074-WF: 1.2.3-Trichloropropane	96-18-4	1	µg/L	<1	<1	0.00	No Limit
		EP074-WF: 1.2-Dibromo-3-chloropropane	96-12-8	1	µg/L	<1	<1	0.00	No Limit
		EP074-WF: 1.2-Dichloroethane	107-06-2	1	µg/L	<1	<1	0.00	No Limit
		EP074-WF: 1.3-Dichloropropane	142-28-9	1	µg/L	<1	<1	0.00	No Limit
		EP074-WF: Carbon Tetrachloride	56-23-5	1	µg/L	<1	<1	0.00	No Limit
		EP074-WF: cis-1.2-Dichloroethene	156-59-2	1	µg/L	<1	<1	0.00	No Limit
		EP074-WF: cis-1.4-Dichloro-2-butene	1476-11-5	1	µg/L	<1	<1	0.00	No Limit
		EP074-WF: Dibromomethane	74-95-3	1	µg/L	<1	<1	0.00	No Limit
		EP074-WF: Iodomethane	74-88-4	1	µg/L	<1	<1	0.00	No Limit
		EP074-WF: Pentachloroethane	76-01-7	1	µg/L	<1	<1	0.00	No Limit
		EP074-WF: Tetrachloroethene	127-18-4	1	µg/L	<1	<1	0.00	No Limit
		EP074-WF: trans-1.2-Dichloroethene	156-60-5	1	µg/L	<1	<1	0.00	No Limit

Sub-Matrix: **WATER**

				Laboratory Duplicate (DUP) Report					
Laboratory sample ID	*Client sample ID*	*Method: Compound*	*CAS Number*	*LOR*	*Unit*	*Original Result*	*Duplicate Result*	*RPD (%)*	*Recovery Limits (%)*
EP074E: Halogenated Aliphatic Compounds (QC Lot: 287387) - continued									
EM1517312-001	GW14	EP074-WF: trans-1.4-Dichloro-2-butene	110-57-6	1	µg/L	<1	<1	0.00	No Limit
		EP074-WF: Trichloroethene	79-01-6	1	µg/L	<1	<1	0.00	No Limit
		EP074-WF: Bromomethane	74-83-9	10	µg/L	<10	<10	0.00	No Limit
		EP074-WF: Chloroethane	75-00-3	10	µg/L	<10	<10	0.00	No Limit
		EP074-WF: Chloromethane	74-87-3	10	µg/L	<10	<10	0.00	No Limit
		EP074-WF: Dichlorodifluoromethane	75-71-8	10	µg/L	<10	<10	0.00	No Limit
		EP074-WF: Trichlorofluoromethane	75-69-4	10	µg/L	<10	<10	0.00	No Limit
		EP074-WF: Methylene chloride	75-09-2	2	µg/L	<5	<5	0.00	No Limit
EP074F: Halogenated Aromatic Compounds (QC Lot: 287387)									
EM1517312-001	GW14	EP074-WF: 1.4-Dichlorobenzene	106-46-7	0.1	µg/L	<1.0	<1.0	0.00	No Limit
		EP074-WF: 1.2.3-Trichlorobenzene	87-61-6	1	µg/L	<1	<1	0.00	No Limit
		EP074-WF: 1.2.4-Trichlorobenzene	120-82-1	1	µg/L	<1	<1	0.00	No Limit
		EP074-WF: 1.2-Dichlorobenzene	95-50-1	1	µg/L	<1	<1	0.00	No Limit
		EP074-WF: 1.3-Dichlorobenzene	541-73-1	1	µg/L	<1	<1	0.00	No Limit
		EP074-WF: 2-Chlorotoluene	95-49-8	1	µg/L	<1	<1	0.00	No Limit
		EP074-WF: 4-Chlorotoluene	106-43-4	1	µg/L	<1	<1	0.00	No Limit
		EP074-WF: Bromobenzene	108-86-1	1	µg/L	<1	<1	0.00	No Limit
		EP074-WF: Chlorobenzene	108-90-7	1	µg/L	<1	<1	0.00	No Limit
EP074G: Trihalomethanes (QC Lot: 287387)									
EM1517312-001	GW14	EP074-WF: Bromodichloromethane	75-27-4	1	µg/L	<1	<1	0.00	No Limit
		EP074-WF: Bromoform	75-25-2	1	µg/L	<1	<1	0.00	No Limit
		EP074-WF: Chloroform	67-66-3	1	µg/L	2	2	0.00	No Limit
		EP074-WF: Dibromochloromethane	124-48-1	1	µg/L	<1	<1	0.00	No Limit
EP074H: Naphthalene (QC Lot: 287387)									
EM1517312-001	GW14	EP074-WF: Naphthalene	91-20-3	5	µg/L	<5	<5	0.00	No Limit
EP080/071: Total Petroleum Hydrocarbons (QC Lot: 287386)									
EM1517312-001	GW14	EP080: C6 - C9 Fraction	----	20	µg/L	<20	<20	0.00	No Limit
EP080/071: Total Recoverable Hydrocarbons - NEPM 2013 Fractions (QC Lot: 287386)									
EM1517312-001	GW14	EP080: C6 - C10 Fraction	C6_C10	20	µg/L	<20	<20	0.00	No Limit
EP080: BTEXN (QC Lot: 287386)									
EM1517312-001	GW14	EP080: Benzene	71-43-2	1	µg/L	<1	<1	0.00	No Limit
		EP080: Ethylbenzene	100-41-4	2	µg/L	<2	<2	0.00	No Limit
		EP080: meta- & para-Xylene	108-38-3 106-42-3	2	µg/L	<2	<2	0.00	No Limit
		EP080: ortho-Xylene	95-47-6	2	µg/L	<2	<2	0.00	No Limit
		EP080: Toluene	108-88-3	2	µg/L	<2	<2	0.00	No Limit
		EP080: Naphthalene	91-20-3	5	µg/L	<5	<5	0.00	No Limit

Method Blank (MB) and Laboratory Control Spike (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 (%)	Recovery Limits (%)	
Method: Compound	CAS Number	LOR	Unit	Result	Concentration	LCS	Low	High
EA015: Total Dissolved Solids dried at 180 ± 5 °C (QCLot: 287235)								
EA015H: Total Dissolved Solids @180°C	----	10	mg/L	<10	2000 mg/L	99.5	97	105
				<10	293 mg/L	100	97	105
EA015: Total Dissolved Solids dried at 180 ± 5 °C (QCLot: 287236)								
EA015H: Total Dissolved Solids @180°C	----	10	mg/L	<10	2000 mg/L	101	97	105
				<10	293 mg/L	103	97	105
ED037P: Alkalinity by PC Titrator (QCLot: 286185)								
ED037-P: Total Alkalinity as CaCO3	----	----	mg/L	----	200 mg/L	95.2	90	110
ED041G: Sulfate (Turbidimetric) as SO4 2- by DA (QCLot: 285098)								
ED041G: Sulfate as SO4 - Turbidimetric	14808-79-8	1	mg/L	<1	25 mg/L	100	90	116
				<1	100 mg/L	97.8	80	120
ED043: Total Oxidised Sulfur as SO4 2- (QCLot: 288187)								
ED043: Total Oxidised Sulfur as SO4 2-	----	1	mg/L	<10	500 mg/L	105	87	121
ED045G: Chloride by Discrete Analyser (QCLot: 285099)								
ED045G: Chloride	16887-00-6	1	mg/L	<1	10 mg/L	101	89	117
				<1	1000 mg/L	100	92	112
ED093F: Dissolved Major Cations (QCLot: 285913)								
ED093F: Calcium	7440-70-2	1	mg/L	<1	5 mg/L	102	92	108
ED093F: Magnesium	7439-95-4	1	mg/L	<1	5 mg/L	108	92	108
ED093F: Potassium	7440-09-7	1	mg/L	<1	50 mg/L	103	89	107
ED093F: Sodium	7440-23-5	1	mg/L	<1	50 mg/L	102	89	107
EG020F: Dissolved Metals by ICP-MS (QCLot: 285915)								
EG020A-F: Aluminium	7429-90-5	0.01	mg/L	<0.01	0.5 mg/L	93.2	93	105
EG020A-F: Arsenic	7440-38-2	0.001	mg/L	<0.001	0.1 mg/L	94.0	94	108
EG020A-F: Cadmium	7440-43-9	0.0001	mg/L	<0.0001	0.1 mg/L	101	86	108
EG020A-F: Chromium	7440-47-3	0.001	mg/L	<0.001	0.1 mg/L	96.8	86	110
EG020A-F: Copper	7440-50-8	0.001	mg/L	<0.001	0.1 mg/L	91.2	87	107
EG020A-F: Iron	7439-89-6	0.05	mg/L	<0.05	0.5 mg/L	97.1	94	106
EG020A-F: Lead	7439-92-1	0.001	mg/L	<0.001	0.1 mg/L	98.4	87	109
EG020A-F: Manganese	7439-96-5	0.001	mg/L	<0.001	0.1 mg/L	95.1	87	109
EG020A-F: Nickel	7440-02-0	0.001	mg/L	<0.001	0.1 mg/L	93.2	87	109
EG020A-F: Selenium	7782-49-2	0.01	mg/L	<0.01	0.1 mg/L	93.6	87	109
EG020A-F: Zinc	7440-66-6	0.005	mg/L	<0.005	0.1 mg/L	102	87	107
EG020F: Dissolved Metals by ICP-MS (QCLot: 288052)								

Sub-Matrix: **WATER**

Method: Compound	CAS Number	LOR	Unit	Method Blank (MB) Report	Laboratory Control Spike (LCS) Report			
					Spike	Spike Recovery (%)	Recovery Limits (%)	
				Result	Concentration	LCS	Low	High
EG020F: Dissolved Metals by ICP-MS (QCLot: 288052) - continued								
EG020A-F: Aluminium	7429-90-5	0.01	mg/L	<0.01	0.5 mg/L	101	93	105
EG020A-F: Arsenic	7440-38-2	0.001	mg/L	<0.001	0.1 mg/L	99.5	94	108
EG020A-F: Cadmium	7440-43-9	0.0001	mg/L	<0.0001	0.1 mg/L	100	86	108
EG020A-F: Chromium	7440-47-3	0.001	mg/L	<0.001	0.1 mg/L	98.7	86	110
EG020A-F: Copper	7440-50-8	0.001	mg/L	<0.001	0.1 mg/L	92.3	87	107
EG020A-F: Iron	7439-89-6	0.05	mg/L	<0.05	0.5 mg/L	98.9	94	106
EG020A-F: Lead	7439-92-1	0.001	mg/L	<0.001	0.1 mg/L	96.5	87	109
EG020A-F: Manganese	7439-96-5	0.001	mg/L	<0.001	0.1 mg/L	94.3	87	109
EG020A-F: Nickel	7440-02-0	0.001	mg/L	<0.001	0.1 mg/L	97.6	87	109
EG020A-F: Selenium	7782-49-2	0.01	mg/L	<0.01	0.1 mg/L	92.2	87	109
EG020A-F: Zinc	7440-66-6	0.005	mg/L	<0.005	0.1 mg/L	96.7	87	107
EG020T: Total Metals by ICP-MS (QCLot: 288879)								
EG020A-T: Aluminium	7429-90-5	0.01	mg/L	<0.01	0.5 mg/L	106	100	108
EG020A-T: Arsenic	7440-38-2	0.001	mg/L	<0.001	0.1 mg/L	106	94	116
EG020A-T: Cadmium	7440-43-9	0.0001	mg/L	<0.0001	0.1 mg/L	106	90	110
EG020A-T: Chromium	7440-47-3	0.001	mg/L	<0.001	0.1 mg/L	95.5	90	110
EG020A-T: Copper	7440-50-8	0.001	mg/L	<0.001	0.1 mg/L	93.6	91	109
EG020A-T: Iron	7439-89-6	0.05	mg/L	<0.05	0.5 mg/L	103	99	109
EG020A-T: Lead	7439-92-1	0.001	mg/L	<0.001	0.1 mg/L	98.7	91	111
EG020A-T: Manganese	7439-96-5	0.001	mg/L	<0.001	0.1 mg/L	97.0	91	111
EG020A-T: Nickel	7440-02-0	0.001	mg/L	<0.001	0.1 mg/L	94.5	91	111
EG020A-T: Selenium	7782-49-2	0.01	mg/L	<0.01	0.1 mg/L	98.8	86	110
EG020A-T: Zinc	7440-66-6	0.005	mg/L	<0.005	0.1 mg/L	96.1	91	109
EG035F: Dissolved Mercury by FIMS (QCLot: 285914)								
EG035F: Mercury	7439-97-6	0.0001	mg/L	<0.0001	0.01 mg/L	104	83	117
EG035F: Dissolved Mercury by FIMS (QCLot: 288054)								
EG035F: Mercury	7439-97-6	0.0001	mg/L	<0.0001	0.01 mg/L	99.8	83	117
EG035T: Total Recoverable Mercury by FIMS (QCLot: 287457)								
EG035T: Mercury	7439-97-6	0.0001	mg/L	<0.0001	0.01 mg/L	96.5	87	113
EK040P: Fluoride by PC Titrator (QCLot: 286182)								
EK040P: Fluoride	16984-48-8	0.1	mg/L	<0.1	5 mg/L	98.4	89	111
EK040P: Fluoride by PC Titrator (QCLot: 286187)								
EK040P: Fluoride	16984-48-8	0.1	mg/L	<0.1	5 mg/L	91.6	89	111
EK055G: Ammonia as N by Discrete Analyser (QCLot: 285847)								
EK055G: Ammonia as N	7664-41-7	0.01	mg/L	<0.01	1 mg/L	106	80	115
EK057G: Nitrite as N by Discrete Analyser (QCLot: 285100)								
EK057G: Nitrite as N	14797-65-0	0.01	mg/L	<0.01	0.5 mg/L	102	92	108

Sub-Matrix: **WATER**

Method: Compound	CAS Number	LOR	Unit	Method Blank (MB) Report	Laboratory Control Spike (LCS) Report			
					Spike	Spike Recovery (%)	Recovery Limits (%)	
				Result	Concentration	LCS	Low	High
EK059G: Nitrite plus Nitrate as N (NOx) by Discrete Analyser (QCLot: 285846)								
EK059G: Nitrite + Nitrate as N	----	0.01	mg/L	<0.01	0.5 mg/L	112	91	117
EK071G: Reactive Phosphorus as P by discrete analyser (QCLot: 285101)								
EK071G: Reactive Phosphorus as P	14265-44-2	0.01	mg/L	<0.01	0.5 mg/L	102	94	108
EP005: Total Organic Carbon (TOC) (QCLot: 289127)								
EP005: Total Organic Carbon	----	1	mg/L	<1	100 mg/L	90.1	86	112
EP005: Total Organic Carbon (TOC) (QCLot: 289128)								
EP005: Total Organic Carbon	----	1	mg/L	<1	100 mg/L	90.6	86	112
EP074A: Monocyclic Aromatic Hydrocarbons (QCLot: 287387)								
EP074-WF: 1.2.4-Trimethylbenzene	95-63-6	1	µg/L	<1	20 µg/L	93.7	77	109
EP074-WF: 1.3.5-Trimethylbenzene	108-67-8	1	µg/L	<1	20 µg/L	95.9	77	109
EP074-WF: Benzene	71-43-2	1	µg/L	<1	20 µg/L	98.8	81	119
EP074-WF: Ethylbenzene	100-41-4	1	µg/L	<1	20 µg/L	97.0	78	118
EP074-WF: Isopropylbenzene	98-82-8	1	µg/L	<1	20 µg/L	96.0	77	117
EP074-WF: meta- & para-Xylene	108-38-3 106-42-3	1	µg/L	<1	40 µg/L	97.1	78	118
EP074-WF: n-Butylbenzene	104-51-8	1	µg/L	<1	20 µg/L	90.9	65	111
EP074-WF: n-Propylbenzene	103-65-1	1	µg/L	<1	20 µg/L	95.9	74	110
EP074-WF: ortho-Xylene	95-47-6	1	µg/L	<1	20 µg/L	99.8	82	118
EP074-WF: p-Isopropyltoluene	99-87-6	1	µg/L	<1	20 µg/L	91.1	73	113
EP074-WF: sec-Butylbenzene	135-98-8	1	µg/L	<1	20 µg/L	96.8	76	110
EP074-WF: Styrene	100-42-5	1	µg/L	<1	20 µg/L	91.9	78	118
EP074-WF: tert-Butylbenzene	98-06-6	1	µg/L	<1	20 µg/L	95.9	78	110
EP074-WF: Toluene	108-88-3	1	µg/L	<1	20 µg/L	100	81	121
EP074B: Oxygenated Compounds (QCLot: 287387)								
EP074-WF: 2-Butanone (MEK)	78-93-3	10	µg/L	<10	200 µg/L	110	71	131
EP074-WF: 2-Hexanone (MBK)	591-78-6	10	µg/L	<10	200 µg/L	101	75	129
EP074-WF: 2-Propanone (Acetone)	67-64-1	10	µg/L	<10	200 µg/L	110	69	151
EP074-WF: 4-Methyl-2-pentanone (MIBK)	108-10-1	10	µg/L	<10	200 µg/L	97.6	72	132
EP074-WF: Vinyl Acetate	108-05-4	10	µg/L	<10	200 µg/L	101	65	129
EP074C: Sulfonated Compounds (QCLot: 287387)								
EP074-WF: Carbon disulfide	75-15-0	1	µg/L	<1	20 µg/L	99.7	53	123
EP074D: Fumigants (QCLot: 287387)								
EP074-WF: 1.2-Dibromoethane (EDB)	106-93-4	1	µg/L	<1	20 µg/L	99.0	81	115
EP074-WF: 1.2-Dichloropropane	78-87-5	1	µg/L	<1	20 µg/L	99.5	80	118
EP074-WF: 2.2-Dichloropropane	594-20-7	1	µg/L	<1	20 µg/L	93.8	69	115
EP074-WF: cis-1.3-Dichloropropylene	10061-01-5	2	µg/L	<2	20 µg/L	92.4	72	110
EP074-WF: trans-1.3-Dichloropropylene	10061-02-6	2	µg/L	<2	20 µg/L	91.2	70	108
EP074E: Halogenated Aliphatic Compounds (QCLot: 287387)								

Sub-Matrix: **WATER**

Method: Compound	CAS Number	LOR	Unit	Method Blank (MB) Report	Laboratory Control Spike (LCS) Report			
					Spike	Spike Recovery (%)	Recovery Limits (%)	
				Result	Concentration	LCS	Low	High
EP074E: Halogenated Aliphatic Compounds (QCLot: 287387) - continued								
EP074-WF: 1.1.1.2-Tetrachloroethane	630-20-6	1	µg/L	<1	20 µg/L	95.4	75	107
EP074-WF: 1.1.1-Trichloroethane	71-55-6	1	µg/L	<1	20 µg/L	96.3	75	113
EP074-WF: 1.1.2.2-Tetrachloroethane	79-34-5	1	µg/L	<1	20 µg/L	99.9	85	121
EP074-WF: 1.1.2-Trichloroethane	79-00-5	1	µg/L	<1	20 µg/L	103	85	117
EP074-WF: 1.1-Dichloroethane	75-34-3	1	µg/L	<1	20 µg/L	104	76	120
EP074-WF: 1.1-Dichloroethene	75-35-4	1	µg/L	<1	20 µg/L	101	68	122
EP074-WF: 1.1-Dichloropropylene	563-58-6	1	µg/L	<1	20 µg/L	96.6	73	117
EP074-WF: 1.2.3-Trichloropropane	96-18-4	1	µg/L	<1	20 µg/L	99.0	84	118
EP074-WF: 1.2-Dibromo-3-chloropropane	96-12-8	1	µg/L	<1	20 µg/L	89.6	64	114
EP074-WF: 1.2-Dichloroethane	107-06-2	1	µg/L	<1	20 µg/L	99.2	81	119
EP074-WF: 1.3-Dichloropropane	142-28-9	1	µg/L	<1	20 µg/L	102	85	117
EP074-WF: Bromomethane	74-83-9	10	µg/L	<10	200 µg/L	82.5	52	128
EP074-WF: Carbon Tetrachloride	56-23-5	1	µg/L	<1	20 µg/L	93.3	66	110
EP074-WF: Chloroethane	75-00-3	10	µg/L	<10	200 µg/L	106	67	127
EP074-WF: Chloromethane	74-87-3	10	µg/L	<10	200 µg/L	94.1	66	138
EP074-WF: cis-1.2-Dichloroethene	156-59-2	1	µg/L	<1	20 µg/L	100	82	118
EP074-WF: cis-1.4-Dichloro-2-butene	1476-11-5	1	µg/L	<1	20 µg/L	79.8	51	109
EP074-WF: Dibromomethane	74-95-3	1	µg/L	<1	20 µg/L	86.7	80	116
EP074-WF: Dichlorodifluoromethane	75-71-8	10	µg/L	<10	200 µg/L	92.3	61	137
EP074-WF: Hexachlorobutadiene	87-68-3	0.5	µg/L	<0.5	20 µg/L	106	64	118
EP074-WF: Iodomethane	74-88-4	1	µg/L	<1	20 µg/L	86.6	26	119
EP074-WF: Methylene chloride	75-09-2	2	µg/L	<2	20 µg/L	125	52	184
EP074-WF: Pentachloroethane	76-01-7	1	µg/L	<1	20 µg/L	87.2	52	126
EP074-WF: Tetrachloroethene	127-18-4	1	µg/L	<1	20 µg/L	97.0	74	116
EP074-WF: trans-1.2-Dichloroethene	156-60-5	1	µg/L	<1	20 µg/L	104	69	123
EP074-WF: trans-1.4-Dichloro-2-butene	110-57-6	1	µg/L	<1	20 µg/L	88.8	64	118
EP074-WF: Trichloroethene	79-01-6	1	µg/L	<1	20 µg/L	96.2	76	118
EP074-WF: Trichlorofluoromethane	75-69-4	10	µg/L	<10	200 µg/L	99.6	70	124
EP074-WF: Vinyl chloride	75-01-4	0.2	µg/L	<0.2	200 µg/L	98.4	60	138
EP074F: Halogenated Aromatic Compounds (QCLot: 287387)								
EP074-WF: 1.2.3-Trichlorobenzene	87-61-6	1	µg/L	<1	20 µg/L	102	78	116
EP074-WF: 1.2.4-Trichlorobenzene	120-82-1	1	µg/L	<1	20 µg/L	96.6	68	112
EP074-WF: 1.2-Dichlorobenzene	95-50-1	1	µg/L	<1	20 µg/L	96.8	83	113
EP074-WF: 1.3-Dichlorobenzene	541-73-1	1	µg/L	<1	20 µg/L	95.5	78	112
EP074-WF: 1.4-Dichlorobenzene	106-46-7	0.1	µg/L	<0.1	20 µg/L	96.2	78	116
EP074-WF: 2-Chlorotoluene	95-49-8	1	µg/L	<1	20 µg/L	99.3	79	111
EP074-WF: 4-Chlorotoluene	106-43-4	1	µg/L	<1	20 µg/L	97.4	77	111
EP074-WF: Bromobenzene	108-86-1	1	µg/L	<1	20 µg/L	99.6	71	117
EP074-WF: Chlorobenzene	108-90-7	1	µg/L	<1	20 µg/L	99.2	82	116

Sub-Matrix: **WATER**

Method: Compound	CAS Number	LOR	Unit	Method Blank (MB) Report	Laboratory Control Spike (LCS) Report			
					Spike	Spike Recovery (%)	Recovery Limits (%)	
				Result	Concentration	LCS	Low	High
EP074G: Trihalomethanes (QCLot: 287387)								
EP074-WF: Bromodichloromethane	75-27-4	1	µg/L	<1	20 µg/L	95.5	75	112
EP074-WF: Bromoform	75-25-2	1	µg/L	<1	20 µg/L	86.6	62	106
EP074-WF: Chloroform	67-66-3	1	µg/L	<1	20 µg/L	96.6	83	115
EP074-WF: Dibromochloromethane	124-48-1	1	µg/L	<1	20 µg/L	91.4	68	108
EP074H: Naphthalene (QCLot: 287387)								
EP074-WF: Naphthalene	91-20-3	5	µg/L	<5	20 µg/L	102	82	116
EP075(SIM)B: Polynuclear Aromatic Hydrocarbons (QCLot: 285015)								
EP075(SIM): Acenaphthene	83-32-9	1	µg/L	<1.0	5 µg/L	78.0	46	120
EP075(SIM): Acenaphthylene	208-96-8	1	µg/L	<1.0	5 µg/L	81.6	40	124
EP075(SIM): Anthracene	120-12-7	1	µg/L	<1.0	5 µg/L	74.0	53	127
EP075(SIM): Benz(a)anthracene	56-55-3	1	µg/L	<1.0	5 µg/L	88.0	52	136
EP075(SIM): Benzo(a)pyrene	50-32-8	0.5	µg/L	<0.5	5 µg/L	87.8	55	133
EP075(SIM): Benzo(b+j)fluoranthene	205-99-2 205-82-3	1	µg/L	<1.0	5 µg/L	87.7	48	142
EP075(SIM): Benzo(g.h.i)perylene	191-24-2	1	µg/L	<1.0	5 µg/L	90.7	52	142
EP075(SIM): Benzo(k)fluoranthene	207-08-9	1	µg/L	<1.0	5 µg/L	91.2	54	134
EP075(SIM): Chrysene	218-01-9	1	µg/L	<1.0	5 µg/L	87.1	54	132
EP075(SIM): Dibenz(a.h)anthracene	53-70-3	1	µg/L	<1.0	5 µg/L	89.7	52	142
EP075(SIM): Fluoranthene	206-44-0	1	µg/L	<1.0	5 µg/L	88.4	56	130
EP075(SIM): Fluorene	86-73-7	1	µg/L	<1.0	5 µg/L	78.4	47	125
EP075(SIM): Indeno(1.2.3.cd)pyrene	193-39-5	1	µg/L	<1.0	5 µg/L	90.4	49	143
EP075(SIM): Naphthalene	91-20-3	1	µg/L	<1.0	5 µg/L	72.8	39	115
EP075(SIM): Phenanthrene	85-01-8	1	µg/L	<1.0	5 µg/L	85.0	55	125
EP075(SIM): Pyrene	129-00-0	1	µg/L	<1.0	5 µg/L	91.8	56	132
EP080/071: Total Petroleum Hydrocarbons (QCLot: 285016)								
EP071: C10 - C14 Fraction	----	50	µg/L	<50	3980 µg/L	84.0	53	123
EP071: C15 - C28 Fraction	----	100	µg/L	<100	17006 µg/L	97.8	57	133
EP071: C29 - C36 Fraction	----	50	µg/L	<50	8662 µg/L	94.4	55	141
EP080/071: Total Petroleum Hydrocarbons (QCLot: 285017)								
EP071-SV: C10 - C14 Fraction	----	50	µg/L	<50	3980 µg/L	84.0	56	120
EP071-SV: C10 - C36 Fraction (sum)	----	50	µg/L	<50	----	----	----	----
EP071-SV: C15 - C28 Fraction	----	100	µg/L	<100	17006 µg/L	97.8	58	134
EP071-SV: C29 - C36 Fraction	----	50	µg/L	<50	8662 µg/L	94.4	53	143
EP080/071: Total Petroleum Hydrocarbons (QCLot: 287386)								
EP080: C6 - C9 Fraction	----	20	µg/L	<20	360 µg/L	101	67	127
EP080/071: Total Recoverable Hydrocarbons - NEPM 2013 Fractions (QCLot: 285016)								
EP071: >C10 - C16 Fraction	----	100	µg/L	<100	5753 µg/L	92.1	54	122
EP071: >C16 - C34 Fraction	----	100	µg/L	<100	24516 µg/L	91.4	56	132

Sub-Matrix: **WATER**

Method: Compound	CAS Number	LOR	Unit	Method Blank (MB) Report: Result	Laboratory Control Spike (LCS) Report: Spike Concentration	Spike Recovery (%): LCS	Recovery Limits (%): Low	Recovery Limits (%): High
EP080/071: Total Recoverable Hydrocarbons - NEPM 2013 Fractions (QCLot: 285016) - continued								
EP071: >C34 - C40 Fraction	----	100	µg/L	<100	828 µg/L	103	51	137
EP080/071: Total Recoverable Hydrocarbons - NEPM 2013 Fractions (QCLot: 285017)								
EP071-SV: >C10 - C16 Fraction	----	100	µg/L	<100	5753 µg/L	92.1	56	120
EP071-SV: >C10 - C40 Fraction (sum)	----	100	µg/L	<100	----	----	----	----
EP071-SV: >C16 - C34 Fraction	----	100	µg/L	<100	24516 µg/L	91.4	53	149
EP071-SV: >C34 - C40 Fraction	----	100	µg/L	<100	828 µg/L	103	49	143
EP080/071: Total Recoverable Hydrocarbons - NEPM 2013 Fractions (QCLot: 287386)								
EP080: C6 - C10 Fraction	C6_C10	20	µg/L	<20	450 µg/L	100	65	125
EP080: BTEXN (QCLot: 287386)								
EP080: Benzene	71-43-2	1	µg/L	<1	20 µg/L	116	76	120
EP080: Ethylbenzene	100-41-4	2	µg/L	<2	20 µg/L	103	72	124
EP080: meta- & para-Xylene	108-38-3 106-42-3	2	µg/L	<2	40 µg/L	101	72	130
EP080: Naphthalene	91-20-3	5	µg/L	<5	5 µg/L	108	71	129
EP080: ortho-Xylene	95-47-6	2	µg/L	<2	20 µg/L	105	75	127
EP080: Toluene	108-88-3	2	µg/L	<2	20 µg/L	107	76	124

Matrix Spike (MS) Report

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

Sub-Matrix: **WATER**

Laboratory sample ID	Client sample ID	Method: Compound	CAS Number	Matrix Spike (MS) Report: Spike Concentration	SpikeRecovery(%): MS	Recovery Limits (%): Low	Recovery Limits (%): High
ED041G: Sulfate (Turbidimetric) as SO4 2- by DA (QCLot: 285098)							
EM1517312-002	GW16	ED041G: Sulfate as SO4 - Turbidimetric	14808-79-8	10 mg/L	# Not Determined	70	130
ED043: Total Oxidised Sulfur as SO4 2- (QCLot: 288187)							
EM1517312-002	GW16	ED043: Total Oxidised Sulfur as SO4 2-	----	500 mg/L	99.4	70	130
ED045G: Chloride by Discrete Analyser (QCLot: 285099)							
EM1517312-002	GW16	ED045G: Chloride	16887-00-6	400 mg/L	104	70	130
EG020F: Dissolved Metals by ICP-MS (QCLot: 285915)							
EM1517312-001	GW14	EG020A-F: Arsenic	7440-38-2	0.2 mg/L	94.1	85	131
		EG020A-F: Cadmium	7440-43-9	0.05 mg/L	82.9	81	133
		EG020A-F: Chromium	7440-47-3	0.2 mg/L	88.8	71	135
		EG020A-F: Copper	7440-50-8	0.2 mg/L	84.0	76	130
		EG020A-F: Lead	7439-92-1	0.2 mg/L	94.6	75	133

Sub-Matrix: **WATER**

				Matrix Spike (MS) Report			
				Spike	SpikeRecovery(%)	Recovery Limits (%)	
Laboratory sample ID	Client sample ID	Method: Compound	CAS Number	Concentration	MS	Low	High
EG020F: Dissolved Metals by ICP-MS (QCLot: 285915) - continued							
EM1517312-001	GW14	EG020A-F: Manganese	7439-96-5	0.2 mg/L	91.1	64	134
		EG020A-F: Nickel	7440-02-0	0.2 mg/L	88.2	73	131
		EG020A-F: Zinc	7440-66-6	0.2 mg/L	100	75	131
EG020F: Dissolved Metals by ICP-MS (QCLot: 288052)							
EM1517043-001	Anonymous	EG020A-F: Arsenic	7440-38-2	0.2 mg/L	93.7	85	131
		EG020A-F: Cadmium	7440-43-9	0.05 mg/L	108	81	133
		EG020A-F: Chromium	7440-47-3	0.2 mg/L	93.3	71	135
		EG020A-F: Copper	7440-50-8	0.2 mg/L	87.4	76	130
		EG020A-F: Lead	7439-92-1	0.2 mg/L	94.9	75	133
		EG020A-F: Manganese	7439-96-5	0.2 mg/L	93.1	64	134
		EG020A-F: Nickel	7440-02-0	0.2 mg/L	89.6	73	131
		EG020A-F: Zinc	7440-66-6	0.2 mg/L	89.5	75	131
EG020T: Total Metals by ICP-MS (QCLot: 288879)							
EM1517138-036	Anonymous	EG020A-T: Arsenic	7440-38-2	1 mg/L	95.4	82	118
		EG020A-T: Cadmium	7440-43-9	0.25 mg/L	107	75	129
		EG020A-T: Chromium	7440-47-3	1 mg/L	96.9	80	118
		EG020A-T: Copper	7440-50-8	1 mg/L	93.4	81	115
		EG020A-T: Lead	7439-92-1	1 mg/L	104	83	121
		EG020A-T: Manganese	7439-96-5	1 mg/L	96.5	73	123
		EG020A-T: Nickel	7440-02-0	1 mg/L	93.8	80	118
		EG020A-T: Zinc	7440-66-6	1 mg/L	94.6	74	116
EG035F: Dissolved Mercury by FIMS (QCLot: 285914)							
EM1517312-002	GW16	EG035F: Mercury	7439-97-6	0.01 mg/L	96.3	70	120
EG035F: Dissolved Mercury by FIMS (QCLot: 288054)							
EM1517220-002	Anonymous	EG035F: Mercury	7439-97-6	0.01 mg/L	105	70	120
EG035T: Total Recoverable Mercury by FIMS (QCLot: 287457)							
EM1517256-002	Anonymous	EG035T: Mercury	7439-97-6	0.01 mg/L	95.0	70	130
EK040P: Fluoride by PC Titrator (QCLot: 286182)							
EM1517279-004	Anonymous	EK040P: Fluoride	16984-48-8	5 mg/L	104	70	130
EK040P: Fluoride by PC Titrator (QCLot: 286187)							
EM1517312-014	GW27	EK040P: Fluoride	16984-48-8	5 mg/L	95.0	70	130
EK055G: Ammonia as N by Discrete Analyser (QCLot: 285847)							
EM1517312-002	GW16	EK055G: Ammonia as N	7664-41-7	1 mg/L	113	70	130
EK057G: Nitrite as N by Discrete Analyser (QCLot: 285100)							
EM1517312-002	GW16	EK057G: Nitrite as N	14797-65-0	0.5 mg/L	92.0	80	114
EK059G: Nitrite plus Nitrate as N (NOx) by Discrete Analyser (QCLot: 285846)							

Sub-Matrix: **WATER**

				Matrix Spike (MS) Report			
				Spike	SpikeRecovery(%)	Recovery Limits (%)	
Laboratory sample ID	*Client sample ID*	*Method: Compound*	*CAS Number*	*Concentration*	*MS*	*Low*	*High*
EK059G: Nitrite plus Nitrate as N (NOx) by Discrete Analyser (QCLot: 285846) - continued							
EM1517312-002	GW16	EK059G: Nitrite + Nitrate as N	----	0.5 mg/L	105	70	130
EK071G: Reactive Phosphorus as P by discrete analyser (QCLot: 285101)							
EM1517312-002	GW16	EK071G: Reactive Phosphorus as P	14265-44-2	0.5 mg/L	93.5	79	123
EP005: Total Organic Carbon (TOC) (QCLot: 289127)							
EM1517215-002	Anonymous	EP005: Total Organic Carbon	----	100 mg/L	83.0	80	114
EP005: Total Organic Carbon (TOC) (QCLot: 289128)							
EM1517312-018	QC03	EP005: Total Organic Carbon	----	100 mg/L	93.0	80	114
EP074A: Monocyclic Aromatic Hydrocarbons (QCLot: 287387)							
EM1517312-002	GW16	EP074-WF: Benzene	71-43-2	20 µg/L	82.8	76	128
		EP074-WF: Toluene	108-88-3	20 µg/L	91.3	72	132
EP074E: Halogenated Aliphatic Compounds (QCLot: 287387)							
EM1517312-002	GW16	EP074-WF: 1.1-Dichloroethene	75-35-4	20 µg/L	79.8	63	129
		EP074-WF: Trichloroethene	79-01-6	20 µg/L	76.4	64	126
EP074F: Halogenated Aromatic Compounds (QCLot: 287387)							
EM1517312-002	GW16	EP074-WF: Chlorobenzene	108-90-7	20 µg/L	87.7	81	119
EP080/071: Total Petroleum Hydrocarbons (QCLot: 287386)							
EM1517312-002	GW16	EP080: C6 - C9 Fraction	----	280 µg/L	70.8	43	125
EP080/071: Total Recoverable Hydrocarbons - NEPM 2013 Fractions (QCLot: 287386)							
EM1517312-002	GW16	EP080: C6 - C10 Fraction	C6_C10	330 µg/L	69.1	44	122
EP080: BTEXN (QCLot: 287386)							
EM1517312-002	GW16	EP080: Benzene	71-43-2	20 µg/L	94.4	68	130
		EP080: Toluene	108-88-3	20 µg/L	94.8	72	132

ALS Environmental

QA/QC Compliance Assessment to assist with Quality Review

Work Order	: **EM1517312**	Page	: 1 of 15
Client	: **AECOM Australia Pty Ltd**	Laboratory	: Environmental Division Melbourne
Contact	: MS AVERYLL COYNE	Telephone	: +61-3-8549 9608
Project	: 60431087	Date Samples Received	: 19-Nov-2015
Site	:	Issue Date	: 26-Nov-2015
Sampler	: OLIVER TAYLOR, ZACHARY OCONNOR	No. of samples received	: 21
Order number	: 60431087 1.4	No. of samples analysed	: 19

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.**
- **Matrix Spike outliers exist - please see following pages for full details.**
- **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 : Quality Control Samples

Duplicates, Method Blanks, Laboratory Control Samples and Matrix Spikes

Matrix: **WATER**

Compound Group Name	Laboratory Sample ID	Client Sample ID	Analyte	CAS Number	Data	Limits	Comment
Matrix Spike (MS) Recoveries							
ED041G: Sulfate (Turbidimetric) as SO4 2- by DA	EM1517312--002	GW16	**Sulfate as SO4 - Turbidimetric**	14808-79-8	Not Determined	----	**MS recovery not determined, background level greater than or equal to 4x spike level.**

Outliers : Analysis Holding Time Compliance

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
EA005P: pH by PC Titrator						
Clear Plastic Bottle - Natural						
GW14, GW16, GW15, GW23	----	----	----	23-Nov-2015	17-Nov-2015	**6**
Clear Plastic Bottle - Natural						
GW17, GW21, QC01, GW25, GW29, GW13, GW20, GW26, GW22, GW27, GW30, GW05, GW10	----	----	----	23-Nov-2015	18-Nov-2015	**5**

Outliers : Frequency of Quality Control Samples

Matrix: **WATER**

Quality Control Sample Type / Method	Count: QC	Count: Regular	Rate (%): Actual	Rate (%): Expected	Quality Control Specification
Laboratory Duplicates (DUP)					
PAH/Phenols (GC/MS - SIM)	0	18	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
TRH - Semivolatile Fractions Only	0	9	0.00	10.00	NEPM 2013 B3 & ALS QC Standard
Matrix Spikes (MS)					
PAH/Phenols (GC/MS - SIM)	0	18	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
TRH - Semivolatile Fractions Only	0	9	0.00	5.00	NEPM 2013 B3 & ALS QC Standard

Analysis Holding Time Compliance

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
EA005P: pH by PC Titrator							
Clear Plastic Bottle - Natural (EA005-P)							
GW14, GW16, GW15, GW23	**17-Nov-2015**	**----**	----	----	**23-Nov-2015**	17-Nov-2015	×
Clear Plastic Bottle - Natural (EA005-P)							
GW17, GW21, QC01, GW25, GW29, GW13, GW20, GW26, GW22, GW27, GW30, GW05, GW10	**18-Nov-2015**	**----**	----	----	**23-Nov-2015**	18-Nov-2015	×
EA015: Total Dissolved Solids dried at 180 ± 5 °C							
Clear Plastic Bottle - Natural (EA015H)							
GW14, GW16, GW15, GW23	**17-Nov-2015**	**----**	----	----	**24-Nov-2015**	24-Nov-2015	✓
Clear Plastic Bottle - Natural (EA015H)							
GW17, GW21, QC01, GW25, GW29, GW13, GW20, GW26, GW22, GW27, GW30, GW05, GW10	**18-Nov-2015**	**----**	----	----	**24-Nov-2015**	25-Nov-2015	✓

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
ED037P: Alkalinity by PC Titrator							
Clear Plastic Bottle - Natural (ED037-P) GW14, GW16, GW15, GW23	**17-Nov-2015**	**----**	----	----	**23-Nov-2015**	01-Dec-2015	✓
Clear Plastic Bottle - Natural (ED037-P) GW17, GW21, QC01, GW25, GW29, GW13, GW20, GW26, GW22, GW27, GW30, GW05, GW10	**18-Nov-2015**	**----**	----	----	**23-Nov-2015**	02-Dec-2015	✓
ED041G: Sulfate (Turbidimetric) as SO4 2- by DA							
Clear Plastic Bottle - Natural (ED041G) GW14, GW16, GW15, GW23	**17-Nov-2015**	**----**	----	----	**24-Nov-2015**	15-Dec-2015	✓
Clear Plastic Bottle - Natural (ED041G) GW17, GW21, QC01, GW25, GW29, GW13, GW20, GW26, GW22, GW27, GW30, GW05, GW10	**18-Nov-2015**	**----**	----	----	**24-Nov-2015**	16-Dec-2015	✓
ED043: Total Oxidised Sulfur as SO4 2-							
Clear Plastic Bottle - Natural (ED043) GW14, GW16, GW15, GW23	**17-Nov-2015**	**25-Nov-2015**	15-Dec-2015	✓	**26-Nov-2015**	15-Dec-2015	✓
Clear Plastic Bottle - Natural (ED043) GW17, GW21, QC01, GW25, GW29, GW13, GW20, GW26, GW22, GW27, GW30, GW05, GW10	**18-Nov-2015**	**25-Nov-2015**	16-Dec-2015	✓	**26-Nov-2015**	16-Dec-2015	✓

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
ED045G: Chloride by Discrete Analyser							
Clear Plastic Bottle - Natural (ED045G)							
GW14, GW16, GW15, GW23	**17-Nov-2015**	**----**	----	----	**24-Nov-2015**	15-Dec-2015	✓
Clear Plastic Bottle - Natural (ED045G)							
GW17, GW21, QC01, GW25, GW29, GW13, GW20, GW26, GW22, GW27, GW30, GW05, GW10	**18-Nov-2015**	**----**	----	----	**24-Nov-2015**	16-Dec-2015	✓
ED093F: Dissolved Major Cations							
Clear Plastic Bottle - Nitric Acid; Filtered (ED093F)							
GW14, GW16, GW15, GW23	**17-Nov-2015**	**----**	----	----	**24-Nov-2015**	15-Dec-2015	✓
Clear Plastic Bottle - Nitric Acid; Filtered (ED093F)							
GW17, GW21, QC01, GW25, GW29, GW13, GW20, GW26, GW22, GW27, GW30, GW05, GW10	**18-Nov-2015**	**----**	----	----	**24-Nov-2015**	16-Dec-2015	✓
EG020F: Dissolved Metals by ICP-MS							
Clear Plastic Bottle - Nitric Acid; Filtered (EG020A-F)							
GW14, GW16, GW15, GW23	**17-Nov-2015**	**----**	----	----	**23-Nov-2015**	15-May-2016	✓
Clear Plastic Bottle - Nitric Acid; Filtered (EG020A-F)							
GW17, GW21, QC01, GW25, GW29, GW13, GW20, GW26, GW22, GW27, GW30, GW05, GW10	**18-Nov-2015**	**----**	----	----	**23-Nov-2015**	16-May-2016	✓
Clear Plastic Bottle - Nitric Acid; Filtered (EG020A-F)							
QC03	**18-Nov-2015**	**----**	----	----	**25-Nov-2015**	16-May-2016	✓
EG020T: Total Metals by ICP-MS							
Clear Plastic Bottle - Nitric Acid; Unfiltered (EG020A-T)							
QCF	**17-Nov-2015**	**25-Nov-2015**	15-May-2016	✓	**25-Nov-2015**	15-May-2016	✓

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
EG035F: Dissolved Mercury by FIMS							
Clear Plastic Bottle - Nitric Acid; Filtered (EG035F)							
GW14, GW16, GW15, GW23	**17-Nov-2015**	**----**	----	----	**26-Nov-2015**	15-Dec-2015	✓
Clear Plastic Bottle - Nitric Acid; Filtered (EG035F)							
GW17, GW21, QC01, GW25, GW29, GW13, GW20, GW26, GW22, GW27, GW30, GW05, GW10, QC03	**18-Nov-2015**	**----**	----	----	**26-Nov-2015**	16-Dec-2015	✓
EG035T: Total Recoverable Mercury by FIMS							
Clear Plastic Bottle - Nitric Acid; Unfiltered (EG035T)							
QCF	**17-Nov-2015**	**----**	----	----	**24-Nov-2015**	15-Dec-2015	✓
EK040P: Fluoride by PC Titrator							
Clear Plastic Bottle - Natural (EK040P)							
GW14, GW16, GW15, GW23	**17-Nov-2015**	**----**	----	----	**23-Nov-2015**	15-Dec-2015	✓
Clear Plastic Bottle - Natural (EK040P)							
GW17, GW21, QC01, GW25, GW29, GW13, GW20, GW26, GW22, GW27, GW30, GW05, GW10	**18-Nov-2015**	**----**	----	----	**23-Nov-2015**	16-Dec-2015	✓
EK055G: Ammonia as N by Discrete Analyser							
Clear Plastic Bottle - Sulfuric Acid (EK055G)							
GW14, GW16, GW15, GW23	**17-Nov-2015**	**----**	----	----	**24-Nov-2015**	15-Dec-2015	✓
Clear Plastic Bottle - Sulfuric Acid (EK055G)							
GW17, GW21, QC01, GW25, GW29, GW13, GW20, GW26, GW22, GW27, GW30, GW05, GW10, QC03	**18-Nov-2015**	**----**	----	----	**24-Nov-2015**	16-Dec-2015	✓

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
EK057G: Nitrite as N by Discrete Analyser							
Clear Plastic Bottle - Natural (EK057G)							
GW14, GW16, GW15, GW23	**17-Nov-2015**	**----**	----	----	**19-Nov-2015**	19-Nov-2015	✓
Clear Plastic Bottle - Natural (EK057G)							
GW17, GW21, QC01, GW25, GW29, GW13, GW20, GW26, GW22, GW27, GW30, GW05, GW10	**18-Nov-2015**	**----**	----	----	**19-Nov-2015**	20-Nov-2015	✓
EK059G: Nitrite plus Nitrate as N (NOx) by Discrete Analyser							
Clear Plastic Bottle - Sulfuric Acid (EK059G)							
GW14, GW16, GW15, GW23	**17-Nov-2015**	**----**	----	----	**24-Nov-2015**	15-Dec-2015	✓
Clear Plastic Bottle - Sulfuric Acid (EK059G)							
GW17, GW21, QC01, GW25, GW29, GW13, GW20, GW26, GW22, GW27, GW30, GW05, GW10	**18-Nov-2015**	**----**	----	----	**24-Nov-2015**	16-Dec-2015	✓
EK071G: Reactive Phosphorus as P by discrete analyser							
Clear Plastic Bottle - Natural (EK071G)							
GW14, GW16, GW15, GW23	**17-Nov-2015**	**----**	----	----	**19-Nov-2015**	19-Nov-2015	✓
Clear Plastic Bottle - Natural (EK071G)							
GW17, GW21, QC01, GW25, GW29, GW13, GW20, GW26, GW22, GW27, GW30, GW05, GW10	**18-Nov-2015**	**----**	----	----	**19-Nov-2015**	20-Nov-2015	✓

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
EP005: Total Organic Carbon (TOC)							
Amber TOC Vial - Sulfuric Acid (EP005)							
GW14, GW16, GW15, GW23	**17-Nov-2015**	**----**	----	----	**25-Nov-2015**	15-Dec-2015	✓
Amber TOC Vial - Sulfuric Acid (EP005)							
GW21, QC01	**18-Nov-2015**	**----**	----	----	**25-Nov-2015**	16-Dec-2015	✓
Amber VOC Vial - Sulfuric Acid (EP005)							
GW27, GW10, QC03	**18-Nov-2015**	**----**	----	----	**25-Nov-2015**	16-Dec-2015	✓
EP080/071: Total Petroleum Hydrocarbons							
Amber Glass Bottle - Unpreserved (EP071)							
GW14, GW16, GW15, GW23, QCF	**17-Nov-2015**	**23-Nov-2015**	24-Nov-2015	✓	**24-Nov-2015**	02-Jan-2016	✓
Amber Glass Bottle - Unpreserved (EP071)							
GW21, QC01, GW27, GW10, QC03	**18-Nov-2015**	**23-Nov-2015**	25-Nov-2015	✓	**24-Nov-2015**	02-Jan-2016	✓
EP080/071: Total Petroleum Hydrocarbons							
Amber Glass Bottle - Unpreserved (EP071-SV)							
GW17, GW25, GW29, GW13, GW20, GW26, GW22, GW30, GW05	**18-Nov-2015**	**23-Nov-2015**	25-Nov-2015	✓	**24-Nov-2015**	02-Jan-2016	✓
EP074E: Halogenated Aliphatic Compounds							
Amber VOC Vial - Sulfuric Acid (EP074-WF)							
GW14, GW16	**17-Nov-2015**	**24-Nov-2015**	01-Dec-2015	✓	**24-Nov-2015**	01-Dec-2015	✓
Amber VOC Vial - Sulfuric Acid (EP074-WF)							
GW21, QC01, GW27, GW10, QC03	**18-Nov-2015**	**24-Nov-2015**	02-Dec-2015	✓	**24-Nov-2015**	02-Dec-2015	✓

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
EP075(SIM)B: Polynuclear Aromatic Hydrocarbons							
Amber Glass Bottle - Unpreserved (EP075(SIM))							
GW14, GW16, GW15, GW23	**17-Nov-2015**	**23-Nov-2015**	24-Nov-2015	✓	**24-Nov-2015**	02-Jan-2016	✓
Amber Glass Bottle - Unpreserved (EP075(SIM))							
GW17, GW21, QC01, GW25, GW29, GW13, GW20, GW26, GW22, GW27, GW30, GW05, GW10, QC03	**18-Nov-2015**	**23-Nov-2015**	25-Nov-2015	✓	**24-Nov-2015**	02-Jan-2016	✓
EP080/071: Total Petroleum Hydrocarbons							
Amber VOC Vial - Sulfuric Acid (EP080)							
GW14, GW16, GW15, GW23, QCF	**17-Nov-2015**	**24-Nov-2015**	01-Dec-2015	✓	**24-Nov-2015**	01-Dec-2015	✓
Amber VOC Vial - Sulfuric Acid (EP080)							
GW21, QC01, GW27, GW10, QC03	**18-Nov-2015**	**24-Nov-2015**	02-Dec-2015	✓	**24-Nov-2015**	02-Dec-2015	✓

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)							
Alkalinity by PC Titrator	ED037-P	2	20	**10.00**	**10.00**	✓	NEPM 2013 B3 & ALS QC Standard
Ammonia as N by Discrete analyser	EK055G	2	20	**10.00**	**10.00**	✓	NEPM 2013 B3 & ALS QC Standard
Chloride by Discrete Analyser	ED045G	2	17	**11.76**	**10.00**	✓	NEPM 2013 B3 & ALS QC Standard
Dissolved Mercury by FIMS	EG035F	2	17	**11.76**	**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
Fluoride by PC Titrator	EK040P	2	20	**10.00**	**10.00**	✓	NEPM 2013 B3 & ALS QC Standard
Major Cations - Dissolved	ED093F	2	20	**10.00**	**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	20	**10.00**	**10.00**	✓	NEPM 2013 B3 & ALS QC Standard
PAH/Phenols (GC/MS - SIM)	EP075(SIM)	0	18	**0.00**	**10.00**	×	NEPM 2013 B3 & ALS QC Standard
pH by PC Titrator	EA005-P	2	20	**10.00**	**10.00**	✓	NEPM 2013 B3 & ALS QC Standard
Reactive Phosphorus as P-By Discrete Analyser	EK071G	2	17	**11.76**	**10.00**	✓	NEPM 2013 B3 & ALS QC Standard
Sulfate (Turbidimetric) as SO4 2- by Discrete Analyser	ED041G	2	20	**10.00**	**10.00**	✓	NEPM 2013 B3 & ALS QC Standard
Total Dissolved Solids (High Level)	EA015H	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-MS - Suite A	EG020A-T	2	20	**10.00**	**10.00**	✓	NEPM 2013 B3 & ALS QC Standard
Total Organic Carbon	EP005	2	20	**10.00**	**10.00**	✓	NEPM 2013 B3 & ALS QC Standard
Total Oxidised Sulfur as SO4 2-	ED043	2	17	**11.76**	**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 - Semivolatile Fractions Only	EP071-SV	0	9	**0.00**	**10.00**	×	NEPM 2013 B3 & ALS QC Standard
TRH Volatiles/BTEX	EP080	1	10	**10.00**	**10.00**	✓	NEPM 2013 B3 & ALS QC Standard
Volatile Organic Compounds WF Detection Limits	EP074-WF	1	7	**14.29**	**10.00**	✓	NEPM 2013 B3 & ALS QC Standard
Laboratory Control Samples (LCS)							
Alkalinity by PC Titrator	ED037-P	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
Chloride by Discrete Analyser	ED045G	2	17	**11.76**	**10.00**	✓	NEPM 2013 B3 & ALS QC Standard
Dissolved Mercury by FIMS	EG035F	1	17	**5.88**	**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
Fluoride by PC Titrator	EK040P	1	20	**5.00**	**5.00**	✓	NEPM 2013 B3 & ALS QC Standard
Major Cations - Dissolved	ED093F	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
Nitrite as N by Discrete Analyser	EK057G	1	20	**5.00**	**5.00**	✓	NEPM 2013 B3 & ALS QC Standard
PAH/Phenols (GC/MS - SIM)	EP075(SIM)	1	18	**5.56**	**5.00**	✓	NEPM 2013 B3 & ALS QC Standard
Reactive Phosphorus as P-By Discrete Analyser	EK071G	1	17	**5.88**	**5.00**	✓	NEPM 2013 B3 & ALS QC Standard
Sulfate (Turbidimetric) as SO4 2- by Discrete Analyser	ED041G	2	20	**10.00**	**10.00**	✓	NEPM 2013 B3 & ALS QC Standard
Total Dissolved Solids (High Level)	EA015H	2	20	**10.00**	**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 Control Samples (LCS) - Continued							
Total Mercury by FIMS	EG035T	1	20	**5.00**	**5.00**	✓	NEPM 2013 B3 & ALS QC Standard
Total Metals by ICP-MS - Suite A	EG020A-T	1	20	**5.00**	**5.00**	✓	NEPM 2013 B3 & ALS QC Standard
Total Organic Carbon	EP005	1	20	**5.00**	**5.00**	✓	NEPM 2013 B3 & ALS QC Standard
Total Oxidised Sulfur as SO4 2-	ED043	1	17	**5.88**	**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 - Semivolatile Fractions Only	EP071-SV	1	9	**11.11**	**5.00**	✓	NEPM 2013 B3 & ALS QC Standard
TRH Volatiles/BTEX	EP080	1	10	**10.00**	**5.00**	✓	NEPM 2013 B3 & ALS QC Standard
Volatile Organic Compounds WF Detection Limits	EP074-WF	1	7	**14.29**	**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
Chloride by Discrete Analyser	ED045G	1	17	**5.88**	**5.00**	✓	NEPM 2013 B3 & ALS QC Standard
Dissolved Mercury by FIMS	EG035F	1	17	**5.88**	**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
Fluoride by PC Titrator	EK040P	1	20	**5.00**	**5.00**	✓	NEPM 2013 B3 & ALS QC Standard
Major Cations - Dissolved	ED093F	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
Nitrite as N by Discrete Analyser	EK057G	1	20	**5.00**	**5.00**	✓	NEPM 2013 B3 & ALS QC Standard
PAH/Phenols (GC/MS - SIM)	EP075(SIM)	1	18	**5.56**	**5.00**	✓	NEPM 2013 B3 & ALS QC Standard
Reactive Phosphorus as P-By Discrete Analyser	EK071G	1	17	**5.88**	**5.00**	✓	NEPM 2013 B3 & ALS QC Standard
Sulfate (Turbidimetric) as SO4 2- by Discrete Analyser	ED041G	1	20	**5.00**	**5.00**	✓	NEPM 2013 B3 & ALS QC Standard
Total Dissolved Solids (High Level)	EA015H	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-MS - Suite A	EG020A-T	1	20	**5.00**	**5.00**	✓	NEPM 2013 B3 & ALS QC Standard
Total Organic Carbon	EP005	1	20	**5.00**	**5.00**	✓	NEPM 2013 B3 & ALS QC Standard
Total Oxidised Sulfur as SO4 2-	ED043	1	17	**5.88**	**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 - Semivolatile Fractions Only	EP071-SV	1	9	**11.11**	**5.00**	✓	NEPM 2013 B3 & ALS QC Standard
TRH Volatiles/BTEX	EP080	1	10	**10.00**	**5.00**	✓	NEPM 2013 B3 & ALS QC Standard
Volatile Organic Compounds WF Detection Limits	EP074-WF	1	7	**14.29**	**5.00**	✓	NEPM 2013 B3 & ALS QC Standard
Matrix Spikes (MS)							
Ammonia as N by Discrete analyser	EK055G	1	20	**5.00**	**5.00**	✓	NEPM 2013 B3 & ALS QC Standard
Chloride by Discrete Analyser	ED045G	1	17	**5.88**	**5.00**	✓	NEPM 2013 B3 & ALS QC Standard
Dissolved Mercury by FIMS	EG035F	1	17	**5.88**	**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
Fluoride by PC Titrator	EK040P	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
Nitrite as N by Discrete Analyser	EK057G	1	20	**5.00**	**5.00**	✓	NEPM 2013 B3 & ALS QC Standard
PAH/Phenols (GC/MS - SIM)	EP075(SIM)	0	18	**0.00**	**5.00**	×	NEPM 2013 B3 & ALS QC Standard
Reactive Phosphorus as P-By Discrete Analyser	EK071G	1	17	**5.88**	**5.00**	✓	NEPM 2013 B3 & ALS QC Standard
Sulfate (Turbidimetric) as SO4 2- by Discrete Analyser	ED041G	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.

Quality Control Sample Type		Count		Rate (%)			Quality Control Specification
Analytical Methods	*Method*	*QC*	*Regular*	***Actual***	***Expected***	*Evaluation*	
Matrix Spikes (MS) - Continued							
Total Mercury by FIMS	EG035T	1	20	**5.00**	**5.00**	✓	NEPM 2013 B3 & ALS QC Standard
Total Metals by ICP-MS - Suite A	EG020A-T	1	20	**5.00**	**5.00**	✓	NEPM 2013 B3 & ALS QC Standard
Total Organic Carbon	EP005	1	20	**5.00**	**5.00**	✓	NEPM 2013 B3 & ALS QC Standard
Total Oxidised Sulfur as SO4 2-	ED043	1	17	**5.88**	**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 - Semivolatile Fractions Only	EP071-SV	0	9	**0.00**	**5.00**	×	NEPM 2013 B3 & ALS QC Standard
TRH Volatiles/BTEX	EP080	1	10	**10.00**	**5.00**	✓	NEPM 2013 B3 & ALS QC Standard
Volatile Organic Compounds WF Detection Limits	EP074-WF	1	7	**14.29**	**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 by PC Titrator	EA005-P	WATER	In house: Referenced to APHA 4500 H+ B. This procedure determines pH of water samples by automated ISE. This method is compliant with NEPM (2013) Schedule B(3)
Total Dissolved Solids (High Level)	EA015H	WATER	In house: Referenced to APHA 2540C. A gravimetric procedure that determines the amount of `filterable` residue in an aqueous sample. A well-mixed sample is filtered through a glass fibre filter (1.2um). The filtrate is evaporated to dryness and dried to constant weight at 180+/-5C. This method is compliant with NEPM (2013) Schedule B(3)
Alkalinity by PC Titrator	ED037-P	WATER	In house: Referenced to APHA 2320 B This procedure determines alkalinity by automated measurement (e.g. PC Titrate) using pH 4.5 for indicating the total alkalinity end-point. This method is compliant with NEPM (2013) Schedule B(3)
Sulfate (Turbidimetric) as SO4 2- by Discrete Analyser	ED041G	WATER	In house: Referenced to APHA 4500-SO4. Dissolved sulfate is determined in a 0.45um filtered sample. Sulfate ions are converted to a barium sulfate suspension in an acetic acid medium with barium chloride. Light absorbance of the BaSO4 suspension is measured by a photometer and the SO4-2 concentration is determined by comparison of the reading with a standard curve. This method is compliant with NEPM (2013) Schedule B(3)
Total Oxidised Sulfur as SO4 2-	ED043	WATER	In-house. The sample is treated with Peroxide to convert all Sulfur species to Sulfate. Sulfate in the sample can then be determined by ICPAES and reported as TOS as SO4 2-.
Chloride by Discrete Analyser	ED045G	WATER	In house: Referenced to APHA 4500 Cl - G.The thiocyanate ion is liberated from mercuric thiocyanate through sequestration of mercury by the chloride ion to form non-ionised mercuric chloride.in the presence of ferric ions the librated thiocynate forms highly-coloured ferric thiocynate which is measured at 480 nm APHA 21st edition seal method 2 017-1-L april 2003
Major Cations - Dissolved	ED093F	WATER	In house: Referenced to APHA 3120 and 3125; USEPA SW 846 - 6010 and 6020; Cations are determined by either ICP-AES or ICP-MS techniques. This method is compliant with NEPM (2013) Schedule B(3) Sodium Adsorption Ratio is calculated from Ca, Mg and Na which determined by ALS in house method QWI-EN/ED093F. This method is compliant with NEPM (2013) Schedule B(3) Hardness parameters are calculated based on APHA 2340 B. This method is compliant with NEPM (2013) Schedule B(3)
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 0.45 um 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.
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.

Analytical Methods	Method	Matrix	Method Descriptions
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 0.45 um 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 (2013) Schedule B(3)
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 (2013) Schedule B(3)
Fluoride by PC Titrator	EK040P	WATER	In house: Referenced to APHA 4500 F--C CDTA is added to the sample to provide a uniform ionic strength background, adjust pH, and break up complexes. Fluoride concentration is determined by either manual or automatic ISE measurement. This method is compliant with NEPM (2013) 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 (2013) 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 (2013) 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 (2013) 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 (2013) Schedule B(3)
Reactive Phosphorus as P-By Discrete Analyser	EK071G	WATER	In house: Referenced to APHA 4500-P F Ammonium molybdate and potassium antimonyl tartrate reacts in acid medium with othophosphate to form a heteropoly acid -phosphomolybdic acid - which is reduced to intensely coloured molybdenum blue by ascorbic acid. Quantification is by Discrete Analyser. This method is compliant with NEPM (2013) Schedule B(3)
Ionic Balance by PCT DA and Turbi SO4 DA	EN055 - PG	WATER	In house: Referenced to APHA 1030F. This method is compliant with NEPM (2013) Schedule B(3)
Total Organic Carbon	EP005	WATER	In house: Referenced to APHA 5310 B, The automated TOC analyzer determines Total and Inorganic Carbon by IR cell. TOC is calculated as the difference. This method is compliant with NEPM (2013) Schedule B(3)
TRH - Semivolatile Fraction	EP071	WATER	USEPA SW 846 - 8015A 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 (2013) Schedule B(3)
TRH - Semivolatile Fractions Only	EP071-SV	WATER	USEPA SW 846 - 8015A 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 NEPM (2013) Schedule B(3)
Volatile Organic Compounds WF Detection Limits	EP074-WF	WATER	USEPA SW 846 - 8260B Water samples are directly purged prior to analysis by Capillary GC/MS and quantification is by comparison against an established 5 point calibration curve. This method is compliant with NEPM (2013) Schedule B(3)

Analytical Methods	Method	Matrix	Method Descriptions
PAH/Phenols (GC/MS - SIM)	EP075(SIM)	WATER	USEPA SW 846 - 8270D 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 (2013) Schedule B(3)
TRH Volatiles/BTEX	EP080	WATER	USEPA SW 846 - 8260B 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 (2013) Schedule B(3)

Preparation Methods	Method	Matrix	Method Descriptions
Total Oxidisable Sulfur as SO4 2- Prep	ED043-PR	WATER	In - House
Digestion for Total Recoverable Metals	EN25	WATER	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 (2013) Schedule B(3)

SAMPLE RECEIPT NOTIFICATION (SRN)

Work Order : **EM1517384**

Client	: **AECOM Australia Pty Ltd**	Laboratory	: Environmental Division Melbourne
Contact	: MS AVERYLL COYNE	Contact	: Carol Walsh
Address	: LEVEL 9 8 EXHIBITION ST MELBOURNE VIC 3000	Address	: 4 Westall Rd Springvale VIC Australia 3171
E-mail	: averyll.coyne@aecom.com	E-mail	: carol.walsh@alsglobal.com
Telephone	: +61 03 9653 1234	Telephone	: +61-3-8549 9608
Facsimile	: +61 03 9654 7117	Facsimile	: +61-3-8549 9601
Project	: 60431087	Page	: 1 of 3
Order number	: 60431087 1.4	Quote number	: EM2015AECOMAU0625 (ME/543/15)
C-O-C number	: ----	QC Level	: NEPM 2013 B3 & ALS QC Standard
Site	:		
Sampler	: OLIVER TAYLOR, ZACHARY OCONNOR		

Dates

Date Samples Received	: 20-Nov-2015 4:35 PM	Issue Date	: 24-Nov-2015
Client Requested Due Date	: 27-Nov-2015	Scheduled Reporting Date	: **27-Nov-2015**

Delivery Details

Mode of Delivery	: Carrier	Security Seal	: Intact.
No. of coolers/boxes	: 3	Temperature	: 9.9°C - Ice present
Receipt Detail	:	No. of samples received / analysed	: 17 / 16

General Comments

- This report contains the following information:
  - Sample Container(s)/Preservation Non-Compliances
  - Summary of Sample(s) and Requested Analysis
  - Proactive Holding Time Report
  - Requested Deliverables
- **Please direct any queries related to sample condition / numbering / breakages to Client Services.**
- Sample Disposal - Aqueous (14 days), Solid (60 days) from date of completion of work order.
- **Analytical work for this work order will be conducted at ALS Springvale.**
- **For sample QCM, TPH/BTEX has been requested; only VOC vials have been received and so only the volatile fraction of TPH (C6-C9) plus BTEX analysis (ALS suite W-18) has been booked in.**
- **Please refer to the Proactive Holding Time Report table below which summarises breaches of recommended holding times that have occurred prior to samples/instructions being received at the laboratory. The absence of this summary table indicates that all samples have been received within the recommended holding times for the analysis requested.**

Sample Container(s)/Preservation Non-Compliances

All comparisons are made against pretreatment/preservation AS, APHA, USEPA standards.

- **No sample container / preservation non-compliance exist.**

Summary of Sample(s) and Requested Analysis

Some items described below may be part of a laboratory process necessary for the execution of client requested tasks. Packages may contain additional analyses, such as the determination of moisture content and preparation tasks, that are included in the package.

Matrix: **WATER**

Laboratory sample ID	Client sampling date / time	Client sample ID	WATER - EA005P pH (PC)	WATER - EG020F Dissolved Metals by ICPMS	WATER - EK055G Ammonia as N By Discrete Analyser	WATER - NT-01 & 02 Ca, Mg, Na, K, Cl, SO4, Alkalinity	WATER - NT-03 Minor Anions (Nitrite, Nitrate, Fluoride,	WATER - W-02 8 Metals	WATER - W-07 TRH/BTEXN/PAH
EM1517384-001	[19-Nov-2015]	GW04	✓	✓	✓	✓	✓	✓	✓
EM1517384-002	[19-Nov-2015]	GW09	✓	✓	✓	✓	✓	✓	✓
EM1517384-003	[19-Nov-2015]	GW07	✓	✓	✓	✓	✓	✓	✓
EM1517384-004	[19-Nov-2015]	GW03	✓	✓	✓	✓	✓	✓	✓
EM1517384-005	[19-Nov-2015]	GW11	✓	✓	✓	✓	✓	✓	✓
EM1517384-006	[19-Nov-2015]	GW08	✓	✓	✓	✓	✓	✓	✓
EM1517384-007	[19-Nov-2015]	GW12	✓	✓	✓	✓	✓	✓	✓
EM1517384-008	[19-Nov-2015]	GW32	✓	✓	✓	✓	✓	✓	

Matrix: **WATER**

Laboratory sample ID	Client sampling date / time	Client sample ID	(On Hold) WATER No analysis requested	WATER - EA015H Total Dissolved Solids - High Level	WATER - ED043 Total Oxidised Sulfur as SO4 2-	WATER - EP005 Total Organic Carbon (TOC)	WATER - EP074-WF Full VOCs with WF DL incl DCM & Acetone	WATER - W-04 TRH/BTEXN	WATER - W-18 TRH(C6 - C9)/BTEXN
EM1517384-001	[19-Nov-2015]	GW04		✓	✓		✓		
EM1517384-002	[19-Nov-2015]	GW09		✓	✓				
EM1517384-003	[19-Nov-2015]	GW07		✓	✓				
EM1517384-004	[19-Nov-2015]	GW03		✓	✓				
EM1517384-005	[19-Nov-2015]	GW11		✓	✓				
EM1517384-006	[19-Nov-2015]	GW08		✓	✓				
EM1517384-007	[19-Nov-2015]	GW12		✓	✓		✓		
EM1517384-008	[19-Nov-2015]	GW32		✓	✓				
EM1517384-009	[19-Nov-2015]	GW20				✓			✓
EM1517384-010	[19-Nov-2015]	GW26				✓			✓
EM1517384-011	[19-Nov-2015]	GW31				✓			✓
EM1517384-012	[19-Nov-2015]	GW33				✓			✓
EM1517384-013	[19-Nov-2015]	GW34				✓			✓
EM1517384-014	[19-Nov-2015]	GW37				✓			✓
EM1517384-015	[19-Nov-2015]	QCK						✓	
EM1517384-016	[19-Nov-2015]	QCL	✓						

			(On Hold) WATER No analysis requested	WATER - EA015H Total Dissolved Solids - High Level	WATER - ED043 Total Oxidised Sulfur as SO4 2-	WATER - EP005 Total Organic Carbon (TOC)	WATER - EP074-WF Full VOCs with WF DL incl DCM & Acetone	WATER - W-04 TRH/BTEXN	WATER - W-18 TRH(C6 - C9)/BTEXN
EM1517384-017	[19-Nov-2015]	QCM							✓

Proactive Holding Time Report

The following table summarises breaches of recommended holding times that have occurred prior to samples/instructions being received at the laboratory.

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

Method / Client Sample ID(s)	Container	Due for extraction	Due for analysis	Samples Received Date	Samples Received Evaluation	Instructions Received Date	Instructions Received Evaluation
EA005-P: pH by PC Titrator							
GW03	Clear Plastic Bottle - Natural	----	19-Nov-2015	20-Nov-2015	×	----	----
GW04	Clear Plastic Bottle - Natural	----	19-Nov-2015	20-Nov-2015	×	----	----
GW07	Clear Plastic Bottle - Natural	----	19-Nov-2015	20-Nov-2015	×	----	----
GW08	Clear Plastic Bottle - Natural	----	19-Nov-2015	20-Nov-2015	×	----	----
GW09	Clear Plastic Bottle - Natural	----	19-Nov-2015	20-Nov-2015	×	----	----
GW11	Clear Plastic Bottle - Natural	----	19-Nov-2015	20-Nov-2015	×	----	----
GW12	Clear Plastic Bottle - Natural	----	19-Nov-2015	20-Nov-2015	×	----	----
GW32	Clear Plastic Bottle - Natural	----	19-Nov-2015	20-Nov-2015	×	----	----

Requested Deliverables

ACCOUNTS PAYABLE

- A4 - AU Tax Invoice (INV)	Email	AP_CustomerService.anz@aecom.com

AVERYLL COYNE

- *AU Certificate of Analysis - NATA (COA)	Email	averyll.coyne@aecom.com
- *AU Interpretive QC Report - DEFAULT (Anon QCI Rep) (QCI)	Email	averyll.coyne@aecom.com
- *AU QC Report - DEFAULT (Anon QC Rep) - NATA (QC)	Email	averyll.coyne@aecom.com
- A4 - AU Sample Receipt Notification - Environmental HT (SRN)	Email	averyll.coyne@aecom.com
- A4 - AU Tax Invoice (INV)	Email	averyll.coyne@aecom.com
- Chain of Custody (CoC) (COC)	Email	averyll.coyne@aecom.com
- EDI Format - ENMRG (ENMRG)	Email	averyll.coyne@aecom.com
- EDI Format - ESDAT (ESDAT)	Email	averyll.coyne@aecom.com
- EDI Format - HLAPro (HLAPro)	Email	averyll.coyne@aecom.com
- EDI Format - XTab (XTAB)	Email	averyll.coyne@aecom.com

ALS Environmental

CERTIFICATE OF ANALYSIS

Work Order	: **EM1517384**	Page	: 1 of 22
Amendment	: **1**		
Client	: **AECOM Australia Pty Ltd**	Laboratory	: Environmental Division Melbourne
Contact	: MS AVERYLL COYNE	Contact	: Carol Walsh
Address	: LEVEL 9 8 EXHIBITION ST MELBOURNE VIC 3000	Address	: 4 Westall Rd Springvale VIC Australia 3171
E-mail	: averyll.coyne@aecom.com	E-mail	: carol.walsh@alsglobal.com
Telephone	: +61 03 9653 1234	Telephone	: +61-3-8549 9608
Facsimile	: +61 03 9654 7117	Facsimile	: +61-3-8549 9601
Project	: 60431087	QC Level	: NEPM 2013 B3 & ALS QC Standard
Order number	: 60431087 1.4	Date Samples Received	: 20-Nov-2015 16:35
C-O-C number	: ----	Date Analysis Commenced	: 20-Nov-2015
Sampler	: OLIVER TAYLOR, ZACHARY OCONNOR	Issue Date	: 08-Dec-2015 09:22
Site	:		
		No. of samples received	: 17
Quote number	: ----	No. of samples analysed	: 17

This report supersedes any previous report(s) with this reference. Results apply to the sample(s) as submitted.

This Certificate of Analysis contains the following information:

- General Comments
- Analytical Results

NATA Accredited Laboratory 825

Accredited for compliance with ISO/IEC 17025.

Signatories

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

Signatories	*Position*	*Accreditation Category*
Dilani Fernando	Senior Inorganic Chemist	Melbourne Inorganics
Herman Lin	Laboratory Manager	Melbourne Inorganics
Nancy Wang	Senior Semivolatile Instrument Chemist	Melbourne Organics
Xing Lin	Senior Organic Chemist	Melbourne Organics

General Comments

The analytical procedures used by the Environmental Division have been developed from established internationally recognized procedures such as those published by the USEPA, APHA, AS and NEPM. In house developed procedures are employed in the absence of documented standards or by 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.

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.

- **EP080: Minor Benzene result in sample EM1517384-004 has been confirmed by re-extraction and re-analysis.**
- 30/11/2015 : This report has been amended as a result of a request to change sample identification numbers (IDs) received by ALS from Zachary O'Connor and add analysis to samples QCQ and QCR.
- Ionic balances were calculated using: major anions - chloride, alkalinity and sulfate; and major cations - calcium, magnesium, potassium and sodium.
- ED045G: The presence of thiocyanate can positively contribute to the chloride result, thereby may bias results higher than expected. Results should be scrutinised accordingly.
- Benzo(a)pyrene Toxicity Equivalent Quotient (TEQ) 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.

Analytical Results

Sub-Matrix: GROUNDWATER (Matrix: WATER)				Client sample ID	GW04	GW09	GW07	GW03	GW11
				Client sampling date / time	[19-Nov-2015]	[19-Nov-2015]	[19-Nov-2015]	[19-Nov-2015]	[19-Nov-2015]
Compound	CAS Number	LOR	Unit		EM1517384-001	EM1517384-002	EM1517384-003	EM1517384-004	EM1517384-005
					Result	Result	Result	Result	Result
EA005P: pH by PC Titrator									
pH Value	----	0.01	pH Unit		6.38	7.10	7.25	7.10	7.61
EA015: Total Dissolved Solids dried at 180 ± 5 °C									
Total Dissolved Solids @180°C	----	10	mg/L		787	1240	1250	1390	632
ED037P: Alkalinity by PC Titrator									
Hydroxide Alkalinity as CaCO3	DMO-210-001	1	mg/L		<1	<1	<1	<1	<1
Carbonate Alkalinity as CaCO3	3812-32-6	1	mg/L		<1	<1	<1	<1	<1
Bicarbonate Alkalinity as CaCO3	71-52-3	1	mg/L		535	436	894	852	186
Total Alkalinity as CaCO3	----	1	mg/L		535	436	894	852	186
ED041G: Sulfate (Turbidimetric) as SO4 2- by DA									
Sulfate as SO4 - Turbidimetric	14808-79-8	1	mg/L		208	447	116	255	211
ED043: Total Oxidised Sulfur as SO4 2-									
Total Oxidised Sulfur as SO4 2-	----	1	mg/L		209	478	106	236	212
ED045G: Chloride by Discrete Analyser									
Chloride	16887-00-6	1	mg/L		22	102	142	101	20
ED093F: Dissolved Major Cations									
Calcium	7440-70-2	1	mg/L		174	203	212	176	62
Magnesium	7439-95-4	1	mg/L		41	36	52	94	4
Sodium	7440-23-5	1	mg/L		46	149	123	143	111
Potassium	7440-09-7	1	mg/L		12	25	28	41	10
EG020F: Dissolved Metals by ICP-MS									
Aluminium	7429-90-5	0.01	mg/L		0.04	0.03	0.06	0.04	0.05
Arsenic	7440-38-2	0.001	mg/L		0.002	0.001	0.021	0.007	0.009
Cadmium	7440-43-9	0.0001	mg/L		<0.0001	<0.0001	<0.0001	<0.0001	<0.0001
Chromium	7440-47-3	0.001	mg/L		<0.001	<0.001	0.002	<0.001	0.001
Copper	7440-50-8	0.001	mg/L		0.002	<0.001	<0.001	<0.001	<0.001
Nickel	7440-02-0	0.001	mg/L		0.042	0.060	0.006	0.014	0.007
Lead	7439-92-1	0.001	mg/L		<0.001	<0.001	<0.001	<0.001	<0.001
Zinc	7440-66-6	0.005	mg/L		0.090	0.016	0.010	0.029	0.006
Manganese	7439-96-5	0.001	mg/L		0.098	0.346	0.150	0.475	0.073
Selenium	7782-49-2	0.01	mg/L		<0.01	<0.01	<0.01	<0.01	<0.01
Iron	7439-89-6	0.05	mg/L		0.25	20.0	9.95	6.85	1.08
EG035F: Dissolved Mercury by FIMS									
Mercury	7439-97-6	0.0001	mg/L		<0.0001	<0.0001	<0.0001	<0.0001	<0.0001
EK040P: Fluoride by PC Titrator									

Analytical Results

Sub-Matrix: GROUNDWATER (Matrix: WATER)				Client sample ID	GW04	GW09	GW07	GW03	GW11
				Client sampling date / time	[19-Nov-2015]	[19-Nov-2015]	[19-Nov-2015]	[19-Nov-2015]	[19-Nov-2015]
Compound	CAS Number	LOR	Unit		EM1517384-001	EM1517384-002	EM1517384-003	EM1517384-004	EM1517384-005
					Result	Result	Result	Result	Result
EK040P: Fluoride by PC Titrator - Continued									
Fluoride	16984-48-8	0.1	mg/L		**0.3**	**0.3**	**0.4**	**0.4**	**0.4**
EK055G: Ammonia as N by Discrete Analyser									
Ammonia as N	7664-41-7	0.01	mg/L		**0.05**	**7.86**	**26.7**	**2.23**	**1.05**
EK057G: Nitrite as N by Discrete Analyser									
Nitrite as N	14797-65-0	0.01	mg/L		<0.01	<0.01	<0.01	**0.01**	<0.01
EK058G: Nitrate as N by Discrete Analyser									
Nitrate as N	14797-55-8	0.01	mg/L		**0.02**	**0.02**	**0.02**	**0.05**	<0.01
EK059G: Nitrite plus Nitrate as N (NOx) by Discrete Analyser									
Nitrite + Nitrate as N	----	0.01	mg/L		**0.02**	**0.02**	**0.02**	**0.06**	<0.01
EK071G: Reactive Phosphorus as P by discrete analyser									
Reactive Phosphorus as P	14265-44-2	0.01	mg/L		**0.04**	<0.01	**0.03**	<0.01	<0.01
EN055: Ionic Balance									
Total Anions	----	0.01	meq/L		**15.6**	**20.9**	**24.3**	**25.2**	**8.67**
Total Cations	----	0.01	meq/L		**14.4**	**20.2**	**20.9**	**23.8**	**8.51**
Ionic Balance	----	0.01	%		**4.23**	**1.65**	**7.42**	**2.85**	**0.98**
EP005: Total Organic Carbon (TOC)									
Total Organic Carbon	----	1	mg/L		**----**	**----**	**----**	**----**	**----**
EP074A: Monocyclic Aromatic Hydrocarbons									
Benzene	71-43-2	1	µg/L		<1	**----**	**----**	**----**	**----**
Toluene	108-88-3	1	µg/L		<1	**----**	**----**	**----**	**----**
Ethylbenzene	100-41-4	1	µg/L		<1	**----**	**----**	**----**	**----**
meta- & para-Xylene	108-38-3 106-42-3	1	µg/L		<1	**----**	**----**	**----**	**----**
Styrene	100-42-5	1	µg/L		<1	**----**	**----**	**----**	**----**
ortho-Xylene	95-47-6	1	µg/L		<1	**----**	**----**	**----**	**----**
Isopropylbenzene	98-82-8	1	µg/L		<1	**----**	**----**	**----**	**----**
n-Propylbenzene	103-65-1	1	µg/L		<1	**----**	**----**	**----**	**----**
1.3.5-Trimethylbenzene	108-67-8	1	µg/L		<1	**----**	**----**	**----**	**----**
sec-Butylbenzene	135-98-8	1	µg/L		<1	**----**	**----**	**----**	**----**
1.2.4-Trimethylbenzene	95-63-6	1	µg/L		<1	**----**	**----**	**----**	**----**
tert-Butylbenzene	98-06-6	1	µg/L		<1	**----**	**----**	**----**	**----**
p-Isopropyltoluene	99-87-6	1	µg/L		<1	**----**	**----**	**----**	**----**
n-Butylbenzene	104-51-8	1	µg/L		<1	**----**	**----**	**----**	**----**
EP074B: Oxygenated Compounds									
2-Propanone (Acetone)	67-64-1	10	µg/L		<10	**----**	**----**	**----**	**----**

Analytical Results

Sub-Matrix: GROUNDWATER (Matrix: WATER)				Client sample ID	GW04	GW09	GW07	GW03	GW11
				Client sampling date / time	[19-Nov-2015]	[19-Nov-2015]	[19-Nov-2015]	[19-Nov-2015]	[19-Nov-2015]
Compound	CAS Number	LOR	Unit		EM1517384-001	EM1517384-002	EM1517384-003	EM1517384-004	EM1517384-005
					Result	Result	Result	Result	Result
EP074B: Oxygenated Compounds - Continued									
Vinyl Acetate	108-05-4	10	µg/L		<10	----	----	----	----
2-Butanone (MEK)	78-93-3	10	µg/L		<10	----	----	----	----
4-Methyl-2-pentanone (MIBK)	108-10-1	10	µg/L		<10	----	----	----	----
2-Hexanone (MBK)	591-78-6	10	µg/L		<10	----	----	----	----
EP074C: Sulfonated Compounds									
Carbon disulfide	75-15-0	1	µg/L		<1	----	----	----	----
EP074D: Fumigants									
2.2-Dichloropropane	594-20-7	1	µg/L		<1	----	----	----	----
1.2-Dichloropropane	78-87-5	1	µg/L		<1	----	----	----	----
cis-1.3-Dichloropropylene	10061-01-5	2	µg/L		<2	----	----	----	----
trans-1.3-Dichloropropylene	10061-02-6	2	µg/L		<2	----	----	----	----
1.2-Dibromoethane (EDB)	106-93-4	1	µg/L		<1	----	----	----	----
EP074E: Halogenated Aliphatic Compounds									
Dichlorodifluoromethane	75-71-8	10	µg/L		<10	----	----	----	----
Chloromethane	74-87-3	10	µg/L		<10	----	----	----	----
Vinyl chloride	75-01-4	10	µg/L		<10.0	----	----	----	----
Bromomethane	74-83-9	10	µg/L		<10	----	----	----	----
Chloroethane	75-00-3	10	µg/L		<10	----	----	----	----
Trichlorofluoromethane	75-69-4	10	µg/L		<10	----	----	----	----
1.1-Dichloroethene	75-35-4	1	µg/L		<1	----	----	----	----
Iodomethane	74-88-4	1	µg/L		<1	----	----	----	----
Methylene chloride	75-09-2	5	µg/L		<5	----	----	----	----
trans-1.2-Dichloroethene	156-60-5	1	µg/L		<1	----	----	----	----
1.1-Dichloroethane	75-34-3	1	µg/L		<1	----	----	----	----
cis-1.2-Dichloroethene	156-59-2	1	µg/L		<1	----	----	----	----
1.1.1-Trichloroethane	71-55-6	1	µg/L		<1	----	----	----	----
1.1-Dichloropropylene	563-58-6	1	µg/L		<1	----	----	----	----
Carbon Tetrachloride	56-23-5	1	µg/L		<1	----	----	----	----
1.2-Dichloroethane	107-06-2	1	µg/L		<1	----	----	----	----
Trichloroethene	79-01-6	1	µg/L		<1	----	----	----	----
Dibromomethane	74-95-3	1	µg/L		<1	----	----	----	----
1.1.2-Trichloroethane	79-00-5	1	µg/L		<1	----	----	----	----
1.3-Dichloropropane	142-28-9	1	µg/L		<1	----	----	----	----
Tetrachloroethene	127-18-4	1	µg/L		<1	----	----	----	----

Analytical Results

Sub-Matrix: GROUNDWATER (Matrix: WATER)				Client sample ID	GW04	GW09	GW07	GW03	GW11
				Client sampling date / time	[19-Nov-2015]	[19-Nov-2015]	[19-Nov-2015]	[19-Nov-2015]	[19-Nov-2015]
Compound	CAS Number	LOR	Unit		EM1517384-001	EM1517384-002	EM1517384-003	EM1517384-004	EM1517384-005
					Result	Result	Result	Result	Result
EP074E: Halogenated Aliphatic Compounds - Continued									
1.1.1.2-Tetrachloroethane	630-20-6	1	µg/L		<1	----	----	----	----
trans-1.4-Dichloro-2-butene	110-57-6	1	µg/L		<1	----	----	----	----
cis-1.4-Dichloro-2-butene	1476-11-5	1	µg/L		<1	----	----	----	----
1.1.2.2-Tetrachloroethane	79-34-5	1	µg/L		<1	----	----	----	----
1.2.3-Trichloropropane	96-18-4	1	µg/L		<1	----	----	----	----
Pentachloroethane	76-01-7	1	µg/L		<1	----	----	----	----
1.2-Dibromo-3-chloropropane	96-12-8	1	µg/L		<1	----	----	----	----
Hexachlorobutadiene	87-68-3	1	µg/L		<1.0	----	----	----	----
EP074F: Halogenated Aromatic Compounds									
Chlorobenzene	108-90-7	1	µg/L		<1	----	----	----	----
Bromobenzene	108-86-1	1	µg/L		<1	----	----	----	----
2-Chlorotoluene	95-49-8	1	µg/L		<1	----	----	----	----
4-Chlorotoluene	106-43-4	1	µg/L		<1	----	----	----	----
1.3-Dichlorobenzene	541-73-1	1	µg/L		<1	----	----	----	----
1.4-Dichlorobenzene	106-46-7	1	µg/L		<1.0	----	----	----	----
1.2-Dichlorobenzene	95-50-1	1	µg/L		<1	----	----	----	----
1.2.4-Trichlorobenzene	120-82-1	1	µg/L		<1	----	----	----	----
1.2.3-Trichlorobenzene	87-61-6	1	µg/L		<1	----	----	----	----
EP074G: Trihalomethanes									
Chloroform	67-66-3	1	µg/L		<1	----	----	----	----
Bromodichloromethane	75-27-4	1	µg/L		<1	----	----	----	----
Dibromochloromethane	124-48-1	1	µg/L		<1	----	----	----	----
Bromoform	75-25-2	1	µg/L		<1	----	----	----	----
EP074H: Naphthalene									
Naphthalene	91-20-3	5	µg/L		<5	----	----	----	----
EP075(SIM)B: Polynuclear Aromatic Hydrocarbons									
Naphthalene	91-20-3	1	µg/L		<1.0	<1.0	<1.0	**2.3**	<1.0
Acenaphthylene	208-96-8	1	µg/L		<1.0	<1.0	<1.0	<1.0	<1.0
Acenaphthene	83-32-9	1	µg/L		<1.0	<1.0	<1.0	<1.0	<1.0
Fluorene	86-73-7	1	µg/L		<1.0	<1.0	<1.0	<1.0	<1.0
Phenanthrene	85-01-8	1	µg/L		<1.0	<1.0	<1.0	**1.0**	<1.0
Anthracene	120-12-7	1	µg/L		<1.0	<1.0	<1.0	<1.0	<1.0
Fluoranthene	206-44-0	1	µg/L		<1.0	<1.0	<1.0	<1.0	<1.0
Pyrene	129-00-0	1	µg/L		<1.0	<1.0	<1.0	<1.0	<1.0

Analytical Results

Sub-Matrix: GROUNDWATER (Matrix: WATER)				Client sample ID	GW04	GW09	GW07	GW03	GW11
				Client sampling date / time	[19-Nov-2015]	[19-Nov-2015]	[19-Nov-2015]	[19-Nov-2015]	[19-Nov-2015]
Compound	CAS Number	LOR	Unit		EM1517384-001	EM1517384-002	EM1517384-003	EM1517384-004	EM1517384-005
					Result	Result	Result	Result	Result
EP075(SIM)B: Polynuclear Aromatic Hydrocarbons - Continued									
Benz(a)anthracene	56-55-3	1	µg/L		<1.0	<1.0	<1.0	<1.0	<1.0
Chrysene	218-01-9	1	µg/L		<1.0	<1.0	<1.0	<1.0	<1.0
Benzo(b+j)fluoranthene	205-99-2 205-82-3	1	µg/L		<1.0	<1.0	<1.0	<1.0	<1.0
Benzo(k)fluoranthene	207-08-9	1	µg/L		<1.0	<1.0	<1.0	<1.0	<1.0
Benzo(a)pyrene	50-32-8	0.5	µg/L		<0.5	<0.5	<0.5	<0.5	<0.5
Indeno(1.2.3.cd)pyrene	193-39-5	1	µg/L		<1.0	<1.0	<1.0	<1.0	<1.0
Dibenz(a.h)anthracene	53-70-3	1	µg/L		<1.0	<1.0	<1.0	<1.0	<1.0
Benzo(g.h.i)perylene	191-24-2	1	µg/L		<1.0	<1.0	<1.0	<1.0	<1.0
^ Sum of polycyclic aromatic hydrocarbons	----	0.5	µg/L		<0.5	<0.5	<0.5	**3.3**	<0.5
^ Benzo(a)pyrene TEQ (zero)	----	0.5	µg/L		<0.5	<0.5	<0.5	<0.5	<0.5
EP080/071: Total Petroleum Hydrocarbons									
C6 - C9 Fraction	----	20	µg/L		<20	<20	<20	<20	<20
C10 - C14 Fraction	----	50	µg/L		<50	<50	**50**	<50	<50
C15 - C28 Fraction	----	100	µg/L		<100	<100	<100	<100	<100
C29 - C36 Fraction	----	50	µg/L		<50	<50	<50	<50	<50
^ C10 - C36 Fraction (sum)	----	50	µg/L		<50	<50	**50**	<50	<50
EP080/071: Total Recoverable Hydrocarbons - NEPM 2013 Fractions									
C6 - C10 Fraction	C6_C10	20	µg/L		<20	<20	<20	<20	<20
^ C6 - C10 Fraction minus BTEX (F1)	C6_C10-BTEX	20	µg/L		<20	<20	<20	<20	<20
>C10 - C16 Fraction	----	100	µg/L		<100	<100	<100	<100	<100
>C16 - C34 Fraction	----	100	µg/L		<100	<100	<100	<100	<100
>C34 - C40 Fraction	----	100	µg/L		<100	<100	<100	<100	<100
^ >C10 - C40 Fraction (sum)	----	100	µg/L		<100	<100	<100	<100	<100
^ >C10 - C16 Fraction minus Naphthalene (F2)	----	100	µg/L		<100	<100	<100	<100	<100
EP080: BTEXN									
Benzene	71-43-2	1	µg/L		----	<1	<1	**2**	<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	1330-20-7	2	µg/L		----	<2	<2	<2	<2
^ Sum of BTEX	----	1	µg/L		----	<1	<1	**2**	<1
Naphthalene	91-20-3	5	µg/L		----	<5	<5	<5	<5

Analytical Results

Sub-Matrix: GROUNDWATER (Matrix: WATER)				Client sample ID	GW04	GW09	GW07	GW03	GW11
				Client sampling date / time	[19-Nov-2015]	[19-Nov-2015]	[19-Nov-2015]	[19-Nov-2015]	[19-Nov-2015]
Compound	CAS Number	LOR	Unit		EM1517384-001	EM1517384-002	EM1517384-003	EM1517384-004	EM1517384-005
					Result	Result	Result	Result	Result
EP080: BTEXN - Continued									
EP074S: VOC Surrogates									
1.2-Dichloroethane-D4	17060-07-0	1	%		113	----	----	----	----
Toluene-D8	2037-26-5	1	%		118	----	----	----	----
4-Bromofluorobenzene	460-00-4	1	%		101	----	----	----	----
EP075(SIM)S: Phenolic Compound Surrogates									
Phenol-d6	13127-88-3	1	%		28.8	29.8	27.6	27.8	29.8
2-Chlorophenol-D4	93951-73-6	1	%		59.3	62.8	56.2	58.6	64.7
2.4.6-Tribromophenol	118-79-6	1	%		40.9	48.5	42.8	47.9	48.4
EP075(SIM)T: PAH Surrogates									
2-Fluorobiphenyl	321-60-8	1	%		70.0	75.8	61.1	66.6	73.2
Anthracene-d10	1719-06-8	1	%		84.6	92.3	73.3	81.7	86.8
4-Terphenyl-d14	1718-51-0	1	%		74.2	84.5	68.6	79.5	79.2
EP080S: TPH(V)/BTEX Surrogates									
1.2-Dichloroethane-D4	17060-07-0	2	%		110	102	107	114	113
Toluene-D8	2037-26-5	2	%		104	82.1	90.0	90.0	82.8
4-Bromofluorobenzene	460-00-4	2	%		96.7	91.4	98.7	98.1	93.2

Analytical Results

Sub-Matrix: GROUNDWATER (Matrix: WATER)				Client sample ID	GW08	GW12	GW32	GW20	GW26
				Client sampling date / time	[19-Nov-2015]	[19-Nov-2015]	[19-Nov-2015]	[19-Nov-2015]	[19-Nov-2015]
Compound	CAS Number	LOR	Unit		EM1517384-006	EM1517384-007	EM1517384-008	EM1517384-009	EM1517384-010
					Result	Result	Result	Result	Result
EA005P: pH by PC Titrator									
pH Value	----	0.01	pH Unit		7.03	7.19	6.96	----	----
EA015: Total Dissolved Solids dried at 180 ± 5 °C									
Total Dissolved Solids @180°C	----	10	mg/L		996	1380	9950	----	----
ED037P: Alkalinity by PC Titrator									
Hydroxide Alkalinity as CaCO3	DMO-210-001	1	mg/L		<1	<1	<1	----	----
Carbonate Alkalinity as CaCO3	3812-32-6	1	mg/L		<1	<1	<1	----	----
Bicarbonate Alkalinity as CaCO3	71-52-3	1	mg/L		406	334	601	----	----
Total Alkalinity as CaCO3	----	1	mg/L		406	334	601	----	----
ED041G: Sulfate (Turbidimetric) as SO4 2- by DA									
Sulfate as SO4 - Turbidimetric	14808-79-8	1	mg/L		299	477	1000	----	----
ED043: Total Oxidised Sulfur as SO4 2-									
Total Oxidised Sulfur as SO4 2-	----	1	mg/L		310	466	1020	----	----
ED045G: Chloride by Discrete Analyser									
Chloride	16887-00-6	1	mg/L		38	186	4820	----	----
ED093F: Dissolved Major Cations									
Calcium	7440-70-2	1	mg/L		209	262	845	----	----
Magnesium	7439-95-4	1	mg/L		29	36	273	----	----
Sodium	7440-23-5	1	mg/L		46	115	2230	----	----
Potassium	7440-09-7	1	mg/L		15	25	54	----	----
EG020F: Dissolved Metals by ICP-MS									
Aluminium	7429-90-5	0.01	mg/L		0.06	0.03	<0.01	----	----
Arsenic	7440-38-2	0.001	mg/L		0.003	0.012	<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	----	----
Nickel	7440-02-0	0.001	mg/L		0.009	0.008	<0.001	----	----
Lead	7439-92-1	0.001	mg/L		<0.001	<0.001	<0.001	----	----
Zinc	7440-66-6	0.005	mg/L		0.009	0.015	0.006	----	----
Manganese	7439-96-5	0.001	mg/L		0.253	0.113	3.25	----	----
Selenium	7782-49-2	0.01	mg/L		<0.01	<0.01	<0.01	----	----
Iron	7439-89-6	0.05	mg/L		2.65	2.61	0.20	----	----
EG035F: Dissolved Mercury by FIMS									
Mercury	7439-97-6	0.0001	mg/L		<0.0001	<0.0001	<0.0001	----	----
EK040P: Fluoride by PC Titrator									

Analytical Results

Sub-Matrix: GROUNDWATER (Matrix: WATER)				Client sample ID	GW08	GW12	GW32	GW20	GW26
				Client sampling date / time	[19-Nov-2015]	[19-Nov-2015]	[19-Nov-2015]	[19-Nov-2015]	[19-Nov-2015]
Compound	CAS Number	LOR	Unit		EM1517384-006	EM1517384-007	EM1517384-008	EM1517384-009	EM1517384-010
					Result	Result	Result	Result	Result
EK040P: Fluoride by PC Titrator - Continued									
Fluoride	16984-48-8	0.1	mg/L		0.3	0.1	0.7	----	----
EK055G: Ammonia as N by Discrete Analyser									
Ammonia as N	7664-41-7	0.01	mg/L		2.68	0.17	10.9	----	----
EK057G: Nitrite as N by Discrete Analyser									
Nitrite as N	14797-65-0	0.01	mg/L		<0.01	0.04	<0.01	----	----
EK058G: Nitrate as N by Discrete Analyser									
Nitrate as N	14797-55-8	0.01	mg/L		0.02	1.03	0.02	----	----
EK059G: Nitrite plus Nitrate as N (NOx) by Discrete Analyser									
Nitrite + Nitrate as N	----	0.01	mg/L		0.02	1.07	0.02	----	----
EK071G: Reactive Phosphorus as P by discrete analyser									
Reactive Phosphorus as P	14265-44-2	0.01	mg/L		<0.01	<0.01	0.38	----	----
EN055: Ionic Balance									
Total Anions	----	0.01	meq/L		15.4	21.8	169	----	----
Total Cations	----	0.01	meq/L		15.2	21.7	163	----	----
Ionic Balance	----	0.01	%		0.65	0.37	1.74	----	----
EP005: Total Organic Carbon (TOC)									
Total Organic Carbon	----	1	mg/L		----	----	----	13	6
EP074A: Monocyclic Aromatic Hydrocarbons									
Benzene	71-43-2	1	µg/L		----	<1	----	----	----
Toluene	108-88-3	1	µg/L		----	<1	----	----	----
Ethylbenzene	100-41-4	1	µg/L		----	<1	----	----	----
meta- & para-Xylene	108-38-3 106-42-3	1	µg/L		----	<1	----	----	----
Styrene	100-42-5	1	µg/L		----	<1	----	----	----
ortho-Xylene	95-47-6	1	µg/L		----	<1	----	----	----
Isopropylbenzene	98-82-8	1	µg/L		----	<1	----	----	----
n-Propylbenzene	103-65-1	1	µg/L		----	<1	----	----	----
1.3.5-Trimethylbenzene	108-67-8	1	µg/L		----	<1	----	----	----
sec-Butylbenzene	135-98-8	1	µg/L		----	<1	----	----	----
1.2.4-Trimethylbenzene	95-63-6	1	µg/L		----	<1	----	----	----
tert-Butylbenzene	98-06-6	1	µg/L		----	<1	----	----	----
p-Isopropyltoluene	99-87-6	1	µg/L		----	<1	----	----	----
n-Butylbenzene	104-51-8	1	µg/L		----	<1	----	----	----
EP074B: Oxygenated Compounds									
2-Propanone (Acetone)	67-64-1	10	µg/L		----	<10	----	----	----

Analytical Results

Sub-Matrix: GROUNDWATER (Matrix: WATER)				Client sample ID	GW08	GW12	GW32	GW20	GW26
				Client sampling date / time	[19-Nov-2015]	[19-Nov-2015]	[19-Nov-2015]	[19-Nov-2015]	[19-Nov-2015]
Compound	CAS Number	LOR	Unit		EM1517384-006	EM1517384-007	EM1517384-008	EM1517384-009	EM1517384-010
					Result	Result	Result	Result	Result
EP074B: Oxygenated Compounds - Continued									
Vinyl Acetate	108-05-4	10	µg/L		----	<10	----	----	----
2-Butanone (MEK)	78-93-3	10	µg/L		----	<10	----	----	----
4-Methyl-2-pentanone (MIBK)	108-10-1	10	µg/L		----	<10	----	----	----
2-Hexanone (MBK)	591-78-6	10	µg/L		----	<10	----	----	----
EP074C: Sulfonated Compounds									
Carbon disulfide	75-15-0	1	µg/L		----	<1	----	----	----
EP074D: Fumigants									
2.2-Dichloropropane	594-20-7	1	µg/L		----	<1	----	----	----
1.2-Dichloropropane	78-87-5	1	µg/L		----	<1	----	----	----
cis-1.3-Dichloropropylene	10061-01-5	2	µg/L		----	<2	----	----	----
trans-1.3-Dichloropropylene	10061-02-6	2	µg/L		----	<2	----	----	----
1.2-Dibromoethane (EDB)	106-93-4	1	µg/L		----	<1	----	----	----
EP074E: Halogenated Aliphatic Compounds									
Dichlorodifluoromethane	75-71-8	10	µg/L		----	<10	----	----	----
Chloromethane	74-87-3	10	µg/L		----	<10	----	----	----
Vinyl chloride	75-01-4	10	µg/L		----	<10.0	----	----	----
Bromomethane	74-83-9	10	µg/L		----	<10	----	----	----
Chloroethane	75-00-3	10	µg/L		----	<10	----	----	----
Trichlorofluoromethane	75-69-4	10	µg/L		----	<10	----	----	----
1.1-Dichloroethene	75-35-4	1	µg/L		----	<1	----	----	----
Iodomethane	74-88-4	1	µg/L		----	<1	----	----	----
Methylene chloride	75-09-2	5	µg/L		----	<5	----	----	----
trans-1.2-Dichloroethene	156-60-5	1	µg/L		----	<1	----	----	----
1.1-Dichloroethane	75-34-3	1	µg/L		----	<1	----	----	----
cis-1.2-Dichloroethene	156-59-2	1	µg/L		----	<1	----	----	----
1.1.1-Trichloroethane	71-55-6	1	µg/L		----	<1	----	----	----
1.1-Dichloropropylene	563-58-6	1	µg/L		----	<1	----	----	----
Carbon Tetrachloride	56-23-5	1	µg/L		----	<1	----	----	----
1.2-Dichloroethane	107-06-2	1	µg/L		----	<1	----	----	----
Trichloroethene	79-01-6	1	µg/L		----	<1	----	----	----
Dibromomethane	74-95-3	1	µg/L		----	<1	----	----	----
1.1.2-Trichloroethane	79-00-5	1	µg/L		----	<1	----	----	----
1.3-Dichloropropane	142-28-9	1	µg/L		----	<1	----	----	----
Tetrachloroethene	127-18-4	1	µg/L		----	<1	----	----	----

Analytical Results

Sub-Matrix: GROUNDWATER (Matrix: WATER)				Client sample ID	GW08	GW12	GW32	GW20	GW26
				Client sampling date / time	[19-Nov-2015]	[19-Nov-2015]	[19-Nov-2015]	[19-Nov-2015]	[19-Nov-2015]
Compound	CAS Number	LOR	Unit		EM1517384-006	EM1517384-007	EM1517384-008	EM1517384-009	EM1517384-010
					Result	Result	Result	Result	Result
EP074E: Halogenated Aliphatic Compounds - Continued									
1.1.1.2-Tetrachloroethane	630-20-6	1	µg/L		----	<1	----	----	----
trans-1.4-Dichloro-2-butene	110-57-6	1	µg/L		----	<1	----	----	----
cis-1.4-Dichloro-2-butene	1476-11-5	1	µg/L		----	<1	----	----	----
1.1.2.2-Tetrachloroethane	79-34-5	1	µg/L		----	<1	----	----	----
1.2.3-Trichloropropane	96-18-4	1	µg/L		----	<1	----	----	----
Pentachloroethane	76-01-7	1	µg/L		----	<1	----	----	----
1.2-Dibromo-3-chloropropane	96-12-8	1	µg/L		----	<1	----	----	----
Hexachlorobutadiene	87-68-3	1	µg/L		----	<1.0	----	----	----
EP074F: Halogenated Aromatic Compounds									
Chlorobenzene	108-90-7	1	µg/L		----	<1	----	----	----
Bromobenzene	108-86-1	1	µg/L		----	<1	----	----	----
2-Chlorotoluene	95-49-8	1	µg/L		----	<1	----	----	----
4-Chlorotoluene	106-43-4	1	µg/L		----	<1	----	----	----
1.3-Dichlorobenzene	541-73-1	1	µg/L		----	<1	----	----	----
1.4-Dichlorobenzene	106-46-7	1	µg/L		----	<1.0	----	----	----
1.2-Dichlorobenzene	95-50-1	1	µg/L		----	<1	----	----	----
1.2.4-Trichlorobenzene	120-82-1	1	µg/L		----	<1	----	----	----
1.2.3-Trichlorobenzene	87-61-6	1	µg/L		----	<1	----	----	----
EP074G: Trihalomethanes									
Chloroform	67-66-3	1	µg/L		----	<1	----	----	----
Bromodichloromethane	75-27-4	1	µg/L		----	<1	----	----	----
Dibromochloromethane	124-48-1	1	µg/L		----	<1	----	----	----
Bromoform	75-25-2	1	µg/L		----	<1	----	----	----
EP074H: Naphthalene									
Naphthalene	91-20-3	5	µg/L		----	<5	----	----	----
EP075(SIM)B: Polynuclear Aromatic Hydrocarbons									
Naphthalene	91-20-3	1	µg/L		<1.0	<1.0	----	----	----
Acenaphthylene	208-96-8	1	µg/L		<1.0	<1.0	----	----	----
Acenaphthene	83-32-9	1	µg/L		<1.0	<1.0	----	----	----
Fluorene	86-73-7	1	µg/L		<1.0	<1.0	----	----	----
Phenanthrene	85-01-8	1	µg/L		<1.0	<1.0	----	----	----
Anthracene	120-12-7	1	µg/L		<1.0	<1.0	----	----	----
Fluoranthene	206-44-0	1	µg/L		<1.0	<1.0	----	----	----
Pyrene	129-00-0	1	µg/L		<1.0	<1.0	----	----	----

Analytical Results

Sub-Matrix: GROUNDWATER (Matrix: WATER)				Client sample ID	GW08	GW12	GW32	GW20	GW26
				Client sampling date / time	[19-Nov-2015]	[19-Nov-2015]	[19-Nov-2015]	[19-Nov-2015]	[19-Nov-2015]
Compound	CAS Number	LOR	Unit		EM1517384-006	EM1517384-007	EM1517384-008	EM1517384-009	EM1517384-010
					Result	Result	Result	Result	Result
EP075(SIM)B: Polynuclear Aromatic Hydrocarbons - Continued									
Benz(a)anthracene	56-55-3	1	µg/L		<1.0	<1.0	----	----	----
Chrysene	218-01-9	1	µg/L		<1.0	<1.0	----	----	----
Benzo(b+j)fluoranthene	205-99-2 205-82-3	1	µg/L		<1.0	<1.0	----	----	----
Benzo(k)fluoranthene	207-08-9	1	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	µg/L		<1.0	<1.0	----	----	----
Dibenz(a.h)anthracene	53-70-3	1	µg/L		<1.0	<1.0	----	----	----
Benzo(g.h.i)perylene	191-24-2	1	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	----	<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	----	----	----
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	----	----	----
>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	<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	1330-20-7	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

Analytical Results

Sub-Matrix: GROUNDWATER (Matrix: WATER)				Client sample ID	GW08	GW12	GW32	GW20	GW26
				Client sampling date / time	[19-Nov-2015]	[19-Nov-2015]	[19-Nov-2015]	[19-Nov-2015]	[19-Nov-2015]
Compound	CAS Number	LOR	Unit		EM1517384-006	EM1517384-007	EM1517384-008	EM1517384-009	EM1517384-010
					Result	Result	Result	Result	Result
EP080: BTEXN - Continued									
EP074S: VOC Surrogates									
1.2-Dichloroethane-D4	17060-07-0	1	%		----	115	----	----	----
Toluene-D8	2037-26-5	1	%		----	122	----	----	----
4-Bromofluorobenzene	460-00-4	1	%		----	101	----	----	----
EP075(SIM)S: Phenolic Compound Surrogates									
Phenol-d6	13127-88-3	1	%		27.9	31.3	----	----	----
2-Chlorophenol-D4	93951-73-6	1	%		58.2	66.2	----	----	----
2.4.6-Tribromophenol	118-79-6	1	%		46.2	46.6	----	----	----
EP075(SIM)T: PAH Surrogates									
2-Fluorobiphenyl	321-60-8	1	%		69.5	78.6	----	----	----
Anthracene-d10	1719-06-8	1	%		83.8	89.7	----	----	----
4-Terphenyl-d14	1718-51-0	1	%		81.1	82.2	----	----	----
EP080S: TPH(V)/BTEX Surrogates									
1.2-Dichloroethane-D4	17060-07-0	2	%		102	112	----	105	101
Toluene-D8	2037-26-5	2	%		83.4	108	----	82.0	78.5
4-Bromofluorobenzene	460-00-4	2	%		93.5	96.6	----	92.8	88.3

Analytical Results

Sub-Matrix: GROUNDWATER (Matrix: WATER)				Client sample ID	GW31	GW33	GW34	GW37	----
				Client sampling date / time	[19-Nov-2015]	[19-Nov-2015]	[19-Nov-2015]	[19-Nov-2015]	----
Compound	CAS Number	LOR	Unit		EM1517384-011	EM1517384-012	EM1517384-013	EM1517384-014	--------
					Result	Result	Result	Result	Result
EA005P: pH by PC Titrator									
pH Value	----	0.01	pH Unit		----	----	----	----	----
EA015: Total Dissolved Solids dried at 180 ± 5 °C									
Total Dissolved Solids @180°C	----	10	mg/L		----	----	----	----	----
ED037P: Alkalinity by PC Titrator									
Hydroxide Alkalinity as CaCO3	DMO-210-001	1	mg/L		----	----	----	----	----
Carbonate Alkalinity as CaCO3	3812-32-6	1	mg/L		----	----	----	----	----
Bicarbonate Alkalinity as CaCO3	71-52-3	1	mg/L		----	----	----	----	----
Total Alkalinity as CaCO3	----	1	mg/L		----	----	----	----	----
ED041G: Sulfate (Turbidimetric) as SO4 2- by DA									
Sulfate as SO4 - Turbidimetric	14808-79-8	1	mg/L		----	----	----	----	----
ED043: Total Oxidised Sulfur as SO4 2-									
Total Oxidised Sulfur as SO4 2-	----	1	mg/L		----	----	----	----	----
ED045G: Chloride by Discrete Analyser									
Chloride	16887-00-6	1	mg/L		----	----	----	----	----
ED093F: Dissolved Major Cations									
Calcium	7440-70-2	1	mg/L		----	----	----	----	----
Magnesium	7439-95-4	1	mg/L		----	----	----	----	----
Sodium	7440-23-5	1	mg/L		----	----	----	----	----
Potassium	7440-09-7	1	mg/L		----	----	----	----	----
EG020F: Dissolved Metals by ICP-MS									
Aluminium	7429-90-5	0.01	mg/L		----	----	----	----	----
Arsenic	7440-38-2	0.001	mg/L		----	----	----	----	----
Cadmium	7440-43-9	0.0001	mg/L		----	----	----	----	----
Chromium	7440-47-3	0.001	mg/L		----	----	----	----	----
Copper	7440-50-8	0.001	mg/L		----	----	----	----	----
Nickel	7440-02-0	0.001	mg/L		----	----	----	----	----
Lead	7439-92-1	0.001	mg/L		----	----	----	----	----
Zinc	7440-66-6	0.005	mg/L		----	----	----	----	----
Manganese	7439-96-5	0.001	mg/L		----	----	----	----	----
Selenium	7782-49-2	0.01	mg/L		----	----	----	----	----
Iron	7439-89-6	0.05	mg/L		----	----	----	----	----
EG035F: Dissolved Mercury by FIMS									
Mercury	7439-97-6	0.0001	mg/L		----	----	----	----	----
EK040P: Fluoride by PC Titrator									

Analytical Results

Sub-Matrix: GROUNDWATER (Matrix: WATER)				Client sample ID	GW31	GW33	GW34	GW37	----
				Client sampling date / time	[19-Nov-2015]	[19-Nov-2015]	[19-Nov-2015]	[19-Nov-2015]	----
Compound	CAS Number	LOR	Unit		EM1517384-011	EM1517384-012	EM1517384-013	EM1517384-014	--------
					Result	Result	Result	Result	Result
EK040P: Fluoride by PC Titrator - Continued									
Fluoride	16984-48-8	0.1	mg/L		----	----	----	----	----
EK055G: Ammonia as N by Discrete Analyser									
Ammonia as N	7664-41-7	0.01	mg/L		----	----	----	----	----
EK057G: Nitrite as N by Discrete Analyser									
Nitrite as N	14797-65-0	0.01	mg/L		----	----	----	----	----
EK058G: Nitrate as N by Discrete Analyser									
Nitrate as N	14797-55-8	0.01	mg/L		----	----	----	----	----
EK059G: Nitrite plus Nitrate as N (NOx) by Discrete Analyser									
Nitrite + Nitrate as N	----	0.01	mg/L		----	----	----	----	----
EK071G: Reactive Phosphorus as P by discrete analyser									
Reactive Phosphorus as P	14265-44-2	0.01	mg/L		----	----	----	----	----
EN055: Ionic Balance									
Total Anions	----	0.01	meq/L		----	----	----	----	----
Total Cations	----	0.01	meq/L		----	----	----	----	----
Ionic Balance	----	0.01	%		----	----	----	----	----
EP005: Total Organic Carbon (TOC)									
Total Organic Carbon	----	1	mg/L		15	8	6	4	----
EP074A: Monocyclic Aromatic Hydrocarbons									
Benzene	71-43-2	1	µg/L		----	----	----	----	----
Toluene	108-88-3	1	µg/L		----	----	----	----	----
Ethylbenzene	100-41-4	1	µg/L		----	----	----	----	----
meta- & para-Xylene	108-38-3 106-42-3	1	µg/L		----	----	----	----	----
Styrene	100-42-5	1	µg/L		----	----	----	----	----
ortho-Xylene	95-47-6	1	µg/L		----	----	----	----	----
Isopropylbenzene	98-82-8	1	µg/L		----	----	----	----	----
n-Propylbenzene	103-65-1	1	µg/L		----	----	----	----	----
1.3.5-Trimethylbenzene	108-67-8	1	µg/L		----	----	----	----	----
sec-Butylbenzene	135-98-8	1	µg/L		----	----	----	----	----
1.2.4-Trimethylbenzene	95-63-6	1	µg/L		----	----	----	----	----
tert-Butylbenzene	98-06-6	1	µg/L		----	----	----	----	----
p-Isopropyltoluene	99-87-6	1	µg/L		----	----	----	----	----
n-Butylbenzene	104-51-8	1	µg/L		----	----	----	----	----
EP074B: Oxygenated Compounds									
2-Propanone (Acetone)	67-64-1	10	µg/L		----	----	----	----	----

Analytical Results

Sub-Matrix: GROUNDWATER (Matrix: WATER)				Client sample ID	GW31	GW33	GW34	GW37	----
				Client sampling date / time	[19-Nov-2015]	[19-Nov-2015]	[19-Nov-2015]	[19-Nov-2015]	----
Compound	CAS Number	LOR	Unit		EM1517384-011	EM1517384-012	EM1517384-013	EM1517384-014	--------
					Result	Result	Result	Result	Result
EP074B: Oxygenated Compounds - Continued									
Vinyl Acetate	108-05-4	10	µg/L		----	----	----	----	----
2-Butanone (MEK)	78-93-3	10	µg/L		----	----	----	----	----
4-Methyl-2-pentanone (MIBK)	108-10-1	10	µg/L		----	----	----	----	----
2-Hexanone (MBK)	591-78-6	10	µg/L		----	----	----	----	----
EP074C: Sulfonated Compounds									
Carbon disulfide	75-15-0	1	µg/L		----	----	----	----	----
EP074D: Fumigants									
2.2-Dichloropropane	594-20-7	1	µg/L		----	----	----	----	----
1.2-Dichloropropane	78-87-5	1	µg/L		----	----	----	----	----
cis-1.3-Dichloropropylene	10061-01-5	2	µg/L		----	----	----	----	----
trans-1.3-Dichloropropylene	10061-02-6	2	µg/L		----	----	----	----	----
1.2-Dibromoethane (EDB)	106-93-4	1	µg/L		----	----	----	----	----
EP074E: Halogenated Aliphatic Compounds									
Dichlorodifluoromethane	75-71-8	10	µg/L		----	----	----	----	----
Chloromethane	74-87-3	10	µg/L		----	----	----	----	----
Vinyl chloride	75-01-4	10	µg/L		----	----	----	----	----
Bromomethane	74-83-9	10	µg/L		----	----	----	----	----
Chloroethane	75-00-3	10	µg/L		----	----	----	----	----
Trichlorofluoromethane	75-69-4	10	µg/L		----	----	----	----	----
1.1-Dichloroethene	75-35-4	1	µg/L		----	----	----	----	----
Iodomethane	74-88-4	1	µg/L		----	----	----	----	----
Methylene chloride	75-09-2	5	µg/L		----	----	----	----	----
trans-1.2-Dichloroethene	156-60-5	1	µg/L		----	----	----	----	----
1.1-Dichloroethane	75-34-3	1	µg/L		----	----	----	----	----
cis-1.2-Dichloroethene	156-59-2	1	µg/L		----	----	----	----	----
1.1.1-Trichloroethane	71-55-6	1	µg/L		----	----	----	----	----
1.1-Dichloropropylene	563-58-6	1	µg/L		----	----	----	----	----
Carbon Tetrachloride	56-23-5	1	µg/L		----	----	----	----	----
1.2-Dichloroethane	107-06-2	1	µg/L		----	----	----	----	----
Trichloroethene	79-01-6	1	µg/L		----	----	----	----	----
Dibromomethane	74-95-3	1	µg/L		----	----	----	----	----
1.1.2-Trichloroethane	79-00-5	1	µg/L		----	----	----	----	----
1.3-Dichloropropane	142-28-9	1	µg/L		----	----	----	----	----
Tetrachloroethene	127-18-4	1	µg/L		----	----	----	----	----

Analytical Results

Sub-Matrix: GROUNDWATER (Matrix: WATER)				Client sample ID	GW31	GW33	GW34	GW37	----
				Client sampling date / time	[19-Nov-2015]	[19-Nov-2015]	[19-Nov-2015]	[19-Nov-2015]	----
Compound	CAS Number	LOR	Unit		EM1517384-011	EM1517384-012	EM1517384-013	EM1517384-014	--------
					Result	Result	Result	Result	Result
EP074E: Halogenated Aliphatic Compounds - Continued									
1.1.1.2-Tetrachloroethane	630-20-6	1	µg/L		----	----	----	----	----
trans-1.4-Dichloro-2-butene	110-57-6	1	µg/L		----	----	----	----	----
cis-1.4-Dichloro-2-butene	1476-11-5	1	µg/L		----	----	----	----	----
1.1.2.2-Tetrachloroethane	79-34-5	1	µg/L		----	----	----	----	----
1.2.3-Trichloropropane	96-18-4	1	µg/L		----	----	----	----	----
Pentachloroethane	76-01-7	1	µg/L		----	----	----	----	----
1.2-Dibromo-3-chloropropane	96-12-8	1	µg/L		----	----	----	----	----
Hexachlorobutadiene	87-68-3	1	µg/L		----	----	----	----	----
EP074F: Halogenated Aromatic Compounds									
Chlorobenzene	108-90-7	1	µg/L		----	----	----	----	----
Bromobenzene	108-86-1	1	µg/L		----	----	----	----	----
2-Chlorotoluene	95-49-8	1	µg/L		----	----	----	----	----
4-Chlorotoluene	106-43-4	1	µg/L		----	----	----	----	----
1.3-Dichlorobenzene	541-73-1	1	µg/L		----	----	----	----	----
1.4-Dichlorobenzene	106-46-7	1	µg/L		----	----	----	----	----
1.2-Dichlorobenzene	95-50-1	1	µg/L		----	----	----	----	----
1.2.4-Trichlorobenzene	120-82-1	1	µg/L		----	----	----	----	----
1.2.3-Trichlorobenzene	87-61-6	1	µg/L		----	----	----	----	----
EP074G: Trihalomethanes									
Chloroform	67-66-3	1	µg/L		----	----	----	----	----
Bromodichloromethane	75-27-4	1	µg/L		----	----	----	----	----
Dibromochloromethane	124-48-1	1	µg/L		----	----	----	----	----
Bromoform	75-25-2	1	µg/L		----	----	----	----	----
EP074H: Naphthalene									
Naphthalene	91-20-3	5	µg/L		----	----	----	----	----
EP075(SIM)B: Polynuclear Aromatic Hydrocarbons									
Naphthalene	91-20-3	1	µg/L		----	----	----	----	----
Acenaphthylene	208-96-8	1	µg/L		----	----	----	----	----
Acenaphthene	83-32-9	1	µg/L		----	----	----	----	----
Fluorene	86-73-7	1	µg/L		----	----	----	----	----
Phenanthrene	85-01-8	1	µg/L		----	----	----	----	----
Anthracene	120-12-7	1	µg/L		----	----	----	----	----
Fluoranthene	206-44-0	1	µg/L		----	----	----	----	----
Pyrene	129-00-0	1	µg/L		----	----	----	----	----

Analytical Results

Sub-Matrix: GROUNDWATER (Matrix: WATER)				Client sample ID	GW31	GW33	GW34	GW37	----
				Client sampling date / time	[19-Nov-2015]	[19-Nov-2015]	[19-Nov-2015]	[19-Nov-2015]	----
Compound	CAS Number	LOR	Unit		EM1517384-011	EM1517384-012	EM1517384-013	EM1517384-014	--------
					Result	Result	Result	Result	Result
EP075(SIM)B: Polynuclear Aromatic Hydrocarbons - Continued									
Benz(a)anthracene	56-55-3	1	µg/L		----	----	----	----	----
Chrysene	218-01-9	1	µg/L		----	----	----	----	----
Benzo(b+j)fluoranthene	205-99-2 205-82-3	1	µg/L		----	----	----	----	----
Benzo(k)fluoranthene	207-08-9	1	µg/L		----	----	----	----	----
Benzo(a)pyrene	50-32-8	0.5	µg/L		----	----	----	----	----
Indeno(1.2.3.cd)pyrene	193-39-5	1	µg/L		----	----	----	----	----
Dibenz(a.h)anthracene	53-70-3	1	µg/L		----	----	----	----	----
Benzo(g.h.i)perylene	191-24-2	1	µg/L		----	----	----	----	----
^ Sum of polycyclic aromatic hydrocarbons	----	0.5	µg/L		----	----	----	----	----
^ Benzo(a)pyrene TEQ (zero)	----	0.5	µg/L		----	----	----	----	----
EP080/071: Total Petroleum Hydrocarbons									
C6 - C9 Fraction	----	20	µg/L		<20	<20	<20	<20	----
C10 - C14 Fraction	----	50	µg/L		----	----	----	----	----
C15 - C28 Fraction	----	100	µg/L		----	----	----	----	----
C29 - C36 Fraction	----	50	µg/L		----	----	----	----	----
^ C10 - C36 Fraction (sum)	----	50	µg/L		----	----	----	----	----
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		----	----	----	----	----
>C16 - C34 Fraction	----	100	µg/L		----	----	----	----	----
>C34 - C40 Fraction	----	100	µg/L		----	----	----	----	----
^ >C10 - C40 Fraction (sum)	----	100	µg/L		----	----	----	----	----
^ >C10 - C16 Fraction minus Naphthalene (F2)	----	100	µg/L		----	----	----	----	----
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	1330-20-7	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	----

Analytical Results

Sub-Matrix: GROUNDWATER (Matrix: WATER)				Client sample ID	GW31	GW33	GW34	GW37	----
				Client sampling date / time	[19-Nov-2015]	[19-Nov-2015]	[19-Nov-2015]	[19-Nov-2015]	----
Compound	CAS Number	LOR	Unit		EM1517384-011	EM1517384-012	EM1517384-013	EM1517384-014	--------
					Result	Result	Result	Result	Result
EP080: BTEXN - Continued									
EP074S: VOC Surrogates									
1.2-Dichloroethane-D4	17060-07-0	1	%		----	----	----	----	----
Toluene-D8	2037-26-5	1	%		----	----	----	----	----
4-Bromofluorobenzene	460-00-4	1	%		----	----	----	----	----
EP075(SIM)S: Phenolic Compound Surrogates									
Phenol-d6	13127-88-3	1	%		----	----	----	----	----
2-Chlorophenol-D4	93951-73-6	1	%		----	----	----	----	----
2.4.6-Tribromophenol	118-79-6	1	%		----	----	----	----	----
EP075(SIM)T: PAH Surrogates									
2-Fluorobiphenyl	321-60-8	1	%		----	----	----	----	----
Anthracene-d10	1719-06-8	1	%		----	----	----	----	----
4-Terphenyl-d14	1718-51-0	1	%		----	----	----	----	----
EP080S: TPH(V)/BTEX Surrogates									
1.2-Dichloroethane-D4	17060-07-0	2	%		**109**	**101**	**122**	**98.0**	----
Toluene-D8	2037-26-5	2	%		**81.3**	**79.8**	**101**	**74.5**	----
4-Bromofluorobenzene	460-00-4	2	%		**92.6**	**88.9**	**113**	**87.9**	----

Analytical Results

Sub-Matrix: WATER (Matrix: WATER)				Client sample ID	QCQ	QCR	QCM	----	----
				Client sampling date / time	[19-Nov-2015]	[19-Nov-2015]	[19-Nov-2015]	----	----
Compound	CAS Number	LOR	Unit		EM1517384-015	EM1517384-016	EM1517384-017	--------	--------
					Result	Result	Result	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	----	----	----
Nickel	7440-02-0	0.001	mg/L		<0.001	<0.001	----	----	----
Lead	7439-92-1	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	----	----	----
EP080/071: Total Petroleum Hydrocarbons									
C6 - C9 Fraction	----	20	µg/L		<20	<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	----	----	----
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	----	----
>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	<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**	1330-20-7	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	----	----

Analytical Results

Sub-Matrix: WATER (Matrix: WATER)				Client sample ID	QCQ	QCR	QCM	----	----
				Client sampling date / time	[19-Nov-2015]	[19-Nov-2015]	[19-Nov-2015]	----	----
Compound	CAS Number	LOR	Unit		EM1517384-015	EM1517384-016	EM1517384-017	--------	--------
					Result	Result	Result	Result	Result
EP080S: TPH(V)/BTEX Surrogates									
1.2-Dichloroethane-D4	17060-07-0	2	%		**95.9**	**100**	**74.8**	----	----
Toluene-D8	2037-26-5	2	%		**74.5**	**90.3**	**88.1**	----	----
4-Bromofluorobenzene	460-00-4	2	%		**85.7**	**102**	**97.9**	----	----

ALS Environmental

QUALITY CONTROL REPORT

Work Order	: **EM1517384**	Page	: 1 of 18
Amendment	: **1**		
Client	: **AECOM Australia Pty Ltd**	Laboratory	: Environmental Division Melbourne
Contact	: MS AVERYLL COYNE	Contact	: Carol Walsh
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Facsimile	: +61 03 9654 7117	Facsimile	: +61-3-8549 9601
Project	: 60431087	QC Level	: NEPM 2013 B3 & ALS QC Standard
Order number	: 60431087 1.4	Date Samples Received	: 20-Nov-2015
C-O-C number	: ----	Date Analysis Commenced	: 20-Nov-2015
Sampler	: OLIVER TAYLOR, ZACHARY OCONNOR	Issue Date	: 08-Dec-2015
Site	:	No. of samples received	: 17
Quote number	: ----	No. of samples analysed	: 17

This report supersedes any previous report(s) with this reference. Results apply to the sample(s) as submitted.

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

NATA WORLD RECOGNISED ACCREDITATION

NATA Accredited Laboratory 825

Accredited for compliance with ISO/IEC 17025.

Signatories

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

Signatories	*Position*	*Accreditation Category*
Dilani Fernando	Senior Inorganic Chemist	Melbourne Inorganics
Herman Lin	Laboratory Manager	Melbourne Inorganics
Nancy Wang	Senior Semivolatile Instrument Chemist	Melbourne Organics
Xing Lin	Senior Organic Chemist	Melbourne Organics

General Comments

The analytical procedures used by the Environmental Division have been developed from established internationally recognized procedures such as those published by the USEPA, APHA, AS and NEPM. In house developed procedures are employed in the absence of documented standards or by 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

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	*Client sample ID*	*Method: Compound*	*CAS Number*	*LOR*	*Unit*	*Original Result*	*Duplicate Result*	*RPD (%)*	*Recovery Limits (%)*
EA005P: pH by PC Titrator (QC Lot: 289041)									
EM1517384-002	GW09	EA005-P: pH Value	----	0.01	pH Unit	7.10	7.11	0.141	0% - 20%
EM1517387-011	Anonymous	EA005-P: pH Value	----	0.01	pH Unit	6.50	6.50	0.00	0% - 20%
EA015: Total Dissolved Solids dried at 180 ± 5 °C (QC Lot: 290289)									
EM1517371-001	Anonymous	EA015H: Total Dissolved Solids @180°C	----	10	mg/L	1460	1540	5.55	0% - 20%
EM1517384-006	GW08	EA015H: Total Dissolved Solids @180°C	----	10	mg/L	996	1010	1.40	0% - 20%
ED037P: Alkalinity by PC Titrator (QC Lot: 289042)									
EM1517384-002	GW09	ED037-P: Bicarbonate Alkalinity as CaCO3	71-52-3	1	mg/L	436	438	0.384	0% - 20%
		ED037-P: Carbonate Alkalinity as CaCO3	3812-32-6	1	mg/L	<1	<1	0.00	No Limit
		ED037-P: Hydroxide Alkalinity as CaCO3	DMO-210-001	1	mg/L	<1	<1	0.00	No Limit
		ED037-P: Total Alkalinity as CaCO3	----	1	mg/L	436	438	0.384	0% - 20%
EM1517387-011	Anonymous	ED037-P: Bicarbonate Alkalinity as CaCO3	71-52-3	1	mg/L	473	473	0.00	0% - 20%
		ED037-P: Carbonate Alkalinity as CaCO3	3812-32-6	1	mg/L	<1	<1	0.00	No Limit
		ED037-P: Hydroxide Alkalinity as CaCO3	DMO-210-001	1	mg/L	<1	<1	0.00	No Limit
		ED037-P: Total Alkalinity as CaCO3	----	1	mg/L	473	473	0.00	0% - 20%
ED041G: Sulfate (Turbidimetric) as SO4 2- by DA (QC Lot: 287977)									
EM1517384-001	GW04	ED041G: Sulfate as SO4 - Turbidimetric	14808-79-8	1	mg/L	208	210	0.861	0% - 20%
EM1517387-002	Anonymous	ED041G: Sulfate as SO4 - Turbidimetric	14808-79-8	1	mg/L	16	16	0.00	0% - 50%
ED043: Total Oxidised Sulfur as SO4 2- (QC Lot: 289692)									
EM1517375-001	Anonymous	ED043: Total Oxidised Sulfur as SO4 2-	----	1	mg/L	497	506	1.76	0% - 20%
EM1517384-008	GW32	ED043: Total Oxidised Sulfur as SO4 2-	----	1	mg/L	1020	1010	0.416	0% - 20%
ED045G: Chloride by Discrete Analyser (QC Lot: 287976)									
EM1517384-001	GW04	ED045G: Chloride	16887-00-6	1	mg/L	22	21	0.00	0% - 20%
EM1517387-002	Anonymous	ED045G: Chloride	16887-00-6	1	mg/L	307	307	0.00	0% - 20%
ED093F: Dissolved Major Cations (QC Lot: 288051)									
EM1517043-002	Anonymous	ED093F: Calcium	7440-70-2	1	mg/L	48	46	3.84	0% - 20%
		ED093F: Magnesium	7439-95-4	1	mg/L	287	286	0.00	0% - 20%
		ED093F: Potassium	7440-09-7	1	mg/L	42	40	5.43	0% - 20%
		ED093F: Sodium	7440-23-5	1	mg/L	1230	1230	0.561	0% - 20%
EM1517220-005	Anonymous	ED093F: Calcium	7440-70-2	1	mg/L	53	54	0.00	0% - 50%
		ED093F: Magnesium	7439-95-4	1	mg/L	859	862	0.407	0% - 20%
		ED093F: Potassium	7440-09-7	1	mg/L	<5	<5	0.00	No Limit
		ED093F: Sodium	7440-23-5	1	mg/L	4280	4290	0.198	0% - 20%
ED093F: Dissolved Major Cations (QC Lot: 288055)									
EM1517384-004	GW03	ED093F: Calcium	7440-70-2	1	mg/L	176	177	0.604	0% - 20%

Sub-Matrix: **WATER**

				Laboratory Duplicate (DUP) Report					
Laboratory sample ID	*Client sample ID*	*Method: Compound*	*CAS Number*	*LOR*	*Unit*	*Original Result*	*Duplicate Result*	*RPD (%)*	*Recovery Limits (%)*
ED093F: Dissolved Major Cations (QC Lot: 288055) - continued									
EM1517384-004	GW03	ED093F: Magnesium	7439-95-4	1	mg/L	94	94	0.00	0% - 20%
		ED093F: Potassium	7440-09-7	1	mg/L	41	42	0.00	0% - 20%
		ED093F: Sodium	7440-23-5	1	mg/L	143	144	0.00	0% - 20%
EM1517387-011	Anonymous	ED093F: Calcium	7440-70-2	1	mg/L	485	487	0.387	0% - 20%
		ED093F: Magnesium	7439-95-4	1	mg/L	181	181	0.00	0% - 20%
		ED093F: Potassium	7440-09-7	1	mg/L	40	40	0.00	0% - 20%
		ED093F: Sodium	7440-23-5	1	mg/L	393	394	0.266	0% - 20%
EG020F: Dissolved Metals by ICP-MS (QC Lot: 288052)									
EM1517043-001	Anonymous	EG020A-F: Cadmium	7440-43-9	0.0001	mg/L	<0.0001	<0.0001	0.00	No Limit
		EG020A-F: Arsenic	7440-38-2	0.001	mg/L	0.001	0.001	0.00	No Limit
		EG020A-F: Chromium	7440-47-3	0.001	mg/L	<0.001	0.001	0.00	No Limit
		EG020A-F: Copper	7440-50-8	0.001	mg/L	0.002	0.002	0.00	No Limit
		EG020A-F: Lead	7439-92-1	0.001	mg/L	<0.001	<0.001	0.00	No Limit
		EG020A-F: Manganese	7439-96-5	0.001	mg/L	0.004	0.004	0.00	No Limit
		EG020A-F: Nickel	7440-02-0	0.001	mg/L	0.036	0.037	0.00	0% - 20%
		EG020A-F: Zinc	7440-66-6	0.005	mg/L	0.015	0.014	0.00	No Limit
		EG020A-F: Aluminium	7429-90-5	0.01	mg/L	<0.01	0.04	112	No Limit
		EG020A-F: Selenium	7782-49-2	0.01	mg/L	<0.01	<0.01	0.00	No Limit
		EG020A-F: Iron	7439-89-6	0.05	mg/L	<0.05	<0.05	0.00	No Limit
EM1517220-005	Anonymous	EG020A-F: Cadmium	7440-43-9	0.0001	mg/L	0.0019	0.0013	40.8	0% - 50%
		EG020A-F: Arsenic	7440-38-2	0.001	mg/L	0.028	0.028	0.00	0% - 20%
		EG020A-F: Chromium	7440-47-3	0.001	mg/L	0.003	0.003	0.00	No Limit
		EG020A-F: Copper	7440-50-8	0.001	mg/L	0.014	0.015	0.00	0% - 50%
		EG020A-F: Lead	7439-92-1	0.001	mg/L	0.134	0.144	6.78	0% - 20%
		EG020A-F: Manganese	7439-96-5	0.001	mg/L	2.74	3.20	15.6	0% - 20%
		EG020A-F: Nickel	7440-02-0	0.001	mg/L	0.175	0.182	3.82	0% - 20%
		EG020A-F: Zinc	7440-66-6	0.005	mg/L	4.46	4.68	4.99	0% - 20%
		EG020A-F: Aluminium	7429-90-5	0.01	mg/L	14.1	14.4	1.93	0% - 20%
		EG020A-F: Selenium	7782-49-2	0.01	mg/L	0.04	0.04	0.00	No Limit
		EG020A-F: Iron	7439-89-6	0.05	mg/L	40.7	43.2	5.88	0% - 20%
EG020F: Dissolved Metals by ICP-MS (QC Lot: 288056)									
EM1517384-003	GW07	EG020A-F: Cadmium	7440-43-9	0.0001	mg/L	<0.0001	<0.0001	0.00	No Limit
		EG020A-F: Arsenic	7440-38-2	0.001	mg/L	0.021	0.021	0.00	0% - 20%
		EG020A-F: Chromium	7440-47-3	0.001	mg/L	0.002	0.002	0.00	No Limit
		EG020A-F: Copper	7440-50-8	0.001	mg/L	<0.001	<0.001	0.00	No Limit
		EG020A-F: Lead	7439-92-1	0.001	mg/L	<0.001	<0.001	0.00	No Limit
		EG020A-F: Manganese	7439-96-5	0.001	mg/L	0.150	0.151	0.00	0% - 20%
		EG020A-F: Nickel	7440-02-0	0.001	mg/L	0.006	0.009	36.9	No Limit
		EG020A-F: Zinc	7440-66-6	0.005	mg/L	0.010	0.010	0.00	No Limit
		EG020A-F: Aluminium	7429-90-5	0.01	mg/L	0.06	0.06	0.00	No Limit

Sub-Matrix: **WATER**

				Laboratory Duplicate (DUP) Report					
Laboratory sample ID	*Client sample ID*	*Method: Compound*	*CAS Number*	*LOR*	*Unit*	*Original Result*	*Duplicate Result*	*RPD (%)*	*Recovery Limits (%)*
EG020F: Dissolved Metals by ICP-MS (QC Lot: 288056) - continued									
EM1517384-003	GW07	EG020A-F: Selenium	7782-49-2	0.01	mg/L	<0.01	<0.01	0.00	No Limit
		EG020A-F: Iron	7439-89-6	0.05	mg/L	9.95	9.68	2.71	0% - 20%
EM1517387-011	Anonymous	EG020A-F: Cadmium	7440-43-9	0.0001	mg/L	<0.0001	0.0001	0.00	No Limit
		EG020A-F: Arsenic	7440-38-2	0.001	mg/L	<0.001	<0.001	0.00	No Limit
		EG020A-F: Chromium	7440-47-3	0.001	mg/L	<0.001	<0.001	0.00	No Limit
		EG020A-F: Copper	7440-50-8	0.001	mg/L	<0.001	<0.001	0.00	No Limit
		EG020A-F: Lead	7439-92-1	0.001	mg/L	<0.001	<0.001	0.00	No Limit
		EG020A-F: Manganese	7439-96-5	0.001	mg/L	1.28	1.25	2.26	0% - 20%
		EG020A-F: Nickel	7440-02-0	0.001	mg/L	0.022	0.025	11.9	0% - 20%
		EG020A-F: Zinc	7440-66-6	0.005	mg/L	<0.005	<0.005	0.00	No Limit
		EG020A-F: Aluminium	7429-90-5	0.01	mg/L	<0.01	<0.01	0.00	No Limit
		EG020A-F: Selenium	7782-49-2	0.01	mg/L	<0.01	<0.01	0.00	No Limit
		EG020A-F: Iron	7439-89-6	0.05	mg/L	0.89	0.85	4.24	0% - 50%
EG020T: Total Metals by ICP-MS (QC Lot: 297756)									
EM1517384-015	QCQ	EG020A-T: Cadmium	7440-43-9	0.0001	mg/L	<0.0001	<0.0001	0.00	No Limit
		EG020A-T: Arsenic	7440-38-2	0.001	mg/L	<0.001	<0.001	0.00	No Limit
		EG020A-T: Chromium	7440-47-3	0.001	mg/L	<0.001	<0.001	0.00	No Limit
		EG020A-T: Copper	7440-50-8	0.001	mg/L	<0.001	<0.001	0.00	No Limit
		EG020A-T: Lead	7439-92-1	0.001	mg/L	<0.001	<0.001	0.00	No Limit
		EG020A-T: Nickel	7440-02-0	0.001	mg/L	<0.001	<0.001	0.00	No Limit
		EG020A-T: Zinc	7440-66-6	0.005	mg/L	<0.005	<0.005	0.00	No Limit
EM1517738-002	Anonymous	EG020A-T: Cadmium	7440-43-9	0.0001	mg/L	<0.0001	<0.0001	0.00	No Limit
		EG020A-T: Arsenic	7440-38-2	0.001	mg/L	0.002	0.002	0.00	No Limit
		EG020A-T: Chromium	7440-47-3	0.001	mg/L	<0.001	<0.001	0.00	No Limit
		EG020A-T: Copper	7440-50-8	0.001	mg/L	<0.001	<0.001	0.00	No Limit
		EG020A-T: Lead	7439-92-1	0.001	mg/L	<0.001	<0.001	0.00	No Limit
		EG020A-T: Nickel	7440-02-0	0.001	mg/L	0.003	0.003	0.00	No Limit
		EG020A-T: Zinc	7440-66-6	0.005	mg/L	0.009	0.010	12.4	No Limit
EG035F: Dissolved Mercury by FIMS (QC Lot: 288054)									
EM1517384-002	GW09	EG035F: Mercury	7439-97-6	0.0001	mg/L	<0.0001	<0.0001	0.00	No Limit
EM1517220-005	Anonymous	EG035F: Mercury	7439-97-6	0.0001	mg/L	<0.0001	<0.0001	0.00	No Limit
EG035T: Total Recoverable Mercury by FIMS (QC Lot: 296140)									
EM1517384-015	QCQ	EG035T: Mercury	7439-97-6	0.0001	mg/L	<0.0001	<0.0001	0.00	No Limit
EM1517763-017	Anonymous	EG035T: Mercury	7439-97-6	0.0001	mg/L	<0.0001	<0.0001	0.00	No Limit
EK040P: Fluoride by PC Titrator (QC Lot: 289040)									
EM1517384-002	GW09	EK040P: Fluoride	16984-48-8	0.1	mg/L	0.3	0.3	0.00	No Limit
EM1517387-011	Anonymous	EK040P: Fluoride	16984-48-8	0.1	mg/L	0.2	0.2	0.00	No Limit
EK055G: Ammonia as N by Discrete Analyser (QC Lot: 288697)									
EM1517384-001	GW04	EK055G: Ammonia as N	7664-41-7	0.01	mg/L	0.05	0.05	0.00	No Limit

Sub-Matrix: **WATER**

				Laboratory Duplicate (DUP) Report					
Laboratory sample ID	*Client sample ID*	*Method: Compound*	*CAS Number*	*LOR*	*Unit*	*Original Result*	*Duplicate Result*	*RPD (%)*	*Recovery Limits (%)*
EK055G: Ammonia as N by Discrete Analyser (QC Lot: 288697) - continued									
EM1517387-002	Anonymous	EK055G: Ammonia as N	7664-41-7	0.01	mg/L	78.1	77.2	1.18	0% - 20%
EK057G: Nitrite as N by Discrete Analyser (QC Lot: 287975)									
EM1517384-001	GW04	EK057G: Nitrite as N	14797-65-0	0.01	mg/L	<0.01	<0.01	0.00	No Limit
EM1517387-002	Anonymous	EK057G: Nitrite as N	14797-65-0	0.01	mg/L	<0.01	<0.01	0.00	No Limit
EK059G: Nitrite plus Nitrate as N (NOx) by Discrete Analyser (QC Lot: 288696)									
EM1517384-001	GW04	EK059G: Nitrite + Nitrate as N	----	0.01	mg/L	0.02	0.02	0.00	No Limit
EM1517387-002	Anonymous	EK059G: Nitrite + Nitrate as N	----	0.01	mg/L	0.10	0.12	22.1	0% - 50%
EK071G: Reactive Phosphorus as P by discrete analyser (QC Lot: 287974)									
EM1517384-001	GW04	EK071G: Reactive Phosphorus as P	14265-44-2	0.01	mg/L	0.04	<0.01	113	No Limit
EM1517387-002	Anonymous	EK071G: Reactive Phosphorus as P	14265-44-2	0.01	mg/L	<0.01	<0.01	0.00	No Limit
EP005: Total Organic Carbon (TOC) (QC Lot: 291489)									
EM1517382-001	Anonymous	EP005: Total Organic Carbon	----	1	mg/L	7	7	0.00	No Limit
EM1517387-003	Anonymous	EP005: Total Organic Carbon	----	1	mg/L	35	36	0.00	0% - 20%
EP074A: Monocyclic Aromatic Hydrocarbons (QC Lot: 289004)									
EM1517384-001	GW04	EP074-WF: 1.2.4-Trimethylbenzene	95-63-6	1	µg/L	<1	<1	0.00	No Limit
		EP074-WF: 1.3.5-Trimethylbenzene	108-67-8	1	µg/L	<1	<1	0.00	No Limit
		EP074-WF: Benzene	71-43-2	1	µg/L	<1	<1	0.00	No Limit
		EP074-WF: Ethylbenzene	100-41-4	1	µg/L	<1	<1	0.00	No Limit
		EP074-WF: Isopropylbenzene	98-82-8	1	µg/L	<1	<1	0.00	No Limit
		EP074-WF: meta- & para-Xylene	108-38-3 106-42-3	1	µg/L	<1	<1	0.00	No Limit
		EP074-WF: n-Butylbenzene	104-51-8	1	µg/L	<1	<1	0.00	No Limit
		EP074-WF: n-Propylbenzene	103-65-1	1	µg/L	<1	<1	0.00	No Limit
		EP074-WF: ortho-Xylene	95-47-6	1	µg/L	<1	<1	0.00	No Limit
		EP074-WF: p-Isopropyltoluene	99-87-6	1	µg/L	<1	<1	0.00	No Limit
		EP074-WF: sec-Butylbenzene	135-98-8	1	µg/L	<1	<1	0.00	No Limit
		EP074-WF: Styrene	100-42-5	1	µg/L	<1	<1	0.00	No Limit
		EP074-WF: tert-Butylbenzene	98-06-6	1	µg/L	<1	<1	0.00	No Limit
		EP074-WF: Toluene	108-88-3	1	µg/L	<1	<1	0.00	No Limit
EP074B: Oxygenated Compounds (QC Lot: 289004)									
EM1517384-001	GW04	EP074-WF: 2-Butanone (MEK)	78-93-3	10	µg/L	<10	<10	0.00	No Limit
		EP074-WF: 2-Hexanone (MBK)	591-78-6	10	µg/L	<10	<10	0.00	No Limit
		EP074-WF: 2-Propanone (Acetone)	67-64-1	10	µg/L	<10	<10	0.00	No Limit
		EP074-WF: 4-Methyl-2-pentanone (MIBK)	108-10-1	10	µg/L	<10	<10	0.00	No Limit
		EP074-WF: Vinyl Acetate	108-05-4	10	µg/L	<10	<10	0.00	No Limit
EP074C: Sulfonated Compounds (QC Lot: 289004)									
EM1517384-001	GW04	EP074-WF: Carbon disulfide	75-15-0	1	µg/L	<1	<1	0.00	No Limit
EP074D: Fumigants (QC Lot: 289004)									
EM1517384-001	GW04	EP074-WF: 1.2-Dibromoethane (EDB)	106-93-4	1	µg/L	<1	<1	0.00	No Limit

Sub-Matrix: **WATER**

				Laboratory Duplicate (DUP) Report					
Laboratory sample ID	*Client sample ID*	*Method: Compound*	*CAS Number*	*LOR*	*Unit*	*Original Result*	*Duplicate Result*	*RPD (%)*	*Recovery Limits (%)*
EP074D: Fumigants (QC Lot: 289004) - continued									
EM1517384-001	GW04	EP074-WF: 1.2-Dichloropropane	78-87-5	1	µg/L	<1	<1	0.00	No Limit
		EP074-WF: 2.2-Dichloropropane	594-20-7	1	µg/L	<1	<1	0.00	No Limit
		EP074-WF: cis-1.3-Dichloropropylene	10061-01-5	2	µg/L	<2	<2	0.00	No Limit
		EP074-WF: trans-1.3-Dichloropropylene	10061-02-6	2	µg/L	<2	<2	0.00	No Limit
EP074E: Halogenated Aliphatic Compounds (QC Lot: 289004)									
EM1517384-001	GW04	EP074-WF: Vinyl chloride	75-01-4	0.2	µg/L	<10.0	<10.0	0.00	No Limit
		EP074-WF: Hexachlorobutadiene	87-68-3	0.5	µg/L	<1.0	<1.0	0.00	No Limit
		EP074-WF: 1.1.1.2-Tetrachloroethane	630-20-6	1	µg/L	<1	<1	0.00	No Limit
		EP074-WF: 1.1.1-Trichloroethane	71-55-6	1	µg/L	<1	<1	0.00	No Limit
		EP074-WF: 1.1.2.2-Tetrachloroethane	79-34-5	1	µg/L	<1	<1	0.00	No Limit
		EP074-WF: 1.1.2-Trichloroethane	79-00-5	1	µg/L	<1	<1	0.00	No Limit
		EP074-WF: 1.1-Dichloroethane	75-34-3	1	µg/L	<1	<1	0.00	No Limit
		EP074-WF: 1.1-Dichloroethene	75-35-4	1	µg/L	<1	<1	0.00	No Limit
		EP074-WF: 1.1-Dichloropropylene	563-58-6	1	µg/L	<1	<1	0.00	No Limit
		EP074-WF: 1.2.3-Trichloropropane	96-18-4	1	µg/L	<1	<1	0.00	No Limit
		EP074-WF: 1.2-Dibromo-3-chloropropane	96-12-8	1	µg/L	<1	<1	0.00	No Limit
		EP074-WF: 1.2-Dichloroethane	107-06-2	1	µg/L	<1	<1	0.00	No Limit
		EP074-WF: 1.3-Dichloropropane	142-28-9	1	µg/L	<1	<1	0.00	No Limit
		EP074-WF: Carbon Tetrachloride	56-23-5	1	µg/L	<1	<1	0.00	No Limit
		EP074-WF: cis-1.2-Dichloroethene	156-59-2	1	µg/L	<1	<1	0.00	No Limit
		EP074-WF: cis-1.4-Dichloro-2-butene	1476-11-5	1	µg/L	<1	<1	0.00	No Limit
		EP074-WF: Dibromomethane	74-95-3	1	µg/L	<1	<1	0.00	No Limit
		EP074-WF: Iodomethane	74-88-4	1	µg/L	<1	<1	0.00	No Limit
		EP074-WF: Pentachloroethane	76-01-7	1	µg/L	<1	<1	0.00	No Limit
		EP074-WF: Tetrachloroethene	127-18-4	1	µg/L	<1	<1	0.00	No Limit
		EP074-WF: trans-1.2-Dichloroethene	156-60-5	1	µg/L	<1	<1	0.00	No Limit
		EP074-WF: trans-1.4-Dichloro-2-butene	110-57-6	1	µg/L	<1	<1	0.00	No Limit
		EP074-WF: Trichloroethene	79-01-6	1	µg/L	<1	<1	0.00	No Limit
		EP074-WF: Bromomethane	74-83-9	10	µg/L	<10	<10	0.00	No Limit
		EP074-WF: Chloroethane	75-00-3	10	µg/L	<10	<10	0.00	No Limit
		EP074-WF: Chloromethane	74-87-3	10	µg/L	<10	<10	0.00	No Limit
		EP074-WF: Dichlorodifluoromethane	75-71-8	10	µg/L	<10	<10	0.00	No Limit
		EP074-WF: Trichlorofluoromethane	75-69-4	10	µg/L	<10	<10	0.00	No Limit
		EP074-WF: Methylene chloride	75-09-2	2	µg/L	<5	<5	0.00	No Limit
EP074F: Halogenated Aromatic Compounds (QC Lot: 289004)									
EM1517384-001	GW04	EP074-WF: 1.4-Dichlorobenzene	106-46-7	0.1	µg/L	<1.0	<1.0	0.00	No Limit
		EP074-WF: 1.2.3-Trichlorobenzene	87-61-6	1	µg/L	<1	<1	0.00	No Limit
		EP074-WF: 1.2.4-Trichlorobenzene	120-82-1	1	µg/L	<1	<1	0.00	No Limit
		EP074-WF: 1.2-Dichlorobenzene	95-50-1	1	µg/L	<1	<1	0.00	No Limit
		EP074-WF: 1.3-Dichlorobenzene	541-73-1	1	µg/L	<1	<1	0.00	No Limit

Sub-Matrix: **WATER**

				Laboratory Duplicate (DUP) Report					
Laboratory sample ID	*Client sample ID*	*Method: Compound*	*CAS Number*	*LOR*	*Unit*	*Original Result*	*Duplicate Result*	*RPD (%)*	*Recovery Limits (%)*
EP074F: Halogenated Aromatic Compounds (QC Lot: 289004) - continued									
EM1517384-001	GW04	EP074-WF: 2-Chlorotoluene	95-49-8	1	µg/L	<1	<1	0.00	No Limit
		EP074-WF: 4-Chlorotoluene	106-43-4	1	µg/L	<1	<1	0.00	No Limit
		EP074-WF: Bromobenzene	108-86-1	1	µg/L	<1	<1	0.00	No Limit
		EP074-WF: Chlorobenzene	108-90-7	1	µg/L	<1	<1	0.00	No Limit
EP074G: Trihalomethanes (QC Lot: 289004)									
EM1517384-001	GW04	EP074-WF: Bromodichloromethane	75-27-4	1	µg/L	<1	<1	0.00	No Limit
		EP074-WF: Bromoform	75-25-2	1	µg/L	<1	<1	0.00	No Limit
		EP074-WF: Chloroform	67-66-3	1	µg/L	<1	<1	0.00	No Limit
		EP074-WF: Dibromochloromethane	124-48-1	1	µg/L	<1	<1	0.00	No Limit
EP074H: Naphthalene (QC Lot: 289004)									
EM1517384-001	GW04	EP074-WF: Naphthalene	91-20-3	5	µg/L	<5	<5	0.00	No Limit
EP080/071: Total Petroleum Hydrocarbons (QC Lot: 288527)									
EM1517518-006	Anonymous	EP080: C6 - C9 Fraction	----	20	µg/L	<20	<20	0.00	No Limit
EM1517384-006	GW08	EP080: C6 - C9 Fraction	----	20	µg/L	<20	<20	0.00	No Limit
EP080/071: Total Petroleum Hydrocarbons (QC Lot: 289005)									
EM1517384-001	GW04	EP080: C6 - C9 Fraction	----	20	µg/L	<20	<20	0.00	No Limit
EP080/071: Total Petroleum Hydrocarbons (QC Lot: 294769)									
EM1517737-022	Anonymous	EP071: C15 - C28 Fraction	----	100	µg/L	140	120	15.8	No Limit
		EP071: C10 - C14 Fraction	----	50	µg/L	90	80	16.7	No Limit
		EP071: C29 - C36 Fraction	----	50	µg/L	<50	<50	0.00	No Limit
EP080/071: Total Petroleum Hydrocarbons (QC Lot: 295852)									
EM1517384-016	QCR	EP080: C6 - C9 Fraction	----	20	µg/L	<20	<20	0.00	No Limit
EP080/071: Total Recoverable Hydrocarbons - NEPM 2013 Fractions (QC Lot: 288527)									
EM1517518-006	Anonymous	EP080: C6 - C10 Fraction	C6_C10	20	µg/L	<20	<20	0.00	No Limit
EM1517384-006	GW08	EP080: C6 - C10 Fraction	C6_C10	20	µg/L	<20	<20	0.00	No Limit
EP080/071: Total Recoverable Hydrocarbons - NEPM 2013 Fractions (QC Lot: 289005)									
EM1517384-001	GW04	EP080: C6 - C10 Fraction	C6_C10	20	µg/L	<20	<20	0.00	No Limit
EP080/071: Total Recoverable Hydrocarbons - NEPM 2013 Fractions (QC Lot: 294769)									
EM1517737-022	Anonymous	EP071: >C10 - C16 Fraction	----	100	µg/L	100	<100	0.00	No Limit
		EP071: >C16 - C34 Fraction	----	100	µg/L	100	<100	0.00	No Limit
		EP071: >C34 - C40 Fraction	----	100	µg/L	<100	<100	0.00	No Limit
EP080/071: Total Recoverable Hydrocarbons - NEPM 2013 Fractions (QC Lot: 295852)									
EM1517384-016	QCR	EP080: C6 - C10 Fraction	C6_C10	20	µg/L	<20	<20	0.00	No Limit
EP080: BTEXN (QC Lot: 288527)									
EM1517518-006	Anonymous	EP080: Benzene	71-43-2	1	µg/L	<1	<1	0.00	No Limit
		EP080: Ethylbenzene	100-41-4	2	µg/L	<2	<2	0.00	No Limit
		EP080: meta- & para-Xylene	108-38-3 106-42-3	2	µg/L	<2	<2	0.00	No Limit

Sub-Matrix: **WATER**

				Laboratory Duplicate (DUP) Report					
Laboratory sample ID	*Client sample ID*	*Method: Compound*	*CAS Number*	*LOR*	*Unit*	*Original Result*	*Duplicate Result*	*RPD (%)*	*Recovery Limits (%)*
EP080: BTEXN (QC Lot: 288527) - continued									
EM1517518-006	Anonymous	EP080: ortho-Xylene	95-47-6	2	µg/L	<2	<2	0.00	No Limit
		EP080: Toluene	108-88-3	2	µg/L	<2	<2	0.00	No Limit
		EP080: Naphthalene	91-20-3	5	µg/L	<5	<5	0.00	No Limit
EM1517384-006	GW08	EP080: Benzene	71-43-2	1	µg/L	<1	<1	0.00	No Limit
		EP080: Ethylbenzene	100-41-4	2	µg/L	<2	<2	0.00	No Limit
		EP080: meta- & para-Xylene	108-38-3 106-42-3	2	µg/L	<2	<2	0.00	No Limit
		EP080: ortho-Xylene	95-47-6	2	µg/L	<2	<2	0.00	No Limit
		EP080: Toluene	108-88-3	2	µg/L	<2	<2	0.00	No Limit
		EP080: Naphthalene	91-20-3	5	µg/L	<5	<5	0.00	No Limit
EP080: BTEXN (QC Lot: 289005)									
EM1517384-001	GW04	EP080: Benzene	71-43-2	1	µg/L	<1	<1	0.00	No Limit
		EP080: Ethylbenzene	100-41-4	2	µg/L	<2	<2	0.00	No Limit
		EP080: meta- & para-Xylene	108-38-3 106-42-3	2	µg/L	<2	<2	0.00	No Limit
		EP080: ortho-Xylene	95-47-6	2	µg/L	<2	<2	0.00	No Limit
		EP080: Toluene	108-88-3	2	µg/L	<2	<2	0.00	No Limit
		EP080: Naphthalene	91-20-3	5	µg/L	<5	<5	0.00	No Limit
EP080: BTEXN (QC Lot: 295852)									
EM1517384-016	QCR	EP080: Benzene	71-43-2	1	µg/L	<1	<1	0.00	No Limit
		EP080: Ethylbenzene	100-41-4	2	µg/L	<2	<2	0.00	No Limit
		EP080: meta- & para-Xylene	108-38-3 106-42-3	2	µg/L	<2	<2	0.00	No Limit
		EP080: ortho-Xylene	95-47-6	2	µg/L	<2	<2	0.00	No Limit
		EP080: Toluene	108-88-3	2	µg/L	<2	<2	0.00	No Limit
		EP080: Naphthalene	91-20-3	5	µg/L	<5	<5	0.00	No Limit

Method Blank (MB) and Laboratory Control Spike (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 (%)	Recovery Limits (%)	
Method: Compound	CAS Number	LOR	Unit	Result	Concentration	LCS	Low	High
EA015: Total Dissolved Solids dried at 180 ± 5 °C (QCLot: 290289)								
EA015H: Total Dissolved Solids @180°C	----	10	mg/L	<10	2000 mg/L	101	97	105
				<10	293 mg/L	104	97	105
ED037P: Alkalinity by PC Titrator (QCLot: 289042)								
ED037-P: Total Alkalinity as CaCO3	----	----	mg/L	----	200 mg/L	102	90	110
ED041G: Sulfate (Turbidimetric) as SO4 2- by DA (QCLot: 287977)								
ED041G: Sulfate as SO4 - Turbidimetric	14808-79-8	1	mg/L	<1	25 mg/L	97.6	90	116
				<1	100 mg/L	98.5	80	120
ED043: Total Oxidised Sulfur as SO4 2- (QCLot: 289692)								
ED043: Total Oxidised Sulfur as SO4 2-	----	1	mg/L	<10	500 mg/L	98.9	87	121
ED045G: Chloride by Discrete Analyser (QCLot: 287976)								
ED045G: Chloride	16887-00-6	1	mg/L	<1	10 mg/L	103	89	117
				<1	1000 mg/L	102	92	112
ED093F: Dissolved Major Cations (QCLot: 288051)								
ED093F: Calcium	7440-70-2	1	mg/L	<1	5 mg/L	105	92	108
ED093F: Magnesium	7439-95-4	1	mg/L	<1	5 mg/L	108	92	108
ED093F: Potassium	7440-09-7	1	mg/L	<1	50 mg/L	105	89	107
ED093F: Sodium	7440-23-5	1	mg/L	<1	50 mg/L	105	89	107
ED093F: Dissolved Major Cations (QCLot: 288055)								
ED093F: Calcium	7440-70-2	1	mg/L	<1	5 mg/L	103	92	108
ED093F: Magnesium	7439-95-4	1	mg/L	<1	5 mg/L	102	92	108
ED093F: Potassium	7440-09-7	1	mg/L	<1	50 mg/L	100	89	107
ED093F: Sodium	7440-23-5	1	mg/L	<1	50 mg/L	99.8	89	107
EG020F: Dissolved Metals by ICP-MS (QCLot: 288052)								
EG020A-F: Aluminium	7429-90-5	0.01	mg/L	<0.01	0.5 mg/L	101	93	105
EG020A-F: Arsenic	7440-38-2	0.001	mg/L	<0.001	0.1 mg/L	99.5	94	108
EG020A-F: Cadmium	7440-43-9	0.0001	mg/L	<0.0001	0.1 mg/L	100	86	108
EG020A-F: Chromium	7440-47-3	0.001	mg/L	<0.001	0.1 mg/L	98.7	86	110
EG020A-F: Copper	7440-50-8	0.001	mg/L	<0.001	0.1 mg/L	92.3	87	107
EG020A-F: Iron	7439-89-6	0.05	mg/L	<0.05	0.5 mg/L	98.9	94	106
EG020A-F: Lead	7439-92-1	0.001	mg/L	<0.001	0.1 mg/L	96.5	87	109
EG020A-F: Manganese	7439-96-5	0.001	mg/L	<0.001	0.1 mg/L	94.3	87	109
EG020A-F: Nickel	7440-02-0	0.001	mg/L	<0.001	0.1 mg/L	97.6	87	109
EG020A-F: Selenium	7782-49-2	0.01	mg/L	<0.01	0.1 mg/L	92.2	87	109
EG020A-F: Zinc	7440-66-6	0.005	mg/L	<0.005	0.1 mg/L	96.7	87	107

Sub-Matrix: **WATER**

Method: Compound	CAS Number	LOR	Unit	Method Blank (MB) Report	Laboratory Control Spike (LCS) Report			
					Spike	Spike Recovery (%)	Recovery Limits (%)	
				Result	Concentration	LCS	Low	High
EG020F: Dissolved Metals by ICP-MS (QCLot: 288056)								
EG020A-F: Aluminium	7429-90-5	0.01	mg/L	<0.01	0.5 mg/L	99.3	93	105
EG020A-F: Arsenic	7440-38-2	0.001	mg/L	<0.001	0.1 mg/L	99.4	94	108
EG020A-F: Cadmium	7440-43-9	0.0001	mg/L	<0.0001	0.1 mg/L	101	86	108
EG020A-F: Chromium	7440-47-3	0.001	mg/L	<0.001	0.1 mg/L	94.7	86	110
EG020A-F: Copper	7440-50-8	0.001	mg/L	<0.001	0.1 mg/L	92.2	87	107
EG020A-F: Iron	7439-89-6	0.05	mg/L	<0.05	0.5 mg/L	97.2	94	106
EG020A-F: Lead	7439-92-1	0.001	mg/L	<0.001	0.1 mg/L	96.7	87	109
EG020A-F: Manganese	7439-96-5	0.001	mg/L	<0.001	0.1 mg/L	93.7	87	109
EG020A-F: Nickel	7440-02-0	0.001	mg/L	<0.001	0.1 mg/L	96.5	87	109
EG020A-F: Selenium	7782-49-2	0.01	mg/L	<0.01	0.1 mg/L	98.9	87	109
EG020A-F: Zinc	7440-66-6	0.005	mg/L	<0.005	0.1 mg/L	95.5	87	107
EG020T: Total Metals by ICP-MS (QCLot: 297756)								
EG020A-T: Arsenic	7440-38-2	0.001	mg/L	<0.001	0.1 mg/L	106	94	116
EG020A-T: Cadmium	7440-43-9	0.0001	mg/L	<0.0001	0.1 mg/L	99.6	90	110
EG020A-T: Chromium	7440-47-3	0.001	mg/L	<0.001	0.1 mg/L	95.3	90	110
EG020A-T: Copper	7440-50-8	0.001	mg/L	<0.001	0.1 mg/L	94.4	91	109
EG020A-T: Lead	7439-92-1	0.001	mg/L	<0.001	0.1 mg/L	104	91	111
EG020A-T: Nickel	7440-02-0	0.001	mg/L	<0.001	0.1 mg/L	94.1	91	111
EG020A-T: Zinc	7440-66-6	0.005	mg/L	<0.005	0.1 mg/L	96.6	91	109
EG035F: Dissolved Mercury by FIMS (QCLot: 288054)								
EG035F: Mercury	7439-97-6	0.0001	mg/L	<0.0001	0.01 mg/L	99.8	83	117
EG035T: Total Recoverable Mercury by FIMS (QCLot: 296140)								
EG035T: Mercury	7439-97-6	0.0001	mg/L	<0.0001	0.01 mg/L	102	87	113
EK040P: Fluoride by PC Titrator (QCLot: 289040)								
EK040P: Fluoride	16984-48-8	0.1	mg/L	<0.1	5 mg/L	102	89	111
EK055G: Ammonia as N by Discrete Analyser (QCLot: 288697)								
EK055G: Ammonia as N	7664-41-7	0.01	mg/L	<0.01	1 mg/L	105	80	115
EK057G: Nitrite as N by Discrete Analyser (QCLot: 287975)								
EK057G: Nitrite as N	14797-65-0	0.01	mg/L	<0.01	0.5 mg/L	102	92	108
EK059G: Nitrite plus Nitrate as N (NOx) by Discrete Analyser (QCLot: 288696)								
EK059G: Nitrite + Nitrate as N	----	0.01	mg/L	<0.01	0.5 mg/L	103	91	117
EK071G: Reactive Phosphorus as P by discrete analyser (QCLot: 287974)								
EK071G: Reactive Phosphorus as P	14265-44-2	0.01	mg/L	<0.01	0.5 mg/L	101	94	108
EP005: Total Organic Carbon (TOC) (QCLot: 291489)								
EP005: Total Organic Carbon	----	1	mg/L	<1	100 mg/L	90.0	86	112
EP074A: Monocyclic Aromatic Hydrocarbons (QCLot: 289004)								
EP074-WF: 1.2.4-Trimethylbenzene	95-63-6	1	µg/L	<1	20 µg/L	91.7	77	109

Sub-Matrix: **WATER**

Method: Compound	CAS Number	LOR	Unit	Method Blank (MB) Report	Laboratory Control Spike (LCS) Report			
					Spike	Spike Recovery (%)	Recovery Limits (%)	
				Result	Concentration	LCS	Low	High
EP074A: Monocyclic Aromatic Hydrocarbons (QCLot: 289004) - continued								
EP074-WF: 1.3.5-Trimethylbenzene	108-67-8	1	µg/L	<1	20 µg/L	93.1	77	109
EP074-WF: Benzene	71-43-2	1	µg/L	<1	20 µg/L	98.6	81	119
EP074-WF: Ethylbenzene	100-41-4	1	µg/L	<1	20 µg/L	93.9	78	118
EP074-WF: Isopropylbenzene	98-82-8	1	µg/L	<1	20 µg/L	87.9	77	117
EP074-WF: meta- & para-Xylene	108-38-3 106-42-3	1	µg/L	<1	40 µg/L	90.5	78	118
EP074-WF: n-Butylbenzene	104-51-8	1	µg/L	<1	20 µg/L	86.0	65	111
EP074-WF: n-Propylbenzene	103-65-1	1	µg/L	<1	20 µg/L	93.0	74	110
EP074-WF: ortho-Xylene	95-47-6	1	µg/L	<1	20 µg/L	94.1	82	118
EP074-WF: p-Isopropyltoluene	99-87-6	1	µg/L	<1	20 µg/L	88.9	73	113
EP074-WF: sec-Butylbenzene	135-98-8	1	µg/L	<1	20 µg/L	91.0	76	110
EP074-WF: Styrene	100-42-5	1	µg/L	<1	20 µg/L	88.2	78	118
EP074-WF: tert-Butylbenzene	98-06-6	1	µg/L	<1	20 µg/L	92.2	78	110
EP074-WF: Toluene	108-88-3	1	µg/L	<1	20 µg/L	97.0	81	121
EP074B: Oxygenated Compounds (QCLot: 289004)								
EP074-WF: 2-Butanone (MEK)	78-93-3	10	µg/L	<10	200 µg/L	104	71	131
EP074-WF: 2-Hexanone (MBK)	591-78-6	10	µg/L	<10	200 µg/L	99.4	75	129
EP074-WF: 2-Propanone (Acetone)	67-64-1	10	µg/L	<10	200 µg/L	98.8	69	151
EP074-WF: 4-Methyl-2-pentanone (MIBK)	108-10-1	10	µg/L	<10	200 µg/L	88.0	72	132
EP074-WF: Vinyl Acetate	108-05-4	10	µg/L	<10	200 µg/L	117	65	129
EP074C: Sulfonated Compounds (QCLot: 289004)								
EP074-WF: Carbon disulfide	75-15-0	1	µg/L	<1	20 µg/L	88.5	53	123
EP074D: Fumigants (QCLot: 289004)								
EP074-WF: 1.2-Dibromoethane (EDB)	106-93-4	1	µg/L	<1	20 µg/L	95.1	81	115
EP074-WF: 1.2-Dichloropropane	78-87-5	1	µg/L	<1	20 µg/L	99.6	80	118
EP074-WF: 2.2-Dichloropropane	594-20-7	1	µg/L	<1	20 µg/L	102	69	115
EP074-WF: cis-1.3-Dichloropropylene	10061-01-5	2	µg/L	<2	20 µg/L	84.6	72	110
EP074-WF: trans-1.3-Dichloropropylene	10061-02-6	2	µg/L	<2	20 µg/L	82.7	70	108
EP074E: Halogenated Aliphatic Compounds (QCLot: 289004)								
EP074-WF: 1.1.1.2-Tetrachloroethane	630-20-6	1	µg/L	<1	20 µg/L	90.7	75	107
EP074-WF: 1.1.1-Trichloroethane	71-55-6	1	µg/L	<1	20 µg/L	89.0	75	113
EP074-WF: 1.1.2.2-Tetrachloroethane	79-34-5	1	µg/L	<1	20 µg/L	94.8	85	121
EP074-WF: 1.1.2-Trichloroethane	79-00-5	1	µg/L	<1	20 µg/L	99.8	85	117
EP074-WF: 1.1-Dichloroethane	75-34-3	1	µg/L	<1	20 µg/L	115	76	120
EP074-WF: 1.1-Dichloroethene	75-35-4	1	µg/L	<1	20 µg/L	90.3	68	122
EP074-WF: 1.1-Dichloropropylene	563-58-6	1	µg/L	<1	20 µg/L	102	73	117
EP074-WF: 1.2.3-Trichloropropane	96-18-4	1	µg/L	<1	20 µg/L	95.6	84	118
EP074-WF: 1.2-Dibromo-3-chloropropane	96-12-8	1	µg/L	<1	20 µg/L	90.8	64	114

Sub-Matrix: **WATER**

Method: Compound	CAS Number	LOR	Unit	Method Blank (MB) Report	Laboratory Control Spike (LCS) Report			
					Spike	Spike Recovery (%)	Recovery Limits (%)	
				Result	Concentration	LCS	Low	High
EP074E: Halogenated Aliphatic Compounds (QCLot: 289004) - continued								
EP074-WF: 1.2-Dichloroethane	107-06-2	1	µg/L	<1	20 µg/L	95.3	81	119
EP074-WF: 1.3-Dichloropropane	142-28-9	1	µg/L	<1	20 µg/L	99.0	85	117
EP074-WF: Bromomethane	74-83-9	10	µg/L	<10	200 µg/L	85.8	52	128
EP074-WF: Carbon Tetrachloride	56-23-5	1	µg/L	<1	20 µg/L	90.1	66	110
EP074-WF: Chloroethane	75-00-3	10	µg/L	<10	200 µg/L	101	67	127
EP074-WF: Chloromethane	74-87-3	10	µg/L	<10	200 µg/L	94.6	66	138
EP074-WF: cis-1.2-Dichloroethene	156-59-2	1	µg/L	<1	20 µg/L	110	82	118
EP074-WF: cis-1.4-Dichloro-2-butene	1476-11-5	1	µg/L	<1	20 µg/L	80.9	51	109
EP074-WF: Dibromomethane	74-95-3	1	µg/L	<1	20 µg/L	97.6	80	116
EP074-WF: Dichlorodifluoromethane	75-71-8	10	µg/L	<10	200 µg/L	85.5	61	137
EP074-WF: Hexachlorobutadiene	87-68-3	0.5	µg/L	<0.5	20 µg/L	87.8	64	118
EP074-WF: Iodomethane	74-88-4	1	µg/L	<1	20 µg/L	81.4	26	119
EP074-WF: Methylene chloride	75-09-2	2	µg/L	<2	20 µg/L	124	52	184
EP074-WF: Pentachloroethane	76-01-7	1	µg/L	<1	20 µg/L	88.9	52	126
EP074-WF: Tetrachloroethene	127-18-4	1	µg/L	<1	20 µg/L	90.0	74	116
EP074-WF: trans-1.2-Dichloroethene	156-60-5	1	µg/L	<1	20 µg/L	92.7	69	123
EP074-WF: trans-1.4-Dichloro-2-butene	110-57-6	1	µg/L	<1	20 µg/L	88.7	64	118
EP074-WF: Trichloroethene	79-01-6	1	µg/L	<1	20 µg/L	90.1	76	118
EP074-WF: Trichlorofluoromethane	75-69-4	10	µg/L	<10	200 µg/L	89.5	70	124
EP074-WF: Vinyl chloride	75-01-4	0.2	µg/L	<0.2	200 µg/L	93.2	60	138
EP074F: Halogenated Aromatic Compounds (QCLot: 289004)								
EP074-WF: 1.2.3-Trichlorobenzene	87-61-6	1	µg/L	<1	20 µg/L	92.5	78	116
EP074-WF: 1.2.4-Trichlorobenzene	120-82-1	1	µg/L	<1	20 µg/L	87.9	68	112
EP074-WF: 1.2-Dichlorobenzene	95-50-1	1	µg/L	<1	20 µg/L	94.3	83	113
EP074-WF: 1.3-Dichlorobenzene	541-73-1	1	µg/L	<1	20 µg/L	91.1	78	112
EP074-WF: 1.4-Dichlorobenzene	106-46-7	0.1	µg/L	<0.1	20 µg/L	92.8	78	116
EP074-WF: 2-Chlorotoluene	95-49-8	1	µg/L	<1	20 µg/L	94.4	79	111
EP074-WF: 4-Chlorotoluene	106-43-4	1	µg/L	<1	20 µg/L	94.7	77	111
EP074-WF: Bromobenzene	108-86-1	1	µg/L	<1	20 µg/L	94.1	71	117
EP074-WF: Chlorobenzene	108-90-7	1	µg/L	<1	20 µg/L	94.0	82	116
EP074G: Trihalomethanes (QCLot: 289004)								
EP074-WF: Bromodichloromethane	75-27-4	1	µg/L	<1	20 µg/L	94.2	75	112
EP074-WF: Bromoform	75-25-2	1	µg/L	<1	20 µg/L	84.3	62	106
EP074-WF: Chloroform	67-66-3	1	µg/L	<1	20 µg/L	111	83	115
EP074-WF: Dibromochloromethane	124-48-1	1	µg/L	<1	20 µg/L	90.0	68	108
EP074H: Naphthalene (QCLot: 289004)								
EP074-WF: Naphthalene	91-20-3	5	µg/L	<5	20 µg/L	94.1	82	116
EP075(SIM)B: Polynuclear Aromatic Hydrocarbons (QCLot: 287852)								

Sub-Matrix: **WATER**

Method: Compound	CAS Number	LOR	Unit	Method Blank (MB) Report	Laboratory Control Spike (LCS) Report			
					Spike	Spike Recovery (%)	Recovery Limits (%)	
				Result	Concentration	LCS	Low	High
EP075(SIM)B: Polynuclear Aromatic Hydrocarbons (QCLot: 287852) - continued								
EP075(SIM): Acenaphthene	83-32-9	1	µg/L	<1.0	5 µg/L	76.5	46	120
EP075(SIM): Acenaphthylene	208-96-8	1	µg/L	<1.0	5 µg/L	78.5	40	124
EP075(SIM): Anthracene	120-12-7	1	µg/L	<1.0	5 µg/L	67.9	53	127
EP075(SIM): Benz(a)anthracene	56-55-3	1	µg/L	<1.0	5 µg/L	81.2	52	136
EP075(SIM): Benzo(a)pyrene	50-32-8	0.5	µg/L	<0.5	5 µg/L	75.6	55	133
EP075(SIM): Benzo(b+j)fluoranthene	205-99-2 205-82-3	1	µg/L	<1.0	5 µg/L	69.7	48	142
EP075(SIM): Benzo(g.h.i)perylene	191-24-2	1	µg/L	<1.0	5 µg/L	77.8	52	142
EP075(SIM): Benzo(k)fluoranthene	207-08-9	1	µg/L	<1.0	5 µg/L	71.2	54	134
EP075(SIM): Chrysene	218-01-9	1	µg/L	<1.0	5 µg/L	75.5	54	132
EP075(SIM): Dibenz(a.h)anthracene	53-70-3	1	µg/L	<1.0	5 µg/L	76.6	52	142
EP075(SIM): Fluoranthene	206-44-0	1	µg/L	<1.0	5 µg/L	81.9	56	130
EP075(SIM): Fluorene	86-73-7	1	µg/L	<1.0	5 µg/L	78.3	47	125
EP075(SIM): Indeno(1.2.3.cd)pyrene	193-39-5	1	µg/L	<1.0	5 µg/L	77.6	49	143
EP075(SIM): Naphthalene	91-20-3	1	µg/L	<1.0	5 µg/L	81.9	39	115
EP075(SIM): Phenanthrene	85-01-8	1	µg/L	<1.0	5 µg/L	79.0	55	125
EP075(SIM): Pyrene	129-00-0	1	µg/L	<1.0	5 µg/L	82.7	56	132
EP080/071: Total Petroleum Hydrocarbons (QCLot: 287853)								
EP071: C10 - C14 Fraction	----	50	µg/L	<50	3980 µg/L	65.6	53	123
EP071: C15 - C28 Fraction	----	100	µg/L	<100	17006 µg/L	77.3	57	133
EP071: C29 - C36 Fraction	----	50	µg/L	<50	8662 µg/L	74.2	55	141
EP080/071: Total Petroleum Hydrocarbons (QCLot: 288527)								
EP080: C6 - C9 Fraction	----	20	µg/L	<20	360 µg/L	84.0	67	127
EP080/071: Total Petroleum Hydrocarbons (QCLot: 289005)								
EP080: C6 - C9 Fraction	----	20	µg/L	<20	360 µg/L	99.6	67	127
EP080/071: Total Petroleum Hydrocarbons (QCLot: 294769)								
EP071: C10 - C14 Fraction	----	50	µg/L	<50	3980 µg/L	70.4	53	123
EP071: C15 - C28 Fraction	----	100	µg/L	<100	17006 µg/L	84.1	57	133
EP071: C29 - C36 Fraction	----	50	µg/L	<50	8662 µg/L	78.0	55	141
EP080/071: Total Petroleum Hydrocarbons (QCLot: 295852)								
EP080: C6 - C9 Fraction	----	20	µg/L	<20	360 µg/L	102	67	127
EP080/071: Total Recoverable Hydrocarbons - NEPM 2013 Fractions (QCLot: 287853)								
EP071: >C10 - C16 Fraction	----	100	µg/L	<100	5753 µg/L	73.2	54	122
EP071: >C16 - C34 Fraction	----	100	µg/L	<100	24516 µg/L	71.7	56	132
EP071: >C34 - C40 Fraction	----	100	µg/L	<100	828 µg/L	82.0	51	137
EP080/071: Total Recoverable Hydrocarbons - NEPM 2013 Fractions (QCLot: 288527)								
EP080: C6 - C10 Fraction	C6_C10	20	µg/L	<20	450 µg/L	82.6	65	125
EP080/071: Total Recoverable Hydrocarbons - NEPM 2013 Fractions (QCLot: 289005)								

Sub-Matrix: **WATER**

Method: Compound	CAS Number	LOR	Unit	Method Blank (MB) Report: Result	Laboratory Control Spike (LCS) Report: Spike Concentration	Spike Recovery (%): LCS	Recovery Limits (%): Low	Recovery Limits (%): High
EP080/071: Total Recoverable Hydrocarbons - NEPM 2013 Fractions (QCLot: 289005) - continued								
EP080: C6 - C10 Fraction	C6_C10	20	µg/L	<20	450 µg/L	97.8	65	125
EP080/071: Total Recoverable Hydrocarbons - NEPM 2013 Fractions (QCLot: 294769)								
EP071: >C10 - C16 Fraction	----	100	µg/L	<100	5753 µg/L	62.2	54	122
EP071: >C16 - C34 Fraction	----	100	µg/L	<100	24516 µg/L	77.0	56	132
EP071: >C34 - C40 Fraction	----	100	µg/L	<100	828 µg/L	97.2	51	137
EP080/071: Total Recoverable Hydrocarbons - NEPM 2013 Fractions (QCLot: 295852)								
EP080: C6 - C10 Fraction	C6_C10	20	µg/L	<20	450 µg/L	99.7	65	125
EP080: BTEXN (QCLot: 288527)								
EP080: Benzene	71-43-2	1	µg/L	<1	20 µg/L	90.7	76	120
EP080: Ethylbenzene	100-41-4	2	µg/L	<2	20 µg/L	87.3	72	124
EP080: meta- & para-Xylene	108-38-3 106-42-3	2	µg/L	<2	40 µg/L	91.0	72	130
EP080: Naphthalene	91-20-3	5	µg/L	<5	5 µg/L	98.2	71	129
EP080: ortho-Xylene	95-47-6	2	µg/L	<2	20 µg/L	92.8	75	127
EP080: Toluene	108-88-3	2	µg/L	<2	20 µg/L	89.5	76	124
EP080: BTEXN (QCLot: 289005)								
EP080: Benzene	71-43-2	1	µg/L	<1	20 µg/L	98.8	76	120
EP080: Ethylbenzene	100-41-4	2	µg/L	<2	20 µg/L	95.6	72	124
EP080: meta- & para-Xylene	108-38-3 106-42-3	2	µg/L	<2	40 µg/L	94.6	72	130
EP080: Naphthalene	91-20-3	5	µg/L	<5	5 µg/L	98.5	71	129
EP080: ortho-Xylene	95-47-6	2	µg/L	<2	20 µg/L	98.9	75	127
EP080: Toluene	108-88-3	2	µg/L	<2	20 µg/L	98.0	76	124
EP080: BTEXN (QCLot: 295852)								
EP080: Benzene	71-43-2	1	µg/L	<1	20 µg/L	106	76	120
EP080: Ethylbenzene	100-41-4	2	µg/L	<2	20 µg/L	102	72	124
EP080: meta- & para-Xylene	108-38-3 106-42-3	2	µg/L	<2	40 µg/L	104	72	130
EP080: Naphthalene	91-20-3	5	µg/L	<5	5 µg/L	93.9	71	129
EP080: ortho-Xylene	95-47-6	2	µg/L	<2	20 µg/L	106	75	127
EP080: Toluene	108-88-3	2	µg/L	<2	20 µg/L	106	76	124

Matrix Spike (MS) Report

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

Sub-Matrix: **WATER**

Matrix Spike (MS) Report		
Spike	SpikeRecovery(%)	Recovery Limits (%)

Sub-Matrix: **WATER**

				Matrix Spike (MS) Report			
				Spike	SpikeRecovery(%)	Recovery Limits (%)	
Laboratory sample ID	Client sample ID	Method: Compound	CAS Number	Concentration	MS	Low	High
ED041G: Sulfate (Turbidimetric) as SO4 2- by DA (QCLot: 287977)							
EM1517384-002	GW09	ED041G: Sulfate as SO4 - Turbidimetric	14808-79-8	10 mg/L	# Not Determined	70	130
ED043: Total Oxidised Sulfur as SO4 2- (QCLot: 289692)							
EM1517377-001	Anonymous	ED043: Total Oxidised Sulfur as SO4 2-	----	500 mg/L	94.8	70	130
ED045G: Chloride by Discrete Analyser (QCLot: 287976)							
EM1517384-002	GW09	ED045G: Chloride	16887-00-6	400 mg/L	102	70	130
EG020F: Dissolved Metals by ICP-MS (QCLot: 288052)							
EM1517043-001	Anonymous	EG020A-F: Arsenic	7440-38-2	0.2 mg/L	93.7	85	131
		EG020A-F: Cadmium	7440-43-9	0.05 mg/L	108	81	133
		EG020A-F: Chromium	7440-47-3	0.2 mg/L	93.3	71	135
		EG020A-F: Copper	7440-50-8	0.2 mg/L	87.4	76	130
		EG020A-F: Lead	7439-92-1	0.2 mg/L	94.9	75	133
		EG020A-F: Manganese	7439-96-5	0.2 mg/L	93.1	64	134
		EG020A-F: Nickel	7440-02-0	0.2 mg/L	89.6	73	131
		EG020A-F: Zinc	7440-66-6	0.2 mg/L	89.5	75	131
EG020F: Dissolved Metals by ICP-MS (QCLot: 288056)							
EM1517384-003	GW07	EG020A-F: Arsenic	7440-38-2	0.2 mg/L	102	85	131
		EG020A-F: Cadmium	7440-43-9	0.05 mg/L	113	81	133
		EG020A-F: Chromium	7440-47-3	0.2 mg/L	99.4	71	135
		EG020A-F: Copper	7440-50-8	0.2 mg/L	95.8	76	130
		EG020A-F: Lead	7439-92-1	0.2 mg/L	99.2	75	133
		EG020A-F: Manganese	7439-96-5	0.2 mg/L	94.5	64	134
		EG020A-F: Nickel	7440-02-0	0.2 mg/L	103	73	131
		EG020A-F: Zinc	7440-66-6	0.2 mg/L	98.3	75	131
EG020T: Total Metals by ICP-MS (QCLot: 297756)							
EM1517384-015	QCQ	EG020A-T: Arsenic	7440-38-2	1 mg/L	105	82	118
		EG020A-T: Cadmium	7440-43-9	0.25 mg/L	109	75	129
		EG020A-T: Chromium	7440-47-3	1 mg/L	101	80	118
		EG020A-T: Copper	7440-50-8	1 mg/L	98.0	81	115
		EG020A-T: Lead	7439-92-1	1 mg/L	92.2	83	121
		EG020A-T: Nickel	7440-02-0	1 mg/L	99.1	80	118
		EG020A-T: Zinc	7440-66-6	1 mg/L	102	74	116
EG035F: Dissolved Mercury by FIMS (QCLot: 288054)							
EM1517220-002	Anonymous	EG035F: Mercury	7439-97-6	0.01 mg/L	105	70	120
EG035T: Total Recoverable Mercury by FIMS (QCLot: 296140)							
EM1517384-016	QCR	EG035T: Mercury	7439-97-6	0.01 mg/L	90.2	70	130

Sub-Matrix: **WATER**

				Matrix Spike (MS) Report			
				Spike	SpikeRecovery(%)	Recovery Limits (%)	
Laboratory sample ID	Client sample ID	Method: Compound	CAS Number	Concentration	MS	Low	High
EK040P: Fluoride by PC Titrator (QCLot: 289040)							
EM1517384-003	GW07	EK040P: Fluoride	16984-48-8	5 mg/L	95.6	70	130
EK055G: Ammonia as N by Discrete Analyser (QCLot: 288697)							
EM1517384-002	GW09	EK055G: Ammonia as N	7664-41-7	1 mg/L	# Not Determined	70	130
EK057G: Nitrite as N by Discrete Analyser (QCLot: 287975)							
EM1517384-002	GW09	EK057G: Nitrite as N	14797-65-0	0.5 mg/L	90.9	80	114
EK059G: Nitrite plus Nitrate as N (NOx) by Discrete Analyser (QCLot: 288696)							
EM1517384-002	GW09	EK059G: Nitrite + Nitrate as N	----	0.5 mg/L	105	70	130
EK071G: Reactive Phosphorus as P by discrete analyser (QCLot: 287974)							
EM1517384-002	GW09	EK071G: Reactive Phosphorus as P	14265-44-2	0.5 mg/L	101	79	123
EP005: Total Organic Carbon (TOC) (QCLot: 291489)							
EM1517384-009	GW20	EP005: Total Organic Carbon	----	100 mg/L	86.8	80	114
EP074A: Monocyclic Aromatic Hydrocarbons (QCLot: 289004)							
EM1517384-007	GW12	EP074-WF: Benzene	71-43-2	20 µg/L	112	76	128
		EP074-WF: Toluene	108-88-3	20 µg/L	130	72	132
EP074E: Halogenated Aliphatic Compounds (QCLot: 289004)							
EM1517384-007	GW12	EP074-WF: 1.1-Dichloroethene	75-35-4	20 µg/L	82.3	63	129
		EP074-WF: Trichloroethene	79-01-6	20 µg/L	89.7	64	126
EP074F: Halogenated Aromatic Compounds (QCLot: 289004)							
EM1517384-007	GW12	EP074-WF: Chlorobenzene	108-90-7	20 µg/L	97.7	81	119
EP080/071: Total Petroleum Hydrocarbons (QCLot: 288527)							
EM1517383-001	Anonymous	EP080: C6 - C9 Fraction	----	280 µg/L	73.0	43	125
EP080/071: Total Petroleum Hydrocarbons (QCLot: 289005)							
EM1517384-007	GW12	EP080: C6 - C9 Fraction	----	280 µg/L	89.6	43	125
EP080/071: Total Petroleum Hydrocarbons (QCLot: 294769)							
EM1517737-022	Anonymous	EP071: C10 - C14 Fraction	----	3980 µg/L	62.6	50	130
		EP071: C15 - C28 Fraction	----	17006 µg/L	79.0	54	136
		EP071: C29 - C36 Fraction	----	8662 µg/L	74.6	50	142
EP080/071: Total Petroleum Hydrocarbons (QCLot: 295852)							
EM1517384-016	QCR	EP080: C6 - C9 Fraction	----	280 µg/L	81.1	43	125
EP080/071: Total Recoverable Hydrocarbons - NEPM 2013 Fractions (QCLot: 288527)							
EM1517383-001	Anonymous	EP080: C6 - C10 Fraction	C6_C10	330 µg/L	71.0	44	122
EP080/071: Total Recoverable Hydrocarbons - NEPM 2013 Fractions (QCLot: 289005)							
EM1517384-007	GW12	EP080: C6 - C10 Fraction	C6_C10	330 µg/L	83.0	44	122

Sub-Matrix: **WATER**

				Matrix Spike (MS) Report			
				Spike	SpikeRecovery(%)	Recovery Limits (%)	
Laboratory sample ID	Client sample ID	Method: Compound	CAS Number	Concentration	MS	Low	High
EP080/071: Total Recoverable Hydrocarbons - NEPM 2013 Fractions (QCLot: 294769)							
EM1517737-022	Anonymous	EP071: >C10 - C16 Fraction	----	5753 µg/L	55.3	50	128
		EP071: >C16 - C34 Fraction	----	24516 µg/L	72.8	50	150
		EP071: >C34 - C40 Fraction	----	828 µg/L	95.2	51	159
EP080/071: Total Recoverable Hydrocarbons - NEPM 2013 Fractions (QCLot: 295852)							
EM1517384-016	QCR	EP080: C6 - C10 Fraction	C6_C10	330 µg/L	79.4	44	122
EP080: BTEXN (QCLot: 288527)							
EM1517383-001	Anonymous	EP080: Benzene	71-43-2	20 µg/L	96.1	68	130
		EP080: Toluene	108-88-3	20 µg/L	92.5	72	132
EP080: BTEXN (QCLot: 289005)							
EM1517384-007	GW12	EP080: Benzene	71-43-2	20 µg/L	102	68	130
		EP080: Toluene	108-88-3	20 µg/L	121	72	132
EP080: BTEXN (QCLot: 295852)							
EM1517384-016	QCR	EP080: Benzene	71-43-2	20 µg/L	103	68	130
		EP080: Toluene	108-88-3	20 µg/L	104	72	132

ALS Environmental

QA/QC Compliance Assessment to assist with Quality Review

Work Order	: **EM1517384**	Page	: 1 of 11
Amendment	: **1**		
Client	: **AECOM Australia Pty Ltd**	Laboratory	: Environmental Division Melbourne
Contact	: MS AVERYLL COYNE	Telephone	: +61-3-8549 9608
Project	: 60431087	Date Samples Received	: 20-Nov-2015
Site	:	Issue Date	: 08-Dec-2015
Sampler	: OLIVER TAYLOR, ZACHARY OCONNOR	No. of samples received	: 17
Order number	: 60431087 1.4	No. of samples analysed	: 17

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

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

Summary of Outliers

Outliers : Quality Control Samples

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

- **NO Method Blank value outliers occur.**
- **NO Duplicate outliers occur.**
- **NO Laboratory Control outliers occur.**
- **Matrix Spike outliers exist - please see following pages for full details.**
- **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 : Quality Control Samples

Duplicates, Method Blanks, Laboratory Control Samples and Matrix Spikes

Matrix: **WATER**

Compound Group Name	Laboratory Sample ID	Client Sample ID	Analyte	CAS Number	Data	Limits	Comment
Matrix Spike (MS) Recoveries							
ED041G: Sulfate (Turbidimetric) as SO4 2- by DA	EM1517384--002	GW09	**Sulfate as SO4 - Turbidimetric**	14808-79-8	Not Determined	----	**MS recovery not determined, background level greater than or equal to 4x spike level.**
EK055G: Ammonia as N by Discrete Analyser	EM1517384--002	GW09	**Ammonia as N**	7664-41-7	Not Determined	----	**MS recovery not determined, background level greater than or equal to 4x spike level.**

Outliers : Analysis Holding Time Compliance

Matrix: **WATER**

Method / Container / Client Sample ID(s)	Extraction / Preparation: Date extracted	Extraction / Preparation: Due for extraction	Extraction / Preparation: Days overdue	Analysis: Date analysed	Analysis: Due for analysis	Analysis: Days overdue
EA005P: pH by PC Titrator						
Clear Plastic Bottle - Natural						
GW04, GW09, GW07, GW03, GW11, GW08, GW12, GW32	----	----	----	25-Nov-2015	19-Nov-2015	**6**
EP080/071: Total Petroleum Hydrocarbons						
Amber Glass Bottle - Unpreserved						
QCR	01-Dec-2015	26-Nov-2015	**4**	----	----	----

Outliers : Frequency of Quality Control Samples

Matrix: **WATER**

Quality Control Sample Type / Method	Count: QC	Count: Regular	Rate (%): Actual	Rate (%): Expected	Quality Control Specification
Laboratory Duplicates (DUP)					
PAH/Phenols (GC/MS - SIM)	0	10	0.00	10.00	NEPM 2013 B3 & ALS QC Standard
TRH - Semivolatile Fraction	0	13	0.00	10.00	NEPM 2013 B3 & ALS QC Standard
Matrix Spikes (MS)					
PAH/Phenols (GC/MS - SIM)	0	10	0.00	5.00	NEPM 2013 B3 & ALS QC Standard
TRH - Semivolatile Fraction	0	13	0.00	5.00	NEPM 2013 B3 & ALS QC Standard

Analysis Holding Time Compliance

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
EA005P: pH by PC Titrator							
Clear Plastic Bottle - Natural (EA005-P)							
GW04, GW09, GW07, GW03, GW11, GW08, GW12, GW32	**19-Nov-2015**	**----**	----	----	**25-Nov-2015**	19-Nov-2015	×
EA015: Total Dissolved Solids dried at 180 ± 5 °C							
Clear Plastic Bottle - Natural (EA015H)							
GW04, GW09, GW07, GW03, GW11, GW08, GW12, GW32	**19-Nov-2015**	**----**	----	----	**26-Nov-2015**	26-Nov-2015	✓
ED037P: Alkalinity by PC Titrator							
Clear Plastic Bottle - Natural (ED037-P)							
GW04, GW09, GW07, GW03, GW11, GW08, GW12, GW32	**19-Nov-2015**	**----**	----	----	**25-Nov-2015**	03-Dec-2015	✓
ED041G: Sulfate (Turbidimetric) as SO4 2- by DA							
Clear Plastic Bottle - Natural (ED041G)							
GW04, GW09, GW07, GW03, GW11, GW08, GW12, GW32	**19-Nov-2015**	**----**	----	----	**25-Nov-2015**	17-Dec-2015	✓
ED043: Total Oxidised Sulfur as SO4 2-							
Clear Plastic Bottle - Natural (ED043)							
GW04, GW09, GW07, GW03, GW11, GW08, GW12, GW32	**19-Nov-2015**	**26-Nov-2015**	17-Dec-2015	✓	**26-Nov-2015**	17-Dec-2015	✓
ED045G: Chloride by Discrete Analyser							
Clear Plastic Bottle - Natural (ED045G)							
GW04, GW09, GW07, GW03, GW11, GW08, GW12, GW32	**19-Nov-2015**	**----**	----	----	**25-Nov-2015**	17-Dec-2015	✓
ED093F: Dissolved Major Cations							
Clear Plastic Bottle - Nitric Acid; Filtered (ED093F)							
GW04, GW09, GW07, GW03, GW11, GW08, GW12, GW32	**19-Nov-2015**	**----**	----	----	**25-Nov-2015**	17-Dec-2015	✓

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)							
GW04, GW09, GW07, GW03, GW11, GW08, GW12, GW32	**19-Nov-2015**	**----**	----	----	**25-Nov-2015**	17-May-2016	✓
EG020T: Total Metals by ICP-MS							
Clear Plastic Bottle - Nitric Acid; Unspecified (EG020A-T)							
QCQ, QCR	**19-Nov-2015**	**03-Dec-2015**	17-May-2016	✓	**03-Dec-2015**	17-May-2016	✓
EG035F: Dissolved Mercury by FIMS							
Clear Plastic Bottle - Nitric Acid; Filtered (EG035F)							
GW04, GW09, GW07, GW03, GW11, GW08, GW12, GW32	**19-Nov-2015**	**----**	----	----	**26-Nov-2015**	17-Dec-2015	✓
EG035T: Total Recoverable Mercury by FIMS							
Clear Plastic Bottle - Nitric Acid; Unspecified (EG035T)							
QCQ, QCR	**19-Nov-2015**	**----**	----	----	**02-Dec-2015**	17-Dec-2015	✓
EK040P: Fluoride by PC Titrator							
Clear Plastic Bottle - Natural (EK040P)							
GW04, GW09, GW07, GW03, GW11, GW08, GW12, GW32	**19-Nov-2015**	**----**	----	----	**25-Nov-2015**	17-Dec-2015	✓
EK055G: Ammonia as N by Discrete Analyser							
Clear Plastic Bottle - Sulfuric Acid (EK055G)							
GW04, GW09, GW07, GW03, GW11, GW08, GW12, GW32	**19-Nov-2015**	**----**	----	----	**26-Nov-2015**	17-Dec-2015	✓
EK057G: Nitrite as N by Discrete Analyser							
Clear Plastic Bottle - Natural (EK057G)							
GW04, GW09, GW07, GW03, GW11, GW08, GW12, GW32	**19-Nov-2015**	**----**	----	----	**20-Nov-2015**	21-Nov-2015	✓
EK059G: Nitrite plus Nitrate as N (NOx) by Discrete Analyser							
Clear Plastic Bottle - Sulfuric Acid (EK059G)							
GW04, GW09, GW07, GW03, GW11, GW08, GW12, GW32	**19-Nov-2015**	**----**	----	----	**25-Nov-2015**	17-Dec-2015	✓

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
EK071G: Reactive Phosphorus as P by discrete analyser							
Clear Plastic Bottle - Natural (EK071G)							
GW04, GW09, GW07, GW03, GW11, GW08, GW12, GW32	**19-Nov-2015**	**----**	----	----	**20-Nov-2015**	21-Nov-2015	✓
EP005: Total Organic Carbon (TOC)							
Amber TOC Vial - Sulfuric Acid (EP005)							
GW20, GW26, GW31, GW33, GW34, GW37	**19-Nov-2015**	**----**	----	----	**27-Nov-2015**	17-Dec-2015	✓
EP080/071: Total Petroleum Hydrocarbons							
Amber Glass Bottle - Unpreserved (EP071)							
QCR	**19-Nov-2015**	**01-Dec-2015**	26-Nov-2015	×	**02-Dec-2015**	10-Jan-2016	✓
Amber Glass Bottle - Unpreserved (EP071)							
GW04, GW09, GW07, GW03, GW11, GW08, GW12, QCQ	**19-Nov-2015**	**24-Nov-2015**	26-Nov-2015	✓	**25-Nov-2015**	03-Jan-2016	✓
EP074A: Monocyclic Aromatic Hydrocarbons							
Amber VOC Vial - Sulfuric Acid (EP074-WF)							
GW04, GW12	**19-Nov-2015**	**25-Nov-2015**	03-Dec-2015	✓	**25-Nov-2015**	03-Dec-2015	✓
EP075(SIM)T: PAH Surrogates							
Amber Glass Bottle - Unpreserved (EP075(SIM))							
GW04, GW09, GW07, GW03, GW11, GW08, GW12	**19-Nov-2015**	**24-Nov-2015**	26-Nov-2015	✓	**25-Nov-2015**	03-Jan-2016	✓
EP080S: TPH(V)/BTEX Surrogates							
Amber VOC Vial - Sulfuric Acid (EP080)							
QCR	**19-Nov-2015**	**02-Dec-2015**	03-Dec-2015	✓	**02-Dec-2015**	03-Dec-2015	✓
Amber VOC Vial - Sulfuric Acid (EP080)							
GW04, GW09, GW07, GW03, GW11, GW08, GW12, GW20, GW26, GW31, GW33, GW34, GW37, QCQ, QCM	**19-Nov-2015**	**25-Nov-2015**	03-Dec-2015	✓	**25-Nov-2015**	03-Dec-2015	✓

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)							
Alkalinity by PC Titrator	ED037-P	2	20	**10.00**	**10.00**	✓	NEPM 2013 B3 & ALS QC Standard
Ammonia as N by Discrete analyser	EK055G	2	20	**10.00**	**10.00**	✓	NEPM 2013 B3 & ALS QC Standard
Chloride by Discrete Analyser	ED045G	2	12	**16.67**	**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
Fluoride by PC Titrator	EK040P	2	20	**10.00**	**10.00**	✓	NEPM 2013 B3 & ALS QC Standard
Major Cations - Dissolved	ED093F	2	20	**10.00**	**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	14	**14.29**	**10.00**	✓	NEPM 2013 B3 & ALS QC Standard
PAH/Phenols (GC/MS - SIM)	EP075(SIM)	0	10	**0.00**	**10.00**	×	NEPM 2013 B3 & ALS QC Standard
pH by PC Titrator	EA005-P	2	20	**10.00**	**10.00**	✓	NEPM 2013 B3 & ALS QC Standard
Reactive Phosphorus as P-By Discrete Analyser	EK071G	2	12	**16.67**	**10.00**	✓	NEPM 2013 B3 & ALS QC Standard
Sulfate (Turbidimetric) as SO4 2- by Discrete Analyser	ED041G	2	14	**14.29**	**10.00**	✓	NEPM 2013 B3 & ALS QC Standard
Total Dissolved Solids (High Level)	EA015H	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-MS - Suite A	EG020A-T	2	20	**10.00**	**10.00**	✓	NEPM 2013 B3 & ALS QC Standard
Total Organic Carbon	EP005	2	14	**14.29**	**10.00**	✓	NEPM 2013 B3 & ALS QC Standard
Total Oxidised Sulfur as SO4 2-	ED043	2	15	**13.33**	**10.00**	✓	NEPM 2013 B3 & ALS QC Standard
TRH - Semivolatile Fraction	EP071	0	13	**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
Volatile Organic Compounds WF Detection Limits	EP074-WF	1	4	**25.00**	**10.00**	✓	NEPM 2013 B3 & ALS QC Standard
Laboratory Control Samples (LCS)							
Alkalinity by PC Titrator	ED037-P	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
Chloride by Discrete Analyser	ED045G	2	12	**16.67**	**10.00**	✓	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
Fluoride by PC Titrator	EK040P	1	20	**5.00**	**5.00**	✓	NEPM 2013 B3 & ALS QC Standard
Major Cations - Dissolved	ED093F	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
Nitrite as N by Discrete Analyser	EK057G	1	14	**7.14**	**5.00**	✓	NEPM 2013 B3 & ALS QC Standard
PAH/Phenols (GC/MS - SIM)	EP075(SIM)	1	10	**10.00**	**5.00**	✓	NEPM 2013 B3 & ALS QC Standard
Reactive Phosphorus as P-By Discrete Analyser	EK071G	1	12	**8.33**	**5.00**	✓	NEPM 2013 B3 & ALS QC Standard
Sulfate (Turbidimetric) as SO4 2- by Discrete Analyser	ED041G	2	14	**14.29**	**10.00**	✓	NEPM 2013 B3 & ALS QC Standard
Total Dissolved Solids (High Level)	EA015H	2	20	**10.00**	**10.00**	✓	NEPM 2013 B3 & ALS QC Standard
Total Mercury by FIMS	EG035T	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.

Quality Control Sample Type		Count		Rate (%)			Quality Control Specification
Analytical Methods	*Method*	*QC*	*Regular*	***Actual***	***Expected***	*Evaluation*	
Laboratory Control Samples (LCS) - Continued							
Total Metals by ICP-MS - Suite A	EG020A-T	1	20	**5.00**	**5.00**	✓	NEPM 2013 B3 & ALS QC Standard
Total Organic Carbon	EP005	1	14	**7.14**	**5.00**	✓	NEPM 2013 B3 & ALS QC Standard
Total Oxidised Sulfur as SO4 2-	ED043	1	15	**6.67**	**5.00**	✓	NEPM 2013 B3 & ALS QC Standard
TRH - Semivolatile Fraction	EP071	1	13	**7.69**	**5.00**	✓	NEPM 2013 B3 & ALS QC Standard
TRH Volatiles/BTEX	EP080	1	20	**5.00**	**5.00**	✓	NEPM 2013 B3 & ALS QC Standard
Volatile Organic Compounds WF Detection Limits	EP074-WF	1	4	**25.00**	**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
Chloride by Discrete Analyser	ED045G	1	12	**8.33**	**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
Fluoride by PC Titrator	EK040P	1	20	**5.00**	**5.00**	✓	NEPM 2013 B3 & ALS QC Standard
Major Cations - Dissolved	ED093F	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
Nitrite as N by Discrete Analyser	EK057G	1	14	**7.14**	**5.00**	✓	NEPM 2013 B3 & ALS QC Standard
PAH/Phenols (GC/MS - SIM)	EP075(SIM)	1	10	**10.00**	**5.00**	✓	NEPM 2013 B3 & ALS QC Standard
Reactive Phosphorus as P-By Discrete Analyser	EK071G	1	12	**8.33**	**5.00**	✓	NEPM 2013 B3 & ALS QC Standard
Sulfate (Turbidimetric) as SO4 2- by Discrete Analyser	ED041G	1	14	**7.14**	**5.00**	✓	NEPM 2013 B3 & ALS QC Standard
Total Dissolved Solids (High Level)	EA015H	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-MS - Suite A	EG020A-T	1	20	**5.00**	**5.00**	✓	NEPM 2013 B3 & ALS QC Standard
Total Organic Carbon	EP005	1	14	**7.14**	**5.00**	✓	NEPM 2013 B3 & ALS QC Standard
Total Oxidised Sulfur as SO4 2-	ED043	1	15	**6.67**	**5.00**	✓	NEPM 2013 B3 & ALS QC Standard
TRH - Semivolatile Fraction	EP071	1	13	**7.69**	**5.00**	✓	NEPM 2013 B3 & ALS QC Standard
TRH Volatiles/BTEX	EP080	1	20	**5.00**	**5.00**	✓	NEPM 2013 B3 & ALS QC Standard
Volatile Organic Compounds WF Detection Limits	EP074-WF	1	4	**25.00**	**5.00**	✓	NEPM 2013 B3 & ALS QC Standard
Matrix Spikes (MS)							
Ammonia as N by Discrete analyser	EK055G	1	20	**5.00**	**5.00**	✓	NEPM 2013 B3 & ALS QC Standard
Chloride by Discrete Analyser	ED045G	1	12	**8.33**	**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
Fluoride by PC Titrator	EK040P	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
Nitrite as N by Discrete Analyser	EK057G	1	14	**7.14**	**5.00**	✓	NEPM 2013 B3 & ALS QC Standard
PAH/Phenols (GC/MS - SIM)	EP075(SIM)	0	10	**0.00**	**5.00**	×	NEPM 2013 B3 & ALS QC Standard
Reactive Phosphorus as P-By Discrete Analyser	EK071G	1	12	**8.33**	**5.00**	✓	NEPM 2013 B3 & ALS QC Standard
Sulfate (Turbidimetric) as SO4 2- by Discrete Analyser	ED041G	1	14	**7.14**	**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-MS - Suite A	EG020A-T	1	20	**5.00**	**5.00**	✓	NEPM 2013 B3 & ALS QC Standard
Total Organic Carbon	EP005	1	14	**7.14**	**5.00**	✓	NEPM 2013 B3 & ALS QC Standard

Matrix: **WATER**

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

Quality Control Sample Type		Count		Rate (%)			Quality Control Specification
Analytical Methods	*Method*	*QC*	*Regular*	***Actual***	***Expected***	*Evaluation*	
Matrix Spikes (MS) - Continued							
Total Oxidised Sulfur as SO4 2-	ED043	1	15	**6.67**	**5.00**	✓	NEPM 2013 B3 & ALS QC Standard
TRH - Semivolatile Fraction	EP071	0	13	**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
Volatile Organic Compounds WF Detection Limits	EP074-WF	1	4	**25.00**	**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 by PC Titrator	EA005-P	WATER	In house: Referenced to APHA 4500 H+ B. This procedure determines pH of water samples by automated ISE. This method is compliant with NEPM (2013) Schedule B(3)
Total Dissolved Solids (High Level)	EA015H	WATER	In house: Referenced to APHA 2540C. A gravimetric procedure that determines the amount of `filterable` residue in an aqueous sample. A well-mixed sample is filtered through a glass fibre filter (1.2um). The filtrate is evaporated to dryness and dried to constant weight at 180+/-5C. This method is compliant with NEPM (2013) Schedule B(3)
Alkalinity by PC Titrator	ED037-P	WATER	In house: Referenced to APHA 2320 B This procedure determines alkalinity by automated measurement (e.g. PC Titrate) using pH 4.5 for indicating the total alkalinity end-point. This method is compliant with NEPM (2013) Schedule B(3)
Sulfate (Turbidimetric) as SO4 2- by Discrete Analyser	ED041G	WATER	In house: Referenced to APHA 4500-SO4. Dissolved sulfate is determined in a 0.45um filtered sample. Sulfate ions are converted to a barium sulfate suspension in an acetic acid medium with barium chloride. Light absorbance of the BaSO4 suspension is measured by a photometer and the SO4-2 concentration is determined by comparison of the reading with a standard curve. This method is compliant with NEPM (2013) Schedule B(3)
Total Oxidised Sulfur as SO4 2-	ED043	WATER	In-house. The sample is treated with Peroxide to convert all Sulfur species to Sulfate. Sulfate in the sample can then be determined by ICPAES and reported as TOS as SO4 2-.
Chloride by Discrete Analyser	ED045G	WATER	In house: Referenced to APHA 4500 Cl - G.The thiocyanate ion is liberated from mercuric thiocyanate through sequestration of mercury by the chloride ion to form non-ionised mercuric chloride.in the presence of ferric ions the librated thiocynate forms highly-coloured ferric thiocynate which is measured at 480 nm APHA 21st edition seal method 2 017-1-L april 2003
Major Cations - Dissolved	ED093F	WATER	In house: Referenced to APHA 3120 and 3125; USEPA SW 846 - 6010 and 6020; Cations are determined by either ICP-AES or ICP-MS techniques. This method is compliant with NEPM (2013) Schedule B(3) Sodium Adsorption Ratio is calculated from Ca, Mg and Na which determined by ALS in house method QWI-EN/ED093F. This method is compliant with NEPM (2013) Schedule B(3) Hardness parameters are calculated based on APHA 2340 B. This method is compliant with NEPM (2013) Schedule B(3)
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 0.45 um 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.
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.

Analytical Methods	Method	Matrix	Method Descriptions
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 0.45 um 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 (2013) Schedule B(3)
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 (2013) Schedule B(3)
Fluoride by PC Titrator	EK040P	WATER	In house: Referenced to APHA 4500 F--C CDTA is added to the sample to provide a uniform ionic strength background, adjust pH, and break up complexes. Fluoride concentration is determined by either manual or automatic ISE measurement. This method is compliant with NEPM (2013) 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 (2013) 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 (2013) 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 (2013) 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 (2013) Schedule B(3)
Reactive Phosphorus as P-By Discrete Analyser	EK071G	WATER	In house: Referenced to APHA 4500-P F Ammonium molybdate and potassium antimonyl tartrate reacts in acid medium with othophosphate to form a heteropoly acid -phosphomolybdic acid - which is reduced to intensely coloured molybdenum blue by ascorbic acid. Quantification is by Discrete Analyser. This method is compliant with NEPM (2013) Schedule B(3)
Ionic Balance by PCT DA and Turbi SO4 DA	EN055 - PG	WATER	In house: Referenced to APHA 1030F. This method is compliant with NEPM (2013) Schedule B(3)
Total Organic Carbon	EP005	WATER	In house: Referenced to APHA 5310 B, The automated TOC analyzer determines Total and Inorganic Carbon by IR cell. TOC is calculated as the difference. This method is compliant with NEPM (2013) Schedule B(3)
TRH - Semivolatile Fraction	EP071	WATER	USEPA SW 846 - 8015A 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 (2013) Schedule B(3)
Volatile Organic Compounds WF Detection Limits	EP074-WF	WATER	USEPA SW 846 - 8260B Water samples are directly purged prior to analysis by Capillary GC/MS and quantification is by comparison against an established 5 point calibration curve. This method is compliant with NEPM (2013) Schedule B(3)
PAH/Phenols (GC/MS - SIM)	EP075(SIM)	WATER	USEPA SW 846 - 8270D 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 (2013) Schedule B(3)

Analytical Methods	Method	Matrix	Method Descriptions
TRH Volatiles/BTEX	EP080	WATER	USEPA SW 846 - 8260B 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 (2013) Schedule B(3)

Preparation Methods	Method	Matrix	Method Descriptions
Total Oxidisable Sulfur as SO4 2- Prep	ED043-PR	WATER	In - House
Digestion for Total Recoverable Metals	EN25	WATER	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 (2013) Schedule B(3)

SCANNED

Samples sent to lab fo
Micro Nitrate BOD pH
Colour Turbidity RP
Other
Rec 20/11/15

Environmental Division
Melbourne
Work Order Reference
EM1517384

Telephone : +61-3-8549 9600

Form:

Chain of Custody & Analysis Request Form

AECOM

AECOM - Melbourne
Level 9, 8 Exhibition Street
Melbourne VIC 3000
Tel: 03 9653 8072
Fax: 61 3 9653 1234
Email: averyll.coyne@aecom.com

Laboratory Details

Lab. Name: ALS
Lab. Address: 4 Westall Rd, Springvale
Contact Name:
Lab. Ref:
Tel: 8549 9600
Fax:
Preliminary Report by:
Final Report by:
Lab Quote No:

Project Name: Fishermans Bend
Project Number: 60431087
Purchase Order Number: NA

Sample collected by: Zach O'Connor and Oliver Taylor
Sample Results to be returned to: Averyll Coyne

Specifications:

	(Tick)		
1. Urgent TAT required? (please circle: 24hr 48hr ___3___days)	☐ Yes	☑ No	☐ N/A
2. Fast TAT Guarantee Required?	☐ Yes	☑ No	☐ N/A
3. Is any sediment layer present in waters to be excluded from extractions?	☐ Yes	☑ No	☐ N/A
4. Special storage requirements?	☐ Yes	☑ No	☐ N/A
5. Preservation requirements?	☐ Yes	☑ No	☐ N/A
6. Other requirements? ☐ Fax ☐ Hard copy ☐ Email	☑ Yes	☐ No	☐ N/A

7. Report Format: email with QC reports
8. Project Manager: Averyll Coyne tel: 9653 8072

Quote No. ME-543-15

Note: Please analyse for Al, Fe, Se and Mn in EG020F

Lab. ID	Sample ID	Sampling Date & time (on)	Sampling Date & Time (off)	Matrix: soil	Matrix: water	Matrix: other	Preservation: filt'ed	Preservation: acid	Preservation: ice	Preservation: other	Container (No. & type)	Analysis Request: EA005, EA01H	NT-1, NT-2, EK055G, NT-3, W-2F, EG020F, ED043	EP005	W-4	W-7	EP074A-G-WF	TRH(C6-C9) / BTEXN								Comments
1 (12)	GW04	19/11/2015			x				x			x	x			x	x									W-7: Please exclude BTEXN from W-7 as it is in EP074A-G-WF
2 (2)	GW09	19/11/2015			x				x			x	x			x										
3 (3)	GW07	19/11/2015			x				x			x	x			x										
4 (4)	GW03	19/11/2015			x				x			x	x			x										
5 (5)	GW11	19/11/2015			x				x			x	x			x										
6 (6)	GW08	19/11/2015			x				x			x	x			x										
7 (7)	GW12	19/11/2015			x				x			x	x			x	x									W-7: Please exclude BTEXN from W-7 as it is in EP074A-G-WF
8 (8)	GW32	19/11/2015			x				x			x	x													
9 9	GW20	19/11/2015			x				x					x				x								
10 10	GW26	19/11/2015			x				x					x				x								
11 11	GW31	19/11/2015			x				x					x				x								
12 12	GW33	19/11/2015			x				x					x				x								
13 13	GW34	19/11/2015			x				x					x				x								
14 14	GW37	19/11/2015			x				x					x				x								
15 15	QCK	19/11/2015			x				x						x											
16 15	QCL	19/11/2015			x				x																	On hold
17 17	QCM	19/11/2015			x				x						x											

Relinquished By:	**Received by:**	Received in good condition?	Yes/No/NA	Method of Shipment	
Name: Zach O and Oliver T Date: 20/11/2015	Name: Date: 20/11	Samples received chilled?	Yes/No/NA	Consignment Note No.	
of: AECOM Time:9:00	of: ALS Time: 1631		Yes/No/NA	Transport Co:	
Relinquished By:	**Received by:**	Received in good condition?	Yes/No/NA	Method of Shipment	
Name: Date:	Name: Date:	Samples received chilled?	Yes/No/NA	Consignment Note No.	
of: Time:	of: Time:		Yes/No/NA	Transport Co:	

Printed copies of this document are uncontrolled
Page 1 of 1

Environment

UB 24/11

Revision: Oct 09
BMS-PM-DV-F046

Samantha Smith

From: Carol Walsh
Sent: Monday, 30 November 2015 11:27 AM
To: Samples Melbourne
Subject: SAMPLE ID CHANGE and ADD ANALYSIS - WO Info-EM1517384-AECOMAU

Importance: High

Please action request below.
Thanks

Carol

From: O'Connor, Zachary [mailto:Zachary.OConnor@aecom.com]
Sent: Monday, 30 November 2015 11:23 AM
To: Carol Walsh; Sheppard, Matthew
Subject: RE: WO Info-EM1517384-AECOMAU

Hi Carol,

Could you please change the Sample ID's according to the below:

- QCK → change to QCQ
- QCL → change to QCR

Please analyse both of these for TRH, BTEX and Metals

Cheers,
Zach.

Zach O'Connor
Graduate Environmental Engineer
D +61 3 9653 8016
Zachary.OConnor@aecom.com

AECOM
Level 9, 8 Exhibition Street, Melbourne, VIC 3000
T +61 3 9653 1234 F +61 3 9654 7117
aecom.com

From: Carol Walsh [mailto:Carol.Walsh@alsglobal.com]
Sent: Tuesday, 24 November 2015 1:31 PM
To: Sheppard, Matthew
Subject: FW: WO Info-EM1517384-AECOMAU

Sent: Tuesday, 24 November 2015 12:33 PM
To: averyll.coyne@aecom.com; 'O'Connor, Zachary'; 'Taylor, Oliver'
Subject: WO Info-EM1517384-AECOMAU

Averyll,

A couple of issues with samples received in EM1517384.

For Samples 015 (QCK) & 016 (QCL) we have received unspecified metals bottles.

No analysis has been requested for 016, and 015 only requires TPH/BTEX.

Just wondering if any metals analysis is required on either of these samples.

For sample 017 (QCM) we only received 1 x vial – so we have booked W18 (V-TPH/BTEX).

Kind Regards

Carol Walsh

Senior Client Services Officer
ALS | Environmental Division

4 Westall Road
Springvale VIC 3171 Australia

T +61 3 8549 9600
F +61 3 8549 9626

www.alsglobal.com

We are keen for your feedback! Please click here for your 1 question survey

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EnviroMail™ 00 - Summary of all EnviroMails™ by Category

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Andrew Matheson

From: Carol Walsh
Sent: Friday, 20 November 2015 10:06 AM
To: Samples Melbourne
Subject: COC FOR AECOM SAMPLES RECEIVED YESTERDAY - FBURA GW COC3
Attachments: 60431087 COC3A.pdf

From: Coyne, Averyll [mailto:Averyll.Coyne@aecom.com]
Sent: Friday, 20 November 2015 10:03 AM
To: Carol Walsh
Cc: O'Connor, Zachary
Subject: FBURA GW COC3

Hi Carol,

Please find attached the COC for groundwater samples collected at FBURA yesterday.

Kind Regards
Averyll

Averyll Coyne
Principal Environmental Scientist
D +61 3 9653 8072 M +61 499 252 502
Averyll.Coyne@aecom.com

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ALS Environmental

CERTIFICATE OF ANALYSIS

Work Order	: **EM1517387**	Page	: 1 of 17
Client	: **AECOM Australia Pty Ltd**	Laboratory	: Environmental Division Melbourne
Contact	: MS AVERYLL COYNE	Contact	: Carol Walsh
Address	: LEVEL 9 8 EXHIBITION ST MELBOURNE VIC 3000	Address	: 4 Westall Rd Springvale VIC Australia 3171
E-mail	: averyll.coyne@aecom.com	E-mail	: carol.walsh@alsglobal.com
Telephone	: +61 03 9653 1234	Telephone	: +61-3-8549 9608
Facsimile	: +61 03 9654 7117	Facsimile	: +61-3-8549 9601
Project	: 60431087	QC Level	: NEPM 2013 B3 & ALS QC Standard
Order number	: 60431087 1.4	Date Samples Received	: 20-Nov-2015 16:35
C-O-C number	: ----	Date Analysis Commenced	: 20-Nov-2015
Sampler	: OLIVER TAYLOR, ZACHARY OCONNOR	Issue Date	: 30-Nov-2015 12:56
Site	:		
		No. of samples received	: 11
Quote number	: ----	No. of samples analysed	: 10

This report supersedes any previous report(s) with this reference. Results apply to the sample(s) as submitted.

This Certificate of Analysis contains the following information:

- General Comments
- Analytical Results

NATA Accredited Laboratory 825

Accredited for compliance with ISO/IEC 17025.

Signatories

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

Signatories	*Position*	*Accreditation Category*
Dilani Fernando	Senior Inorganic Chemist	Melbourne Inorganics
Eric Chau	Metals Team Leader	Melbourne Inorganics
Xing Lin	Senior Organic Chemist	Melbourne Organics

General Comments

The analytical procedures used by the Environmental Division have been developed from established internationally recognized procedures such as those published by the USEPA, APHA, AS and NEPM. In house developed procedures are employed in the absence of documented standards or by 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.

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.

- Sample QC05 was filtered through a 0.45um filter prior to the dissolved metals analysis.
- Ionic balances were calculated using: major anions - chloride, alkalinity and sulfate; and major cations - calcium, magnesium, potassium and sodium.
- Ionic balances were calculated using: major anions - chloride, alkalinity, sulfate; and major cations - calcium, magnesium, potassium, sodium and ammonia #1 and #2
- ED045G: The presence of thiocyanate can positively contribute to the chloride result, thereby may bias results higher than expected. Results should be scrutinised accordingly.
- EP080: Particular samples EM-1517387-001 shows minor BTEX results. Confirmed by re-analysis.
- Benzo(a)pyrene Toxicity Equivalent Quotient (TEQ) 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.

Analytical Results

Sub-Matrix: GROUNDWATER (Matrix: WATER)				Client sample ID	GW01	GW02	GW06	GW05	GW13
				Client sampling date / time	[20-Nov-2015]	[20-Nov-2015]	[20-Nov-2015]	[20-Nov-2015]	[20-Nov-2015]
Compound	CAS Number	LOR	Unit		EM1517387-001	EM1517387-002	EM1517387-003	EM1517387-004	EM1517387-005
					Result	Result	Result	Result	Result
EA005P: pH by PC Titrator									
pH Value	----	0.01	pH Unit		7.33	6.85	6.63	----	----
EA015: Total Dissolved Solids dried at 180 ± 5 °C									
Total Dissolved Solids @180°C	----	10	mg/L		2960	1910	1550	----	----
ED037P: Alkalinity by PC Titrator									
Hydroxide Alkalinity as CaCO3	DMO-210-001	1	mg/L		<1	<1	<1	----	----
Carbonate Alkalinity as CaCO3	3812-32-6	1	mg/L		<1	<1	<1	----	----
Bicarbonate Alkalinity as CaCO3	71-52-3	1	mg/L		1740	1470	871	----	----
Total Alkalinity as CaCO3	----	1	mg/L		1740	1470	871	----	----
ED041G: Sulfate (Turbidimetric) as SO4 2- by DA									
Sulfate as SO4 - Turbidimetric	14808-79-8	1	mg/L		<1	16	405	----	----
ED043: Total Oxidised Sulfur as SO4 2-									
Total Oxidised Sulfur as SO4 2-	----	1	mg/L		12	19	371	----	----
ED045G: Chloride by Discrete Analyser									
Chloride	16887-00-6	1	mg/L		815	307	203	----	----
ED093F: Dissolved Major Cations									
Calcium	7440-70-2	1	mg/L		42	69	252	----	----
Magnesium	7439-95-4	1	mg/L		92	81	76	----	----
Sodium	7440-23-5	1	mg/L		740	443	214	----	----
Potassium	7440-09-7	1	mg/L		162	44	39	----	----
EG020F: Dissolved Metals by ICP-MS									
Aluminium	7429-90-5	0.01	mg/L		0.01	<0.01	0.03	----	----
Arsenic	7440-38-2	0.001	mg/L		0.003	0.003	0.050	----	----
Cadmium	7440-43-9	0.0001	mg/L		<0.0001	<0.0001	<0.0001	----	----
Chromium	7440-47-3	0.001	mg/L		0.005	0.004	0.002	----	----
Copper	7440-50-8	0.001	mg/L		<0.001	<0.001	<0.001	----	----
Nickel	7440-02-0	0.001	mg/L		0.028	0.052	0.011	----	----
Lead	7439-92-1	0.001	mg/L		<0.001	<0.001	<0.001	----	----
Zinc	7440-66-6	0.005	mg/L		0.009	<0.005	0.014	----	----
Manganese	7439-96-5	0.001	mg/L		0.040	0.092	0.671	----	----
Selenium	7782-49-2	0.01	mg/L		<0.01	<0.01	<0.01	----	----
Iron	7439-89-6	0.05	mg/L		7.57	13.6	35.6	----	----
EG035F: Dissolved Mercury by FIMS									
Mercury	7439-97-6	0.0001	mg/L		<0.0001	<0.0001	<0.0001	----	----
EK040P: Fluoride by PC Titrator									

Analytical Results

Sub-Matrix: GROUNDWATER (Matrix: WATER)				Client sample ID	GW01	GW02	GW06	GW05	GW13
				Client sampling date / time	[20-Nov-2015]	[20-Nov-2015]	[20-Nov-2015]	[20-Nov-2015]	[20-Nov-2015]
Compound	CAS Number	LOR	Unit		EM1517387-001	EM1517387-002	EM1517387-003	EM1517387-004	EM1517387-005
					Result	Result	Result	Result	Result
EK040P: Fluoride by PC Titrator - Continued									
Fluoride	16984-48-8	0.1	mg/L		0.4	0.5	0.3	----	----
EK055G: Ammonia as N by Discrete Analyser									
Ammonia as N	7664-41-7	0.01	mg/L		106	78.1	14.6	----	----
EK057G: Nitrite as N by Discrete Analyser									
Nitrite as N	14797-65-0	0.01	mg/L		<0.01	<0.01	<0.01	----	----
EK058G: Nitrate as N by Discrete Analyser									
Nitrate as N	14797-55-8	0.01	mg/L		0.02	0.10	0.01	----	----
EK059G: Nitrite plus Nitrate as N (NOx) by Discrete Analyser									
Nitrite + Nitrate as N	----	0.01	mg/L		0.02	0.10	0.01	----	----
EK071G: Reactive Phosphorus as P by discrete analyser									
Reactive Phosphorus as P	14265-44-2	0.01	mg/L		0.03	<0.01	<0.01	----	----
EN055: Ionic Balance									
Total Anions	----	0.01	meq/L		57.8	38.4	31.6	----	----
Total Cations	----	0.01	meq/L		53.6	36.1	----	----	----
Total Cations	----	0.01	meq/L		----	----	29.1	----	----
Ionic Balance	----	0.01	%		3.78	3.10	----	----	----
Ionic Balance	----	0.01	%		----	----	3.99	----	----
EP005: Total Organic Carbon (TOC)									
Total Organic Carbon	----	1	mg/L		52	40	35	17	6
EP074A: Monocyclic Aromatic Hydrocarbons									
Benzene	71-43-2	1	µg/L		2	<1	----	----	----
Toluene	108-88-3	1	µg/L		4	<1	----	----	----
Ethylbenzene	100-41-4	1	µg/L		<1	<1	----	----	----
meta- & para-Xylene	108-38-3 106-42-3	1	µg/L		2	<1	----	----	----
Styrene	100-42-5	1	µg/L		<1	<1	----	----	----
ortho-Xylene	95-47-6	1	µg/L		<1	<1	----	----	----
Isopropylbenzene	98-82-8	1	µg/L		1	3	----	----	----
n-Propylbenzene	103-65-1	1	µg/L		<1	3	----	----	----
1.3.5-Trimethylbenzene	108-67-8	1	µg/L		<1	<1	----	----	----
sec-Butylbenzene	135-98-8	1	µg/L		<1	<1	----	----	----
1.2.4-Trimethylbenzene	95-63-6	1	µg/L		2	<1	----	----	----
tert-Butylbenzene	98-06-6	1	µg/L		<1	<1	----	----	----
p-Isopropyltoluene	99-87-6	1	µg/L		<1	2	----	----	----
n-Butylbenzene	104-51-8	1	µg/L		<1	<1	----	----	----

Analytical Results

Sub-Matrix: GROUNDWATER (Matrix: WATER)				Client sample ID	GW01	GW02	GW06	GW05	GW13
				Client sampling date / time	[20-Nov-2015]	[20-Nov-2015]	[20-Nov-2015]	[20-Nov-2015]	[20-Nov-2015]
Compound	CAS Number	LOR	Unit		EM1517387-001	EM1517387-002	EM1517387-003	EM1517387-004	EM1517387-005
					Result	Result	Result	Result	Result
EP074B: Oxygenated Compounds									
2-Propanone (Acetone)	67-64-1	10	µg/L		<10	<10	----	----	----
Vinyl Acetate	108-05-4	10	µg/L		<10	<10	----	----	----
2-Butanone (MEK)	78-93-3	10	µg/L		<10	<10	----	----	----
4-Methyl-2-pentanone (MIBK)	108-10-1	10	µg/L		<10	<10	----	----	----
2-Hexanone (MBK)	591-78-6	10	µg/L		<10	<10	----	----	----
EP074C: Sulfonated Compounds									
Carbon disulfide	75-15-0	1	µg/L		<1	<1	----	----	----
EP074D: Fumigants									
2.2-Dichloropropane	594-20-7	1	µg/L		<1	<1	----	----	----
1.2-Dichloropropane	78-87-5	1	µg/L		<1	<1	----	----	----
cis-1.3-Dichloropropylene	10061-01-5	2	µg/L		<2	<2	----	----	----
trans-1.3-Dichloropropylene	10061-02-6	2	µg/L		<2	<2	----	----	----
1.2-Dibromoethane (EDB)	106-93-4	1	µg/L		<1	<1	----	----	----
EP074E: Halogenated Aliphatic Compounds									
Dichlorodifluoromethane	75-71-8	10	µg/L		<10	<10	----	----	----
Chloromethane	74-87-3	10	µg/L		<10	<10	----	----	----
Vinyl chloride	75-01-4	10	µg/L		<10.0	<10.0	----	----	----
Bromomethane	74-83-9	10	µg/L		<10	<10	----	----	----
Chloroethane	75-00-3	10	µg/L		<10	<10	----	----	----
Trichlorofluoromethane	75-69-4	10	µg/L		<10	<10	----	----	----
1.1-Dichloroethene	75-35-4	1	µg/L		<1	<1	----	----	----
Iodomethane	74-88-4	1	µg/L		<1	<1	----	----	----
Methylene chloride	75-09-2	5	µg/L		<5	<5	----	----	----
trans-1.2-Dichloroethene	156-60-5	1	µg/L		<1	<1	----	----	----
1.1-Dichloroethane	75-34-3	1	µg/L		<1	<1	----	----	----
cis-1.2-Dichloroethene	156-59-2	1	µg/L		<1	<1	----	----	----
1.1.1-Trichloroethane	71-55-6	1	µg/L		<1	<1	----	----	----
1.1-Dichloropropylene	563-58-6	1	µg/L		<1	<1	----	----	----
Carbon Tetrachloride	56-23-5	1	µg/L		<1	<1	----	----	----
1.2-Dichloroethane	107-06-2	1	µg/L		<1	<1	----	----	----
Trichloroethene	79-01-6	1	µg/L		<1	<1	----	----	----
Dibromomethane	74-95-3	1	µg/L		<1	<1	----	----	----
1.1.2-Trichloroethane	79-00-5	1	µg/L		<1	<1	----	----	----
1.3-Dichloropropane	142-28-9	1	µg/L		<1	<1	----	----	----

Analytical Results

Sub-Matrix: GROUNDWATER (Matrix: WATER)				Client sample ID	GW01	GW02	GW06	GW05	GW13
				Client sampling date / time	[20-Nov-2015]	[20-Nov-2015]	[20-Nov-2015]	[20-Nov-2015]	[20-Nov-2015]
Compound	CAS Number	LOR	Unit		EM1517387-001	EM1517387-002	EM1517387-003	EM1517387-004	EM1517387-005
					Result	Result	Result	Result	Result
EP074E: Halogenated Aliphatic Compounds - Continued									
Tetrachloroethene	127-18-4	1	µg/L		<1	<1	----	----	----
1.1.1.2-Tetrachloroethane	630-20-6	1	µg/L		<1	<1	----	----	----
trans-1.4-Dichloro-2-butene	110-57-6	1	µg/L		<1	<1	----	----	----
cis-1.4-Dichloro-2-butene	1476-11-5	1	µg/L		<1	<1	----	----	----
1.1.2.2-Tetrachloroethane	79-34-5	1	µg/L		<1	<1	----	----	----
1.2.3-Trichloropropane	96-18-4	1	µg/L		<1	<1	----	----	----
Pentachloroethane	76-01-7	1	µg/L		<1	<1	----	----	----
1.2-Dibromo-3-chloropropane	96-12-8	1	µg/L		<1	<1	----	----	----
Hexachlorobutadiene	87-68-3	1	µg/L		<1.0	<1.0	----	----	----
EP074F: Halogenated Aromatic Compounds									
Chlorobenzene	108-90-7	1	µg/L		**3**	**22**	----	----	----
Bromobenzene	108-86-1	1	µg/L		<1	<1	----	----	----
2-Chlorotoluene	95-49-8	1	µg/L		<1	<1	----	----	----
4-Chlorotoluene	106-43-4	1	µg/L		<1	<1	----	----	----
1.3-Dichlorobenzene	541-73-1	1	µg/L		<1	<1	----	----	----
1.4-Dichlorobenzene	106-46-7	1	µg/L		**1.1**	**3.4**	----	----	----
1.2-Dichlorobenzene	95-50-1	1	µg/L		<1	<1	----	----	----
1.2.4-Trichlorobenzene	120-82-1	1	µg/L		<1	<1	----	----	----
1.2.3-Trichlorobenzene	87-61-6	1	µg/L		<1	<1	----	----	----
EP074G: Trihalomethanes									
Chloroform	67-66-3	1	µg/L		<1	<1	----	----	----
Bromodichloromethane	75-27-4	1	µg/L		<1	<1	----	----	----
Dibromochloromethane	124-48-1	1	µg/L		<1	<1	----	----	----
Bromoform	75-25-2	1	µg/L		<1	<1	----	----	----
EP074H: Naphthalene									
Naphthalene	91-20-3	5	µg/L		<5	<5	----	----	----
EP075(SIM)B: Polynuclear Aromatic Hydrocarbons									
Naphthalene	91-20-3	1	µg/L		<1.0	<1.0	<1.0	----	----
Acenaphthylene	208-96-8	1	µg/L		<1.0	<1.0	<1.0	----	----
Acenaphthene	83-32-9	1	µg/L		<1.0	<1.0	<1.0	----	----
Fluorene	86-73-7	1	µg/L		<1.0	<1.0	<1.0	----	----
Phenanthrene	85-01-8	1	µg/L		<1.0	<1.0	<1.0	----	----
Anthracene	120-12-7	1	µg/L		<1.0	<1.0	<1.0	----	----
Fluoranthene	206-44-0	1	µg/L		<1.0	<1.0	<1.0	----	----

Analytical Results

Sub-Matrix: GROUNDWATER (Matrix: WATER)				Client sample ID	GW01	GW02	GW06	GW05	GW13
				Client sampling date / time	[20-Nov-2015]	[20-Nov-2015]	[20-Nov-2015]	[20-Nov-2015]	[20-Nov-2015]
Compound	CAS Number	LOR	Unit		EM1517387-001	EM1517387-002	EM1517387-003	EM1517387-004	EM1517387-005
					Result	Result	Result	Result	Result
EP075(SIM)B: Polynuclear Aromatic Hydrocarbons - Continued									
Pyrene	129-00-0	1	µg/L		<1.0	<1.0	<1.0	----	----
Benz(a)anthracene	56-55-3	1	µg/L		<1.0	<1.0	<1.0	----	----
Chrysene	218-01-9	1	µg/L		<1.0	<1.0	<1.0	----	----
Benzo(b+j)fluoranthene	205-99-2 205-82-3	1	µg/L		<1.0	<1.0	<1.0	----	----
Benzo(k)fluoranthene	207-08-9	1	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	µg/L		<1.0	<1.0	<1.0	----	----
Dibenz(a.h)anthracene	53-70-3	1	µg/L		<1.0	<1.0	<1.0	----	----
Benzo(g.h.i)perylene	191-24-2	1	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	**40**	<20	<20	<20
C10 - C14 Fraction	----	50	µg/L		**160**	**200**	<50	----	----
C15 - C28 Fraction	----	100	µg/L		**410**	**500**	<100	----	----
C29 - C36 Fraction	----	50	µg/L		**70**	<50	<50	----	----
^ C10 - C36 Fraction (sum)	----	50	µg/L		**640**	**700**	<50	----	----
EP080/071: Total Recoverable Hydrocarbons - NEPM 2013 Fractions									
C6 - C10 Fraction	C6_C10	20	µg/L		<20	**30**	<20	<20	<20
^ C6 - C10 Fraction minus BTEX (F1)	C6_C10-BTEX	20	µg/L		<20	**30**	<20	<20	<20
>C10 - C16 Fraction	----	100	µg/L		**190**	**270**	<100	----	----
>C16 - C34 Fraction	----	100	µg/L		**400**	**420**	<100	----	----
>C34 - C40 Fraction	----	100	µg/L		<100	<100	<100	----	----
^ >C10 - C40 Fraction (sum)	----	100	µg/L		**590**	**690**	<100	----	----
^ >C10 - C16 Fraction minus Naphthalene (F2)	----	100	µg/L		**190**	**270**	<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	1330-20-7	2	µg/L		----	----	<2	<2	<2
^ Sum of BTEX	----	1	µg/L		----	----	<1	<1	<1

Analytical Results

Sub-Matrix: GROUNDWATER (Matrix: WATER)				Client sample ID	GW01	GW02	GW06	GW05	GW13
				Client sampling date / time	[20-Nov-2015]	[20-Nov-2015]	[20-Nov-2015]	[20-Nov-2015]	[20-Nov-2015]
Compound	CAS Number	LOR	Unit		EM1517387-001	EM1517387-002	EM1517387-003	EM1517387-004	EM1517387-005
					Result	Result	Result	Result	Result
EP080: BTEXN - Continued									
Naphthalene	91-20-3	5	µg/L		----	----	<5	<5	<5
EP074S: VOC Surrogates									
1.2-Dichloroethane-D4	17060-07-0	1	%		113	122	----	----	----
Toluene-D8	2037-26-5	1	%		124	128	----	----	----
4-Bromofluorobenzene	460-00-4	1	%		104	105	----	----	----
EP075(SIM)S: Phenolic Compound Surrogates									
Phenol-d6	13127-88-3	1	%		23.4	23.2	30.6	----	----
2-Chlorophenol-D4	93951-73-6	1	%		48.0	45.1	61.1	----	----
2.4.6-Tribromophenol	118-79-6	1	%		43.1	51.6	51.2	----	----
EP075(SIM)T: PAH Surrogates									
2-Fluorobiphenyl	321-60-8	1	%		51.6	56.1	70.5	----	----
Anthracene-d10	1719-06-8	1	%		68.3	73.0	89.3	----	----
4-Terphenyl-d14	1718-51-0	1	%		66.2	76.2	84.2	----	----
EP080S: TPH(V)/BTEX Surrogates									
1.2-Dichloroethane-D4	17060-07-0	2	%		110	119	109	116	117
Toluene-D8	2037-26-5	2	%		110	113	91.0	91.2	96.9
4-Bromofluorobenzene	460-00-4	2	%		99.6	101	93.0	97.1	100

Analytical Results

Sub-Matrix: GROUNDWATER (Matrix: WATER)				Client sample ID	GW19	GW35	----	----	----
				Client sampling date / time	[20-Nov-2015]	[20-Nov-2015]	----	----	----
Compound	CAS Number	LOR	Unit		EM1517387-006	EM1517387-007	--------	--------	--------
					Result	Result	Result	Result	Result
EA005P: pH by PC Titrator									
pH Value	----	0.01	pH Unit		----	----	----	----	----
EA015: Total Dissolved Solids dried at 180 ± 5 °C									
Total Dissolved Solids @180°C	----	10	mg/L		----	----	----	----	----
ED037P: Alkalinity by PC Titrator									
Hydroxide Alkalinity as CaCO3	DMO-210-001	1	mg/L		----	----	----	----	----
Carbonate Alkalinity as CaCO3	3812-32-6	1	mg/L		----	----	----	----	----
Bicarbonate Alkalinity as CaCO3	71-52-3	1	mg/L		----	----	----	----	----
Total Alkalinity as CaCO3	----	1	mg/L		----	----	----	----	----
ED041G: Sulfate (Turbidimetric) as SO4 2- by DA									
Sulfate as SO4 - Turbidimetric	14808-79-8	1	mg/L		----	----	----	----	----
ED043: Total Oxidised Sulfur as SO4 2-									
Total Oxidised Sulfur as SO4 2-	----	1	mg/L		----	----	----	----	----
ED045G: Chloride by Discrete Analyser									
Chloride	16887-00-6	1	mg/L		----	----	----	----	----
ED093F: Dissolved Major Cations									
Calcium	7440-70-2	1	mg/L		----	----	----	----	----
Magnesium	7439-95-4	1	mg/L		----	----	----	----	----
Sodium	7440-23-5	1	mg/L		----	----	----	----	----
Potassium	7440-09-7	1	mg/L		----	----	----	----	----
EG020F: Dissolved Metals by ICP-MS									
Aluminium	7429-90-5	0.01	mg/L		----	----	----	----	----
Arsenic	7440-38-2	0.001	mg/L		----	----	----	----	----
Cadmium	7440-43-9	0.0001	mg/L		----	----	----	----	----
Chromium	7440-47-3	0.001	mg/L		----	----	----	----	----
Copper	7440-50-8	0.001	mg/L		----	----	----	----	----
Nickel	7440-02-0	0.001	mg/L		----	----	----	----	----
Lead	7439-92-1	0.001	mg/L		----	----	----	----	----
Zinc	7440-66-6	0.005	mg/L		----	----	----	----	----
Manganese	7439-96-5	0.001	mg/L		----	----	----	----	----
Selenium	7782-49-2	0.01	mg/L		----	----	----	----	----
Iron	7439-89-6	0.05	mg/L		----	----	----	----	----
EG035F: Dissolved Mercury by FIMS									
Mercury	7439-97-6	0.0001	mg/L		----	----	----	----	----
EK040P: Fluoride by PC Titrator									

Analytical Results

Sub-Matrix: GROUNDWATER (Matrix: WATER)				Client sample ID	GW19	GW35	----	----	----
				Client sampling date / time	[20-Nov-2015]	[20-Nov-2015]	----	----	----
Compound	CAS Number	LOR	Unit		EM1517387-006	EM1517387-007	--------	--------	--------
					Result	Result	Result	Result	Result
EK040P: Fluoride by PC Titrator - Continued									
Fluoride	16984-48-8	0.1	mg/L		----	----	----	----	----
EK055G: Ammonia as N by Discrete Analyser									
Ammonia as N	7664-41-7	0.01	mg/L		----	----	----	----	----
EK057G: Nitrite as N by Discrete Analyser									
Nitrite as N	14797-65-0	0.01	mg/L		----	----	----	----	----
EK058G: Nitrate as N by Discrete Analyser									
Nitrate as N	14797-55-8	0.01	mg/L		----	----	----	----	----
EK059G: Nitrite plus Nitrate as N (NOx) by Discrete Analyser									
Nitrite + Nitrate as N	----	0.01	mg/L		----	----	----	----	----
EK071G: Reactive Phosphorus as P by discrete analyser									
Reactive Phosphorus as P	14265-44-2	0.01	mg/L		----	----	----	----	----
EN055: Ionic Balance									
Total Anions	----	0.01	meq/L		----	----	----	----	----
Total Cations	----	0.01	meq/L		----	----	----	----	----
Total Cations	----	0.01	meq/L		----	----	----	----	----
Ionic Balance	----	0.01	%		----	----	----	----	----
Ionic Balance	----	0.01	%		----	----	----	----	----
EP005: Total Organic Carbon (TOC)									
Total Organic Carbon	----	1	mg/L		183	26	----	----	----
EP074A: Monocyclic Aromatic Hydrocarbons									
Benzene	71-43-2	1	µg/L		----	----	----	----	----
Toluene	108-88-3	1	µg/L		----	----	----	----	----
Ethylbenzene	100-41-4	1	µg/L		----	----	----	----	----
meta- & para-Xylene	108-38-3 106-42-3	1	µg/L		----	----	----	----	----
Styrene	100-42-5	1	µg/L		----	----	----	----	----
ortho-Xylene	95-47-6	1	µg/L		----	----	----	----	----
Isopropylbenzene	98-82-8	1	µg/L		----	----	----	----	----
n-Propylbenzene	103-65-1	1	µg/L		----	----	----	----	----
1.3.5-Trimethylbenzene	108-67-8	1	µg/L		----	----	----	----	----
sec-Butylbenzene	135-98-8	1	µg/L		----	----	----	----	----
1.2.4-Trimethylbenzene	95-63-6	1	µg/L		----	----	----	----	----
tert-Butylbenzene	98-06-6	1	µg/L		----	----	----	----	----
p-Isopropyltoluene	99-87-6	1	µg/L		----	----	----	----	----
n-Butylbenzene	104-51-8	1	µg/L		----	----	----	----	----

Analytical Results

Sub-Matrix: GROUNDWATER (Matrix: WATER)				Client sample ID	GW19	GW35	----	----	----
				Client sampling date / time	[20-Nov-2015]	[20-Nov-2015]	----	----	----
Compound	CAS Number	LOR	Unit		EM1517387-006	EM1517387-007	--------	--------	--------
					Result	Result	Result	Result	Result
EP074B: Oxygenated Compounds									
2-Propanone (Acetone)	67-64-1	10	µg/L		----	----	----	----	----
Vinyl Acetate	108-05-4	10	µg/L		----	----	----	----	----
2-Butanone (MEK)	78-93-3	10	µg/L		----	----	----	----	----
4-Methyl-2-pentanone (MIBK)	108-10-1	10	µg/L		----	----	----	----	----
2-Hexanone (MBK)	591-78-6	10	µg/L		----	----	----	----	----
EP074C: Sulfonated Compounds									
Carbon disulfide	75-15-0	1	µg/L		----	----	----	----	----
EP074D: Fumigants									
2.2-Dichloropropane	594-20-7	1	µg/L		----	----	----	----	----
1.2-Dichloropropane	78-87-5	1	µg/L		----	----	----	----	----
cis-1.3-Dichloropropylene	10061-01-5	2	µg/L		----	----	----	----	----
trans-1.3-Dichloropropylene	10061-02-6	2	µg/L		----	----	----	----	----
1.2-Dibromoethane (EDB)	106-93-4	1	µg/L		----	----	----	----	----
EP074E: Halogenated Aliphatic Compounds									
Dichlorodifluoromethane	75-71-8	10	µg/L		----	----	----	----	----
Chloromethane	74-87-3	10	µg/L		----	----	----	----	----
Vinyl chloride	75-01-4	10	µg/L		----	----	----	----	----
Bromomethane	74-83-9	10	µg/L		----	----	----	----	----
Chloroethane	75-00-3	10	µg/L		----	----	----	----	----
Trichlorofluoromethane	75-69-4	10	µg/L		----	----	----	----	----
1.1-Dichloroethene	75-35-4	1	µg/L		----	----	----	----	----
Iodomethane	74-88-4	1	µg/L		----	----	----	----	----
Methylene chloride	75-09-2	5	µg/L		----	----	----	----	----
trans-1.2-Dichloroethene	156-60-5	1	µg/L		----	----	----	----	----
1.1-Dichloroethane	75-34-3	1	µg/L		----	----	----	----	----
cis-1.2-Dichloroethene	156-59-2	1	µg/L		----	----	----	----	----
1.1.1-Trichloroethane	71-55-6	1	µg/L		----	----	----	----	----
1.1-Dichloropropylene	563-58-6	1	µg/L		----	----	----	----	----
Carbon Tetrachloride	56-23-5	1	µg/L		----	----	----	----	----
1.2-Dichloroethane	107-06-2	1	µg/L		----	----	----	----	----
Trichloroethene	79-01-6	1	µg/L		----	----	----	----	----
Dibromomethane	74-95-3	1	µg/L		----	----	----	----	----
1.1.2-Trichloroethane	79-00-5	1	µg/L		----	----	----	----	----
1.3-Dichloropropane	142-28-9	1	µg/L		----	----	----	----	----

Analytical Results

Sub-Matrix: GROUNDWATER (Matrix: WATER)				Client sample ID	GW19	GW35	----	----	----
				Client sampling date / time	[20-Nov-2015]	[20-Nov-2015]	----	----	----
Compound	CAS Number	LOR	Unit		EM1517387-006	EM1517387-007	--------	--------	--------
					Result	Result	Result	Result	Result
EP074E: Halogenated Aliphatic Compounds - Continued									
Tetrachloroethene	127-18-4	1	µg/L		----	----	----	----	----
1.1.1.2-Tetrachloroethane	630-20-6	1	µg/L		----	----	----	----	----
trans-1.4-Dichloro-2-butene	110-57-6	1	µg/L		----	----	----	----	----
cis-1.4-Dichloro-2-butene	1476-11-5	1	µg/L		----	----	----	----	----
1.1.2.2-Tetrachloroethane	79-34-5	1	µg/L		----	----	----	----	----
1.2.3-Trichloropropane	96-18-4	1	µg/L		----	----	----	----	----
Pentachloroethane	76-01-7	1	µg/L		----	----	----	----	----
1.2-Dibromo-3-chloropropane	96-12-8	1	µg/L		----	----	----	----	----
Hexachlorobutadiene	87-68-3	1	µg/L		----	----	----	----	----
EP074F: Halogenated Aromatic Compounds									
Chlorobenzene	108-90-7	1	µg/L		----	----	----	----	----
Bromobenzene	108-86-1	1	µg/L		----	----	----	----	----
2-Chlorotoluene	95-49-8	1	µg/L		----	----	----	----	----
4-Chlorotoluene	106-43-4	1	µg/L		----	----	----	----	----
1.3-Dichlorobenzene	541-73-1	1	µg/L		----	----	----	----	----
1.4-Dichlorobenzene	106-46-7	1	µg/L		----	----	----	----	----
1.2-Dichlorobenzene	95-50-1	1	µg/L		----	----	----	----	----
1.2.4-Trichlorobenzene	120-82-1	1	µg/L		----	----	----	----	----
1.2.3-Trichlorobenzene	87-61-6	1	µg/L		----	----	----	----	----
EP074G: Trihalomethanes									
Chloroform	67-66-3	1	µg/L		----	----	----	----	----
Bromodichloromethane	75-27-4	1	µg/L		----	----	----	----	----
Dibromochloromethane	124-48-1	1	µg/L		----	----	----	----	----
Bromoform	75-25-2	1	µg/L		----	----	----	----	----
EP074H: Naphthalene									
Naphthalene	91-20-3	5	µg/L		----	----	----	----	----
EP075(SIM)B: Polynuclear Aromatic Hydrocarbons									
Naphthalene	91-20-3	1	µg/L		----	----	----	----	----
Acenaphthylene	208-96-8	1	µg/L		----	----	----	----	----
Acenaphthene	83-32-9	1	µg/L		----	----	----	----	----
Fluorene	86-73-7	1	µg/L		----	----	----	----	----
Phenanthrene	85-01-8	1	µg/L		----	----	----	----	----
Anthracene	120-12-7	1	µg/L		----	----	----	----	----
Fluoranthene	206-44-0	1	µg/L		----	----	----	----	----

Analytical Results

Sub-Matrix: GROUNDWATER (Matrix: WATER)				Client sample ID	GW19	GW35	----	----	----
				Client sampling date / time	[20-Nov-2015]	[20-Nov-2015]	----	----	----
Compound	CAS Number	LOR	Unit		EM1517387-006	EM1517387-007	--------	--------	--------
					Result	Result	Result	Result	Result
EP075(SIM)B: Polynuclear Aromatic Hydrocarbons - Continued									
Pyrene	129-00-0	1	µg/L		----	----	----	----	----
Benz(a)anthracene	56-55-3	1	µg/L		----	----	----	----	----
Chrysene	218-01-9	1	µg/L		----	----	----	----	----
Benzo(b+j)fluoranthene	205-99-2 205-82-3	1	µg/L		----	----	----	----	----
Benzo(k)fluoranthene	207-08-9	1	µg/L		----	----	----	----	----
Benzo(a)pyrene	50-32-8	0.5	µg/L		----	----	----	----	----
Indeno(1.2.3.cd)pyrene	193-39-5	1	µg/L		----	----	----	----	----
Dibenz(a.h)anthracene	53-70-3	1	µg/L		----	----	----	----	----
Benzo(g.h.i)perylene	191-24-2	1	µg/L		----	----	----	----	----
^ Sum of polycyclic aromatic hydrocarbons	----	0.5	µg/L		----	----	----	----	----
^ Benzo(a)pyrene TEQ (zero)	----	0.5	µg/L		----	----	----	----	----
EP080/071: Total Petroleum Hydrocarbons									
C6 - C9 Fraction	----	20	µg/L		<20	<20	----	----	----
C10 - C14 Fraction	----	50	µg/L		----	----	----	----	----
C15 - C28 Fraction	----	100	µg/L		----	----	----	----	----
C29 - C36 Fraction	----	50	µg/L		----	----	----	----	----
^ C10 - C36 Fraction (sum)	----	50	µg/L		----	----	----	----	----
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		----	----	----	----	----
>C16 - C34 Fraction	----	100	µg/L		----	----	----	----	----
>C34 - C40 Fraction	----	100	µg/L		----	----	----	----	----
^ >C10 - C40 Fraction (sum)	----	100	µg/L		----	----	----	----	----
^ >C10 - C16 Fraction minus Naphthalene (F2)	----	100	µg/L		----	----	----	----	----
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	1330-20-7	2	µg/L		<2	<2	----	----	----
^ Sum of BTEX	----	1	µg/L		<1	<1	----	----	----

Analytical Results

Sub-Matrix: GROUNDWATER (Matrix: WATER)				Client sample ID	GW19	GW35	----	----	----
				Client sampling date / time	[20-Nov-2015]	[20-Nov-2015]	----	----	----
Compound	CAS Number	LOR	Unit		EM1517387-006	EM1517387-007	--------	--------	--------
					Result	Result	Result	Result	Result
EP080: BTEXN - Continued									
Naphthalene	91-20-3	5	µg/L		<5	<5	----	----	----
EP074S: VOC Surrogates									
1.2-Dichloroethane-D4	17060-07-0	1	%		----	----	----	----	----
Toluene-D8	2037-26-5	1	%		----	----	----	----	----
4-Bromofluorobenzene	460-00-4	1	%		----	----	----	----	----
EP075(SIM)S: Phenolic Compound Surrogates									
Phenol-d6	13127-88-3	1	%		----	----	----	----	----
2-Chlorophenol-D4	93951-73-6	1	%		----	----	----	----	----
2.4.6-Tribromophenol	118-79-6	1	%		----	----	----	----	----
EP075(SIM)T: PAH Surrogates									
2-Fluorobiphenyl	321-60-8	1	%		----	----	----	----	----
Anthracene-d10	1719-06-8	1	%		----	----	----	----	----
4-Terphenyl-d14	1718-51-0	1	%		----	----	----	----	----
EP080S: TPH(V)/BTEX Surrogates									
1.2-Dichloroethane-D4	17060-07-0	2	%		**118**	**108**	----	----	----
Toluene-D8	2037-26-5	2	%		**96.8**	**87.8**	----	----	----
4-Bromofluorobenzene	460-00-4	2	%		**101**	**93.5**	----	----	----

Analytical Results

Sub-Matrix: WATER (Matrix: WATER)				Client sample ID	QCN	QC9	QC05	----	----
				Client sampling date / time	[20-Nov-2015]	[20-Nov-2015]	[20-Nov-2015]	----	----
Compound	CAS Number	LOR	Unit		EM1517387-008	EM1517387-010	EM1517387-011	--------	--------
					Result	Result	Result	Result	Result
EA005P: pH by PC Titrator									
pH Value	----	0.01	pH Unit		----	----	6.50	----	----
EA015: Total Dissolved Solids dried at 180 ± 5 °C									
Total Dissolved Solids @180°C	----	10	mg/L		----	----	3410	----	----
ED037P: Alkalinity by PC Titrator									
Hydroxide Alkalinity as CaCO3	DMO-210-001	1	mg/L		----	----	<1	----	----
Carbonate Alkalinity as CaCO3	3812-32-6	1	mg/L		----	----	<1	----	----
Bicarbonate Alkalinity as CaCO3	71-52-3	1	mg/L		----	----	473	----	----
Total Alkalinity as CaCO3	----	1	mg/L		----	----	473	----	----
ED041G: Sulfate (Turbidimetric) as SO4 2- by DA									
Sulfate as SO4 - Turbidimetric	14808-79-8	1	mg/L		----	----	1950	----	----
ED043: Total Oxidised Sulfur as SO4 2-									
Total Oxidised Sulfur as SO4 2-	----	1	mg/L		----	----	1790	----	----
ED045G: Chloride by Discrete Analyser									
Chloride	16887-00-6	1	mg/L		----	----	158	----	----
ED093F: Dissolved Major Cations									
Calcium	7440-70-2	1	mg/L		----	----	485	----	----
Magnesium	7439-95-4	1	mg/L		----	----	181	----	----
Sodium	7440-23-5	1	mg/L		----	----	393	----	----
Potassium	7440-09-7	1	mg/L		----	----	40	----	----
EG020F: Dissolved Metals by ICP-MS									
Aluminium	7429-90-5	0.01	mg/L		----	----	<0.01	----	----
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	----	----
Nickel	7440-02-0	0.001	mg/L		----	----	0.022	----	----
Lead	7439-92-1	0.001	mg/L		----	----	<0.001	----	----
Zinc	7440-66-6	0.005	mg/L		----	----	<0.005	----	----
Manganese	7439-96-5	0.001	mg/L		----	----	1.28	----	----
Selenium	7782-49-2	0.01	mg/L		----	----	<0.01	----	----
Iron	7439-89-6	0.05	mg/L		----	----	0.89	----	----
EG020T: Total Metals by ICP-MS									
Aluminium	7429-90-5	0.01	mg/L		<0.01	----	----	----	----
Arsenic	7440-38-2	0.001	mg/L		<0.001	----	----	----	----

Analytical Results

Sub-Matrix: WATER (Matrix: WATER)				Client sample ID	QCN	QC9	QC05	----	----
				Client sampling date / time	[20-Nov-2015]	[20-Nov-2015]	[20-Nov-2015]	----	----
Compound	CAS Number	LOR	Unit		EM1517387-008	EM1517387-010	EM1517387-011	--------	--------
					Result	Result	Result	Result	Result
EG020T: Total Metals by ICP-MS - Continued									
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	----	----	----	----
Nickel	7440-02-0	0.001	mg/L		<0.001	----	----	----	----
Lead	7439-92-1	0.001	mg/L		<0.001	----	----	----	----
Zinc	7440-66-6	0.005	mg/L		<0.005	----	----	----	----
Manganese	7439-96-5	0.001	mg/L		<0.001	----	----	----	----
Selenium	7782-49-2	0.01	mg/L		<0.01	----	----	----	----
Iron	7439-89-6	0.05	mg/L		<0.05	----	----	----	----
EG035F: Dissolved Mercury by FIMS									
Mercury	7439-97-6	0.0001	mg/L		----	----	<0.0001	----	----
EG035T: Total Recoverable Mercury by FIMS									
Mercury	7439-97-6	0.0001	mg/L		<0.0001	----	----	----	----
EK040P: Fluoride by PC Titrator									
Fluoride	16984-48-8	0.1	mg/L		----	----	**0.2**	----	----
EK055G: Ammonia as N by Discrete Analyser									
Ammonia as N	7664-41-7	0.01	mg/L		----	----	**7.27**	----	----
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		----	----	<0.01	----	----
EK059G: Nitrite plus Nitrate as N (NOx) by Discrete Analyser									
Nitrite + Nitrate as N	----	0.01	mg/L		----	----	<0.01	----	----
EK071G: Reactive Phosphorus as P by discrete analyser									
Reactive Phosphorus as P	14265-44-2	0.01	mg/L		----	----	<0.01	----	----
EN055: Ionic Balance									
Total Anions	----	0.01	meq/L		----	----	**54.5**	----	----
Total Cations	----	0.01	meq/L		----	----	**57.2**	----	----
Ionic Balance	----	0.01	%		----	----	**2.43**	----	----
EP080/071: Total Petroleum Hydrocarbons									
C6 - C9 Fraction	----	20	µg/L		<20	<20	----	----	----
C10 - C14 Fraction	----	50	µg/L		<50	----	----	----	----
C15 - C28 Fraction	----	100	µg/L		<100	----	----	----	----

Analytical Results

Sub-Matrix: WATER (Matrix: WATER)				Client sample ID	QCN	QC9	QC05	----	----
				Client sampling date / time	[20-Nov-2015]	[20-Nov-2015]	[20-Nov-2015]	----	----
Compound	CAS Number	LOR	Unit		EM1517387-008	EM1517387-010	EM1517387-011	--------	--------
					Result	Result	Result	Result	Result
EP080/071: Total Petroleum Hydrocarbons - Continued									
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	<20	----	----	----
^ C6 - C10 Fraction minus BTEX (F1)	C6_C10-BTEX	20	µg/L		<20	<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	<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	1330-20-7	2	µg/L		<2	<2	----	----	----
^ Sum of BTEX	----	1	µg/L		<1	<1	----	----	----
Naphthalene	91-20-3	5	µg/L		<5	<5	----	----	----
EP080S: TPH(V)/BTEX Surrogates									
1.2-Dichloroethane-D4	17060-07-0	2	%		**112**	**117**	----	----	----
Toluene-D8	2037-26-5	2	%		**88.2**	**99.3**	----	----	----
4-Bromofluorobenzene	460-00-4	2	%		**94.8**	**99.4**	----	----	----

ALS Environmental

QUALITY CONTROL REPORT

Work Order	: **EM1517387**	Page	: 1 of 15
Client	: **AECOM Australia Pty Ltd**	Laboratory	: Environmental Division Melbourne
Contact	: MS AVERYLL COYNE	Contact	: Carol Walsh
Address	: LEVEL 9 8 EXHIBITION ST MELBOURNE VIC 3000	Address	: 4 Westall Rd Springvale VIC Australia 3171
E-mail	: averyll.coyne@aecom.com	E-mail	: carol.walsh@alsglobal.com
Telephone	: +61 03 9653 1234	Telephone	: +61-3-8549 9608
Facsimile	: +61 03 9654 7117	Facsimile	: +61-3-8549 9601
Project	: 60431087	QC Level	: NEPM 2013 B3 & ALS QC Standard
Order number	: 60431087 1.4	Date Samples Received	: 20-Nov-2015
C-O-C number	: ----	Date Analysis Commenced	: 20-Nov-2015
Sampler	: OLIVER TAYLOR, ZACHARY OCONNOR	Issue Date	: 30-Nov-2015
Site	:	No. of samples received	: 11
Quote number	: ----	No. of samples analysed	: 10

This report supersedes any previous report(s) with this reference. Results apply to the sample(s) as submitted.

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

NATA WORLD RECOGNISED ACCREDITATION

NATA Accredited Laboratory 825

Accredited for compliance with ISO/IEC 17025.

Signatories

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

Signatories	*Position*	*Accreditation Category*
Dilani Fernando	Senior Inorganic Chemist	Melbourne Inorganics
Eric Chau	Metals Team Leader	Melbourne Inorganics
Xing Lin	Senior Organic Chemist	Melbourne Organics

General Comments

The analytical procedures used by the Environmental Division have been developed from established internationally recognized procedures such as those published by the USEPA, APHA, AS and NEPM. In house developed procedures are employed in the absence of documented standards or by 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

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	*Client sample ID*	*Method: Compound*	*CAS Number*	*LOR*	*Unit*	*Original Result*	*Duplicate Result*	*RPD (%)*	*Recovery Limits (%)*
EA005P: pH by PC Titrator (QC Lot: 289041)									
EM1517384-002	Anonymous	EA005-P: pH Value	----	0.01	pH Unit	7.10	7.11	0.141	0% - 20%
EM1517387-011	QC05	EA005-P: pH Value	----	0.01	pH Unit	6.50	6.50	0.00	0% - 20%
EA015: Total Dissolved Solids dried at 180 ± 5 °C (QC Lot: 290289)									
EM1517371-001	Anonymous	EA015H: Total Dissolved Solids @180°C	----	10	mg/L	1460	1540	5.55	0% - 20%
EM1517384-006	Anonymous	EA015H: Total Dissolved Solids @180°C	----	10	mg/L	996	1010	1.40	0% - 20%
ED037P: Alkalinity by PC Titrator (QC Lot: 289042)									
EM1517384-002	Anonymous	ED037-P: Bicarbonate Alkalinity as CaCO3	71-52-3	1	mg/L	436	438	0.384	0% - 20%
		ED037-P: Carbonate Alkalinity as CaCO3	3812-32-6	1	mg/L	<1	<1	0.00	No Limit
		ED037-P: Hydroxide Alkalinity as CaCO3	DMO-210-001	1	mg/L	<1	<1	0.00	No Limit
		ED037-P: Total Alkalinity as CaCO3	----	1	mg/L	436	438	0.384	0% - 20%
EM1517387-011	QC05	ED037-P: Bicarbonate Alkalinity as CaCO3	71-52-3	1	mg/L	473	473	0.00	0% - 20%
		ED037-P: Carbonate Alkalinity as CaCO3	3812-32-6	1	mg/L	<1	<1	0.00	No Limit
		ED037-P: Hydroxide Alkalinity as CaCO3	DMO-210-001	1	mg/L	<1	<1	0.00	No Limit
		ED037-P: Total Alkalinity as CaCO3	----	1	mg/L	473	473	0.00	0% - 20%
ED041G: Sulfate (Turbidimetric) as SO4 2- by DA (QC Lot: 287977)									
EM1517384-001	Anonymous	ED041G: Sulfate as SO4 - Turbidimetric	14808-79-8	1	mg/L	208	210	0.861	0% - 20%
EM1517387-002	GW02	ED041G: Sulfate as SO4 - Turbidimetric	14808-79-8	1	mg/L	16	16	0.00	0% - 50%
ED043: Total Oxidised Sulfur as SO4 2- (QC Lot: 289692)									
EM1517375-001	Anonymous	ED043: Total Oxidised Sulfur as SO4 2-	----	1	mg/L	497	506	1.76	0% - 20%
EM1517384-008	Anonymous	ED043: Total Oxidised Sulfur as SO4 2-	----	1	mg/L	1020	1010	0.416	0% - 20%
ED045G: Chloride by Discrete Analyser (QC Lot: 287976)									
EM1517384-001	Anonymous	ED045G: Chloride	16887-00-6	1	mg/L	22	21	0.00	0% - 20%
EM1517387-002	GW02	ED045G: Chloride	16887-00-6	1	mg/L	307	307	0.00	0% - 20%
ED093F: Dissolved Major Cations (QC Lot: 288055)									
EM1517384-004	Anonymous	ED093F: Calcium	7440-70-2	1	mg/L	176	177	0.604	0% - 20%
		ED093F: Magnesium	7439-95-4	1	mg/L	94	94	0.00	0% - 20%
		ED093F: Potassium	7440-09-7	1	mg/L	41	42	0.00	0% - 20%
		ED093F: Sodium	7440-23-5	1	mg/L	143	144	0.00	0% - 20%
EM1517387-011	QC05	ED093F: Calcium	7440-70-2	1	mg/L	485	487	0.387	0% - 20%
		ED093F: Magnesium	7439-95-4	1	mg/L	181	181	0.00	0% - 20%
		ED093F: Potassium	7440-09-7	1	mg/L	40	40	0.00	0% - 20%
		ED093F: Sodium	7440-23-5	1	mg/L	393	394	0.266	0% - 20%
EG020F: Dissolved Metals by ICP-MS (QC Lot: 288056)									
EM1517384-003	Anonymous	EG020A-F: Cadmium	7440-43-9	0.0001	mg/L	<0.0001	<0.0001	0.00	No Limit

Sub-Matrix: **WATER**

				Laboratory Duplicate (DUP) Report					
Laboratory sample ID	*Client sample ID*	*Method: Compound*	*CAS Number*	*LOR*	*Unit*	*Original Result*	*Duplicate Result*	*RPD (%)*	*Recovery Limits (%)*
EG020F: Dissolved Metals by ICP-MS (QC Lot: 288056) - continued									
EM1517384-003	Anonymous	EG020A-F: Arsenic	7440-38-2	0.001	mg/L	0.021	0.021	0.00	0% - 20%
		EG020A-F: Chromium	7440-47-3	0.001	mg/L	0.002	0.002	0.00	No Limit
		EG020A-F: Copper	7440-50-8	0.001	mg/L	<0.001	<0.001	0.00	No Limit
		EG020A-F: Lead	7439-92-1	0.001	mg/L	<0.001	<0.001	0.00	No Limit
		EG020A-F: Manganese	7439-96-5	0.001	mg/L	0.150	0.151	0.00	0% - 20%
		EG020A-F: Nickel	7440-02-0	0.001	mg/L	0.006	0.009	36.9	No Limit
		EG020A-F: Zinc	7440-66-6	0.005	mg/L	0.010	0.010	0.00	No Limit
		EG020A-F: Aluminium	7429-90-5	0.01	mg/L	0.06	0.06	0.00	No Limit
		EG020A-F: Selenium	7782-49-2	0.01	mg/L	<0.01	<0.01	0.00	No Limit
		EG020A-F: Iron	7439-89-6	0.05	mg/L	9.95	9.68	2.71	0% - 20%
EM1517387-011	QC05	EG020A-F: Cadmium	7440-43-9	0.0001	mg/L	<0.0001	0.0001	0.00	No Limit
		EG020A-F: Arsenic	7440-38-2	0.001	mg/L	<0.001	<0.001	0.00	No Limit
		EG020A-F: Chromium	7440-47-3	0.001	mg/L	<0.001	<0.001	0.00	No Limit
		EG020A-F: Copper	7440-50-8	0.001	mg/L	<0.001	<0.001	0.00	No Limit
		EG020A-F: Lead	7439-92-1	0.001	mg/L	<0.001	<0.001	0.00	No Limit
		EG020A-F: Manganese	7439-96-5	0.001	mg/L	1.28	1.25	2.26	0% - 20%
		EG020A-F: Nickel	7440-02-0	0.001	mg/L	0.022	0.025	11.9	0% - 20%
		EG020A-F: Zinc	7440-66-6	0.005	mg/L	<0.005	<0.005	0.00	No Limit
		EG020A-F: Aluminium	7429-90-5	0.01	mg/L	<0.01	<0.01	0.00	No Limit
		EG020A-F: Selenium	7782-49-2	0.01	mg/L	<0.01	<0.01	0.00	No Limit
		EG020A-F: Iron	7439-89-6	0.05	mg/L	0.89	0.85	4.24	0% - 50%
EG020T: Total Metals by ICP-MS (QC Lot: 289265)									
EM1517387-008	QCN	EG020A-T: Cadmium	7440-43-9	0.0001	mg/L	<0.0001	<0.0001	0.00	No Limit
		EG020A-T: Arsenic	7440-38-2	0.001	mg/L	<0.001	<0.001	0.00	No Limit
		EG020A-T: Chromium	7440-47-3	0.001	mg/L	<0.001	<0.001	0.00	No Limit
		EG020A-T: Copper	7440-50-8	0.001	mg/L	<0.001	<0.001	0.00	No Limit
		EG020A-T: Lead	7439-92-1	0.001	mg/L	<0.001	<0.001	0.00	No Limit
		EG020A-T: Manganese	7439-96-5	0.001	mg/L	<0.001	<0.001	0.00	No Limit
		EG020A-T: Nickel	7440-02-0	0.001	mg/L	<0.001	0.002	0.00	No Limit
		EG020A-T: Zinc	7440-66-6	0.005	mg/L	<0.005	<0.005	0.00	No Limit
		EG020A-T: Aluminium	7429-90-5	0.01	mg/L	<0.01	<0.01	0.00	No Limit
		EG020A-T: Selenium	7782-49-2	0.01	mg/L	<0.01	<0.01	0.00	No Limit
		EG020A-T: Iron	7439-89-6	0.05	mg/L	<0.05	<0.05	0.00	No Limit
EM1517436-016	Anonymous	EG020A-T: Cadmium	7440-43-9	0.0001	mg/L	<0.0001	<0.0001	0.00	No Limit
		EG020A-T: Arsenic	7440-38-2	0.001	mg/L	<0.001	<0.001	0.00	No Limit
		EG020A-T: Chromium	7440-47-3	0.001	mg/L	<0.001	<0.001	0.00	No Limit
		EG020A-T: Copper	7440-50-8	0.001	mg/L	<0.001	<0.001	0.00	No Limit
		EG020A-T: Lead	7439-92-1	0.001	mg/L	<0.001	<0.001	0.00	No Limit
		EG020A-T: Manganese	7439-96-5	0.001	mg/L	<0.001	<0.001	0.00	No Limit
		EG020A-T: Nickel	7440-02-0	0.001	mg/L	<0.001	<0.001	0.00	No Limit

Sub-Matrix: **WATER**

				Laboratory Duplicate (DUP) Report					
Laboratory sample ID	*Client sample ID*	*Method: Compound*	*CAS Number*	*LOR*	*Unit*	*Original Result*	*Duplicate Result*	*RPD (%)*	*Recovery Limits (%)*
EG020T: Total Metals by ICP-MS (QC Lot: 289265) - continued									
EM1517436-016	Anonymous	EG020A-T: Zinc	7440-66-6	0.005	mg/L	<0.005	<0.005	0.00	No Limit
		EG020A-T: Aluminium	7429-90-5	0.01	mg/L	0.02	<0.01	0.00	No Limit
		EG020A-T: Selenium	7782-49-2	0.01	mg/L	<0.01	<0.01	0.00	No Limit
		EG020A-T: Iron	7439-89-6	0.05	mg/L	<0.05	<0.05	0.00	No Limit
EG035F: Dissolved Mercury by FIMS (QC Lot: 288054)									
EM1517384-002	Anonymous	EG035F: Mercury	7439-97-6	0.0001	mg/L	<0.0001	<0.0001	0.00	No Limit
EM1517220-005	Anonymous	EG035F: Mercury	7439-97-6	0.0001	mg/L	<0.0001	<0.0001	0.00	No Limit
EG035T: Total Recoverable Mercury by FIMS (QC Lot: 290444)									
EM1517220-006	Anonymous	EG035T: Mercury	7439-97-6	0.0001	mg/L	<0.0001	<0.0001	0.00	No Limit
EM1517436-016	Anonymous	EG035T: Mercury	7439-97-6	0.0001	mg/L	<0.0001	<0.0001	0.00	No Limit
EK040P: Fluoride by PC Titrator (QC Lot: 289040)									
EM1517384-002	Anonymous	EK040P: Fluoride	16984-48-8	0.1	mg/L	0.3	0.3	0.00	No Limit
EM1517387-011	QC05	EK040P: Fluoride	16984-48-8	0.1	mg/L	0.2	0.2	0.00	No Limit
EK055G: Ammonia as N by Discrete Analyser (QC Lot: 288697)									
EM1517384-001	Anonymous	EK055G: Ammonia as N	7664-41-7	0.01	mg/L	0.05	0.05	0.00	No Limit
EM1517387-002	GW02	EK055G: Ammonia as N	7664-41-7	0.01	mg/L	78.1	77.2	1.18	0% - 20%
EK057G: Nitrite as N by Discrete Analyser (QC Lot: 287975)									
EM1517384-001	Anonymous	EK057G: Nitrite as N	14797-65-0	0.01	mg/L	<0.01	<0.01	0.00	No Limit
EM1517387-002	GW02	EK057G: Nitrite as N	14797-65-0	0.01	mg/L	<0.01	<0.01	0.00	No Limit
EK059G: Nitrite plus Nitrate as N (NOx) by Discrete Analyser (QC Lot: 288696)									
EM1517384-001	Anonymous	EK059G: Nitrite + Nitrate as N	----	0.01	mg/L	0.02	0.02	0.00	No Limit
EM1517387-002	GW02	EK059G: Nitrite + Nitrate as N	----	0.01	mg/L	0.10	0.12	22.1	0% - 50%
EK071G: Reactive Phosphorus as P by discrete analyser (QC Lot: 287974)									
EM1517384-001	Anonymous	EK071G: Reactive Phosphorus as P	14265-44-2	0.01	mg/L	0.04	<0.01	113	No Limit
EM1517387-002	GW02	EK071G: Reactive Phosphorus as P	14265-44-2	0.01	mg/L	<0.01	<0.01	0.00	No Limit
EP005: Total Organic Carbon (TOC) (QC Lot: 291489)									
EM1517382-001	Anonymous	EP005: Total Organic Carbon	----	1	mg/L	7	7	0.00	No Limit
EM1517387-003	GW06	EP005: Total Organic Carbon	----	1	mg/L	35	36	0.00	0% - 20%
EP074A: Monocyclic Aromatic Hydrocarbons (QC Lot: 289004)									
EM1517384-001	Anonymous	EP074-WF: 1.2.4-Trimethylbenzene	95-63-6	1	µg/L	<1	<1	0.00	No Limit
		EP074-WF: 1.3.5-Trimethylbenzene	108-67-8	1	µg/L	<1	<1	0.00	No Limit
		EP074-WF: Benzene	71-43-2	1	µg/L	<1	<1	0.00	No Limit
		EP074-WF: Ethylbenzene	100-41-4	1	µg/L	<1	<1	0.00	No Limit
		EP074-WF: Isopropylbenzene	98-82-8	1	µg/L	<1	<1	0.00	No Limit
		EP074-WF: meta- & para-Xylene	108-38-3 106-42-3	1	µg/L	<1	<1	0.00	No Limit
		EP074-WF: n-Butylbenzene	104-51-8	1	µg/L	<1	<1	0.00	No Limit
		EP074-WF: n-Propylbenzene	103-65-1	1	µg/L	<1	<1	0.00	No Limit

Sub-Matrix: **WATER**

				Laboratory Duplicate (DUP) Report					
Laboratory sample ID	*Client sample ID*	*Method: Compound*	*CAS Number*	*LOR*	*Unit*	*Original Result*	*Duplicate Result*	*RPD (%)*	*Recovery Limits (%)*
EP074A: Monocyclic Aromatic Hydrocarbons (QC Lot: 289004) - continued									
EM1517384-001	Anonymous	EP074-WF: ortho-Xylene	95-47-6	1	µg/L	<1	<1	0.00	No Limit
		EP074-WF: p-Isopropyltoluene	99-87-6	1	µg/L	<1	<1	0.00	No Limit
		EP074-WF: sec-Butylbenzene	135-98-8	1	µg/L	<1	<1	0.00	No Limit
		EP074-WF: Styrene	100-42-5	1	µg/L	<1	<1	0.00	No Limit
		EP074-WF: tert-Butylbenzene	98-06-6	1	µg/L	<1	<1	0.00	No Limit
		EP074-WF: Toluene	108-88-3	1	µg/L	<1	<1	0.00	No Limit
EP074B: Oxygenated Compounds (QC Lot: 289004)									
EM1517384-001	Anonymous	EP074-WF: 2-Butanone (MEK)	78-93-3	10	µg/L	<10	<10	0.00	No Limit
		EP074-WF: 2-Hexanone (MBK)	591-78-6	10	µg/L	<10	<10	0.00	No Limit
		EP074-WF: 2-Propanone (Acetone)	67-64-1	10	µg/L	<10	<10	0.00	No Limit
		EP074-WF: 4-Methyl-2-pentanone (MIBK)	108-10-1	10	µg/L	<10	<10	0.00	No Limit
		EP074-WF: Vinyl Acetate	108-05-4	10	µg/L	<10	<10	0.00	No Limit
EP074C: Sulfonated Compounds (QC Lot: 289004)									
EM1517384-001	Anonymous	EP074-WF: Carbon disulfide	75-15-0	1	µg/L	<1	<1	0.00	No Limit
EP074D: Fumigants (QC Lot: 289004)									
EM1517384-001	Anonymous	EP074-WF: 1.2-Dibromoethane (EDB)	106-93-4	1	µg/L	<1	<1	0.00	No Limit
		EP074-WF: 1.2-Dichloropropane	78-87-5	1	µg/L	<1	<1	0.00	No Limit
		EP074-WF: 2.2-Dichloropropane	594-20-7	1	µg/L	<1	<1	0.00	No Limit
		EP074-WF: cis-1.3-Dichloropropylene	10061-01-5	2	µg/L	<2	<2	0.00	No Limit
		EP074-WF: trans-1.3-Dichloropropylene	10061-02-6	2	µg/L	<2	<2	0.00	No Limit
EP074E: Halogenated Aliphatic Compounds (QC Lot: 289004)									
EM1517384-001	Anonymous	EP074-WF: Vinyl chloride	75-01-4	0.2	µg/L	<10.0	<10.0	0.00	No Limit
		EP074-WF: Hexachlorobutadiene	87-68-3	0.5	µg/L	<1.0	<1.0	0.00	No Limit
		EP074-WF: 1.1.1.2-Tetrachloroethane	630-20-6	1	µg/L	<1	<1	0.00	No Limit
		EP074-WF: 1.1.1-Trichloroethane	71-55-6	1	µg/L	<1	<1	0.00	No Limit
		EP074-WF: 1.1.2.2-Tetrachloroethane	79-34-5	1	µg/L	<1	<1	0.00	No Limit
		EP074-WF: 1.1.2-Trichloroethane	79-00-5	1	µg/L	<1	<1	0.00	No Limit
		EP074-WF: 1.1-Dichloroethane	75-34-3	1	µg/L	<1	<1	0.00	No Limit
		EP074-WF: 1.1-Dichloroethene	75-35-4	1	µg/L	<1	<1	0.00	No Limit
		EP074-WF: 1.1-Dichloropropylene	563-58-6	1	µg/L	<1	<1	0.00	No Limit
		EP074-WF: 1.2.3-Trichloropropane	96-18-4	1	µg/L	<1	<1	0.00	No Limit
		EP074-WF: 1.2-Dibromo-3-chloropropane	96-12-8	1	µg/L	<1	<1	0.00	No Limit
		EP074-WF: 1.2-Dichloroethane	107-06-2	1	µg/L	<1	<1	0.00	No Limit
		EP074-WF: 1.3-Dichloropropane	142-28-9	1	µg/L	<1	<1	0.00	No Limit
		EP074-WF: Carbon Tetrachloride	56-23-5	1	µg/L	<1	<1	0.00	No Limit
		EP074-WF: cis-1.2-Dichloroethene	156-59-2	1	µg/L	<1	<1	0.00	No Limit
		EP074-WF: cis-1.4-Dichloro-2-butene	1476-11-5	1	µg/L	<1	<1	0.00	No Limit
		EP074-WF: Dibromomethane	74-95-3	1	µg/L	<1	<1	0.00	No Limit
		EP074-WF: Iodomethane	74-88-4	1	µg/L	<1	<1	0.00	No Limit

Sub-Matrix: **WATER**

				Laboratory Duplicate (DUP) Report					
Laboratory sample ID	*Client sample ID*	*Method: Compound*	*CAS Number*	*LOR*	*Unit*	*Original Result*	*Duplicate Result*	*RPD (%)*	*Recovery Limits (%)*
EP074E: Halogenated Aliphatic Compounds (QC Lot: 289004) - continued									
EM1517384-001	Anonymous	EP074-WF: Pentachloroethane	76-01-7	1	µg/L	<1	<1	0.00	No Limit
		EP074-WF: Tetrachloroethene	127-18-4	1	µg/L	<1	<1	0.00	No Limit
		EP074-WF: trans-1.2-Dichloroethene	156-60-5	1	µg/L	<1	<1	0.00	No Limit
		EP074-WF: trans-1.4-Dichloro-2-butene	110-57-6	1	µg/L	<1	<1	0.00	No Limit
		EP074-WF: Trichloroethene	79-01-6	1	µg/L	<1	<1	0.00	No Limit
		EP074-WF: Bromomethane	74-83-9	10	µg/L	<10	<10	0.00	No Limit
		EP074-WF: Chloroethane	75-00-3	10	µg/L	<10	<10	0.00	No Limit
		EP074-WF: Chloromethane	74-87-3	10	µg/L	<10	<10	0.00	No Limit
		EP074-WF: Dichlorodifluoromethane	75-71-8	10	µg/L	<10	<10	0.00	No Limit
		EP074-WF: Trichlorofluoromethane	75-69-4	10	µg/L	<10	<10	0.00	No Limit
		EP074-WF: Methylene chloride	75-09-2	2	µg/L	<5	<5	0.00	No Limit
EP074F: Halogenated Aromatic Compounds (QC Lot: 289004)									
EM1517384-001	Anonymous	EP074-WF: 1.4-Dichlorobenzene	106-46-7	0.1	µg/L	<1.0	<1.0	0.00	No Limit
		EP074-WF: 1.2.3-Trichlorobenzene	87-61-6	1	µg/L	<1	<1	0.00	No Limit
		EP074-WF: 1.2.4-Trichlorobenzene	120-82-1	1	µg/L	<1	<1	0.00	No Limit
		EP074-WF: 1.2-Dichlorobenzene	95-50-1	1	µg/L	<1	<1	0.00	No Limit
		EP074-WF: 1.3-Dichlorobenzene	541-73-1	1	µg/L	<1	<1	0.00	No Limit
		EP074-WF: 2-Chlorotoluene	95-49-8	1	µg/L	<1	<1	0.00	No Limit
		EP074-WF: 4-Chlorotoluene	106-43-4	1	µg/L	<1	<1	0.00	No Limit
		EP074-WF: Bromobenzene	108-86-1	1	µg/L	<1	<1	0.00	No Limit
		EP074-WF: Chlorobenzene	108-90-7	1	µg/L	<1	<1	0.00	No Limit
EP074G: Trihalomethanes (QC Lot: 289004)									
EM1517384-001	Anonymous	EP074-WF: Bromodichloromethane	75-27-4	1	µg/L	<1	<1	0.00	No Limit
		EP074-WF: Bromoform	75-25-2	1	µg/L	<1	<1	0.00	No Limit
		EP074-WF: Chloroform	67-66-3	1	µg/L	<1	<1	0.00	No Limit
		EP074-WF: Dibromochloromethane	124-48-1	1	µg/L	<1	<1	0.00	No Limit
EP074H: Naphthalene (QC Lot: 289004)									
EM1517384-001	Anonymous	EP074-WF: Naphthalene	91-20-3	5	µg/L	<5	<5	0.00	No Limit
EP080/071: Total Petroleum Hydrocarbons (QC Lot: 288529)									
EM1517387-003	GW06	EP080: C6 - C9 Fraction	----	20	µg/L	<20	<20	0.00	No Limit
EM1517388-004	Anonymous	EP080: C6 - C9 Fraction	----	20	µg/L	<20	<20	0.00	No Limit
EP080/071: Total Petroleum Hydrocarbons (QC Lot: 289005)									
EM1517384-001	Anonymous	EP080: C6 - C9 Fraction	----	20	µg/L	<20	<20	0.00	No Limit
EP080/071: Total Recoverable Hydrocarbons - NEPM 2013 Fractions (QC Lot: 288529)									
EM1517387-003	GW06	EP080: C6 - C10 Fraction	C6_C10	20	µg/L	<20	<20	0.00	No Limit
EM1517388-004	Anonymous	EP080: C6 - C10 Fraction	C6_C10	20	µg/L	<20	<20	0.00	No Limit
EP080/071: Total Recoverable Hydrocarbons - NEPM 2013 Fractions (QC Lot: 289005)									
EM1517384-001	Anonymous	EP080: C6 - C10 Fraction	C6_C10	20	µg/L	<20	<20	0.00	No Limit
EP080: BTEXN (QC Lot: 288529)									

Sub-Matrix: **WATER**

				Laboratory Duplicate (DUP) Report					
Laboratory sample ID	*Client sample ID*	*Method: Compound*	*CAS Number*	*LOR*	*Unit*	*Original Result*	*Duplicate Result*	*RPD (%)*	*Recovery Limits (%)*
EP080: BTEXN (QC Lot: 288529) - continued									
EM1517387-003	GW06	EP080: Benzene	71-43-2	1	µg/L	<1	<1	0.00	No Limit
		EP080: Ethylbenzene	100-41-4	2	µg/L	<2	<2	0.00	No Limit
		EP080: meta- & para-Xylene	108-38-3 106-42-3	2	µg/L	<2	<2	0.00	No Limit
		EP080: ortho-Xylene	95-47-6	2	µg/L	<2	<2	0.00	No Limit
		EP080: Toluene	108-88-3	2	µg/L	<2	<2	0.00	No Limit
		EP080: Naphthalene	91-20-3	5	µg/L	<5	<5	0.00	No Limit
EM1517388-004	Anonymous	EP080: Benzene	71-43-2	1	µg/L	<1	<1	0.00	No Limit
		EP080: Ethylbenzene	100-41-4	2	µg/L	<2	<2	0.00	No Limit
		EP080: meta- & para-Xylene	108-38-3 106-42-3	2	µg/L	<2	<2	0.00	No Limit
		EP080: ortho-Xylene	95-47-6	2	µg/L	<2	<2	0.00	No Limit
		EP080: Toluene	108-88-3	2	µg/L	<2	<2	0.00	No Limit
		EP080: Naphthalene	91-20-3	5	µg/L	<5	<5	0.00	No Limit
EP080: BTEXN (QC Lot: 289005)									
EM1517384-001	Anonymous	EP080: Benzene	71-43-2	1	µg/L	<1	<1	0.00	No Limit
		EP080: Ethylbenzene	100-41-4	2	µg/L	<2	<2	0.00	No Limit
		EP080: meta- & para-Xylene	108-38-3 106-42-3	2	µg/L	<2	<2	0.00	No Limit
		EP080: ortho-Xylene	95-47-6	2	µg/L	<2	<2	0.00	No Limit
		EP080: Toluene	108-88-3	2	µg/L	<2	<2	0.00	No Limit
		EP080: Naphthalene	91-20-3	5	µg/L	<5	<5	0.00	No Limit

Method Blank (MB) and Laboratory Control Spike (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 (%)	Recovery Limits (%)	
Method: Compound	CAS Number	LOR	Unit	Result	Concentration	LCS	Low	High
EA015: Total Dissolved Solids dried at 180 ± 5 °C (QCLot: 290289)								
EA015H: Total Dissolved Solids @180°C	----	10	mg/L	<10	2000 mg/L	101	97	105
				<10	293 mg/L	104	97	105
ED037P: Alkalinity by PC Titrator (QCLot: 289042)								
ED037-P: Total Alkalinity as CaCO3	----	----	mg/L	----	200 mg/L	102	90	110
ED041G: Sulfate (Turbidimetric) as SO4 2- by DA (QCLot: 287977)								
ED041G: Sulfate as SO4 - Turbidimetric	14808-79-8	1	mg/L	<1	25 mg/L	97.6	90	116
				<1	100 mg/L	98.5	80	120
ED043: Total Oxidised Sulfur as SO4 2- (QCLot: 289692)								
ED043: Total Oxidised Sulfur as SO4 2-	----	1	mg/L	<10	500 mg/L	98.9	87	121
ED045G: Chloride by Discrete Analyser (QCLot: 287976)								
ED045G: Chloride	16887-00-6	1	mg/L	<1	10 mg/L	103	89	117
				<1	1000 mg/L	102	92	112
ED093F: Dissolved Major Cations (QCLot: 288055)								
ED093F: Calcium	7440-70-2	1	mg/L	<1	5 mg/L	103	92	108
ED093F: Magnesium	7439-95-4	1	mg/L	<1	5 mg/L	102	92	108
ED093F: Potassium	7440-09-7	1	mg/L	<1	50 mg/L	100	89	107
ED093F: Sodium	7440-23-5	1	mg/L	<1	50 mg/L	99.8	89	107
EG020F: Dissolved Metals by ICP-MS (QCLot: 288056)								
EG020A-F: Aluminium	7429-90-5	0.01	mg/L	<0.01	0.5 mg/L	99.3	93	105
EG020A-F: Arsenic	7440-38-2	0.001	mg/L	<0.001	0.1 mg/L	99.4	94	108
EG020A-F: Cadmium	7440-43-9	0.0001	mg/L	<0.0001	0.1 mg/L	101	86	108
EG020A-F: Chromium	7440-47-3	0.001	mg/L	<0.001	0.1 mg/L	94.7	86	110
EG020A-F: Copper	7440-50-8	0.001	mg/L	<0.001	0.1 mg/L	92.2	87	107
EG020A-F: Iron	7439-89-6	0.05	mg/L	<0.05	0.5 mg/L	97.2	94	106
EG020A-F: Lead	7439-92-1	0.001	mg/L	<0.001	0.1 mg/L	96.7	87	109
EG020A-F: Manganese	7439-96-5	0.001	mg/L	<0.001	0.1 mg/L	93.7	87	109
EG020A-F: Nickel	7440-02-0	0.001	mg/L	<0.001	0.1 mg/L	96.5	87	109
EG020A-F: Selenium	7782-49-2	0.01	mg/L	<0.01	0.1 mg/L	98.9	87	109
EG020A-F: Zinc	7440-66-6	0.005	mg/L	<0.005	0.1 mg/L	95.5	87	107
EG020T: Total Metals by ICP-MS (QCLot: 289265)								
EG020A-T: Aluminium	7429-90-5	0.01	mg/L	<0.01	0.5 mg/L	104	100	108
EG020A-T: Arsenic	7440-38-2	0.001	mg/L	<0.001	0.1 mg/L	100	94	116
EG020A-T: Cadmium	7440-43-9	0.0001	mg/L	<0.0001	0.1 mg/L	99.2	90	110
EG020A-T: Chromium	7440-47-3	0.001	mg/L	<0.001	0.1 mg/L	96.0	90	110

Sub-Matrix: **WATER**

Method: Compound	CAS Number	LOR	Unit	Method Blank (MB) Report	Laboratory Control Spike (LCS) Report			
					Spike	Spike Recovery (%)	Recovery Limits (%)	
				Result	Concentration	LCS	Low	High
EG020T: Total Metals by ICP-MS (QCLot: 289265) - continued								
EG020A-T: Copper	7440-50-8	0.001	mg/L	<0.001	0.1 mg/L	93.8	91	109
EG020A-T: Iron	7439-89-6	0.05	mg/L	<0.05	0.5 mg/L	105	99	109
EG020A-T: Lead	7439-92-1	0.001	mg/L	<0.001	0.1 mg/L	96.2	91	111
EG020A-T: Manganese	7439-96-5	0.001	mg/L	<0.001	0.1 mg/L	93.2	91	111
EG020A-T: Nickel	7440-02-0	0.001	mg/L	<0.001	0.1 mg/L	96.0	91	111
EG020A-T: Selenium	7782-49-2	0.01	mg/L	<0.01	0.1 mg/L	102	86	110
EG020A-T: Zinc	7440-66-6	0.005	mg/L	<0.005	0.1 mg/L	95.7	91	109
EG035F: Dissolved Mercury by FIMS (QCLot: 288054)								
EG035F: Mercury	7439-97-6	0.0001	mg/L	<0.0001	0.01 mg/L	99.8	83	117
EG035T: Total Recoverable Mercury by FIMS (QCLot: 290444)								
EG035T: Mercury	7439-97-6	0.0001	mg/L	<0.0001	0.01 mg/L	106	87	113
EK040P: Fluoride by PC Titrator (QCLot: 289040)								
EK040P: Fluoride	16984-48-8	0.1	mg/L	<0.1	5 mg/L	102	89	111
EK055G: Ammonia as N by Discrete Analyser (QCLot: 288697)								
EK055G: Ammonia as N	7664-41-7	0.01	mg/L	<0.01	1 mg/L	105	80	115
EK057G: Nitrite as N by Discrete Analyser (QCLot: 287975)								
EK057G: Nitrite as N	14797-65-0	0.01	mg/L	<0.01	0.5 mg/L	102	92	108
EK059G: Nitrite plus Nitrate as N (NOx) by Discrete Analyser (QCLot: 288696)								
EK059G: Nitrite + Nitrate as N	----	0.01	mg/L	<0.01	0.5 mg/L	103	91	117
EK071G: Reactive Phosphorus as P by discrete analyser (QCLot: 287974)								
EK071G: Reactive Phosphorus as P	14265-44-2	0.01	mg/L	<0.01	0.5 mg/L	101	94	108
EP005: Total Organic Carbon (TOC) (QCLot: 291489)								
EP005: Total Organic Carbon	----	1	mg/L	<1	100 mg/L	90.0	86	112
EP074A: Monocyclic Aromatic Hydrocarbons (QCLot: 289004)								
EP074-WF: 1.2.4-Trimethylbenzene	95-63-6	1	µg/L	<1	20 µg/L	91.7	77	109
EP074-WF: 1.3.5-Trimethylbenzene	108-67-8	1	µg/L	<1	20 µg/L	93.1	77	109
EP074-WF: Benzene	71-43-2	1	µg/L	<1	20 µg/L	98.6	81	119
EP074-WF: Ethylbenzene	100-41-4	1	µg/L	<1	20 µg/L	93.9	78	118
EP074-WF: Isopropylbenzene	98-82-8	1	µg/L	<1	20 µg/L	87.9	77	117
EP074-WF: meta- & para-Xylene	108-38-3 106-42-3	1	µg/L	<1	40 µg/L	90.5	78	118
EP074-WF: n-Butylbenzene	104-51-8	1	µg/L	<1	20 µg/L	86.0	65	111
EP074-WF: n-Propylbenzene	103-65-1	1	µg/L	<1	20 µg/L	93.0	74	110
EP074-WF: ortho-Xylene	95-47-6	1	µg/L	<1	20 µg/L	94.1	82	118
EP074-WF: p-Isopropyltoluene	99-87-6	1	µg/L	<1	20 µg/L	88.9	73	113
EP074-WF: sec-Butylbenzene	135-98-8	1	µg/L	<1	20 µg/L	91.0	76	110
EP074-WF: Styrene	100-42-5	1	µg/L	<1	20 µg/L	88.2	78	118

Sub-Matrix: **WATER**

Method: Compound	CAS Number	LOR	Unit	Method Blank (MB) Report	Laboratory Control Spike (LCS) Report			
					Spike	Spike Recovery (%)	Recovery Limits (%)	
				Result	Concentration	LCS	Low	High
EP074A: Monocyclic Aromatic Hydrocarbons (QCLot: 289004) - continued								
EP074-WF: tert-Butylbenzene	98-06-6	1	µg/L	<1	20 µg/L	92.2	78	110
EP074-WF: Toluene	108-88-3	1	µg/L	<1	20 µg/L	97.0	81	121
EP074B: Oxygenated Compounds (QCLot: 289004)								
EP074-WF: 2-Butanone (MEK)	78-93-3	10	µg/L	<10	200 µg/L	104	71	131
EP074-WF: 2-Hexanone (MBK)	591-78-6	10	µg/L	<10	200 µg/L	99.4	75	129
EP074-WF: 2-Propanone (Acetone)	67-64-1	10	µg/L	<10	200 µg/L	98.8	69	151
EP074-WF: 4-Methyl-2-pentanone (MIBK)	108-10-1	10	µg/L	<10	200 µg/L	88.0	72	132
EP074-WF: Vinyl Acetate	108-05-4	10	µg/L	<10	200 µg/L	117	65	129
EP074C: Sulfonated Compounds (QCLot: 289004)								
EP074-WF: Carbon disulfide	75-15-0	1	µg/L	<1	20 µg/L	88.5	53	123
EP074D: Fumigants (QCLot: 289004)								
EP074-WF: 1.2-Dibromoethane (EDB)	106-93-4	1	µg/L	<1	20 µg/L	95.1	81	115
EP074-WF: 1.2-Dichloropropane	78-87-5	1	µg/L	<1	20 µg/L	99.6	80	118
EP074-WF: 2.2-Dichloropropane	594-20-7	1	µg/L	<1	20 µg/L	102	69	115
EP074-WF: cis-1.3-Dichloropropylene	10061-01-5	2	µg/L	<2	20 µg/L	84.6	72	110
EP074-WF: trans-1.3-Dichloropropylene	10061-02-6	2	µg/L	<2	20 µg/L	82.7	70	108
EP074E: Halogenated Aliphatic Compounds (QCLot: 289004)								
EP074-WF: 1.1.1.2-Tetrachloroethane	630-20-6	1	µg/L	<1	20 µg/L	90.7	75	107
EP074-WF: 1.1.1-Trichloroethane	71-55-6	1	µg/L	<1	20 µg/L	89.0	75	113
EP074-WF: 1.1.2.2-Tetrachloroethane	79-34-5	1	µg/L	<1	20 µg/L	94.8	85	121
EP074-WF: 1.1.2-Trichloroethane	79-00-5	1	µg/L	<1	20 µg/L	99.8	85	117
EP074-WF: 1.1-Dichloroethane	75-34-3	1	µg/L	<1	20 µg/L	115	76	120
EP074-WF: 1.1-Dichloroethene	75-35-4	1	µg/L	<1	20 µg/L	90.3	68	122
EP074-WF: 1.1-Dichloropropylene	563-58-6	1	µg/L	<1	20 µg/L	102	73	117
EP074-WF: 1.2.3-Trichloropropane	96-18-4	1	µg/L	<1	20 µg/L	95.6	84	118
EP074-WF: 1.2-Dibromo-3-chloropropane	96-12-8	1	µg/L	<1	20 µg/L	90.8	64	114
EP074-WF: 1.2-Dichloroethane	107-06-2	1	µg/L	<1	20 µg/L	95.3	81	119
EP074-WF: 1.3-Dichloropropane	142-28-9	1	µg/L	<1	20 µg/L	99.0	85	117
EP074-WF: Bromomethane	74-83-9	10	µg/L	<10	200 µg/L	85.8	52	128
EP074-WF: Carbon Tetrachloride	56-23-5	1	µg/L	<1	20 µg/L	90.1	66	110
EP074-WF: Chloroethane	75-00-3	10	µg/L	<10	200 µg/L	101	67	127
EP074-WF: Chloromethane	74-87-3	10	µg/L	<10	200 µg/L	94.6	66	138
EP074-WF: cis-1.2-Dichloroethene	156-59-2	1	µg/L	<1	20 µg/L	110	82	118
EP074-WF: cis-1.4-Dichloro-2-butene	1476-11-5	1	µg/L	<1	20 µg/L	80.9	51	109
EP074-WF: Dibromomethane	74-95-3	1	µg/L	<1	20 µg/L	97.6	80	116
EP074-WF: Dichlorodifluoromethane	75-71-8	10	µg/L	<10	200 µg/L	85.5	61	137
EP074-WF: Hexachlorobutadiene	87-68-3	0.5	µg/L	<0.5	20 µg/L	87.8	64	118
EP074-WF: Iodomethane	74-88-4	1	µg/L	<1	20 µg/L	81.4	26	119

Sub-Matrix: **WATER**

Method: Compound	CAS Number	LOR	Unit	Method Blank (MB) Report	Laboratory Control Spike (LCS) Report			
					Spike	Spike Recovery (%)	Recovery Limits (%)	
				Result	Concentration	LCS	Low	High
EP074E: Halogenated Aliphatic Compounds (QCLot: 289004) - continued								
EP074-WF: Methylene chloride	75-09-2	2	µg/L	<2	20 µg/L	124	52	184
EP074-WF: Pentachloroethane	76-01-7	1	µg/L	<1	20 µg/L	88.9	52	126
EP074-WF: Tetrachloroethene	127-18-4	1	µg/L	<1	20 µg/L	90.0	74	116
EP074-WF: trans-1.2-Dichloroethene	156-60-5	1	µg/L	<1	20 µg/L	92.7	69	123
EP074-WF: trans-1.4-Dichloro-2-butene	110-57-6	1	µg/L	<1	20 µg/L	88.7	64	118
EP074-WF: Trichloroethene	79-01-6	1	µg/L	<1	20 µg/L	90.1	76	118
EP074-WF: Trichlorofluoromethane	75-69-4	10	µg/L	<10	200 µg/L	89.5	70	124
EP074-WF: Vinyl chloride	75-01-4	0.2	µg/L	<0.2	200 µg/L	93.2	60	138
EP074F: Halogenated Aromatic Compounds (QCLot: 289004)								
EP074-WF: 1.2.3-Trichlorobenzene	87-61-6	1	µg/L	<1	20 µg/L	92.5	78	116
EP074-WF: 1.2.4-Trichlorobenzene	120-82-1	1	µg/L	<1	20 µg/L	87.9	68	112
EP074-WF: 1.2-Dichlorobenzene	95-50-1	1	µg/L	<1	20 µg/L	94.3	83	113
EP074-WF: 1.3-Dichlorobenzene	541-73-1	1	µg/L	<1	20 µg/L	91.1	78	112
EP074-WF: 1.4-Dichlorobenzene	106-46-7	0.1	µg/L	<0.1	20 µg/L	92.8	78	116
EP074-WF: 2-Chlorotoluene	95-49-8	1	µg/L	<1	20 µg/L	94.4	79	111
EP074-WF: 4-Chlorotoluene	106-43-4	1	µg/L	<1	20 µg/L	94.7	77	111
EP074-WF: Bromobenzene	108-86-1	1	µg/L	<1	20 µg/L	94.1	71	117
EP074-WF: Chlorobenzene	108-90-7	1	µg/L	<1	20 µg/L	94.0	82	116
EP074G: Trihalomethanes (QCLot: 289004)								
EP074-WF: Bromodichloromethane	75-27-4	1	µg/L	<1	20 µg/L	94.2	75	112
EP074-WF: Bromoform	75-25-2	1	µg/L	<1	20 µg/L	84.3	62	106
EP074-WF: Chloroform	67-66-3	1	µg/L	<1	20 µg/L	111	83	115
EP074-WF: Dibromochloromethane	124-48-1	1	µg/L	<1	20 µg/L	90.0	68	108
EP074H: Naphthalene (QCLot: 289004)								
EP074-WF: Naphthalene	91-20-3	5	µg/L	<5	20 µg/L	94.1	82	116
EP075(SIM)B: Polynuclear Aromatic Hydrocarbons (QCLot: 287852)								
EP075(SIM): Acenaphthene	83-32-9	1	µg/L	<1.0	5 µg/L	76.5	46	120
EP075(SIM): Acenaphthylene	208-96-8	1	µg/L	<1.0	5 µg/L	78.5	40	124
EP075(SIM): Anthracene	120-12-7	1	µg/L	<1.0	5 µg/L	67.9	53	127
EP075(SIM): Benz(a)anthracene	56-55-3	1	µg/L	<1.0	5 µg/L	81.2	52	136
EP075(SIM): Benzo(a)pyrene	50-32-8	0.5	µg/L	<0.5	5 µg/L	75.6	55	133
EP075(SIM): Benzo(b+j)fluoranthene	205-99-2 205-82-3	1	µg/L	<1.0	5 µg/L	69.7	48	142
EP075(SIM): Benzo(g.h.i)perylene	191-24-2	1	µg/L	<1.0	5 µg/L	77.8	52	142
EP075(SIM): Benzo(k)fluoranthene	207-08-9	1	µg/L	<1.0	5 µg/L	71.2	54	134
EP075(SIM): Chrysene	218-01-9	1	µg/L	<1.0	5 µg/L	75.5	54	132
EP075(SIM): Dibenz(a.h)anthracene	53-70-3	1	µg/L	<1.0	5 µg/L	76.6	52	142
EP075(SIM): Fluoranthene	206-44-0	1	µg/L	<1.0	5 µg/L	81.9	56	130

Sub-Matrix: **WATER**

Method: Compound	CAS Number	LOR	Unit	Method Blank (MB) Report	Laboratory Control Spike (LCS) Report			
					Spike	Spike Recovery (%)	Recovery Limits (%)	
				Result	Concentration	LCS	Low	High
EP075(SIM)B: Polynuclear Aromatic Hydrocarbons (QCLot: 287852) - continued								
EP075(SIM): Fluorene	86-73-7	1	µg/L	<1.0	5 µg/L	78.3	47	125
EP075(SIM): Indeno(1.2.3.cd)pyrene	193-39-5	1	µg/L	<1.0	5 µg/L	77.6	49	143
EP075(SIM): Naphthalene	91-20-3	1	µg/L	<1.0	5 µg/L	81.9	39	115
EP075(SIM): Phenanthrene	85-01-8	1	µg/L	<1.0	5 µg/L	79.0	55	125
EP075(SIM): Pyrene	129-00-0	1	µg/L	<1.0	5 µg/L	82.7	56	132
EP080/071: Total Petroleum Hydrocarbons (QCLot: 287853)								
EP071: C10 - C14 Fraction	----	50	µg/L	<50	3980 µg/L	65.6	53	123
EP071: C15 - C28 Fraction	----	100	µg/L	<100	17006 µg/L	77.3	57	133
EP071: C29 - C36 Fraction	----	50	µg/L	<50	8662 µg/L	74.2	55	141
EP080/071: Total Petroleum Hydrocarbons (QCLot: 288529)								
EP080: C6 - C9 Fraction	----	20	µg/L	<20	360 µg/L	102	67	127
EP080/071: Total Petroleum Hydrocarbons (QCLot: 289005)								
EP080: C6 - C9 Fraction	----	20	µg/L	<20	360 µg/L	99.6	67	127
EP080/071: Total Recoverable Hydrocarbons - NEPM 2013 Fractions (QCLot: 287853)								
EP071: >C10 - C16 Fraction	----	100	µg/L	<100	5753 µg/L	73.2	54	122
EP071: >C16 - C34 Fraction	----	100	µg/L	<100	24516 µg/L	71.7	56	132
EP071: >C34 - C40 Fraction	----	100	µg/L	<100	828 µg/L	82.0	51	137
EP080/071: Total Recoverable Hydrocarbons - NEPM 2013 Fractions (QCLot: 288529)								
EP080: C6 - C10 Fraction	C6_C10	20	µg/L	<20	450 µg/L	99.3	65	125
EP080/071: Total Recoverable Hydrocarbons - NEPM 2013 Fractions (QCLot: 289005)								
EP080: C6 - C10 Fraction	C6_C10	20	µg/L	<20	450 µg/L	97.8	65	125
EP080: BTEXN (QCLot: 288529)								
EP080: Benzene	71-43-2	1	µg/L	<1	20 µg/L	112	76	120
EP080: Ethylbenzene	100-41-4	2	µg/L	<2	20 µg/L	107	72	124
EP080: meta- & para-Xylene	108-38-3 106-42-3	2	µg/L	<2	40 µg/L	107	72	130
EP080: Naphthalene	91-20-3	5	µg/L	<5	5 µg/L	100	71	129
EP080: ortho-Xylene	95-47-6	2	µg/L	<2	20 µg/L	110	75	127
EP080: Toluene	108-88-3	2	µg/L	<2	20 µg/L	110	76	124
EP080: BTEXN (QCLot: 289005)								
EP080: Benzene	71-43-2	1	µg/L	<1	20 µg/L	98.8	76	120
EP080: Ethylbenzene	100-41-4	2	µg/L	<2	20 µg/L	95.6	72	124
EP080: meta- & para-Xylene	108-38-3 106-42-3	2	µg/L	<2	40 µg/L	94.6	72	130
EP080: Naphthalene	91-20-3	5	µg/L	<5	5 µg/L	98.5	71	129
EP080: ortho-Xylene	95-47-6	2	µg/L	<2	20 µg/L	98.9	75	127
EP080: Toluene	108-88-3	2	µg/L	<2	20 µg/L	98.0	76	124

Matrix Spike (MS) Report

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

Sub-Matrix: **WATER**

				Matrix Spike (MS) Report			
				Spike	SpikeRecovery(%)	Recovery Limits (%)	
Laboratory sample ID	Client sample ID	Method: Compound	CAS Number	Concentration	MS	Low	High
ED041G: Sulfate (Turbidimetric) as SO4 2- by DA (QCLot: 287977)							
EM1517384-002	Anonymous	ED041G: Sulfate as SO4 - Turbidimetric	14808-79-8	10 mg/L	# Not Determined	70	130
ED043: Total Oxidised Sulfur as SO4 2- (QCLot: 289692)							
EM1517377-001	Anonymous	ED043: Total Oxidised Sulfur as SO4 2-	----	500 mg/L	94.8	70	130
ED045G: Chloride by Discrete Analyser (QCLot: 287976)							
EM1517384-002	Anonymous	ED045G: Chloride	16887-00-6	400 mg/L	102	70	130
EG020F: Dissolved Metals by ICP-MS (QCLot: 288056)							
EM1517384-003	Anonymous	EG020A-F: Arsenic	7440-38-2	0.2 mg/L	102	85	131
		EG020A-F: Cadmium	7440-43-9	0.05 mg/L	113	81	133
		EG020A-F: Chromium	7440-47-3	0.2 mg/L	99.4	71	135
		EG020A-F: Copper	7440-50-8	0.2 mg/L	95.8	76	130
		EG020A-F: Lead	7439-92-1	0.2 mg/L	99.2	75	133
		EG020A-F: Manganese	7439-96-5	0.2 mg/L	94.5	64	134
		EG020A-F: Nickel	7440-02-0	0.2 mg/L	103	73	131
		EG020A-F: Zinc	7440-66-6	0.2 mg/L	98.3	75	131
EG020T: Total Metals by ICP-MS (QCLot: 289265)							
EM1517387-008	QCN	EG020A-T: Arsenic	7440-38-2	1 mg/L	97.8	82	118
		EG020A-T: Cadmium	7440-43-9	0.25 mg/L	94.0	75	129
		EG020A-T: Chromium	7440-47-3	1 mg/L	93.6	80	118
		EG020A-T: Copper	7440-50-8	1 mg/L	92.8	81	115
		EG020A-T: Lead	7439-92-1	1 mg/L	85.2	83	121
		EG020A-T: Manganese	7439-96-5	1 mg/L	94.6	73	123
		EG020A-T: Nickel	7440-02-0	1 mg/L	93.3	80	118
		EG020A-T: Zinc	7440-66-6	1 mg/L	90.3	74	116
EG035F: Dissolved Mercury by FIMS (QCLot: 288054)							
EM1517220-002	Anonymous	EG035F: Mercury	7439-97-6	0.01 mg/L	105	70	120
EG035T: Total Recoverable Mercury by FIMS (QCLot: 290444)							
EM1517349-044	Anonymous	EG035T: Mercury	7439-97-6	0.01 mg/L	104	70	130
EK040P: Fluoride by PC Titrator (QCLot: 289040)							
EM1517384-003	Anonymous	EK040P: Fluoride	16984-48-8	5 mg/L	95.6	70	130
EK055G: Ammonia as N by Discrete Analyser (QCLot: 288697)							
EM1517384-002	Anonymous						

Sub-Matrix: **WATER**

				Matrix Spike (MS) Report			
				Spike	SpikeRecovery(%)	Recovery Limits (%)	
Laboratory sample ID	Client sample ID	Method: Compound	CAS Number	Concentration	MS	Low	High
EK055G: Ammonia as N by Discrete Analyser (QCLot: 288697) - continued							
EM1517384-002	Anonymous	EK055G: Ammonia as N	7664-41-7	1 mg/L	# Not Determined	70	130
EK057G: Nitrite as N by Discrete Analyser (QCLot: 287975)							
EM1517384-002	Anonymous	EK057G: Nitrite as N	14797-65-0	0.5 mg/L	90.9	80	114
EK059G: Nitrite plus Nitrate as N (NOx) by Discrete Analyser (QCLot: 288696)							
EM1517384-002	Anonymous	EK059G: Nitrite + Nitrate as N	----	0.5 mg/L	105	70	130
EK071G: Reactive Phosphorus as P by discrete analyser (QCLot: 287974)							
EM1517384-002	Anonymous	EK071G: Reactive Phosphorus as P	14265-44-2	0.5 mg/L	101	79	123
EP005: Total Organic Carbon (TOC) (QCLot: 291489)							
EM1517384-009	Anonymous	EP005: Total Organic Carbon	----	100 mg/L	86.8	80	114
EP074A: Monocyclic Aromatic Hydrocarbons (QCLot: 289004)							
EM1517384-007	Anonymous	EP074-WF: Benzene	71-43-2	20 µg/L	112	76	128
		EP074-WF: Toluene	108-88-3	20 µg/L	# 130	72	132
EP074E: Halogenated Aliphatic Compounds (QCLot: 289004)							
EM1517384-007	Anonymous	EP074-WF: 1.1-Dichloroethene	75-35-4	20 µg/L	82.3	63	129
		EP074-WF: Trichloroethene	79-01-6	20 µg/L	89.7	64	126
EP074F: Halogenated Aromatic Compounds (QCLot: 289004)							
EM1517384-007	Anonymous	EP074-WF: Chlorobenzene	108-90-7	20 µg/L	97.7	81	119
EP080/071: Total Petroleum Hydrocarbons (QCLot: 288529)							
EM1517387-004	GW05	EP080: C6 - C9 Fraction	----	280 µg/L	81.2	43	125
EP080/071: Total Petroleum Hydrocarbons (QCLot: 289005)							
EM1517384-007	Anonymous	EP080: C6 - C9 Fraction	----	280 µg/L	89.6	43	125
EP080/071: Total Recoverable Hydrocarbons - NEPM 2013 Fractions (QCLot: 288529)							
EM1517387-004	GW05	EP080: C6 - C10 Fraction	C6_C10	330 µg/L	77.5	44	122
EP080/071: Total Recoverable Hydrocarbons - NEPM 2013 Fractions (QCLot: 289005)							
EM1517384-007	Anonymous	EP080: C6 - C10 Fraction	C6_C10	330 µg/L	83.0	44	122
EP080: BTEXN (QCLot: 288529)							
EM1517387-004	GW05	EP080: Benzene	71-43-2	20 µg/L	102	68	130
		EP080: Toluene	108-88-3	20 µg/L	99.5	72	132
EP080: BTEXN (QCLot: 289005)							
EM1517384-007	Anonymous	EP080: Benzene	71-43-2	20 µg/L	102	68	130
		EP080: Toluene	108-88-3	20 µg/L	121	72	132

ALS Environmental

QA/QC Compliance Assessment to assist with Quality Review

Work Order	: **EM1517387**	Page	: 1 of 11
Client	: **AECOM Australia Pty Ltd**	Laboratory	: Environmental Division Melbourne
Contact	: MS AVERYLL COYNE	Telephone	: +61-3-8549 9608
Project	: 60431087	Date Samples Received	: 20-Nov-2015
Site	:	Issue Date	: 30-Nov-2015
Sampler	: OLIVER TAYLOR, ZACHARY OCONNOR	No. of samples received	: 11
Order number	: 60431087 1.4	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.**
- **Matrix Spike outliers exist - please see following pages for full details.**
- **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.**

Outliers : Quality Control Samples

Duplicates, Method Blanks, Laboratory Control Samples and Matrix Spikes

Matrix: **WATER**

Compound Group Name	Laboratory Sample ID	Client Sample ID	Analyte	CAS Number	Data	Limits	Comment
Matrix Spike (MS) Recoveries							
ED041G: Sulfate (Turbidimetric) as SO4 2- by DA	EM1517384--002	Anonymous	**Sulfate as SO4 - Turbidimetric**	14808-79-8	Not Determined	----	**MS recovery not determined, background level greater than or equal to 4x spike level.**
EK055G: Ammonia as N by Discrete Analyser	EM1517384--002	Anonymous	**Ammonia as N**	7664-41-7	Not Determined	----	**MS recovery not determined, background level greater than or equal to 4x spike level.**

Regular Sample Surrogates

Sub-Matrix: **GROUNDWATER**

Compound Group Name	Laboratory Sample ID	Client Sample ID	Analyte	CAS Number	Data	Limits	Comment
Samples Submitted							
EP074S: VOC Surrogates	EM1517387-002	GW02	**1.2-Dichloroethane-D4**	17060-07-0	122 %	72-120 %	**Recovery greater than upper data quality objective**

Outliers : Frequency of Quality Control Samples

Matrix: **WATER**

Quality Control Sample Type	Count		Rate (%)		Quality Control Specification
Method	QC	Regular	Actual	Expected	
Laboratory Duplicates (DUP)					
PAH/Phenols (GC/MS - SIM)	0	10	0.00	10.00	NEPM 2013 B3 & ALS QC Standard
TRH - Semivolatile Fraction	0	13	0.00	10.00	NEPM 2013 B3 & ALS QC Standard
Matrix Spikes (MS)					
PAH/Phenols (GC/MS - SIM)	0	10	0.00	5.00	NEPM 2013 B3 & ALS QC Standard
TRH - Semivolatile Fraction	0	13	0.00	5.00	NEPM 2013 B3 & ALS QC Standard

Analysis Holding Time Compliance

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*
EA005P: pH by PC Titrator							
Clear Plastic Bottle - Natural (EA005-P)							
GW01, GW02, GW06, QC05	**20-Nov-2015**	**----**	----	----	**20-Nov-2015**	20-Nov-2015	✓

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
EA015: Total Dissolved Solids dried at 180 ± 5 °C							
Clear Plastic Bottle - Natural (EA015H)							
GW01, GW02, GW06, QC05	**20-Nov-2015**	**----**	----	----	**26-Nov-2015**	27-Nov-2015	✓
ED037P: Alkalinity by PC Titrator							
Clear Plastic Bottle - Natural (ED037-P)							
GW01, GW02, GW06, QC05	**20-Nov-2015**	**----**	----	----	**25-Nov-2015**	04-Dec-2015	✓
ED041G: Sulfate (Turbidimetric) as SO4 2- by DA							
Clear Plastic Bottle - Natural (ED041G)							
GW01, GW02, GW06, QC05	**20-Nov-2015**	**----**	----	----	**25-Nov-2015**	18-Dec-2015	✓
ED043: Total Oxidised Sulfur as SO4 2-							
Clear Plastic Bottle - Natural (ED043)							
GW01, GW02, GW06, QC05	**20-Nov-2015**	**26-Nov-2015**	18-Dec-2015	✓	**26-Nov-2015**	18-Dec-2015	✓
ED045G: Chloride by Discrete Analyser							
Clear Plastic Bottle - Natural (ED045G)							
GW01, GW02, GW06, QC05	**20-Nov-2015**	**----**	----	----	**25-Nov-2015**	18-Dec-2015	✓
ED093F: Dissolved Major Cations							
Clear Plastic Bottle - Natural (ED093F)							
QC05	**20-Nov-2015**	**----**	----	----	**25-Nov-2015**	27-Nov-2015	✓
Clear Plastic Bottle - Nitric Acid; Filtered (ED093F)							
GW01, GW02, GW06	**20-Nov-2015**	**----**	----	----	**25-Nov-2015**	18-Dec-2015	✓
EG020F: Dissolved Metals by ICP-MS							
Clear Plastic Bottle - Natural (EG020A-F)							
QC05	**20-Nov-2015**	**----**	----	----	**25-Nov-2015**	18-May-2016	✓
Clear Plastic Bottle - Nitric Acid; Filtered (EG020A-F)							
GW01, GW02, GW06	**20-Nov-2015**	**----**	----	----	**25-Nov-2015**	18-May-2016	✓
EG020T: Total Metals by ICP-MS							
Clear Plastic Bottle - Nitric Acid; Unfiltered (EG020A-T)							
QCN	**20-Nov-2015**	**25-Nov-2015**	18-May-2016	✓	**26-Nov-2015**	18-May-2016	✓
EG035F: Dissolved Mercury by FIMS							
Clear Plastic Bottle - Natural (EG035F)							
QC05	**20-Nov-2015**	**----**	----	----	**26-Nov-2015**	18-Dec-2015	✓
Clear Plastic Bottle - Nitric Acid; Filtered (EG035F)							
GW01, GW02, GW06	**20-Nov-2015**	**----**	----	----	**26-Nov-2015**	18-Dec-2015	✓

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
EG035T: Total Recoverable Mercury by FIMS							
Clear Plastic Bottle - Nitric Acid; Unfiltered (EG035T)							
QCN	**20-Nov-2015**	**----**	----	----	**26-Nov-2015**	18-Dec-2015	✓
EK040P: Fluoride by PC Titrator							
Clear Plastic Bottle - Natural (EK040P)							
GW01, GW02, GW06, QC05	**20-Nov-2015**	**----**	----	----	**25-Nov-2015**	18-Dec-2015	✓
EK055G: Ammonia as N by Discrete Analyser							
Clear Plastic Bottle - Sulfuric Acid (EK055G)							
GW01, GW02, GW06, QC05	**20-Nov-2015**	**----**	----	----	**26-Nov-2015**	18-Dec-2015	✓
EK057G: Nitrite as N by Discrete Analyser							
Clear Plastic Bottle - Natural (EK057G)							
GW01, GW02, GW06, QC05	**20-Nov-2015**	**----**	----	----	**20-Nov-2015**	22-Nov-2015	✓
EK059G: Nitrite plus Nitrate as N (NOx) by Discrete Analyser							
Clear Plastic Bottle - Sulfuric Acid (EK059G)							
GW01, GW02, GW06, QC05	**20-Nov-2015**	**----**	----	----	**25-Nov-2015**	18-Dec-2015	✓
EK071G: Reactive Phosphorus as P by discrete analyser							
Clear Plastic Bottle - Natural (EK071G)							
GW01, GW02, GW06, QC05	**20-Nov-2015**	**----**	----	----	**20-Nov-2015**	22-Nov-2015	✓
EP005: Total Organic Carbon (TOC)							
Amber TOC Vial - Sulfuric Acid (EP005)							
GW01, GW06, GW05	**20-Nov-2015**	**----**	----	----	**27-Nov-2015**	18-Dec-2015	✓
Amber VOC Vial - Sulfuric Acid (EP005)							
GW02, GW13, GW19, GW35	**20-Nov-2015**	**----**	----	----	**27-Nov-2015**	18-Dec-2015	✓
EP080/071: Total Petroleum Hydrocarbons							
Amber Glass Bottle - Unpreserved (EP071)							
GW01, GW02, GW06, QCN	**20-Nov-2015**	**24-Nov-2015**	27-Nov-2015	✓	**25-Nov-2015**	03-Jan-2016	✓
EP074E: Halogenated Aliphatic Compounds							
Amber VOC Vial - Sulfuric Acid (EP074-WF)							
GW01, GW02	**20-Nov-2015**	**25-Nov-2015**	04-Dec-2015	✓	**25-Nov-2015**	04-Dec-2015	✓
EP075(SIM)B: Polynuclear Aromatic Hydrocarbons							
Amber Glass Bottle - Unpreserved (EP075(SIM))							
GW01, GW02, GW06	**20-Nov-2015**	**24-Nov-2015**	27-Nov-2015	✓	**25-Nov-2015**	03-Jan-2016	✓

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 Petroleum Hydrocarbons							
Amber VOC Vial - Sulfuric Acid (EP080)							
GW01, GW02	**20-Nov-2015**	**25-Nov-2015**	04-Dec-2015	✓	**25-Nov-2015**	04-Dec-2015	✓
Amber VOC Vial - Sulfuric Acid (EP080)							
GW06, GW05, GW13, GW19, GW35, QCN, QC9	**20-Nov-2015**	**25-Nov-2015**	04-Dec-2015	✓	**26-Nov-2015**	04-Dec-2015	✓

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)							
Alkalinity by PC Titrator	ED037-P	2	20	**10.00**	**10.00**	✓	NEPM 2013 B3 & ALS QC Standard
Ammonia as N by Discrete analyser	EK055G	2	20	**10.00**	**10.00**	✓	NEPM 2013 B3 & ALS QC Standard
Chloride by Discrete Analyser	ED045G	2	12	**16.67**	**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	17	**11.76**	**10.00**	✓	NEPM 2013 B3 & ALS QC Standard
Fluoride by PC Titrator	EK040P	2	20	**10.00**	**10.00**	✓	NEPM 2013 B3 & ALS QC Standard
Major Cations - Dissolved	ED093F	2	11	**18.18**	**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	14	**14.29**	**10.00**	✓	NEPM 2013 B3 & ALS QC Standard
PAH/Phenols (GC/MS - SIM)	EP075(SIM)	0	10	**0.00**	**10.00**	×	NEPM 2013 B3 & ALS QC Standard
pH by PC Titrator	EA005-P	2	20	**10.00**	**10.00**	✓	NEPM 2013 B3 & ALS QC Standard
Reactive Phosphorus as P-By Discrete Analyser	EK071G	2	12	**16.67**	**10.00**	✓	NEPM 2013 B3 & ALS QC Standard
Sulfate (Turbidimetric) as SO4 2- by Discrete Analyser	ED041G	2	14	**14.29**	**10.00**	✓	NEPM 2013 B3 & ALS QC Standard
Total Dissolved Solids (High Level)	EA015H	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-MS - Suite A	EG020A-T	2	20	**10.00**	**10.00**	✓	NEPM 2013 B3 & ALS QC Standard
Total Organic Carbon	EP005	2	14	**14.29**	**10.00**	✓	NEPM 2013 B3 & ALS QC Standard
Total Oxidised Sulfur as SO4 2-	ED043	2	15	**13.33**	**10.00**	✓	NEPM 2013 B3 & ALS QC Standard
TRH - Semivolatile Fraction	EP071	0	13	**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
Volatile Organic Compounds WF Detection Limits	EP074-WF	1	4	**25.00**	**10.00**	✓	NEPM 2013 B3 & ALS QC Standard
Laboratory Control Samples (LCS)							
Alkalinity by PC Titrator	ED037-P	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
Chloride by Discrete Analyser	ED045G	2	12	**16.67**	**10.00**	✓	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	17	**5.88**	**5.00**	✓	NEPM 2013 B3 & ALS QC Standard
Fluoride by PC Titrator	EK040P	1	20	**5.00**	**5.00**	✓	NEPM 2013 B3 & ALS QC Standard
Major Cations - Dissolved	ED093F	1	11	**9.09**	**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	14	**7.14**	**5.00**	✓	NEPM 2013 B3 & ALS QC Standard
PAH/Phenols (GC/MS - SIM)	EP075(SIM)	1	10	**10.00**	**5.00**	✓	NEPM 2013 B3 & ALS QC Standard
Reactive Phosphorus as P-By Discrete Analyser	EK071G	1	12	**8.33**	**5.00**	✓	NEPM 2013 B3 & ALS QC Standard
Sulfate (Turbidimetric) as SO4 2- by Discrete Analyser	ED041G	2	14	**14.29**	**10.00**	✓	NEPM 2013 B3 & ALS QC Standard
Total Dissolved Solids (High Level)	EA015H	2	20	**10.00**	**10.00**	✓	NEPM 2013 B3 & ALS QC Standard
Total Mercury by FIMS	EG035T	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.

Quality Control Sample Type		Count		Rate (%)			Quality Control Specification
Analytical Methods	*Method*	*QC*	*Regular*	***Actual***	***Expected***	*Evaluation*	
Laboratory Control Samples (LCS) - Continued							
Total Metals by ICP-MS - Suite A	EG020A-T	1	20	**5.00**	**5.00**	✓	NEPM 2013 B3 & ALS QC Standard
Total Organic Carbon	EP005	1	14	**7.14**	**5.00**	✓	NEPM 2013 B3 & ALS QC Standard
Total Oxidised Sulfur as SO4 2-	ED043	1	15	**6.67**	**5.00**	✓	NEPM 2013 B3 & ALS QC Standard
TRH - Semivolatile Fraction	EP071	1	13	**7.69**	**5.00**	✓	NEPM 2013 B3 & ALS QC Standard
TRH Volatiles/BTEX	EP080	1	20	**5.00**	**5.00**	✓	NEPM 2013 B3 & ALS QC Standard
Volatile Organic Compounds WF Detection Limits	EP074-WF	1	4	**25.00**	**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
Chloride by Discrete Analyser	ED045G	1	12	**8.33**	**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	17	**5.88**	**5.00**	✓	NEPM 2013 B3 & ALS QC Standard
Fluoride by PC Titrator	EK040P	1	20	**5.00**	**5.00**	✓	NEPM 2013 B3 & ALS QC Standard
Major Cations - Dissolved	ED093F	1	11	**9.09**	**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	14	**7.14**	**5.00**	✓	NEPM 2013 B3 & ALS QC Standard
PAH/Phenols (GC/MS - SIM)	EP075(SIM)	1	10	**10.00**	**5.00**	✓	NEPM 2013 B3 & ALS QC Standard
Reactive Phosphorus as P-By Discrete Analyser	EK071G	1	12	**8.33**	**5.00**	✓	NEPM 2013 B3 & ALS QC Standard
Sulfate (Turbidimetric) as SO4 2- by Discrete Analyser	ED041G	1	14	**7.14**	**5.00**	✓	NEPM 2013 B3 & ALS QC Standard
Total Dissolved Solids (High Level)	EA015H	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-MS - Suite A	EG020A-T	1	20	**5.00**	**5.00**	✓	NEPM 2013 B3 & ALS QC Standard
Total Organic Carbon	EP005	1	14	**7.14**	**5.00**	✓	NEPM 2013 B3 & ALS QC Standard
Total Oxidised Sulfur as SO4 2-	ED043	1	15	**6.67**	**5.00**	✓	NEPM 2013 B3 & ALS QC Standard
TRH - Semivolatile Fraction	EP071	1	13	**7.69**	**5.00**	✓	NEPM 2013 B3 & ALS QC Standard
TRH Volatiles/BTEX	EP080	1	20	**5.00**	**5.00**	✓	NEPM 2013 B3 & ALS QC Standard
Volatile Organic Compounds WF Detection Limits	EP074-WF	1	4	**25.00**	**5.00**	✓	NEPM 2013 B3 & ALS QC Standard
Matrix Spikes (MS)							
Ammonia as N by Discrete analyser	EK055G	1	20	**5.00**	**5.00**	✓	NEPM 2013 B3 & ALS QC Standard
Chloride by Discrete Analyser	ED045G	1	12	**8.33**	**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	17	**5.88**	**5.00**	✓	NEPM 2013 B3 & ALS QC Standard
Fluoride by PC Titrator	EK040P	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
Nitrite as N by Discrete Analyser	EK057G	1	14	**7.14**	**5.00**	✓	NEPM 2013 B3 & ALS QC Standard
PAH/Phenols (GC/MS - SIM)	EP075(SIM)	0	10	**0.00**	**5.00**	×	NEPM 2013 B3 & ALS QC Standard
Reactive Phosphorus as P-By Discrete Analyser	EK071G	1	12	**8.33**	**5.00**	✓	NEPM 2013 B3 & ALS QC Standard
Sulfate (Turbidimetric) as SO4 2- by Discrete Analyser	ED041G	1	14	**7.14**	**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-MS - Suite A	EG020A-T	1	20	**5.00**	**5.00**	✓	NEPM 2013 B3 & ALS QC Standard
Total Organic Carbon	EP005	1	14	**7.14**	**5.00**	✓	NEPM 2013 B3 & ALS QC Standard

Matrix: **WATER**

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

Quality Control Sample Type		Count		Rate (%)			Quality Control Specification
Analytical Methods	*Method*	*QC*	*Regular*	***Actual***	***Expected***	*Evaluation*	
Matrix Spikes (MS) - Continued							
Total Oxidised Sulfur as SO4 2-	ED043	1	15	**6.67**	**5.00**	✓	NEPM 2013 B3 & ALS QC Standard
TRH - Semivolatile Fraction	EP071	0	13	**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
Volatile Organic Compounds WF Detection Limits	EP074-WF	1	4	**25.00**	**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 by PC Titrator	EA005-P	WATER	In house: Referenced to APHA 4500 H+ B. This procedure determines pH of water samples by automated ISE. This method is compliant with NEPM (2013) Schedule B(3)
Total Dissolved Solids (High Level)	EA015H	WATER	In house: Referenced to APHA 2540C. A gravimetric procedure that determines the amount of `filterable` residue in an aqueous sample. A well-mixed sample is filtered through a glass fibre filter (1.2um). The filtrate is evaporated to dryness and dried to constant weight at 180+/-5C. This method is compliant with NEPM (2013) Schedule B(3)
Alkalinity by PC Titrator	ED037-P	WATER	In house: Referenced to APHA 2320 B This procedure determines alkalinity by automated measurement (e.g. PC Titrate) using pH 4.5 for indicating the total alkalinity end-point. This method is compliant with NEPM (2013) Schedule B(3)
Sulfate (Turbidimetric) as SO4 2- by Discrete Analyser	ED041G	WATER	In house: Referenced to APHA 4500-SO4. Dissolved sulfate is determined in a 0.45um filtered sample. Sulfate ions are converted to a barium sulfate suspension in an acetic acid medium with barium chloride. Light absorbance of the BaSO4 suspension is measured by a photometer and the SO4-2 concentration is determined by comparison of the reading with a standard curve. This method is compliant with NEPM (2013) Schedule B(3)
Total Oxidised Sulfur as SO4 2-	ED043	WATER	In-house. The sample is treated with Peroxide to convert all Sulfur species to Sulfate. Sulfate in the sample can then be determined by ICPAES and reported as TOS as SO4 2-.
Chloride by Discrete Analyser	ED045G	WATER	In house: Referenced to APHA 4500 Cl - G.The thiocyanate ion is liberated from mercuric thiocyanate through sequestration of mercury by the chloride ion to form non-ionised mercuric chloride.in the presence of ferric ions the librated thiocynate forms highly-coloured ferric thiocynate which is measured at 480 nm APHA 21st edition seal method 2 017-1-L april 2003
Major Cations - Dissolved	ED093F	WATER	In house: Referenced to APHA 3120 and 3125; USEPA SW 846 - 6010 and 6020; Cations are determined by either ICP-AES or ICP-MS techniques. This method is compliant with NEPM (2013) Schedule B(3) Sodium Adsorption Ratio is calculated from Ca, Mg and Na which determined by ALS in house method QWI-EN/ED093F. This method is compliant with NEPM (2013) Schedule B(3) Hardness parameters are calculated based on APHA 2340 B. This method is compliant with NEPM (2013) Schedule B(3)
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 0.45 um 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.
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.

Analytical Methods	Method	Matrix	Method Descriptions
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 0.45 um 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 (2013) Schedule B(3)
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 (2013) Schedule B(3)
Fluoride by PC Titrator	EK040P	WATER	In house: Referenced to APHA 4500 F--C CDTA is added to the sample to provide a uniform ionic strength background, adjust pH, and break up complexes. Fluoride concentration is determined by either manual or automatic ISE measurement. This method is compliant with NEPM (2013) 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 (2013) 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 (2013) 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 (2013) 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 (2013) Schedule B(3)
Reactive Phosphorus as P-By Discrete Analyser	EK071G	WATER	In house: Referenced to APHA 4500-P F Ammonium molybdate and potassium antimonyl tartrate reacts in acid medium with othophosphate to form a heteropoly acid -phosphomolybdic acid - which is reduced to intensely coloured molybdenum blue by ascorbic acid. Quantification is by Discrete Analyser. This method is compliant with NEPM (2013) Schedule B(3)
Ionic Balance by PCT DA and Turbi SO4 DA	EN055 - PG	WATER	In house: Referenced to APHA 1030F. This method is compliant with NEPM (2013) Schedule B(3)
Total Organic Carbon	EP005	WATER	In house: Referenced to APHA 5310 B, The automated TOC analyzer determines Total and Inorganic Carbon by IR cell. TOC is calculated as the difference. This method is compliant with NEPM (2013) Schedule B(3)
TRH - Semivolatile Fraction	EP071	WATER	USEPA SW 846 - 8015A 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 (2013) Schedule B(3)
Volatile Organic Compounds WF Detection Limits	EP074-WF	WATER	USEPA SW 846 - 8260B Water samples are directly purged prior to analysis by Capillary GC/MS and quantification is by comparison against an established 5 point calibration curve. This method is compliant with NEPM (2013) Schedule B(3)
PAH/Phenols (GC/MS - SIM)	EP075(SIM)	WATER	USEPA SW 846 - 8270D 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 (2013) Schedule B(3)

Analytical Methods	Method	Matrix	Method Descriptions
TRH Volatiles/BTEX	EP080	WATER	USEPA SW 846 - 8260B 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 (2013) Schedule B(3)

Preparation Methods	Method	Matrix	Method Descriptions
Total Oxidisable Sulfur as SO4 2- Prep	ED043-PR	WATER	In - House
Digestion for Total Recoverable Metals	EN25	WATER	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 (2013) Schedule B(3)

SAMPLE RECEIPT NOTIFICATION (SRN)

Work Order : **EM1517387**

Client	: **AECOM Australia Pty Ltd**	Laboratory	: Environmental Division Melbourne
Contact	: MS AVERYLL COYNE	Contact	: Carol Walsh
Address	: LEVEL 9 8 EXHIBITION ST MELBOURNE VIC 3000	Address	: 4 Westall Rd Springvale VIC Australia 3171
E-mail	: averyll.coyne@aecom.com	E-mail	: carol.walsh@alsglobal.com
Telephone	: +61 03 9653 1234	Telephone	: +61-3-8549 9608
Facsimile	: +61 03 9654 7117	Facsimile	: +61-3-8549 9601
Project	: 60431087	Page	: 1 of 3
Order number	: 60431087 1.4	Quote number	: EM2015AECOMAU0625 (ME/543/15)
C-O-C number	: ----	QC Level	: NEPM 2013 B3 & ALS QC Standard
Site	:		
Sampler	: OLIVER TAYLOR, ZACHARY OCONNOR		

Dates

Date Samples Received	: 20-Nov-2015 4:35 PM	Issue Date	: 24-Nov-2015
Client Requested Due Date	: 27-Nov-2015	Scheduled Reporting Date	: **27-Nov-2015**

Delivery Details

Mode of Delivery	: Carrier	Security Seal	: Intact.
No. of coolers/boxes	: 3	Temperature	: 9.9°C - Ice present
Receipt Detail	:	No. of samples received / analysed	: 11 / 10

General Comments

- This report contains the following information:
  - Sample Container(s)/Preservation Non-Compliances
  - Summary of Sample(s) and Requested Analysis
  - Proactive Holding Time Report
  - Requested Deliverables
- **Sample QC05 to be filtered through a 0.45um filter prior to the dissolved metals analysis.**
- **Please direct any queries related to sample condition / numbering / breakages to Client Services.**
- Sample Disposal - Aqueous (14 days), Solid (60 days) from date of completion of work order.
- **Analytical work for this work order will be conducted at ALS Springvale.**
- **For sample QC9 TPH/BTEX has been requested; only VOC vials have been received and so only the volatile fraction of TPH (C6-C9) plus BTEX analysis (ALS suite W-18) has been booked in.**
- **Please refer to the Proactive Holding Time Report table below which summarises breaches of recommended holding times that have occurred prior to samples/instructions being received at the laboratory. The absence of this summary table indicates that all samples have been received within the recommended holding times for the analysis requested.**

Sample Container(s)/Preservation Non-Compliances

All comparisons are made against pretreatment/preservation AS, APHA, USEPA standards.

Method / Client sample ID	Sample Container Received	Preferred Sample Container for Analysis
Dissolved Mercury by FIMS : EG035F		
QC05	- Clear Plastic Bottle - Natural	- Clear Plastic Bottle - Nitric Acid; Filtered
Dissolved Metals by ICP-MS - Suite A : EG020A-F		
QC05	- Clear Plastic Bottle - Natural	- Clear Plastic Bottle - Nitric Acid; Filtered

Summary of Sample(s) and Requested Analysis

Some items described below may be part of a laboratory process necessary for the execution of client requested tasks. Packages may contain additional analyses, such as the determination of moisture content and preparation tasks, that are included in the package.

Matrix: **WATER**

Laboratory sample ID	Client sampling date / time	Client sample ID	WATER - EA005P pH (PC)	WATER - EG020F Dissolved Metals by ICPMS	WATER - EK055G Ammonia as N By Discrete Analyser	WATER - NT-01 & 02 Ca, Mg, Na, K, Cl, SO4, Alkalinity	WATER - NT-03 Minor Anions (Nitrite, Nitrate, Fluoride,	WATER - W-02 8 Metals	WATER - W-07 TRH/BTEXN/PAH
EM1517387-001	[20-Nov-2015]	GW01	✓	✓	✓	✓	✓	✓	✓
EM1517387-002	[20-Nov-2015]	GW02	✓	✓	✓	✓	✓	✓	✓
EM1517387-003	[20-Nov-2015]	GW06	✓	✓	✓	✓	✓	✓	✓
EM1517387-011	[20-Nov-2015]	QC05	✓	✓	✓	✓	✓	✓	

Matrix: **WATER**

Laboratory sample ID	Client sampling date / time	Client sample ID	WATER - EA015H Total Dissolved Solids - High Level	WATER - ED043 Total Oxidised Sulfur as SO4 2-	WATER - EG020T Total Recoverable Metals by ICPMS (including	WATER - EP005 Total Organic Carbon (TOC)	WATER - EP074-WF Full VOCs with WF DL incl DCM & Acetone	WATER - W-02T 8 metals (Total)	WATER - W-18 TRH(C6 - C9)/BTEXN
EM1517387-001	[20-Nov-2015]	GW01	✓	✓		✓	✓		
EM1517387-002	[20-Nov-2015]	GW02	✓	✓		✓	✓		
EM1517387-003	[20-Nov-2015]	GW06	✓	✓		✓			
EM1517387-004	[20-Nov-2015]	GW05				✓			✓
EM1517387-005	[20-Nov-2015]	GW13				✓			✓
EM1517387-006	[20-Nov-2015]	GW19				✓			✓
EM1517387-007	[20-Nov-2015]	GW35				✓			✓
EM1517387-008	[20-Nov-2015]	QCN			✓			✓	
EM1517387-010	[20-Nov-2015]	QC9							✓
EM1517387-011	[20-Nov-2015]	QC05	✓	✓					

Matrix: **WATER**

Laboratory sample ID	*Client sampling date / time*	*Client sample ID*	(On Hold) WATER No analysis requested	WATER - W-04 TRH/BTEXN
EM1517387-008	[20-Nov-2015]	QCN		✓
EM1517387-009	[20-Nov-2015]	QCO	✓	

Proactive Holding Time Report

Sample(s) have been received within the recommended holding times for the requested analysis.

Requested Deliverables

ACCOUNTS PAYABLE

- A4 - AU Tax Invoice (INV)	Email	AP_CustomerService.anz@aecom.com

AVERYLL COYNE

- *AU Certificate of Analysis - NATA (COA)	Email	averyll.coyne@aecom.com
- *AU Interpretive QC Report - DEFAULT (Anon QCI Rep) (QCI)	Email	averyll.coyne@aecom.com
- *AU QC Report - DEFAULT (Anon QC Rep) - NATA (QC)	Email	averyll.coyne@aecom.com
- A4 - AU Sample Receipt Notification - Environmental HT (SRN)	Email	averyll.coyne@aecom.com
- A4 - AU Tax Invoice (INV)	Email	averyll.coyne@aecom.com
- Chain of Custody (CoC) (COC)	Email	averyll.coyne@aecom.com
- EDI Format - ENMRG (ENMRG)	Email	averyll.coyne@aecom.com
- EDI Format - ESDAT (ESDAT)	Email	averyll.coyne@aecom.com
- EDI Format - HLAPro (HLAPro)	Email	averyll.coyne@aecom.com
- EDI Format - XTab (XTAB)	Email	averyll.coyne@aecom.com

ALS Environmental

CERTIFICATE OF ANALYSIS

Work Order	: **EM1517502**	Page	: 1 of 4
Client	: **AECOM Australia Pty Ltd**	Laboratory	: Environmental Division Melbourne
Contact	: MS AVERYLL COYNE	Contact	: Carol Walsh
Address	: LEVEL 9 8 EXHIBITION ST MELBOURNE VIC 3000	Address	: 4 Westall Rd Springvale VIC Australia 3171
E-mail	: averyll.coyne@aecom.com	E-mail	: carol.walsh@alsglobal.com
Telephone	: +61 03 9653 1234	Telephone	: +61-3-8549 9608
Facsimile	: +61 03 9654 7117	Facsimile	: +61-3-8549 9601
Project	: 60431087	QC Level	: NEPM 2013 B3 & ALS QC Standard
Order number	: ----	Date Samples Received	: 23-Nov-2015 16:40
C-O-C number	: ----	Date Analysis Commenced	: 26-Nov-2015
Sampler	: MATTHEW SHEPPARD	Issue Date	: 30-Nov-2015 18:50
Site	:		
		No. of samples received	: 7
Quote number	: ----	No. of samples analysed	: 7

This report supersedes any previous report(s) with this reference. Results apply to the sample(s) as submitted.

This Certificate of Analysis contains the following information:

- General Comments
- Analytical Results

NATA Accredited Laboratory 825

Accredited for compliance with ISO/IEC 17025.

Signatories

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

Signatories	*Position*	*Accreditation Category*
Dilani Fernando	Senior Inorganic Chemist	Melbourne Inorganics
Nancy Wang	Senior Semivolatile Instrument Chemist	Melbourne Organics
Xing Lin	Senior Organic Chemist	Melbourne Organics

General Comments

The analytical procedures used by the Environmental Division have been developed from established internationally recognized procedures such as those published by the USEPA, APHA, AS and NEPM. In house developed procedures are employed in the absence of documented standards or by 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.

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.

Analytical Results

Sub-Matrix: WATER (Matrix: WATER)				Client sample ID	GW17	GW22	GW25	GW29	GW30
				Client sampling date / time	[23-Nov-2015]	[23-Nov-2015]	[23-Nov-2015]	[23-Nov-2015]	[23-Nov-2015]
Compound	CAS Number	LOR	Unit		EM1517502-001	EM1517502-002	EM1517502-003	EM1517502-004	EM1517502-005
					Result	Result	Result	Result	Result
EP005: Total Organic Carbon (TOC)									
Total Organic Carbon	----	1	mg/L		**13**	**16**	**12**	**14**	**14**
EP080/071: Total Petroleum Hydrocarbons									
C6 - C9 Fraction	----	20	µg/L		<20	<20	<20	<20	<20
EP080/071: Total Recoverable Hydrocarbons - NEPM 2013 Fractions									
C6 - C10 Fraction	C6_C10	20	µg/L		<20	<20	<20	<20	<20
^ **C6 - C10 Fraction minus BTEX (F1)**	C6_C10-BTEX	20	µg/L		<20	<20	<20	<20	<20
EP080: BTEXN									
Benzene	71-43-2	1	µg/L		<1	<1	<1	<1	<1
Toluene	108-88-3	2	µg/L		<2	<2	<2	<2	<2
Ethylbenzene	100-41-4	2	µg/L		<2	<2	<2	<2	<2
meta- & para-Xylene	108-38-3 106-42-3	2	µg/L		<2	<2	<2	<2	<2
ortho-Xylene	95-47-6	2	µg/L		<2	<2	<2	<2	<2
^ **Total Xylenes**	1330-20-7	2	µg/L		<2	<2	<2	<2	<2
^ **Sum of BTEX**	----	1	µg/L		<1	<1	<1	<1	<1
Naphthalene	91-20-3	5	µg/L		<5	<5	<5	<5	<5
EP080S: TPH(V)/BTEX Surrogates									
1.2-Dichloroethane-D4	17060-07-0	2	%		**107**	**109**	**119**	**108**	**120**
Toluene-D8	2037-26-5	2	%		**86.5**	**84.1**	**95.6**	**84.4**	**97.9**
4-Bromofluorobenzene	460-00-4	2	%		**97.4**	**94.2**	**103**	**93.6**	**99.9**

Analytical Results

Sub-Matrix: WATER (Matrix: WATER)				Client sample ID	QCK	QCL	----	----	----
				Client sampling date / time	[23-Nov-2015]	[23-Nov-2015]	----	----	----
Compound	CAS Number	LOR	Unit		EM1517502-006	EM1517502-007	--------	--------	--------
					Result	Result	Result	Result	Result
EP005: Total Organic Carbon (TOC)									
Total Organic Carbon	----	1	mg/L		----	----	----	----	----
EP080/071: Total Petroleum Hydrocarbons									
C6 - C9 Fraction	----	20	µg/L		<20	<20	----	----	----
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	----	----	----
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**	1330-20-7	2	µg/L		<2	<2	----	----	----
^ **Sum of BTEX**	----	1	µg/L		<1	<1	----	----	----
Naphthalene	91-20-3	5	µg/L		<5	<5	----	----	----
EP080S: TPH(V)/BTEX Surrogates									
1.2-Dichloroethane-D4	17060-07-0	2	%		**102**	**110**	----	----	----
Toluene-D8	2037-26-5	2	%		**94.5**	**87.3**	----	----	----
4-Bromofluorobenzene	460-00-4	2	%		**97.4**	**96.1**	----	----	----

ALS Environmental

QUALITY CONTROL REPORT

Work Order	: **EM1517502**	Page	: 1 of 4
Client	: **AECOM Australia Pty Ltd**	Laboratory	: Environmental Division Melbourne
Contact	: MS AVERYLL COYNE	Contact	: Carol Walsh
Address	: LEVEL 9 8 EXHIBITION ST MELBOURNE VIC 3000	Address	: 4 Westall Rd Springvale VIC Australia 3171
E-mail	: averyll.coyne@aecom.com	E-mail	: carol.walsh@alsglobal.com
Telephone	: +61 03 9653 1234	Telephone	: +61-3-8549 9608
Facsimile	: +61 03 9654 7117	Facsimile	: +61-3-8549 9601
Project	: 60431087	QC Level	: NEPM 2013 B3 & ALS QC Standard
Order number	: ----	Date Samples Received	: 23-Nov-2015
C-O-C number	: ----	Date Analysis Commenced	: 26-Nov-2015
Sampler	: MATTHEW SHEPPARD	Issue Date	: 30-Nov-2015
Site	:	No. of samples received	: 7
Quote number	: ----	No. of samples analysed	: 7

This report supersedes any previous report(s) with this reference. Results apply to the sample(s) as submitted.

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

NATA WORLD RECOGNISED ACCREDITATION

NATA Accredited Laboratory 825

Accredited for compliance with ISO/IEC 17025.

Signatories

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

Signatories	*Position*	*Accreditation Category*
Dilani Fernando	Senior Inorganic Chemist	Melbourne Inorganics
Nancy Wang	Senior Semivolatile Instrument Chemist	Melbourne Organics
Xing Lin	Senior Organic Chemist	Melbourne Organics

General Comments

The analytical procedures used by the Environmental Division have been developed from established internationally recognized procedures such as those published by the USEPA, APHA, AS and NEPM. In house developed procedures are employed in the absence of documented standards or by 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

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	*Client sample ID*	*Method: Compound*	*CAS Number*	*LOR*	*Unit*	*Original Result*	*Duplicate Result*	*RPD (%)*	*Recovery Limits (%)*
EP005: Total Organic Carbon (TOC) (QC Lot: 292163)									
EM1517348-001	Anonymous	EP005: Total Organic Carbon	----	1	mg/L	4	4	0.00	No Limit
EM1517477-007	Anonymous	EP005: Total Organic Carbon	----	1	mg/L	4	4	0.00	No Limit
EP080/071: Total Petroleum Hydrocarbons (QC Lot: 290073)									
EM1517502-001	GW17	EP080: C6 - C9 Fraction	----	20	µg/L	<20	<20	0.00	No Limit
EM1517525-001	Anonymous	EP080: C6 - C9 Fraction	----	20	µg/L	<20	<20	0.00	No Limit
EP080/071: Total Recoverable Hydrocarbons - NEPM 2013 Fractions (QC Lot: 290073)									
EM1517502-001	GW17	EP080: C6 - C10 Fraction	C6_C10	20	µg/L	<20	<20	0.00	No Limit
EM1517525-001	Anonymous	EP080: C6 - C10 Fraction	C6_C10	20	µg/L	<20	<20	0.00	No Limit
EP080: BTEXN (QC Lot: 290073)									
EM1517502-001	GW17	EP080: Benzene	71-43-2	1	µg/L	<1	<1	0.00	No Limit
		EP080: Ethylbenzene	100-41-4	2	µg/L	<2	<2	0.00	No Limit
		EP080: meta- & para-Xylene	108-38-3 106-42-3	2	µg/L	<2	<2	0.00	No Limit
		EP080: ortho-Xylene	95-47-6	2	µg/L	<2	<2	0.00	No Limit
		EP080: Toluene	108-88-3	2	µg/L	<2	<2	0.00	No Limit
		EP080: Naphthalene	91-20-3	5	µg/L	<5	<5	0.00	No Limit
EM1517525-001	Anonymous	EP080: Benzene	71-43-2	1	µg/L	<1	<1	0.00	No Limit
		EP080: Ethylbenzene	100-41-4	2	µg/L	<2	<2	0.00	No Limit
		EP080: meta- & para-Xylene	108-38-3 106-42-3	2	µg/L	<2	<2	0.00	No Limit
		EP080: ortho-Xylene	95-47-6	2	µg/L	<2	<2	0.00	No Limit
		EP080: Toluene	108-88-3	2	µg/L	<2	<2	0.00	No Limit
		EP080: Naphthalene	91-20-3	5	µg/L	<5	<5	0.00	No Limit

Method Blank (MB) and Laboratory Control Spike (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 (%)	Recovery Limits (%)	
Method: Compound	CAS Number	LOR	Unit	Result	Concentration	LCS	Low	High
EP005: Total Organic Carbon (TOC) (QCLot: 292163)								
EP005: Total Organic Carbon	----	1	mg/L	<1	100 mg/L	90.4	86	112
EP080/071: Total Petroleum Hydrocarbons (QCLot: 290073)								
EP080: C6 - C9 Fraction	----	20	µg/L	<20	360 µg/L	81.8	67	127
EP080/071: Total Recoverable Hydrocarbons - NEPM 2013 Fractions (QCLot: 290073)								
EP080: C6 - C10 Fraction	C6_C10	20	µg/L	<20	450 µg/L	81.3	65	125
EP080: BTEXN (QCLot: 290073)								
EP080: Benzene	71-43-2	1	µg/L	<1	20 µg/L	90.6	76	120
EP080: Ethylbenzene	100-41-4	2	µg/L	<2	20 µg/L	86.8	72	124
EP080: meta- & para-Xylene	108-38-3 106-42-3	2	µg/L	<2	40 µg/L	89.4	72	130
EP080: Naphthalene	91-20-3	5	µg/L	<5	5 µg/L	85.3	71	129
EP080: ortho-Xylene	95-47-6	2	µg/L	<2	20 µg/L	91.2	75	127
EP080: Toluene	108-88-3	2	µg/L	<2	20 µg/L	88.3	76	124

Matrix Spike (MS) Report

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

Sub-Matrix: **WATER**

				Matrix Spike (MS) Report			
				Spike	SpikeRecovery(%)	Recovery Limits (%)	
Laboratory sample ID	Client sample ID	Method: Compound	CAS Number	Concentration	MS	Low	High
EP005: Total Organic Carbon (TOC) (QCLot: 292163)							
EM1517348-002	Anonymous	EP005: Total Organic Carbon	----	100 mg/L	86.8	80	114
EP080/071: Total Petroleum Hydrocarbons (QCLot: 290073)							
EM1517502-002	GW22	EP080: C6 - C9 Fraction	----	280 µg/L	73.0	43	125
EP080/071: Total Recoverable Hydrocarbons - NEPM 2013 Fractions (QCLot: 290073)							
EM1517502-002	GW22	EP080: C6 - C10 Fraction	C6_C10	330 µg/L	69.5	44	122
EP080: BTEXN (QCLot: 290073)							
EM1517502-002	GW22	EP080: Benzene	71-43-2	20 µg/L	98.1	68	130
		EP080: Toluene	108-88-3	20 µg/L	94.8	72	132

ALS Environmental

QA/QC Compliance Assessment to assist with Quality Review

Work Order	: **EM1517502**	Page	: 1 of 4
Client	: **AECOM Australia Pty Ltd**	Laboratory	: Environmental Division Melbourne
Contact	: MS AVERYLL COYNE	Telephone	: +61-3-8549 9608
Project	: 60431087	Date Samples Received	: 23-Nov-2015
Site	:	Issue Date	: 30-Nov-2015
Sampler	: MATTHEW SHEPPARD	No. of samples received	: 7
Order number	: ----	No. of samples analysed	: 7

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

- **NO Quality Control Sample Frequency Outliers exist.**

Analysis Holding Time Compliance

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
EP005: Total Organic Carbon (TOC)							
Amber VOC Vial - Sulfuric Acid (EP005)							
GW17, GW22, GW25, GW29, GW30	**23-Nov-2015**	**----**	----	----	**27-Nov-2015**	21-Dec-2015	✓
EP080/071: Total Petroleum Hydrocarbons							
Amber VOC Vial - Sulfuric Acid (EP080)							
GW17, GW22, GW25, GW29, GW30, QCK, QCL	**23-Nov-2015**	**26-Nov-2015**	07-Dec-2015	✓	**27-Nov-2015**	07-Dec-2015	✓

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)							
Total Organic Carbon	EP005	2	19	**10.53**	**10.00**	✓	NEPM 2013 B3 & ALS QC Standard
TRH Volatiles/BTEX	EP080	2	16	**12.50**	**10.00**	✓	NEPM 2013 B3 & ALS QC Standard
Laboratory Control Samples (LCS)							
Total Organic Carbon	EP005	1	19	**5.26**	**5.00**	✓	NEPM 2013 B3 & ALS QC Standard
TRH Volatiles/BTEX	EP080	1	16	**6.25**	**5.00**	✓	NEPM 2013 B3 & ALS QC Standard
Method Blanks (MB)							
Total Organic Carbon	EP005	1	19	**5.26**	**5.00**	✓	NEPM 2013 B3 & ALS QC Standard
TRH Volatiles/BTEX	EP080	1	16	**6.25**	**5.00**	✓	NEPM 2013 B3 & ALS QC Standard
Matrix Spikes (MS)							
Total Organic Carbon	EP005	1	19	**5.26**	**5.00**	✓	NEPM 2013 B3 & ALS QC Standard
TRH Volatiles/BTEX	EP080	1	16	**6.25**	**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
Total Organic Carbon	EP005	WATER	In house: Referenced to APHA 5310 B, The automated TOC analyzer determines Total and Inorganic Carbon by IR cell. TOC is calculated as the difference. This method is compliant with NEPM (2013) Schedule B(3)
TRH Volatiles/BTEX	EP080	WATER	USEPA SW 846 - 8260B 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 (2013) Schedule B(3)

Form:

AECOM

Chain of Custody & Analysis Request Form

AECOM - Melbourne
Level 9, 8 Exhibition Street
Melbourne VIC 3000
Tel: 03 9653 8072
Fax: 61 3 9653 1234
Email: averyll.coyne@aecom.com

Laboratory Details
Lab. Name: ALS
Lab. Address: 4 Westall Rd. Springvale
Contact Name:
Lab. Ref:
Tel: 8549 9600
Fax:
Preliminary Report by:
Final Report by:
Lab Quote No:

Project Name: Fishermans Bend
Project Number: 60431087
Purchase Order Number: NA

Sample collected by:Matthew Sheppard
Sample Results to be returned to: Averyll Coyne & Matthew Sheppard

Specifications:

	(Tick)		
1. Urgent TAT required? (please circle: 24hr 48hr 3 days)	☐ Yes	☑ No	☐ N/A
2. Fast TAT Guarantee Required?	☐ Yes	☑ No	☐ N/A
3. Is any sediment layer present in waters to be excluded from extractions?	☐ Yes	☑ No	☐ N/A
4. Special storage requirements?	☐ Yes	☑ No	☐ N/A
5. Preservation requirements?	☐ Yes	☑ No	☐ N/A
6. Other requirements? ☐ Fax ☐ Hard copy ☐ Email	☑ Yes	☐ No	☐ N/A

7. Report Format: email with QC reports
8. Project Manager: Averyll Coyne tel: 9653 8072

Analysis Request

Quote No. ME-543-15

Note: Please analyse for Al, Fe, Se and Mn in EG020F

Lab. ID	Sample ID	Sampling Date & time (on)	Sampling Date & Time (off)	Matrix: soil	Matrix: water	Matrix: other	Preservation: filt'ed	Preservation: acid	Preservation: ice	Preservation: other	Container (No. & type)	EA005, EA015H	NT-1, NT-2, EK055G, NT-3, W-2F, EG020F, ED043	EP005	W-4	W-7	EP074A-G-WF	TRH(C6-C9) / BTEXN
1	GW17	23/11/2015			x				x					x				x
2	GW22	23/11/2015			x				x					x				x
3	GW25	23/11/2015			x				x					x				x
4	GW29	23/11/2015			x				x					x				x
5	GW30	23/11/2015			x				x					x				x
6	QCK	23/11/2015			x				x						x			x
7	QCL	23/11/2015			x				x						x			

Environmental Division
Melbourne
Work Order Reference
EM1517502
24/11 16:50
Telephone : +61-3-8549 9600

Relinquished By:	**Received by:**	Received in good condition? Yes/No/NA	Method of Shipment
Name: Matthew Sheppard Date: 23/11/2015	Name: Scott Date: 23/11/15	Samples received chilled? Yes/No/NA	Consignment Note No.
of: AECOM Time:9:00	of: ALS Time: 16.40	Yes/No/NA	Transport Co:
Relinquished By:	**Received by:**	Received in good condition? Yes/No/NA	Method of Shipment
Name: Date:	Name: Date:	Samples received chilled? Yes/No/NA	Consignment Note No.
of: Time:	of: Time:	Yes/No/NA	Transport Co:

Form:

AECOM

Chain of Custody & Analysis Request Form

AECOM - Melbourne
Level 9, 8 Exhibition Street
Melbourne VIC 3000
Tel: 03 9653 8072
Fax: 61 3 9653 1234
Email: averyll.coyne@aecom.com

Laboratory Details

Lab. Name:	Envirolab	Tel:	97632500
Lab. Address:	1 Dalmore Drive Scoresby	Fax:	
Contact Name:		Preliminary Report by:	
Lab. Ref:		Final Report by:	
		Lab Quote No:	

Project Name: Fishermans Bend **Project Number:** 60431087 **Purchase Order Number:** NA

Sample collected by: Zach O'Connor and Oliver Taylor **Sample Results to be returned to:** Averyll Coyne

Specifications:

	(Tick)		
1. Urgent TAT required? (please circle: 24hr 48hr ___3___ days)	☐ Yes	☑ No	☐ N/A
2. Fast TAT Guarantee Required?	☐ Yes	☑ No	☐ N/A
3. Is any sediment layer present in waters to be excluded from extractions?	☐ Yes	☑ No	☐ N/A
4. Special storage requirements?	☐ Yes	☑ No	☐ N/A
5. Preservation requirements?	☐ Yes	☑ No	☐ N/A
6. Other requirements? ☐ Fax ☐ Hard copy ☐ Email	☑ Yes	☐ No	☐ N/A

7. Report Format: email with QC reports 8. Project Manager: Averyll Coyne tel: 9653 8072

Lab. ID	Sample ID	Sampling Date & time (on)	Sampling Date & Time (off)	Matrix: soil	Matrix: water	Matrix: other	Preservation: filted	Preservation: acid	Preservation: ice	Preservation: other	Container (No. & type)	pH, TDS, TOC	Ca, Mg, Na, K, Cl, SO4, Alkalinity, Ammonia as N, Reactive P, Nitrite as N, Nitrate as N plus Nox, F,	Metals: As, Cd, Cr, Cu, Ni, Pb, Zn, Hg, Al, Fe, Se, Mn	TOS as SO4	TRH(C6-C40)/PAH	VOC Scan including BTEXN
1	QC02	18/11/2015			x				x			x	x	x	x	x	x
2	QC04	18/11/2015			x				x			x	x	x	x	x	x

ENVIROLAB

Envirolab Services
1a Dalmore Drive
Caribbean Park
Scoresby VIC 3179
Ph: (03) 9763 2500

Job No: 7195
Date Received: 19/11/15
Time Received: 11:20
Received by: MB
Temp: Cool/Ambient 3°C
Cooling: Ice/Icepack
Security: Intact/Broken/None

Relinquished By:	Received by:		
Name: Zach O and Oliver T Date: 19/11/2015	Name: Date:	Received in good condition? Yes/No/NA	Method of Shipment
of: AECOM Time:9:00	of: ALS Time:	Samples received chilled? Yes/No/NA	Consignment Note No.
		Yes/No/NA	Transport Co:
Relinquished By:	**Received by:**	Received in good condition? Yes/No/NA	Method of Shipment
Name: Date:	Name: Date:	Samples received chilled? Yes/No/NA	Consignment Note No.
of: Time:	of: Time:	Yes/No/NA	Transport Co:

1 Dalmore Drive, Scoresby, Victoria 3179
tel: +61 3 9763 2500

email: melbourne@envirolab.com.au
envirolab.com.au

Envirolab Services Pty Ltd - Melbourne | ABN 37 112 535 645 - 002

CERTIFICATE OF ANALYSIS 7495

Client:

AECOM Australia Pty Ltd (Melbourne)
Level 9, 8 Exhibition St
Melbourne
VIC 3000

Attention: Averyll Coyne

Sample log in details:

Your Reference:	**60431087 - Fishermans Bend**
No. of samples:	2 Waters
Date samples received / completed instructions received	20/11/2015 / 20/11/2015

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: / Issue Date:	25/11/15 / 25/11/15
Date of Preliminary Report:	Not Issued

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

Results Approved By:

Analisa Mathrick
Laboratory Manager

ACCREDITED FOR TECHNICAL COMPETENCE

VOCs in water Our Reference: Your Reference Date Sampled Type of sample	UNITS ---------- ----------	7495-1 QC02 18/11/2015 Water	7495-2 QC04 18/11/2015 Water
Date extracted	-	20/11/2015	20/11/2015
Date analysed	-	21/11/2015	21/11/2015
Dichlorodifluoromethane	µg/L	<10	<10
Chloromethane	µg/L	<10	<10
Vinyl Chloride	µg/L	<10	<10
Bromomethane	µg/L	<10	<10
Chloroethane	µg/L	<10	<10
Trichlorofluoromethane	µg/L	<10	<10
1,1-Dichloroethene	µg/L	<1	<1
Trans-1,2-dichloroethene	µg/L	<1	<1
1,1-dichloroethane	µg/L	<1	<1
Cis-1,2-dichloroethene	µg/L	<1	<1
Bromochloromethane	µg/L	<1	<1
Chloroform	µg/L	<1	<1
2,2-dichloropropane	µg/L	<1	<1
1,2-dichloroethane	µg/L	<1	<1
1,1,1-trichloroethane	µg/L	<1	<1
1,1-dichloropropene	µg/L	<1	<1
Cyclohexane	µg/L	<1	<1
Carbon tetrachloride	µg/L	<1	<1
Benzene	µg/L	<1	<1
Dibromomethane	µg/L	<1	<1
1,2-dichloropropane	µg/L	<1	<1
Trichloroethene	µg/L	<1	<1
Bromodichloromethane	µg/L	<1	<1
trans-1,3-dichloropropene	µg/L	<1	<1
cis-1,3-dichloropropene	µg/L	<1	<1
1,1,2-trichloroethane	µg/L	<1	<1
Toluene	µg/L	<1	<1
1,3-dichloropropane	µg/L	<1	<1
Dibromochloromethane	µg/L	<1	<1
1,2-dibromoethane	µg/L	<1	<1
Tetrachloroethene	µg/L	<1	<1
1,1,1,2-tetrachloroethane	µg/L	<1	<1
Chlorobenzene	µg/L	<1	<1
Ethylbenzene	µg/L	<1	<1
Bromoform	µg/L	<1	<1
m+p-xylene	µg/L	<2	<2
Styrene	µg/L	<1	<1
1,1,2,2-tetrachloroethane	µg/L	<1	<1

VOCs in water Our Reference: Your Reference Date Sampled Type of sample	UNITS ---------- ----------	7495-1 QC02 18/11/2015 Water	7495-2 QC04 18/11/2015 Water
o-xylene	µg/L	<1	<1
1,2,3-trichloropropane	µg/L	<1	<1
Isopropylbenzene	µg/L	<1	<1
Bromobenzene	µg/L	<1	<1
n-propyl benzene	µg/L	<1	<1
2-chlorotoluene	µg/L	<1	<1
4-chlorotoluene	µg/L	<1	<1
1,3,5-trimethyl benzene	µg/L	<1	<1
Tert-butyl benzene	µg/L	<1	<1
1,2,4-trimethyl benzene	µg/L	<1	<1
1,3-dichlorobenzene	µg/L	<1	<1
Sec-butyl benzene	µg/L	<1	<1
1,4-dichlorobenzene	µg/L	<1	<1
4-isopropyl toluene	µg/L	<1	<1
1,2-dichlorobenzene	µg/L	<1	<1
n-butyl benzene	µg/L	<1	<1
1,2-dibromo-3-chloropropane	µg/L	<1	<1
1,2,4-trichlorobenzene	µg/L	<1	<1
Hexachlorobutadiene	µg/L	<1	<1
1,2,3-trichlorobenzene	µg/L	<1	<1
Surrogate Dibromofluoromethane	%	102	90
Surrogate toluene-d8	%	84	75
Surrogate 4-BFB	%	96	95

vTRH(C6-C10)/BTEXN in Water			
Our Reference:	UNITS	7495-1	7495-2
Your Reference	----------	QC02	QC04
Date Sampled	----------	18/11/2015	18/11/2015
Type of sample		Water	Water
Date extracted	-	20/11/2015	20/11/2015
Date analysed	-	21/11/2015	21/11/2015
$TRHC_6$ - C_9	µg/L	<10	<10
$TRHC_6$ - C_{10}	µg/L	<10	<10
$TRHC_6$ - 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	%	108	95
Surrogate toluene-d8	%	93	83
Surrogate 4-BFB	%	97	97

TRH Water(C10-C40) NEPM			
Our Reference:	UNITS	7495-1	7495-2
Your Reference	----------	QC02	QC04
Date Sampled	----------	18/11/2015	18/11/2015
Type of sample		Water	Water
Date extracted	-	24/11/2015	24/11/2015
Date analysed	-	25/11/2015	25/11/2015
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
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
Surrogate o-Terphenyl	%	107	136

PAHs in Water Our Reference: Your Reference Date Sampled Type of sample	UNITS ---------- ----------	7495-1 QC02 18/11/2015 Water	7495-2 QC04 18/11/2015 Water
Date extracted	-	24/11/2015	24/11/2015
Date analysed	-	24/11/2015	24/11/2015
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
Total +ve PAH's	µg/L	<1	<1
Benzo(a)pyrene TEQ	µg/L	<5	<5
Surrogate p-Terphenyl-d_{14}	%	122	79

Ion Balance Our Reference: Your Reference Date Sampled Type of sample	UNITS ---------- ----------	7495-1 QC02 18/11/2015 Water
Date prepared	-	24/11/2015
Date analysed	-	24/11/2015
Calcium - Dissolved	mg/L	100
Potassium - Dissolved	mg/L	5.8
Sodium - Dissolved	mg/L	68
Magnesium - Dissolved	mg/L	21
Hydroxide Alkalinity (OH^-) as $CaCO_3$	mg/L	<5
Bicarbonate Alkalinity as $CaCO_3$	mg/L	230
Carbonate Alkalinity as $CaCO_3$	mg/L	<5
Total Alkalinity as $CaCO_3$	mg/L	230
Sulphate, SO4	mg/L	210
Chloride, Cl	mg/L	30
Ionic Balance	%	0.030

HM in water - dissolved Our Reference: Your Reference Date Sampled Type of sample	UNITS ---------- ----------	7495-1 QC02 18/11/2015 Water	7495-2 QC04 18/11/2015 Water
Date prepared	-	23/11/2015	23/11/2015
Date analysed	-	23/11/2015	23/11/2015
Arsenic-Dissolved	µg/L	7	1
Cadmium-Dissolved	µg/L	<0.1	<0.1
Chromium-Dissolved	µg/L	2	<1
Copper-Dissolved	µg/L	<1	<1
Lead-Dissolved	µg/L	<1	<1
Nickel-Dissolved	µg/L	18	20
Zinc-Dissolved	µg/L	7	16
Mercury-Dissolved	µg/L	<0.05	<0.05
Aluminium-Dissolved	µg/L	45	110
Iron-Dissolved	µg/L	13,000	22,000
Selenium-Dissolved	µg/L	<1	<1
Manganese-Dissolved	µg/L	250	640

Miscellaneous Inorganics			
Our Reference:	UNITS	7495-1	7495-2
Your Reference	----------	QC02	QC04
Date Sampled	----------	18/11/2015	18/11/2015
Type of sample		Water	Water
Date prepared	-	23/11/2015	23/11/2015
Date analysed	-	23/11/2015	23/11/2015
pH	pH Units	9.5	[NA]
Total Dissolved Solids (grav)	mg/L	650	[NA]
Total Organic Carbon	mg/L	10	5
Ammonia as N in water	mg/L	0.49	[NA]
Phosphate as P in water	mg/L	<0.005	[NA]
Nitrite as N in water	mg/L	<0.005	[NA]
Nitrate as N in water	mg/L	<0.005	[NA]
NOx as N in water	mg/L	<0.005	[NA]
Fluoride, F	mg/L	0.3	[NA]

Method ID	Methodology Summary
Org-013	Water samples are analysed directly by purge and trap GC-MS.
Org-016	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-003	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-012	Soil samples are extracted with Dichloromethane/Acetone and waters with Dichloromethane and analysed by GC-MS. Benzo(a)pyrene TEQ as per NEPM B1 Guideline on Investigation Levels for Soil and Groundwater 2013.
Metals-020 ICP-AES	Determination of various metals by ICP-AES.
Inorg-006	Alkalinity - determined titrimetrically in accordance with APHA latest edition, 2320-B.
Inorg-081	Anions - a range of Anions are determined by Ion Chromatography, in accordance with APHA 22nd ED, 4110 -B. Alternatively determined by colourimetry/turbidity using Discrete Analyer.
Inorg-041	Gravimetric determination of the total solids content of water based on APHA latest edition 2540B.
Metals-022 ICP-MS	Determination of various metals by ICP-MS.
Metals-021 CV-AAS	Determination of Mercury by Cold Vapour AAS.
Inorg-001	pH - Measured using pH meter and electrode in accordance with APHA latest edition, 4500-H+. Please note that the results for water analyses are indicative only as analysis outside of the APHA storage times.
Inorg-018	Total Dissolved Solids - determined gravimetrically. The solids are dried at 180oC +/-5oC.
Inorg-079	TOC determined using a TOC analyser using the combustion method. DOC is filtered prior to determination. Analysis using APHA latest edition 5310B.
Inorg-057	Ammonia - determined colourimetrically based on EPA350.1 and APHA latest edition 4500-NH3 F, Soils are analysed following a KCl extraction.
Inorg-060	Phosphate determined colourimetrically based on EPA365.1 and APHA latest edition 4500 P E. Soils are analysed following a water extraction.
Inorg-055	Nitrite - determined colourimetrically based on APHA latest edition NO2- B. Soils are analysed following a water extraction.
Inorg-055	Nitrate - determined colourimetrically. Soils are analysed following a water extraction.
Inorg-026	Fluoride determined by ion selective electrode (ISE) in accordance with APHA latest edition, 4500-F-C.

QUALITY CONTROL VOCs in water	UNITS	PQL	METHOD	Blank	Duplicate Sm#	Duplicate results Base II Duplicate II %RPD	Spike Sm#	Spike % Recovery
Date extracted	-			20/11/2015	[NT]	[NT]	LCS-1	20/11/2015
Date analysed	-			21/11/2015	[NT]	[NT]	LCS-1	21/11/2015
Dichlorodifluoromethane	µg/L	10	Org-013	<10	[NT]	[NT]	[NR]	[NR]
Chloromethane	µg/L	10	Org-013	<10	[NT]	[NT]	[NR]	[NR]
Vinyl Chloride	µg/L	10	Org-013	<10	[NT]	[NT]	[NR]	[NR]
Bromomethane	µg/L	10	Org-013	<10	[NT]	[NT]	[NR]	[NR]
Chloroethane	µg/L	10	Org-013	<10	[NT]	[NT]	[NR]	[NR]
Trichlorofluoromethane	µg/L	10	Org-013	<10	[NT]	[NT]	[NR]	[NR]
1,1-Dichloroethene	µg/L	1	Org-013	<1	[NT]	[NT]	[NR]	[NR]
Trans-1,2-dichloroethene	µg/L	1	Org-013	<1	[NT]	[NT]	[NR]	[NR]
1,1-dichloroethane	µg/L	1	Org-013	<1	[NT]	[NT]	LCS-1	77%
Cis-1,2-dichloroethene	µg/L	1	Org-013	<1	[NT]	[NT]	[NR]	[NR]
Bromochloromethane	µg/L	1	Org-013	<1	[NT]	[NT]	[NR]	[NR]
Chloroform	µg/L	1	Org-013	<1	[NT]	[NT]	LCS-1	89%
2,2-dichloropropane	µg/L	1	Org-013	<1	[NT]	[NT]	[NR]	[NR]
1,2-dichloroethane	µg/L	1	Org-013	<1	[NT]	[NT]	LCS-1	83%
1,1,1-trichloroethane	µg/L	1	Org-013	<1	[NT]	[NT]	LCS-1	89%
1,1-dichloropropene	µg/L	1	Org-013	<1	[NT]	[NT]	[NR]	[NR]
Cyclohexane	µg/L	1	Org-013	<1	[NT]	[NT]	[NR]	[NR]
Carbon tetrachloride	µg/L	1	Org-013	<1	[NT]	[NT]	[NR]	[NR]
Benzene	µg/L	1	Org-013	<1	[NT]	[NT]	[NR]	[NR]
Dibromomethane	µg/L	1	Org-013	<1	[NT]	[NT]	[NR]	[NR]
1,2-dichloropropane	µg/L	1	Org-013	<1	[NT]	[NT]	[NR]	[NR]
Trichloroethene	µg/L	1	Org-013	<1	[NT]	[NT]	LCS-1	114%
Bromodichloromethane	µg/L	1	Org-013	<1	[NT]	[NT]	LCS-1	77%
trans-1,3-dichloropropene	µg/L	1	Org-013	<1	[NT]	[NT]	[NR]	[NR]
cis-1,3-dichloropropene	µg/L	1	Org-013	<1	[NT]	[NT]	[NR]	[NR]
1,1,2-trichloroethane	µg/L	1	Org-013	<1	[NT]	[NT]	[NR]	[NR]
Toluene	µg/L	1	Org-013	<1	[NT]	[NT]	[NR]	[NR]
1,3-dichloropropane	µg/L	1	Org-013	<1	[NT]	[NT]	[NR]	[NR]
Dibromochloromethane	µg/L	1	Org-013	<1	[NT]	[NT]	LCS-1	78%
1,2-dibromoethane	µg/L	1	Org-013	<1	[NT]	[NT]	[NR]	[NR]
Tetrachloroethene	µg/L	1	Org-013	<1	[NT]	[NT]	LCS-1	130%
1,1,1,2-tetrachloroethane	µg/L	1	Org-013	<1	[NT]	[NT]	[NR]	[NR]
Chlorobenzene	µg/L	1	Org-013	<1	[NT]	[NT]	[NR]	[NR]
Ethylbenzene	µg/L	1	Org-013	<1	[NT]	[NT]	[NR]	[NR]
Bromoform	µg/L	1	Org-013	<1	[NT]	[NT]	[NR]	[NR]
m+p-xylene	µg/L	2	Org-013	<2	[NT]	[NT]	[NR]	[NR]
Styrene	µg/L	1	Org-013	<1	[NT]	[NT]	[NR]	[NR]
1,1,2,2-tetrachloroethane	µg/L	1	Org-013	<1	[NT]	[NT]	[NR]	[NR]

QUALITY CONTROL VOCs in water	UNITS	PQL	METHOD	Blank	Duplicate Sm#	Duplicate results Base II Duplicate II %RPD	Spike Sm#	Spike % Recovery
o-xylene	µg/L	1	Org-013	<1	[NT]	[NT]	[NR]	[NR]
1,2,3-trichloropropane	µg/L	1	Org-013	<1	[NT]	[NT]	[NR]	[NR]
Isopropylbenzene	µg/L	1	Org-013	<1	[NT]	[NT]	[NR]	[NR]
Bromobenzene	µg/L	1	Org-013	<1	[NT]	[NT]	[NR]	[NR]
n-propyl benzene	µg/L	1	Org-013	<1	[NT]	[NT]	[NR]	[NR]
2-chlorotoluene	µg/L	1	Org-013	<1	[NT]	[NT]	[NR]	[NR]
4-chlorotoluene	µg/L	1	Org-013	<1	[NT]	[NT]	[NR]	[NR]
1,3,5-trimethyl benzene	µg/L	1	Org-013	<1	[NT]	[NT]	[NR]	[NR]
Tert-butyl benzene	µg/L	1	Org-013	<1	[NT]	[NT]	[NR]	[NR]
1,2,4-trimethyl benzene	µg/L	1	Org-013	<1	[NT]	[NT]	[NR]	[NR]
1,3-dichlorobenzene	µg/L	1	Org-013	<1	[NT]	[NT]	[NR]	[NR]
Sec-butyl benzene	µg/L	1	Org-013	<1	[NT]	[NT]	[NR]	[NR]
1,4-dichlorobenzene	µg/L	1	Org-013	<1	[NT]	[NT]	[NR]	[NR]
4-isopropyl toluene	µg/L	1	Org-013	<1	[NT]	[NT]	[NR]	[NR]
1,2-dichlorobenzene	µg/L	1	Org-013	<1	[NT]	[NT]	[NR]	[NR]
n-butyl benzene	µg/L	1	Org-013	<1	[NT]	[NT]	[NR]	[NR]
1,2-dibromo-3-chloropropane	µg/L	1	Org-013	<1	[NT]	[NT]	[NR]	[NR]
1,2,4-trichlorobenzene	µg/L	1	Org-013	<1	[NT]	[NT]	[NR]	[NR]
Hexachlorobutadiene	µg/L	1	Org-013	<1	[NT]	[NT]	[NR]	[NR]
1,2,3-trichlorobenzene	µg/L	1	Org-013	<1	[NT]	[NT]	[NR]	[NR]
Surrogate Dibromofluoromethane	%		Org-013	98	[NT]	[NT]	LCS-1	97%
Surrogate toluene-d8	%		Org-013	77	[NT]	[NT]	LCS-1	84%
Surrogate 4-BFB	%		Org-013	96	[NT]	[NT]	LCS-1	104%

QUALITY CONTROL vTRH(C6-C10)/BTEXN in Water	UNITS	PQL	METHOD	Blank	Duplicate Sm#	Duplicate results Base II Duplicate II %RPD	Spike Sm#	Spike % Recovery
Date extracted	-			20/11/2015	[NT]	[NT]	LCS-1	20/11/2015
Date analysed	-			21/11/2015	[NT]	[NT]	LCS-1	21/11/2015
TRHC$_6$ - C$_9$	µg/L	10	Org-016	<10	[NT]	[NT]	LCS-1	96%
TRHC$_6$ - C$_{10}$	µg/L	10	Org-016	<10	[NT]	[NT]	LCS-1	96%
Benzene	µg/L	1	Org-016	<1	[NT]	[NT]	LCS-1	104%
Toluene	µg/L	1	Org-016	<1	[NT]	[NT]	LCS-1	91%
Ethylbenzene	µg/L	1	Org-016	<1	[NT]	[NT]	LCS-1	94%
m+p-xylene	µg/L	2	Org-016	<2	[NT]	[NT]	LCS-1	96%
o-xylene	µg/L	1	Org-016	<1	[NT]	[NT]	LCS-1	96%
Naphthalene	µg/L	1	Org-013	<1	[NT]	[NT]	[NR]	[NR]
Surrogate Dibromofluoromethane	%		Org-016	103	[NT]	[NT]	LCS-1	96%
Surrogate toluene-d8	%		Org-016	86	[NT]	[NT]	LCS-1	94%
Surrogate 4-BFB	%		Org-016	97	[NT]	[NT]	LCS-1	102%

QUALITY CONTROL TRH Water(C10-C40) NEPM	UNITS	PQL	METHOD	Blank	Duplicate Sm#	Duplicate results Base II Duplicate II %RPD	Spike Sm#	Spike % Recovery
Date extracted	-			24/11/2015	[NT]	[NT]	LCS-W1	24/11/2015
Date analysed	-			25/11/2015	[NT]	[NT]	LCS-W1	25/11/2015
TRHC$_{10}$ - C$_{14}$	µg/L	50	Org-003	<50	[NT]	[NT]	LCS-W1	77%
TRHC$_{15}$ - C$_{28}$	µg/L	100	Org-003	<100	[NT]	[NT]	LCS-W1	87%
TRHC$_{29}$ - C$_{36}$	µg/L	100	Org-003	<100	[NT]	[NT]	LCS-W1	120%
TRH>C$_{10}$ - C$_{16}$	µg/L	50	Org-003	<50	[NT]	[NT]	LCS-W1	77%
TRH>C$_{16}$ - C$_{34}$	µg/L	100	Org-003	<100	[NT]	[NT]	LCS-W1	87%
TRH>C$_{34}$ - C$_{40}$	µg/L	100	Org-003	<100	[NT]	[NT]	LCS-W1	120%
Surrogate o-Terphenyl	%		Org-003	99	[NT]	[NT]	LCS-W1	97%

QUALITY CONTROL PAHs in Water	UNITS	PQL	METHOD	Blank	Duplicate Sm#	Duplicate results Base II Duplicate II %RPD	Spike Sm#	Spike % Recovery
Date extracted	-			24/11/2015	[NT]	[NT]	LCS-1	24/11/2015
Date analysed	-			24/11/2015	[NT]	[NT]	LCS-1	24/11/2015
Naphthalene	µg/L	1	Org-012	<1	[NT]	[NT]	LCS-1	80%
Acenaphthylene	µg/L	1	Org-012	<1	[NT]	[NT]	LCS-1	84%
Acenaphthene	µg/L	1	Org-012	<1	[NT]	[NT]	[NR]	[NR]
Fluorene	µg/L	1	Org-012	<1	[NT]	[NT]	LCS-1	72%
Phenanthrene	µg/L	1	Org-012	<1	[NT]	[NT]	LCS-1	92%
Anthracene	µg/L	1	Org-012	<1	[NT]	[NT]	[NR]	[NR]
Fluoranthene	µg/L	1	Org-012	<1	[NT]	[NT]	LCS-1	98%
Pyrene	µg/L	1	Org-012	<1	[NT]	[NT]	LCS-1	104%
Benzo(a)anthracene	µg/L	1	Org-012	<1	[NT]	[NT]	[NR]	[NR]
Chrysene	µg/L	1	Org-012	<1	[NT]	[NT]	LCS-1	100%
Benzo(b,j&k) fluoranthene	µg/L	2	Org-012	<2	[NT]	[NT]	[NR]	[NR]
Benzo(a)pyrene	µg/L	1	Org-012	<1	[NT]	[NT]	LCS-1	100%
Indeno(1,2,3-c,d)pyrene	µg/L	1	Org-012	<1	[NT]	[NT]	[NR]	[NR]
Dibenzo(a,h)anthracene	µg/L	1	Org-012	<1	[NT]	[NT]	[NR]	[NR]
Benzo(g,h,i)perylene	µg/L	1	Org-012	<1	[NT]	[NT]	[NR]	[NR]
Surrogate p-Terphenyl-d_{14}	%		Org-012	128	[NT]	[NT]	LCS-1	124%

QUALITY CONTROL Ion Balance	UNITS	PQL	METHOD	Blank	Duplicate Sm#	Duplicate results Base II Duplicate II %RPD	Spike Sm#	Spike % Recovery
Date prepared	-			24/11/2015	[NT]	[NT]	LCS-1	24/11/2015
Date analysed	-			24/11/2015	[NT]	[NT]	LCS-1	24/11/2015
Calcium - Dissolved	mg/L	0.5	Metals-020 ICP-AES	<0.5	[NT]	[NT]	LCS-1	96%
Potassium - Dissolved	mg/L	0.5	Metals-020 ICP-AES	<0.5	[NT]	[NT]	LCS-1	96%
Sodium - Dissolved	mg/L	0.5	Metals-020 ICP-AES	<0.5	[NT]	[NT]	LCS-1	89%
Magnesium - Dissolved	mg/L	0.5	Metals-020 ICP-AES	<0.5	[NT]	[NT]	LCS-1	94%
Hydroxide Alkalinity (OH^-) as $CaCO_3$	mg/L	5	Inorg-006	<5	[NT]	[NT]	[NR]	[NR]
Bicarbonate Alkalinity as $CaCO_3$	mg/L	5	Inorg-006	<5	[NT]	[NT]	LCS-1	102%
Carbonate Alkalinity as $CaCO_3$	mg/L	5	Inorg-006	<5	[NT]	[NT]	[NR]	[NR]
Total Alkalinity as $CaCO_3$	mg/L	5	Inorg-006	<5	[NT]	[NT]	LCS-1	102%
Sulphate, SO4	mg/L	1	Inorg-081	<1	[NT]	[NT]	LCS-1	95%
Chloride, Cl	mg/L	1	Inorg-081	<1	[NT]	[NT]	LCS-1	108%
Ionic Balance	%		Inorg-041	[NT]	[NT]	[NT]	[NR]	[NR]

QUALITY CONTROL HM in water - dissolved	UNITS	PQL	METHOD	Blank	Duplicate Sm#	Duplicate results Base II Duplicate II %RPD	Spike Sm#	Spike % Recovery
Date prepared	-			23/11/2015	[NT]	[NT]	LCS-1	24/11/2015
Date analysed	-			23/11/2015	[NT]	[NT]	LCS-1	24/11/2015
Arsenic-Dissolved	µg/L	1	Metals-022 ICP-MS	<1	[NT]	[NT]	LCS-1	102%
Cadmium-Dissolved	µg/L	0.1	Metals-022 ICP-MS	<0.1	[NT]	[NT]	LCS-1	103%
Chromium-Dissolved	µg/L	1	Metals-022 ICP-MS	<1	[NT]	[NT]	LCS-1	103%
Copper-Dissolved	µg/L	1	Metals-022 ICP-MS	<1	[NT]	[NT]	LCS-1	101%
Lead-Dissolved	µg/L	1	Metals-022 ICP-MS	<1	[NT]	[NT]	LCS-1	104%
Nickel-Dissolved	µg/L	1	Metals-022 ICP-MS	<1	[NT]	[NT]	LCS-1	102%
Zinc-Dissolved	µg/L	1	Metals-022 ICP-MS	<1	[NT]	[NT]	LCS-1	102%
Mercury-Dissolved	µg/L	0.05	Metals-021 CV-AAS	<0.05	[NT]	[NT]	LCS-1	102%
Aluminium-Dissolved	µg/L	10	Metals-022 ICP-MS	<10	[NT]	[NT]	LCS-1	104%
Iron-Dissolved	µg/L	10	Metals-022 ICP-MS	<10	[NT]	[NT]	LCS-1	105%

QUALITY CONTROL HM in water - dissolved	UNITS	PQL	METHOD	Blank	Duplicate Sm#	Duplicate results Base II Duplicate II %RPD	Spike Sm#	Spike % Recovery
Selenium-Dissolved	µg/L	1	Metals-022 ICP-MS	<1	[NT]	[NT]	LCS-1	101%
Manganese-Dissolved	µg/L	5	Metals-022 ICP-MS	<5	[NT]	[NT]	LCS-1	104%
QUALITY CONTROL Miscellaneous Inorganics	UNITS	PQL	METHOD	Blank	Duplicate Sm#	Duplicate results Base II Duplicate II %RPD	Spike Sm#	Spike % Recovery
Date prepared	-			23/11/2015	[NT]	[NT]	LCS-1	23/11/2015
Date analysed	-			23/11/2015	[NT]	[NT]	LCS-1	23/11/2015
pH	pH Units		Inorg-001	[NT]	[NT]	[NT]	LCS-1	99%
Total Dissolved Solids (grav)	mg/L	5	Inorg-018	<5	[NT]	[NT]	LCS-1	93%
Total Organic Carbon	mg/L	1	Inorg-079	<1	[NT]	[NT]	LCS-1	95%
Ammonia as N in water	mg/L	0.005	Inorg-057	<0.005	[NT]	[NT]	LCS-1	107%
Phosphate as P in water	mg/L	0.005	Inorg-060	<0.005	[NT]	[NT]	LCS-1	89%
Nitrite as N in water	mg/L	0.005	Inorg-055	<0.005	[NT]	[NT]	LCS-1	116%
Nitrate as N in water	mg/L	0.005	Inorg-055	<0.005	[NT]	[NT]	[NR]	[NR]
NOx as N in water	mg/L	0.005	Inorg-055	<0.005	[NT]	[NT]	LCS-1	100%
Fluoride, F	mg/L	0.1	Inorg-026	<0.1	[NT]	[NT]	LCS-1	103%

Report Comments:

TOC analysed by Envirolab Sydney, report number 137805.

Asbestos ID was analysed by Approved Identifier:	Not applicable for this job
Asbestos ID was authorised by Approved Signatory:	Not applicable for this job

INS: Insufficient sample for this test	PQL: Practical Quantitation Limit	NT: Not tested
NR: Test not required	RPD: Relative Percent Difference	NA: Test not required
<: Less than	>: Greater than	LCS: Laboratory Control Sample

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.

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 batched 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: <5xPQL - any RPD is acceptable; >5xPQL - 0-50% RPD is acceptable.
Matrix Spikes, LCS and Surrogate recoveries: Generally 70-130% for inorganics/metals; 60-140% for organics (+/-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.

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Envirolab Services Pty Ltd - Melbourne | ABN 37 112 535 645 - 002

CERTIFICATE OF ANALYSIS 7495

Client:

AECOM Australia Pty Ltd (Melbourne)
Level 9, 8 Exhibition St
Melbourne
VIC 3000

Attention: Averyll Coyne

Sample log in details:

Your Reference:	**60431087 - Fishermans Bend**
No. of samples:	2 Waters
Date samples received / completed instructions received	20/11/2015 / 20/11/2015

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: / Issue Date:	25/11/15 / 25/11/15
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Results Approved By:

Analisa Mathrick
Laboratory Manager

ACCREDITED FOR TECHNICAL COMPETENCE

VOCs in water Our Reference: Your Reference Date Sampled Type of sample	UNITS ---------- ----------	7495-1 QC02 18/11/2015 Water	7495-2 QC04 18/11/2015 Water
Date extracted	-	20/11/2015	20/11/2015
Date analysed	-	21/11/2015	21/11/2015
Dichlorodifluoromethane	µg/L	<10	<10
Chloromethane	µg/L	<10	<10
Vinyl Chloride	µg/L	<10	<10
Bromomethane	µg/L	<10	<10
Chloroethane	µg/L	<10	<10
Trichlorofluoromethane	µg/L	<10	<10
1,1-Dichloroethene	µg/L	<1	<1
Trans-1,2-dichloroethene	µg/L	<1	<1
1,1-dichloroethane	µg/L	<1	<1
Cis-1,2-dichloroethene	µg/L	<1	<1
Bromochloromethane	µg/L	<1	<1
Chloroform	µg/L	<1	<1
2,2-dichloropropane	µg/L	<1	<1
1,2-dichloroethane	µg/L	<1	<1
1,1,1-trichloroethane	µg/L	<1	<1
1,1-dichloropropene	µg/L	<1	<1
Cyclohexane	µg/L	<1	<1
Carbon tetrachloride	µg/L	<1	<1
Benzene	µg/L	<1	<1
Dibromomethane	µg/L	<1	<1
1,2-dichloropropane	µg/L	<1	<1
Trichloroethene	µg/L	<1	<1
Bromodichloromethane	µg/L	<1	<1
trans-1,3-dichloropropene	µg/L	<1	<1
cis-1,3-dichloropropene	µg/L	<1	<1
1,1,2-trichloroethane	µg/L	<1	<1
Toluene	µg/L	<1	<1
1,3-dichloropropane	µg/L	<1	<1
Dibromochloromethane	µg/L	<1	<1
1,2-dibromoethane	µg/L	<1	<1
Tetrachloroethene	µg/L	<1	<1
1,1,1,2-tetrachloroethane	µg/L	<1	<1
Chlorobenzene	µg/L	<1	<1
Ethylbenzene	µg/L	<1	<1
Bromoform	µg/L	<1	<1
m+p-xylene	µg/L	<2	<2
Styrene	µg/L	<1	<1
1,1,2,2-tetrachloroethane	µg/L	<1	<1

VOCs in water Our Reference: Your Reference Date Sampled Type of sample	UNITS ---------- ----------	7495-1 QC02 18/11/2015 Water	7495-2 QC04 18/11/2015 Water
o-xylene	µg/L	<1	<1
1,2,3-trichloropropane	µg/L	<1	<1
Isopropylbenzene	µg/L	<1	<1
Bromobenzene	µg/L	<1	<1
n-propyl benzene	µg/L	<1	<1
2-chlorotoluene	µg/L	<1	<1
4-chlorotoluene	µg/L	<1	<1
1,3,5-trimethyl benzene	µg/L	<1	<1
Tert-butyl benzene	µg/L	<1	<1
1,2,4-trimethyl benzene	µg/L	<1	<1
1,3-dichlorobenzene	µg/L	<1	<1
Sec-butyl benzene	µg/L	<1	<1
1,4-dichlorobenzene	µg/L	<1	<1
4-isopropyl toluene	µg/L	<1	<1
1,2-dichlorobenzene	µg/L	<1	<1
n-butyl benzene	µg/L	<1	<1
1,2-dibromo-3-chloropropane	µg/L	<1	<1
1,2,4-trichlorobenzene	µg/L	<1	<1
Hexachlorobutadiene	µg/L	<1	<1
1,2,3-trichlorobenzene	µg/L	<1	<1
Surrogate Dibromofluoromethane	%	102	90
Surrogate toluene-d8	%	84	75
Surrogate 4-BFB	%	96	95

vTRH(C6-C10)/BTEXN in Water			
Our Reference:	UNITS	7495-1	7495-2
Your Reference	----------	QC02	QC04
Date Sampled	----------	18/11/2015	18/11/2015
Type of sample		Water	Water
Date extracted	-	20/11/2015	20/11/2015
Date analysed	-	21/11/2015	21/11/2015
$TRHC_6$ - C_9	µg/L	<10	<10
$TRHC_6$ - C_{10}	µg/L	<10	<10
$TRHC_6$ - 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	%	108	95
Surrogate toluene-d8	%	93	83
Surrogate 4-BFB	%	97	97

TRH Water(C10-C40) NEPM			
Our Reference:	UNITS	7495-1	7495-2
Your Reference	----------	QC02	QC04
Date Sampled	----------	18/11/2015	18/11/2015
Type of sample		Water	Water
Date extracted	-	24/11/2015	24/11/2015
Date analysed	-	25/11/2015	25/11/2015
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
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
Surrogate o-Terphenyl	%	107	136

PAHs in Water Our Reference: Your Reference Date Sampled Type of sample	UNITS ---------- ----------	7495-1 QC02 18/11/2015 Water	7495-2 QC04 18/11/2015 Water
Date extracted	-	24/11/2015	24/11/2015
Date analysed	-	24/11/2015	24/11/2015
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
Total +ve PAH's	µg/L	<1	<1
Benzo(a)pyrene TEQ	µg/L	<5	<5
Surrogate p-Terphenyl-d_{14}	%	122	79

Ion Balance Our Reference: Your Reference Date Sampled Type of sample	UNITS ---------- ----------	7495-1 QC02 18/11/2015 Water
Date prepared	-	24/11/2015
Date analysed	-	24/11/2015
Calcium - Dissolved	mg/L	100
Potassium - Dissolved	mg/L	5.8
Sodium - Dissolved	mg/L	68
Magnesium - Dissolved	mg/L	21
Hydroxide Alkalinity (OH^-) as $CaCO_3$	mg/L	<5
Bicarbonate Alkalinity as $CaCO_3$	mg/L	230
Carbonate Alkalinity as $CaCO_3$	mg/L	<5
Total Alkalinity as $CaCO_3$	mg/L	230
Sulphate, SO4	mg/L	210
Chloride, Cl	mg/L	30
Ionic Balance	%	0.030

HM in water - dissolved Our Reference: Your Reference Date Sampled Type of sample	UNITS ---------- ----------	7495-1 QC02 18/11/2015 Water	7495-2 QC04 18/11/2015 Water
Date prepared	-	23/11/2015	23/11/2015
Date analysed	-	23/11/2015	23/11/2015
Arsenic-Dissolved	µg/L	7	1
Cadmium-Dissolved	µg/L	<0.1	<0.1
Chromium-Dissolved	µg/L	2	<1
Copper-Dissolved	µg/L	<1	<1
Lead-Dissolved	µg/L	<1	<1
Nickel-Dissolved	µg/L	18	20
Zinc-Dissolved	µg/L	7	16
Mercury-Dissolved	µg/L	<0.05	<0.05
Aluminium-Dissolved	µg/L	45	110
Iron-Dissolved	µg/L	13,000	22,000
Selenium-Dissolved	µg/L	<1	<1
Manganese-Dissolved	µg/L	250	640

Miscellaneous Inorganics			
Our Reference:	UNITS	7495-1	7495-2
Your Reference	----------	QC02	QC04
Date Sampled	----------	18/11/2015	18/11/2015
Type of sample		Water	Water
Date prepared	-	23/11/2015	23/11/2015
Date analysed	-	23/11/2015	23/11/2015
pH	pH Units	9.5	[NA]
Total Dissolved Solids (grav)	mg/L	650	[NA]
Total Organic Carbon	mg/L	10	5
Ammonia as N in water	mg/L	0.49	[NA]
Phosphate as P in water	mg/L	<0.005	[NA]
Nitrite as N in water	mg/L	<0.005	[NA]
Nitrate as N in water	mg/L	<0.005	[NA]
NOx as N in water	mg/L	<0.005	[NA]
Fluoride, F	mg/L	0.3	[NA]

Method ID	Methodology Summary
Org-013	Water samples are analysed directly by purge and trap GC-MS.
Org-016	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-003	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-012	Soil samples are extracted with Dichloromethane/Acetone and waters with Dichloromethane and analysed by GC-MS. Benzo(a)pyrene TEQ as per NEPM B1 Guideline on Investigation Levels for Soil and Groundwater 2013.
Metals-020 ICP-AES	Determination of various metals by ICP-AES.
Inorg-006	Alkalinity - determined titrimetrically in accordance with APHA latest edition, 2320-B.
Inorg-081	Anions - a range of Anions are determined by Ion Chromatography, in accordance with APHA 22nd ED, 4110 -B. Alternatively determined by colourimetry/turbidity using Discrete Analyer.
Inorg-041	Gravimetric determination of the total solids content of water based on APHA latest edition 2540B.
Metals-022 ICP-MS	Determination of various metals by ICP-MS.
Metals-021 CV-AAS	Determination of Mercury by Cold Vapour AAS.
Inorg-001	pH - Measured using pH meter and electrode in accordance with APHA latest edition, 4500-H+. Please note that the results for water analyses are indicative only as analysis outside of the APHA storage times.
Inorg-018	Total Dissolved Solids - determined gravimetrically. The solids are dried at 180oC +/-5oC.
Inorg-079	TOC determined using a TOC analyser using the combustion method. DOC is filtered prior to determination. Analysis using APHA latest edition 5310B.
Inorg-057	Ammonia - determined colourimetrically based on EPA350.1 and APHA latest edition 4500-NH3 F, Soils are analysed following a KCl extraction.
Inorg-060	Phosphate determined colourimetrically based on EPA365.1 and APHA latest edition 4500 P E. Soils are analysed following a water extraction.
Inorg-055	Nitrite - determined colourimetrically based on APHA latest edition NO2- B. Soils are analysed following a water extraction.
Inorg-055	Nitrate - determined colourimetrically. Soils are analysed following a water extraction.
Inorg-026	Fluoride determined by ion selective electrode (ISE) in accordance with APHA latest edition, 4500-F-C.

QUALITY CONTROL VOCs in water	UNITS	PQL	METHOD	Blank	Duplicate Sm#	Duplicate results Base II Duplicate II %RPD	Spike Sm#	Spike % Recovery
Date extracted	-			20/11/2015	[NT]	[NT]	LCS-1	20/11/2015
Date analysed	-			21/11/2015	[NT]	[NT]	LCS-1	21/11/2015
Dichlorodifluoromethane	µg/L	10	Org-013	<10	[NT]	[NT]	[NR]	[NR]
Chloromethane	µg/L	10	Org-013	<10	[NT]	[NT]	[NR]	[NR]
Vinyl Chloride	µg/L	10	Org-013	<10	[NT]	[NT]	[NR]	[NR]
Bromomethane	µg/L	10	Org-013	<10	[NT]	[NT]	[NR]	[NR]
Chloroethane	µg/L	10	Org-013	<10	[NT]	[NT]	[NR]	[NR]
Trichlorofluoromethane	µg/L	10	Org-013	<10	[NT]	[NT]	[NR]	[NR]
1,1-Dichloroethene	µg/L	1	Org-013	<1	[NT]	[NT]	[NR]	[NR]
Trans-1,2-dichloroethene	µg/L	1	Org-013	<1	[NT]	[NT]	[NR]	[NR]
1,1-dichloroethane	µg/L	1	Org-013	<1	[NT]	[NT]	LCS-1	77%
Cis-1,2-dichloroethene	µg/L	1	Org-013	<1	[NT]	[NT]	[NR]	[NR]
Bromochloromethane	µg/L	1	Org-013	<1	[NT]	[NT]	[NR]	[NR]
Chloroform	µg/L	1	Org-013	<1	[NT]	[NT]	LCS-1	89%
2,2-dichloropropane	µg/L	1	Org-013	<1	[NT]	[NT]	[NR]	[NR]
1,2-dichloroethane	µg/L	1	Org-013	<1	[NT]	[NT]	LCS-1	83%
1,1,1-trichloroethane	µg/L	1	Org-013	<1	[NT]	[NT]	LCS-1	89%
1,1-dichloropropene	µg/L	1	Org-013	<1	[NT]	[NT]	[NR]	[NR]
Cyclohexane	µg/L	1	Org-013	<1	[NT]	[NT]	[NR]	[NR]
Carbon tetrachloride	µg/L	1	Org-013	<1	[NT]	[NT]	[NR]	[NR]
Benzene	µg/L	1	Org-013	<1	[NT]	[NT]	[NR]	[NR]
Dibromomethane	µg/L	1	Org-013	<1	[NT]	[NT]	[NR]	[NR]
1,2-dichloropropane	µg/L	1	Org-013	<1	[NT]	[NT]	[NR]	[NR]
Trichloroethene	µg/L	1	Org-013	<1	[NT]	[NT]	LCS-1	114%
Bromodichloromethane	µg/L	1	Org-013	<1	[NT]	[NT]	LCS-1	77%
trans-1,3-dichloropropene	µg/L	1	Org-013	<1	[NT]	[NT]	[NR]	[NR]
cis-1,3-dichloropropene	µg/L	1	Org-013	<1	[NT]	[NT]	[NR]	[NR]
1,1,2-trichloroethane	µg/L	1	Org-013	<1	[NT]	[NT]	[NR]	[NR]
Toluene	µg/L	1	Org-013	<1	[NT]	[NT]	[NR]	[NR]
1,3-dichloropropane	µg/L	1	Org-013	<1	[NT]	[NT]	[NR]	[NR]
Dibromochloromethane	µg/L	1	Org-013	<1	[NT]	[NT]	LCS-1	78%
1,2-dibromoethane	µg/L	1	Org-013	<1	[NT]	[NT]	[NR]	[NR]
Tetrachloroethene	µg/L	1	Org-013	<1	[NT]	[NT]	LCS-1	130%
1,1,1,2-tetrachloroethane	µg/L	1	Org-013	<1	[NT]	[NT]	[NR]	[NR]
Chlorobenzene	µg/L	1	Org-013	<1	[NT]	[NT]	[NR]	[NR]
Ethylbenzene	µg/L	1	Org-013	<1	[NT]	[NT]	[NR]	[NR]
Bromoform	µg/L	1	Org-013	<1	[NT]	[NT]	[NR]	[NR]
m+p-xylene	µg/L	2	Org-013	<2	[NT]	[NT]	[NR]	[NR]
Styrene	µg/L	1	Org-013	<1	[NT]	[NT]	[NR]	[NR]
1,1,2,2-tetrachloroethane	µg/L	1	Org-013	<1	[NT]	[NT]	[NR]	[NR]

QUALITY CONTROL VOCs in water	UNITS	PQL	METHOD	Blank	Duplicate Sm#	Duplicate results Base II Duplicate II %RPD	Spike Sm#	Spike % Recovery
o-xylene	µg/L	1	Org-013	<1	[NT]	[NT]	[NR]	[NR]
1,2,3-trichloropropane	µg/L	1	Org-013	<1	[NT]	[NT]	[NR]	[NR]
Isopropylbenzene	µg/L	1	Org-013	<1	[NT]	[NT]	[NR]	[NR]
Bromobenzene	µg/L	1	Org-013	<1	[NT]	[NT]	[NR]	[NR]
n-propyl benzene	µg/L	1	Org-013	<1	[NT]	[NT]	[NR]	[NR]
2-chlorotoluene	µg/L	1	Org-013	<1	[NT]	[NT]	[NR]	[NR]
4-chlorotoluene	µg/L	1	Org-013	<1	[NT]	[NT]	[NR]	[NR]
1,3,5-trimethyl benzene	µg/L	1	Org-013	<1	[NT]	[NT]	[NR]	[NR]
Tert-butyl benzene	µg/L	1	Org-013	<1	[NT]	[NT]	[NR]	[NR]
1,2,4-trimethyl benzene	µg/L	1	Org-013	<1	[NT]	[NT]	[NR]	[NR]
1,3-dichlorobenzene	µg/L	1	Org-013	<1	[NT]	[NT]	[NR]	[NR]
Sec-butyl benzene	µg/L	1	Org-013	<1	[NT]	[NT]	[NR]	[NR]
1,4-dichlorobenzene	µg/L	1	Org-013	<1	[NT]	[NT]	[NR]	[NR]
4-isopropyl toluene	µg/L	1	Org-013	<1	[NT]	[NT]	[NR]	[NR]
1,2-dichlorobenzene	µg/L	1	Org-013	<1	[NT]	[NT]	[NR]	[NR]
n-butyl benzene	µg/L	1	Org-013	<1	[NT]	[NT]	[NR]	[NR]
1,2-dibromo-3-chloropropane	µg/L	1	Org-013	<1	[NT]	[NT]	[NR]	[NR]
1,2,4-trichlorobenzene	µg/L	1	Org-013	<1	[NT]	[NT]	[NR]	[NR]
Hexachlorobutadiene	µg/L	1	Org-013	<1	[NT]	[NT]	[NR]	[NR]
1,2,3-trichlorobenzene	µg/L	1	Org-013	<1	[NT]	[NT]	[NR]	[NR]
Surrogate Dibromofluoromethane	%		Org-013	98	[NT]	[NT]	LCS-1	97%
Surrogate toluene-d8	%		Org-013	77	[NT]	[NT]	LCS-1	84%
Surrogate 4-BFB	%		Org-013	96	[NT]	[NT]	LCS-1	104%

QUALITY CONTROL vTRH(C6-C10)/BTEXN in Water	UNITS	PQL	METHOD	Blank	Duplicate Sm#	Duplicate results Base II Duplicate II %RPD	Spike Sm#	Spike % Recovery
Date extracted	-			20/11/2015	[NT]	[NT]	LCS-1	20/11/2015
Date analysed	-			21/11/2015	[NT]	[NT]	LCS-1	21/11/2015
TRHC$_6$ - C$_9$	µg/L	10	Org-016	<10	[NT]	[NT]	LCS-1	96%
TRHC$_6$ - C$_{10}$	µg/L	10	Org-016	<10	[NT]	[NT]	LCS-1	96%
Benzene	µg/L	1	Org-016	<1	[NT]	[NT]	LCS-1	104%
Toluene	µg/L	1	Org-016	<1	[NT]	[NT]	LCS-1	91%
Ethylbenzene	µg/L	1	Org-016	<1	[NT]	[NT]	LCS-1	94%
m+p-xylene	µg/L	2	Org-016	<2	[NT]	[NT]	LCS-1	96%
o-xylene	µg/L	1	Org-016	<1	[NT]	[NT]	LCS-1	96%
Naphthalene	µg/L	1	Org-013	<1	[NT]	[NT]	[NR]	[NR]
Surrogate Dibromofluoromethane	%		Org-016	103	[NT]	[NT]	LCS-1	96%
Surrogate toluene-d8	%		Org-016	86	[NT]	[NT]	LCS-1	94%
Surrogate 4-BFB	%		Org-016	97	[NT]	[NT]	LCS-1	102%

QUALITY CONTROL TRH Water(C10-C40) NEPM	UNITS	PQL	METHOD	Blank	Duplicate Sm#	Duplicate results Base II Duplicate II %RPD	Spike Sm#	Spike % Recovery
Date extracted	-			24/11/2015	[NT]	[NT]	LCS-W1	24/11/2015
Date analysed	-			25/11/2015	[NT]	[NT]	LCS-W1	25/11/2015
TRHC$_{10}$ - C$_{14}$	µg/L	50	Org-003	<50	[NT]	[NT]	LCS-W1	77%
TRHC$_{15}$ - C$_{28}$	µg/L	100	Org-003	<100	[NT]	[NT]	LCS-W1	87%
TRHC$_{29}$ - C$_{36}$	µg/L	100	Org-003	<100	[NT]	[NT]	LCS-W1	120%
TRH>C$_{10}$ - C$_{16}$	µg/L	50	Org-003	<50	[NT]	[NT]	LCS-W1	77%
TRH>C$_{16}$ - C$_{34}$	µg/L	100	Org-003	<100	[NT]	[NT]	LCS-W1	87%
TRH>C$_{34}$ - C$_{40}$	µg/L	100	Org-003	<100	[NT]	[NT]	LCS-W1	120%
Surrogate o-Terphenyl	%		Org-003	99	[NT]	[NT]	LCS-W1	97%

QUALITY CONTROL PAHs in Water	UNITS	PQL	METHOD	Blank	Duplicate Sm#	Duplicate results Base II Duplicate II %RPD	Spike Sm#	Spike % Recovery
Date extracted	-			24/11/2015	[NT]	[NT]	LCS-1	24/11/2015
Date analysed	-			24/11/2015	[NT]	[NT]	LCS-1	24/11/2015
Naphthalene	µg/L	1	Org-012	<1	[NT]	[NT]	LCS-1	80%
Acenaphthylene	µg/L	1	Org-012	<1	[NT]	[NT]	LCS-1	84%
Acenaphthene	µg/L	1	Org-012	<1	[NT]	[NT]	[NR]	[NR]
Fluorene	µg/L	1	Org-012	<1	[NT]	[NT]	LCS-1	72%
Phenanthrene	µg/L	1	Org-012	<1	[NT]	[NT]	LCS-1	92%
Anthracene	µg/L	1	Org-012	<1	[NT]	[NT]	[NR]	[NR]
Fluoranthene	µg/L	1	Org-012	<1	[NT]	[NT]	LCS-1	98%
Pyrene	µg/L	1	Org-012	<1	[NT]	[NT]	LCS-1	104%
Benzo(a)anthracene	µg/L	1	Org-012	<1	[NT]	[NT]	[NR]	[NR]
Chrysene	µg/L	1	Org-012	<1	[NT]	[NT]	LCS-1	100%
Benzo(b,j&k) fluoranthene	µg/L	2	Org-012	<2	[NT]	[NT]	[NR]	[NR]
Benzo(a)pyrene	µg/L	1	Org-012	<1	[NT]	[NT]	LCS-1	100%
Indeno(1,2,3-c,d)pyrene	µg/L	1	Org-012	<1	[NT]	[NT]	[NR]	[NR]
Dibenzo(a,h)anthracene	µg/L	1	Org-012	<1	[NT]	[NT]	[NR]	[NR]
Benzo(g,h,i)perylene	µg/L	1	Org-012	<1	[NT]	[NT]	[NR]	[NR]
Surrogate p-Terphenyl-d_{14}	%		Org-012	128	[NT]	[NT]	LCS-1	124%

QUALITY CONTROL Ion Balance	UNITS	PQL	METHOD	Blank	Duplicate Sm#	Duplicate results Base II Duplicate II %RPD	Spike Sm#	Spike % Recovery
Date prepared	-			24/11/2015	[NT]	[NT]	LCS-1	24/11/2015
Date analysed	-			24/11/2015	[NT]	[NT]	LCS-1	24/11/2015
Calcium - Dissolved	mg/L	0.5	Metals-020 ICP-AES	<0.5	[NT]	[NT]	LCS-1	96%
Potassium - Dissolved	mg/L	0.5	Metals-020 ICP-AES	<0.5	[NT]	[NT]	LCS-1	96%
Sodium - Dissolved	mg/L	0.5	Metals-020 ICP-AES	<0.5	[NT]	[NT]	LCS-1	89%
Magnesium - Dissolved	mg/L	0.5	Metals-020 ICP-AES	<0.5	[NT]	[NT]	LCS-1	94%
Hydroxide Alkalinity (OH^-) as $CaCO_3$	mg/L	5	Inorg-006	<5	[NT]	[NT]	[NR]	[NR]
Bicarbonate Alkalinity as $CaCO_3$	mg/L	5	Inorg-006	<5	[NT]	[NT]	LCS-1	102%
Carbonate Alkalinity as $CaCO_3$	mg/L	5	Inorg-006	<5	[NT]	[NT]	[NR]	[NR]
Total Alkalinity as $CaCO_3$	mg/L	5	Inorg-006	<5	[NT]	[NT]	LCS-1	102%
Sulphate, SO4	mg/L	1	Inorg-081	<1	[NT]	[NT]	LCS-1	95%
Chloride, Cl	mg/L	1	Inorg-081	<1	[NT]	[NT]	LCS-1	108%
Ionic Balance	%		Inorg-041	[NT]	[NT]	[NT]	[NR]	[NR]

QUALITY CONTROL HM in water - dissolved	UNITS	PQL	METHOD	Blank	Duplicate Sm#	Duplicate results Base II Duplicate II %RPD	Spike Sm#	Spike % Recovery
Date prepared	-			23/11/2015	[NT]	[NT]	LCS-1	24/11/2015
Date analysed	-			23/11/2015	[NT]	[NT]	LCS-1	24/11/2015
Arsenic-Dissolved	µg/L	1	Metals-022 ICP-MS	<1	[NT]	[NT]	LCS-1	102%
Cadmium-Dissolved	µg/L	0.1	Metals-022 ICP-MS	<0.1	[NT]	[NT]	LCS-1	103%
Chromium-Dissolved	µg/L	1	Metals-022 ICP-MS	<1	[NT]	[NT]	LCS-1	103%
Copper-Dissolved	µg/L	1	Metals-022 ICP-MS	<1	[NT]	[NT]	LCS-1	101%
Lead-Dissolved	µg/L	1	Metals-022 ICP-MS	<1	[NT]	[NT]	LCS-1	104%
Nickel-Dissolved	µg/L	1	Metals-022 ICP-MS	<1	[NT]	[NT]	LCS-1	102%
Zinc-Dissolved	µg/L	1	Metals-022 ICP-MS	<1	[NT]	[NT]	LCS-1	102%
Mercury-Dissolved	µg/L	0.05	Metals-021 CV-AAS	<0.05	[NT]	[NT]	LCS-1	102%
Aluminium-Dissolved	µg/L	10	Metals-022 ICP-MS	<10	[NT]	[NT]	LCS-1	104%
Iron-Dissolved	µg/L	10	Metals-022 ICP-MS	<10	[NT]	[NT]	LCS-1	105%

QUALITY CONTROL HM in water - dissolved	UNITS	PQL	METHOD	Blank	Duplicate Sm#	Duplicate results Base II Duplicate II %RPD	Spike Sm#	Spike % Recovery
Selenium-Dissolved	µg/L	1	Metals-022 ICP-MS	<1	[NT]	[NT]	LCS-1	101%
Manganese-Dissolved	µg/L	5	Metals-022 ICP-MS	<5	[NT]	[NT]	LCS-1	104%
QUALITY CONTROL Miscellaneous Inorganics	UNITS	PQL	METHOD	Blank	Duplicate Sm#	Duplicate results Base II Duplicate II %RPD	Spike Sm#	Spike % Recovery
Date prepared	-			23/11/2015	[NT]	[NT]	LCS-1	23/11/2015
Date analysed	-			23/11/2015	[NT]	[NT]	LCS-1	23/11/2015
pH	pH Units		Inorg-001	[NT]	[NT]	[NT]	LCS-1	99%
Total Dissolved Solids (grav)	mg/L	5	Inorg-018	<5	[NT]	[NT]	LCS-1	93%
Total Organic Carbon	mg/L	1	Inorg-079	<1	[NT]	[NT]	LCS-1	95%
Ammonia as N in water	mg/L	0.005	Inorg-057	<0.005	[NT]	[NT]	LCS-1	107%
Phosphate as P in water	mg/L	0.005	Inorg-060	<0.005	[NT]	[NT]	LCS-1	89%
Nitrite as N in water	mg/L	0.005	Inorg-055	<0.005	[NT]	[NT]	LCS-1	116%
Nitrate as N in water	mg/L	0.005	Inorg-055	<0.005	[NT]	[NT]	[NR]	[NR]
NOx as N in water	mg/L	0.005	Inorg-055	<0.005	[NT]	[NT]	LCS-1	100%
Fluoride, F	mg/L	0.1	Inorg-026	<0.1	[NT]	[NT]	LCS-1	103%

Report Comments:

TOC analysed by Envirolab Sydney, report number 137805.

Asbestos ID was analysed by Approved Identifier:	Not applicable for this job
Asbestos ID was authorised by Approved Signatory:	Not applicable for this job

INS: Insufficient sample for this test	PQL: Practical Quantitation Limit	NT: Not tested
NR: Test not required	RPD: Relative Percent Difference	NA: Test not required
<: Less than	>: Greater than	LCS: Laboratory Control Sample

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.

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 batched 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: <5xPQL - any RPD is acceptable; >5xPQL - 0-50% RPD is acceptable.
Matrix Spikes, LCS and Surrogate recoveries: Generally 70-130% for inorganics/metals; 60-140% for organics (+/-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.

Form:

AECOM

Chain of Custody & Analysis Request Form

AECOM - Melbourne
Level 9, 8 Exhibition Street
Melbourne VIC 3000
Tel: 03 9653 8072
Fax: 61 3 9653 1234
Email: averyll.coyne@aecom.com

Laboratory Details

Lab. Name: Envirolab
Lab. Address: 1 Dalmore Drive Scoresby
Contact Name:
Lab. Ref:
Tel: 97632500
Fax:
Preliminary Report by:
Final Report by:
Lab Quote No:

Project Name: Fishermans Bend
Project Number: 60431087
Purchase Order Number: NA

Sample collected by: Zach O'Connor and Oliver Taylor
Sample Results to be returned to: Averyll Coyne

Specifications:

	(Tick)		
1. Urgent TAT required? (please circle: 24hr 48hr 3 days)	☐ Yes	☑ No	☐ N/A
2. Fast TAT Guarantee Required?	☐ Yes	☑ No	☐ N/A
3. Is any sediment layer present in waters to be excluded from extractions?	☐ Yes	☑ No	☐ N/A
4. Special storage requirements?	☐ Yes	☑ No	☐ N/A
5. Preservation requirements?	☐ Yes	☑ No	☐ N/A
6. Other requirements? ☐ Fax ☐ Hard copy ☐ Email	☑ Yes	☐ No	☐ N/A

7. Report Format: email with QC reports
8. Project Manager: Averyll Coyne tel: 9653 8072

Lab. ID	Sample ID	Sampling Date & time (on)	Sampling Date & Time (off)	Matrix: soil	Matrix: water	Matrix: other	Preservation: filtred	Preservation: acid	Preservation: ice	Preservation: other	Container (No. & type)
1	QC06	20/11/2015			x				x		

Analysis Request

pH, TDS	Ca, Mg, Na, K, Cl, SO4, Alkalinity, Ammonia as N, Reactive P, Nitrite as N, Nitrate as N plus Nox, F,	Metals: As, Cd, Cr, Cu, Ni, Pb, Zn, Hg, Al, Fe, Se, Mn	TOS as SO4	TRH(C6-C40)/PAH	VOC Scan including BTEXN
x	x	x	x		

ENVIROLAB GROUP

Envirolab Services
1a Dalmore Drive
Caribbean Park
Scoresby VIC 3179
Ph: (03) 9763 2500

Job No: 97504
Date Received: 20/11/15
Time Received: 16:55
Received by: MS
Temp: Cool/Ambient 6.2°C
Cooling: Ice/Icepack
Security: Intact/Broken/None

Relinquished By:	Received by:	Received in good condition?	Yes/No/NA	Method of Shipment	
Name: Zach O and Oliver T Date: 20/11/2015	Name: Date:	Samples received chilled?	Yes/No/NA	Consignment Note No.	
of: AECOM Time: 9:00	of: ALS Time:		Yes/No/NA	Transport Co:	
Relinquished By:	**Received by:**	Received in good condition?	Yes/No/NA	Method of Shipment	
Name: Date:	Name: M. SHAD Date: 20/11/15	Samples received chilled?	Yes/No/NA	Consignment Note No.	
of: Time:	of: ELS Time: 16:55		Yes/No/NA	Transport Co:	

1 Dalmore Drive, Scoresby, Victoria 3179
tel: +61 3 9763 2500

email: melbourne@envirolab.com.au
envirolab.com.au

Envirolab Services Pty Ltd - Melbourne | ABN 37 112 535 645 - 002

CERTIFICATE OF ANALYSIS 7504

Client:

AECOM Australia Pty Ltd (Melbourne)
Level 9, 8 Exhibition St
Melbourne
VIC 3000

Attention: Averyll Coyne

Sample log in details:

Your Reference:	**60431087 - Fishermans Bend**
No. of samples:	1 Water
Date samples received / completed instructions received	20/11/2015 / 20/11/2015

This report replaces the previous one dated 27/11/2015 due to changes in Sulphate, Chloride and Fluoride.

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: / Issue Date:	27/11/15 / 27/11/15
Date of Preliminary Report:	Not Issued

NATA accreditation number 2901. This document shall not be reproduced except in full.
Accredited for compliance with ISO/IEC 17025. **Tests not covered by NATA are denoted with *.**

Results Approved By:

Analisa Mathrick
Laboratory Manager

ACCREDITED FOR TECHNICAL COMPETENCE

Ion Balance		
Our Reference:	UNITS	7504-1
Your Reference	----------	QC06
Date Sampled	----------	20/11/2015
Type of sample		Water
Date prepared	-	24/11/2015
Date analysed	-	24/11/2015
Calcium - Dissolved	mg/L	470
Potassium - Dissolved	mg/L	34
Sodium - Dissolved	mg/L	370
Magnesium - Dissolved	mg/L	170
Hydroxide Alkalinity (OH^-) as $CaCO_3$	mg/L	<5
Bicarbonate Alkalinity as $CaCO_3$	mg/L	500
Carbonate Alkalinity as $CaCO_3$	mg/L	<5
Total Alkalinity as $CaCO_3$	mg/L	500
Sulphate, SO4	mg/L	1,300
Chloride, Cl	mg/L	81
Ionic Balance	%	15

HM in water - dissolved		
Our Reference:	UNITS	7504-1
Your Reference	----------	QC06
Date Sampled	----------	20/11/2015
Type of sample		Water
Date prepared	-	23/11/2015
Date analysed	-	23/11/2015
Arsenic-Dissolved	µg/L	3
Cadmium-Dissolved	µg/L	<0.1
Chromium-Dissolved	µg/L	<1
Copper-Dissolved	µg/L	<1
Lead-Dissolved	µg/L	<1
Nickel-Dissolved	µg/L	23
Zinc-Dissolved	µg/L	5
Mercury-Dissolved	µg/L	<0.05
Aluminium-Dissolved	µg/L	11
Iron-Dissolved	µg/L	19,000
Selenium-Dissolved	µg/L	<1
Manganese-Dissolved	µg/L	1,600

Miscellaneous Inorganics		
Our Reference:	UNITS	7504-1
Your Reference	----------	QC06
Date Sampled	----------	20/11/2015
Type of sample		Water
Date prepared	-	20/11/2015
Date analysed	-	20/11/2015
pH	pH Units	7.2
Total Dissolved Solids (grav)	mg/L	4,000
Ammonia as N in water	mg/L	4.5
Phosphate as P in water	mg/L	<0.005
Nitrite as N in water	mg/L	<0.005
Nitrate as N in water	mg/L	<0.005
NOx as N in water	mg/L	<0.005
Fluoride, F	mg/L	<1

Method ID	Methodology Summary
Metals-020 ICP-AES	Determination of various metals by ICP-AES.
Inorg-006	Alkalinity - determined titrimetrically in accordance with APHA latest edition, 2320-B.
Inorg-081	Anions - a range of Anions are determined by Ion Chromatography, in accordance with APHA 22nd ED, 4110 -B. Alternatively determined by colourimetry/turbidity using Discrete Analyer.
Inorg-041	Gravimetric determination of the total solids content of water based on APHA latest edition 2540B.
Metals-022 ICP-MS	Determination of various metals by ICP-MS.
Metals-021 CV-AAS	Determination of Mercury by Cold Vapour AAS.
Inorg-001	pH - Measured using pH meter and electrode in accordance with APHA latest edition, 4500-H+. Please note that the results for water analyses are indicative only as analysis outside of the APHA storage times.
Inorg-018	Total Dissolved Solids - determined gravimetrically. The solids are dried at 180oC +/-5oC.
Inorg-057	Ammonia - determined colourimetrically based on EPA350.1 and APHA latest edition 4500-NH3 F, Soils are analysed following a KCl extraction.
Inorg-060	Phosphate determined colourimetrically based on EPA365.1 and APHA latest edition 4500 P E. Soils are analysed following a water extraction.
Inorg-055	Nitrite - determined colourimetrically based on APHA latest edition NO2- B. Soils are analysed following a water extraction.
Inorg-055	Nitrate - determined colourimetrically. Soils are analysed following a water extraction.
Inorg-026	Fluoride determined by ion selective electrode (ISE) in accordance with APHA latest edition, 4500-F-C.

QUALITY CONTROL Ion Balance	UNITS	PQL	METHOD	Blank	Duplicate Sm#	Duplicate results Base II Duplicate II %RPD	Spike Sm#	Spike % Recovery
Date prepared	-			24/11/2015	[NT]	[NT]	LCS-1	24/11/2015
Date analysed	-			24/11/2015	[NT]	[NT]	LCS-1	24/11/2015
Calcium - Dissolved	mg/L	0.5	Metals-020 ICP-AES	<0.5	[NT]	[NT]	LCS-1	96%
Potassium - Dissolved	mg/L	0.5	Metals-020 ICP-AES	<0.5	[NT]	[NT]	LCS-1	96%
Sodium - Dissolved	mg/L	0.5	Metals-020 ICP-AES	<0.5	[NT]	[NT]	LCS-1	89%
Magnesium - Dissolved	mg/L	0.5	Metals-020 ICP-AES	<0.5	[NT]	[NT]	LCS-1	94%
Hydroxide Alkalinity (OH^-) as $CaCO_3$	mg/L	5	Inorg-006	<5	[NT]	[NT]	[NR]	[NR]
Bicarbonate Alkalinity as $CaCO_3$	mg/L	5	Inorg-006	<5	[NT]	[NT]	LCS-1	102%
Carbonate Alkalinity as $CaCO_3$	mg/L	5	Inorg-006	<5	[NT]	[NT]	[NR]	[NR]
Total Alkalinity as $CaCO_3$	mg/L	5	Inorg-006	<5	[NT]	[NT]	LCS-1	102%
Sulphate, SO4	mg/L	1	Inorg-081	<1	[NT]	[NT]	LCS-1	107%
Chloride, Cl	mg/L	1	Inorg-081	<1	[NT]	[NT]	LCS-1	95%
Ionic Balance	%		Inorg-041	[NT]	[NT]	[NT]	[NR]	[NR]
QUALITY CONTROL HM in water - dissolved	UNITS	PQL	METHOD	Blank	Duplicate Sm#	Duplicate results Base II Duplicate II %RPD	Spike Sm#	Spike % Recovery
Date prepared	-			23/11/2015	[NT]	[NT]	LCS-1	24/11/2015
Date analysed	-			23/11/2015	[NT]	[NT]	LCS-1	24/11/2015
Arsenic-Dissolved	µg/L	1	Metals-022 ICP-MS	<1	[NT]	[NT]	LCS-1	102%
Cadmium-Dissolved	µg/L	0.1	Metals-022 ICP-MS	<0.1	[NT]	[NT]	LCS-1	103%
Chromium-Dissolved	µg/L	1	Metals-022 ICP-MS	<1	[NT]	[NT]	LCS-1	103%
Copper-Dissolved	µg/L	1	Metals-022 ICP-MS	<1	[NT]	[NT]	LCS-1	101%
Lead-Dissolved	µg/L	1	Metals-022 ICP-MS	<1	[NT]	[NT]	LCS-1	104%
Nickel-Dissolved	µg/L	1	Metals-022 ICP-MS	<1	[NT]	[NT]	LCS-1	102%
Zinc-Dissolved	µg/L	1	Metals-022 ICP-MS	<1	[NT]	[NT]	LCS-1	102%
Mercury-Dissolved	µg/L	0.05	Metals-021 CV-AAS	<0.05	[NT]	[NT]	LCS-1	102%
Aluminium-Dissolved	µg/L	10	Metals-022 ICP-MS	<10	[NT]	[NT]	LCS-1	104%
Iron-Dissolved	µg/L	10	Metals-022 ICP-MS	<10	[NT]	[NT]	LCS-1	105%

QUALITY CONTROL HM in water - dissolved	UNITS	PQL	METHOD	Blank	Duplicate Sm#	Duplicate results Base II Duplicate II %RPD	Spike Sm#	Spike % Recovery
Selenium-Dissolved	µg/L	1	Metals-022 ICP-MS	<1	[NT]	[NT]	LCS-1	101%
Manganese-Dissolved	µg/L	5	Metals-022 ICP-MS	<5	[NT]	[NT]	LCS-1	104%
QUALITY CONTROL Miscellaneous Inorganics	UNITS	PQL	METHOD	Blank	Duplicate Sm#	Duplicate results Base II Duplicate II %RPD	Spike Sm#	Spike % Recovery
Date prepared	-			20/11/2015	[NT]	[NT]	LCS-1	20/11/2015
Date analysed	-			20/11/2015	[NT]	[NT]	LCS-1	20/11/2015
pH	pH Units		Inorg-001	[NT]	[NT]	[NT]	LCS-1	99%
Total Dissolved Solids (grav)	mg/L	5	Inorg-018	<5	[NT]	[NT]	LCS-1	98%
Ammonia as N in water	mg/L	0.005	Inorg-057	<0.005	[NT]	[NT]	LCS-1	107%
Phosphate as P in water	mg/L	0.005	Inorg-060	<0.005	[NT]	[NT]	LCS-1	89%
Nitrite as N in water	mg/L	0.005	Inorg-055	<0.005	[NT]	[NT]	LCS-1	116%
Nitrate as N in water	mg/L	0.005	Inorg-055	<0.005	[NT]	[NT]	[NR]	[NR]
NOx as N in water	mg/L	0.005	Inorg-055	<0.005	[NT]	[NT]	LCS-1	100%
Fluoride, F	mg/L	0.1	Inorg-026	<0.1	[NT]	[NT]	LCS-1	103%

Report Comments:

ION BALANCE: The mass inbalance may be caused by other ions that have not been measured and / or not included in Ion balace calaculation.

INORGANIC: PQL was raised for Fluoride due to sample matrix interfernce.

Asbestos ID was analysed by Approved Identifier:	Not applicable for this job
Asbestos ID was authorised by Approved Signatory:	Not applicable for this job

INS: Insufficient sample for this test	PQL: Practical Quantitation Limit	NT: Not tested
NR: Test not required	RPD: Relative Percent Difference	NA: Test not required
<: Less than	>: Greater than	LCS: Laboratory Control Sample

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.

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 batched 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: <5xPQL - any RPD is acceptable; >5xPQL - 0-50% RPD is acceptable.
Matrix Spikes, LCS and Surrogate recoveries: Generally 70-130% for inorganics/metals; 60-140% for organics (+/-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.

ENVIROLAB SERVICES
A division of Envirolab Group
ENVIROLAB GROUP
Envirolab Services Pty Ltd - Melbourne
ABN 37 112 535 645 -02
1 Dalmore Drive, Scoresby, VIC 3179 Australia
Ph +613 9763 2500 Fax +613 9763 2633
melbourne@envirolab.com.au
www.envirolab.com.au

SAMPLE RECEIPT ADVICE

Client Details	
Client	AECOM Australia Pty Ltd (Melbourne)
Attention	Averyll Coyne

Sample Login Details	
Your Reference	60431087 - Fishermans Bend
Envirolab Reference	**7504**
Date Sample Received	20/11/2015
Date Instructions Received	20/11/2015
Date Results Expected to be Reported	**27/11/2015**

Sample Condition	
Samples received in appropriate condition for analysis	YES
No. of Samples Provided	1 Water
Turnaround Time Requested	Standard
Temperature on receipt (°C)	6.2C
Cooling Method	Ice
Sampling Date Provided	YES

Comments
Samples will be held for 1 month for water samples and 2 months for soil samples from date of receipt of samples
Unable to test TOS, incorrect bottles provided. Metals filtered in the lab.

Please direct any queries to:

Chris De Luca	Analisa Mathrick
Phone: 03 9763 2500	Phone: 03 9763 2500
Fax: 03 9763 2633	Fax: 03 9763 2633
Email: cdeluca@envirolab.com.au	Email: amathrick@envirolab.com.au

Sample and Testing Details on following page

ENVIROLAB SERVICES

A division of Envirolab Group

ENVIROLAB GROUP

Envirolab Services Pty Ltd - Melbourne
ABN 37 112 535 645 -02
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melbourne@envirolab.com.au
www.envirolab.com.au

Sample Id	*Bicarbonate Alkalinity as CaCO3*	*Calcium - Dissolved*	*Carbonate Alkalinity as CaCO3*	*Chloride, Cl*	*Hydroxide Alkalinity (OH-) as CaCO3*	*Ionic Balance*	*Magnesium - Dissolved*	*Potassium - Dissolved*	*Sodium - Dissolved*	*Sulphate, SO4*	*Total Alkalinity as CaCO3*	*HM in water - dissolved*	*Ammonia as N in water*	*Fluoride, F*	*Nitrate as N in water*	*Nitrite as N in water*	*NOx as N in water*	*pH*	*Phosphate as P in water*	*Total Dissolved Solids (grav)*
QC06	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓

Form:

AECOM

Chain of Custody & Analysis Request Form

AECOM - Melbourne
Level 9, 8 Exhibition Street
Melbourne VIC 3000
Tel: 03 9653 8072
Fax: 61 3 9653 1234
Email: averyll.coyne@aecom.com

Laboratory Details
Lab. Name: Eurofins-MGT
Lab. Address: 2-5 Kingston Town Close
Contact Name:
Lab. Ref:
Tel: 0385645000
Fax:
Preliminary Report by:
Final Report by:
Lab Quote No:

Project Name: Fishermans Bend
Project Number: 60431087
Purchase Order Number: NA

Sample collected by: Nathan Jensen, Matthew Sheppard and Dug Cunningham
Sample Results to be returned to: Averyll Coyne

Specifications:	(Tick)		
1. Urgent TAT required? (please circle: 24hr 48hr ___3___ days)	☐ Yes	☑ No	☐ N/A
2. Fast TAT Guarantee Required?	☐ Yes	☑ No	☐ N/A
3. Is any sediment layer present in waters to be excluded from extractions?	☐ Yes	☑ No	☐ N/A
4. Special storage requirements?	☐ Yes	☑ No	☐ N/A
5. Preservation requirements: ☐ Fax ☐ Hard copy ☑ Email	☐ Yes	☑ No	☐ N/A
6. Other requirements?	☑ Yes	☐ No	☐ N/A
7. Report Format: email with QC reports	8. Project Manager: Averyll Coyne		tel: 9653 8072

Lab. ID	Sample ID	Sampling Date & time (on)	Sampling Date & Time (off)	Matrix: soil	Matrix: water	Matrix: other	Preservation: fil'ed	Preservation: acid	Preservation: ice	Preservation: other	Container (No. & type)	TRH(C6-C40)	Full VOC Scan (70 Analytes)	PAH	Metals	Remarks & comments
1	QC07	14/10/2015		x					x		Jar	x	x	x	x	Metals (As, Cd, Cr, Cu, Pb, Ni, Zn, Al, Fe, Se, Hg)

Relinquished By:	Received by:		
Name: Nathan Jensen	Date: 15/10/2015	Name:	Date:
of: AECOM	Time: 9:00	of: ALS	Time:
Relinquished By:		**Received by:** LiAm	
Name:	Date:	Name:	Date: 15/10
of:	Time:	of: GFMet	Time: 3:58pm

Received in good condition?	Yes/No/NA	Method of Shipment	
Samples received chilled?	Yes/No/NA	Consignment Note No.	
	Yes/No/NA	Transport Co:	
Received in good condition?	Yes/No/NA	Method of Shipment	
Samples received chilled?	Yes/No/NA	Consignment Note No.	
	Yes/No/NA	Transport Co:	

476023

EnviroSampleVIC

From: Onur Mehmet <OnurMehmet@eurofins.com>
Sent: Thursday, 15 October 2015 4:52 PM
To: EnviroSampleVIC
Subject: FW: COC for a soil sample sent this morning
Attachments: 60431087 COC Day 3.pdf

Importance: High

Onur Mehmet
Phone : +61 3 8564 5026
Email : OnurMehmet@eurofins.com

From: Coyne, Averyll [mailto:Averyll.Coyne@aecom.com]
Sent: Thursday, 15 October 2015 3:58 PM
To: OnurMehmet@eurofins.com.au
Subject: COC for a soil sample sent this morning
Importance: High

Hi Onur,

Sorry to email this to you. A colleague gave me your details.

Can you please ensure this COC gets to your sample receipt area? The soil sample was couriered to your laboratory today.

Kind Regards
Averyll

Averyll Coyne
Principal Environmental Scientist
D +61 3 9653 8072 M +61 499 252 502
Averyll.Coyne@aecom.com

AECOM
Level 9, 8 Exhibition Street, Melbourne, VIC 3000
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476023

ABN – 50 005 085 521 e.mail : EnviroSales@eurofins.com.au web : www.eurofins.com.au

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Phone : +61 3 8564 5000
NATA # 1261
Site # 1254 & 14271

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Lane Cove West NSW 2066
Phone : +61 2 9900 8400
NATA # 1261 Site # 18217

Brisbane
1/21 Smallwood Place
Murarrie QLD 4172
Phone : +61 7 3902 4600
NATA # 1261 Site # 20794

Sample Receipt Advice

Company name:	**AECOM Aust Pty Ltd Melbourne**
Contact name:	Averyll Coyne
Project name:	FISHERMANS BEND
Project ID:	60431087
COC number:	Not provided
Turn around time:	3 Day
Date/Time received:	Oct 15, 2015 3:58 PM
Eurofins | mgt reference:	**476023**

Sample information

☑ A detailed list of analytes logged into our LIMS, is included in the attached summary table.

☑ All samples have been received as described on the above COC.

☑ COC has been completed correctly.

☑ Attempt to chill was evident.

☑ Appropriately preserved sample containers have been used.

☑ All samples were received in good condition.

☑ Samples have been provided with adequate time to commence analysis in accordance with the relevant holding times.

☑ Appropriate sample containers have been used.

☒ Some samples have been subcontracted.

N/A Custody Seals intact (if used).

Contact notes

If you have any questions with respect to these samples please contact:

Onur Mehmet on Phone : (+61) (3) 8564 5026 or by e.mail: OnurMehmet@eurofins.com

Results will be delivered electronically via e.mail to Averyll Coyne - averyll.coyne@aecom.com.

Note: A copy of these results will also be delivered to the general AECOM Aust Pty Ltd Melbourne email address.

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ABN – 50 005 085 521 e.mail : EnviroSales@eurofins.com.au web : www.eurofins.com.au

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Murarrie QLD 4172
Phone : +61 7 3902 4600
NATA # 1261 Site # 20794

Company Name: AECOM Aust Pty Ltd Melbourne
Address: Level 9/ 8 Exhibition St
Melbourne
VIC 3004

Project Name: FISHERMANS BEND
Project ID: 60431087

Order No.:
Report #: 476023
Phone: 03 9653 1234
Fax: 03 9654 7117

Received: Oct 15, 2015 3:58 PM
Due: Oct 20, 2015
Priority: 3 Day
Contact Name: Averyll Coyne

Eurofins | mgt Client Manager: Onur Mehmet

Sample Detail					Aluminium	Arsenic	Cadmium	Chromium	Copper	Iron	Lead	Mercury	Nickel	Selenium	Zinc	Polycyclic Aromatic Hydrocarbons	Volatile Organics	Moisture Set	Total Recoverable Hydrocarbons
Laboratory where analysis is conducted																			
Melbourne Laboratory - NATA Site # 1254 & 14271					X	X	X	X	X	X	X	X	X	X	X	X	X	X	X
Sydney Laboratory - NATA Site # 18217																			
Brisbane Laboratory - NATA Site # 20794																			
External Laboratory																			
Sample ID	**Sample Date**	**Sampling Time**	**Matrix**	**LAB ID**															
QC07	Oct 14, 2015		Soil	M15-Oc11144	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X

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Certificate of Analysis

AECOM Aust Pty Ltd Melbourne
Level 9/ 8 Exhibition St
Melbourne
VIC 3004

NATA Accredited
Accreditation Number 1261
Site Number 1254

Accredited for compliance with ISO/IEC 17025.
The results of the tests, calibrations and/or measurements included in this document are traceable to Australian/national standards.

Attention: **Averyll Coyne**

Report **476023-S**
Project name FISHERMANS BEND
Project ID 60431087
Received Date Oct 15, 2015

Client Sample ID			**QC07**
Sample Matrix			**Soil**
Eurofins | mgt Sample No.			**M15-Oc11144**
Date Sampled			**Oct 14, 2015**
Test/Reference	LOR	Unit	
Total Recoverable Hydrocarbons - 1999 NEPM Fractions			
TRH C6-C9	20	mg/kg	< 20
TRH C10-C14	20	mg/kg	< 20
TRH C15-C28	50	mg/kg	88
TRH C29-C36	50	mg/kg	130
TRH C10-36 (Total)	50	mg/kg	220
Volatile Organics			
1.1-Dichloroethane	0.05	mg/kg	< 0.05
1.1-Dichloroethene	0.05	mg/kg	< 0.05
1.1.1-Trichloroethane	0.05	mg/kg	< 0.05
1.1.1.2-Tetrachloroethane	0.05	mg/kg	< 0.05
1.1.2-Trichloroethane	0.05	mg/kg	< 0.05
1.1.2.2-Tetrachloroethane	0.05	mg/kg	< 0.05
1.2-Dibromoethane	0.05	mg/kg	< 0.05
1.2-Dichlorobenzene	0.05	mg/kg	< 0.05
1.2-Dichloroethane	0.05	mg/kg	< 0.05
1.2-Dichloropropane	0.05	mg/kg	< 0.05
1.2.3-Trichloropropane	0.05	mg/kg	< 0.05
1.2.4-Trimethylbenzene	0.05	mg/kg	< 0.05
1.3-Dichlorobenzene	0.05	mg/kg	< 0.05
1.3-Dichloropropane	0.05	mg/kg	< 0.05
1.3.5-Trimethylbenzene	0.05	mg/kg	< 0.05
1.4-Dichlorobenzene	0.05	mg/kg	< 0.05
2-Butanone (MEK)	0.05	mg/kg	< 0.05
2-Propanone (Acetone)	0.05	mg/kg	< 0.05
4-Chlorotoluene	0.05	mg/kg	< 0.05
4-Methyl-2-pentanone (MIBK)	0.05	mg/kg	< 0.05
Allyl chloride	0.05	mg/kg	< 0.05
Benzene	0.1	mg/kg	< 0.1
Bromobenzene	0.05	mg/kg	< 0.05
Bromochloromethane	0.05	mg/kg	< 0.05
Bromodichloromethane	0.05	mg/kg	< 0.05
Bromoform	0.05	mg/kg	< 0.05
Bromomethane	0.05	mg/kg	< 0.05
Carbon disulfide	0.05	mg/kg	< 0.05
Carbon Tetrachloride	0.05	mg/kg	< 0.05

Client Sample ID			QC07
Sample Matrix			Soil
Eurofins | mgt Sample No.			M15-Oc11144
Date Sampled			Oct 14, 2015
Test/Reference	LOR	Unit	
Volatile Organics			
Chlorobenzene	0.05	mg/kg	< 0.05
Chloroethane	0.05	mg/kg	< 0.05
Chloroform	0.05	mg/kg	< 0.05
Chloromethane	0.05	mg/kg	< 0.05
cis-1.2-Dichloroethene	0.05	mg/kg	< 0.05
cis-1.3-Dichloropropene	0.05	mg/kg	< 0.05
Dibromochloromethane	0.05	mg/kg	< 0.05
Dibromomethane	0.05	mg/kg	< 0.05
Dichlorodifluoromethane	0.05	mg/kg	< 0.05
Ethylbenzene	0.1	mg/kg	< 0.1
Iodomethane	0.05	mg/kg	< 0.05
Isopropyl benzene (Cumene)	0.05	mg/kg	< 0.05
m&p-Xylenes	0.2	mg/kg	< 0.2
Methylene Chloride	0.05	mg/kg	< 0.05
o-Xylene	0.1	mg/kg	< 0.1
Styrene	0.05	mg/kg	< 0.05
Tetrachloroethene	0.05	mg/kg	< 0.05
Toluene	0.1	mg/kg	< 0.1
trans-1.2-Dichloroethene	0.05	mg/kg	< 0.05
trans-1.3-Dichloropropene	0.05	mg/kg	< 0.05
Trichloroethene	0.05	mg/kg	< 0.05
Trichlorofluoromethane	0.05	mg/kg	< 0.05
Vinyl chloride	0.05	mg/kg	< 0.05
Xylenes - Total	0.3	mg/kg	< 0.3
Fluorobenzene (surr.)	1	%	85
4-Bromofluorobenzene (surr.)	1	%	76
Total Recoverable Hydrocarbons - 2013 NEPM Fractions			
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 less Naphthalene (F2)[N01]	50	mg/kg	< 50
Polycyclic Aromatic Hydrocarbons			
Benzo(a)pyrene TEQ (lower bound) *	0.5	mg/kg	2.7
Benzo(a)pyrene TEQ (medium bound) *	0.5	mg/kg	2.7
Benzo(a)pyrene TEQ (upper bound) *	0.5	mg/kg	2.7
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	1.3
Benzo(a)pyrene	0.5	mg/kg	1.7
Benzo(b&j)fluoranthene[N07]	0.5	mg/kg	1.3
Benzo(g.h.i)perylene	0.5	mg/kg	1.7
Benzo(k)fluoranthene	0.5	mg/kg	1.1
Chrysene	0.5	mg/kg	1.3
Dibenz(a.h)anthracene	0.5	mg/kg	0.5
Fluoranthene	0.5	mg/kg	2.1
Fluorene	0.5	mg/kg	< 0.5
Indeno(1.2.3-cd)pyrene	0.5	mg/kg	1.1
Naphthalene	0.5	mg/kg	< 0.5

Client Sample ID			QC07
Sample Matrix			**Soil**
Eurofins | mgt Sample No.			**M15-Oc11144**
Date Sampled			**Oct 14, 2015**
Test/Reference	LOR	Unit	
Polycyclic Aromatic Hydrocarbons			
Phenanthrene	0.5	mg/kg	1.2
Pyrene	0.5	mg/kg	2.0
Total PAH*	0.5	mg/kg	15
2-Fluorobiphenyl (surr.)	1	%	135
p-Terphenyl-d14 (surr.)	1	%	126
Total Recoverable Hydrocarbons - 2013 NEPM Fractions			
TRH >C10-C16	50	mg/kg	< 50
TRH >C16-C34	100	mg/kg	140
TRH >C34-C40	100	mg/kg	130
Heavy Metals			
Aluminium	10	mg/kg	9200
Arsenic	2	mg/kg	12
Cadmium	0.4	mg/kg	0.5
Chromium	5	mg/kg	21
Copper	5	mg/kg	57
Iron	5	mg/kg	29000
Lead	5	mg/kg	180
Mercury	0.1	mg/kg	0.3
Nickel	5	mg/kg	44
Selenium	2	mg/kg	< 2
Zinc	5	mg/kg	310
% Moisture	0.1	%	5.8

Sample History

Where samples are submitted/analysed over several days, the last date of extraction and analysis is reported.
A recent review of our LIMS has resulted in the correction or clarification of some method identifications. Due to this, some of the method reference information on reports has changed. However, no substantive change has been made to our laboratory methods, and as such there is no change in the validity of current or previous results (regarding both quality and NATA accreditation).

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	Melbourne	Oct 15, 2015	14 Day
- Method: TRH C6-C36 - LTM-ORG-2010			
Total Recoverable Hydrocarbons - 2013 NEPM Fractions	Melbourne	Oct 15, 2015	14 Day
- Method: TRH C6-C40 - LTM-ORG-2010			
Total Recoverable Hydrocarbons - 2013 NEPM Fractions	Melbourne	Oct 15, 2015	14 Day
- Method: TRH C6-C40 - LTM-ORG-2010			
Volatile Organics	Melbourne	Oct 15, 2015	7 Day
- Method: USEPA 8260 - MGT 350A Volatile Organics by GCMS			
Polycyclic Aromatic Hydrocarbons	Melbourne	Oct 15, 2015	14 Day
- Method: USEPA 8270 Polycyclic Aromatic Hydrocarbons			
Heavy Metals	Melbourne	Oct 15, 2015	180 Day
- Method: LTM-MET-3030 by ICP-OES (hydride ICP-OES for Mercury)			
% Moisture	Melbourne	Oct 15, 2015	14 Day
- Method: LTM-GEN-7080 Moisture			

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ABN – 50 005 085 521 e.mail : EnviroSales@eurofins.com.au web : www.eurofins.com.au

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NATA # 1261 Site # 20794

Company Name: AECOM Aust Pty Ltd Melbourne
Address: Level 9/ 8 Exhibition St
Melbourne
VIC 3004

Project Name: FISHERMANS BEND
Project ID: 60431087

Order No.:
Report #: 476023
Phone: 03 9653 1234
Fax: 03 9654 7117

Received: Oct 15, 2015 3:58 PM
Due: Oct 20, 2015
Priority: 3 Day
Contact Name: Averyll Coyne

Eurofins | mgt Client Manager: Onur Mehmet

Sample Detail					Aluminium	Arsenic	Cadmium	Chromium	Copper	Iron	Lead	Mercury	Nickel	Selenium	Zinc	Polycyclic Aromatic Hydrocarbons	Volatile Organics	Moisture Set	Total Recoverable Hydrocarbons
Laboratory where analysis is conducted																			
Melbourne Laboratory - NATA Site # 1254 & 14271					X	X	X	X	X	X	X	X	X	X	X	X	X	X	X
Sydney Laboratory - NATA Site # 18217																			
Brisbane Laboratory - NATA Site # 20794																			
External Laboratory																			
Sample ID	**Sample Date**	**Sampling Time**	**Matrix**	**LAB ID**															
QC07	Oct 14, 2015		Soil	M15-Oc11144	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X

Eurofins | mgt Internal Quality Control Review and Glossary

General

1. Laboratory QC results for Method Blanks, Duplicates, Matrix Spikes, and Laboratory Control Samples are included in this QC report where applicable. Additional QC data may be available on request.
2. All soil results are reported on a dry basis, unless otherwise stated.
3. Actual LORs are matrix dependant. Quoted LORs may be raised where sample extracts are diluted due to interferences.
4. Results are uncorrected for matrix spikes or surrogate recoveries.
5. SVOC analysis on waters are performed on homogenised, unfiltered samples, unless noted otherwise.
6. Samples were analysed on an 'as received' basis. 7. 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.

****NOTE:** pH duplicates are reported as a range NOT as RPD

UNITS

mg/kg: milligrams per Kilogram

ug/l: micrograms per litre

ppb: Parts per billion

org/100ml: Organisms per 100 millilitres

MPN/100mL: Most Probable Number of organisms per 100 millilitres

mg/l: milligrams per litre

ppm: Parts per million

%: Percentage

NTU: Nephelometric Turbidity Units

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. 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.
Batch Duplicate	A second piece of analysis from a sample outside of the clients batch of samples but run within the laboratory batch of analysis.
Batch SPIKE	Spike recovery reported on a sample from outside of the clients batch of samples but run within the laboratory batch of analysis.
USEPA	United States Environmental Protection Agency
APHA	American Public Health Association
ASLP	Australian Standard Leaching Procedure (AS4439.3)
TCLP	Toxicity Characteristic Leaching Procedure
COC	Chain of Custody
SRA	Sample Receipt Advice
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 50-150% - Phenols 20-130%.

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, Toxophene & Chlordane are not added to the LCS.
4. Organochlorine Pesticide analysis - where reporting Spike data, Toxophene 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 Arochlor 1260 in Matrix Spikes and LCS's.
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 RPD's 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 - 1999 NEPM Fractions							
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	
Method Blank							
Volatile Organics							
1.1-Dichloroethane	mg/kg	< 0.05			0.05	Pass	
1.1-Dichloroethene	mg/kg	< 0.05			0.05	Pass	
1.1.1-Trichloroethane	mg/kg	< 0.05			0.05	Pass	
1.1.1.2-Tetrachloroethane	mg/kg	< 0.05			0.05	Pass	
1.1.2-Trichloroethane	mg/kg	< 0.05			0.05	Pass	
1.1.2.2-Tetrachloroethane	mg/kg	< 0.05			0.05	Pass	
1.2-Dibromoethane	mg/kg	< 0.05			0.05	Pass	
1.2-Dichlorobenzene	mg/kg	< 0.05			0.05	Pass	
1.2-Dichloroethane	mg/kg	< 0.05			0.05	Pass	
1.2-Dichloropropane	mg/kg	< 0.05			0.05	Pass	
1.2.3-Trichloropropane	mg/kg	< 0.05			0.05	Pass	
1.2.4-Trimethylbenzene	mg/kg	< 0.05			0.05	Pass	
1.3-Dichlorobenzene	mg/kg	< 0.05			0.05	Pass	
1.3-Dichloropropane	mg/kg	< 0.05			0.05	Pass	
1.3.5-Trimethylbenzene	mg/kg	< 0.05			0.05	Pass	
1.4-Dichlorobenzene	mg/kg	< 0.05			0.05	Pass	
2-Butanone (MEK)	mg/kg	< 0.05			0.05	Pass	
2-Propanone (Acetone)	mg/kg	< 0.05			0.05	Pass	
4-Chlorotoluene	mg/kg	< 0.05			0.05	Pass	
4-Methyl-2-pentanone (MIBK)	mg/kg	< 0.05			0.05	Pass	
Allyl chloride	mg/kg	< 0.05			0.05	Pass	
Benzene	mg/kg	< 0.1			0.1	Pass	
Bromobenzene	mg/kg	< 0.05			0.05	Pass	
Bromochloromethane	mg/kg	< 0.05			0.05	Pass	
Bromodichloromethane	mg/kg	< 0.05			0.05	Pass	
Bromoform	mg/kg	< 0.05			0.05	Pass	
Bromomethane	mg/kg	< 0.05			0.05	Pass	
Carbon disulfide	mg/kg	< 0.05			0.05	Pass	
Carbon Tetrachloride	mg/kg	< 0.05			0.05	Pass	
Chlorobenzene	mg/kg	< 0.05			0.05	Pass	
Chloroethane	mg/kg	< 0.05			0.05	Pass	
Chloroform	mg/kg	< 0.05			0.05	Pass	
Chloromethane	mg/kg	< 0.05			0.05	Pass	
cis-1.2-Dichloroethene	mg/kg	< 0.05			0.05	Pass	
cis-1.3-Dichloropropene	mg/kg	< 0.05			0.05	Pass	
Dibromochloromethane	mg/kg	< 0.05			0.05	Pass	
Dibromomethane	mg/kg	< 0.05			0.05	Pass	
Dichlorodifluoromethane	mg/kg	< 0.05			0.05	Pass	
Ethylbenzene	mg/kg	< 0.1			0.1	Pass	
Iodomethane	mg/kg	< 0.05			0.05	Pass	
Isopropyl benzene (Cumene)	mg/kg	< 0.05			0.05	Pass	
m&p-Xylenes	mg/kg	< 0.2			0.2	Pass	
Methylene Chloride	mg/kg	< 0.05			0.05	Pass	
o-Xylene	mg/kg	< 0.1			0.1	Pass	

Test	Units	Result 1			Acceptance Limits	Pass Limits	Qualifying Code
Styrene	mg/kg	< 0.05			0.05	Pass	
Tetrachloroethene	mg/kg	< 0.05			0.05	Pass	
Toluene	mg/kg	< 0.1			0.1	Pass	
trans-1.2-Dichloroethene	mg/kg	< 0.05			0.05	Pass	
trans-1.3-Dichloropropene	mg/kg	< 0.05			0.05	Pass	
Trichloroethene	mg/kg	< 0.05			0.05	Pass	
Trichlorofluoromethane	mg/kg	< 0.05			0.05	Pass	
Vinyl chloride	mg/kg	< 0.05			0.05	Pass	
Xylenes - Total	mg/kg	< 0.3			0.3	Pass	
Method Blank							
Total Recoverable Hydrocarbons - 2013 NEPM Fractions							
Naphthalene	mg/kg	< 0.5			0.5	Pass	
TRH C6-C10	mg/kg	< 20			20	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							
Total Recoverable Hydrocarbons - 2013 NEPM Fractions							
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							
Heavy Metals							
Aluminium	mg/kg	< 10			10	Pass	
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	
Iron	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	
Selenium	mg/kg	< 2			2	Pass	
Zinc	mg/kg	< 5			5	Pass	
LCS - % Recovery							
Total Recoverable Hydrocarbons - 1999 NEPM Fractions							
TRH C6-C9	%	118			70-130	Pass	
TRH C10-C14	%	130			70-130	Pass	
LCS - % Recovery							

Test	Units	Result 1			Acceptance Limits	Pass Limits	Qualifying Code
Volatile Organics							
1.1.1-Trichloroethane	%	124			70-130	Pass	
1.2-Dichloroethane	%	116			70-130	Pass	
Benzene	%	125			70-130	Pass	
Ethylbenzene	%	119			70-130	Pass	
m&p-Xylenes	%	123			70-130	Pass	
Toluene	%	123			70-130	Pass	
Trichloroethene	%	125			70-130	Pass	
Xylenes - Total	%	121			70-130	Pass	
LCS - % Recovery							
Total Recoverable Hydrocarbons - 2013 NEPM Fractions							
Naphthalene	%	120			75-125	Pass	
TRH C6-C10	%	106			70-130	Pass	
LCS - % Recovery							
Polycyclic Aromatic Hydrocarbons							
Acenaphthene	%	87			70-130	Pass	
Acenaphthylene	%	88			70-130	Pass	
Anthracene	%	91			70-130	Pass	
Benz(a)anthracene	%	86			70-130	Pass	
Benzo(a)pyrene	%	84			70-130	Pass	
Benzo(b&j)fluoranthene	%	89			70-130	Pass	
Benzo(g.h.i)perylene	%	87			70-130	Pass	
Benzo(k)fluoranthene	%	81			70-130	Pass	
Chrysene	%	82			70-130	Pass	
Dibenz(a.h)anthracene	%	84			70-130	Pass	
Fluoranthene	%	76			70-130	Pass	
Fluorene	%	87			70-130	Pass	
Indeno(1.2.3-cd)pyrene	%	81			70-130	Pass	
Naphthalene	%	84			70-130	Pass	
Phenanthrene	%	87			70-130	Pass	
Pyrene	%	73			70-130	Pass	
LCS - % Recovery							
Total Recoverable Hydrocarbons - 2013 NEPM Fractions							
TRH >C10-C16	%	117			70-130	Pass	
LCS - % Recovery							
Heavy Metals							
Arsenic	%	84			80-120	Pass	
Cadmium	%	81			80-120	Pass	
Chromium	%	84			80-120	Pass	
Copper	%	83			80-120	Pass	
Lead	%	82			80-120	Pass	
Mercury	%	114			75-125	Pass	
Nickel	%	82			80-120	Pass	
Selenium	%	83			80-120	Pass	
Zinc	%	112			80-120	Pass	

Test	Lab Sample ID	QA Source	Units	Result 1			Acceptance Limits	Pass Limits	Qualifying Code
Spike - % Recovery									
Total Recoverable Hydrocarbons - 1999 NEPM Fractions				Result 1					
TRH C6-C9	M15-Oc09057	NCP	%	115			70-130	Pass	
TRH C10-C14	M15-Oc09522	NCP	%	114			70-130	Pass	
Spike - % Recovery									
Volatile Organics				Result 1					
1.1.1-Trichloroethane	M15-Oc09692	NCP	%	91			70-130	Pass	
1.2-Dichlorobenzene	M15-Oc09692	NCP	%	79			70-130	Pass	

Test	Lab Sample ID	QA Source	Units	Result 1			Acceptance Limits	Pass Limits	Qualifying Code
1.2-Dichloroethane	M15-Oc09692	NCP	%	87			70-130	Pass	
Benzene	M15-Oc09692	NCP	%	93			70-130	Pass	
Ethylbenzene	M15-Oc09692	NCP	%	90			70-130	Pass	
m&p-Xylenes	M15-Oc09692	NCP	%	92			70-130	Pass	
o-Xylene	M15-Oc09692	NCP	%	89			70-130	Pass	
Toluene	M15-Oc09692	NCP	%	90			70-130	Pass	
Trichloroethene	M15-Oc09692	NCP	%	92			70-130	Pass	
Xylenes - Total	M15-Oc09692	NCP	%	91			70-130	Pass	
Spike - % Recovery									
Total Recoverable Hydrocarbons - 2013 NEPM Fractions				Result 1					
Naphthalene	M15-Oc09692	NCP	%	93			70-130	Pass	
TRH C6-C10	M15-Oc09057	NCP	%	104			70-130	Pass	
Spike - % Recovery									
Polycyclic Aromatic Hydrocarbons				Result 1					
Acenaphthene	B15-Oc10757	NCP	%	88			70-130	Pass	
Acenaphthylene	B15-Oc10757	NCP	%	95			70-130	Pass	
Anthracene	B15-Oc10757	NCP	%	109			70-130	Pass	
Benz(a)anthracene	B15-Oc10757	NCP	%	102			70-130	Pass	
Benzo(a)pyrene	B15-Oc10757	NCP	%	108			70-130	Pass	
Benzo(b&j)fluoranthene	B15-Oc10757	NCP	%	102			70-130	Pass	
Benzo(g.h.i)perylene	B15-Oc10757	NCP	%	103			70-130	Pass	
Benzo(k)fluoranthene	B15-Oc10757	NCP	%	97			70-130	Pass	
Chrysene	B15-Oc10757	NCP	%	90			70-130	Pass	
Dibenz(a.h)anthracene	B15-Oc10757	NCP	%	111			70-130	Pass	
Fluoranthene	B15-Oc10757	NCP	%	83			70-130	Pass	
Fluorene	B15-Oc10757	NCP	%	98			70-130	Pass	
Indeno(1.2.3-cd)pyrene	B15-Oc10757	NCP	%	130			70-130	Pass	
Naphthalene	B15-Oc10757	NCP	%	86			70-130	Pass	
Phenanthrene	B15-Oc10757	NCP	%	91			70-130	Pass	
Pyrene	B15-Oc10757	NCP	%	81			70-130	Pass	
Spike - % Recovery									
Total Recoverable Hydrocarbons - 2013 NEPM Fractions				Result 1					
TRH >C10-C16	M15-Oc09522	NCP	%	102			70-130	Pass	
Spike - % Recovery									
Heavy Metals				Result 1					
Arsenic	M15-Oc11103	NCP	%	75			75-125	Pass	
Cadmium	M15-Oc11103	NCP	%	78			75-125	Pass	
Chromium	M15-Oc11103	NCP	%	81			75-125	Pass	
Copper	M15-Oc11103	NCP	%	87			75-125	Pass	
Lead	M15-Oc11103	NCP	%	88			75-125	Pass	
Mercury	M15-Oc11103	NCP	%	106			70-130	Pass	
Nickel	M15-Oc11103	NCP	%	78			75-125	Pass	
Selenium	M15-Oc11103	NCP	%	75			75-125	Pass	
Zinc	M15-Oc10848	NCP	%	80			75-125	Pass	
Test	**Lab Sample ID**	**QA Source**	**Units**	**Result 1**			**Acceptance Limits**	**Pass Limits**	**Qualifying Code**
Duplicate									
Total Recoverable Hydrocarbons - 1999 NEPM Fractions				Result 1	Result 2	RPD			
TRH C6-C9	M15-Oc09691	NCP	mg/kg	< 20	< 20	<1	30%	Pass	
TRH C10-C14	B15-Oc10757	NCP	mg/kg	930	830	11	30%	Pass	
TRH C15-C28	B15-Oc10757	NCP	mg/kg	6400	6600	3.0	30%	Pass	
TRH C29-C36	B15-Oc10757	NCP	mg/kg	2900	3100	5.6	30%	Pass	

Duplicate									
Volatile Organics				Result 1	Result 2	RPD			
1.1-Dichloroethane	M15-Oc09691	NCP	mg/kg	< 0.05	< 0.05	<1	30%	Pass	
1.1-Dichloroethene	M15-Oc09691	NCP	mg/kg	< 0.05	< 0.05	<1	30%	Pass	
1.1.1-Trichloroethane	M15-Oc09691	NCP	mg/kg	< 0.05	< 0.05	<1	30%	Pass	
1.1.1.2-Tetrachloroethane	M15-Oc09691	NCP	mg/kg	< 0.05	< 0.05	<1	30%	Pass	
1.1.2-Trichloroethane	M15-Oc09691	NCP	mg/kg	< 0.05	< 0.05	<1	30%	Pass	
1.1.2.2-Tetrachloroethane	M15-Oc09691	NCP	mg/kg	< 0.05	< 0.05	<1	30%	Pass	
1.2-Dibromoethane	M15-Oc09691	NCP	mg/kg	< 0.05	< 0.05	<1	30%	Pass	
1.2-Dichlorobenzene	M15-Oc09691	NCP	mg/kg	< 0.05	< 0.05	<1	30%	Pass	
1.2-Dichloroethane	M15-Oc09691	NCP	mg/kg	< 0.05	< 0.05	<1	30%	Pass	
1.2-Dichloropropane	M15-Oc09691	NCP	mg/kg	< 0.05	< 0.05	<1	30%	Pass	
1.2.3-Trichloropropane	M15-Oc09691	NCP	mg/kg	< 0.05	< 0.05	<1	30%	Pass	
1.2.4-Trimethylbenzene	M15-Oc09691	NCP	mg/kg	< 0.05	< 0.05	<1	30%	Pass	
1.3-Dichlorobenzene	M15-Oc09691	NCP	mg/kg	< 0.05	< 0.05	<1	30%	Pass	
1.3-Dichloropropane	M15-Oc09691	NCP	mg/kg	< 0.05	< 0.05	<1	30%	Pass	
1.3.5-Trimethylbenzene	M15-Oc09691	NCP	mg/kg	< 0.05	< 0.05	<1	30%	Pass	
1.4-Dichlorobenzene	M15-Oc09691	NCP	mg/kg	< 0.05	< 0.05	<1	30%	Pass	
2-Butanone (MEK)	M15-Oc09691	NCP	mg/kg	< 0.05	< 0.05	<1	30%	Pass	
2-Propanone (Acetone)	M15-Oc09691	NCP	mg/kg	< 0.05	< 0.05	<1	30%	Pass	
4-Chlorotoluene	M15-Oc09691	NCP	mg/kg	< 0.05	< 0.05	<1	30%	Pass	
4-Methyl-2-pentanone (MIBK)	M15-Oc09691	NCP	mg/kg	< 0.05	< 0.05	<1	30%	Pass	
Allyl chloride	M15-Oc09691	NCP	mg/kg	< 0.05	< 0.05	<1	30%	Pass	
Benzene	M15-Oc09691	NCP	mg/kg	< 0.1	< 0.1	<1	30%	Pass	
Bromobenzene	M15-Oc09691	NCP	mg/kg	< 0.05	< 0.05	<1	30%	Pass	
Bromochloromethane	M15-Oc09691	NCP	mg/kg	< 0.05	< 0.05	<1	30%	Pass	
Bromodichloromethane	M15-Oc09691	NCP	mg/kg	< 0.05	< 0.05	<1	30%	Pass	
Bromoform	M15-Oc09691	NCP	mg/kg	< 0.05	< 0.05	<1	30%	Pass	
Bromomethane	M15-Oc09691	NCP	mg/kg	< 0.05	< 0.05	<1	30%	Pass	
Carbon disulfide	M15-Oc09691	NCP	mg/kg	< 0.05	< 0.05	<1	30%	Pass	
Carbon Tetrachloride	M15-Oc09691	NCP	mg/kg	< 0.05	< 0.05	<1	30%	Pass	
Chlorobenzene	M15-Oc09691	NCP	mg/kg	< 0.05	< 0.05	<1	30%	Pass	
Chloroethane	M15-Oc09691	NCP	mg/kg	< 0.05	< 0.05	<1	30%	Pass	
Chloroform	M15-Oc09691	NCP	mg/kg	< 0.05	< 0.05	<1	30%	Pass	
Chloromethane	M15-Oc09691	NCP	mg/kg	< 0.05	< 0.05	<1	30%	Pass	
cis-1.2-Dichloroethene	M15-Oc09691	NCP	mg/kg	< 0.05	< 0.05	<1	30%	Pass	
cis-1.3-Dichloropropene	M15-Oc09691	NCP	mg/kg	< 0.05	< 0.05	<1	30%	Pass	
Dibromochloromethane	M15-Oc09691	NCP	mg/kg	< 0.05	< 0.05	<1	30%	Pass	
Dibromomethane	M15-Oc09691	NCP	mg/kg	< 0.05	< 0.05	<1	30%	Pass	
Dichlorodifluoromethane	M15-Oc09691	NCP	mg/kg	< 0.05	< 0.05	<1	30%	Pass	
Ethylbenzene	M15-Oc09691	NCP	mg/kg	< 0.1	< 0.1	<1	30%	Pass	
Iodomethane	M15-Oc09691	NCP	mg/kg	< 0.05	< 0.05	<1	30%	Pass	
Isopropyl benzene (Cumene)	M15-Oc09691	NCP	mg/kg	< 0.05	< 0.05	<1	30%	Pass	
m&p-Xylenes	M15-Oc09691	NCP	mg/kg	< 0.2	< 0.2	<1	30%	Pass	
Methylene Chloride	M15-Oc09691	NCP	mg/kg	< 0.05	< 0.05	<1	30%	Pass	
o-Xylene	M15-Oc09691	NCP	mg/kg	< 0.1	< 0.1	<1	30%	Pass	
Styrene	M15-Oc09691	NCP	mg/kg	< 0.05	< 0.05	<1	30%	Pass	
Tetrachloroethene	M15-Oc09691	NCP	mg/kg	< 0.05	< 0.05	<1	30%	Pass	
Toluene	M15-Oc09691	NCP	mg/kg	< 0.1	< 0.1	<1	30%	Pass	
trans-1.2-Dichloroethene	M15-Oc09691	NCP	mg/kg	< 0.05	< 0.05	<1	30%	Pass	
trans-1.3-Dichloropropene	M15-Oc09691	NCP	mg/kg	< 0.05	< 0.05	<1	30%	Pass	
Trichloroethene	M15-Oc09691	NCP	mg/kg	< 0.05	< 0.05	<1	30%	Pass	
Trichlorofluoromethane	M15-Oc09691	NCP	mg/kg	< 0.05	< 0.05	<1	30%	Pass	
Vinyl chloride	M15-Oc09691	NCP	mg/kg	< 0.05	< 0.05	<1	30%	Pass	
Xylenes - Total	M15-Oc09691	NCP	mg/kg	< 0.3	< 0.3	<1	30%	Pass	

Duplicate									
Total Recoverable Hydrocarbons - 2013 NEPM Fractions				Result 1	Result 2	RPD			
Naphthalene	M15-Oc09691	NCP	mg/kg	< 0.5	< 0.5	<1	30%	Pass	
TRH C6-C10	M15-Oc09691	NCP	mg/kg	< 20	< 20	<1	30%	Pass	
Duplicate									
Polycyclic Aromatic Hydrocarbons				Result 1	Result 2	RPD			
Acenaphthene	B15-Oc10754	NCP	mg/kg	< 0.5	< 0.5	<1	30%	Pass	
Acenaphthylene	B15-Oc10754	NCP	mg/kg	< 0.5	< 0.5	<1	30%	Pass	
Anthracene	B15-Oc10754	NCP	mg/kg	< 0.5	< 0.5	<1	30%	Pass	
Benz(a)anthracene	B15-Oc10754	NCP	mg/kg	< 0.5	< 0.5	<1	30%	Pass	
Benzo(a)pyrene	B15-Oc10754	NCP	mg/kg	< 0.5	< 0.5	<1	30%	Pass	
Benzo(b&j)fluoranthene	B15-Oc10754	NCP	mg/kg	< 0.5	< 0.5	<1	30%	Pass	
Benzo(g.h.i)perylene	B15-Oc10754	NCP	mg/kg	< 0.5	< 0.5	<1	30%	Pass	
Benzo(k)fluoranthene	B15-Oc10754	NCP	mg/kg	< 0.5	< 0.5	<1	30%	Pass	
Chrysene	B15-Oc10754	NCP	mg/kg	< 0.5	< 0.5	<1	30%	Pass	
Dibenz(a.h)anthracene	B15-Oc10754	NCP	mg/kg	< 0.5	< 0.5	<1	30%	Pass	
Fluoranthene	B15-Oc10754	NCP	mg/kg	< 0.5	< 0.5	<1	30%	Pass	
Fluorene	B15-Oc10754	NCP	mg/kg	< 0.5	< 0.5	<1	30%	Pass	
Indeno(1.2.3-cd)pyrene	B15-Oc10754	NCP	mg/kg	< 0.5	< 0.5	<1	30%	Pass	
Naphthalene	B15-Oc10754	NCP	mg/kg	< 0.5	< 0.5	<1	30%	Pass	
Phenanthrene	B15-Oc10754	NCP	mg/kg	< 0.5	< 0.5	<1	30%	Pass	
Pyrene	B15-Oc10754	NCP	mg/kg	< 0.5	< 0.5	<1	30%	Pass	
Duplicate									
Total Recoverable Hydrocarbons - 2013 NEPM Fractions				Result 1	Result 2	RPD			
TRH >C10-C16	B15-Oc10757	NCP	mg/kg	1600	1500	8.6	30%	Pass	
TRH >C16-C34	B15-Oc10757	NCP	mg/kg	6900	7200	4.5	30%	Pass	
TRH >C34-C40	B15-Oc10757	NCP	mg/kg	900	1000	12	30%	Pass	
Duplicate									
Heavy Metals				Result 1	Result 2	RPD			
Arsenic	M15-Oc11103	NCP	mg/kg	5.4	5.8	7.0	30%	Pass	
Cadmium	M15-Oc11103	NCP	mg/kg	< 0.4	< 0.4	<1	30%	Pass	
Chromium	M15-Oc11103	NCP	mg/kg	8.1	8.0	1.0	30%	Pass	
Copper	M15-Oc11103	NCP	mg/kg	7.3	7.2	2.0	30%	Pass	
Lead	M15-Oc11103	NCP	mg/kg	18	18	<1	30%	Pass	
Mercury	M15-Oc11103	NCP	mg/kg	< 0.1	< 0.1	<1	30%	Pass	
Nickel	M15-Oc11103	NCP	mg/kg	< 5	< 5	<1	30%	Pass	
Selenium	M15-Oc11103	NCP	mg/kg	< 2	< 2	<1	30%	Pass	
Zinc	M15-Oc08696	NCP	mg/kg	450	470	6.0	30%	Pass	
Duplicate									
				Result 1	Result 2	RPD			
% Moisture	M15-Oc11162	NCP	%	17	17	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

Authorised By

Onur Mehmet	Analytical Services Manager
Carroll Lee	Senior Analyst-Organic (VIC)
Carroll Lee	Senior Analyst-Volatile (VIC)
Emily Rosenberg	Senior Analyst-Metal (VIC)
Huong Le	Senior Analyst-Inorganic (VIC)

Glenn Jackson

National Operations Manager

Final report - this Report replaces any previously issued Report

- Indicates Not Requested

* Indicates NATA accreditation does not cover the performance of this service

Uncertainty data is available on request

ALS Environmental

CERTIFICATE OF ANALYSIS

Work Order	: **EM1515593**	Page	: 1 of 15
Client	: **AECOM Australia Pty Ltd**	Laboratory	: Environmental Division Melbourne
Contact	: MS AVERYLL COYNE	Contact	: Carsten Emrich
Address	: LEVEL 9 8 EXHIBITION ST MELBOURNE VIC 3000	Address	: 4 Westall Rd Springvale VIC Australia 3171
E-mail	: averyll.coyne@aecom.com	E-mail	: carsten.emrich@alsenviro.com
Telephone	: +61 03 9653 1234	Telephone	: +61 7 3243 7123
Facsimile	: +61 03 9654 7117	Facsimile	: +61-3-8549 9601
Project	: 60431087	QC Level	: NEPM 2013 Schedule B(3) and ALS QCS3 requirement
Order number	: 60431087 1.4	Date Samples Received	: 15-Oct-2015 12:35
C-O-C number	: ----	Date Analysis Commenced	: 19-Oct-2015
Sampler	: NATHAN JENSEN, OLIVER TAYLOR	Issue Date	: 26-Oct-2015 17:43
Site	: Fishermans Bend		
		No. of samples received	: 66
Quote number	: ----	No. of samples analysed	: 11

This report supersedes any previous report(s) with this reference. Results apply to the sample(s) as submitted.

This Certificate of Analysis contains the following information:

- General Comments
- Analytical Results

Signatories

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

Signatories	Position	Accreditation Category
Dilani Fernando	Senior Inorganic Chemist	Melbourne Inorganics
Eric Chau	Metals Team Leader	Melbourne Inorganics
Nancy Wang	Senior Semivolatile Instrument Chemist	Melbourne Inorganics Melbourne Organics
Satishkumar Trivedi	Acid Sulfate Soils Supervisor	Brisbane Acid Sulphate Soils Brisbane Inorganics
Xing Lin	Senior Organic Chemist	Melbourne Organics

General Comments

The analytical procedures used by the Environmental Division have been developed from established internationally recognized procedures such as those published by the USEPA, APHA, AS and NEPM. In house developed procedures are employed in the absence of documented standards or by 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.

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.

- Benzo(a)pyrene Toxicity Equivalent Quotient (TEQ) 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.

Analytical Results

Sub-Matrix: SOIL (Matrix: SOIL)				Client sample ID	GW18(0.4-0.5)	GW18(2.3-2.4)	GW27(2.9-3.0)	GW34(2.2-2.3)	GW28(1.6-1.7)
				Client sampling date / time	[14-Oct-2015]	[14-Oct-2015]	[14-Oct-2015]	[14-Oct-2015]	[14-Oct-2015]
Compound	CAS Number	LOR	Unit		EM1515593-002	EM1515593-006	EM1515593-010	EM1515593-018	EM1515593-033
					Result	Result	Result	Result	Result
EA001: pH in soil using 0.01M CaCl extract									
pH (CaCl2)	----	0.1	pH Unit		7.9	----	----	----	----
EA055: Moisture Content									
^ Moisture Content (dried @ 103°C)	----	1	%		12.8	31.2	21.2	18.4	17.3
ED040N: Sulfate - Calcium Phosphate Soluble (NEPM)									
Sulfate as SO4 2-	14808-79-8	50	mg/kg		170	----	----	----	----
EG005T: Total Metals by ICP-AES									
Aluminium	7429-90-5	50	mg/kg		7580	----	----	----	----
Iron	7439-89-6	50	mg/kg		26500	----	----	----	----
Selenium	7782-49-2	5	mg/kg		<5	----	----	----	----
Arsenic	7440-38-2	5	mg/kg		6	----	----	----	----
Cadmium	7440-43-9	1	mg/kg		<1	----	----	----	----
Chromium	7440-47-3	2	mg/kg		31	----	----	----	----
Copper	7440-50-8	5	mg/kg		26	----	----	----	----
Lead	7439-92-1	5	mg/kg		28	----	----	----	----
Nickel	7440-02-0	2	mg/kg		65	----	----	----	----
Zinc	7440-66-6	5	mg/kg		83	----	----	----	----
EG035T: Total Recoverable Mercury by FIMS									
Mercury	7439-97-6	0.1	mg/kg		<0.1	----	----	----	----
EP003: Total Organic Carbon (TOC) in Soil									
Total Organic Carbon	----	0.02	%		----	1.93	0.09	0.24	0.16
EP074A: Monocyclic Aromatic Hydrocarbons									
Styrene	100-42-5	0.5	mg/kg		<0.5	----	----	----	----
Isopropylbenzene	98-82-8	0.5	mg/kg		<0.5	----	----	----	----
n-Propylbenzene	103-65-1	0.5	mg/kg		<0.5	----	----	----	----
1.3.5-Trimethylbenzene	108-67-8	0.5	mg/kg		<0.5	----	----	----	----
sec-Butylbenzene	135-98-8	0.5	mg/kg		<0.5	----	----	----	----
1.2.4-Trimethylbenzene	95-63-6	0.5	mg/kg		<0.5	----	----	----	----
tert-Butylbenzene	98-06-6	0.5	mg/kg		<0.5	----	----	----	----
p-Isopropyltoluene	99-87-6	0.5	mg/kg		<0.5	----	----	----	----
n-Butylbenzene	104-51-8	0.5	mg/kg		<0.5	----	----	----	----
EP074B: Oxygenated Compounds									
Vinyl Acetate	108-05-4	5	mg/kg		<5	----	----	----	----
2-Butanone (MEK)	78-93-3	5	mg/kg		<5	----	----	----	----
4-Methyl-2-pentanone (MIBK)	108-10-1	5	mg/kg		<5	----	----	----	----

Analytical Results

Sub-Matrix: SOIL (Matrix: SOIL)				Client sample ID	GW18(0.4-0.5)	GW18(2.3-2.4)	GW27(2.9-3.0)	GW34(2.2-2.3)	GW28(1.6-1.7)
				Client sampling date / time	[14-Oct-2015]	[14-Oct-2015]	[14-Oct-2015]	[14-Oct-2015]	[14-Oct-2015]
Compound	CAS Number	LOR	Unit		EM1515593-002	EM1515593-006	EM1515593-010	EM1515593-018	EM1515593-033
					Result	Result	Result	Result	Result
EP074B: Oxygenated Compounds - Continued									
2-Hexanone (MBK)	591-78-6	5	mg/kg		<5	----	----	----	----
EP074C: Sulfonated Compounds									
Carbon disulfide	75-15-0	0.5	mg/kg		<0.5	----	----	----	----
EP074D: Fumigants									
2.2-Dichloropropane	594-20-7	0.5	mg/kg		<0.5	----	----	----	----
1.2-Dichloropropane	78-87-5	0.5	mg/kg		<0.5	----	----	----	----
cis-1.3-Dichloropropylene	10061-01-5	0.5	mg/kg		<0.5	----	----	----	----
trans-1.3-Dichloropropylene	10061-02-6	0.5	mg/kg		<0.5	----	----	----	----
1.2-Dibromoethane (EDB)	106-93-4	0.5	mg/kg		<0.5	----	----	----	----
EP074E: Halogenated Aliphatic Compounds									
Dichlorodifluoromethane	75-71-8	5	mg/kg		<5	----	----	----	----
Chloromethane	74-87-3	5	mg/kg		<5	----	----	----	----
Vinyl chloride	75-01-4	5	mg/kg		<5	----	----	----	----
Bromomethane	74-83-9	5	mg/kg		<5	----	----	----	----
Chloroethane	75-00-3	5	mg/kg		<5	----	----	----	----
Trichlorofluoromethane	75-69-4	5	mg/kg		<5	----	----	----	----
1.1-Dichloroethene	75-35-4	0.5	mg/kg		<0.5	----	----	----	----
Iodomethane	74-88-4	0.5	mg/kg		<0.5	----	----	----	----
trans-1.2-Dichloroethene	156-60-5	0.5	mg/kg		<0.5	----	----	----	----
1.1-Dichloroethane	75-34-3	0.5	mg/kg		<0.5	----	----	----	----
cis-1.2-Dichloroethene	156-59-2	0.5	mg/kg		<0.5	----	----	----	----
1.1.1-Trichloroethane	71-55-6	0.5	mg/kg		<0.5	----	----	----	----
1.1-Dichloropropylene	563-58-6	0.5	mg/kg		<0.5	----	----	----	----
Carbon Tetrachloride	56-23-5	0.5	mg/kg		<0.5	----	----	----	----
1.2-Dichloroethane	107-06-2	0.5	mg/kg		<0.5	----	----	----	----
Trichloroethene	79-01-6	0.5	mg/kg		<0.5	----	----	----	----
Dibromomethane	74-95-3	0.5	mg/kg		<0.5	----	----	----	----
1.1.2-Trichloroethane	79-00-5	0.5	mg/kg		<0.5	----	----	----	----
1.3-Dichloropropane	142-28-9	0.5	mg/kg		<0.5	----	----	----	----
Tetrachloroethene	127-18-4	0.5	mg/kg		<0.5	----	----	----	----
1.1.1.2-Tetrachloroethane	630-20-6	0.5	mg/kg		<0.5	----	----	----	----
trans-1.4-Dichloro-2-butene	110-57-6	0.5	mg/kg		<0.5	----	----	----	----
cis-1.4-Dichloro-2-butene	1476-11-5	0.5	mg/kg		<0.5	----	----	----	----
1.1.2.2-Tetrachloroethane	79-34-5	0.5	mg/kg		<0.5	----	----	----	----

Analytical Results

Sub-Matrix: SOIL (Matrix: SOIL)				Client sample ID	GW18(0.4-0.5)	GW18(2.3-2.4)	GW27(2.9-3.0)	GW34(2.2-2.3)	GW28(1.6-1.7)
				Client sampling date / time	[14-Oct-2015]	[14-Oct-2015]	[14-Oct-2015]	[14-Oct-2015]	[14-Oct-2015]
Compound	CAS Number	LOR	Unit		EM1515593-002	EM1515593-006	EM1515593-010	EM1515593-018	EM1515593-033
					Result	Result	Result	Result	Result
EP074E: Halogenated Aliphatic Compounds - Continued									
1.2.3-Trichloropropane	96-18-4	0.5	mg/kg		<0.5	----	----	----	----
Pentachloroethane	76-01-7	0.5	mg/kg		<0.5	----	----	----	----
1.2-Dibromo-3-chloropropane	96-12-8	0.5	mg/kg		<0.5	----	----	----	----
Hexachlorobutadiene	87-68-3	0.5	mg/kg		<0.5	----	----	----	----
EP074F: Halogenated Aromatic Compounds									
Chlorobenzene	108-90-7	0.5	mg/kg		<0.5	----	----	----	----
Bromobenzene	108-86-1	0.5	mg/kg		<0.5	----	----	----	----
2-Chlorotoluene	95-49-8	0.5	mg/kg		<0.5	----	----	----	----
4-Chlorotoluene	106-43-4	0.5	mg/kg		<0.5	----	----	----	----
1.3-Dichlorobenzene	541-73-1	0.5	mg/kg		<0.5	----	----	----	----
1.4-Dichlorobenzene	106-46-7	0.5	mg/kg		<0.5	----	----	----	----
1.2-Dichlorobenzene	95-50-1	0.5	mg/kg		<0.5	----	----	----	----
1.2.4-Trichlorobenzene	120-82-1	0.5	mg/kg		<0.5	----	----	----	----
1.2.3-Trichlorobenzene	87-61-6	0.5	mg/kg		<0.5	----	----	----	----
EP074G: Trihalomethanes									
Chloroform	67-66-3	0.5	mg/kg		<0.5	----	----	----	----
Bromodichloromethane	75-27-4	0.5	mg/kg		<0.5	----	----	----	----
Dibromochloromethane	124-48-1	0.5	mg/kg		<0.5	----	----	----	----
Bromoform	75-25-2	0.5	mg/kg		<0.5	----	----	----	----
EP075(SIM)B: Polynuclear Aromatic Hydrocarbons									
Naphthalene	91-20-3	0.5	mg/kg		<0.5	----	----	----	----
Acenaphthylene	208-96-8	0.5	mg/kg		**0.6**	----	----	----	----
Acenaphthene	83-32-9	0.5	mg/kg		<0.5	----	----	----	----
Fluorene	86-73-7	0.5	mg/kg		<0.5	----	----	----	----
Phenanthrene	85-01-8	0.5	mg/kg		**2.5**	----	----	----	----
Anthracene	120-12-7	0.5	mg/kg		**1.1**	----	----	----	----
Fluoranthene	206-44-0	0.5	mg/kg		**6.0**	----	----	----	----
Pyrene	129-00-0	0.5	mg/kg		**6.4**	----	----	----	----
Benz(a)anthracene	56-55-3	0.5	mg/kg		**3.2**	----	----	----	----
Chrysene	218-01-9	0.5	mg/kg		**3.0**	----	----	----	----
Benzo(b+j)fluoranthene	205-99-2 205-82-3	0.5	mg/kg		**5.5**	----	----	----	----
Benzo(k)fluoranthene	207-08-9	0.5	mg/kg		**2.0**	----	----	----	----
Benzo(a)pyrene	50-32-8	0.5	mg/kg		**5.0**	----	----	----	----
Indeno(1.2.3.cd)pyrene	193-39-5	0.5	mg/kg		**3.1**	----	----	----	----

Analytical Results

Sub-Matrix: SOIL (Matrix: SOIL)				Client sample ID	GW18(0.4-0.5)	GW18(2.3-2.4)	GW27(2.9-3.0)	GW34(2.2-2.3)	GW28(1.6-1.7)
				Client sampling date / time	[14-Oct-2015]	[14-Oct-2015]	[14-Oct-2015]	[14-Oct-2015]	[14-Oct-2015]
Compound	CAS Number	LOR	Unit		EM1515593-002	EM1515593-006	EM1515593-010	EM1515593-018	EM1515593-033
					Result	Result	Result	Result	Result
EP075(SIM)B: Polynuclear Aromatic Hydrocarbons - Continued									
Dibenz(a.h)anthracene	53-70-3	0.5	mg/kg		**1.3**	----	----	----	----
Benzo(g.h.i)perylene	191-24-2	0.5	mg/kg		**4.0**	----	----	----	----
^ Sum of polycyclic aromatic hydrocarbons	----	0.5	mg/kg		**43.7**	----	----	----	----
^ Benzo(a)pyrene TEQ (zero)	----	0.5	mg/kg		**7.8**	----	----	----	----
^ Benzo(a)pyrene TEQ (half LOR)	----	0.5	mg/kg		**7.8**	----	----	----	----
^ Benzo(a)pyrene TEQ (LOR)	----	0.5	mg/kg		**7.8**	----	----	----	----
EP080/071: Total Petroleum Hydrocarbons									
C6 - C9 Fraction	----	10	mg/kg		<10	----	----	----	----
C10 - C14 Fraction	----	50	mg/kg		<50	----	----	----	----
C15 - C28 Fraction	----	100	mg/kg		**140**	----	----	----	----
C29 - C36 Fraction	----	100	mg/kg		**200**	----	----	----	----
^ C10 - C36 Fraction (sum)	----	50	mg/kg		**340**	----	----	----	----
EP080/071: Total Recoverable Hydrocarbons - NEPM 2013 Fractions									
C6 - C10 Fraction	C6_C10	10	mg/kg		<10	----	----	----	----
^ C6 - C10 Fraction minus BTEX (F1)	C6_C10-BTEX	10	mg/kg		<10	----	----	----	----
>C10 - C16 Fraction	>C10_C16	50	mg/kg		<50	----	----	----	----
>C16 - C34 Fraction	----	100	mg/kg		**300**	----	----	----	----
>C34 - C40 Fraction	----	100	mg/kg		**140**	----	----	----	----
^ >C10 - C40 Fraction (sum)	----	50	mg/kg		**440**	----	----	----	----
^ >C10 - C16 Fraction minus Naphthalene (F2)	----	50	mg/kg		<50	----	----	----	----
EP080: BTEXN									
Benzene	71-43-2	0.2	mg/kg		<0.2	----	----	----	----
Toluene	108-88-3	0.5	mg/kg		<0.5	----	----	----	----
Ethylbenzene	100-41-4	0.5	mg/kg		<0.5	----	----	----	----
meta- & para-Xylene	108-38-3 106-42-3	0.5	mg/kg		<0.5	----	----	----	----
ortho-Xylene	95-47-6	0.5	mg/kg		<0.5	----	----	----	----
^ Sum of BTEX	----	0.2	mg/kg		<0.2	----	----	----	----
^ Total Xylenes	1330-20-7	0.5	mg/kg		<0.5	----	----	----	----
Naphthalene	91-20-3	1	mg/kg		<1	----	----	----	----
EP074S: VOC Surrogates									
1.2-Dichloroethane-D4	17060-07-0	0.5	%		**89.2**	----	----	----	----
Toluene-D8	2037-26-5	0.5	%		**86.3**	----	----	----	----

Analytical Results

Sub-Matrix: SOIL (Matrix: SOIL)				Client sample ID	GW18(0.4-0.5)	GW18(2.3-2.4)	GW27(2.9-3.0)	GW34(2.2-2.3)	GW28(1.6-1.7)
				Client sampling date / time	[14-Oct-2015]	[14-Oct-2015]	[14-Oct-2015]	[14-Oct-2015]	[14-Oct-2015]
Compound	CAS Number	LOR	Unit		EM1515593-002	EM1515593-006	EM1515593-010	EM1515593-018	EM1515593-033
					Result	Result	Result	Result	Result
EP074S: VOC Surrogates - Continued									
4-Bromofluorobenzene	460-00-4	0.5	%		87.9	----	----	----	----
EP075(SIM)S: Phenolic Compound Surrogates									
Phenol-d6	13127-88-3	0.5	%		86.0	----	----	----	----
2-Chlorophenol-D4	93951-73-6	0.5	%		92.8	----	----	----	----
2.4.6-Tribromophenol	118-79-6	0.5	%		77.9	----	----	----	----
EP075(SIM)T: PAH Surrogates									
2-Fluorobiphenyl	321-60-8	0.5	%		111	----	----	----	----
Anthracene-d10	1719-06-8	0.5	%		116	----	----	----	----
4-Terphenyl-d14	1718-51-0	0.5	%		104	----	----	----	----
EP080S: TPH(V)/BTEX Surrogates									
1.2-Dichloroethane-D4	17060-07-0	0.2	%		85.8	----	----	----	----
Toluene-D8	2037-26-5	0.2	%		79.2	----	----	----	----
4-Bromofluorobenzene	460-00-4	0.2	%		87.2	----	----	----	----

Analytical Results

Sub-Matrix: SOIL (Matrix: SOIL)			Client sample ID	GW24(1.6-1.7)	GW04(0.5-0.6)	QC06	----	----
			Client sampling date / time	[14-Oct-2015]	[14-Oct-2015]	[14-Oct-2015]	----	----
Compound	CAS Number	LOR	Unit	EM1515593-042	EM1515593-059	EM1515593-066	--------	--------
				Result	Result	Result	Result	Result
EA001: pH in soil using 0.01M CaCl extract								
pH (CaCl2)	----	0.1	pH Unit	----	8.0	7.9	----	----
EA055: Moisture Content								
^ Moisture Content (dried @ 103°C)	----	1	%	17.7	7.7	8.0	----	----
ED040N: Sulfate - Calcium Phosphate Soluble (NEPM)								
Sulfate as SO4 2-	14808-79-8	50	mg/kg	----	50	60	----	----
EG005T: Total Metals by ICP-AES								
Aluminium	7429-90-5	50	mg/kg	----	7470	7010	----	----
Iron	7439-89-6	50	mg/kg	----	25700	28400	----	----
Selenium	7782-49-2	5	mg/kg	----	<5	<5	----	----
Arsenic	7440-38-2	5	mg/kg	----	17	23	----	----
Cadmium	7440-43-9	1	mg/kg	----	<1	<1	----	----
Chromium	7440-47-3	2	mg/kg	----	22	21	----	----
Copper	7440-50-8	5	mg/kg	----	60	52	----	----
Lead	7439-92-1	5	mg/kg	----	217	271	----	----
Nickel	7440-02-0	2	mg/kg	----	40	38	----	----
Zinc	7440-66-6	5	mg/kg	----	318	233	----	----
EG035T: Total Recoverable Mercury by FIMS								
Mercury	7439-97-6	0.1	mg/kg	----	<0.1	<0.1	----	----
EP003: Total Organic Carbon (TOC) in Soil								
Total Organic Carbon	----	0.02	%	0.36	----	----	----	----
EP074A: Monocyclic Aromatic Hydrocarbons								
Styrene	100-42-5	0.5	mg/kg	----	<0.5	<0.5	----	----
Isopropylbenzene	98-82-8	0.5	mg/kg	----	<0.5	<0.5	----	----
n-Propylbenzene	103-65-1	0.5	mg/kg	----	<0.5	<0.5	----	----
1.3.5-Trimethylbenzene	108-67-8	0.5	mg/kg	----	<0.5	<0.5	----	----
sec-Butylbenzene	135-98-8	0.5	mg/kg	----	<0.5	<0.5	----	----
1.2.4-Trimethylbenzene	95-63-6	0.5	mg/kg	----	<0.5	<0.5	----	----
tert-Butylbenzene	98-06-6	0.5	mg/kg	----	<0.5	<0.5	----	----
p-Isopropyltoluene	99-87-6	0.5	mg/kg	----	<0.5	<0.5	----	----
n-Butylbenzene	104-51-8	0.5	mg/kg	----	<0.5	<0.5	----	----
EP074B: Oxygenated Compounds								
Vinyl Acetate	108-05-4	5	mg/kg	----	<5	<5	----	----
2-Butanone (MEK)	78-93-3	5	mg/kg	----	<5	<5	----	----
4-Methyl-2-pentanone (MIBK)	108-10-1	5	mg/kg	----	<5	<5	----	----

Analytical Results

Sub-Matrix: SOIL (Matrix: SOIL)				Client sample ID	GW24(1.6-1.7)	GW04(0.5-0.6)	QC06	----	----
				Client sampling date / time	[14-Oct-2015]	[14-Oct-2015]	[14-Oct-2015]	----	----
Compound	CAS Number	LOR	Unit		EM1515593-042	EM1515593-059	EM1515593-066	--------	--------
					Result	Result	Result	Result	Result
EP074B: Oxygenated Compounds - Continued									
2-Hexanone (MBK)	591-78-6	5	mg/kg		----	<5	<5	----	----
EP074C: Sulfonated Compounds									
Carbon disulfide	75-15-0	0.5	mg/kg		----	<0.5	<0.5	----	----
EP074D: Fumigants									
2.2-Dichloropropane	594-20-7	0.5	mg/kg		----	<0.5	<0.5	----	----
1.2-Dichloropropane	78-87-5	0.5	mg/kg		----	<0.5	<0.5	----	----
cis-1.3-Dichloropropylene	10061-01-5	0.5	mg/kg		----	<0.5	<0.5	----	----
trans-1.3-Dichloropropylene	10061-02-6	0.5	mg/kg		----	<0.5	<0.5	----	----
1.2-Dibromoethane (EDB)	106-93-4	0.5	mg/kg		----	<0.5	<0.5	----	----
EP074E: Halogenated Aliphatic Compounds									
Dichlorodifluoromethane	75-71-8	5	mg/kg		----	<5	<5	----	----
Chloromethane	74-87-3	5	mg/kg		----	<5	<5	----	----
Vinyl chloride	75-01-4	5	mg/kg		----	<5	<5	----	----
Bromomethane	74-83-9	5	mg/kg		----	<5	<5	----	----
Chloroethane	75-00-3	5	mg/kg		----	<5	<5	----	----
Trichlorofluoromethane	75-69-4	5	mg/kg		----	<5	<5	----	----
1.1-Dichloroethene	75-35-4	0.5	mg/kg		----	<0.5	<0.5	----	----
Iodomethane	74-88-4	0.5	mg/kg		----	<0.5	<0.5	----	----
trans-1.2-Dichloroethene	156-60-5	0.5	mg/kg		----	<0.5	<0.5	----	----
1.1-Dichloroethane	75-34-3	0.5	mg/kg		----	<0.5	<0.5	----	----
cis-1.2-Dichloroethene	156-59-2	0.5	mg/kg		----	<0.5	<0.5	----	----
1.1.1-Trichloroethane	71-55-6	0.5	mg/kg		----	<0.5	<0.5	----	----
1.1-Dichloropropylene	563-58-6	0.5	mg/kg		----	<0.5	<0.5	----	----
Carbon Tetrachloride	56-23-5	0.5	mg/kg		----	<0.5	<0.5	----	----
1.2-Dichloroethane	107-06-2	0.5	mg/kg		----	<0.5	<0.5	----	----
Trichloroethene	79-01-6	0.5	mg/kg		----	<0.5	<0.5	----	----
Dibromomethane	74-95-3	0.5	mg/kg		----	<0.5	<0.5	----	----
1.1.2-Trichloroethane	79-00-5	0.5	mg/kg		----	<0.5	<0.5	----	----
1.3-Dichloropropane	142-28-9	0.5	mg/kg		----	<0.5	<0.5	----	----
Tetrachloroethene	127-18-4	0.5	mg/kg		----	<0.5	<0.5	----	----
1.1.1.2-Tetrachloroethane	630-20-6	0.5	mg/kg		----	<0.5	<0.5	----	----
trans-1.4-Dichloro-2-butene	110-57-6	0.5	mg/kg		----	<0.5	<0.5	----	----
cis-1.4-Dichloro-2-butene	1476-11-5	0.5	mg/kg		----	<0.5	<0.5	----	----
1.1.2.2-Tetrachloroethane	79-34-5	0.5	mg/kg		----	<0.5	<0.5	----	----

Analytical Results

Sub-Matrix: SOIL (Matrix: SOIL)				Client sample ID	GW24(1.6-1.7)	GW04(0.5-0.6)	QC06	----	----
				Client sampling date / time	[14-Oct-2015]	[14-Oct-2015]	[14-Oct-2015]	----	----
Compound	CAS Number	LOR	Unit		EM1515593-042	EM1515593-059	EM1515593-066	--------	--------
					Result	Result	Result	Result	Result
EP074E: Halogenated Aliphatic Compounds - Continued									
1.2.3-Trichloropropane	96-18-4	0.5	mg/kg		----	<0.5	<0.5	----	----
Pentachloroethane	76-01-7	0.5	mg/kg		----	<0.5	<0.5	----	----
1.2-Dibromo-3-chloropropane	96-12-8	0.5	mg/kg		----	<0.5	<0.5	----	----
Hexachlorobutadiene	87-68-3	0.5	mg/kg		----	<0.5	<0.5	----	----
EP074F: Halogenated Aromatic Compounds									
Chlorobenzene	108-90-7	0.5	mg/kg		----	<0.5	<0.5	----	----
Bromobenzene	108-86-1	0.5	mg/kg		----	<0.5	<0.5	----	----
2-Chlorotoluene	95-49-8	0.5	mg/kg		----	<0.5	<0.5	----	----
4-Chlorotoluene	106-43-4	0.5	mg/kg		----	<0.5	<0.5	----	----
1.3-Dichlorobenzene	541-73-1	0.5	mg/kg		----	<0.5	<0.5	----	----
1.4-Dichlorobenzene	106-46-7	0.5	mg/kg		----	<0.5	<0.5	----	----
1.2-Dichlorobenzene	95-50-1	0.5	mg/kg		----	<0.5	<0.5	----	----
1.2.4-Trichlorobenzene	120-82-1	0.5	mg/kg		----	<0.5	<0.5	----	----
1.2.3-Trichlorobenzene	87-61-6	0.5	mg/kg		----	<0.5	<0.5	----	----
EP074G: Trihalomethanes									
Chloroform	67-66-3	0.5	mg/kg		----	<0.5	<0.5	----	----
Bromodichloromethane	75-27-4	0.5	mg/kg		----	<0.5	<0.5	----	----
Dibromochloromethane	124-48-1	0.5	mg/kg		----	<0.5	<0.5	----	----
Bromoform	75-25-2	0.5	mg/kg		----	<0.5	<0.5	----	----
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		----	1.0	1.0	----	----
Anthracene	120-12-7	0.5	mg/kg		----	<0.5	<0.5	----	----
Fluoranthene	206-44-0	0.5	mg/kg		----	2.2	2.4	----	----
Pyrene	129-00-0	0.5	mg/kg		----	2.4	2.4	----	----
Benz(a)anthracene	56-55-3	0.5	mg/kg		----	1.1	1.2	----	----
Chrysene	218-01-9	0.5	mg/kg		----	1.0	1.1	----	----
Benzo(b+j)fluoranthene	205-99-2 205-82-3	0.5	mg/kg		----	1.5	1.6	----	----
Benzo(k)fluoranthene	207-08-9	0.5	mg/kg		----	0.6	0.6	----	----
Benzo(a)pyrene	50-32-8	0.5	mg/kg		----	1.3	1.4	----	----
Indeno(1.2.3.cd)pyrene	193-39-5	0.5	mg/kg		----	0.7	0.7	----	----

Analytical Results

Sub-Matrix: SOIL (Matrix: SOIL)				Client sample ID	GW24(1.6-1.7)	GW04(0.5-0.6)	QC06	----	----
				Client sampling date / time	[14-Oct-2015]	[14-Oct-2015]	[14-Oct-2015]	----	----
Compound	CAS Number	LOR	Unit		EM1515593-042	EM1515593-059	EM1515593-066	--------	--------
					Result	Result	Result	Result	Result
EP075(SIM)B: Polynuclear Aromatic Hydrocarbons - Continued									
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		----	**0.8**	**0.8**	----	----
^ Sum of polycyclic aromatic hydrocarbons	----	0.5	mg/kg		----	**12.6**	**13.2**	----	----
^ Benzo(a)pyrene TEQ (zero)	----	0.5	mg/kg		----	**1.7**	**1.8**	----	----
^ Benzo(a)pyrene TEQ (half LOR)	----	0.5	mg/kg		----	**2.0**	**2.1**	----	----
^ Benzo(a)pyrene TEQ (LOR)	----	0.5	mg/kg		----	**2.2**	**2.3**	----	----
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	----	----
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	>C10_C16	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	----	----
Toluene	108-88-3	0.5	mg/kg		----	<0.5	<0.5	----	----
Ethylbenzene	100-41-4	0.5	mg/kg		----	<0.5	<0.5	----	----
meta- & para-Xylene	108-38-3 106-42-3	0.5	mg/kg		----	<0.5	<0.5	----	----
ortho-Xylene	95-47-6	0.5	mg/kg		----	<0.5	<0.5	----	----
^ Sum of BTEX	----	0.2	mg/kg		----	<0.2	<0.2	----	----
^ Total Xylenes	1330-20-7	0.5	mg/kg		----	<0.5	<0.5	----	----
Naphthalene	91-20-3	1	mg/kg		----	<1	<1	----	----
EP074S: VOC Surrogates									
1.2-Dichloroethane-D4	17060-07-0	0.5	%		----	**91.5**	**81.2**	----	----
Toluene-D8	2037-26-5	0.5	%		----	**90.0**	**78.8**	----	----

Analytical Results

Sub-Matrix: SOIL (Matrix: SOIL)				Client sample ID	GW24(1.6-1.7)	GW04(0.5-0.6)	QC06	----	----
				Client sampling date / time	[14-Oct-2015]	[14-Oct-2015]	[14-Oct-2015]	----	----
Compound	CAS Number	LOR	Unit		EM1515593-042	EM1515593-059	EM1515593-066	--------	--------
					Result	Result	Result	Result	Result
EP074S: VOC Surrogates - Continued									
4-Bromofluorobenzene	460-00-4	0.5	%		----	102	90.3	----	----
EP075(SIM)S: Phenolic Compound Surrogates									
Phenol-d6	13127-88-3	0.5	%		----	76.6	80.0	----	----
2-Chlorophenol-D4	93951-73-6	0.5	%		----	89.3	86.3	----	----
2.4.6-Tribromophenol	118-79-6	0.5	%		----	77.1	68.1	----	----
EP075(SIM)T: PAH Surrogates									
2-Fluorobiphenyl	321-60-8	0.5	%		----	102	96.0	----	----
Anthracene-d10	1719-06-8	0.5	%		----	115	114	----	----
4-Terphenyl-d14	1718-51-0	0.5	%		----	101	97.1	----	----
EP080S: TPH(V)/BTEX Surrogates									
1.2-Dichloroethane-D4	17060-07-0	0.2	%		----	87.8	78.0	----	----
Toluene-D8	2037-26-5	0.2	%		----	82.6	72.2	----	----
4-Bromofluorobenzene	460-00-4	0.2	%		----	91.5	80.4	----	----

Analytical Results

Sub-Matrix: WATER (Matrix: WATER)				Client sample ID	QC08	QC09	QC10	----	----
				Client sampling date / time	[14-Oct-2015]	[14-Oct-2015]	[14-Oct-2015]	----	----
Compound	CAS Number	LOR	Unit		EM1515593-067	EM1515593-068	EM1515593-069	--------	--------
					Result	Result	Result	Result	Result
EG020T: Total Metals by ICP-MS									
Aluminium	7429-90-5	0.01	mg/L		<0.01	----	----	----	----
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	----	----	----	----
Nickel	7440-02-0	0.001	mg/L		<0.001	----	----	----	----
Lead	7439-92-1	0.001	mg/L		<0.001	----	----	----	----
Zinc	7440-66-6	0.005	mg/L		<0.005	----	----	----	----
Selenium	7782-49-2	0.01	mg/L		<0.01	----	----	----	----
Iron	7439-89-6	0.05	mg/L		<0.05	----	----	----	----
EG035T: Total Recoverable Mercury by FIMS									
Mercury	7439-97-6	0.0001	mg/L		<0.0001	----	----	----	----
EP080/071: Total Petroleum Hydrocarbons									
C6 - C9 Fraction	----	20	µg/L		<20	<20	<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	<20	<20	----	----
^ C6 - C10 Fraction minus BTEX (F1)	C6_C10-BTEX	20	µg/L		<20	<20	<20	----	----
>C10 - C16 Fraction	>C10_C16	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	<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	----	----

Analytical Results

Sub-Matrix: WATER (Matrix: WATER)				Client sample ID	QC08	QC09	QC10	----	----
				Client sampling date / time	[14-Oct-2015]	[14-Oct-2015]	[14-Oct-2015]	----	----
Compound	CAS Number	LOR	Unit		EM1515593-067	EM1515593-068	EM1515593-069	--------	--------
					Result	Result	Result	Result	Result
EP080: BTEXN - Continued									
^ **Total Xylenes**	1330-20-7	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	----	----
EP080S: TPH(V)/BTEX Surrogates									
1.2-Dichloroethane-D4	17060-07-0	2	%		**102**	**99.2**	**99.2**	----	----
Toluene-D8	2037-26-5	2	%		**107**	**105**	**102**	----	----
4-Bromofluorobenzene	460-00-4	2	%		**114**	**110**	**110**	----	----

ALS Environmental

QUALITY CONTROL REPORT

Work Order	: **EM1515593**	Page	: 1 of 15
Client	: **AECOM Australia Pty Ltd**	Laboratory	: Environmental Division Melbourne
Contact	: MS AVERYLL COYNE	Contact	: Carsten Emrich
Address	: LEVEL 9 8 EXHIBITION ST MELBOURNE VIC 3000	Address	: 4 Westall Rd Springvale VIC Australia 3171
E-mail	: averyll.coyne@aecom.com	E-mail	: carsten.emrich@alsenviro.com
Telephone	: +61 03 9653 1234	Telephone	: +61 7 3243 7123
Facsimile	: +61 03 9654 7117	Facsimile	: +61-3-8549 9601
Project	: 60431087	QC Level	: NEPM 2013 Schedule B(3) and ALS QCS3 requirement
Order number	: 60431087 1.4	Date Samples Received	: 15-Oct-2015
C-O-C number	: ----	Date Analysis Commenced	: 19-Oct-2015
Sampler	: NATHAN JENSEN, OLIVER TAYLOR	Issue Date	: 26-Oct-2015
Site	: Fishermans Bend	No. of samples received	: 66
Quote number	: ----	No. of samples analysed	: 11

This report supersedes any previous report(s) with this reference. Results apply to the sample(s) as submitted.

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

General Comments

The analytical procedures used by the Environmental Division have been developed from established internationally recognized procedures such as those published by the USEPA, APHA, AS and NEPM. In house developed procedures are employed in the absence of documented standards or by 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

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

NATA Accredited Laboratory 825

Accredited for compliance with ISO/IEC 17025.

Signatories

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

Signatories	*Position*	*Accreditation Category*
Dilani Fernando	Senior Inorganic Chemist	Melbourne Inorganics
Eric Chau	Metals Team Leader	Melbourne Inorganics
Nancy Wang	Senior Semivolatile Instrument Chemist	Melbourne Inorganics
		Melbourne Organics
Satishkumar Trivedi	Acid Sulfate Soils Supervisor	Brisbane Acid Sulphate Soils
		Brisbane Inorganics
Xing Lin	Senior Organic Chemist	Melbourne Organics

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	*Client sample ID*	*Method: Compound*	*CAS Number*	*LOR*	*Unit*	*Original Result*	*Duplicate Result*	*RPD (%)*	*Recovery Limits (%)*
EA001: pH in soil using 0.01M CaCl extract (QC Lot: 251010)									
EM1515593-002	GW18(0.4-0.5)	EA001: pH (CaCl2)	----	0.1	pH Unit	7.9	7.9	0.00	0% - 20%
EA055: Moisture Content (QC Lot: 247192)									
EM1515593-002	GW18(0.4-0.5)	EA055-103: Moisture Content (dried @ 103°C)	----	1	%	12.8	14.3	10.8	0% - 50%
EM1515873-001	Anonymous	EA055-103: Moisture Content (dried @ 103°C)	----	1	%	6.2	5.3	16.2	No Limit
EA055: Moisture Content (QC Lot: 251980)									
EM1515593-006	GW18(2.3-2.4)	EA055-103: Moisture Content (dried @ 103°C)	----	1	%	31.2	31.2	0.00	0% - 20%
ED040N: Sulfate - Calcium Phosphate Soluble (NEPM) (QC Lot: 251011)									
EM1515593-066	QC06	ED040N: Sulfate as SO4 2-	14808-79-8	50	mg/kg	60	60	0.00	No Limit
EM1515925-002	Anonymous	ED040N: Sulfate as SO4 2-	14808-79-8	50	mg/kg	<50	<50	0.00	No Limit
EG005T: Total Metals by ICP-AES (QC Lot: 247527)									
EM1515841-006	Anonymous	EG005T: Cadmium	7440-43-9	1	mg/kg	<1	<1	0.00	No Limit
		EG005T: Chromium	7440-47-3	2	mg/kg	4	3	0.00	No Limit
		EG005T: Nickel	7440-02-0	2	mg/kg	5	4	0.00	No Limit
		EG005T: Arsenic	7440-38-2	5	mg/kg	6	6	0.00	No Limit
		EG005T: Copper	7440-50-8	5	mg/kg	8	6	26.0	No Limit
		EG005T: Lead	7439-92-1	5	mg/kg	13	6	78.9	No Limit
		EG005T: Selenium	7782-49-2	5	mg/kg	<5	<5	0.00	No Limit
		EG005T: Zinc	7440-66-6	5	mg/kg	13	11	17.4	No Limit
		EG005T: Aluminium	7429-90-5	50	mg/kg	920	860	7.43	0% - 50%
		EG005T: Iron	7439-89-6	50	mg/kg	9580	8670	9.97	0% - 20%
EM1515593-002	GW18(0.4-0.5)	EG005T: Cadmium	7440-43-9	1	mg/kg	<1	<1	0.00	No Limit
		EG005T: Chromium	7440-47-3	2	mg/kg	31	35	10.2	0% - 50%
		EG005T: Nickel	7440-02-0	2	mg/kg	65	67	2.32	0% - 20%
		EG005T: Arsenic	7440-38-2	5	mg/kg	6	10	52.1	No Limit
		EG005T: Copper	7440-50-8	5	mg/kg	26	27	0.00	No Limit
		EG005T: Lead	7439-92-1	5	mg/kg	28	22	23.1	No Limit
		EG005T: Selenium	7782-49-2	5	mg/kg	<5	<5	0.00	No Limit
		EG005T: Zinc	7440-66-6	5	mg/kg	83	80	3.17	0% - 50%
		EG005T: Aluminium	7429-90-5	50	mg/kg	7580	7490	1.13	0% - 20%
		EG005T: Iron	7439-89-6	50	mg/kg	26500	28700	7.84	0% - 20%
EG035T: Total Recoverable Mercury by FIMS (QC Lot: 247526)									
EM1515593-002	GW18(0.4-0.5)	EG035T: Mercury	7439-97-6	0.1	mg/kg	<0.1	<0.1	0.00	No Limit
EP003: Total Organic Carbon (TOC) in Soil (QC Lot: 254629)									
EM1515593-006	GW18(2.3-2.4)	EP003: Total Organic Carbon	----	0.02	%	1.93	2.26	15.8	0% - 20%

Sub-Matrix: **SOIL**

				Laboratory Duplicate (DUP) Report					
Laboratory sample ID	*Client sample ID*	*Method: Compound*	*CAS Number*	*LOR*	*Unit*	*Original Result*	*Duplicate Result*	*RPD (%)*	*Recovery Limits (%)*
EP074A: Monocyclic Aromatic Hydrocarbons (QC Lot: 247137)									
EM1515593-002	GW18(0.4-0.5)	EP074: 1.2.4-Trimethylbenzene	95-63-6	0.5	mg/kg	<0.5	<0.5	0.00	No Limit
		EP074: 1.3.5-Trimethylbenzene	108-67-8	0.5	mg/kg	<0.5	<0.5	0.00	No Limit
		EP074: Isopropylbenzene	98-82-8	0.5	mg/kg	<0.5	<0.5	0.00	No Limit
		EP074: n-Butylbenzene	104-51-8	0.5	mg/kg	<0.5	<0.5	0.00	No Limit
		EP074: n-Propylbenzene	103-65-1	0.5	mg/kg	<0.5	<0.5	0.00	No Limit
		EP074: p-Isopropyltoluene	99-87-6	0.5	mg/kg	<0.5	<0.5	0.00	No Limit
		EP074: sec-Butylbenzene	135-98-8	0.5	mg/kg	<0.5	<0.5	0.00	No Limit
		EP074: Styrene	100-42-5	0.5	mg/kg	<0.5	<0.5	0.00	No Limit
		EP074: tert-Butylbenzene	98-06-6	0.5	mg/kg	<0.5	<0.5	0.00	No Limit
EP074B: Oxygenated Compounds (QC Lot: 247137)									
EM1515593-002	GW18(0.4-0.5)	EP074: 2-Butanone (MEK)	78-93-3	5	mg/kg	<5	<5	0.00	No Limit
		EP074: 2-Hexanone (MBK)	591-78-6	5	mg/kg	<5	<5	0.00	No Limit
		EP074: 4-Methyl-2-pentanone (MIBK)	108-10-1	5	mg/kg	<5	<5	0.00	No Limit
		EP074: Vinyl Acetate	108-05-4	5	mg/kg	<5	<5	0.00	No Limit
EP074C: Sulfonated Compounds (QC Lot: 247137)									
EM1515593-002	GW18(0.4-0.5)	EP074: Carbon disulfide	75-15-0	0.5	mg/kg	<0.5	<0.5	0.00	No Limit
EP074D: Fumigants (QC Lot: 247137)									
EM1515593-002	GW18(0.4-0.5)	EP074: 1.2-Dibromoethane (EDB)	106-93-4	0.5	mg/kg	<0.5	<0.5	0.00	No Limit
		EP074: 1.2-Dichloropropane	78-87-5	0.5	mg/kg	<0.5	<0.5	0.00	No Limit
		EP074: 2.2-Dichloropropane	594-20-7	0.5	mg/kg	<0.5	<0.5	0.00	No Limit
		EP074: cis-1.3-Dichloropropylene	10061-01-5	0.5	mg/kg	<0.5	<0.5	0.00	No Limit
		EP074: trans-1.3-Dichloropropylene	10061-02-6	0.5	mg/kg	<0.5	<0.5	0.00	No Limit
EP074E: Halogenated Aliphatic Compounds (QC Lot: 247137)									
EM1515593-002	GW18(0.4-0.5)	EP074: 1.1.1.2-Tetrachloroethane	630-20-6	0.5	mg/kg	<0.5	<0.5	0.00	No Limit
		EP074: 1.1.1-Trichloroethane	71-55-6	0.5	mg/kg	<0.5	<0.5	0.00	No Limit
		EP074: 1.1.2.2-Tetrachloroethane	79-34-5	0.5	mg/kg	<0.5	<0.5	0.00	No Limit
		EP074: 1.1.2-Trichloroethane	79-00-5	0.5	mg/kg	<0.5	<0.5	0.00	No Limit
		EP074: 1.1-Dichloroethane	75-34-3	0.5	mg/kg	<0.5	<0.5	0.00	No Limit
		EP074: 1.1-Dichloroethene	75-35-4	0.5	mg/kg	<0.5	<0.5	0.00	No Limit
		EP074: 1.1-Dichloropropylene	563-58-6	0.5	mg/kg	<0.5	<0.5	0.00	No Limit
		EP074: 1.2.3-Trichloropropane	96-18-4	0.5	mg/kg	<0.5	<0.5	0.00	No Limit
		EP074: 1.2-Dibromo-3-chloropropane	96-12-8	0.5	mg/kg	<0.5	<0.5	0.00	No Limit
		EP074: 1.2-Dichloroethane	107-06-2	0.5	mg/kg	<0.5	<0.5	0.00	No Limit
		EP074: 1.3-Dichloropropane	142-28-9	0.5	mg/kg	<0.5	<0.5	0.00	No Limit
		EP074: Carbon Tetrachloride	56-23-5	0.5	mg/kg	<0.5	<0.5	0.00	No Limit
		EP074: cis-1.2-Dichloroethene	156-59-2	0.5	mg/kg	<0.5	<0.5	0.00	No Limit
		EP074: cis-1.4-Dichloro-2-butene	1476-11-5	0.5	mg/kg	<0.5	<0.5	0.00	No Limit
		EP074: Dibromomethane	74-95-3	0.5	mg/kg	<0.5	<0.5	0.00	No Limit
		EP074: Hexachlorobutadiene	87-68-3	0.5	mg/kg	<0.5	<0.5	0.00	No Limit

Sub-Matrix: **SOIL**

				Laboratory Duplicate (DUP) Report					
Laboratory sample ID	*Client sample ID*	*Method: Compound*	*CAS Number*	*LOR*	*Unit*	*Original Result*	*Duplicate Result*	*RPD (%)*	*Recovery Limits (%)*
EP074E: Halogenated Aliphatic Compounds (QC Lot: 247137) - continued									
EM1515593-002	GW18(0.4-0.5)	EP074: Iodomethane	74-88-4	0.5	mg/kg	<0.5	<0.5	0.00	No Limit
		EP074: Pentachloroethane	76-01-7	0.5	mg/kg	<0.5	<0.5	0.00	No Limit
		EP074: Tetrachloroethene	127-18-4	0.5	mg/kg	<0.5	<0.5	0.00	No Limit
		EP074: trans-1.2-Dichloroethene	156-60-5	0.5	mg/kg	<0.5	<0.5	0.00	No Limit
		EP074: trans-1.4-Dichloro-2-butene	110-57-6	0.5	mg/kg	<0.5	<0.5	0.00	No Limit
		EP074: Trichloroethene	79-01-6	0.5	mg/kg	<0.5	<0.5	0.00	No Limit
		EP074: Bromomethane	74-83-9	5	mg/kg	<5	<5	0.00	No Limit
		EP074: Chloroethane	75-00-3	5	mg/kg	<5	<5	0.00	No Limit
		EP074: Chloromethane	74-87-3	5	mg/kg	<5	<5	0.00	No Limit
		EP074: Dichlorodifluoromethane	75-71-8	5	mg/kg	<5	<5	0.00	No Limit
		EP074: Trichlorofluoromethane	75-69-4	5	mg/kg	<5	<5	0.00	No Limit
		EP074: Vinyl chloride	75-01-4	5	mg/kg	<5	<5	0.00	No Limit
EP074F: Halogenated Aromatic Compounds (QC Lot: 247137)									
EM1515593-002	GW18(0.4-0.5)	EP074: 1.2.3-Trichlorobenzene	87-61-6	0.5	mg/kg	<0.5	<0.5	0.00	No Limit
		EP074: 1.2.4-Trichlorobenzene	120-82-1	0.5	mg/kg	<0.5	<0.5	0.00	No Limit
		EP074: 1.2-Dichlorobenzene	95-50-1	0.5	mg/kg	<0.5	<0.5	0.00	No Limit
		EP074: 1.3-Dichlorobenzene	541-73-1	0.5	mg/kg	<0.5	<0.5	0.00	No Limit
		EP074: 1.4-Dichlorobenzene	106-46-7	0.5	mg/kg	<0.5	<0.5	0.00	No Limit
		EP074: 2-Chlorotoluene	95-49-8	0.5	mg/kg	<0.5	<0.5	0.00	No Limit
		EP074: 4-Chlorotoluene	106-43-4	0.5	mg/kg	<0.5	<0.5	0.00	No Limit
		EP074: Bromobenzene	108-86-1	0.5	mg/kg	<0.5	<0.5	0.00	No Limit
		EP074: Chlorobenzene	108-90-7	0.5	mg/kg	<0.5	<0.5	0.00	No Limit
EP074G: Trihalomethanes (QC Lot: 247137)									
EM1515593-002	GW18(0.4-0.5)	EP074: Bromodichloromethane	75-27-4	0.5	mg/kg	<0.5	<0.5	0.00	No Limit
		EP074: Bromoform	75-25-2	0.5	mg/kg	<0.5	<0.5	0.00	No Limit
		EP074: Chloroform	67-66-3	0.5	mg/kg	<0.5	<0.5	0.00	No Limit
		EP074: Dibromochloromethane	124-48-1	0.5	mg/kg	<0.5	<0.5	0.00	No Limit
EP075(SIM)B: Polynuclear Aromatic Hydrocarbons (QC Lot: 247431)									
EM1515593-002	GW18(0.4-0.5)	EP075(SIM): Acenaphthene	83-32-9	0.5	mg/kg	<0.5	<0.5	0.00	No Limit
		EP075(SIM): Acenaphthylene	208-96-8	0.5	mg/kg	0.6	0.6	0.00	No Limit
		EP075(SIM): Anthracene	120-12-7	0.5	mg/kg	1.1	1.2	0.00	No Limit
		EP075(SIM): Benz(a)anthracene	56-55-3	0.5	mg/kg	3.2	3.3	0.00	No Limit
		EP075(SIM): Benzo(a)pyrene	50-32-8	0.5	mg/kg	5.0	5.0	0.00	No Limit
		EP075(SIM): Benzo(b+j)fluoranthene	205-99-2 205-82-3	0.5	mg/kg	5.5	5.5	0.00	0% - 50%
		EP075(SIM): Benzo(g.h.i)perylene	191-24-2	0.5	mg/kg	4.0	3.7	7.32	No Limit
		EP075(SIM): Benzo(k)fluoranthene	207-08-9	0.5	mg/kg	2.0	2.3	14.0	No Limit
		EP075(SIM): Chrysene	218-01-9	0.5	mg/kg	3.0	3.1	4.00	No Limit
		EP075(SIM): Dibenz(a.h)anthracene	53-70-3	0.5	mg/kg	1.3	1.2	0.00	No Limit
		EP075(SIM): Fluoranthene	206-44-0	0.5	mg/kg	6.0	5.8	3.77	0% - 50%

Sub-Matrix: **SOIL**

				Laboratory Duplicate (DUP) Report					
Laboratory sample ID	Client sample ID	Method: Compound	CAS Number	LOR	Unit	Original Result	Duplicate Result	RPD (%)	Recovery Limits (%)
EP075(SIM)B: Polynuclear Aromatic Hydrocarbons (QC Lot: 247431) - continued									
EM1515593-002	GW18(0.4-0.5)	EP075(SIM): Fluorene	86-73-7	0.5	mg/kg	<0.5	<0.5	0.00	No Limit
		EP075(SIM): Indeno(1.2.3.cd)pyrene	193-39-5	0.5	mg/kg	3.1	3.0	0.00	No Limit
		EP075(SIM): Naphthalene	91-20-3	0.5	mg/kg	<0.5	<0.5	0.00	No Limit
		EP075(SIM): Phenanthrene	85-01-8	0.5	mg/kg	2.5	2.3	6.70	No Limit
		EP075(SIM): Pyrene	129-00-0	0.5	mg/kg	6.4	6.4	0.00	0% - 50%
EP080/071: Total Petroleum Hydrocarbons (QC Lot: 247138)									
EM1515593-002	GW18(0.4-0.5)	EP080: C6 - C9 Fraction	----	10	mg/kg	<10	<10	0.00	No Limit
EP080/071: Total Petroleum Hydrocarbons (QC Lot: 247433)									
EM1515882-004	Anonymous	EP071: C15 - C28 Fraction	----	100	mg/kg	<100	<100	0.00	No Limit
		EP071: C29 - C36 Fraction	----	100	mg/kg	<100	<100	0.00	No Limit
		EP071: C10 - C14 Fraction	----	50	mg/kg	<50	<50	0.00	No Limit
		EP071: C10 - C36 Fraction (sum)	----	50	mg/kg	<50	<50	0.00	No Limit
EM1515593-002	GW18(0.4-0.5)	EP071: C15 - C28 Fraction	----	100	mg/kg	140	160	12.3	No Limit
		EP071: C29 - C36 Fraction	----	100	mg/kg	200	210	9.28	No Limit
		EP071: C10 - C14 Fraction	----	50	mg/kg	<50	<50	0.00	No Limit
		EP071: C10 - C36 Fraction (sum)	----	50	mg/kg	340	370	8.45	No Limit
EP080/071: Total Recoverable Hydrocarbons - NEPM 2013 Fractions (QC Lot: 247138)									
EM1515593-002	GW18(0.4-0.5)	EP080: C6 - C10 Fraction	C6_C10	10	mg/kg	<10	<10	0.00	No Limit
EP080/071: Total Recoverable Hydrocarbons - NEPM 2013 Fractions (QC Lot: 247433)									
EM1515882-004	Anonymous	EP071: >C16 - C34 Fraction	----	100	mg/kg	<100	<100	0.00	No Limit
		EP071: >C34 - C40 Fraction	----	100	mg/kg	<100	<100	0.00	No Limit
		EP071: >C10 - C16 Fraction	>C10_C16	50	mg/kg	<50	<50	0.00	No Limit
		EP071: >C10 - C40 Fraction (sum)	----	50	mg/kg	<50	<50	0.00	No Limit
EM1515593-002	GW18(0.4-0.5)	EP071: >C16 - C34 Fraction	----	100	mg/kg	300	330	11.2	No Limit
		EP071: >C34 - C40 Fraction	----	100	mg/kg	140	140	0.00	No Limit
		EP071: >C10 - C16 Fraction	>C10_C16	50	mg/kg	<50	<50	0.00	No Limit
		EP071: >C10 - C40 Fraction (sum)	----	50	mg/kg	440	470	6.59	No Limit
EP080: BTEXN (QC Lot: 247138)									
EM1515593-002	GW18(0.4-0.5)	EP080: Benzene	71-43-2	0.2	mg/kg	<0.2	<0.2	0.00	No Limit
		EP080: Ethylbenzene	100-41-4	0.5	mg/kg	<0.5	<0.5	0.00	No Limit
		EP080: meta- & para-Xylene	108-38-3 106-42-3	0.5	mg/kg	<0.5	<0.5	0.00	No Limit
		EP080: ortho-Xylene	95-47-6	0.5	mg/kg	<0.5	<0.5	0.00	No Limit
		EP080: Toluene	108-88-3	0.5	mg/kg	<0.5	<0.5	0.00	No Limit
		EP080: Naphthalene	91-20-3	1	mg/kg	<1	<1	0.00	No Limit

Sub-Matrix: **WATER**

				Laboratory Duplicate (DUP) Report					
Laboratory sample ID	Client sample ID	Method: Compound	CAS Number	LOR	Unit	Original Result	Duplicate Result	RPD (%)	Recovery Limits (%)
EG020T: Total Metals by ICP-MS (QC Lot: 250106)									
EM1515593-067	QC08	EG020A-T: Cadmium	7440-43-9	0.0001	mg/L	<0.0001	<0.0001	0.00	No Limit

Sub-Matrix: **WATER**

				Laboratory Duplicate (DUP) Report					
Laboratory sample ID	*Client sample ID*	*Method: Compound*	*CAS Number*	*LOR*	*Unit*	*Original Result*	*Duplicate Result*	*RPD (%)*	*Recovery Limits (%)*
EG020T: Total Metals by ICP-MS (QC Lot: 250106) - continued									
EM1515593-067	QC08	EG020A-T: Arsenic	7440-38-2	0.001	mg/L	<0.001	<0.001	0.00	No Limit
		EG020A-T: Chromium	7440-47-3	0.001	mg/L	<0.001	<0.001	0.00	No Limit
		EG020A-T: Copper	7440-50-8	0.001	mg/L	<0.001	<0.001	0.00	No Limit
		EG020A-T: Lead	7439-92-1	0.001	mg/L	<0.001	<0.001	0.00	No Limit
		EG020A-T: Nickel	7440-02-0	0.001	mg/L	<0.001	<0.001	0.00	No Limit
		EG020A-T: Zinc	7440-66-6	0.005	mg/L	<0.005	<0.005	0.00	No Limit
		EG020A-T: Aluminium	7429-90-5	0.01	mg/L	<0.01	<0.01	0.00	No Limit
		EG020A-T: Selenium	7782-49-2	0.01	mg/L	<0.01	<0.01	0.00	No Limit
		EG020A-T: Iron	7439-89-6	0.05	mg/L	<0.05	<0.05	0.00	No Limit
EM1515838-001	Anonymous	EG020A-T: Cadmium	7440-43-9	0.0001	mg/L	0.690	0.711	3.10	0% - 20%
		EG020A-T: Arsenic	7440-38-2	0.001	mg/L	3.95	4.17	5.22	0% - 20%
		EG020A-T: Chromium	7440-47-3	0.001	mg/L	2.06	2.09	1.33	0% - 50%
		EG020A-T: Copper	7440-50-8	0.001	mg/L	10.7	10.8	1.18	0% - 20%
		EG020A-T: Lead	7439-92-1	0.001	mg/L	0.227	0.220	3.32	No Limit
		EG020A-T: Nickel	7440-02-0	0.001	mg/L	5.26	5.66	7.28	0% - 20%
		EG020A-T: Zinc	7440-66-6	0.005	mg/L	22.9	23.7	3.51	0% - 20%
		EG020A-T: Aluminium	7429-90-5	0.01	mg/L	865	882	2.00	0% - 20%
		EG020A-T: Selenium	7782-49-2	0.01	mg/L	1.15	1.10	5.08	No Limit
		EG020A-T: Iron	7439-89-6	0.05	mg/L	1780	1810	1.99	0% - 20%
EG035T: Total Recoverable Mercury by FIMS (QC Lot: 247403)									
EM1515593-067	QC08	EG035T: Mercury	7439-97-6	0.0001	mg/L	<0.0001	<0.0001	0.00	No Limit
EM1515801-001	Anonymous	EG035T: Mercury	7439-97-6	0.0001	mg/L	<0.0001	<0.0001	0.00	No Limit
EP080/071: Total Petroleum Hydrocarbons (QC Lot: 247613)									
EM1515593-067	QC08	EP080: C6 - C9 Fraction	----	20	µg/L	<20	<20	0.00	No Limit
EM1515848-026	Anonymous	EP080: C6 - C9 Fraction	----	20	µg/L	4940	5010	1.48	0% - 20%
EP080/071: Total Recoverable Hydrocarbons - NEPM 2013 Fractions (QC Lot: 247613)									
EM1515593-067	QC08	EP080: C6 - C10 Fraction	C6_C10	20	µg/L	<20	<20	0.00	No Limit
EM1515848-026	Anonymous	EP080: C6 - C10 Fraction	C6_C10	20	µg/L	4880	4950	1.43	0% - 20%
EP080: BTEXN (QC Lot: 247613)									
EM1515593-067	QC08	EP080: Benzene	71-43-2	1	µg/L	<1	<1	0.00	No Limit
		EP080: Ethylbenzene	100-41-4	2	µg/L	<2	<2	0.00	No Limit
		EP080: meta- & para-Xylene	108-38-3 106-42-3	2	µg/L	<2	<2	0.00	No Limit
		EP080: ortho-Xylene	95-47-6	2	µg/L	<2	<2	0.00	No Limit
		EP080: Toluene	108-88-3	2	µg/L	<2	<2	0.00	No Limit
		EP080: Naphthalene	91-20-3	5	µg/L	<5	<5	0.00	No Limit
EM1515848-026	Anonymous	EP080: Benzene	71-43-2	1	µg/L	1140	1160	1.14	0% - 20%
		EP080: Ethylbenzene	100-41-4	2	µg/L	232	236	1.53	0% - 20%
		EP080: meta- & para-Xylene	108-38-3 106-42-3	2	µg/L	741	754	1.74	0% - 20%

Sub-Matrix: **WATER**

				Laboratory Duplicate (DUP) Report					
Laboratory sample ID	*Client sample ID*	*Method: Compound*	*CAS Number*	*LOR*	*Unit*	*Original Result*	*Duplicate Result*	*RPD (%)*	*Recovery Limits (%)*
EP080: BTEXN (QC Lot: 247613) - continued									
EM1515848-026	Anonymous	EP080: ortho-Xylene	95-47-6	2	µg/L	328	333	1.45	0% - 20%
		EP080: Toluene	108-88-3	2	µg/L	1740	1780	2.29	0% - 20%
		EP080: Naphthalene	91-20-3	5	µg/L	21	20	0.00	No Limit

Method Blank (MB) and Laboratory Control Spike (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 (%)	Recovery Limits (%)	
Method: Compound	CAS Number	LOR	Unit	Result	Concentration	LCS	Low	High
ED040N: Sulfate - Calcium Phosphate Soluble (NEPM) (QCLot: 251011)								
ED040N: Sulfate as SO4 2-	14808-79-8	50	mg/kg	<50	3000 mg/kg	96.7	86	110
EG005T: Total Metals by ICP-AES (QCLot: 247527)								
EG005T: Aluminium	7429-90-5	50	mg/kg	<50	6134 mg/kg	110	93	115
EG005T: Arsenic	7440-38-2	5	mg/kg	<5	21.7 mg/kg	95.8	79	113
EG005T: Cadmium	7440-43-9	1	mg/kg	<1	4.64 mg/kg	91.0	87	115
EG005T: Chromium	7440-47-3	2	mg/kg	<2	43.9 mg/kg	103	89	113
EG005T: Copper	7440-50-8	5	mg/kg	<5	32 mg/kg	97.2	90	116
EG005T: Iron	7439-89-6	50	mg/kg	<50	8400 mg/kg	108	96	112
EG005T: Lead	7439-92-1	5	mg/kg	<5	40 mg/kg	90.4	85	107
EG005T: Nickel	7440-02-0	2	mg/kg	<2	55 mg/kg	95.0	89	111
EG005T: Selenium	7782-49-2	5	mg/kg	<5	5.37 mg/kg	101	93	109
EG005T: Zinc	7440-66-6	5	mg/kg	<5	60.8 mg/kg	95.9	89	111
EG035T: Total Recoverable Mercury by FIMS (QCLot: 247526)								
EG035T: Mercury	7439-97-6	0.1	mg/kg	<0.1	2.57 mg/kg	91.4	85	103
EP003: Total Organic Carbon (TOC) in Soil (QCLot: 254629)								
EP003: Total Organic Carbon	----	0.02	%	<0.02	100 %	97.9	70	130
EP074A: Monocyclic Aromatic Hydrocarbons (QCLot: 247137)								
EP074: 1.2.4-Trimethylbenzene	95-63-6	0.5	mg/kg	<0.5	1 mg/kg	80.3	66	108
EP074: 1.3.5-Trimethylbenzene	108-67-8	0.5	mg/kg	<0.5	1 mg/kg	79.0	67	109
EP074: Isopropylbenzene	98-82-8	0.5	mg/kg	<0.5	1 mg/kg	81.6	69	119
EP074: n-Butylbenzene	104-51-8	0.5	mg/kg	<0.5	1 mg/kg	80.5	58	110
EP074: n-Propylbenzene	103-65-1	0.5	mg/kg	<0.5	1 mg/kg	80.0	64	110
EP074: p-Isopropyltoluene	99-87-6	0.5	mg/kg	<0.5	1 mg/kg	83.7	65	111
EP074: sec-Butylbenzene	135-98-8	0.5	mg/kg	<0.5	1 mg/kg	79.3	66	110
EP074: Styrene	100-42-5	0.5	mg/kg	<0.5	1 mg/kg	93.3	72	118
EP074: tert-Butylbenzene	98-06-6	0.5	mg/kg	<0.5	1 mg/kg	80.9	67	111
EP074B: Oxygenated Compounds (QCLot: 247137)								
EP074: 2-Butanone (MEK)	78-93-3	5	mg/kg	<5	10 mg/kg	123	68	142
EP074: 2-Hexanone (MBK)	591-78-6	5	mg/kg	<5	10 mg/kg	118	62	128
EP074: 4-Methyl-2-pentanone (MIBK)	108-10-1	5	mg/kg	<5	10 mg/kg	114	67	123
EP074: Vinyl Acetate	108-05-4	5	mg/kg	<5	10 mg/kg	106	54	128
EP074C: Sulfonated Compounds (QCLot: 247137)								
EP074: Carbon disulfide	75-15-0	0.5	mg/kg	<0.5	1 mg/kg	87.5	50	128

Sub-Matrix: **SOIL**

Method: Compound	CAS Number	LOR	Unit	Method Blank (MB) Report	Laboratory Control Spike (LCS) Report			
					Spike	Spike Recovery (%)	Recovery Limits (%)	
				Result	Concentration	LCS	Low	High
EP074D: Fumigants (QCLot: 247137)								
EP074: 1.2-Dibromoethane (EDB)	106-93-4	0.5	mg/kg	<0.5	1 mg/kg	102	73	117
EP074: 1.2-Dichloropropane	78-87-5	0.5	mg/kg	<0.5	1 mg/kg	88.5	72	116
EP074: 2.2-Dichloropropane	594-20-7	0.5	mg/kg	<0.5	1 mg/kg	84.4	65	115
EP074: cis-1.3-Dichloropropylene	10061-01-5	0.5	mg/kg	<0.5	1 mg/kg	86.0	64	104
EP074: trans-1.3-Dichloropropylene	10061-02-6	0.5	mg/kg	<0.5	1 mg/kg	89.3	61	103
EP074E: Halogenated Aliphatic Compounds (QCLot: 247137)								
EP074: 1.1.1.2-Tetrachloroethane	630-20-6	0.5	mg/kg	<0.5	1 mg/kg	86.8	65	109
EP074: 1.1.1-Trichloroethane	71-55-6	0.5	mg/kg	<0.5	1 mg/kg	85.1	68	110
EP074: 1.1.2.2-Tetrachloroethane	79-34-5	0.5	mg/kg	<0.5	1 mg/kg	115	76	124
EP074: 1.1.2-Trichloroethane	79-00-5	0.5	mg/kg	<0.5	1 mg/kg	106	76	120
EP074: 1.1-Dichloroethane	75-34-3	0.5	mg/kg	<0.5	1 mg/kg	88.8	72	118
EP074: 1.1-Dichloroethene	75-35-4	0.5	mg/kg	<0.5	1 mg/kg	88.8	65	127
EP074: 1.1-Dichloropropylene	563-58-6	0.5	mg/kg	<0.5	1 mg/kg	87.9	70	116
EP074: 1.2.3-Trichloropropane	96-18-4	0.5	mg/kg	<0.5	1 mg/kg	116	75	123
EP074: 1.2-Dibromo-3-chloropropane	96-12-8	0.5	mg/kg	<0.5	1 mg/kg	99.0	54	106
EP074: 1.2-Dichloroethane	107-06-2	0.5	mg/kg	<0.5	1 mg/kg	100	75	119
EP074: 1.3-Dichloropropane	142-28-9	0.5	mg/kg	<0.5	1 mg/kg	105	78	120
EP074: Bromomethane	74-83-9	5	mg/kg	<5	10 mg/kg	74.6	43	133
EP074: Carbon Tetrachloride	56-23-5	0.5	mg/kg	<0.5	1 mg/kg	80.1	61	107
EP074: Chloroethane	75-00-3	5	mg/kg	<5	10 mg/kg	83.1	58	134
EP074: Chloromethane	74-87-3	5	mg/kg	<5	10 mg/kg	94.4	55	133
EP074: cis-1.2-Dichloroethene	156-59-2	0.5	mg/kg	<0.5	1 mg/kg	93.5	76	120
EP074: cis-1.4-Dichloro-2-butene	1476-11-5	0.5	mg/kg	<0.5	1 mg/kg	86.0	40	114
EP074: Dibromomethane	74-95-3	0.5	mg/kg	<0.5	1 mg/kg	95.4	74	114
EP074: Dichlorodifluoromethane	75-71-8	5	mg/kg	<5	10 mg/kg	70.9	45	123
EP074: Hexachlorobutadiene	87-68-3	0.5	mg/kg	<0.5	1 mg/kg	70.6	60	118
EP074: Iodomethane	74-88-4	0.5	mg/kg	<0.5	1 mg/kg	64.9	47	116
EP074: Pentachloroethane	76-01-7	0.5	mg/kg	<0.5	1 mg/kg	73.1	45	123
EP074: Tetrachloroethene	127-18-4	0.5	mg/kg	<0.5	1 mg/kg	89.3	69	121
EP074: trans-1.2-Dichloroethene	156-60-5	0.5	mg/kg	<0.5	1 mg/kg	89.4	70	118
EP074: trans-1.4-Dichloro-2-butene	110-57-6	0.5	mg/kg	<0.5	1 mg/kg	98.1	56	114
EP074: Trichloroethene	79-01-6	0.5	mg/kg	<0.5	1 mg/kg	88.2	72	116
EP074: Trichlorofluoromethane	75-69-4	5	mg/kg	<5	10 mg/kg	89.8	63	127
EP074: Vinyl chloride	75-01-4	5	mg/kg	<5	10 mg/kg	89.7	58	138
EP074F: Halogenated Aromatic Compounds (QCLot: 247137)								
EP074: 1.2.3-Trichlorobenzene	87-61-6	0.5	mg/kg	<0.5	1 mg/kg	84.8	69	117
EP074: 1.2.4-Trichlorobenzene	120-82-1	0.5	mg/kg	<0.5	1 mg/kg	76.1	60	112
EP074: 1.2-Dichlorobenzene	95-50-1	0.5	mg/kg	<0.5	1 mg/kg	89.9	76	112
EP074: 1.3-Dichlorobenzene	541-73-1	0.5	mg/kg	<0.5	1 mg/kg	83.8	70	110

Sub-Matrix: **SOIL**

Method: Compound	CAS Number	LOR	Unit	Method Blank (MB) Report	Laboratory Control Spike (LCS) Report			
					Spike	Spike Recovery (%)	Recovery Limits (%)	
				Result	Concentration	LCS	Low	High
EP074F: Halogenated Aromatic Compounds (QCLot: 247137) - continued								
EP074: 1.4-Dichlorobenzene	106-46-7	0.5	mg/kg	<0.5	1 mg/kg	89.0	73	115
EP074: 2-Chlorotoluene	95-49-8	0.5	mg/kg	<0.5	1 mg/kg	82.5	69	113
EP074: 4-Chlorotoluene	106-43-4	0.5	mg/kg	<0.5	1 mg/kg	81.5	67	111
EP074: Bromobenzene	108-86-1	0.5	mg/kg	<0.5	1 mg/kg	87.2	63	117
EP074: Chlorobenzene	108-90-7	0.5	mg/kg	<0.5	1 mg/kg	93.5	79	115
EP074G: Trihalomethanes (QCLot: 247137)								
EP074: Bromodichloromethane	75-27-4	0.5	mg/kg	<0.5	1 mg/kg	90.1	65	107
EP074: Bromoform	75-25-2	0.5	mg/kg	<0.5	1 mg/kg	92.7	54	104
EP074: Chloroform	67-66-3	0.5	mg/kg	<0.5	1 mg/kg	92.8	75	117
EP074: Dibromochloromethane	124-48-1	0.5	mg/kg	<0.5	1 mg/kg	92.5	61	105
EP075(SIM)B: Polynuclear Aromatic Hydrocarbons (QCLot: 247431)								
EP075(SIM): Acenaphthene	83-32-9	0.5	mg/kg	<0.5	3 mg/kg	99.4	68	114
EP075(SIM): Acenaphthylene	208-96-8	0.5	mg/kg	<0.5	3 mg/kg	95.4	61	125
EP075(SIM): Anthracene	120-12-7	0.5	mg/kg	<0.5	3 mg/kg	104	68	116
EP075(SIM): Benz(a)anthracene	56-55-3	0.5	mg/kg	<0.5	3 mg/kg	91.6	62	116
EP075(SIM): Benzo(a)pyrene	50-32-8	0.5	mg/kg	<0.5	3 mg/kg	94.9	64	114
EP075(SIM): Benzo(b+j)fluoranthene	205-99-2 205-82-3	0.5	mg/kg	<0.5	3 mg/kg	78.6	64	114
EP075(SIM): Benzo(g.h.i)perylene	191-24-2	0.5	mg/kg	<0.5	3 mg/kg	93.1	59	117
EP075(SIM): Benzo(k)fluoranthene	207-08-9	0.5	mg/kg	<0.5	3 mg/kg	107	67	115
EP075(SIM): Chrysene	218-01-9	0.5	mg/kg	<0.5	3 mg/kg	105	63	119
EP075(SIM): Dibenz(a.h)anthracene	53-70-3	0.5	mg/kg	<0.5	3 mg/kg	99.1	62	114
EP075(SIM): Fluoranthene	206-44-0	0.5	mg/kg	<0.5	3 mg/kg	107	67	115
EP075(SIM): Fluorene	86-73-7	0.5	mg/kg	<0.5	3 mg/kg	85.3	62	120
EP075(SIM): Indeno(1.2.3.cd)pyrene	193-39-5	0.5	mg/kg	<0.5	3 mg/kg	102	62	116
EP075(SIM): Naphthalene	91-20-3	0.5	mg/kg	<0.5	3 mg/kg	99.9	65	119
EP075(SIM): Phenanthrene	85-01-8	0.5	mg/kg	<0.5	3 mg/kg	98.1	69	113
EP075(SIM): Pyrene	129-00-0	0.5	mg/kg	<0.5	3 mg/kg	106	66	116
EP080/071: Total Petroleum Hydrocarbons (QCLot: 247138)								
EP080: C6 - C9 Fraction	----	10	mg/kg	<10	36 mg/kg	91.9	66	130
EP080/071: Total Petroleum Hydrocarbons (QCLot: 247433)								
EP071: C10 - C14 Fraction	----	50	mg/kg	<50	658 mg/kg	118	65	131
EP071: C10 - C36 Fraction (sum)	----	50	mg/kg	<50	----	----	----	----
EP071: C15 - C28 Fraction	----	100	mg/kg	<100	3160 mg/kg	107	70	126
EP071: C29 - C36 Fraction	----	100	mg/kg	<100	1448 mg/kg	102	70	122
EP080/071: Total Recoverable Hydrocarbons - NEPM 2013 Fractions (QCLot: 247138)								
EP080: C6 - C10 Fraction	C6_C10	10	mg/kg	<10	45 mg/kg	91.0	64	128
EP080/071: Total Recoverable Hydrocarbons - NEPM 2013 Fractions (QCLot: 247433)								

Sub-Matrix: **SOIL**

Method: Compound	CAS Number	LOR	Unit	Method Blank (MB) Report: Result	Laboratory Control Spike (LCS) Report: Spike Concentration	Spike Recovery (%): LCS	Recovery Limits (%): Low	Recovery Limits (%): High
EP080/071: Total Recoverable Hydrocarbons - NEPM 2013 Fractions (QCLot: 247433) - continued								
EP071: >C10 - C16 Fraction	>C10_C16	50	mg/kg	<50	1051 mg/kg	126	68	130
EP071: >C10 - C40 Fraction (sum)	----	50	mg/kg	<50	----	----	----	----
EP071: >C16 - C34 Fraction	----	100	mg/kg	<100	4124 mg/kg	99.9	72	116
EP071: >C34 - C40 Fraction	----	100	mg/kg	<100	161 mg/kg	112	38	132
EP080: BTEXN (QCLot: 247138)								
EP080: Benzene	71-43-2	0.2	mg/kg	<0.2	2 mg/kg	92.6	74	124
EP080: Ethylbenzene	100-41-4	0.5	mg/kg	<0.5	2 mg/kg	93.3	72	124
EP080: meta- & para-Xylene	108-38-3 106-42-3	0.5	mg/kg	<0.5	4 mg/kg	98.2	72	132
EP080: Naphthalene	91-20-3	1	mg/kg	<1	0.5 mg/kg	94.4	66	132
EP080: ortho-Xylene	95-47-6	0.5	mg/kg	<0.5	2 mg/kg	99.4	76	130
EP080: Toluene	108-88-3	0.5	mg/kg	<0.5	2 mg/kg	94.0	75	129

Sub-Matrix: **WATER**

Method: Compound	CAS Number	LOR	Unit	Method Blank (MB) Report: Result	Laboratory Control Spike (LCS) Report: Spike Concentration	Spike Recovery (%): LCS	Recovery Limits (%): Low	Recovery Limits (%): High
EG020T: Total Metals by ICP-MS (QCLot: 250106)								
EG020A-T: Aluminium	7429-90-5	0.01	mg/L	<0.01	0.5 mg/L	104	100	108
EG020A-T: Arsenic	7440-38-2	0.001	mg/L	<0.001	0.1 mg/L	105	94	116
EG020A-T: Cadmium	7440-43-9	0.0001	mg/L	<0.0001	0.1 mg/L	95.1	90	110
EG020A-T: Chromium	7440-47-3	0.001	mg/L	<0.001	0.1 mg/L	99.6	90	110
EG020A-T: Copper	7440-50-8	0.001	mg/L	<0.001	0.1 mg/L	101	91	109
EG020A-T: Iron	7439-89-6	0.05	mg/L	<0.05	0.5 mg/L	106	99	109
EG020A-T: Lead	7439-92-1	0.001	mg/L	<0.001	0.1 mg/L	96.1	91	111
EG020A-T: Nickel	7440-02-0	0.001	mg/L	<0.001	0.1 mg/L	94.5	91	111
EG020A-T: Selenium	7782-49-2	0.01	mg/L	<0.01	0.1 mg/L	96.7	86	110
EG020A-T: Zinc	7440-66-6	0.005	mg/L	<0.005	0.1 mg/L	106	91	109
EG035T: Total Recoverable Mercury by FIMS (QCLot: 247403)								
EG035T: Mercury	7439-97-6	0.0001	mg/L	<0.0001	0.01 mg/L	93.0	87	113
EP080/071: Total Petroleum Hydrocarbons (QCLot: 247217)								
EP071: C10 - C14 Fraction	----	50	µg/L	<50	3980 µg/L	65.2	53	123
EP071: C15 - C28 Fraction	----	100	µg/L	<100	17006 µg/L	82.1	57	133
EP071: C29 - C36 Fraction	----	50	µg/L	<50	8662 µg/L	74.5	55	141
EP080/071: Total Petroleum Hydrocarbons (QCLot: 247613)								
EP080: C6 - C9 Fraction	----	20	µg/L	<20	360 µg/L	101	67	127
EP080/071: Total Recoverable Hydrocarbons - NEPM 2013 Fractions (QCLot: 247217)								
EP071: >C10 - C16 Fraction	>C10_C16	100	µg/L	<100	5753 µg/L	74.9	54	122
EP071: >C16 - C34 Fraction	----	100	µg/L	<100	24516 µg/L	74.6	56	132
EP071: >C34 - C40 Fraction	----	100	µg/L	<100	828 µg/L	79.8	51	137

Sub-Matrix: **WATER**

Method: Compound	CAS Number	LOR	Unit	Method Blank (MB) Report: Result	Laboratory Control Spike (LCS) Report: Spike Concentration	Spike Recovery (%): LCS	Recovery Limits (%): Low	Recovery Limits (%): High
EP080/071: Total Recoverable Hydrocarbons - NEPM 2013 Fractions (QCLot: 247613)								
EP080: C6 - C10 Fraction	C6_C10	20	µg/L	<20	450 µg/L	99.2	65	125
EP080: BTEXN (QCLot: 247613)								
EP080: Benzene	71-43-2	1	µg/L	<1	20 µg/L	102	76	120
EP080: Ethylbenzene	100-41-4	2	µg/L	<2	20 µg/L	106	72	124
EP080: meta- & para-Xylene	108-38-3 106-42-3	2	µg/L	<2	40 µg/L	105	72	130
EP080: Naphthalene	91-20-3	5	µg/L	<5	5 µg/L	98.0	71	129
EP080: ortho-Xylene	95-47-6	2	µg/L	<2	20 µg/L	106	75	127
EP080: Toluene	108-88-3	2	µg/L	<2	20 µg/L	104	76	124

Matrix Spike (MS) Report

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

Sub-Matrix: **SOIL**

Laboratory sample ID	Client sample ID	Method: Compound	CAS Number	Matrix Spike (MS) Report: Spike Concentration	SpikeRecovery(%): MS	Recovery Limits (%): Low	Recovery Limits (%): High
ED040N: Sulfate - Calcium Phosphate Soluble (NEPM) (QCLot: 251011)							
EM1515593-059	GW04(0.5-0.6)	ED040N: Sulfate as SO4 2-	14808-79-8	3000 mg/kg	95.9	84	116
EG005T: Total Metals by ICP-AES (QCLot: 247527)							
EM1515593-059	GW04(0.5-0.6)	EG005T: Zinc	7440-66-6	50 mg/kg	# Not Determined	74	128
EM1515593-059	GW04(0.5-0.6)	EG005T: Arsenic	7440-38-2	50 mg/kg	101	78	124
		EG005T: Cadmium	7440-43-9	50 mg/kg	96.1	84	116
		EG005T: Chromium	7440-47-3	50 mg/kg	103	79	121
		EG005T: Copper	7440-50-8	50 mg/kg	96.2	82	124
		EG005T: Lead	7439-92-1	50 mg/kg	# Not Determined	76	124
		EG005T: Nickel	7440-02-0	50 mg/kg	103	78	120
		EG005T: Selenium	7782-49-2	50 mg/kg	88.6	71	125
EG035T: Total Recoverable Mercury by FIMS (QCLot: 247526)							
EM1515593-059	GW04(0.5-0.6)	EG035T: Mercury	7439-97-6	5 mg/kg	91.0	76	116
EP074E: Halogenated Aliphatic Compounds (QCLot: 247137)							
EM1515593-059	GW04(0.5-0.6)	EP074: 1.1-Dichloroethene	75-35-4	2 mg/kg	102	29	141
		EP074: Trichloroethene	79-01-6	2 mg/kg	89.4	50	126
EP074F: Halogenated Aromatic Compounds (QCLot: 247137)							
EM1515593-059	GW04(0.5-0.6)	EP074: Chlorobenzene	108-90-7	2 mg/kg	96.2	65	133

Sub-Matrix: **SOIL**

				Matrix Spike (MS) Report			
				Spike	SpikeRecovery(%)	Recovery Limits (%)	
Laboratory sample ID	Client sample ID	Method: Compound	CAS Number	Concentration	MS	Low	High
EP075(SIM)B: Polynuclear Aromatic Hydrocarbons (QCLot: 247431)							
EM1515593-066	QC06	EP075(SIM): Acenaphthene	83-32-9	3 mg/kg	104	67	117
		EP075(SIM): Pyrene	129-00-0	3 mg/kg	115	52	148
EP080/071: Total Petroleum Hydrocarbons (QCLot: 247138)							
EM1515593-059	GW04(0.5-0.6)	EP080: C6 - C9 Fraction	----	28 mg/kg	73.9	42	131
EP080/071: Total Petroleum Hydrocarbons (QCLot: 247433)							
EM1515593-059	GW04(0.5-0.6)	EP071: C10 - C14 Fraction	----	658 mg/kg	# 63.9	53	123
		EP071: C15 - C28 Fraction	----	3160 mg/kg	# 75.7	70	124
		EP071: C29 - C36 Fraction	----	1448 mg/kg	78.7	64	118
EP080/071: Total Recoverable Hydrocarbons - NEPM 2013 Fractions (QCLot: 247138)							
EM1515593-059	GW04(0.5-0.6)	EP080: C6 - C10 Fraction	C6_C10	33 mg/kg	72.6	39	129
EP080/071: Total Recoverable Hydrocarbons - NEPM 2013 Fractions (QCLot: 247433)							
EM1515593-059	GW04(0.5-0.6)	EP071: >C10 - C16 Fraction	>C10_C16	1051 mg/kg	# 69.3	65	123
		EP071: >C16 - C34 Fraction	----	4124 mg/kg	# 75.8	67	121
		EP071: >C34 - C40 Fraction	----	161 mg/kg	74.4	44	126
EP080: BTEXN (QCLot: 247138)							
EM1515593-059	GW04(0.5-0.6)	EP080: Benzene	71-43-2	2 mg/kg	101	50	136
		EP080: Toluene	108-88-3	2 mg/kg	99.5	56	139

Sub-Matrix: **WATER**

				Matrix Spike (MS) Report			
				Spike	SpikeRecovery(%)	Recovery Limits (%)	
Laboratory sample ID	Client sample ID	Method: Compound	CAS Number	Concentration	MS	Low	High
EG020T: Total Metals by ICP-MS (QCLot: 250106)							
EM1515593-067	QC08	EG020A-T: Arsenic	7440-38-2	1 mg/L	103	82	118
		EG020A-T: Cadmium	7440-43-9	0.25 mg/L	97.4	75	129
		EG020A-T: Chromium	7440-47-3	1 mg/L	98.9	80	118
		EG020A-T: Copper	7440-50-8	1 mg/L	101	81	115
		EG020A-T: Lead	7439-92-1	1 mg/L	96.3	83	121
		EG020A-T: Nickel	7440-02-0	1 mg/L	101	80	118
		EG020A-T: Zinc	7440-66-6	1 mg/L	94.9	74	116
EG035T: Total Recoverable Mercury by FIMS (QCLot: 247403)							
EM1515706-038	Anonymous	EG035T: Mercury	7439-97-6	0.01 mg/L	100	70	130
EP080/071: Total Petroleum Hydrocarbons (QCLot: 247613)							
EM1515848-024	Anonymous	EP080: C6 - C9 Fraction	----	280 µg/L	88.5	43	125
EP080/071: Total Recoverable Hydrocarbons - NEPM 2013 Fractions (QCLot: 247613)							
EM1515848-024	Anonymous	EP080: C6 - C10 Fraction	C6_C10	330 µg/L	85.1	44	122
EP080: BTEXN (QCLot: 247613)							

Sub-Matrix: **WATER**

				Matrix Spike (MS) Report			
				Spike	SpikeRecovery(%)	Recovery Limits (%)	
Laboratory sample ID	*Client sample ID*	*Method: Compound*	*CAS Number*	*Concentration*	*MS*	*Low*	*High*
EP080: BTEXN (QCLot: 247613) - continued							
EM1515848-024	Anonymous	EP080: Benzene	71-43-2	20 µg/L	101	68	130
		EP080: Toluene	108-88-3	20 µg/L	104	72	132

ALS Environmental

QA/QC Compliance Assessment for DQO Reporting

Work Order	: **EM1515593**	Page	: 1 of 8
Client	: **AECOM Australia Pty Ltd**	Laboratory	: Environmental Division Melbourne
Contact	: MS AVERYLL COYNE	Telephone	: +61 7 3243 7123
Project	: 60431087	Date Samples Received	: 15-Oct-2015
Site	: Fishermans Bend	Issue Date	: 26-Oct-2015
Sampler	: NATHAN JENSEN, OLIVER TAYLOR	No. of samples received	: 66
Order number	: 60431087 1.4	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.**
- **Matrix Spike outliers exist - please see following pages for full details.**
- **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 : Quality Control Samples

Duplicates, Method Blanks, Laboratory Control Samples and Matrix Spikes

Matrix: **SOIL**

Compound Group Name	Laboratory Sample ID	Client Sample ID	Analyte	CAS Number	Data	Limits	Comment
Matrix Spike (MS) Recoveries							
EG005T: Total Metals by ICP-AES	EM1515593--059	GW04(0.5-0.6)	**Lead**	7439-92-1	Not Determined	----	**MS recovery not determined, background level greater than or equal to 4x spike level.**
EG005T: Total Metals by ICP-AES	EM1515593--059	GW04(0.5-0.6)	**Zinc**	7440-66-6	Not Determined	----	**MS recovery not determined, background level greater than or equal to 4x spike level.**

Outliers : Frequency of Quality Control Samples

Matrix: **WATER**

Quality Control Sample Type / Method	Count QC	Count Regular	Rate (%) Actual	Rate (%) Expected	Quality Control Specification
Laboratory Duplicates (DUP)					
TRH - Semivolatile Fraction	0	20	0.00	10.00	NEPM 2013 Schedule B(3) and ALS QCS3 requirement
Matrix Spikes (MS)					
TRH - Semivolatile Fraction	0	20	0.00	5.00	NEPM 2013 Schedule B(3) and ALS QCS3 requirement

Analysis Holding Time Compliance

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: Date extracted	Extraction / Preparation: Due for extraction	Extraction / Preparation: Evaluation	Analysis: Date analysed	Analysis: Due for analysis	Analysis: Evaluation
EA001: pH in soil using 0.01M CaCl extract							
Soil Glass Jar - Unpreserved (EA001) GW18(0.4-0.5), GW04(0.5-0.6), QC06	**14-Oct-2015**	**21-Oct-2015**	21-Oct-2015	✓	**21-Oct-2015**	22-Oct-2015	✓
EA055: Moisture Content							
Soil Glass Jar - Unpreserved (EA055-103) GW18(0.4-0.5), GW04(0.5-0.6), QC06	**14-Oct-2015**	**----**	----	----	**19-Oct-2015**	28-Oct-2015	✓
Soil Glass Jar - Unpreserved (EA055-103) GW18(2.3-2.4), GW27(2.9-3.0), GW34(2.2-2.3), GW28(1.6-1.7), GW24(1.6-1.7)	**14-Oct-2015**	**----**	----	----	**22-Oct-2015**	28-Oct-2015	✓

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
ED040N: Sulfate - Calcium Phosphate Soluble (NEPM)							
Soil Glass Jar - Unpreserved (ED040N)							
GW18(0.4-0.5), GW04(0.5-0.6), QC06	**14-Oct-2015**	**22-Oct-2015**	11-Apr-2016	✓	**22-Oct-2015**	11-Apr-2016	✓
EG005T: Total Metals by ICP-AES							
Soil Glass Jar - Unpreserved (EG005T)							
GW18(0.4-0.5), GW04(0.5-0.6), QC06	**14-Oct-2015**	**19-Oct-2015**	11-Apr-2016	✓	**19-Oct-2015**	11-Apr-2016	✓
EG035T: Total Recoverable Mercury by FIMS							
Soil Glass Jar - Unpreserved (EG035T)							
GW18(0.4-0.5), GW04(0.5-0.6), QC06	**14-Oct-2015**	**19-Oct-2015**	11-Nov-2015	✓	**19-Oct-2015**	11-Nov-2015	✓
EP003: Total Organic Carbon (TOC) in Soil							
Soil Glass Jar - Unpreserved (EP003)							
GW18(2.3-2.4), GW27(2.9-3.0), GW34(2.2-2.3), GW28(1.6-1.7), GW24(1.6-1.7)	**14-Oct-2015**	**23-Oct-2015**	11-Nov-2015	✓	**23-Oct-2015**	11-Nov-2015	✓
EP080/071: Total Petroleum Hydrocarbons							
Soil Glass Jar - Unpreserved (EP071)							
GW18(0.4-0.5), GW04(0.5-0.6), QC06	**14-Oct-2015**	**19-Oct-2015**	28-Oct-2015	✓	**19-Oct-2015**	28-Nov-2015	✓
EP074A: Monocyclic Aromatic Hydrocarbons							
Soil Glass Jar - Unpreserved (EP074)							
GW18(0.4-0.5), GW04(0.5-0.6), QC06	**14-Oct-2015**	**19-Oct-2015**	21-Oct-2015	✓	**19-Oct-2015**	21-Oct-2015	✓
EP075(SIM)B: Polynuclear Aromatic Hydrocarbons							
Soil Glass Jar - Unpreserved (EP075(SIM))							
GW18(0.4-0.5), GW04(0.5-0.6), QC06	**14-Oct-2015**	**19-Oct-2015**	28-Oct-2015	✓	**19-Oct-2015**	28-Nov-2015	✓
EP080/071: Total Petroleum Hydrocarbons							
Soil Glass Jar - Unpreserved (EP080)							
GW18(0.4-0.5), GW04(0.5-0.6), QC06	**14-Oct-2015**	**19-Oct-2015**	28-Oct-2015	✓	**19-Oct-2015**	28-Oct-2015	✓

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)							
QC08	**14-Oct-2015**	**21-Oct-2015**	11-Apr-2016	✓	**21-Oct-2015**	11-Apr-2016	✓

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
EG035T: Total Recoverable Mercury by FIMS							
Clear Plastic Bottle - Nitric Acid; Unfiltered (EG035T)							
QC08	**14-Oct-2015**	**----**	----	----	**20-Oct-2015**	11-Nov-2015	✓
EP080/071: Total Petroleum Hydrocarbons							
Amber Glass Bottle - Unpreserved (EP071)							
QC08	**14-Oct-2015**	**19-Oct-2015**	21-Oct-2015	✓	**20-Oct-2015**	28-Nov-2015	✓
EP080/071: Total Petroleum Hydrocarbons							
Amber VOC Vial - Sulfuric Acid (EP080)							
QC08, QC09, QC10	**14-Oct-2015**	**19-Oct-2015**	28-Oct-2015	✓	**19-Oct-2015**	28-Oct-2015	✓

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	EA055-103	2	17	**11.76**	**10.00**	✓	NEPM 2013 Schedule B(3) and ALS QCS3 requirement
PAH/Phenols (SIM)	EP075(SIM)	1	8	**12.50**	**10.00**	✓	NEPM 2013 Schedule B(3) and ALS QCS3 requirement
pH in soil using a 0.01M CaCl2 extract	EA001	1	8	**12.50**	**10.00**	✓	NEPM 2013 Schedule B(3) and ALS QCS3 requirement
Sulfate - Calcium Phosphate Soluble	ED040N	2	15	**13.33**	**10.00**	✓	NEPM 2013 Schedule B(3) and ALS QCS3 requirement
Total Mercury by FIMS	EG035T	1	7	**14.29**	**10.00**	✓	NEPM 2013 Schedule B(3) and ALS QCS3 requirement
Total Metals by ICP-AES	EG005T	2	16	**12.50**	**10.00**	✓	NEPM 2013 Schedule B(3) and ALS QCS3 requirement
Total Organic Carbon	EP003	1	5	**20.00**	**10.00**	✓	NEPM 2013 Schedule B(3) and ALS QCS3 requirement
TRH - Semivolatile Fraction	EP071	2	18	**11.11**	**10.00**	✓	NEPM 2013 Schedule B(3) and ALS QCS3 requirement
TRH Volatiles/BTEX	EP080	1	3	**33.33**	**10.00**	✓	NEPM 2013 Schedule B(3) and ALS QCS3 requirement
Volatile Organic Compounds	EP074	1	3	**33.33**	**10.00**	✓	NEPM 2013 Schedule B(3) and ALS QCS3 requirement
Laboratory Control Samples (LCS)							
PAH/Phenols (SIM)	EP075(SIM)	1	8	**12.50**	**5.00**	✓	NEPM 2013 Schedule B(3) and ALS QCS3 requirement
Sulfate - Calcium Phosphate Soluble	ED040N	1	15	**6.67**	**5.00**	✓	NEPM 2013 Schedule B(3) and ALS QCS3 requirement
Total Mercury by FIMS	EG035T	1	7	**14.29**	**5.00**	✓	NEPM 2013 Schedule B(3) and ALS QCS3 requirement
Total Metals by ICP-AES	EG005T	1	16	**6.25**	**5.00**	✓	NEPM 2013 Schedule B(3) and ALS QCS3 requirement
Total Organic Carbon	EP003	1	5	**20.00**	**5.00**	✓	NEPM 2013 Schedule B(3) and ALS QCS3 requirement
TRH - Semivolatile Fraction	EP071	1	18	**5.56**	**5.00**	✓	NEPM 2013 Schedule B(3) and ALS QCS3 requirement
TRH Volatiles/BTEX	EP080	1	3	**33.33**	**5.00**	✓	NEPM 2013 Schedule B(3) and ALS QCS3 requirement
Volatile Organic Compounds	EP074	1	3	**33.33**	**5.00**	✓	NEPM 2013 Schedule B(3) and ALS QCS3 requirement
Method Blanks (MB)							
PAH/Phenols (SIM)	EP075(SIM)	1	8	**12.50**	**5.00**	✓	NEPM 2013 Schedule B(3) and ALS QCS3 requirement
Sulfate - Calcium Phosphate Soluble	ED040N	1	15	**6.67**	**5.00**	✓	NEPM 2013 Schedule B(3) and ALS QCS3 requirement
Total Mercury by FIMS	EG035T	1	7	**14.29**	**5.00**	✓	NEPM 2013 Schedule B(3) and ALS QCS3 requirement
Total Metals by ICP-AES	EG005T	1	16	**6.25**	**5.00**	✓	NEPM 2013 Schedule B(3) and ALS QCS3 requirement
Total Organic Carbon	EP003	1	5	**20.00**	**5.00**	✓	NEPM 2013 Schedule B(3) and ALS QCS3 requirement
TRH - Semivolatile Fraction	EP071	1	18	**5.56**	**5.00**	✓	NEPM 2013 Schedule B(3) and ALS QCS3 requirement
TRH Volatiles/BTEX	EP080	1	3	**33.33**	**5.00**	✓	NEPM 2013 Schedule B(3) and ALS QCS3 requirement
Volatile Organic Compounds	EP074	1	3	**33.33**	**5.00**	✓	NEPM 2013 Schedule B(3) and ALS QCS3 requirement
Matrix Spikes (MS)							
PAH/Phenols (SIM)	EP075(SIM)	1	8	**12.50**	**5.00**	✓	NEPM 2013 Schedule B(3) and ALS QCS3 requirement
Sulfate - Calcium Phosphate Soluble	ED040N	1	15	**6.67**	**5.00**	✓	NEPM 2013 Schedule B(3) and ALS QCS3 requirement
Total Mercury by FIMS	EG035T	1	7	**14.29**	**5.00**	✓	NEPM 2013 Schedule B(3) and ALS QCS3 requirement
Total Metals by ICP-AES	EG005T	2	16	**12.50**	**5.00**	✓	NEPM 2013 Schedule B(3) and ALS QCS3 requirement
TRH - Semivolatile Fraction	EP071	1	18	**5.56**	**5.00**	✓	NEPM 2013 Schedule B(3) and ALS QCS3 requirement
TRH Volatiles/BTEX	EP080	1	3	**33.33**	**5.00**	✓	NEPM 2013 Schedule B(3) and ALS QCS3 requirement
Volatile Organic Compounds	EP074	1	3	**33.33**	**5.00**	✓	NEPM 2013 Schedule B(3) and ALS QCS3 requirement

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)							
Total Mercury by FIMS	EG035T	2	20	**10.00**	**10.00**	✓	NEPM 2013 Schedule B(3) and ALS QCS3 requirement
Total Metals by ICP-MS - Suite A	EG020A-T	2	20	**10.00**	**10.00**	✓	NEPM 2013 Schedule B(3) and ALS QCS3 requirement
TRH - Semivolatile Fraction	EP071	0	20	**0.00**	**10.00**	×	NEPM 2013 Schedule B(3) and ALS QCS3 requirement
TRH Volatiles/BTEX	EP080	2	20	**10.00**	**10.00**	✓	NEPM 2013 Schedule B(3) and ALS QCS3 requirement
Laboratory Control Samples (LCS)							
Total Mercury by FIMS	EG035T	1	20	**5.00**	**5.00**	✓	NEPM 2013 Schedule B(3) and ALS QCS3 requirement
Total Metals by ICP-MS - Suite A	EG020A-T	1	20	**5.00**	**5.00**	✓	NEPM 2013 Schedule B(3) and ALS QCS3 requirement
TRH - Semivolatile Fraction	EP071	1	20	**5.00**	**5.00**	✓	NEPM 2013 Schedule B(3) and ALS QCS3 requirement
TRH Volatiles/BTEX	EP080	1	20	**5.00**	**5.00**	✓	NEPM 2013 Schedule B(3) and ALS QCS3 requirement
Method Blanks (MB)							
Total Mercury by FIMS	EG035T	1	20	**5.00**	**5.00**	✓	NEPM 2013 Schedule B(3) and ALS QCS3 requirement
Total Metals by ICP-MS - Suite A	EG020A-T	1	20	**5.00**	**5.00**	✓	NEPM 2013 Schedule B(3) and ALS QCS3 requirement
TRH - Semivolatile Fraction	EP071	1	20	**5.00**	**5.00**	✓	NEPM 2013 Schedule B(3) and ALS QCS3 requirement
TRH Volatiles/BTEX	EP080	1	20	**5.00**	**5.00**	✓	NEPM 2013 Schedule B(3) and ALS QCS3 requirement
Matrix Spikes (MS)							
Total Mercury by FIMS	EG035T	1	20	**5.00**	**5.00**	✓	NEPM 2013 Schedule B(3) and ALS QCS3 requirement
Total Metals by ICP-MS - Suite A	EG020A-T	1	20	**5.00**	**5.00**	✓	NEPM 2013 Schedule B(3) and ALS QCS3 requirement
TRH - Semivolatile Fraction	EP071	0	20	**0.00**	**5.00**	×	NEPM 2013 Schedule B(3) and ALS QCS3 requirement
TRH Volatiles/BTEX	EP080	1	20	**5.00**	**5.00**	✓	NEPM 2013 Schedule B(3) and ALS QCS3 requirement

Brief Method Summaries

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

Analytical Methods	Method	Matrix	Method Descriptions
pH in soil using a 0.01M CaCl2 extract	EA001	SOIL	In house: Referenced to Rayment and Higginson 4B1 (mod.) 10 g of soil is mixed with 50 mL of 0.01M CaCl2 and tumbled end over end for 1 hour. pH is measured from the continuous suspension. This method is compliant with NEPM (2013) Schedule B(3) (Method 103)
Moisture Content	EA055-103	SOIL	In-house. A gravimetric procedure based on weight loss over a 12 hour drying period at 103-105 degrees C. This method is compliant with NEPM (2013) Schedule B(3) Section 7.1 and Table 1 (14 day holding time).
Sulfate - Calcium Phosphate Soluble	ED040N	SOIL	In-house. The sample is extracted with a calcium phosphate solution. The phosphate ion displaces the adsorbed sulfate while calcium ions depress the extraction of interfering S from soil organic matter. SO4 in the extract is determined by ICPAES and reported as dry weight in the original soil. This method is compliant with NEPM (2013) Schedule B(3) (Method 406)
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 (2013) 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 (2013) Schedule B(3)
Total Organic Carbon	EP003	SOIL	In-house C-IR17. Dried and pulverised sample is reacted with acid to remove inorganic Carbonates, then combusted in a LECO furnace in the presence of strong oxidants / catalysts. The evolved (Organic) Carbon (as CO2) is automaticaly measured by infra-red detector.
TRH - Semivolatile Fraction	EP071	SOIL	(USEPA SW 846 - 8015A) Sample extracts are analysed by Capillary GC/FID and quantified against alkane standards over the range C10 - C40.
Volatile Organic Compounds	EP074	SOIL	(USEPA SW 846 - 8260B) Extracts are analysed by Purge and Trap, Capillary GC/MS. Quantification is by comparison against an established 5 point calibration curve. This method is compliant with NEPM (2013) Schedule B(3) (Method 501)
PAH/Phenols (SIM)	EP075(SIM)	SOIL	(USEPA SW 846 - 8270B) 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 (2013) Schedule B(3) (Method 502 and 507)
TRH Volatiles/BTEX	EP080	SOIL	(USEPA SW 846 - 8260B) Extracts are analysed by Purge and Trap, Capillary GC/MS. Quantification is by comparison against an established 5 point calibration curve.
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.

Analytical Methods	Method	Matrix	Method Descriptions
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 (2013) Schedule B(3)
TRH - Semivolatile Fraction	EP071	WATER	USEPA SW 846 - 8015A 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 (2013) Schedule B(3)
TRH Volatiles/BTEX	EP080	WATER	USEPA SW 846 - 8260B 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 (2013) Schedule B(3)

Preparation Methods	Method	Matrix	Method Descriptions
Dry and Pulverise (up to 100g)	GEO30	SOIL	#
Methanolic Extraction of Soils for Purge and Trap	ORG16	SOIL	(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	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 (2013) Schedule B(3)

ALS Environmental

SAMPLE RECEIPT NOTIFICATION (SRN)

Work Order : **EM1515593**

Client	: **AECOM Australia Pty Ltd**	Laboratory	: Environmental Division Melbourne
Contact	: MS AVERYLL COYNE	Contact	: Carsten Emrich
Address	: LEVEL 9 8 EXHIBITION ST MELBOURNE VIC 3000	Address	: 4 Westall Rd Springvale VIC Australia 3171
E-mail	: averyll.coyne@aecom.com	E-mail	: carsten.emrich@alsenviro.com
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Project	: 60431087	Page	: 1 of 4
Order number	: 60431087 1.4	Quote number	: EB2015AECOMAU0580 (EN/004/15)
C-O-C number	: ----	QC Level	: NEPM 2013 Schedule B(3) and ALS QCS3 requirement
Site	: Fishermans Bend		
Sampler	: NATHAN JENSEN, OLIVER TAYLOR		

Dates

Date Samples Received	: 15-Oct-2015 12:35 PM	Issue Date	: 16-Oct-2015
Client Requested Due Date	: 23-Oct-2015	Scheduled Reporting Date	: **23-Oct-2015**

Delivery Details

Mode of Delivery	: Carrier	Security Seal	: Intact.
No. of coolers/boxes	: 2	Temperature	: 5.4°C - Ice present
Receipt Detail	:	No. of samples received / analysed	: 66 / 11

General Comments

- This report contains the following information:
  - Sample Container(s)/Preservation Non-Compliances
  - Summary of Sample(s) and Requested Analysis
  - Proactive Holding Time Report
  - Requested Deliverables
- **Please direct any queries related to sample condition / numbering / breakages to Client Services.**
- Sample Disposal - Aqueous (14 days), Solid (60 days) from date of completion of work order.
- **Analytical work for this work order will be conducted at ALS Springvale and ALS Brisbane.**
- **Please refer to the Proactive Holding Time Report table below which summarises breaches of recommended holding times that have occurred prior to samples/instructions being received at the laboratory. The absence of this summary table indicates that all samples have been received within the recommended holding times for the analysis requested.**

Sample Container(s)/Preservation Non-Compliances

All comparisons are made against pretreatment/preservation AS, APHA, USEPA standards.

- **No sample container / preservation non-compliance exist.**

Summary of Sample(s) and Requested Analysis

Some items described below may be part of a laboratory process necessary for the execution of client requested tasks. Packages may contain additional analyses, such as the determination of moisture content and preparation tasks, that are included in the package.

Matrix: **SOIL**

Laboratory sample ID	Client sampling date / time	Client sample ID	(On Hold) SOIL No analysis requested	SOIL - EA055-103 Moisture Content	SOIL - EG005T (solids) Total Metals by ICP-AES	SOIL - EP003 Total Organic Carbon (TOC) in Soil	SOIL - S-02 8 Metals (incl. Digestion)	SOIL - S-10 TRH/VOC/PAH
EM1515593-001	[14-Oct-2015]	GW18(0.0-0.1)	✓					
EM1515593-002	[14-Oct-2015]	GW18(0.4-0.5)		✓	✓		✓	✓
EM1515593-003	[14-Oct-2015]	GW18(0.9-1.0)	✓					
EM1515593-004	[14-Oct-2015]	GW18(1.4-1.5)	✓					
EM1515593-005	[14-Oct-2015]	GW18(1.7-1.8)	✓					
EM1515593-006	[14-Oct-2015]	GW18(2.3-2.4)		✓		✓		
EM1515593-007	[14-Oct-2015]	GW18(3.4-3.5)	✓					
EM1515593-008	[14-Oct-2015]	GW18(4.4-4.5)	✓					
EM1515593-009	[14-Oct-2015]	GW27(1.8-1.9)	✓					
EM1515593-010	[14-Oct-2015]	GW27(2.9-3.0)		✓		✓		
EM1515593-011	[14-Oct-2015]	GW27(3.9-4.0)	✓					
EM1515593-012	[14-Oct-2015]	GW27(4.9-5.0)	✓					
EM1515593-013	[14-Oct-2015]	GW34(0.1-0.2)	✓					
EM1515593-014	[14-Oct-2015]	GW34(0.5-0.6)	✓					
EM1515593-015	[14-Oct-2015]	GW34(0.9-1.0)	✓					
EM1515593-016	[14-Oct-2015]	GW34(1.4-1.5)	✓					
EM1515593-017	[14-Oct-2015]	GW34(1.5-2.2)	✓					
EM1515593-018	[14-Oct-2015]	GW34(2.2-2.3)		✓		✓		
EM1515593-019	[14-Oct-2015]	GW34(3.5-3.6)	✓					
EM1515593-020	[14-Oct-2015]	GW34(4.5-4.6)	✓					
EM1515593-021	[14-Oct-2015]	GW37(0.5-0.6)	✓					
EM1515593-023	[14-Oct-2015]	GW37(1.0-1.1)	✓					
EM1515593-024	[14-Oct-2015]	GW37(1.5-1.6)	✓					
EM1515593-025	[14-Oct-2015]	GW37(3.0-3.1)	✓					
EM1515593-026	[14-Oct-2015]	GW37(4.0-4.1)	✓					
EM1515593-027	[14-Oct-2015]	GW37(5.0-5.1)	✓					
EM1515593-028	[14-Oct-2015]	GW28(0.0-0.1)	✓					
EM1515593-029	[14-Oct-2015]	GW28(0.5-0.6)	✓					
EM1515593-030	[14-Oct-2015]	GW28(0.6-0.7)	✓					
EM1515593-031	[14-Oct-2015]	GW28(0.9-1.0)	✓					
EM1515593-032	[14-Oct-2015]	GW28(1.4-1.5)	✓					
EM1515593-033	[14-Oct-2015]	GW28(1.6-1.7)		✓		✓		
EM1515593-034	[14-Oct-2015]	GW28(2.0-2.1)	✓					
EM1515593-035	[14-Oct-2015]	GW28(4.0-4.1)	✓					
EM1515593-036	[14-Oct-2015]	GW28(4.5-5.1)	✓					

			(On Hold) SOIL No analysis requested	SOIL - EA055-103 Moisture Content	SOIL - EG005T (solids) Total Metals by ICP-AES	SOIL - EP003 Total Organic Carbon (TOC) in Soil	SOIL - S-02 8 Metals (incl. Digestion)	SOIL - S-10 TRH/VOC/PAH
EM1515593-037	[14-Oct-2015]	GW24(0.0-0.1)	✓					
EM1515593-038	[14-Oct-2015]	GW24(0.5-0.6)	✓					
EM1515593-039	[14-Oct-2015]	GW24(1.0-1.1)	✓					
EM1515593-040	[14-Oct-2015]	GW24(1.2-1.3)	✓					
EM1515593-041	[14-Oct-2015]	GW24(1.5-1.6)	✓					
EM1515593-042	[14-Oct-2015]	GW24(1.6-1.7)		✓		✓		
EM1515593-043	[14-Oct-2015]	GW24(2.0-2.1)	✓					
EM1515593-044	[14-Oct-2015]	GW24(3.0-3.1)	✓					
EM1515593-045	[14-Oct-2015]	GW24(4.0-4.1)	✓					
EM1515593-046	[14-Oct-2015]	GW24(5.0-5.1)	✓					
EM1515593-047	[14-Oct-2015]	GW17(0.1-0.2)	✓					
EM1515593-048	[14-Oct-2015]	GW17(0.5-0.6)	✓					
EM1515593-049	[14-Oct-2015]	GW17(0.9-1.0)	✓					
EM1515593-050	[14-Oct-2015]	GW17(1.4-1.5)	✓					
EM1515593-054	[14-Oct-2015]	GW31(0.0-0.1)	✓					
EM1515593-055	[14-Oct-2015]	GW31(0.4-0.5)	✓					
EM1515593-056	[14-Oct-2015]	GW31(0.9-1.0)	✓					
EM1515593-057	[14-Oct-2015]	GW31(1.4-1.5)	✓					
EM1515593-058	[14-Oct-2015]	GW04(0.0-0.1)	✓					
EM1515593-059	[14-Oct-2015]	GW04(0.5-0.6)		✓	✓		✓	✓
EM1515593-060	[14-Oct-2015]	GW04(0.9-1.0)	✓					
EM1515593-061	[14-Oct-2015]	GW04(1.4-1.5)	✓					
EM1515593-062	[14-Oct-2015]	GW03(0.0-0.1)	✓					
EM1515593-063	[14-Oct-2015]	GW03(0.4-0.5)	✓					
EM1515593-064	[14-Oct-2015]	GW03(0.9-1.0)	✓					
EM1515593-065	[14-Oct-2015]	GW03(1.1-1.2)	✓					
EM1515593-066	[14-Oct-2015]	QC06		✓	✓		✓	✓
EM1515593-070	[14-Oct-2015]	GW37(0.0-0.1)	✓					

Matrix: **WATER**

Laboratory sample ID	Client sampling date / time	Client sample ID	WATER - W-05T TRH/BTEXN/8 Metals (Total)
EM1515593-067	[14-Oct-2015]	QC08	✓

Matrix: **WATER**

Laboratory sample ID	Client sampling date / time	Client sample ID	WATER - EG020T Total Recoverable Metals by ICPMS (including	WATER - W-18 TRH(C6 - C9)/BTEXN
EM1515593-067	[14-Oct-2015]	QC08	✓	
EM1515593-068	[14-Oct-2015]	QC09		✓
EM1515593-069	[14-Oct-2015]	QC10		✓

Proactive Holding Time Report

Sample(s) have been received within the recommended holding times for the requested analysis.

Requested Deliverables

AP_CUSTOMER SERVICE ANZ

- A4 - AU Tax Invoice (INV)	Email	ap_customerservice.anz@aecom.com

AVERYLL COYNE

- *AU Certificate of Analysis - NATA (COA)	Email	averyll.coyne@aecom.com
- *AU Interpretive QC Report - DEFAULT (Anon QCI Rep) (QCI)	Email	averyll.coyne@aecom.com
- *AU QC Report - DEFAULT (Anon QC Rep) - NATA (QC)	Email	averyll.coyne@aecom.com
- A4 - AU Sample Receipt Notification - Environmental HT (SRN)	Email	averyll.coyne@aecom.com
- A4 - AU Tax Invoice (INV)	Email	averyll.coyne@aecom.com
- Chain of Custody (CoC) (COC)	Email	averyll.coyne@aecom.com
- EDI Format - ENMRG (ENMRG)	Email	averyll.coyne@aecom.com
- EDI Format - ESDAT (ESDAT)	Email	averyll.coyne@aecom.com
- EDI Format - HLAPro (HLAPro)	Email	averyll.coyne@aecom.com
- EDI Format - XTab (XTAB)	Email	averyll.coyne@aecom.com

SAMPLE RECEIPT NOTIFICATION (SRN)

Work Order : **EM1515593**

Client	: **AECOM Australia Pty Ltd**	Laboratory	: Environmental Division Melbourne
Contact	: MS AVERYLL COYNE	Contact	: Carsten Emrich
Address	: LEVEL 9 8 EXHIBITION ST MELBOURNE VIC 3000	Address	: 4 Westall Rd Springvale VIC Australia 3171
E-mail	: averyll.coyne@aecom.com	E-mail	: carsten.emrich@alsenviro.com
Telephone	: +61 03 9653 1234	Telephone	: +61 7 3243 7123
Facsimile	: +61 03 9654 7117	Facsimile	: +61-3-8549 9601
Project	: 60431087	Page	: 1 of 4
Order number	: 60431087 1.4	Quote number	: EB2015AECOMAU0580 (EN/004/15)
C-O-C number	: ----	QC Level	: NEPM 2013 Schedule B(3) and ALS QCS3 requirement
Site	: Fishermans Bend		
Sampler	: NATHAN JENSEN, OLIVER TAYLOR		

Dates

Date Samples Received	: 15-Oct-2015 12:35 PM	Issue Date	: 21-Oct-2015
Client Requested Due Date	: 23-Oct-2015	Scheduled Reporting Date	: **23-Oct-2015**

Delivery Details

Mode of Delivery	: Carrier	Security Seal	: Intact.
No. of coolers/boxes	: 2	Temperature	: 5.4°C - Ice present
Receipt Detail	:	No. of samples received / analysed	: 66 / 11

General Comments

- This report contains the following information:
  - Sample Container(s)/Preservation Non-Compliances
  - Summary of Sample(s) and Requested Analysis
  - Proactive Holding Time Report
  - Requested Deliverables
- **Additional analysis instruction was received by ALS on 21/10/2015 at 3:04 PM.**
- **Please direct any queries related to sample condition / numbering / breakages to Client Services.**
- Sample Disposal - Aqueous (14 days), Solid (60 days) from date of completion of work order.
- **Analytical work for this work order will be conducted at ALS Springvale and ALS Brisbane.**
- **Please refer to the Proactive Holding Time Report table below which summarises breaches of recommended holding times that have occurred prior to samples/instructions being received at the laboratory. The absence of this summary table indicates that all samples have been received within the recommended holding times for the analysis requested.**

Sample Container(s)/Preservation Non-Compliances

All comparisons are made against pretreatment/preservation AS, APHA, USEPA standards.

- **No sample container / preservation non-compliance exist.**

Summary of Sample(s) and Requested Analysis

Some items described below may be part of a laboratory process necessary for the execution of client requested tasks. Packages may contain additional analyses, such as the determination of moisture content and preparation tasks, that are included in the package.

Matrix: **SOIL**

Laboratory sample ID	Client sampling date / time	Client sample ID	(On Hold) SOIL No analysis requested	SOIL - EA001 pH (CaCl)	SOIL - EA055-103 Moisture Content	SOIL - ED040N Calcium Phosphate Extractable Sulfate	SOIL - EG005T (solids) Total Metals by ICP-AES	SOIL - S-02 8 Metals (incl. Digestion)	SOIL - S-10 TRH/VOC/PAH
EM1515593-001	[14-Oct-2015]	GW18(0.0-0.1)	✓						
EM1515593-002	[14-Oct-2015]	GW18(0.4-0.5)		✓	✓	✓	✓	✓	✓
EM1515593-003	[14-Oct-2015]	GW18(0.9-1.0)	✓						
EM1515593-004	[14-Oct-2015]	GW18(1.4-1.5)	✓						
EM1515593-005	[14-Oct-2015]	GW18(1.7-1.8)	✓						
EM1515593-006	[14-Oct-2015]	GW18(2.3-2.4)			✓				
EM1515593-007	[14-Oct-2015]	GW18(3.4-3.5)	✓						
EM1515593-008	[14-Oct-2015]	GW18(4.4-4.5)	✓						
EM1515593-009	[14-Oct-2015]	GW27(1.8-1.9)	✓						
EM1515593-010	[14-Oct-2015]	GW27(2.9-3.0)			✓				
EM1515593-011	[14-Oct-2015]	GW27(3.9-4.0)	✓						
EM1515593-012	[14-Oct-2015]	GW27(4.9-5.0)	✓						
EM1515593-013	[14-Oct-2015]	GW34(0.1-0.2)	✓						
EM1515593-014	[14-Oct-2015]	GW34(0.5-0.6)	✓						
EM1515593-015	[14-Oct-2015]	GW34(0.9-1.0)	✓						
EM1515593-016	[14-Oct-2015]	GW34(1.4-1.5)	✓						
EM1515593-017	[14-Oct-2015]	GW34(1.5-2.2)	✓						
EM1515593-018	[14-Oct-2015]	GW34(2.2-2.3)			✓				
EM1515593-019	[14-Oct-2015]	GW34(3.5-3.6)	✓						
EM1515593-020	[14-Oct-2015]	GW34(4.5-4.6)	✓						
EM1515593-021	[14-Oct-2015]	GW37(0.5-0.6)	✓						
EM1515593-023	[14-Oct-2015]	GW37(1.0-1.1)	✓						
EM1515593-024	[14-Oct-2015]	GW37(1.5-1.6)	✓						
EM1515593-025	[14-Oct-2015]	GW37(3.0-3.1)	✓						
EM1515593-026	[14-Oct-2015]	GW37(4.0-4.1)	✓						
EM1515593-027	[14-Oct-2015]	GW37(5.0-5.1)	✓						
EM1515593-028	[14-Oct-2015]	GW28(0.0-0.1)	✓						
EM1515593-029	[14-Oct-2015]	GW28(0.5-0.6)	✓						
EM1515593-030	[14-Oct-2015]	GW28(0.6-0.7)	✓						
EM1515593-031	[14-Oct-2015]	GW28(0.9-1.0)	✓						
EM1515593-032	[14-Oct-2015]	GW28(1.4-1.5)	✓						
EM1515593-033	[14-Oct-2015]	GW28(1.6-1.7)			✓				
EM1515593-034	[14-Oct-2015]	GW28(2.0-2.1)	✓						
EM1515593-035	[14-Oct-2015]	GW28(4.0-4.1)	✓						
EM1515593-036	[14-Oct-2015]	GW28(4.5-5.1)	✓						

			(On Hold) SOIL No analysis requested	SOIL - EA001 pH (CaCl)	SOIL - EA055-103 Moisture Content	SOIL - ED040N Calcium Phosphate Extractable Sulfate	SOIL - EG005T (solids) Total Metals by ICP-AES	SOIL - S-02 8 Metals (incl. Digestion)	SOIL - S-10 TRH/VOC/PAH
EM1515593-037	[14-Oct-2015]	GW24(0.0-0.1)	✓						
EM1515593-038	[14-Oct-2015]	GW24(0.5-0.6)	✓						
EM1515593-039	[14-Oct-2015]	GW24(1.0-1.1)	✓						
EM1515593-040	[14-Oct-2015]	GW24(1.2-1.3)	✓						
EM1515593-041	[14-Oct-2015]	GW24(1.5-1.6)	✓						
EM1515593-042	[14-Oct-2015]	GW24(1.6-1.7)			✓				
EM1515593-043	[14-Oct-2015]	GW24(2.0-2.1)	✓						
EM1515593-044	[14-Oct-2015]	GW24(3.0-3.1)	✓						
EM1515593-045	[14-Oct-2015]	GW24(4.0-4.1)	✓						
EM1515593-046	[14-Oct-2015]	GW24(5.0-5.1)	✓						
EM1515593-047	[14-Oct-2015]	GW17(0.1-0.2)	✓						
EM1515593-048	[14-Oct-2015]	GW17(0.5-0.6)	✓						
EM1515593-049	[14-Oct-2015]	GW17(0.9-1.0)	✓						
EM1515593-050	[14-Oct-2015]	GW17(1.4-1.5)	✓						
EM1515593-054	[14-Oct-2015]	GW31(0.0-0.1)	✓						
EM1515593-055	[14-Oct-2015]	GW31(0.4-0.5)	✓						
EM1515593-056	[14-Oct-2015]	GW31(0.9-1.0)	✓						
EM1515593-057	[14-Oct-2015]	GW31(1.4-1.5)	✓						
EM1515593-058	[14-Oct-2015]	GW04(0.0-0.1)	✓						
EM1515593-059	[14-Oct-2015]	GW04(0.5-0.6)		✓	✓	✓	✓	✓	✓
EM1515593-060	[14-Oct-2015]	GW04(0.9-1.0)	✓						
EM1515593-061	[14-Oct-2015]	GW04(1.4-1.5)	✓						
EM1515593-062	[14-Oct-2015]	GW03(0.0-0.1)	✓						
EM1515593-063	[14-Oct-2015]	GW03(0.4-0.5)	✓						
EM1515593-064	[14-Oct-2015]	GW03(0.9-1.0)	✓						
EM1515593-065	[14-Oct-2015]	GW03(1.1-1.2)	✓						
EM1515593-066	[14-Oct-2015]	QC06		✓	✓	✓	✓	✓	✓
EM1515593-070	[14-Oct-2015]	GW37(0.0-0.1)	✓						

Matrix: **SOIL**

Laboratory sample ID	Client sampling date / time	Client sample ID	SOIL - EP003 Total Organic Carbon (TOC) in Soil
EM1515593-006	[14-Oct-2015]	GW18(2.3-2.4)	✓
EM1515593-010	[14-Oct-2015]	GW27(2.9-3.0)	✓
EM1515593-018	[14-Oct-2015]	GW34(2.2-2.3)	✓
EM1515593-033	[14-Oct-2015]	GW28(1.6-1.7)	✓
EM1515593-042	[14-Oct-2015]	GW24(1.6-1.7)	✓

Matrix: **WATER**

Laboratory sample ID	Client sampling date / time	Client sample ID	WATER - EG020T Total Recoverable Metals by ICPMS (including	WATER - W-05T TRH/BTEXN/8 Metals (Total)	WATER - W-18 TRH(C6 - C9)/BTEXN
EM1515593-067	[14-Oct-2015]	QC08	✓	✓	
EM1515593-068	[14-Oct-2015]	QC09			✓
EM1515593-069	[14-Oct-2015]	QC10			✓

Proactive Holding Time Report

Sample(s) have been received within the recommended holding times for the requested analysis.

Requested Deliverables

AP_CUSTOMER SERVICE ANZ

- A4 - AU Tax Invoice (INV)	Email	ap_customerservice.anz@aecom.com

AVERYLL COYNE

- *AU Certificate of Analysis - NATA (COA)	Email	averyll.coyne@aecom.com
- *AU Interpretive QC Report - DEFAULT (Anon QCI Rep) (QCI)	Email	averyll.coyne@aecom.com
- *AU QC Report - DEFAULT (Anon QC Rep) - NATA (QC)	Email	averyll.coyne@aecom.com
- A4 - AU Sample Receipt Notification - Environmental HT (SRN)	Email	averyll.coyne@aecom.com
- A4 - AU Tax Invoice (INV)	Email	averyll.coyne@aecom.com
- Chain of Custody (CoC) (COC)	Email	averyll.coyne@aecom.com
- EDI Format - ENMRG (ENMRG)	Email	averyll.coyne@aecom.com
- EDI Format - ESDAT (ESDAT)	Email	averyll.coyne@aecom.com
- EDI Format - HLAPro (HLAPro)	Email	averyll.coyne@aecom.com
- EDI Format - XTab (XTAB)	Email	averyll.coyne@aecom.com

Samples received without CoC

CLIENT / SENDER:	AECOM.
PROJECT:	60431087
CONTACT NAME:	
CONTACT NUMBER:	
CARRIER:	Courier
CONNOTE REFERENCE:	
SAMPLER:	1 60 Soil + 3 waters
NUMBER OF SAMPLES/MATRIX:	
Client services notified by:	

COC SEQUENCE NUMBER (Circle)

COC:	1	2	3	4	5	6	7
OF:	1	2	3	4	5	6	7

SAMPLES RECEIVED BY: Khanh (ALS)

DATE/TIME: 15/10 12:35

ANALYSIS RECEIVED BY:

DATE/TIME:

Comments

Environmental Division
Melbourne
Work Order Reference
EM1515593

Telephone : +61-3-8549 9600

LAB ID	SAMPLE DETAILS: SAMPLE ID	DATE	MATRIX	NUMBER OF CONTAINERS	Additional Information
			TOTAL		

SCAN

R.T 16/10/15.

CoC received 15/10/15 - 3:47 PM.

Form:

AECOM

Chain of Custody & Analysis Request Form

AECOM - Melbourne
Level 9, 8 Exhibition Street
Melbourne VIC 3000
Tel: 03 9653 8072
Fax: 61 3 9653 1234
Email: averyll.coyne@aecom.com

Laboratory Details
Lab. Name: ALS
Lab. Address: 4 Westall Rd, Springvale
Contact Name:
Lab. Ref:
Tel: 8549 9600
Fax:
Preliminary Report by:
Final Report by:
Lab Quote No:

Project Name: Fishermans Bend
Project Number: 60431087
Purchase Order Number: NA

Sample collected by: Nathan Jensen and Oliver Taylor
Sample Results to be returned to: Averyll Coyne

Specifications:	(Tick)		
1. Urgent TAT required? (please circle: 24hr 48hr ___3___ days)	☐ Yes	☑ No	☐ N/A
2. Fast TAT Guarantee Required?	☐ Yes	☑ No	☐ N/A
3. Is any sediment layer present in waters to be excluded from extractions?	☐ Yes	☑ No	☐ N/A
4. Special storage requirements?	☐ Yes	☑ No	☐ N/A
5. Preservation requirements?	☐ Yes	☑ No	☐ N/A
6. Other requirements? ☐ Fax ☐ Hard copy ☑ Email	☑ Yes	☐ No	☐ N/A
7. Report Format: email with QC reports	8. Project Manager: Averyll Coyne		tel: 9653 8072

Lab. ID	Sample ID	Sampling Date & time (on)	Sampling Date & Time (off)	Matrix: soil	water	other	Preservation: filt'ed	acid	ice	other	Container (No. & type)	Analysis Request: TOC	Moisture Content	TRH(C6-C40)	Full VOC Scan (70 Analytes) - Code EP074(A-H)	PAH	Metals	TRH, BTEX and metals	Remarks & comments
1	GW18(0.0-0.1)	14/10/2015		x					x		Jar								
2	GW18(0.4-0.5)	14/10/2015		x					x		Jar			x	x	x	x		
3	GW18(0.9-1.0)	14/10/2015		x					x		Jar								
4	GW18(1.4-1.5)	14/10/2015		x					x		Jar								
5	GW18(1.7-1.8)	14/10/2015		x					x		Jar								
6	GW18(2.3-2.4)	14/10/2015		x					x		Jar	x	x						
7	GW18(3.4-3.5)	14/10/2015		x					x		Jar								
8	GW18(4.4-4.5)	14/10/2015		x					x		Jar								
9	GW27(1.8-1.9)	14/10/2015		x					x		Jar								
10	GW27(2.9-3.0)	14/10/2015		x					x		Jar	x	x						
11	GW27(3.9-4.0)	14/10/2015		x					x		Jar								
12	GW27(4.9-5.0)	14/10/2015		x					x		Jar								
13	GW34(0.1-0.2)	14/10/2015		x					x		Jar								
14	GW34(0.5-0.6)	14/10/2015		x					x		Jar								
15	GW34(0.9-1.0)	14/10/2015		x					x		Jar								
16	GW34(1.4-1.5)	14/10/2015		x					x		Jar								

Remarks & comments: **Metals (As, Cd, Cr, Cu, Pb, Ni, Zn, Al, Fe, Se, Hg)**

Relinquished By:	**Received by:**			
Name: Nathan Jensen	Date: 15/10/2015	Name:	Date:	Received in good condition? Yes/No/NA — Method of Shipment
of: AECOM	Time:9:00	of: ALS	Time:	Samples received chilled? Yes/No/NA — Consignment Note No.
				Yes/No/NA — Transport Co:
Relinquished By:	**Received by:**			
Name:	Date:	Name:	Date:	Received in good condition? Yes/No/NA — Method of Shipment
of:	Time:	of:	Time:	Samples received chilled? Yes/No/NA — Consignment Note No.
				Yes/No/NA — Transport Co:

Form:

AECOM

Chain of Custody & Analysis Request Form

AECOM - Melbourne
Level 9, 8 Exhibition Street
Melbourne VIC 3000
Tel: 03 9653 8072
Fax: 61 3 9653 1234
Email: averyll.coyne@aecom.com

Laboratory Details
Lab. Name: ALS
Lab. Address: 4 Westall Rd, Springvale
Contact Name:
Lab. Ref:
Tel: 8549 9600
Fax:
Preliminary Report by:
Final Report by:
Lab Quote No:

Project Name: Fishermans Bend
Project Number: 60431087
Purchase Order Number: NA

Sample collected by: Nathan Jensen and Oliver Taylor
Sample Results to be returned to: Averyll Coyne

Specifications:	(Tick)		
1. Urgent TAT required? (please circle: 24hr 48hr ___3___days)	☐ Yes	☐ No	☐ N/A
2. Fast TAT Guarantee Required?	☐ Yes	☑ No	☐ N/A
3. Is any sediment layer present in waters to be excluded from extractions?	☐ Yes	☑ No	☐ N/A
4. Special storage requirements?	☐ Yes	☑ No	☐ N/A
5. Preservation requirements?	☐ Yes	☑ No	☐ N/A
6. Other requirements? ☐ Fax ☐ Hard copy ☑ Email	☑ Yes	☐ No	☐ N/A
7. Report Format: Email with QC reports	8. Project Manager: Averyll Coyne		tel: 9653 8072

Lab. ID	Sample ID	Sampling Date & time (on)	Sampling Date & Time (off)	Matrix: soil	Matrix: water	Matrix: other	Preservation: filt'ed	Preservation: acid	Preservation: ice	Preservation: other	Container (No. & type)	TOC	Moisture Content	TRH(C6-C40)	Full VOC Scan (70 Analytes) - Code EP074(A-H)	PAH	Metals	TRH, BTEX and metals	Remarks & comments
17	GW34(1.5-2.2)	14/10		x					x		Jar								Metals (As, Cd, Cr, Cu, Pb, Ni, Zn, Al, Fe, Se, Hg)
18	GW34(2.2-2.3)			x					x		Jar	x	x						
19	GW34(3.5-3.6)			x					x		Jar								
20	GW34(4.5-4.6)			x					x		Jar								
21	GW37(0.5-0.6)			x					x		Jar								
not received	~~22~~ GW37(0.8-0.9)			x					x		Jar								
23	GW37(1.0-1.1)	14/10		x					x		Jar								
24	GW37(1.5-1.6)			x					x		Jar								
25	GW37(3.0-3.1)			x					x		Jar								
26	GW37(4.0-4.1)			x					x		Jar								
27	GW37(5.0-5.1)			x					x		Jar								
28	GW28(0.0-0.1)			x					x		Jar								
29	GW28(0.5-0.6)			x					x		Jar								
30	GW28(0.6-0.7)			x					x		Jar								
3	GW28(0.9-1.0)			x					x		Jar								
32	GW28(1.4-1.5)			x					x		Jar								

Relinquished By:	Received by:			
Name: Nathan Jensen	Date: 15/10/2015	Name:	Date:	Received in good condition? Yes/No/NA — Method of Shipment
of: AECOM	Time:9:00	of: ALS	Time:	Samples received chilled? Yes/No/NA — Consignment Note No.
				Yes/No/NA — Transport Co:
Relinquished By:		**Received by:**		Received in good condition? Yes/No/NA — Method of Shipment
Name:	Date:	Name:	Date:	Samples received chilled? Yes/No/NA — Consignment Note No.
of:	Time:	of:	Time:	Yes/No/NA — Transport Co:

Form:

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Contact Name:
Lab. Ref:
Tel: 8549 9600
Fax:
Preliminary Report by:
Final Report by:
Lab Quote No:

Project Name: Fishermans Bend
Project Number: 60431087
Purchase Order Number: NA

Sample collected by: Nathan Jensen and Oliver Taylor
Sample Results to be returned to: Averyll Coyne

Specifications:

	(Tick)		
1. Urgent TAT required? (please circle: 24hr 48hr ___3___days)	☐ Yes	☐ No	☐ N/A
2. Fast TAT Guarantee Required?	☐ Yes	☑ No	☐ N/A
3. Is any sediment layer present in waters to be excluded from extractions?	☐ Yes	☑ No	☐ N/A
4. Special storage requirements?	☐ Yes	☑ No	☐ N/A
5. Preservation requirements?	☐ Yes	☑ No	☐ N/A
6. Other requirements? ☐ Fax ☐ Hard copy ☑ Email	☑ Yes	☐ No	☐ N/A

7. Report Format: Email with QC reports
8. Project Manager: Averyll Coyne tel: 9653 8072

Lab. ID	Sample ID	Sampling Date & time (on)	Sampling Date & Time (off)	Matrix: soil	Matrix: water	Matrix: other	Preservation: filt'ed	Preservation: acid	Preservation: ice	Preservation: other	Container (No. & type)	TOC	Moisture Content	TRH(C6-C40)	Full VOC Scan (70 Analytes) - Code EP074(A-H	PAH	Metals	TRH, BTEX and metals	Remarks & comments
33	GW28(1.6-1.7)	14/10/2015		x					x		Jar	x	x						Metals (As, Cd, Cr, Cu, Pb, Ni, Zn, Al, Fe, Se, Hg)
34	GW28(2.0-2.1)	14/10/2015		x					x		Jar								
35	GW28(4.0-4.1)	14/10/2015		x					x		Jar								
36	GW28(45.0-5.1)	14/10/2015		x					x		Jar								
37	GW24(0.0-0.1)	14/10/2015		x					x		Jar								
38	GW24(0.5-0.6)	14/10/2015		x					x		Jar								
39	GW24(1.0-1.1)	14/10/2015		x					x		Jar								
40	GW24(1.2-1.3)	14/10/2015		x					x		Jar								
41	GW24(1.5-1.6)	14/10/2015		x					x		Jar								
42	GW24(1.6-1.7)	14/10/2015		x					x		Jar	x	x						
43	GW24(2.0-2.1)	14/10/2015		x					x		Jar								
44	GW24(3.0-3.1)	14/10/2015		x					x		Jar								
45	GW24(4.0-4.1)	14/10/2015		x					x		Jar								
46	GW24(5.0-5.1)	14/10/2015		x					x		Jar								
47	GW17(0.1-0.2)	14/10/2015		x					x		Jar								
48	GW17(0.5-0.6)	14/10/2015		x					x		Jar								

Relinquished By:	**Received by:**			
Name: Nathan Jensen	Date: 14/10/2015	Name:	Date:	Received in good condition? Yes/No/NA — Method of Shipment
of: AECOM	Time:9:00	of: ALS	Time:	Samples received chilled? Yes/No/NA — Consignment Note No. / Transport Co:
Relinquished By:		**Received by:**		Received in good condition? Yes/No/NA — Method of Shipment
Name:	Date:	Name:	Date:	Samples received chilled? Yes/No/NA — Consignment Note No. / Transport Co:
of:	Time:	of:	Time:	

Form:

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Laboratory Details
Lab. Name: ALS
Lab. Address: 4 Westall Rd, Springvale
Contact Name:
Lab. Ref:
Tel: 8549 9600
Fax:
Preliminary Report by:
Final Report by:
Lab Quote No:

Project Name: Fishermans Bend
Project Number: 60431087
Purchase Order Number: NA

Sample collected by: Nathan Jensen and Oliver Taylor
Sample Results to be returned to: Averyll Coyne

Specifications:	(Tick)		
1. Urgent TAT required? (please circle: 24hr 48hr ___3___days)	☐ Yes	☐ No	☐ N/A
2. Fast TAT Guarantee Required?	☐ Yes	☑ No	☐ N/A
3. Is any sediment layer present in waters to be excluded from extractions?	☐ Yes	☑ No	☐ N/A
4. Special storage requirements?	☐ Yes	☑ No	☐ N/A
5. Preservation requirements?	☐ Yes	☑ No	☐ N/A
6. Other requirements? ☐ Fax ☐ Hard copy ☑ Email	☑ Yes	☐ No	☐ N/A

7. Report Format: Email with QC reports
8. Project Manager: Averyll Coyne tel: 9653 8072

Lab. ID	Sample ID	Sampling Date & time (on)	Sampling Date & Time (off)	Matrix: soil	water	other	Preservation: filt'ed	acid	ice	other	Container (No. & type)	TOC	Moisture Content	TRH(C6-C40)	Full VOC Scan (70 Analytes) - Code EP074(A-H)	PAH	Metals	TRH, BTEX and metals	Remarks & comments
49	GW17(0.9-1.0)	14/10/2015		x					x		Jar								Metals (As, Cd, Cr, Cu, Pb, Ni, Zn, Al, Fe, Se, Hg)
50	GW17(1.4-1.5)	14/10/2015		x					x		Jar								
28 ~~51~~	GW28(0.0-0.1)	14/10/2015		x					x		Jar								
30 ~~52~~	GW28(0.6-0.7)	14/10/2015		x					x		Jar								
31 ~~53~~	GW28(0.9-1.0)	14/10/2015		x					x		Jar								
54	GW31(0.0-0.1)	14/10/2015		x					x		Jar								
55	GW31(0.4-0.5)	14/10/2015		x					x		Jar								
56	GW31(0.9-1.0)	14/10/2015		x					x		Jar								
57	GW31(1.4-1.5)	14/10/2015		x					x		Jar								
58	GW04(0.0-0.1)	14/10/2015		x					x		Jar								
59	GW04(0.5-0.6)	14/10/2015		x					x		Jar			x	x	x	x		
60	GW04(0.9-1.0)	14/10/2015		x					x		Jar								
61	GW04(1.4-1.5)	14/10/2015		x					x		Jar								
62	GW03(0.0-0.1)	14/10/2015		x					x		Jar								
63	GW03(0.4-0.5	14/10/2015		x					x		Jar								
64	GW03(0.9-1.0)	14/10/2015		x					x		Jar								
65	GW03(1.1-1.2)	14/10/2015		x					x		Jar								

Relinquished By:	Received by:		
Name: Nathan Jensen	Date: 14/10/2015	Name:	Date:
of: AECOM	Time:9:00	of: ALS	Time:
Relinquished By:		**Received by:**	
Name:	Date:	Name:	Date:
of:	Time:	of:	Time:

Received in good condition?	Yes/No/NA	Method of Shipment	
Samples received chilled?	Yes/No/NA	Consignment Note No.	
	Yes/No/NA	Transport Co:	
Received in good condition?	Yes/No/NA	Method of Shipment	
Samples received chilled?	Yes/No/NA	Consignment Note No.	
	Yes/No/NA	Transport Co:	

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Tel: 8549 9600
Fax:
Preliminary Report by:
Final Report by:
Lab Quote No:

Project Name: Fishermans Bend
Project Number: 60431087
Purchase Order Number: NA

Sample collected by: Nathan Jensen and Oliver Taylor
Sample Results to be returned to: Averyll Coyne

Specifications:	(Tick)		
1. Urgent TAT required? (please circle: 24hr 48hr ___3___days)	☐ Yes	☐ No	☐ N/A
2. Fast TAT Guarantee Required?	☐ Yes	☑ No	☐ N/A
3. Is any sediment layer present in waters to be excluded from extractions?	☐ Yes	☑ No	☐ N/A
4. Special storage requirements?	☐ Yes	☑ No	☐ N/A
5. Preservation requirements?	☐ Yes	☑ No	☐ N/A
6. Other requirements? ☐ Fax ☐ Hard copy ☑ Email	☑ Yes	☐ No	☐ N/A
7. Report Format: Email with QC reports	8. Project Manager: Averyll Coyne		tel: 9653 8072

Lab. ID	Sample ID	Sampling Date & time (on)	Sampling Date & Time (off)	Matrix: soil	Matrix: water	Matrix: other	Preservation: filt'ed	Preservation: acid	Preservation: ice	Preservation: other	Container (No. & type)	TOC	Moisture Content	TRH(C6-C40)	Full VOC Scan (70 Analytes) - Code EP074(A-H)	PAH	Metals	TRH, BTEX and metals	Remarks & comments
66	QC06	14/10/2015		x					x		Jar			x	x	x	x		Metals (As, Cd, Cr, Cu, Pb, Ni, Zn, Al, Fe, Se, Hg)
67	QC08	14/10/2015			x				x		Bottles							x	
68	QC09	14/10/2015			x				x		Bottles			x					
69	QC10	14/10/2015			x				x		Bottles			x					
extra sample 70	QW370001	14/10/15																	

Relinquished By:	Received by:	Received in good condition?	Yes/No/NA	Method of Shipment	
Name: Nathan Jensen Date: 14/10/2015	Name: Date:	Samples received chilled?	Yes/No/NA	Consignment Note No.	
of: AECOM Time:9:00	of: ALS Time:		Yes/No/NA	Transport Co:	
Relinquished By:	**Received by:**	Received in good condition?	Yes/No/NA	Method of Shipment	
Name: Date:	Name: Date:	Samples received chilled?	Yes/No/NA	Consignment Note No.	
of: Time:	of: Time:		Yes/No/NA	Transport Co:	

Samantha Smith

From: Coyne, Averyll <Averyll.Coyne@aecom.com>
Sent: Thursday, 15 October 2015 3:47 PM
To: Bronwyn Sheen
Cc: Samples Melbourne
Subject: Fishermans Bend soil samples Day 3
Attachments: 60431087 COC Day 3A.pdf; 60431087 COC Day 3B.pdf; 60431087 COC Day 3C.pdf; 60431087 COC Day 3D.pdf; 60431087 COC Day 3E.PDF

Hi Bronwyn,

Please find attached the COC for soil samples that arrived at ALS this morning.

Please note that some of the samples have been inadvertently labelled on the jars as 'MW' as opposed to 'GW'. Please ensure all results are reported with the prefix 'GW' NOT 'MW'.

23.

Can I also please have sample GW27(0.5-0.6) on work order EM1515737 analysed for the following:

- TRH(C6-C40)
- Full VOC Scan (70 Analytes) - Code EP074(A-H)
- PAH
- Metals (As, Cd, Cr, Cu, Pb, Ni, Zn, Al, Fe, Se, Hg)

Kind Regards
Averyll

Averyll Coyne
Principal Environmental Scientist
D +61 3 9653 8072 M +61 499 252 502
Averyll.Coyne@aecom.com

AECOM
Level 9, 8 Exhibition Street, Melbourne, VIC 3000
T +61 3 9653 1234 F +61 3 9654 7117
www.aecom.com

From: Coyne, Averyll
Sent: Thursday, 15 October 2015 11:06 AM
To: 'Bronwyn Sheen'
Cc: 'samples.melbourne@alsglobal.com'
Subject: Soil samples

Hi Bronwyn,

I will send a COC through for the Fishermans Bend soil samples shortly.

Cheers
Averyll

Averyll Coyne
Principal Environmental Scientist
D +61 3 9653 8072 M +61 499 252 502
Averyll.Coyne@aecom.com

AECOM
Level 9, 8 Exhibition Street, Melbourne, VIC 3000
T +61 3 9653 1234 F +61 3 9654 7117

Rosalinda Trbusic

Subject: FW: FBURA additional soil analysis

From: Coyne, Averyll [mailto:Averyll.Coyne@aecom.com]
Sent: Wednesday, 21 October 2015 3:04 PM
To: Bronwyn Sheen
Subject: FBURA additional soil analysis

Hi Bronwyn,

Can you please organise the following analysis to be undertaken?

EM1515737 – GW21(0.5-0.6) – pH and Sulfate
EM1515593 – GW18(0.4-0.5), GW04(0.5-0.6) and QC06 – pH and Sulfate
EM1515910 – GW36(0.5-0.6), GW36(0.9-1.0), GW12(0.5-0.6) and GW12(0.9-1.0) – pH and Sulfate

Please phone me if you have any questions.

Kind Regards
Averyll

Averyll Coyne
Principal Environmental Scientist
D +61 3 9653 8072 M +61 499 252 502
Averyll.Coyne@aecom.com

AECOM
Level 9, 8 Exhibition Street, Melbourne, VIC 3000
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ALS Environmental

CERTIFICATE OF ANALYSIS

Work Order	: **EM1515643**	Page	: 1 of 5
Client	: **AECOM Australia Pty Ltd**	Laboratory	: Environmental Division Melbourne
Contact	: MS AVERYLL COYNE	Contact	: Carol Walsh
Address	: LEVEL 45, 80 COLLINS STREET MELBOURNE VIC 3004	Address	: 4 Westall Rd Springvale VIC Australia 3171
E-mail	: averyll.coyne@aecom.com	E-mail	: carol.walsh@alsglobal.com
Telephone	: +61 03 9653 1234	Telephone	: +61-3-8549 9608
Facsimile	: +61 03 9654 7117	Facsimile	: +61-3-8549 9601
Project	: 60431087	QC Level	: NEPM 2013 Schedule B(3) and ALS QCS3 requirement
Order number	: 60431087 1.4	Date Samples Received	: 13-Oct-2015 11:10
C-O-C number	: ----	Date Analysis Commenced	: 13-Oct-2015
Sampler	: NATHAN JENSEN, OLIVER TAYLOR	Issue Date	: 20-Oct-2015 09:22
Site	: Fishermens Bend		
		No. of samples received	: 21
Quote number	: ----	No. of samples analysed	: 4

This report supersedes any previous report(s) with this reference. Results apply to the sample(s) as submitted.

This Certificate of Analysis contains the following information:

- General Comments
- Analytical Results

NATA Accredited Laboratory 825

Accredited for compliance with ISO/IEC 17025.

Signatories

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

Signatories	*Position*	*Accreditation Category*
Dilani Fernando	Senior Inorganic Chemist	Melbourne Inorganics
Greg Vogel	Laboratory Manager	Brisbane Inorganics
Nancy Wang	Senior Semivolatile Instrument Chemist	Melbourne Organics
Satishkumar Trivedi	Acid Sulfate Soils Supervisor	Brisbane Acid Sulphate Soils

General Comments

The analytical procedures used by the Environmental Division have been developed from established internationally recognized procedures such as those published by the USEPA, APHA, AS and NEPM. In house developed procedures are employed in the absence of documented standards or by 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.

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.

Analytical Results

Sub-Matrix: SOIL (Matrix: SOIL)				Client sample ID	GW20(2.5-2.6)	GW25(2.5-2.6)	----	----	----
				Client sampling date / time	[12-Oct-2015]	[12-Oct-2015]	----	----	----
Compound	CAS Number	LOR	Unit		EM1515643-006	EM1515643-014	--------	--------	--------
					Result	Result	Result	Result	Result
EA055: Moisture Content									
^ **Moisture Content (dried @ 103°C)**	----	1	%		**15.8**	**24.3**	**----**	**----**	**----**
EP003: Total Organic Carbon (TOC) in Soil									
Total Organic Carbon	----	0.02	%		**0.11**	**0.18**	**----**	**----**	**----**

Analytical Results

Sub-Matrix: WATER (Matrix: WATER)				Client sample ID	QC01	QC03	----	----	----
				Client sampling date / time	[12-Oct-2015]	[12-Oct-2015]	----	----	----
Compound	CAS Number	LOR	Unit		EM1515643-021	EM1515643-023	--------	--------	--------
					Result	Result	Result	Result	Result
EG020T: Total Metals by ICP-MS									
Aluminium	7429-90-5	0.01	mg/L		<0.01	----	----	----	----
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	----	----	----	----
Nickel	7440-02-0	0.001	mg/L		<0.001	----	----	----	----
Lead	7439-92-1	0.001	mg/L		<0.001	----	----	----	----
Zinc	7440-66-6	0.005	mg/L		<0.005	----	----	----	----
Selenium	7782-49-2	0.01	mg/L		<0.01	----	----	----	----
Iron	7439-89-6	0.05	mg/L		<0.05	----	----	----	----
EG035T: Total Recoverable Mercury by FIMS									
Mercury	7439-97-6	0.0001	mg/L		<0.0001	----	----	----	----
EP080/071: Total Petroleum Hydrocarbons									
C6 - C9 Fraction	----	20	µg/L		<20	<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	<20	----	----	----
^ C6 - C10 Fraction minus BTEX (F1)	C6_C10-BTEX	20	µg/L		<20	<20	----	----	----
>C10 - C16 Fraction	>C10_C16	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	<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	----	----	----

Analytical Results

Sub-Matrix: WATER (Matrix: WATER)				Client sample ID	QC01	QC03	----	----	----
				Client sampling date / time	[12-Oct-2015]	[12-Oct-2015]	----	----	----
Compound	CAS Number	LOR	Unit		EM1515643-021	EM1515643-023	--------	--------	--------
					Result	Result	Result	Result	Result
EP080: BTEXN - Continued									
^ **Total Xylenes**	1330-20-7	2	µg/L		<2	<2	----	----	----
^ **Sum of BTEX**	----	1	µg/L		<1	<1	----	----	----
Naphthalene	91-20-3	5	µg/L		<5	<5	----	----	----
EP080S: TPH(V)/BTEX Surrogates									
1.2-Dichloroethane-D4	17060-07-0	2	%		**97.0**	**96.0**	----	----	----
Toluene-D8	2037-26-5	2	%		**91.7**	**88.6**	----	----	----
4-Bromofluorobenzene	460-00-4	2	%		**102**	**96.6**	----	----	----

ALS Environmental

QUALITY CONTROL REPORT

Work Order	: **EM1515643**	Page	: 1 of 6
Client	: **AECOM Australia Pty Ltd**	Laboratory	: Environmental Division Melbourne
Contact	: MS AVERYLL COYNE	Contact	: Carol Walsh
Address	: LEVEL 45, 80 COLLINS STREET MELBOURNE VIC 3004	Address	: 4 Westall Rd Springvale VIC Australia 3171
E-mail	: averyll.coyne@aecom.com	E-mail	: carol.walsh@alsglobal.com
Telephone	: +61 03 9653 1234	Telephone	: +61-3-8549 9608
Facsimile	: +61 03 9654 7117	Facsimile	: +61-3-8549 9601
Project	: 60431087	QC Level	: NEPM 2013 Schedule B(3) and ALS QCS3 requirement
Order number	: 60431087 1.4	Date Samples Received	: 13-Oct-2015
C-O-C number	: ----	Date Analysis Commenced	: 13-Oct-2015
Sampler	: NATHAN JENSEN, OLIVER TAYLOR	Issue Date	: 20-Oct-2015
Site	: Fishermens Bend	No. of samples received	: 21
Quote number	: ----	No. of samples analysed	: 4

This report supersedes any previous report(s) with this reference. Results apply to the sample(s) as submitted.

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

NATA WORLD RECOGNISED ACCREDITATION

NATA Accredited Laboratory 825

Accredited for compliance with ISO/IEC 17025.

Signatories

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

Signatories	*Position*	*Accreditation Category*
Dilani Fernando	Senior Inorganic Chemist	Melbourne Inorganics
Greg Vogel	Laboratory Manager	Brisbane Inorganics
Nancy Wang	Senior Semivolatile Instrument Chemist	Melbourne Organics
Satishkumar Trivedi	Acid Sulfate Soils Supervisor	Brisbane Acid Sulphate Soils

General Comments

The analytical procedures used by the Environmental Division have been developed from established internationally recognized procedures such as those published by the USEPA, APHA, AS and NEPM. In house developed procedures are employed in the absence of documented standards or by 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

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	*Client sample ID*	*Method: Compound*	*CAS Number*	*LOR*	*Unit*	*Original Result*	*Duplicate Result*	*RPD (%)*	*Recovery Limits (%)*
EA055: Moisture Content (QC Lot: 245264)									
EM1515643-006	GW20(2.5-2.6)	EA055-103: Moisture Content (dried @ 103°C)	----	1	%	15.8	15.8	0.00	0% - 50%
EP003: Total Organic Carbon (TOC) in Soil (QC Lot: 247563)									
EM1515643-006	GW20(2.5-2.6)	EP003: Total Organic Carbon	----	0.02	%	0.11	0.11	0.00	No Limit

Sub-Matrix: **WATER**

				Laboratory Duplicate (DUP) Report					
Laboratory sample ID	*Client sample ID*	*Method: Compound*	*CAS Number*	*LOR*	*Unit*	*Original Result*	*Duplicate Result*	*RPD (%)*	*Recovery Limits (%)*
EG020T: Total Metals by ICP-MS (QC Lot: 243960)									
EM1515624-001	Anonymous	EG020A-T: Cadmium	7440-43-9	0.0001	mg/L	<0.0001	0.0002	0.00	No Limit
		EG020A-T: Arsenic	7440-38-2	0.001	mg/L	<0.001	<0.001	0.00	No Limit
		EG020A-T: Chromium	7440-47-3	0.001	mg/L	<0.001	<0.001	0.00	No Limit
		EG020A-T: Copper	7440-50-8	0.001	mg/L	0.001	<0.001	0.00	No Limit
		EG020A-T: Lead	7439-92-1	0.001	mg/L	0.001	0.001	0.00	No Limit
		EG020A-T: Nickel	7440-02-0	0.001	mg/L	<0.001	<0.001	0.00	No Limit
		EG020A-T: Zinc	7440-66-6	0.005	mg/L	0.007	0.006	0.00	No Limit
		EG020A-T: Aluminium	7429-90-5	0.01	mg/L	0.12	0.12	0.00	0% - 50%
		EG020A-T: Selenium	7782-49-2	0.01	mg/L	<0.01	<0.01	0.00	No Limit
		EG020A-T: Iron	7439-89-6	0.05	mg/L	0.57	0.53	6.26	0% - 50%
EM1515637-001	Anonymous	EG020A-T: Cadmium	7440-43-9	0.0001	mg/L	0.0006	0.0004	50.3	No Limit
		EG020A-T: Arsenic	7440-38-2	0.001	mg/L	0.001	<0.001	0.00	No Limit
		EG020A-T: Chromium	7440-47-3	0.001	mg/L	0.003	0.003	0.00	No Limit
		EG020A-T: Copper	7440-50-8	0.001	mg/L	0.026	0.025	4.30	0% - 20%
		EG020A-T: Lead	7439-92-1	0.001	mg/L	0.014	0.015	0.00	0% - 50%
		EG020A-T: Nickel	7440-02-0	0.001	mg/L	0.003	0.003	0.00	No Limit
		EG020A-T: Zinc	7440-66-6	0.005	mg/L	0.940	0.942	0.204	0% - 20%
		EG020A-T: Aluminium	7429-90-5	0.01	mg/L	0.96	0.81	17.6	0% - 20%
		EG020A-T: Selenium	7782-49-2	0.01	mg/L	<0.01	<0.01	0.00	No Limit
		EG020A-T: Iron	7439-89-6	0.05	mg/L	1.36	1.26	7.35	0% - 20%
EG035T: Total Recoverable Mercury by FIMS (QC Lot: 241615)									
EM1515624-006	Anonymous	EG035T: Mercury	7439-97-6	0.0001	mg/L	<0.0001	<0.0001	0.00	No Limit
EM1515628-088	Anonymous	EG035T: Mercury	7439-97-6	0.0001	mg/L	<0.0001	<0.0001	0.00	No Limit
EP080/071: Total Petroleum Hydrocarbons (QC Lot: 243723)									
EM1515643-021	QC01	EP080: C6 - C9 Fraction	----	20	µg/L	<20	<20	0.00	No Limit
EM1515670-019	Anonymous	EP080: C6 - C9 Fraction	----	20	µg/L	<20	<20	0.00	No Limit
EP080/071: Total Recoverable Hydrocarbons - NEPM 2013 Fractions (QC Lot: 243723)									
EM1515643-021	QC01	EP080: C6 - C10 Fraction	C6_C10	20	µg/L	<20	<20	0.00	No Limit
EM1515670-019	Anonymous	EP080: C6 - C10 Fraction	C6_C10	20	µg/L	<20	<20	0.00	No Limit

Sub-Matrix: **WATER**

				Laboratory Duplicate (DUP) Report					
Laboratory sample ID	*Client sample ID*	*Method: Compound*	*CAS Number*	*LOR*	*Unit*	*Original Result*	*Duplicate Result*	*RPD (%)*	*Recovery Limits (%)*
EP080: BTEXN (QC Lot: 243723)									
EM1515643-021	QC01	EP080: Benzene	71-43-2	1	µg/L	<1	<1	0.00	No Limit
		EP080: Ethylbenzene	100-41-4	2	µg/L	<2	<2	0.00	No Limit
		EP080: meta- & para-Xylene	108-38-3 106-42-3	2	µg/L	<2	<2	0.00	No Limit
		EP080: ortho-Xylene	95-47-6	2	µg/L	<2	<2	0.00	No Limit
		EP080: Toluene	108-88-3	2	µg/L	<2	<2	0.00	No Limit
		EP080: Naphthalene	91-20-3	5	µg/L	<5	<5	0.00	No Limit
EM1515670-019	Anonymous	EP080: Benzene	71-43-2	1	µg/L	<1	<1	0.00	No Limit
		EP080: Ethylbenzene	100-41-4	2	µg/L	<2	<2	0.00	No Limit
		EP080: meta- & para-Xylene	108-38-3 106-42-3	2	µg/L	<2	<2	0.00	No Limit
		EP080: ortho-Xylene	95-47-6	2	µg/L	<2	<2	0.00	No Limit
		EP080: Toluene	108-88-3	2	µg/L	<2	<2	0.00	No Limit
		EP080: Naphthalene	91-20-3	5	µg/L	<5	<5	0.00	No Limit

Method Blank (MB) and Laboratory Control Spike (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 (%)	Recovery Limits (%)	
Method: Compound	CAS Number	LOR	Unit	Result	Concentration	LCS	Low	High
EP003: Total Organic Carbon (TOC) in Soil (QCLot: 247563)								
EP003: Total Organic Carbon	----	0.02	%	<0.02	100 %	112	70	130

Sub-Matrix: **WATER**

				Method Blank (MB) Report	Laboratory Control Spike (LCS) Report			
					Spike	Spike Recovery (%)	Recovery Limits (%)	
Method: Compound	CAS Number	LOR	Unit	Result	Concentration	LCS	Low	High
EG020T: Total Metals by ICP-MS (QCLot: 243960)								
EG020A-T: Aluminium	7429-90-5	0.01	mg/L	<0.01	0.5 mg/L	104	100	108
EG020A-T: Arsenic	7440-38-2	0.001	mg/L	<0.001	0.1 mg/L	106	94	116
EG020A-T: Cadmium	7440-43-9	0.0001	mg/L	<0.0001	0.1 mg/L	101	90	110
EG020A-T: Chromium	7440-47-3	0.001	mg/L	<0.001	0.1 mg/L	93.6	90	110
EG020A-T: Copper	7440-50-8	0.001	mg/L	<0.001	0.1 mg/L	99.4	91	109
EG020A-T: Iron	7439-89-6	0.05	mg/L	<0.05	0.5 mg/L	106	99	109
EG020A-T: Lead	7439-92-1	0.001	mg/L	<0.001	0.1 mg/L	100	91	111
EG020A-T: Nickel	7440-02-0	0.001	mg/L	<0.001	0.1 mg/L	100	91	111
EG020A-T: Selenium	7782-49-2	0.01	mg/L	<0.01	0.1 mg/L	104	86	110
EG020A-T: Zinc	7440-66-6	0.005	mg/L	<0.005	0.1 mg/L	99.4	91	109
EG035T: Total Recoverable Mercury by FIMS (QCLot: 241615)								
EG035T: Mercury	7439-97-6	0.0001	mg/L	<0.0001	0.01 mg/L	104	87	113
EP080/071: Total Petroleum Hydrocarbons (QCLot: 241537)								
EP071: C10 - C14 Fraction	----	50	µg/L	<50	3980 µg/L	56.5	53	123
EP071: C15 - C28 Fraction	----	100	µg/L	<100	17006 µg/L	65.5	57	133
EP071: C29 - C36 Fraction	----	50	µg/L	<50	8662 µg/L	60.9	55	141
EP080/071: Total Petroleum Hydrocarbons (QCLot: 243723)								
EP080: C6 - C9 Fraction	----	20	µg/L	<20	360 µg/L	98.7	67	127
EP080/071: Total Recoverable Hydrocarbons - NEPM 2013 Fractions (QCLot: 241537)								
EP071: >C10 - C16 Fraction	>C10_C16	100	µg/L	<100	5753 µg/L	61.6	54	122
EP071: >C16 - C34 Fraction	----	100	µg/L	<100	24516 µg/L	60.4	56	132
EP071: >C34 - C40 Fraction	----	100	µg/L	<100	828 µg/L	67.6	51	137
EP080/071: Total Recoverable Hydrocarbons - NEPM 2013 Fractions (QCLot: 243723)								
EP080: C6 - C10 Fraction	C6_C10	20	µg/L	<20	450 µg/L	99.0	65	125
EP080: BTEXN (QCLot: 243723)								
EP080: Benzene	71-43-2	1	µg/L	<1	20 µg/L	102	76	120
EP080: Ethylbenzene	100-41-4	2	µg/L	<2	20 µg/L	101	72	124

Sub-Matrix: **WATER**

Method: Compound	CAS Number	LOR	Unit	Method Blank (MB) Report: Result	Laboratory Control Spike (LCS) Report: Spike Concentration	Spike Recovery (%): LCS	Recovery Limits (%): Low	Recovery Limits (%): High
EP080: BTEXN (QCLot: 243723) - continued								
EP080: meta- & para-Xylene	108-38-3 106-42-3	2	µg/L	<2	40 µg/L	101	72	130
EP080: Naphthalene	91-20-3	5	µg/L	<5	5 µg/L	93.7	71	129
EP080: ortho-Xylene	95-47-6	2	µg/L	<2	20 µg/L	104	75	127
EP080: Toluene	108-88-3	2	µg/L	<2	20 µg/L	101	76	124

Matrix Spike (MS) Report

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

Sub-Matrix: **WATER**

Laboratory sample ID	Client sample ID	Method: Compound	CAS Number	Matrix Spike (MS) Report: Spike Concentration	SpikeRecovery(%): MS	Recovery Limits (%): Low	Recovery Limits (%): High
EG020T: Total Metals by ICP-MS (QCLot: 243960)							
EM1515624-001	Anonymous	EG020A-T: Arsenic	7440-38-2	1 mg/L	100.0	82	118
		EG020A-T: Cadmium	7440-43-9	0.25 mg/L	95.8	75	129
		EG020A-T: Chromium	7440-47-3	1 mg/L	97.0	80	118
		EG020A-T: Copper	7440-50-8	1 mg/L	99.1	81	115
		EG020A-T: Lead	7439-92-1	1 mg/L	94.3	83	121
		EG020A-T: Nickel	7440-02-0	1 mg/L	100	80	118
		EG020A-T: Zinc	7440-66-6	1 mg/L	94.1	74	116
EG035T: Total Recoverable Mercury by FIMS (QCLot: 241615)							
EM1515624-007	Anonymous	EG035T: Mercury	7439-97-6	0.01 mg/L	107	70	130
EP080/071: Total Petroleum Hydrocarbons (QCLot: 243723)							
EM1515665-003	Anonymous	EP080: C6 - C9 Fraction	----	280 µg/L	102	43	125
EP080/071: Total Recoverable Hydrocarbons - NEPM 2013 Fractions (QCLot: 243723)							
EM1515665-003	Anonymous	EP080: C6 - C10 Fraction	C6_C10	330 µg/L	94.7	44	122
EP080: BTEXN (QCLot: 243723)							
EM1515665-003	Anonymous	EP080: Benzene	71-43-2	20 µg/L	122	68	130
		EP080: Toluene	108-88-3	20 µg/L	118	72	132

ALS Environmental

QA/QC Compliance Assessment for DQO Reporting

Work Order	: **EM1515643**	Page	: 1 of 4
Client	: **AECOM Australia Pty Ltd**	Laboratory	: Environmental Division Melbourne
Contact	: MS AVERYLL COYNE	Telephone	: +61-3-8549 9608
Project	: 60431087	Date Samples Received	: 13-Oct-2015
Site	: Fishermens Bend	Issue Date	: 20-Oct-2015
Sampler	: NATHAN JENSEN, OLIVER TAYLOR	No. of samples received	: 21
Order number	: 60431087 1.4	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

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

Outliers : Frequency of Quality Control Samples

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

Outliers : Frequency of Quality Control Samples

Matrix: **WATER**

Quality Control Sample Type / Method	Count QC	Count Regular	Rate (%) Actual	Rate (%) Expected	Quality Control Specification
Laboratory Duplicates (DUP)					
TRH - Semivolatile Fraction	0	3	0.00	10.00	NEPM 2013 Schedule B(3) and ALS QCS3 requirement
Matrix Spikes (MS)					
TRH - Semivolatile Fraction	0	3	0.00	5.00	NEPM 2013 Schedule B(3) and ALS QCS3 requirement

Analysis Holding Time Compliance

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: Date extracted	Due for extraction	Evaluation	Analysis: Date analysed	Due for analysis	Evaluation
EA055: Moisture Content							
Soil Glass Jar - Unpreserved (EA055-103)							
GW20(2.5-2.6), GW25(2.5-2.6)	**12-Oct-2015**	**----**	----	----	**16-Oct-2015**	26-Oct-2015	✓
EP003: Total Organic Carbon (TOC) in Soil							
Pulp Bag (EP003)							
GW20(2.5-2.6), GW25(2.5-2.6)	**12-Oct-2015**	**19-Oct-2015**	09-Nov-2015	✓	**19-Oct-2015**	09-Nov-2015	✓

Matrix: **WATER**

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
EG020T: Total Metals by ICP-MS							
Clear Plastic Bottle - Nitric Acid; Unfiltered (EG020A-T)							
QC01	**12-Oct-2015**	**15-Oct-2015**	09-Apr-2016	✓	**15-Oct-2015**	09-Apr-2016	✓
EG035T: Total Recoverable Mercury by FIMS							
Clear Plastic Bottle - Nitric Acid; Unfiltered (EG035T)							
QC01	**12-Oct-2015**	**----**	----	----	**14-Oct-2015**	09-Nov-2015	✓
EP080/071: Total Petroleum Hydrocarbons							
Amber Glass Bottle - Unpreserved (EP071)							
QC01	**12-Oct-2015**	**13-Oct-2015**	19-Oct-2015	✓	**14-Oct-2015**	22-Nov-2015	✓
EP080/071: Total Petroleum Hydrocarbons							
Amber VOC Vial - Sulfuric Acid (EP080)							
QC01, QC03	**12-Oct-2015**	**15-Oct-2015**	26-Oct-2015	✓	**15-Oct-2015**	26-Oct-2015	✓

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	EA055-103	1	6	**16.67**	**10.00**	✓	NEPM 2013 Schedule B(3) and ALS QCS3 requirement
Total Organic Carbon	EP003	1	2	**50.00**	**10.00**	✓	NEPM 2013 Schedule B(3) and ALS QCS3 requirement
Laboratory Control Samples (LCS)							
Total Organic Carbon	EP003	1	2	**50.00**	**5.00**	✓	NEPM 2013 Schedule B(3) and ALS QCS3 requirement
Method Blanks (MB)							
Total Organic Carbon	EP003	1	2	**50.00**	**5.00**	✓	NEPM 2013 Schedule B(3) and ALS QCS3 requirement

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)							
Total Mercury by FIMS	EG035T	2	16	**12.50**	**10.00**	✓	NEPM 2013 Schedule B(3) and ALS QCS3 requirement
Total Metals by ICP-MS - Suite A	EG020A-T	2	20	**10.00**	**10.00**	✓	NEPM 2013 Schedule B(3) and ALS QCS3 requirement
TRH - Semivolatile Fraction	EP071	0	3	**0.00**	**10.00**	×	NEPM 2013 Schedule B(3) and ALS QCS3 requirement
TRH Volatiles/BTEX	EP080	2	20	**10.00**	**10.00**	✓	NEPM 2013 Schedule B(3) and ALS QCS3 requirement
Laboratory Control Samples (LCS)							
Total Mercury by FIMS	EG035T	1	16	**6.25**	**5.00**	✓	NEPM 2013 Schedule B(3) and ALS QCS3 requirement
Total Metals by ICP-MS - Suite A	EG020A-T	1	20	**5.00**	**5.00**	✓	NEPM 2013 Schedule B(3) and ALS QCS3 requirement
TRH - Semivolatile Fraction	EP071	1	3	**33.33**	**5.00**	✓	NEPM 2013 Schedule B(3) and ALS QCS3 requirement
TRH Volatiles/BTEX	EP080	1	20	**5.00**	**5.00**	✓	NEPM 2013 Schedule B(3) and ALS QCS3 requirement
Method Blanks (MB)							
Total Mercury by FIMS	EG035T	1	16	**6.25**	**5.00**	✓	NEPM 2013 Schedule B(3) and ALS QCS3 requirement
Total Metals by ICP-MS - Suite A	EG020A-T	1	20	**5.00**	**5.00**	✓	NEPM 2013 Schedule B(3) and ALS QCS3 requirement
TRH - Semivolatile Fraction	EP071	1	3	**33.33**	**5.00**	✓	NEPM 2013 Schedule B(3) and ALS QCS3 requirement
TRH Volatiles/BTEX	EP080	1	20	**5.00**	**5.00**	✓	NEPM 2013 Schedule B(3) and ALS QCS3 requirement
Matrix Spikes (MS)							
Total Mercury by FIMS	EG035T	1	16	**6.25**	**5.00**	✓	NEPM 2013 Schedule B(3) and ALS QCS3 requirement
Total Metals by ICP-MS - Suite A	EG020A-T	1	20	**5.00**	**5.00**	✓	NEPM 2013 Schedule B(3) and ALS QCS3 requirement
TRH - Semivolatile Fraction	EP071	0	3	**0.00**	**5.00**	×	NEPM 2013 Schedule B(3) and ALS QCS3 requirement
TRH Volatiles/BTEX	EP080	1	20	**5.00**	**5.00**	✓	NEPM 2013 Schedule B(3) and ALS QCS3 requirement

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	EA055-103	SOIL	In-house. A gravimetric procedure based on weight loss over a 12 hour drying period at 103-105 degrees C. This method is compliant with NEPM (2013) Schedule B(3) Section 7.1 and Table 1 (14 day holding time).
Total Organic Carbon	EP003	SOIL	In-house C-IR17. Dried and pulverised sample is reacted with acid to remove inorganic Carbonates, then combusted in a LECO furnace in the presence of strong oxidants / catalysts. The evolved (Organic) Carbon (as CO2) is automaticaly measured by infra-red detector.
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 (2013) Schedule B(3)
TRH - Semivolatile Fraction	EP071	WATER	USEPA SW 846 - 8015A 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 (2013) Schedule B(3)
TRH Volatiles/BTEX	EP080	WATER	USEPA SW 846 - 8260B 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 (2013) Schedule B(3)

Preparation Methods	Method	Matrix	Method Descriptions
Dry and Pulverise (up to 100g)	GEO30	SOIL	#
Digestion for Total Recoverable Metals	EN25	WATER	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 (2013) Schedule B(3)

SAMPLE RECEIPT NOTIFICATION (SRN)

Work Order	: **EM1515643**		
Client	: **AECOM Australia Pty Ltd**	Laboratory	: Environmental Division Melbourne
Contact	: MS AVERYLL COYNE	Contact	: Carol Walsh
Address	: LEVEL 45, 80 COLLINS STREET MELBOURNE VIC 3004	Address	: 4 Westall Rd Springvale VIC Australia 3171
E-mail	: averyll.coyne@aecom.com	E-mail	: carol.walsh@alsglobal.com
Telephone	: +61 03 9653 1234	Telephone	: +61-3-8549 9608
Facsimile	: +61 03 9654 7117	Facsimile	: +61-3-8549 9601
Project	: 60431087	Page	: 1 of 3
Order number	: ----	Quote number	: EB2015AECOMAU0580 (EN/004/15)
C-O-C number	: ----	QC Level	: NEPM 2013 Schedule B(3) and ALS QCS3 requirement
Site	: Fishermens Bend		
Sampler	: NATHAN JENSEN, OLIVER TAYLOR		

Dates

Date Samples Received	: 13-Oct-2015 11:10 AM	Issue Date	: 13-Oct-2015
Client Requested Due Date	: 21-Oct-2015	Scheduled Reporting Date	: **21-Oct-2015**

Delivery Details

Mode of Delivery	: Carrier	Security Seal	: Intact.
No. of coolers/boxes	: 1	Temperature	: 4.4 - Ice present
Receipt Detail	:	No. of samples received / analysed	: 21 / 4

General Comments

- This report contains the following information:
  - Sample Container(s)/Preservation Non-Compliances
  - Summary of Sample(s) and Requested Analysis
  - Proactive Holding Time Report
  - Requested Deliverables
- **Please direct any queries related to sample condition / numbering / breakages to Client Services.**
- Sample Disposal - Aqueous (14 days), Solid (60 days) from date of completion of work order.
- **Analytical work for this work order will be conducted at ALS Springvale and ALS Brisbane.**
- **Please refer to the Proactive Holding Time Report table below which summarises breaches of recommended holding times that have occurred prior to samples/instructions being received at the laboratory. The absence of this summary table indicates that all samples have been received within the recommended holding times for the analysis requested.**

Sample Container(s)/Preservation Non-Compliances

All comparisons are made against pretreatment/preservation AS, APHA, USEPA standards.

- **No sample container / preservation non-compliance exist.**

Summary of Sample(s) and Requested Analysis

Some items described below may be part of a laboratory process necessary for the execution of client requested tasks. Packages may contain additional analyses, such as the determination of moisture content and preparation tasks, that are included in the package.

Matrix: **SOIL**

Laboratory sample ID	Client sampling date / time	Client sample ID	(On Hold) SOIL No analysis requested	SOIL - EA055-103 Moisture Content	SOIL - EP003 Total Organic Carbon (TOC) in Soil
EM1515643-001	[12-Oct-2015]	GW20(0.0-0.1)	✓		
EM1515643-002	[12-Oct-2015]	GW20(0.5-0.6)	✓		
EM1515643-003	[12-Oct-2015]	GW20(1.0-1.1)	✓		
EM1515643-004	[12-Oct-2015]	GW20(1.5-1.6)	✓		
EM1515643-005	[12-Oct-2015]	GW20(2.0-2.1)	✓		
EM1515643-006	[12-Oct-2015]	GW20(2.5-2.6)		✓	✓
EM1515643-009	[12-Oct-2015]	GW25(0.0-0.1)	✓		
EM1515643-010	[12-Oct-2015]	GW25(0.5-0.6)	✓		
EM1515643-011	[12-Oct-2015]	GW25(1.0-1.1)	✓		
EM1515643-012	[12-Oct-2015]	GW25(1.5-1.6)	✓		
EM1515643-013	[12-Oct-2015]	GW25(2.0-2.1)	✓		
EM1515643-014	[12-Oct-2015]	GW25(2.5-2.6)		✓	✓
EM1515643-015	[12-Oct-2015]	GW25(4.0-4.1)	✓		
EM1515643-016	[12-Oct-2015]	GW25(5.0-5.1)	✓		
EM1515643-017	[12-Oct-2015]	GW26(0.0-0.1)	✓		
EM1515643-018	[12-Oct-2015]	GW26(0.5-0.6)	✓		
EM1515643-019	[12-Oct-2015]	GW26(1.0-1.1)	✓		
EM1515643-020	[12-Oct-2015]	GW26(1.5-1.6)	✓		

Matrix: **WATER**

Laboratory sample ID	Client sampling date / time	Client sample ID	(On Hold) WATER No analysis requested	WATER - W-05T TRH/BTEXN/8 Metals (Total)	WATER - W-18 TRH(C6 - C9)/BTEXN
EM1515643-021	[12-Oct-2015]	QC01		✓	
EM1515643-022	[12-Oct-2015]	QC02	✓		
EM1515643-023	[12-Oct-2015]	QC03			✓

Proactive Holding Time Report

Sample(s) have been received within the recommended holding times for the requested analysis.

Requested Deliverables

AP_CUSTOMER SERVICE ANZ

- A4 - AU Tax Invoice (INV)	Email	AP_CustomerService.ANZ@aecom.com

AVERYLL COYNE

- *AU Certificate of Analysis - NATA (COA)	Email	averyll.coyne@aecom.com
- *AU Interpretive QC Report - DEFAULT (Anon QCI Rep) (QCI)	Email	averyll.coyne@aecom.com
- *AU QC Report - DEFAULT (Anon QC Rep) - NATA (QC)	Email	averyll.coyne@aecom.com
- A4 - AU Sample Receipt Notification - Environmental HT (SRN)	Email	averyll.coyne@aecom.com
- A4 - AU Tax Invoice (INV)	Email	averyll.coyne@aecom.com
- Chain of Custody (CoC) (COC)	Email	averyll.coyne@aecom.com
- EDI Format - ENMRG (ENMRG)	Email	averyll.coyne@aecom.com
- EDI Format - ESDAT (ESDAT)	Email	averyll.coyne@aecom.com
- EDI Format - HLAPro (HLAPro)	Email	averyll.coyne@aecom.com
- EDI Format - XTab (XTAB)	Email	averyll.coyne@aecom.com

Form:

AECOM

Chain of Custody & Analysis Request Form

AECOM - Melbourne
Level 9, 8 Exhibition Street
Melbourne VIC 3000

Tel: 03 9653 8072
Fax: 61 3 9653 1234
Email: averyll.coyne@aecom.com

Laboratory Details

Lab. Name: ALS
Lab. Address: 4 Westall Rd, Springvale
Contact Name:
Lab. Ref:

Tel: 8549 9600
Fax:
Preliminary Report by:
Final Report by:
Lab Quote No:

Project Name: Fishermans Bend

Project Number: 60431087

Purchase Order Number: NA

Sample collected by: Nathan Jensen and Oliver Taylor

Sample Results to be returned to: Averyll Coyne

Environmental Division Melbourne
Work Order Reference
EM1515643

Telephone : +61-3-8549 9600

Specifications:

	(Tick)		
1. Urgent TAT required? (please circle: 24hr 48hr ___3___days)	☐ Yes	☑ No	☐ N/A
2. Fast TAT Guarantee Required?	☐ Yes	☑ No	☐ N/A
3. Is any sediment layer present in waters to be excluded from extractions?	☐ Yes	☑ No	☐ N/A
4. Special storage requirements?	☐ Yes	☑ No	☐ N/A
5. Preservation requirements?	☐ Yes	☑ No	☐ N/A
6. Other requirements? ☐ Fax ☐ Hard copy ☑ Email	☑ Yes	☐ No	☐ N/A
7. Report Format: email with QC reports	8. Project Manager: Averyll Coyne		tel: 9653 8072

Lab. ID	Sample ID	Sampling Date & time (on)	Sampling Date & Time (off)	Matrix: soil	Matrix: water	Matrix: other	Preservation: filt'ed	Preservation: acid	Preservation: ice	Preservation: other	Container (No. & type)	Analysis Request: TOC	Analysis Request: Moisture Content	Remarks
i 1	GW20(0.0-0.1)	12/10/2015		x					x		Jar			Please Hold
2 2	GW20(0.5-0.6)	12/10/2015		x					x		Jar			Please Hold
3 3	GW20(1.0-1.1)	12/10/2015		x					x		Jar			Please Hold
4 4	GW20(1.5-1.6)	12/10/2015	1.0-1.5	x					x		Jar			Please Hold
5 5 NR	GW20(2.0-2.1)	12/10/2015		x					x		Jar	One jar from #13 labelled as #5		Please Hold
6 6	GW20(2.5-2.6)	12/10/2015		x					x		Jar	x	x	
7 NR	GW20(4.0-4.1)	12/10/2015		x					x		Jar			Please Hold
8 NR	GW20(5.0-5.1)	12/10/2015		x					x		Jar			Please Hold
9	GW25(0.0-0.1)	12/10/2015		x					x		Jar			Please Hold
10	GW25(0.5-0.6)	12/10/2015		x					x		Jar			Please Hold
11	GW25(1.0-1.1)	12/10/2015		x					x		Jar			Please Hold
12	GW25(1.5-1.6)	12/10/2015		x					x		Jar			Please Hold
13	GW25(2.0-2.1)	12/10/2015	x2	x					x		Jar			Please Hold
14	GW25(2.5-2.6)	12/10/2015		x					x		Jar	x	x	
15	GW25(4.0-4.1)	12/10/2015		x					x		Jar			Please Hold
16	GW25(5.0-5.1)	12/10/2015		x					x		Jar			Please Hold

Relinquished By:	Received by:			
Name: Nathan Jensen	Date: 13/10/2015	Name:	Date: 13/10	Received in good condition? Yes/No/NA — Method of Shipment
of: AECOM	Time: 9:00	of: ALS	Time: 11:00	Samples received chilled? Yes/No/NA — Consignment Note No. — Yes/No/NA — Transport Co:
Relinquished By:		**Received by:**		Received in good condition? Yes/No/NA — Method of Shipment
Name:	Date:	Name:	Date:	Samples received chilled? Yes/No/NA — Consignment Note No. — Yes/No/NA — Transport Co:
of:	Time:	of:	Time:	

Form:

AECOM

Chain of Custody & Analysis Request Form

AECOM - Melbourne
Level 9, 8 Exhibition Street
Melbourne VIC 3000
Tel: 03 9653 8072
Fax: 61 3 9653 1234
Email: averyll.coyne@aecom.com

Laboratory Details
Lab. Name: ALS
Lab. Address: 4 Westall Rd, Springvale
Contact Name:
Lab. Ref:
Tel: 8549 9600
Fax:
Preliminary Report by:
Final Report by:
Lab Quote No:

Project Name: Fishermans Bend
Project Number: 60431087
Purchase Order Number: NA

Sample collected by: Nathan Jensen and Oliver Taylor
Sample Results to be returned to: Averyll Coyne

Specifications:	(Tick)		
1. Urgent TAT required? (please circle: 24hr 48hr ___3___days)	☐ Yes	☐ No	☐ N/A
2. Fast TAT Guarantee Required?	☐ Yes	☑ No	☐ N/A
3. Is any sediment layer present in waters to be excluded from extractions?	☐ Yes	☑ No	☐ N/A
4. Special storage requirements?	☐ Yes	☑ No	☐ N/A
5. Preservation requirements?	☐ Yes	☑ No	☐ N/A
6. Other requirements? ☐ Fax ☐ Hard copy ☑ Email	☑ Yes	☐ No	☐ N/A
7. Report Format: Email with QC reports	8. Project Manager: Averyll Coyne		tel: 9653 8072

Lab. ID	Sample ID	Sampling Date & time (on)	Sampling Date & Time (off)	Matrix: soil	Matrix: water	Matrix: other	Preservation: filt'ed	Preservation: acid	Preservation: ice	Preservation: other	Container (No. & type)	TOC	Moisture Content	TRH, BTEX, Metals	TRHC6-C9	Remarks & comments
15 17 1 17	GW26(0.0-0.1)	12/10/2015		x					x		Jar					Please Hold
16 18 2 18	GW26(0.5-0.6)	12/10/2015		x					x		Jar					Please Hold
17 19 3 19	GW26(1.0-1.1)	12/10/2015		x					x		Jar					Please Hold
18 20 4 20	GW26(1.5-1.6)	12/10/2015		x					x		Jar					Please Hold
19 21 5 21	QC01	12/10/2015			x						Bottles			x		
20 22 6 22	QC02	12/10/2015			x						Bottles					Please Hold
21 23 7 23	QC03	12/10/2015			x						Bottles				x	
8																
9																
10																
11																
12																
13																
14																
15																
16																

Relinquished By:
Name: Nathan Jensen Date: 13/10/2015
of: AECOM Time: 9:00

Received by:
Name: [illegible] Date: 13/10
of: ALS Time: 11:00

Relinquished By:
Name: Date:
of: Time:

Received by:
Name: Date:
of: Time:

Received in good condition?	Yes/No/NA	Method of Shipment	
Samples received chilled?	Yes/No/NA	Consignment Note No.	
	Yes/No/NA	Transport Co:	
Received in good condition?	Yes/No/NA	Method of Shipment	
Samples received chilled?	Yes/No/NA	Consignment Note No.	
	Yes/No/NA	Transport Co:	

ALS Environmental

CERTIFICATE OF ANALYSIS

Work Order	: **EM1515737**	Page	: 1 of 15
Client	: **AECOM Australia Pty Ltd**	Laboratory	: Environmental Division Melbourne
Contact	: MS AVERYLL COYNE	Contact	: Carsten Emrich
Address	: LEVEL 9 8 EXHIBITION ST MELBOURNE VIC 3000	Address	: 4 Westall Rd Springvale VIC Australia 3171
E-mail	: averyll.coyne@aecom.com	E-mail	: carsten.emrich@alsenviro.com
Telephone	: +61 03 9653 1234	Telephone	: +61 7 3243 7123
Facsimile	: +61 03 9654 7117	Facsimile	: +61-3-8549 9601
Project	: 60431087	QC Level	: NEPM 2013 Schedule B(3) and ALS QCS3 requirement
Order number	: 60431087 1.4	Date Samples Received	: 14-Oct-2015 11:15
C-O-C number	: ----	Date Analysis Commenced	: 15-Oct-2015
Sampler	: NATHAN JENSEN, OLIVER TAYLOR	Issue Date	: 21-Oct-2015 12:17
Site	: Fishermans Bend		
		No. of samples received	: 40
Quote number	: ----	No. of samples analysed	: 8

This report supersedes any previous report(s) with this reference. Results apply to the sample(s) as submitted.

This Certificate of Analysis contains the following information:

- General Comments
- Analytical Results

NATA Accredited Laboratory 825

Accredited for compliance with ISO/IEC 17025.

Signatories

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

Signatories	Position	Accreditation Category
Andrew Epps	Senior Inorganic Chemist	Brisbane Inorganics
Bronwyn Sheen	Client Services Mananger	Melbourne Organics
Dilani Fernando	Senior Inorganic Chemist	Melbourne Inorganics
Eric Chau	Metals Team Leader	Melbourne Inorganics
Nancy Wang	Senior Semivolatile Instrument Chemist	Melbourne Inorganics Melbourne Organics
Satishkumar Trivedi	Acid Sulfate Soils Supervisor	Brisbane Acid Sulphate Soils

General Comments

The analytical procedures used by the Environmental Division have been developed from established internationally recognized procedures such as those published by the USEPA, APHA, AS and NEPM. In house developed procedures are employed in the absence of documented standards or by 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.

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.

- EP075(SIM): (EM1515737_002) Higher than expected matrix spike recovery for (Pyrene) due to sample matrix.
- Benzo(a)pyrene Toxicity Equivalent Quotient (TEQ) 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.

Analytical Results

Sub-Matrix: SOIL (Matrix: SOIL)				Client sample ID	GW21(0.5-0.6)	GW21(2.8-2.9)	GW22(2.5-2.6)	GW27(0.5-0.6)	GW30(3.5-3.6)
				Client sampling date / time	[13-Oct-2015]	[13-Oct-2015]	[13-Oct-2015]	[13-Oct-2015]	[13-Oct-2015]
Compound	CAS Number	LOR	Unit		EM1515737-002	EM1515737-007	EM1515737-015	EM1515737-023	EM1515737-030
					Result	Result	Result	Result	Result
EA055: Moisture Content									
^ Moisture Content (dried @ 103°C)	----	1	%		14.0	16.8	18.7	15.4	23.4
EG005T: Total Metals by ICP-AES									
Aluminium	7429-90-5	50	mg/kg		2030	----	----	10000	----
Iron	7439-89-6	50	mg/kg		4290	----	----	29900	----
Selenium	7782-49-2	5	mg/kg		<5	----	----	<5	----
Arsenic	7440-38-2	5	mg/kg		<5	----	----	10	----
Cadmium	7440-43-9	1	mg/kg		<1	----	----	4	----
Chromium	7440-47-3	2	mg/kg		5	----	----	38	----
Copper	7440-50-8	5	mg/kg		6	----	----	171	----
Lead	7439-92-1	5	mg/kg		24	----	----	396	----
Nickel	7440-02-0	2	mg/kg		5	----	----	63	----
Zinc	7440-66-6	5	mg/kg		36	----	----	3060	----
EG035T: Total Recoverable Mercury by FIMS									
Mercury	7439-97-6	0.1	mg/kg		<0.1	----	----	1.6	----
EP003: Total Organic Carbon (TOC) in Soil									
Total Organic Carbon	----	0.02	%		----	0.05	0.12	----	0.22
EP074A: Monocyclic Aromatic Hydrocarbons									
Styrene	100-42-5	0.5	mg/kg		<0.5	----	----	<0.5	----
Isopropylbenzene	98-82-8	0.5	mg/kg		<0.5	----	----	<0.5	----
n-Propylbenzene	103-65-1	0.5	mg/kg		<0.5	----	----	<0.5	----
1.3.5-Trimethylbenzene	108-67-8	0.5	mg/kg		<0.5	----	----	<0.5	----
sec-Butylbenzene	135-98-8	0.5	mg/kg		<0.5	----	----	<0.5	----
1.2.4-Trimethylbenzene	95-63-6	0.5	mg/kg		<0.5	----	----	<0.5	----
tert-Butylbenzene	98-06-6	0.5	mg/kg		<0.5	----	----	<0.5	----
p-Isopropyltoluene	99-87-6	0.5	mg/kg		<0.5	----	----	<0.5	----
n-Butylbenzene	104-51-8	0.5	mg/kg		<0.5	----	----	<0.5	----
EP074B: Oxygenated Compounds									
Vinyl Acetate	108-05-4	5	mg/kg		<5	----	----	<5	----
2-Butanone (MEK)	78-93-3	5	mg/kg		<5	----	----	<5	----
4-Methyl-2-pentanone (MIBK)	108-10-1	5	mg/kg		<5	----	----	<5	----
2-Hexanone (MBK)	591-78-6	5	mg/kg		<5	----	----	<5	----
EP074C: Sulfonated Compounds									
Carbon disulfide	75-15-0	0.5	mg/kg		<0.5	----	----	<0.5	----
EP074D: Fumigants									

Analytical Results

Sub-Matrix: SOIL (Matrix: SOIL)				Client sample ID	GW21(0.5-0.6)	GW21(2.8-2.9)	GW22(2.5-2.6)	GW27(0.5-0.6)	GW30(3.5-3.6)
				Client sampling date / time	[13-Oct-2015]	[13-Oct-2015]	[13-Oct-2015]	[13-Oct-2015]	[13-Oct-2015]
Compound	CAS Number	LOR	Unit		EM1515737-002	EM1515737-007	EM1515737-015	EM1515737-023	EM1515737-030
					Result	Result	Result	Result	Result
EP074D: Fumigants - Continued									
2.2-Dichloropropane	594-20-7	0.5	mg/kg		<0.5	----	----	<0.5	----
1.2-Dichloropropane	78-87-5	0.5	mg/kg		<0.5	----	----	<0.5	----
cis-1.3-Dichloropropylene	10061-01-5	0.5	mg/kg		<0.5	----	----	<0.5	----
trans-1.3-Dichloropropylene	10061-02-6	0.5	mg/kg		<0.5	----	----	<0.5	----
1.2-Dibromoethane (EDB)	106-93-4	0.5	mg/kg		<0.5	----	----	<0.5	----
EP074E: Halogenated Aliphatic Compounds									
Dichlorodifluoromethane	75-71-8	5	mg/kg		<5	----	----	<5	----
Chloromethane	74-87-3	5	mg/kg		<5	----	----	<5	----
Vinyl chloride	75-01-4	5	mg/kg		<5	----	----	<5	----
Bromomethane	74-83-9	5	mg/kg		<5	----	----	<5	----
Chloroethane	75-00-3	5	mg/kg		<5	----	----	<5	----
Trichlorofluoromethane	75-69-4	5	mg/kg		<5	----	----	<5	----
1.1-Dichloroethene	75-35-4	0.5	mg/kg		<0.5	----	----	<0.5	----
Iodomethane	74-88-4	0.5	mg/kg		<0.5	----	----	<0.5	----
trans-1.2-Dichloroethene	156-60-5	0.5	mg/kg		<0.5	----	----	<0.5	----
1.1-Dichloroethane	75-34-3	0.5	mg/kg		<0.5	----	----	<0.5	----
cis-1.2-Dichloroethene	156-59-2	0.5	mg/kg		<0.5	----	----	<0.5	----
1.1.1-Trichloroethane	71-55-6	0.5	mg/kg		<0.5	----	----	<0.5	----
1.1-Dichloropropylene	563-58-6	0.5	mg/kg		<0.5	----	----	<0.5	----
Carbon Tetrachloride	56-23-5	0.5	mg/kg		<0.5	----	----	<0.5	----
1.2-Dichloroethane	107-06-2	0.5	mg/kg		<0.5	----	----	<0.5	----
Trichloroethene	79-01-6	0.5	mg/kg		<0.5	----	----	<0.5	----
Dibromomethane	74-95-3	0.5	mg/kg		<0.5	----	----	<0.5	----
1.1.2-Trichloroethane	79-00-5	0.5	mg/kg		<0.5	----	----	<0.5	----
1.3-Dichloropropane	142-28-9	0.5	mg/kg		<0.5	----	----	<0.5	----
Tetrachloroethene	127-18-4	0.5	mg/kg		<0.5	----	----	<0.5	----
1.1.1.2-Tetrachloroethane	630-20-6	0.5	mg/kg		<0.5	----	----	<0.5	----
trans-1.4-Dichloro-2-butene	110-57-6	0.5	mg/kg		<0.5	----	----	<0.5	----
cis-1.4-Dichloro-2-butene	1476-11-5	0.5	mg/kg		<0.5	----	----	<0.5	----
1.1.2.2-Tetrachloroethane	79-34-5	0.5	mg/kg		<0.5	----	----	<0.5	----
1.2.3-Trichloropropane	96-18-4	0.5	mg/kg		<0.5	----	----	<0.5	----
Pentachloroethane	76-01-7	0.5	mg/kg		<0.5	----	----	<0.5	----
1.2-Dibromo-3-chloropropane	96-12-8	0.5	mg/kg		<0.5	----	----	<0.5	----
Hexachlorobutadiene	87-68-3	0.5	mg/kg		<0.5	----	----	<0.5	----

Analytical Results

Sub-Matrix: SOIL (Matrix: SOIL)				Client sample ID	GW21(0.5-0.6)	GW21(2.8-2.9)	GW22(2.5-2.6)	GW27(0.5-0.6)	GW30(3.5-3.6)
				Client sampling date / time	[13-Oct-2015]	[13-Oct-2015]	[13-Oct-2015]	[13-Oct-2015]	[13-Oct-2015]
Compound	CAS Number	LOR	Unit		EM1515737-002	EM1515737-007	EM1515737-015	EM1515737-023	EM1515737-030
					Result	Result	Result	Result	Result
EP074F: Halogenated Aromatic Compounds									
Chlorobenzene	108-90-7	0.5	mg/kg		<0.5	----	----	<0.5	----
Bromobenzene	108-86-1	0.5	mg/kg		<0.5	----	----	<0.5	----
2-Chlorotoluene	95-49-8	0.5	mg/kg		<0.5	----	----	<0.5	----
4-Chlorotoluene	106-43-4	0.5	mg/kg		<0.5	----	----	<0.5	----
1.3-Dichlorobenzene	541-73-1	0.5	mg/kg		<0.5	----	----	<0.5	----
1.4-Dichlorobenzene	106-46-7	0.5	mg/kg		<0.5	----	----	<0.5	----
1.2-Dichlorobenzene	95-50-1	0.5	mg/kg		<0.5	----	----	<0.5	----
1.2.4-Trichlorobenzene	120-82-1	0.5	mg/kg		<0.5	----	----	<0.5	----
1.2.3-Trichlorobenzene	87-61-6	0.5	mg/kg		<0.5	----	----	<0.5	----
EP074G: Trihalomethanes									
Chloroform	67-66-3	0.5	mg/kg		<0.5	----	----	<0.5	----
Bromodichloromethane	75-27-4	0.5	mg/kg		<0.5	----	----	<0.5	----
Dibromochloromethane	124-48-1	0.5	mg/kg		<0.5	----	----	<0.5	----
Bromoform	75-25-2	0.5	mg/kg		<0.5	----	----	<0.5	----
EP075(SIM)B: Polynuclear Aromatic Hydrocarbons									
Naphthalene	91-20-3	0.5	mg/kg		<0.5	----	----	**0.6**	----
Acenaphthylene	208-96-8	0.5	mg/kg		<0.5	----	----	**1.2**	----
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		**1.4**	----	----	**5.2**	----
Anthracene	120-12-7	0.5	mg/kg		<0.5	----	----	**2.2**	----
Fluoranthene	206-44-0	0.5	mg/kg		**2.8**	----	----	**10.5**	----
Pyrene	129-00-0	0.5	mg/kg		**2.5**	----	----	**11.3**	----
Benz(a)anthracene	56-55-3	0.5	mg/kg		**1.2**	----	----	**5.8**	----
Chrysene	218-01-9	0.5	mg/kg		**1.0**	----	----	**5.7**	----
Benzo(b+j)fluoranthene	205-99-2 205-82-3	0.5	mg/kg		**1.3**	----	----	**9.4**	----
Benzo(k)fluoranthene	207-08-9	0.5	mg/kg		**0.5**	----	----	**2.9**	----
Benzo(a)pyrene	50-32-8	0.5	mg/kg		**1.0**	----	----	**7.1**	----
Indeno(1.2.3.cd)pyrene	193-39-5	0.5	mg/kg		**0.5**	----	----	**4.5**	----
Dibenz(a.h)anthracene	53-70-3	0.5	mg/kg		<0.5	----	----	**1.7**	----
Benzo(g.h.i)perylene	191-24-2	0.5	mg/kg		**0.6**	----	----	**5.2**	----
^ Sum of polycyclic aromatic hydrocarbons	----	0.5	mg/kg		**12.8**	----	----	**73.3**	----
^ Benzo(a)pyrene TEQ (zero)	----	0.5	mg/kg		**1.4**	----	----	**11.2**	----
^ Benzo(a)pyrene TEQ (half LOR)	----	0.5	mg/kg		**1.6**	----	----	**11.2**	----

Analytical Results

Sub-Matrix: SOIL (Matrix: SOIL)				Client sample ID	GW21(0.5-0.6)	GW21(2.8-2.9)	GW22(2.5-2.6)	GW27(0.5-0.6)	GW30(3.5-3.6)
				Client sampling date / time	[13-Oct-2015]	[13-Oct-2015]	[13-Oct-2015]	[13-Oct-2015]	[13-Oct-2015]
Compound	CAS Number	LOR	Unit		EM1515737-002	EM1515737-007	EM1515737-015	EM1515737-023	EM1515737-030
					Result	Result	Result	Result	Result
EP075(SIM)B: Polynuclear Aromatic Hydrocarbons - Continued									
^ Benzo(a)pyrene TEQ (LOR)	----	0.5	mg/kg		**1.9**	----	----	**11.2**	----
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	----	----	**570**	----
C29 - C36 Fraction	----	100	mg/kg		<100	----	----	**430**	----
^ C10 - C36 Fraction (sum)	----	50	mg/kg		<50	----	----	**1000**	----
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	>C10_C16	50	mg/kg		<50	----	----	**70**	----
>C16 - C34 Fraction	----	100	mg/kg		<100	----	----	**910**	----
>C34 - C40 Fraction	----	100	mg/kg		<100	----	----	**180**	----
^ >C10 - C40 Fraction (sum)	----	50	mg/kg		<50	----	----	**1160**	----
^ >C10 - C16 Fraction minus Naphthalene (F2)	----	50	mg/kg		<50	----	----	**70**	----
EP080: BTEXN									
Benzene	71-43-2	0.2	mg/kg		<0.2	----	----	<0.2	----
Toluene	108-88-3	0.5	mg/kg		<0.5	----	----	<0.5	----
Ethylbenzene	100-41-4	0.5	mg/kg		<0.5	----	----	<0.5	----
meta- & para-Xylene	108-38-3 106-42-3	0.5	mg/kg		<0.5	----	----	<0.5	----
ortho-Xylene	95-47-6	0.5	mg/kg		<0.5	----	----	<0.5	----
^ Sum of BTEX	----	0.2	mg/kg		<0.2	----	----	<0.2	----
^ Total Xylenes	1330-20-7	0.5	mg/kg		<0.5	----	----	<0.5	----
Naphthalene	91-20-3	1	mg/kg		<1	----	----	<1	----
EP074S: VOC Surrogates									
1.2-Dichloroethane-D4	17060-07-0	0.5	%		**86.0**	----	----	**82.1**	----
Toluene-D8	2037-26-5	0.5	%		**87.2**	----	----	**79.9**	----
4-Bromofluorobenzene	460-00-4	0.5	%		**87.1**	----	----	**80.9**	----
EP075(SIM)S: Phenolic Compound Surrogates									
Phenol-d6	13127-88-3	0.5	%		**93.4**	----	----	**78.6**	----
2-Chlorophenol-D4	93951-73-6	0.5	%		**97.5**	----	----	**84.5**	----
2.4.6-Tribromophenol	118-79-6	0.5	%		**76.7**	----	----	**92.8**	----

Analytical Results

Sub-Matrix: SOIL (Matrix: SOIL)				Client sample ID	GW21(0.5-0.6)	GW21(2.8-2.9)	GW22(2.5-2.6)	GW27(0.5-0.6)	GW30(3.5-3.6)
				Client sampling date / time	[13-Oct-2015]	[13-Oct-2015]	[13-Oct-2015]	[13-Oct-2015]	[13-Oct-2015]
Compound	CAS Number	LOR	Unit		EM1515737-002	EM1515737-007	EM1515737-015	EM1515737-023	EM1515737-030
					Result	Result	Result	Result	Result
EP075(SIM)T: PAH Surrogates									
2-Fluorobiphenyl	321-60-8	0.5	%		**104**	**----**	**----**	**117**	**----**
Anthracene-d10	1719-06-8	0.5	%		**113**	**----**	**----**	**108**	**----**
4-Terphenyl-d14	1718-51-0	0.5	%		**107**	**----**	**----**	**98.4**	**----**
EP080S: TPH(V)/BTEX Surrogates									
1.2-Dichloroethane-D4	17060-07-0	0.2	%		**79.1**	**----**	**----**	**78.3**	**----**
Toluene-D8	2037-26-5	0.2	%		**77.5**	**----**	**----**	**71.9**	**----**
4-Bromofluorobenzene	460-00-4	0.2	%		**85.3**	**----**	**----**	**83.0**	**----**

Analytical Results

Sub-Matrix: SOIL (Matrix: SOIL)			Client sample ID	GW26(3.0-3.1)	----	----	----	----
			Client sampling date / time	[13-Oct-2015]	----	----	----	----
Compound	CAS Number	LOR	Unit	EM1515737-035	--------	--------	--------	--------
				Result	Result	Result	Result	Result
EA055: Moisture Content								
^ Moisture Content (dried @ 103°C)	----	1	%	18.8	----	----	----	----
EG005T: Total Metals by ICP-AES								
Aluminium	7429-90-5	50	mg/kg	----	----	----	----	----
Iron	7439-89-6	50	mg/kg	----	----	----	----	----
Selenium	7782-49-2	5	mg/kg	----	----	----	----	----
Arsenic	7440-38-2	5	mg/kg	----	----	----	----	----
Cadmium	7440-43-9	1	mg/kg	----	----	----	----	----
Chromium	7440-47-3	2	mg/kg	----	----	----	----	----
Copper	7440-50-8	5	mg/kg	----	----	----	----	----
Lead	7439-92-1	5	mg/kg	----	----	----	----	----
Nickel	7440-02-0	2	mg/kg	----	----	----	----	----
Zinc	7440-66-6	5	mg/kg	----	----	----	----	----
EG035T: Total Recoverable Mercury by FIMS								
Mercury	7439-97-6	0.1	mg/kg	----	----	----	----	----
EP003: Total Organic Carbon (TOC) in Soil								
Total Organic Carbon	----	0.02	%	0.12	----	----	----	----
EP074A: Monocyclic Aromatic Hydrocarbons								
Styrene	100-42-5	0.5	mg/kg	----	----	----	----	----
Isopropylbenzene	98-82-8	0.5	mg/kg	----	----	----	----	----
n-Propylbenzene	103-65-1	0.5	mg/kg	----	----	----	----	----
1.3.5-Trimethylbenzene	108-67-8	0.5	mg/kg	----	----	----	----	----
sec-Butylbenzene	135-98-8	0.5	mg/kg	----	----	----	----	----
1.2.4-Trimethylbenzene	95-63-6	0.5	mg/kg	----	----	----	----	----
tert-Butylbenzene	98-06-6	0.5	mg/kg	----	----	----	----	----
p-Isopropyltoluene	99-87-6	0.5	mg/kg	----	----	----	----	----
n-Butylbenzene	104-51-8	0.5	mg/kg	----	----	----	----	----
EP074B: Oxygenated Compounds								
Vinyl Acetate	108-05-4	5	mg/kg	----	----	----	----	----
2-Butanone (MEK)	78-93-3	5	mg/kg	----	----	----	----	----
4-Methyl-2-pentanone (MIBK)	108-10-1	5	mg/kg	----	----	----	----	----
2-Hexanone (MBK)	591-78-6	5	mg/kg	----	----	----	----	----
EP074C: Sulfonated Compounds								
Carbon disulfide	75-15-0	0.5	mg/kg	----	----	----	----	----
EP074D: Fumigants								

Analytical Results

Sub-Matrix: SOIL (Matrix: SOIL)			Client sample ID	GW26(3.0-3.1)	----	----	----	----
			Client sampling date / time	[13-Oct-2015]	----	----	----	----
Compound	CAS Number	LOR	Unit	EM1515737-035	--------	--------	--------	--------
				Result	Result	Result	Result	Result
EP074D: Fumigants - Continued								
2.2-Dichloropropane	594-20-7	0.5	mg/kg	----	----	----	----	----
1.2-Dichloropropane	78-87-5	0.5	mg/kg	----	----	----	----	----
cis-1.3-Dichloropropylene	10061-01-5	0.5	mg/kg	----	----	----	----	----
trans-1.3-Dichloropropylene	10061-02-6	0.5	mg/kg	----	----	----	----	----
1.2-Dibromoethane (EDB)	106-93-4	0.5	mg/kg	----	----	----	----	----
EP074E: Halogenated Aliphatic Compounds								
Dichlorodifluoromethane	75-71-8	5	mg/kg	----	----	----	----	----
Chloromethane	74-87-3	5	mg/kg	----	----	----	----	----
Vinyl chloride	75-01-4	5	mg/kg	----	----	----	----	----
Bromomethane	74-83-9	5	mg/kg	----	----	----	----	----
Chloroethane	75-00-3	5	mg/kg	----	----	----	----	----
Trichlorofluoromethane	75-69-4	5	mg/kg	----	----	----	----	----
1.1-Dichloroethene	75-35-4	0.5	mg/kg	----	----	----	----	----
Iodomethane	74-88-4	0.5	mg/kg	----	----	----	----	----
trans-1.2-Dichloroethene	156-60-5	0.5	mg/kg	----	----	----	----	----
1.1-Dichloroethane	75-34-3	0.5	mg/kg	----	----	----	----	----
cis-1.2-Dichloroethene	156-59-2	0.5	mg/kg	----	----	----	----	----
1.1.1-Trichloroethane	71-55-6	0.5	mg/kg	----	----	----	----	----
1.1-Dichloropropylene	563-58-6	0.5	mg/kg	----	----	----	----	----
Carbon Tetrachloride	56-23-5	0.5	mg/kg	----	----	----	----	----
1.2-Dichloroethane	107-06-2	0.5	mg/kg	----	----	----	----	----
Trichloroethene	79-01-6	0.5	mg/kg	----	----	----	----	----
Dibromomethane	74-95-3	0.5	mg/kg	----	----	----	----	----
1.1.2-Trichloroethane	79-00-5	0.5	mg/kg	----	----	----	----	----
1.3-Dichloropropane	142-28-9	0.5	mg/kg	----	----	----	----	----
Tetrachloroethene	127-18-4	0.5	mg/kg	----	----	----	----	----
1.1.1.2-Tetrachloroethane	630-20-6	0.5	mg/kg	----	----	----	----	----
trans-1.4-Dichloro-2-butene	110-57-6	0.5	mg/kg	----	----	----	----	----
cis-1.4-Dichloro-2-butene	1476-11-5	0.5	mg/kg	----	----	----	----	----
1.1.2.2-Tetrachloroethane	79-34-5	0.5	mg/kg	----	----	----	----	----
1.2.3-Trichloropropane	96-18-4	0.5	mg/kg	----	----	----	----	----
Pentachloroethane	76-01-7	0.5	mg/kg	----	----	----	----	----
1.2-Dibromo-3-chloropropane	96-12-8	0.5	mg/kg	----	----	----	----	----
Hexachlorobutadiene	87-68-3	0.5	mg/kg	----	----	----	----	----

Analytical Results

Sub-Matrix: SOIL (Matrix: SOIL)				Client sample ID	GW26(3.0-3.1)	----	----	----	----
				Client sampling date / time	[13-Oct-2015]	----	----	----	----
Compound	CAS Number	LOR	Unit		EM1515737-035	--------	--------	--------	--------
					Result	Result	Result	Result	Result
EP074F: Halogenated Aromatic Compounds									
Chlorobenzene	108-90-7	0.5	mg/kg		----	----	----	----	----
Bromobenzene	108-86-1	0.5	mg/kg		----	----	----	----	----
2-Chlorotoluene	95-49-8	0.5	mg/kg		----	----	----	----	----
4-Chlorotoluene	106-43-4	0.5	mg/kg		----	----	----	----	----
1.3-Dichlorobenzene	541-73-1	0.5	mg/kg		----	----	----	----	----
1.4-Dichlorobenzene	106-46-7	0.5	mg/kg		----	----	----	----	----
1.2-Dichlorobenzene	95-50-1	0.5	mg/kg		----	----	----	----	----
1.2.4-Trichlorobenzene	120-82-1	0.5	mg/kg		----	----	----	----	----
1.2.3-Trichlorobenzene	87-61-6	0.5	mg/kg		----	----	----	----	----
EP074G: Trihalomethanes									
Chloroform	67-66-3	0.5	mg/kg		----	----	----	----	----
Bromodichloromethane	75-27-4	0.5	mg/kg		----	----	----	----	----
Dibromochloromethane	124-48-1	0.5	mg/kg		----	----	----	----	----
Bromoform	75-25-2	0.5	mg/kg		----	----	----	----	----
EP075(SIM)B: Polynuclear Aromatic Hydrocarbons									
Naphthalene	91-20-3	0.5	mg/kg		----	----	----	----	----
Acenaphthylene	208-96-8	0.5	mg/kg		----	----	----	----	----
Acenaphthene	83-32-9	0.5	mg/kg		----	----	----	----	----
Fluorene	86-73-7	0.5	mg/kg		----	----	----	----	----
Phenanthrene	85-01-8	0.5	mg/kg		----	----	----	----	----
Anthracene	120-12-7	0.5	mg/kg		----	----	----	----	----
Fluoranthene	206-44-0	0.5	mg/kg		----	----	----	----	----
Pyrene	129-00-0	0.5	mg/kg		----	----	----	----	----
Benz(a)anthracene	56-55-3	0.5	mg/kg		----	----	----	----	----
Chrysene	218-01-9	0.5	mg/kg		----	----	----	----	----
Benzo(b+j)fluoranthene	205-99-2 205-82-3	0.5	mg/kg		----	----	----	----	----
Benzo(k)fluoranthene	207-08-9	0.5	mg/kg		----	----	----	----	----
Benzo(a)pyrene	50-32-8	0.5	mg/kg		----	----	----	----	----
Indeno(1.2.3.cd)pyrene	193-39-5	0.5	mg/kg		----	----	----	----	----
Dibenz(a.h)anthracene	53-70-3	0.5	mg/kg		----	----	----	----	----
Benzo(g.h.i)perylene	191-24-2	0.5	mg/kg		----	----	----	----	----
^ Sum of polycyclic aromatic hydrocarbons	----	0.5	mg/kg		----	----	----	----	----
^ Benzo(a)pyrene TEQ (zero)	----	0.5	mg/kg		----	----	----	----	----
^ Benzo(a)pyrene TEQ (half LOR)	----	0.5	mg/kg		----	----	----	----	----

Analytical Results

Sub-Matrix: SOIL (Matrix: SOIL)				Client sample ID	GW26(3.0-3.1)	----	----	----	----
				Client sampling date / time	[13-Oct-2015]	----	----	----	----
Compound	CAS Number	LOR	Unit		EM1515737-035	--------	--------	--------	--------
					Result	Result	Result	Result	Result
EP075(SIM)B: Polynuclear Aromatic Hydrocarbons - Continued									
^ Benzo(a)pyrene TEQ (LOR)	----	0.5	mg/kg		----	----	----	----	----
EP080/071: Total Petroleum Hydrocarbons									
C6 - C9 Fraction	----	10	mg/kg		----	----	----	----	----
C10 - C14 Fraction	----	50	mg/kg		----	----	----	----	----
C15 - C28 Fraction	----	100	mg/kg		----	----	----	----	----
C29 - C36 Fraction	----	100	mg/kg		----	----	----	----	----
^ C10 - C36 Fraction (sum)	----	50	mg/kg		----	----	----	----	----
EP080/071: Total Recoverable Hydrocarbons - NEPM 2013 Fractions									
C6 - C10 Fraction	C6_C10	10	mg/kg		----	----	----	----	----
^ C6 - C10 Fraction minus BTEX (F1)	C6_C10-BTEX	10	mg/kg		----	----	----	----	----
>C10 - C16 Fraction	>C10_C16	50	mg/kg		----	----	----	----	----
>C16 - C34 Fraction	----	100	mg/kg		----	----	----	----	----
>C34 - C40 Fraction	----	100	mg/kg		----	----	----	----	----
^ >C10 - C40 Fraction (sum)	----	50	mg/kg		----	----	----	----	----
^ >C10 - C16 Fraction minus Naphthalene (F2)	----	50	mg/kg		----	----	----	----	----
EP080: BTEXN									
Benzene	71-43-2	0.2	mg/kg		----	----	----	----	----
Toluene	108-88-3	0.5	mg/kg		----	----	----	----	----
Ethylbenzene	100-41-4	0.5	mg/kg		----	----	----	----	----
meta- & para-Xylene	108-38-3 106-42-3	0.5	mg/kg		----	----	----	----	----
ortho-Xylene	95-47-6	0.5	mg/kg		----	----	----	----	----
^ Sum of BTEX	----	0.2	mg/kg		----	----	----	----	----
^ Total Xylenes	1330-20-7	0.5	mg/kg		----	----	----	----	----
Naphthalene	91-20-3	1	mg/kg		----	----	----	----	----
EP074S: VOC Surrogates									
1.2-Dichloroethane-D4	17060-07-0	0.5	%		----	----	----	----	----
Toluene-D8	2037-26-5	0.5	%		----	----	----	----	----
4-Bromofluorobenzene	460-00-4	0.5	%		----	----	----	----	----
EP075(SIM)S: Phenolic Compound Surrogates									
Phenol-d6	13127-88-3	0.5	%		----	----	----	----	----
2-Chlorophenol-D4	93951-73-6	0.5	%		----	----	----	----	----
2.4.6-Tribromophenol	118-79-6	0.5	%		----	----	----	----	----

Analytical Results

Sub-Matrix: SOIL (Matrix: SOIL)				Client sample ID	GW26(3.0-3.1)	----	----	----	----
				Client sampling date / time	[13-Oct-2015]	----	----	----	----
Compound	CAS Number	LOR	Unit		EM1515737-035	--------	--------	--------	--------
					Result	Result	Result	Result	Result
EP075(SIM)T: PAH Surrogates									
2-Fluorobiphenyl	321-60-8	0.5	%		----	----	----	----	----
Anthracene-d10	1719-06-8	0.5	%		----	----	----	----	----
4-Terphenyl-d14	1718-51-0	0.5	%		----	----	----	----	----
EP080S: TPH(V)/BTEX Surrogates									
1.2-Dichloroethane-D4	17060-07-0	0.2	%		----	----	----	----	----
Toluene-D8	2037-26-5	0.2	%		----	----	----	----	----
4-Bromofluorobenzene	460-00-4	0.2	%		----	----	----	----	----

Analytical Results

Sub-Matrix: WATER (Matrix: WATER)			Client sample ID	QC04	QC05	----	----	----
			Client sampling date / time	[13-Oct-2015]	[13-Oct-2015]	----	----	----
Compound	CAS Number	LOR	Unit	EM1515737-038	EM1515737-039	--------	--------	--------
				Result	Result	Result	Result	Result
EG020T: Total Metals by ICP-MS								
Aluminium	7429-90-5	0.01	mg/L	<0.01	----	----	----	----
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	----	----	----	----
Nickel	7440-02-0	0.001	mg/L	<0.001	----	----	----	----
Lead	7439-92-1	0.001	mg/L	<0.001	----	----	----	----
Zinc	7440-66-6	0.005	mg/L	<0.005	----	----	----	----
Selenium	7782-49-2	0.01	mg/L	<0.01	----	----	----	----
Iron	7439-89-6	0.05	mg/L	<0.05	----	----	----	----
EG035T: Total Recoverable Mercury by FIMS								
Mercury	7439-97-6	0.0001	mg/L	<0.0001	----	----	----	----
EP080/071: Total Petroleum Hydrocarbons								
C6 - C9 Fraction	----	20	µg/L	<20	<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	<20	----	----	----
^ C6 - C10 Fraction minus BTEX (F1)	C6_C10-BTEX	20	µg/L	<20	<20	----	----	----
>C10 - C16 Fraction	>C10_C16	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	<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	----	----	----

Analytical Results

Sub-Matrix: WATER (Matrix: WATER)				Client sample ID	QC04	QC05	----	----	----
				Client sampling date / time	[13-Oct-2015]	[13-Oct-2015]	----	----	----
Compound	CAS Number	LOR	Unit		EM1515737-038	EM1515737-039	--------	--------	--------
					Result	Result	Result	Result	Result
EP080: BTEXN - Continued									
^ **Total Xylenes**	1330-20-7	2	µg/L		<2	<2	----	----	----
^ **Sum of BTEX**	----	1	µg/L		<1	<1	----	----	----
Naphthalene	91-20-3	5	µg/L		<5	<5	----	----	----
EP080S: TPH(V)/BTEX Surrogates									
1.2-Dichloroethane-D4	17060-07-0	2	%		**105**	**93.4**	----	----	----
Toluene-D8	2037-26-5	2	%		**95.7**	**100**	----	----	----
4-Bromofluorobenzene	460-00-4	2	%		**92.4**	**107**	----	----	----

ALS Environmental

QUALITY CONTROL REPORT

Work Order	: **EM1515737**	Page	: 1 of 23
Client	: **AECOM Australia Pty Ltd**	Laboratory	: Environmental Division Melbourne
Contact	: MS AVERYLL COYNE	Contact	: Carsten Emrich
Address	: LEVEL 9 8 EXHIBITION ST MELBOURNE VIC 3000	Address	: 4 Westall Rd Springvale VIC Australia 3171
E-mail	: averyll.coyne@aecom.com	E-mail	: carsten.emrich@alsenviro.com
Telephone	: +61 03 9653 1234	Telephone	: +61 7 3243 7123
Facsimile	: +61 03 9654 7117	Facsimile	: +61-3-8549 9601
Project	: 60431087	QC Level	: NEPM 2013 Schedule B(3) and ALS QCS3 requirement
Order number	: 60431087 1.4	Date Samples Received	: 14-Oct-2015
C-O-C number	: ----	Date Analysis Commenced	: 15-Oct-2015
Sampler	: NATHAN JENSEN, OLIVER TAYLOR	Issue Date	: 21-Oct-2015
Site	: Fishermans Bend	No. of samples received	: 40
Quote number	: ----	No. of samples analysed	: 8

This report supersedes any previous report(s) with this reference. Results apply to the sample(s) as submitted.

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

General Comments

The analytical procedures used by the Environmental Division have been developed from established internationally recognized procedures such as those published by the USEPA, APHA, AS and NEPM. In house developed procedures are employed in the absence of documented standards or by 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

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

NATA Accredited Laboratory 825

Accredited for compliance with ISO/IEC 17025.

Signatories

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

Signatories	Position	Accreditation Category
Andrew Epps	Senior Inorganic Chemist	Brisbane Inorganics
Bronwyn Sheen	Client Services Mananger	Melbourne Organics
Dilani Fernando	Senior Inorganic Chemist	Melbourne Inorganics
Eric Chau	Metals Team Leader	Melbourne Inorganics
Nancy Wang	Senior Semivolatile Instrument Chemist	Melbourne Inorganics
		Melbourne Organics
Satishkumar Trivedi	Acid Sulfate Soils Supervisor	Brisbane Acid Sulphate Soils

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	*Client sample ID*	*Method: Compound*	*CAS Number*	*LOR*	*Unit*	*Original Result*	*Duplicate Result*	*RPD (%)*	*Recovery Limits (%)*
EA055: Moisture Content (QC Lot: 244359)									
EM1515727-007	Anonymous	EA055-103: Moisture Content (dried @ 103°C)	----	1	%	27.2	26.9	1.25	0% - 20%
EM1515740-002	Anonymous	EA055-103: Moisture Content (dried @ 103°C)	----	1	%	44.1	45.7	3.60	0% - 20%
EA055: Moisture Content (QC Lot: 245264)									
EM1515643-006	Anonymous	EA055-103: Moisture Content (dried @ 103°C)	----	1	%	15.8	15.8	0.00	0% - 50%
EA055: Moisture Content (QC Lot: 245676)									
EM1515737-023	GW27(0.5-0.6)	EA055-103: Moisture Content (dried @ 103°C)	----	1	%	15.4	17.2	10.9	0% - 50%
EM1515840-009	Anonymous	EA055-103: Moisture Content (dried @ 103°C)	----	1	%	12.2	13.4	9.41	0% - 50%
EG005T: Total Metals by ICP-AES (QC Lot: 244710)									
EM1515727-009	Anonymous	EG005T: Cadmium	7440-43-9	1	mg/kg	<1	<1	0.00	No Limit
		EG005T: Chromium	7440-47-3	2	mg/kg	20	32	46.7	0% - 50%
		EG005T: Nickel	7440-02-0	2	mg/kg	10	8	19.7	No Limit
		EG005T: Arsenic	7440-38-2	5	mg/kg	<5	<5	0.00	No Limit
		EG005T: Copper	7440-50-8	5	mg/kg	46	28	48.8	No Limit
		EG005T: Lead	7439-92-1	5	mg/kg	19	15	21.7	No Limit
		EG005T: Selenium	7782-49-2	5	mg/kg	<5	<5	0.00	No Limit
		EG005T: Zinc	7440-66-6	5	mg/kg	34	22	42.5	No Limit
		EG005T: Aluminium	7429-90-5	50	mg/kg	13800	15500	12.1	0% - 20%
		EG005T: Iron	7439-89-6	50	mg/kg	44200	39300	11.7	0% - 20%
EG005T: Total Metals by ICP-AES (QC Lot: 245668)									
EM1515707-001	Anonymous	EG005T: Cadmium	7440-43-9	1	mg/kg	<1	<1	0.00	No Limit
		EG005T: Chromium	7440-47-3	2	mg/kg	13	15	14.3	No Limit
		EG005T: Nickel	7440-02-0	2	mg/kg	3	3	0.00	No Limit
		EG005T: Arsenic	7440-38-2	5	mg/kg	<5	<5	0.00	No Limit
		EG005T: Copper	7440-50-8	5	mg/kg	<5	<5	0.00	No Limit
		EG005T: Lead	7439-92-1	5	mg/kg	11	12	13.1	No Limit
		EG005T: Selenium	7782-49-2	5	mg/kg	<5	<5	0.00	No Limit
		EG005T: Zinc	7440-66-6	5	mg/kg	<5	<5	0.00	No Limit
		EG005T: Aluminium	7429-90-5	50	mg/kg	9010	9840	8.76	0% - 20%
		EG005T: Iron	7439-89-6	50	mg/kg	17100	20500	18.0	0% - 20%
EM1515766-007	Anonymous	EG005T: Cadmium	7440-43-9	1	mg/kg	<1	<1	0.00	No Limit
		EG005T: Chromium	7440-47-3	2	mg/kg	27	25	9.38	0% - 50%
		EG005T: Nickel	7440-02-0	2	mg/kg	21	13	42.5	0% - 50%
		EG005T: Arsenic	7440-38-2	5	mg/kg	10	9	16.9	No Limit
		EG005T: Copper	7440-50-8	5	mg/kg	13	9	31.7	No Limit
		EG005T: Lead	7439-92-1	5	mg/kg	10	12	14.2	No Limit

Sub-Matrix: **SOIL**

				Laboratory Duplicate (DUP) Report					
Laboratory sample ID	*Client sample ID*	*Method: Compound*	*CAS Number*	*LOR*	*Unit*	*Original Result*	*Duplicate Result*	*RPD (%)*	*Recovery Limits (%)*
EG005T: Total Metals by ICP-AES (QC Lot: 245668) - continued									
EM1515766-007	Anonymous	EG005T: Selenium	7782-49-2	5	mg/kg	<5	<5	0.00	No Limit
		EG005T: Zinc	7440-66-6	5	mg/kg	33	28	18.7	No Limit
		EG005T: Aluminium	7429-90-5	50	mg/kg	14200	13000	8.35	0% - 20%
		EG005T: Iron	7439-89-6	50	mg/kg	26000	23700	9.50	0% - 20%
EG035T: Total Recoverable Mercury by FIMS (QC Lot: 244711)									
EM1515727-009	Anonymous	EG035T: Mercury	7439-97-6	0.1	mg/kg	0.2	0.2	0.00	No Limit
EG035T: Total Recoverable Mercury by FIMS (QC Lot: 245667)									
EM1515707-001	Anonymous	EG035T: Mercury	7439-97-6	0.1	mg/kg	<0.1	<0.1	0.00	No Limit
EM1515766-007	Anonymous	EG035T: Mercury	7439-97-6	0.1	mg/kg	<0.1	<0.1	0.00	No Limit
EP003: Total Organic Carbon (TOC) in Soil (QC Lot: 247568)									
EM1515737-007	GW21(2.8-2.9)	EP003: Total Organic Carbon	----	0.02	%	0.05	0.04	0.00	No Limit
ES1533297-007	Anonymous	EP003: Total Organic Carbon	----	0.02	%	3.85	3.93	2.07	0% - 20%
EP074A: Monocyclic Aromatic Hydrocarbons (QC Lot: 244334)									
EM1515754-024	Anonymous	EP074: 1.2.4-Trimethylbenzene	95-63-6	0.5	mg/kg	<0.5	<0.5	0.00	No Limit
		EP074: 1.3.5-Trimethylbenzene	108-67-8	0.5	mg/kg	<0.5	<0.5	0.00	No Limit
		EP074: Isopropylbenzene	98-82-8	0.5	mg/kg	<0.5	<0.5	0.00	No Limit
		EP074: n-Butylbenzene	104-51-8	0.5	mg/kg	<0.5	<0.5	0.00	No Limit
		EP074: n-Propylbenzene	103-65-1	0.5	mg/kg	<0.5	<0.5	0.00	No Limit
		EP074: p-Isopropyltoluene	99-87-6	0.5	mg/kg	<0.5	<0.5	0.00	No Limit
		EP074: sec-Butylbenzene	135-98-8	0.5	mg/kg	<0.5	<0.5	0.00	No Limit
		EP074: Styrene	100-42-5	0.5	mg/kg	<0.5	<0.5	0.00	No Limit
		EP074: tert-Butylbenzene	98-06-6	0.5	mg/kg	<0.5	<0.5	0.00	No Limit
EP074A: Monocyclic Aromatic Hydrocarbons (QC Lot: 245845)									
EM1515674-009	Anonymous	EP074: 1.2.4-Trimethylbenzene	95-63-6	0.5	mg/kg	<0.5	<0.5	0.00	No Limit
		EP074: 1.3.5-Trimethylbenzene	108-67-8	0.5	mg/kg	<0.5	<0.5	0.00	No Limit
		EP074: Isopropylbenzene	98-82-8	0.5	mg/kg	<0.5	<0.5	0.00	No Limit
		EP074: n-Butylbenzene	104-51-8	0.5	mg/kg	<0.5	<0.5	0.00	No Limit
		EP074: n-Propylbenzene	103-65-1	0.5	mg/kg	<0.5	<0.5	0.00	No Limit
		EP074: p-Isopropyltoluene	99-87-6	0.5	mg/kg	<0.5	<0.5	0.00	No Limit
		EP074: sec-Butylbenzene	135-98-8	0.5	mg/kg	<0.5	<0.5	0.00	No Limit
		EP074: Styrene	100-42-5	0.5	mg/kg	<0.5	<0.5	0.00	No Limit
		EP074: tert-Butylbenzene	98-06-6	0.5	mg/kg	<0.5	<0.5	0.00	No Limit
EP074B: Oxygenated Compounds (QC Lot: 244334)									
EM1515754-024	Anonymous	EP074: 2-Butanone (MEK)	78-93-3	5	mg/kg	<5	<5	0.00	No Limit
		EP074: 2-Hexanone (MBK)	591-78-6	5	mg/kg	<5	<5	0.00	No Limit
		EP074: 4-Methyl-2-pentanone (MIBK)	108-10-1	5	mg/kg	<5	<5	0.00	No Limit
		EP074: Vinyl Acetate	108-05-4	5	mg/kg	<5	<5	0.00	No Limit
EP074B: Oxygenated Compounds (QC Lot: 245845)									
EM1515674-009	Anonymous	EP074: 2-Butanone (MEK)	78-93-3	5	mg/kg	<5	<5	0.00	No Limit

Sub-Matrix: **SOIL**

				Laboratory Duplicate (DUP) Report					
Laboratory sample ID	*Client sample ID*	*Method: Compound*	*CAS Number*	*LOR*	*Unit*	*Original Result*	*Duplicate Result*	*RPD (%)*	*Recovery Limits (%)*
EP074B: Oxygenated Compounds (QC Lot: 245845) - continued									
EM1515674-009	Anonymous	EP074: 2-Hexanone (MBK)	591-78-6	5	mg/kg	<5	<5	0.00	No Limit
		EP074: 4-Methyl-2-pentanone (MIBK)	108-10-1	5	mg/kg	<5	<5	0.00	No Limit
		EP074: Vinyl Acetate	108-05-4	5	mg/kg	<5	<5	0.00	No Limit
EP074C: Sulfonated Compounds (QC Lot: 244334)									
EM1515754-024	Anonymous	EP074: Carbon disulfide	75-15-0	0.5	mg/kg	<0.5	<0.5	0.00	No Limit
EP074C: Sulfonated Compounds (QC Lot: 245845)									
EM1515674-009	Anonymous	EP074: Carbon disulfide	75-15-0	0.5	mg/kg	<0.5	<0.5	0.00	No Limit
EP074D: Fumigants (QC Lot: 244334)									
EM1515754-024	Anonymous	EP074: 1.2-Dibromoethane (EDB)	106-93-4	0.5	mg/kg	<0.5	<0.5	0.00	No Limit
		EP074: 1.2-Dichloropropane	78-87-5	0.5	mg/kg	<0.5	<0.5	0.00	No Limit
		EP074: 2.2-Dichloropropane	594-20-7	0.5	mg/kg	<0.5	<0.5	0.00	No Limit
		EP074: cis-1.3-Dichloropropylene	10061-01-5	0.5	mg/kg	<0.5	<0.5	0.00	No Limit
		EP074: trans-1.3-Dichloropropylene	10061-02-6	0.5	mg/kg	<0.5	<0.5	0.00	No Limit
EP074D: Fumigants (QC Lot: 245845)									
EM1515674-009	Anonymous	EP074: 1.2-Dibromoethane (EDB)	106-93-4	0.5	mg/kg	<0.5	<0.5	0.00	No Limit
		EP074: 1.2-Dichloropropane	78-87-5	0.5	mg/kg	<0.5	<0.5	0.00	No Limit
		EP074: 2.2-Dichloropropane	594-20-7	0.5	mg/kg	<0.5	<0.5	0.00	No Limit
		EP074: cis-1.3-Dichloropropylene	10061-01-5	0.5	mg/kg	<0.5	<0.5	0.00	No Limit
		EP074: trans-1.3-Dichloropropylene	10061-02-6	0.5	mg/kg	<0.5	<0.5	0.00	No Limit
EP074E: Halogenated Aliphatic Compounds (QC Lot: 244334)									
EM1515754-024	Anonymous	EP074: 1.1.1.2-Tetrachloroethane	630-20-6	0.5	mg/kg	<0.5	<0.5	0.00	No Limit
		EP074: 1.1.1-Trichloroethane	71-55-6	0.5	mg/kg	<0.5	<0.5	0.00	No Limit
		EP074: 1.1.2.2-Tetrachloroethane	79-34-5	0.5	mg/kg	<0.5	<0.5	0.00	No Limit
		EP074: 1.1.2-Trichloroethane	79-00-5	0.5	mg/kg	<0.5	<0.5	0.00	No Limit
		EP074: 1.1-Dichloroethane	75-34-3	0.5	mg/kg	<0.5	<0.5	0.00	No Limit
		EP074: 1.1-Dichloroethene	75-35-4	0.5	mg/kg	<0.5	<0.5	0.00	No Limit
		EP074: 1.1-Dichloropropylene	563-58-6	0.5	mg/kg	<0.5	<0.5	0.00	No Limit
		EP074: 1.2.3-Trichloropropane	96-18-4	0.5	mg/kg	<0.5	<0.5	0.00	No Limit
		EP074: 1.2-Dibromo-3-chloropropane	96-12-8	0.5	mg/kg	<0.5	<0.5	0.00	No Limit
		EP074: 1.2-Dichloroethane	107-06-2	0.5	mg/kg	<0.5	<0.5	0.00	No Limit
		EP074: 1.3-Dichloropropane	142-28-9	0.5	mg/kg	<0.5	<0.5	0.00	No Limit
		EP074: Carbon Tetrachloride	56-23-5	0.5	mg/kg	<0.5	<0.5	0.00	No Limit
		EP074: cis-1.2-Dichloroethene	156-59-2	0.5	mg/kg	<0.5	<0.5	0.00	No Limit
		EP074: cis-1.4-Dichloro-2-butene	1476-11-5	0.5	mg/kg	<0.5	<0.5	0.00	No Limit
		EP074: Dibromomethane	74-95-3	0.5	mg/kg	<0.5	<0.5	0.00	No Limit
		EP074: Hexachlorobutadiene	87-68-3	0.5	mg/kg	<0.5	<0.5	0.00	No Limit
		EP074: Iodomethane	74-88-4	0.5	mg/kg	<0.5	<0.5	0.00	No Limit
		EP074: Pentachloroethane	76-01-7	0.5	mg/kg	<0.5	<0.5	0.00	No Limit
		EP074: Tetrachloroethene	127-18-4	0.5	mg/kg	<0.5	<0.5	0.00	No Limit

Sub-Matrix: **SOIL**

				Laboratory Duplicate (DUP) Report					
Laboratory sample ID	*Client sample ID*	*Method: Compound*	*CAS Number*	*LOR*	*Unit*	*Original Result*	*Duplicate Result*	*RPD (%)*	*Recovery Limits (%)*
EP074E: Halogenated Aliphatic Compounds (QC Lot: 244334) - continued									
EM1515754-024	Anonymous	EP074: trans-1.2-Dichloroethene	156-60-5	0.5	mg/kg	<0.5	<0.5	0.00	No Limit
		EP074: trans-1.4-Dichloro-2-butene	110-57-6	0.5	mg/kg	<0.5	<0.5	0.00	No Limit
		EP074: Trichloroethene	79-01-6	0.5	mg/kg	<0.5	<0.5	0.00	No Limit
		EP074: Bromomethane	74-83-9	5	mg/kg	<5	<5	0.00	No Limit
		EP074: Chloroethane	75-00-3	5	mg/kg	<5	<5	0.00	No Limit
		EP074: Chloromethane	74-87-3	5	mg/kg	<5	<5	0.00	No Limit
		EP074: Dichlorodifluoromethane	75-71-8	5	mg/kg	<5	<5	0.00	No Limit
		EP074: Trichlorofluoromethane	75-69-4	5	mg/kg	<5	<5	0.00	No Limit
		EP074: Vinyl chloride	75-01-4	5	mg/kg	<5	<5	0.00	No Limit
EP074E: Halogenated Aliphatic Compounds (QC Lot: 245845)									
EM1515674-009	Anonymous	EP074: 1.1.1.2-Tetrachloroethane	630-20-6	0.5	mg/kg	<0.5	<0.5	0.00	No Limit
		EP074: 1.1.1-Trichloroethane	71-55-6	0.5	mg/kg	<0.5	<0.5	0.00	No Limit
		EP074: 1.1.2.2-Tetrachloroethane	79-34-5	0.5	mg/kg	<0.5	<0.5	0.00	No Limit
		EP074: 1.1.2-Trichloroethane	79-00-5	0.5	mg/kg	<0.5	<0.5	0.00	No Limit
		EP074: 1.1-Dichloroethane	75-34-3	0.5	mg/kg	<0.5	<0.5	0.00	No Limit
		EP074: 1.1-Dichloroethene	75-35-4	0.5	mg/kg	<0.5	<0.5	0.00	No Limit
		EP074: 1.1-Dichloropropylene	563-58-6	0.5	mg/kg	<0.5	<0.5	0.00	No Limit
		EP074: 1.2.3-Trichloropropane	96-18-4	0.5	mg/kg	<0.5	<0.5	0.00	No Limit
		EP074: 1.2-Dibromo-3-chloropropane	96-12-8	0.5	mg/kg	<0.5	<0.5	0.00	No Limit
		EP074: 1.2-Dichloroethane	107-06-2	0.5	mg/kg	<0.5	<0.5	0.00	No Limit
		EP074: 1.3-Dichloropropane	142-28-9	0.5	mg/kg	<0.5	<0.5	0.00	No Limit
		EP074: Carbon Tetrachloride	56-23-5	0.5	mg/kg	<0.5	<0.5	0.00	No Limit
		EP074: cis-1.2-Dichloroethene	156-59-2	0.5	mg/kg	<0.5	<0.5	0.00	No Limit
		EP074: cis-1.4-Dichloro-2-butene	1476-11-5	0.5	mg/kg	<0.5	<0.5	0.00	No Limit
		EP074: Dibromomethane	74-95-3	0.5	mg/kg	<0.5	<0.5	0.00	No Limit
		EP074: Hexachlorobutadiene	87-68-3	0.5	mg/kg	<0.5	<0.5	0.00	No Limit
		EP074: Iodomethane	74-88-4	0.5	mg/kg	<0.5	<0.5	0.00	No Limit
		EP074: Pentachloroethane	76-01-7	0.5	mg/kg	<0.5	<0.5	0.00	No Limit
		EP074: Tetrachloroethene	127-18-4	0.5	mg/kg	<0.5	<0.5	0.00	No Limit
		EP074: trans-1.2-Dichloroethene	156-60-5	0.5	mg/kg	<0.5	<0.5	0.00	No Limit
		EP074: trans-1.4-Dichloro-2-butene	110-57-6	0.5	mg/kg	<0.5	<0.5	0.00	No Limit
		EP074: Trichloroethene	79-01-6	0.5	mg/kg	<0.5	<0.5	0.00	No Limit
		EP074: Bromomethane	74-83-9	5	mg/kg	<5	<5	0.00	No Limit
		EP074: Chloroethane	75-00-3	5	mg/kg	<5	<5	0.00	No Limit
		EP074: Chloromethane	74-87-3	5	mg/kg	<5	<5	0.00	No Limit
		EP074: Dichlorodifluoromethane	75-71-8	5	mg/kg	<5	<5	0.00	No Limit
		EP074: Trichlorofluoromethane	75-69-4	5	mg/kg	<5	<5	0.00	No Limit
		EP074: Vinyl chloride	75-01-4	5	mg/kg	<5	<5	0.00	No Limit
EP074F: Halogenated Aromatic Compounds (QC Lot: 244334)									
EM1515754-024	Anonymous	EP074: 1.2.3-Trichlorobenzene	87-61-6	0.5	mg/kg	<0.5	<0.5	0.00	No Limit

Sub-Matrix: **SOIL**

				Laboratory Duplicate (DUP) Report					
Laboratory sample ID	*Client sample ID*	*Method: Compound*	*CAS Number*	*LOR*	*Unit*	*Original Result*	*Duplicate Result*	*RPD (%)*	*Recovery Limits (%)*
EP074F: Halogenated Aromatic Compounds (QC Lot: 244334) - continued									
EM1515754-024	Anonymous	EP074: 1.2.4-Trichlorobenzene	120-82-1	0.5	mg/kg	<0.5	<0.5	0.00	No Limit
		EP074: 1.2-Dichlorobenzene	95-50-1	0.5	mg/kg	<0.5	<0.5	0.00	No Limit
		EP074: 1.3-Dichlorobenzene	541-73-1	0.5	mg/kg	<0.5	<0.5	0.00	No Limit
		EP074: 1.4-Dichlorobenzene	106-46-7	0.5	mg/kg	<0.5	<0.5	0.00	No Limit
		EP074: 2-Chlorotoluene	95-49-8	0.5	mg/kg	<0.5	<0.5	0.00	No Limit
		EP074: 4-Chlorotoluene	106-43-4	0.5	mg/kg	<0.5	<0.5	0.00	No Limit
		EP074: Bromobenzene	108-86-1	0.5	mg/kg	<0.5	<0.5	0.00	No Limit
		EP074: Chlorobenzene	108-90-7	0.5	mg/kg	<0.5	<0.5	0.00	No Limit
EP074F: Halogenated Aromatic Compounds (QC Lot: 245845)									
EM1515674-009	Anonymous	EP074: 1.2.3-Trichlorobenzene	87-61-6	0.5	mg/kg	<0.5	<0.5	0.00	No Limit
		EP074: 1.2.4-Trichlorobenzene	120-82-1	0.5	mg/kg	<0.5	<0.5	0.00	No Limit
		EP074: 1.2-Dichlorobenzene	95-50-1	0.5	mg/kg	<0.5	<0.5	0.00	No Limit
		EP074: 1.3-Dichlorobenzene	541-73-1	0.5	mg/kg	<0.5	<0.5	0.00	No Limit
		EP074: 1.4-Dichlorobenzene	106-46-7	0.5	mg/kg	<0.5	<0.5	0.00	No Limit
		EP074: 2-Chlorotoluene	95-49-8	0.5	mg/kg	<0.5	<0.5	0.00	No Limit
		EP074: 4-Chlorotoluene	106-43-4	0.5	mg/kg	<0.5	<0.5	0.00	No Limit
		EP074: Bromobenzene	108-86-1	0.5	mg/kg	<0.5	<0.5	0.00	No Limit
		EP074: Chlorobenzene	108-90-7	0.5	mg/kg	<0.5	<0.5	0.00	No Limit
EP074G: Trihalomethanes (QC Lot: 244334)									
EM1515754-024	Anonymous	EP074: Bromodichloromethane	75-27-4	0.5	mg/kg	<0.5	<0.5	0.00	No Limit
		EP074: Bromoform	75-25-2	0.5	mg/kg	<0.5	<0.5	0.00	No Limit
		EP074: Chloroform	67-66-3	0.5	mg/kg	<0.5	<0.5	0.00	No Limit
		EP074: Dibromochloromethane	124-48-1	0.5	mg/kg	<0.5	<0.5	0.00	No Limit
EP074G: Trihalomethanes (QC Lot: 245845)									
EM1515674-009	Anonymous	EP074: Bromodichloromethane	75-27-4	0.5	mg/kg	<0.5	<0.5	0.00	No Limit
		EP074: Bromoform	75-25-2	0.5	mg/kg	<0.5	<0.5	0.00	No Limit
		EP074: Chloroform	67-66-3	0.5	mg/kg	<0.5	<0.5	0.00	No Limit
		EP074: Dibromochloromethane	124-48-1	0.5	mg/kg	<0.5	<0.5	0.00	No Limit
EP075(SIM)B: Polynuclear Aromatic Hydrocarbons (QC Lot: 245374)									
EM1515711-014	Anonymous	EP075(SIM): Acenaphthene	83-32-9	0.5	mg/kg	<0.5	<0.5	0.00	No Limit
		EP075(SIM): Acenaphthylene	208-96-8	0.5	mg/kg	<0.5	<0.5	0.00	No Limit
		EP075(SIM): Anthracene	120-12-7	0.5	mg/kg	<0.5	<0.5	0.00	No Limit
		EP075(SIM): Benz(a)anthracene	56-55-3	0.5	mg/kg	<0.5	<0.5	0.00	No Limit
		EP075(SIM): Benzo(a)pyrene	50-32-8	0.5	mg/kg	<0.5	<0.5	0.00	No Limit
		EP075(SIM): Benzo(b+j)fluoranthene	205-99-2 205-82-3	0.5	mg/kg	<0.5	<0.5	0.00	No Limit
		EP075(SIM): Benzo(g.h.i)perylene	191-24-2	0.5	mg/kg	<0.5	<0.5	0.00	No Limit
		EP075(SIM): Benzo(k)fluoranthene	207-08-9	0.5	mg/kg	<0.5	<0.5	0.00	No Limit
		EP075(SIM): Chrysene	218-01-9	0.5	mg/kg	<0.5	<0.5	0.00	No Limit

Sub-Matrix: **SOIL**

				Laboratory Duplicate (DUP) Report					
Laboratory sample ID	*Client sample ID*	*Method: Compound*	*CAS Number*	*LOR*	*Unit*	*Original Result*	*Duplicate Result*	*RPD (%)*	*Recovery Limits (%)*
EP075(SIM)B: Polynuclear Aromatic Hydrocarbons (QC Lot: 245374) - continued									
EM1515711-014	Anonymous	EP075(SIM): Dibenz(a.h)anthracene	53-70-3	0.5	mg/kg	<0.5	<0.5	0.00	No Limit
		EP075(SIM): Fluoranthene	206-44-0	0.5	mg/kg	<0.5	<0.5	0.00	No Limit
		EP075(SIM): Fluorene	86-73-7	0.5	mg/kg	<0.5	<0.5	0.00	No Limit
		EP075(SIM): Indeno(1.2.3.cd)pyrene	193-39-5	0.5	mg/kg	<0.5	<0.5	0.00	No Limit
		EP075(SIM): Naphthalene	91-20-3	0.5	mg/kg	<0.5	<0.5	0.00	No Limit
		EP075(SIM): Phenanthrene	85-01-8	0.5	mg/kg	<0.5	<0.5	0.00	No Limit
		EP075(SIM): Pyrene	129-00-0	0.5	mg/kg	<0.5	<0.5	0.00	No Limit
EP075(SIM)B: Polynuclear Aromatic Hydrocarbons (QC Lot: 245620)									
EM1515840-011	Anonymous	EP075(SIM): Acenaphthene	83-32-9	0.5	mg/kg	<0.5	<0.5	0.00	No Limit
		EP075(SIM): Acenaphthylene	208-96-8	0.5	mg/kg	<0.5	<0.5	0.00	No Limit
		EP075(SIM): Anthracene	120-12-7	0.5	mg/kg	<0.5	<0.5	0.00	No Limit
		EP075(SIM): Benz(a)anthracene	56-55-3	0.5	mg/kg	<0.5	<0.5	0.00	No Limit
		EP075(SIM): Benzo(a)pyrene	50-32-8	0.5	mg/kg	<0.5	<0.5	0.00	No Limit
		EP075(SIM): Benzo(b+j)fluoranthene	205-99-2 205-82-3	0.5	mg/kg	<0.5	<0.5	0.00	No Limit
		EP075(SIM): Benzo(g.h.i)perylene	191-24-2	0.5	mg/kg	<0.5	<0.5	0.00	No Limit
		EP075(SIM): Benzo(k)fluoranthene	207-08-9	0.5	mg/kg	<0.5	<0.5	0.00	No Limit
		EP075(SIM): Chrysene	218-01-9	0.5	mg/kg	<0.5	<0.5	0.00	No Limit
		EP075(SIM): Dibenz(a.h)anthracene	53-70-3	0.5	mg/kg	<0.5	<0.5	0.00	No Limit
		EP075(SIM): Fluoranthene	206-44-0	0.5	mg/kg	<0.5	<0.5	0.00	No Limit
		EP075(SIM): Fluorene	86-73-7	0.5	mg/kg	<0.5	<0.5	0.00	No Limit
		EP075(SIM): Indeno(1.2.3.cd)pyrene	193-39-5	0.5	mg/kg	<0.5	<0.5	0.00	No Limit
		EP075(SIM): Naphthalene	91-20-3	0.5	mg/kg	<0.5	<0.5	0.00	No Limit
		EP075(SIM): Phenanthrene	85-01-8	0.5	mg/kg	<0.5	<0.5	0.00	No Limit
		EP075(SIM): Pyrene	129-00-0	0.5	mg/kg	<0.5	<0.5	0.00	No Limit
EM1515737-023	GW27(0.5-0.6)	EP075(SIM): Acenaphthene	83-32-9	0.5	mg/kg	<0.5	<0.5	0.00	No Limit
		EP075(SIM): Acenaphthylene	208-96-8	0.5	mg/kg	1.2	1.1	13.5	No Limit
		EP075(SIM): Anthracene	120-12-7	0.5	mg/kg	2.2	1.5	37.2	No Limit
		EP075(SIM): Benz(a)anthracene	56-55-3	0.5	mg/kg	5.8	4.3	29.7	0% - 50%
		EP075(SIM): Benzo(a)pyrene	50-32-8	0.5	mg/kg	7.1	5.2	29.7	0% - 50%
		EP075(SIM): Benzo(b+j)fluoranthene	205-99-2 205-82-3	0.5	mg/kg	9.4	7.3	24.9	0% - 50%
		EP075(SIM): Benzo(g.h.i)perylene	191-24-2	0.5	mg/kg	5.2	4.1	24.6	0% - 50%
		EP075(SIM): Benzo(k)fluoranthene	207-08-9	0.5	mg/kg	2.9	2.4	21.8	No Limit
		EP075(SIM): Chrysene	218-01-9	0.5	mg/kg	5.7	4.2	29.9	0% - 50%
		EP075(SIM): Dibenz(a.h)anthracene	53-70-3	0.5	mg/kg	1.7	1.4	21.7	No Limit
		EP075(SIM): Fluoranthene	206-44-0	0.5	mg/kg	10.5	8.6	20.0	0% - 20%
		EP075(SIM): Fluorene	86-73-7	0.5	mg/kg	<0.5	<0.5	0.00	No Limit
		EP075(SIM): Indeno(1.2.3.cd)pyrene	193-39-5	0.5	mg/kg	4.5	3.4	25.4	No Limit
		EP075(SIM): Naphthalene	91-20-3	0.5	mg/kg	0.6	0.6	0.00	No Limit

Sub-Matrix: **SOIL**

				Laboratory Duplicate (DUP) Report					
Laboratory sample ID	Client sample ID	Method: Compound	CAS Number	LOR	Unit	Original Result	Duplicate Result	RPD (%)	Recovery Limits (%)
EP075(SIM)B: Polynuclear Aromatic Hydrocarbons (QC Lot: 245620) - continued									
EM1515737-023	GW27(0.5-0.6)	EP075(SIM): Phenanthrene	85-01-8	0.5	mg/kg	5.2	3.8	29.4	0% - 50%
		EP075(SIM): Pyrene	129-00-0	0.5	mg/kg	11.3	9.9	13.2	0% - 20%
EP080/071: Total Petroleum Hydrocarbons (QC Lot: 244333)									
EM1515754-024	Anonymous	EP080: C6 - C9 Fraction	----	10	mg/kg	<10	<10	0.00	No Limit
EP080/071: Total Petroleum Hydrocarbons (QC Lot: 245375)									
EM1515753-010	Anonymous	EP071: C15 - C28 Fraction	----	100	mg/kg	<100	<100	0.00	No Limit
		EP071: C29 - C36 Fraction	----	100	mg/kg	<100	<100	0.00	No Limit
		EP071: C10 - C14 Fraction	----	50	mg/kg	<50	<50	0.00	No Limit
		EP071: C10 - C36 Fraction (sum)	----	50	mg/kg	<50	<50	0.00	No Limit
EM1515711-014	Anonymous	EP071: C15 - C28 Fraction	----	100	mg/kg	<100	<100	0.00	No Limit
		EP071: C29 - C36 Fraction	----	100	mg/kg	<100	<100	0.00	No Limit
		EP071: C10 - C14 Fraction	----	50	mg/kg	<50	<50	0.00	No Limit
		EP071: C10 - C36 Fraction (sum)	----	50	mg/kg	<50	<50	0.00	No Limit
EP080/071: Total Petroleum Hydrocarbons (QC Lot: 245619)									
EM1515737-023	GW27(0.5-0.6)	EP071: C15 - C28 Fraction	----	100	mg/kg	570	480	15.7	No Limit
		EP071: C29 - C36 Fraction	----	100	mg/kg	430	380	12.5	No Limit
		EP071: C10 - C14 Fraction	----	50	mg/kg	<50	60	0.00	No Limit
		EP071: C10 - C36 Fraction (sum)	----	50	mg/kg	1000	920	8.33	0% - 20%
EP080/071: Total Petroleum Hydrocarbons (QC Lot: 245844)									
EM1515674-009	Anonymous	EP080: C6 - C9 Fraction	----	10	mg/kg	<10	<10	0.00	No Limit
EP080/071: Total Recoverable Hydrocarbons - NEPM 2013 Fractions (QC Lot: 244333)									
EM1515754-024	Anonymous	EP080: C6 - C10 Fraction	C6_C10	10	mg/kg	<10	<10	0.00	No Limit
EP080/071: Total Recoverable Hydrocarbons - NEPM 2013 Fractions (QC Lot: 245375)									
EM1515753-010	Anonymous	EP071: >C16 - C34 Fraction	----	100	mg/kg	<100	<100	0.00	No Limit
		EP071: >C34 - C40 Fraction	----	100	mg/kg	<100	<100	0.00	No Limit
		EP071: >C10 - C16 Fraction	>C10_C16	50	mg/kg	<50	<50	0.00	No Limit
		EP071: >C10 - C40 Fraction (sum)	----	50	mg/kg	<50	<50	0.00	No Limit
EM1515711-014	Anonymous	EP071: >C16 - C34 Fraction	----	100	mg/kg	<100	<100	0.00	No Limit
		EP071: >C34 - C40 Fraction	----	100	mg/kg	<100	<100	0.00	No Limit
		EP071: >C10 - C16 Fraction	>C10_C16	50	mg/kg	<50	<50	0.00	No Limit
		EP071: >C10 - C40 Fraction (sum)	----	50	mg/kg	<50	<50	0.00	No Limit
EP080/071: Total Recoverable Hydrocarbons - NEPM 2013 Fractions (QC Lot: 245619)									
EM1515737-023	GW27(0.5-0.6)	EP071: >C16 - C34 Fraction	----	100	mg/kg	910	790	14.0	No Limit
		EP071: >C34 - C40 Fraction	----	100	mg/kg	180	150	16.5	No Limit
		EP071: >C10 - C16 Fraction	>C10_C16	50	mg/kg	70	60	16.3	No Limit
		EP071: >C10 - C40 Fraction (sum)	----	50	mg/kg	1160	1000	14.8	0% - 20%
EP080/071: Total Recoverable Hydrocarbons - NEPM 2013 Fractions (QC Lot: 245844)									
EM1515674-009	Anonymous	EP080: C6 - C10 Fraction	C6_C10	10	mg/kg	<10	<10	0.00	No Limit

Sub-Matrix: **SOIL**

				Laboratory Duplicate (DUP) Report					
Laboratory sample ID	Client sample ID	Method: Compound	CAS Number	LOR	Unit	Original Result	Duplicate Result	RPD (%)	Recovery Limits (%)
EP080: BTEXN (QC Lot: 244333)									
EM1515754-024	Anonymous	EP080: Benzene	71-43-2	0.2	mg/kg	<0.2	<0.2	0.00	No Limit
		EP080: Ethylbenzene	100-41-4	0.5	mg/kg	<0.5	<0.5	0.00	No Limit
		EP080: meta- & para-Xylene	108-38-3 106-42-3	0.5	mg/kg	<0.5	<0.5	0.00	No Limit
		EP080: ortho-Xylene	95-47-6	0.5	mg/kg	<0.5	<0.5	0.00	No Limit
		EP080: Toluene	108-88-3	0.5	mg/kg	<0.5	<0.5	0.00	No Limit
		EP080: Naphthalene	91-20-3	1	mg/kg	<1	<1	0.00	No Limit
EP080: BTEXN (QC Lot: 245844)									
EM1515674-009	Anonymous	EP080: Benzene	71-43-2	0.2	mg/kg	<0.2	<0.2	0.00	No Limit
		EP080: Ethylbenzene	100-41-4	0.5	mg/kg	<0.5	<0.5	0.00	No Limit
		EP080: meta- & para-Xylene	108-38-3 106-42-3	0.5	mg/kg	<0.5	<0.5	0.00	No Limit
		EP080: ortho-Xylene	95-47-6	0.5	mg/kg	<0.5	<0.5	0.00	No Limit
		EP080: Toluene	108-88-3	0.5	mg/kg	<0.5	<0.5	0.00	No Limit
		EP080: Naphthalene	91-20-3	1	mg/kg	<1	<1	0.00	No Limit

Sub-Matrix: **WATER**

				Laboratory Duplicate (DUP) Report					
Laboratory sample ID	Client sample ID	Method: Compound	CAS Number	LOR	Unit	Original Result	Duplicate Result	RPD (%)	Recovery Limits (%)
EG020T: Total Metals by ICP-MS (QC Lot: 247282)									
EM1515721-007	Anonymous	EG020A-T: Cadmium	7440-43-9	0.0001	mg/L	0.0021	0.0020	7.67	0% - 20%
		EG020A-T: Arsenic	7440-38-2	0.001	mg/L	0.002	0.001	0.00	No Limit
		EG020A-T: Chromium	7440-47-3	0.001	mg/L	<0.001	<0.001	0.00	No Limit
		EG020A-T: Copper	7440-50-8	0.001	mg/L	0.010	0.010	0.00	No Limit
		EG020A-T: Lead	7439-92-1	0.001	mg/L	0.143	0.137	4.73	0% - 20%
		EG020A-T: Nickel	7440-02-0	0.001	mg/L	0.002	0.002	0.00	No Limit
		EG020A-T: Zinc	7440-66-6	0.005	mg/L	0.796	0.760	4.72	0% - 20%
		EG020A-T: Aluminium	7429-90-5	0.01	mg/L	0.06	0.06	0.00	No Limit
		EG020A-T: Selenium	7782-49-2	0.01	mg/L	<0.01	<0.01	0.00	No Limit
		EG020A-T: Iron	7439-89-6	0.05	mg/L	0.23	0.22	0.00	No Limit
EM1515691-001	Anonymous	EG020A-T: Cadmium	7440-43-9	0.0001	mg/L	0.0011	0.0011	0.00	No Limit
		EG020A-T: Arsenic	7440-38-2	0.001	mg/L	<0.010	<0.010	0.00	No Limit
		EG020A-T: Chromium	7440-47-3	0.001	mg/L	0.020	0.019	7.01	No Limit
		EG020A-T: Copper	7440-50-8	0.001	mg/L	0.266	0.270	1.54	0% - 20%
		EG020A-T: Lead	7439-92-1	0.001	mg/L	<0.010	<0.010	0.00	No Limit
		EG020A-T: Nickel	7440-02-0	0.001	mg/L	0.080	0.077	3.66	No Limit
		EG020A-T: Zinc	7440-66-6	0.005	mg/L	1.37	1.38	0.910	0% - 20%
		EG020A-T: Aluminium	7429-90-5	0.01	mg/L	5.26	4.88	7.35	0% - 20%
		EG020A-T: Selenium	7782-49-2	0.01	mg/L	<0.10	<0.10	0.00	No Limit
		EG020A-T: Iron	7439-89-6	0.05	mg/L	5.40	5.16	4.66	0% - 50%
EG035T: Total Recoverable Mercury by FIMS (QC Lot: 243781)									
EM1515676-014	Anonymous	EG035T: Mercury	7439-97-6	0.0001	mg/L	<0.0001	<0.0001	0.00	No Limit

Sub-Matrix: **WATER**

				Laboratory Duplicate (DUP) Report					
Laboratory sample ID	Client sample ID	Method: Compound	CAS Number	LOR	Unit	Original Result	Duplicate Result	RPD (%)	Recovery Limits (%)
EG035T: Total Recoverable Mercury by FIMS (QC Lot: 243781) - continued									
EM1515703-008	Anonymous	EG035T: Mercury	7439-97-6	0.0001	mg/L	<0.0001	<0.0001	0.00	No Limit
EP080/071: Total Petroleum Hydrocarbons (QC Lot: 243720)									
EM1515695-001	Anonymous	EP080: C6 - C9 Fraction	----	20	µg/L	<20	<20	0.00	No Limit
EM1515696-004	Anonymous	EP080: C6 - C9 Fraction	----	20	µg/L	<20	<20	0.00	No Limit
EP080/071: Total Petroleum Hydrocarbons (QC Lot: 245170)									
EM1515711-028	Anonymous	EP080: C6 - C9 Fraction	----	20	µg/L	<20	<20	0.00	No Limit
EM1515777-005	Anonymous	EP080: C6 - C9 Fraction	----	20	µg/L	<20	<20	0.00	No Limit
EP080/071: Total Recoverable Hydrocarbons - NEPM 2013 Fractions (QC Lot: 243720)									
EM1515695-001	Anonymous	EP080: C6 - C10 Fraction	C6_C10	20	µg/L	<20	<20	0.00	No Limit
EM1515696-004	Anonymous	EP080: C6 - C10 Fraction	C6_C10	20	µg/L	<20	<20	0.00	No Limit
EP080/071: Total Recoverable Hydrocarbons - NEPM 2013 Fractions (QC Lot: 245170)									
EM1515711-028	Anonymous	EP080: C6 - C10 Fraction	C6_C10	20	µg/L	<20	<20	0.00	No Limit
EM1515777-005	Anonymous	EP080: C6 - C10 Fraction	C6_C10	20	µg/L	<20	<20	0.00	No Limit
EP080: BTEXN (QC Lot: 243720)									
EM1515695-001	Anonymous	EP080: Benzene	71-43-2	1	µg/L	<1	<1	0.00	No Limit
		EP080: Ethylbenzene	100-41-4	2	µg/L	<2	<2	0.00	No Limit
		EP080: meta- & para-Xylene	108-38-3 106-42-3	2	µg/L	<2	<2	0.00	No Limit
		EP080: ortho-Xylene	95-47-6	2	µg/L	<2	<2	0.00	No Limit
		EP080: Toluene	108-88-3	2	µg/L	<2	<2	0.00	No Limit
		EP080: Naphthalene	91-20-3	5	µg/L	<5	<5	0.00	No Limit
EM1515696-004	Anonymous	EP080: Benzene	71-43-2	1	µg/L	<1	<1	0.00	No Limit
		EP080: Ethylbenzene	100-41-4	2	µg/L	<2	<2	0.00	No Limit
		EP080: meta- & para-Xylene	108-38-3 106-42-3	2	µg/L	<2	<2	0.00	No Limit
		EP080: ortho-Xylene	95-47-6	2	µg/L	<2	<2	0.00	No Limit
		EP080: Toluene	108-88-3	2	µg/L	<2	<2	0.00	No Limit
		EP080: Naphthalene	91-20-3	5	µg/L	<5	<5	0.00	No Limit
EP080: BTEXN (QC Lot: 245170)									
EM1515711-028	Anonymous	EP080: Benzene	71-43-2	1	µg/L	<1	<1	0.00	No Limit
		EP080: Ethylbenzene	100-41-4	2	µg/L	<2	<2	0.00	No Limit
		EP080: meta- & para-Xylene	108-38-3 106-42-3	2	µg/L	<2	<2	0.00	No Limit
		EP080: ortho-Xylene	95-47-6	2	µg/L	<2	<2	0.00	No Limit
		EP080: Toluene	108-88-3	2	µg/L	<2	<2	0.00	No Limit
		EP080: Naphthalene	91-20-3	5	µg/L	<5	<5	0.00	No Limit
EM1515777-005	Anonymous	EP080: Benzene	71-43-2	1	µg/L	<1	<1	0.00	No Limit
		EP080: Ethylbenzene	100-41-4	2	µg/L	<2	<2	0.00	No Limit

Sub-Matrix: **WATER**

				Laboratory Duplicate (DUP) Report					
Laboratory sample ID	*Client sample ID*	*Method: Compound*	*CAS Number*	*LOR*	*Unit*	*Original Result*	*Duplicate Result*	*RPD (%)*	*Recovery Limits (%)*
EP080: BTEXN (QC Lot: 245170) - continued									
EM1515777-005	Anonymous	EP080: meta- & para-Xylene	108-38-3 106-42-3	2	µg/L	<2	<2	0.00	No Limit
		EP080: ortho-Xylene	95-47-6	2	µg/L	<2	<2	0.00	No Limit
		EP080: Toluene	108-88-3	2	µg/L	<2	<2	0.00	No Limit
		EP080: Naphthalene	91-20-3	5	µg/L	<5	<5	0.00	No Limit

Method Blank (MB) and Laboratory Control Spike (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 (%)	Recovery Limits (%)	
Method: Compound	CAS Number	LOR	Unit	Result	Concentration	LCS	Low	High
EG005T: Total Metals by ICP-AES (QCLot: 244710)								
EG005T: Aluminium	7429-90-5	50	mg/kg	<50	6134 mg/kg	105	93	115
EG005T: Arsenic	7440-38-2	5	mg/kg	<5	21.7 mg/kg	83.8	79	113
EG005T: Cadmium	7440-43-9	1	mg/kg	<1	4.64 mg/kg	106	87	115
EG005T: Chromium	7440-47-3	2	mg/kg	<2	43.9 mg/kg	92.8	89	113
EG005T: Copper	7440-50-8	5	mg/kg	<5	32 mg/kg	92.1	90	116
EG005T: Iron	7439-89-6	50	mg/kg	<50	8400 mg/kg	98.2	96	112
EG005T: Lead	7439-92-1	5	mg/kg	<5	40 mg/kg	87.2	85	107
EG005T: Nickel	7440-02-0	2	mg/kg	<2	55 mg/kg	99.7	89	111
EG005T: Selenium	7782-49-2	5	mg/kg	<5	5.37 mg/kg	100	93	109
EG005T: Zinc	7440-66-6	5	mg/kg	<5	60.8 mg/kg	90.4	89	111
EG005T: Total Metals by ICP-AES (QCLot: 245668)								
EG005T: Aluminium	7429-90-5	50	mg/kg	<50	6134 mg/kg	108	93	115
EG005T: Arsenic	7440-38-2	5	mg/kg	<5	21.7 mg/kg	98.4	79	113
EG005T: Cadmium	7440-43-9	1	mg/kg	<1	4.64 mg/kg	95.2	87	115
EG005T: Chromium	7440-47-3	2	mg/kg	<2	43.9 mg/kg	106	89	113
EG005T: Copper	7440-50-8	5	mg/kg	<5	32 mg/kg	98.4	90	116
EG005T: Iron	7439-89-6	50	mg/kg	<50	8400 mg/kg	109	96	112
EG005T: Lead	7439-92-1	5	mg/kg	<5	40 mg/kg	95.7	85	107
EG005T: Nickel	7440-02-0	2	mg/kg	<2	55 mg/kg	98.5	89	111
EG005T: Selenium	7782-49-2	5	mg/kg	<5	5.37 mg/kg	101	93	109
EG005T: Zinc	7440-66-6	5	mg/kg	<5	60.8 mg/kg	97.7	89	111
EG035T: Total Recoverable Mercury by FIMS (QCLot: 244711)								
EG035T: Mercury	7439-97-6	0.1	mg/kg	<0.1	2.57 mg/kg	96.7	85	103
EG035T: Total Recoverable Mercury by FIMS (QCLot: 245667)								
EG035T: Mercury	7439-97-6	0.1	mg/kg	<0.1	2.57 mg/kg	90.6	85	103
EP003: Total Organic Carbon (TOC) in Soil (QCLot: 247568)								
EP003: Total Organic Carbon	----	0.02	%	<0.02	100 %	101	70	130
EP074A: Monocyclic Aromatic Hydrocarbons (QCLot: 244334)								
EP074: 1.2.4-Trimethylbenzene	95-63-6	0.5	mg/kg	<0.5	1 mg/kg	83.1	66	108
EP074: 1.3.5-Trimethylbenzene	108-67-8	0.5	mg/kg	<0.5	1 mg/kg	82.3	67	109
EP074: Isopropylbenzene	98-82-8	0.5	mg/kg	<0.5	1 mg/kg	87.7	69	119
EP074: n-Butylbenzene	104-51-8	0.5	mg/kg	<0.5	1 mg/kg	72.9	58	110
EP074: n-Propylbenzene	103-65-1	0.5	mg/kg	<0.5	1 mg/kg	78.1	64	110
EP074: p-Isopropyltoluene	99-87-6	0.5	mg/kg	<0.5	1 mg/kg	81.7	65	111

Sub-Matrix: **SOIL**

Method: Compound	CAS Number	LOR	Unit	Method Blank (MB) Report	Laboratory Control Spike (LCS) Report			
					Spike	Spike Recovery (%)	Recovery Limits (%)	
				Result	Concentration	LCS	Low	High
EP074A: Monocyclic Aromatic Hydrocarbons (QCLot: 244334) - continued								
EP074: sec-Butylbenzene	135-98-8	0.5	mg/kg	<0.5	1 mg/kg	83.4	66	110
EP074: Styrene	100-42-5	0.5	mg/kg	<0.5	1 mg/kg	86.9	72	118
EP074: tert-Butylbenzene	98-06-6	0.5	mg/kg	<0.5	1 mg/kg	85.5	67	111
EP074A: Monocyclic Aromatic Hydrocarbons (QCLot: 245845)								
EP074: 1.2.4-Trimethylbenzene	95-63-6	0.5	mg/kg	<0.5	1 mg/kg	83.6	66	108
EP074: 1.3.5-Trimethylbenzene	108-67-8	0.5	mg/kg	<0.5	1 mg/kg	83.1	67	109
EP074: Isopropylbenzene	98-82-8	0.5	mg/kg	<0.5	1 mg/kg	98.6	69	119
EP074: n-Butylbenzene	104-51-8	0.5	mg/kg	<0.5	1 mg/kg	81.1	58	110
EP074: n-Propylbenzene	103-65-1	0.5	mg/kg	<0.5	1 mg/kg	83.2	64	110
EP074: p-Isopropyltoluene	99-87-6	0.5	mg/kg	<0.5	1 mg/kg	85.6	65	111
EP074: sec-Butylbenzene	135-98-8	0.5	mg/kg	<0.5	1 mg/kg	83.4	66	110
EP074: Styrene	100-42-5	0.5	mg/kg	<0.5	1 mg/kg	96.7	72	118
EP074: tert-Butylbenzene	98-06-6	0.5	mg/kg	<0.5	1 mg/kg	87.9	67	111
EP074B: Oxygenated Compounds (QCLot: 244334)								
EP074: 2-Butanone (MEK)	78-93-3	5	mg/kg	<5	10 mg/kg	92.9	68	142
EP074: 2-Hexanone (MBK)	591-78-6	5	mg/kg	<5	10 mg/kg	97.5	62	128
EP074: 4-Methyl-2-pentanone (MIBK)	108-10-1	5	mg/kg	<5	10 mg/kg	105	67	123
EP074: Vinyl Acetate	108-05-4	5	mg/kg	<5	10 mg/kg	89.8	54	128
EP074B: Oxygenated Compounds (QCLot: 245845)								
EP074: 2-Butanone (MEK)	78-93-3	5	mg/kg	<5	10 mg/kg	106	68	142
EP074: 2-Hexanone (MBK)	591-78-6	5	mg/kg	<5	10 mg/kg	107	62	128
EP074: 4-Methyl-2-pentanone (MIBK)	108-10-1	5	mg/kg	<5	10 mg/kg	108	67	123
EP074: Vinyl Acetate	108-05-4	5	mg/kg	<5	10 mg/kg	111	54	128
EP074C: Sulfonated Compounds (QCLot: 244334)								
EP074: Carbon disulfide	75-15-0	0.5	mg/kg	<0.5	1 mg/kg	71.8	50	128
EP074C: Sulfonated Compounds (QCLot: 245845)								
EP074: Carbon disulfide	75-15-0	0.5	mg/kg	<0.5	1 mg/kg	83.2	50	128
EP074D: Fumigants (QCLot: 244334)								
EP074: 1.2-Dibromoethane (EDB)	106-93-4	0.5	mg/kg	<0.5	1 mg/kg	87.7	73	117
EP074: 1.2-Dichloropropane	78-87-5	0.5	mg/kg	<0.5	1 mg/kg	97.2	72	116
EP074: 2.2-Dichloropropane	594-20-7	0.5	mg/kg	<0.5	1 mg/kg	80.2	65	115
EP074: cis-1.3-Dichloropropylene	10061-01-5	0.5	mg/kg	<0.5	1 mg/kg	75.7	64	104
EP074: trans-1.3-Dichloropropylene	10061-02-6	0.5	mg/kg	<0.5	1 mg/kg	73.4	61	103
EP074D: Fumigants (QCLot: 245845)								
EP074: 1.2-Dibromoethane (EDB)	106-93-4	0.5	mg/kg	<0.5	1 mg/kg	92.4	73	117
EP074: 1.2-Dichloropropane	78-87-5	0.5	mg/kg	<0.5	1 mg/kg	95.0	72	116
EP074: 2.2-Dichloropropane	594-20-7	0.5	mg/kg	<0.5	1 mg/kg	88.2	65	115
EP074: cis-1.3-Dichloropropylene	10061-01-5	0.5	mg/kg	<0.5	1 mg/kg	77.7	64	104

Sub-Matrix: **SOIL**

Method: Compound	CAS Number	LOR	Unit	Method Blank (MB) Report	Laboratory Control Spike (LCS) Report			
					Spike	Spike Recovery (%)	Recovery Limits (%)	
				Result	Concentration	LCS	Low	High
EP074D: Fumigants (QCLot: 245845) - continued								
EP074: trans-1.3-Dichloropropylene	10061-02-6	0.5	mg/kg	<0.5	1 mg/kg	77.7	61	103
EP074E: Halogenated Aliphatic Compounds (QCLot: 244334)								
EP074: 1.1.1.2-Tetrachloroethane	630-20-6	0.5	mg/kg	<0.5	1 mg/kg	70.8	65	109
EP074: 1.1.1-Trichloroethane	71-55-6	0.5	mg/kg	<0.5	1 mg/kg	83.1	68	110
EP074: 1.1.2.2-Tetrachloroethane	79-34-5	0.5	mg/kg	<0.5	1 mg/kg	96.5	76	124
EP074: 1.1.2-Trichloroethane	79-00-5	0.5	mg/kg	<0.5	1 mg/kg	95.2	76	120
EP074: 1.1-Dichloroethane	75-34-3	0.5	mg/kg	<0.5	1 mg/kg	92.4	72	118
EP074: 1.1-Dichloroethene	75-35-4	0.5	mg/kg	<0.5	1 mg/kg	85.4	65	127
EP074: 1.1-Dichloropropylene	563-58-6	0.5	mg/kg	<0.5	1 mg/kg	93.0	70	116
EP074: 1.2.3-Trichloropropane	96-18-4	0.5	mg/kg	<0.5	1 mg/kg	93.1	75	123
EP074: 1.2-Dibromo-3-chloropropane	96-12-8	0.5	mg/kg	<0.5	1 mg/kg	68.3	54	106
EP074: 1.2-Dichloroethane	107-06-2	0.5	mg/kg	<0.5	1 mg/kg	93.7	75	119
EP074: 1.3-Dichloropropane	142-28-9	0.5	mg/kg	<0.5	1 mg/kg	89.4	78	120
EP074: Bromomethane	74-83-9	5	mg/kg	<5	10 mg/kg	71.3	43	133
EP074: Carbon Tetrachloride	56-23-5	0.5	mg/kg	<0.5	1 mg/kg	75.2	61	107
EP074: Chloroethane	75-00-3	5	mg/kg	<5	10 mg/kg	89.2	58	134
EP074: Chloromethane	74-87-3	5	mg/kg	<5	10 mg/kg	90.4	55	133
EP074: cis-1.2-Dichloroethene	156-59-2	0.5	mg/kg	<0.5	1 mg/kg	93.4	76	120
EP074: cis-1.4-Dichloro-2-butene	1476-11-5	0.5	mg/kg	<0.5	1 mg/kg	51.3	40	114
EP074: Dibromomethane	74-95-3	0.5	mg/kg	<0.5	1 mg/kg	91.0	74	114
EP074: Dichlorodifluoromethane	75-71-8	5	mg/kg	<5	10 mg/kg	72.9	45	123
EP074: Hexachlorobutadiene	87-68-3	0.5	mg/kg	<0.5	1 mg/kg	80.6	60	118
EP074: Iodomethane	74-88-4	0.5	mg/kg	<0.5	1 mg/kg	76.9	47	116
EP074: Pentachloroethane	76-01-7	0.5	mg/kg	<0.5	1 mg/kg	66.6	45	123
EP074: Tetrachloroethene	127-18-4	0.5	mg/kg	<0.5	1 mg/kg	86.4	69	121
EP074: trans-1.2-Dichloroethene	156-60-5	0.5	mg/kg	<0.5	1 mg/kg	91.0	70	118
EP074: trans-1.4-Dichloro-2-butene	110-57-6	0.5	mg/kg	<0.5	1 mg/kg	79.0	56	114
EP074: Trichloroethene	79-01-6	0.5	mg/kg	<0.5	1 mg/kg	89.1	72	116
EP074: Trichlorofluoromethane	75-69-4	5	mg/kg	<5	10 mg/kg	85.0	63	127
EP074: Vinyl chloride	75-01-4	5	mg/kg	<5	10 mg/kg	85.2	58	138
EP074E: Halogenated Aliphatic Compounds (QCLot: 245845)								
EP074: 1.1.1.2-Tetrachloroethane	630-20-6	0.5	mg/kg	<0.5	1 mg/kg	83.6	65	109
EP074: 1.1.1-Trichloroethane	71-55-6	0.5	mg/kg	<0.5	1 mg/kg	88.5	68	110
EP074: 1.1.2.2-Tetrachloroethane	79-34-5	0.5	mg/kg	<0.5	1 mg/kg	106	76	124
EP074: 1.1.2-Trichloroethane	79-00-5	0.5	mg/kg	<0.5	1 mg/kg	103	76	120
EP074: 1.1-Dichloroethane	75-34-3	0.5	mg/kg	<0.5	1 mg/kg	95.1	72	118
EP074: 1.1-Dichloroethene	75-35-4	0.5	mg/kg	<0.5	1 mg/kg	96.2	65	127
EP074: 1.1-Dichloropropylene	563-58-6	0.5	mg/kg	<0.5	1 mg/kg	89.2	70	116
EP074: 1.2.3-Trichloropropane	96-18-4	0.5	mg/kg	<0.5	1 mg/kg	106	75	123

Sub-Matrix: **SOIL**

Method: Compound	CAS Number	LOR	Unit	Method Blank (MB) Report	Laboratory Control Spike (LCS) Report			
					Spike	Spike Recovery (%)	Recovery Limits (%)	
				Result	Concentration	LCS	Low	High
EP074E: Halogenated Aliphatic Compounds (QCLot: 245845) - continued								
EP074: 1.2-Dibromo-3-chloropropane	96-12-8	0.5	mg/kg	<0.5	1 mg/kg	84.3	54	106
EP074: 1.2-Dichloroethane	107-06-2	0.5	mg/kg	<0.5	1 mg/kg	97.9	75	119
EP074: 1.3-Dichloropropane	142-28-9	0.5	mg/kg	<0.5	1 mg/kg	103	78	120
EP074: Bromomethane	74-83-9	5	mg/kg	<5	10 mg/kg	84.7	43	133
EP074: Carbon Tetrachloride	56-23-5	0.5	mg/kg	<0.5	1 mg/kg	86.1	61	107
EP074: Chloroethane	75-00-3	5	mg/kg	<5	10 mg/kg	109	58	134
EP074: Chloromethane	74-87-3	5	mg/kg	<5	10 mg/kg	114	55	133
EP074: cis-1.2-Dichloroethene	156-59-2	0.5	mg/kg	<0.5	1 mg/kg	101	76	120
EP074: cis-1.4-Dichloro-2-butene	1476-11-5	0.5	mg/kg	<0.5	1 mg/kg	87.6	40	114
EP074: Dibromomethane	74-95-3	0.5	mg/kg	<0.5	1 mg/kg	91.0	74	114
EP074: Dichlorodifluoromethane	75-71-8	5	mg/kg	<5	10 mg/kg	92.6	45	123
EP074: Hexachlorobutadiene	87-68-3	0.5	mg/kg	<0.5	1 mg/kg	93.0	60	118
EP074: Iodomethane	74-88-4	0.5	mg/kg	<0.5	1 mg/kg	73.2	47	116
EP074: Pentachloroethane	76-01-7	0.5	mg/kg	<0.5	1 mg/kg	79.8	45	123
EP074: Tetrachloroethene	127-18-4	0.5	mg/kg	<0.5	1 mg/kg	89.9	69	121
EP074: trans-1.2-Dichloroethene	156-60-5	0.5	mg/kg	<0.5	1 mg/kg	97.1	70	118
EP074: trans-1.4-Dichloro-2-butene	110-57-6	0.5	mg/kg	<0.5	1 mg/kg	94.0	56	114
EP074: Trichloroethene	79-01-6	0.5	mg/kg	<0.5	1 mg/kg	95.5	72	116
EP074: Trichlorofluoromethane	75-69-4	5	mg/kg	<5	10 mg/kg	102	63	127
EP074: Vinyl chloride	75-01-4	5	mg/kg	<5	10 mg/kg	103	58	138
EP074F: Halogenated Aromatic Compounds (QCLot: 244334)								
EP074: 1.2.3-Trichlorobenzene	87-61-6	0.5	mg/kg	<0.5	1 mg/kg	78.2	69	117
EP074: 1.2.4-Trichlorobenzene	120-82-1	0.5	mg/kg	<0.5	1 mg/kg	74.3	60	112
EP074: 1.2-Dichlorobenzene	95-50-1	0.5	mg/kg	<0.5	1 mg/kg	85.5	76	112
EP074: 1.3-Dichlorobenzene	541-73-1	0.5	mg/kg	<0.5	1 mg/kg	85.8	70	110
EP074: 1.4-Dichlorobenzene	106-46-7	0.5	mg/kg	<0.5	1 mg/kg	88.8	73	115
EP074: 2-Chlorotoluene	95-49-8	0.5	mg/kg	<0.5	1 mg/kg	83.8	69	113
EP074: 4-Chlorotoluene	106-43-4	0.5	mg/kg	<0.5	1 mg/kg	84.3	67	111
EP074: Bromobenzene	108-86-1	0.5	mg/kg	<0.5	1 mg/kg	85.8	63	117
EP074: Chlorobenzene	108-90-7	0.5	mg/kg	<0.5	1 mg/kg	90.2	79	115
EP074F: Halogenated Aromatic Compounds (QCLot: 245845)								
EP074: 1.2.3-Trichlorobenzene	87-61-6	0.5	mg/kg	<0.5	1 mg/kg	98.7	69	117
EP074: 1.2.4-Trichlorobenzene	120-82-1	0.5	mg/kg	<0.5	1 mg/kg	84.9	60	112
EP074: 1.2-Dichlorobenzene	95-50-1	0.5	mg/kg	<0.5	1 mg/kg	98.6	76	112
EP074: 1.3-Dichlorobenzene	541-73-1	0.5	mg/kg	<0.5	1 mg/kg	89.4	70	110
EP074: 1.4-Dichlorobenzene	106-46-7	0.5	mg/kg	<0.5	1 mg/kg	97.6	73	115
EP074: 2-Chlorotoluene	95-49-8	0.5	mg/kg	<0.5	1 mg/kg	87.0	69	113
EP074: 4-Chlorotoluene	106-43-4	0.5	mg/kg	<0.5	1 mg/kg	86.6	67	111
EP074: Bromobenzene	108-86-1	0.5	mg/kg	<0.5	1 mg/kg	90.8	63	117

Sub-Matrix: **SOIL**

Method: Compound	CAS Number	LOR	Unit	Method Blank (MB) Report	Laboratory Control Spike (LCS) Report			
					Spike	Spike Recovery (%)	Recovery Limits (%)	
				Result	Concentration	LCS	Low	High
EP074F: Halogenated Aromatic Compounds (QCLot: 245845) - continued								
EP074: Chlorobenzene	108-90-7	0.5	mg/kg	<0.5	1 mg/kg	97.8	79	115
EP074G: Trihalomethanes (QCLot: 244334)								
EP074: Bromodichloromethane	75-27-4	0.5	mg/kg	<0.5	1 mg/kg	75.2	65	107
EP074: Bromoform	75-25-2	0.5	mg/kg	<0.5	1 mg/kg	62.6	54	104
EP074: Chloroform	67-66-3	0.5	mg/kg	<0.5	1 mg/kg	90.2	75	117
EP074: Dibromochloromethane	124-48-1	0.5	mg/kg	<0.5	1 mg/kg	65.0	61	105
EP074G: Trihalomethanes (QCLot: 245845)								
EP074: Bromodichloromethane	75-27-4	0.5	mg/kg	<0.5	1 mg/kg	84.2	65	107
EP074: Bromoform	75-25-2	0.5	mg/kg	<0.5	1 mg/kg	85.2	54	104
EP074: Chloroform	67-66-3	0.5	mg/kg	<0.5	1 mg/kg	105	75	117
EP074: Dibromochloromethane	124-48-1	0.5	mg/kg	<0.5	1 mg/kg	86.3	61	105
EP075(SIM)B: Polynuclear Aromatic Hydrocarbons (QCLot: 245374)								
EP075(SIM): Acenaphthene	83-32-9	0.5	mg/kg	<0.5	3 mg/kg	106	68	114
EP075(SIM): Acenaphthylene	208-96-8	0.5	mg/kg	<0.5	3 mg/kg	91.1	61	125
EP075(SIM): Anthracene	120-12-7	0.5	mg/kg	<0.5	3 mg/kg	105	68	116
EP075(SIM): Benz(a)anthracene	56-55-3	0.5	mg/kg	<0.5	3 mg/kg	102	62	116
EP075(SIM): Benzo(a)pyrene	50-32-8	0.5	mg/kg	<0.5	3 mg/kg	98.4	64	114
EP075(SIM): Benzo(b+j)fluoranthene	205-99-2 205-82-3	0.5	mg/kg	<0.5	3 mg/kg	95.8	64	114
EP075(SIM): Benzo(g.h.i)perylene	191-24-2	0.5	mg/kg	<0.5	3 mg/kg	105	59	117
EP075(SIM): Benzo(k)fluoranthene	207-08-9	0.5	mg/kg	<0.5	3 mg/kg	105	67	115
EP075(SIM): Chrysene	218-01-9	0.5	mg/kg	<0.5	3 mg/kg	102	63	119
EP075(SIM): Dibenz(a.h)anthracene	53-70-3	0.5	mg/kg	<0.5	3 mg/kg	103	62	114
EP075(SIM): Fluoranthene	206-44-0	0.5	mg/kg	<0.5	3 mg/kg	101	67	115
EP075(SIM): Fluorene	86-73-7	0.5	mg/kg	<0.5	3 mg/kg	106	62	120
EP075(SIM): Indeno(1.2.3.cd)pyrene	193-39-5	0.5	mg/kg	<0.5	3 mg/kg	103	62	116
EP075(SIM): Naphthalene	91-20-3	0.5	mg/kg	<0.5	3 mg/kg	108	65	119
EP075(SIM): Phenanthrene	85-01-8	0.5	mg/kg	<0.5	3 mg/kg	104	69	113
EP075(SIM): Pyrene	129-00-0	0.5	mg/kg	<0.5	3 mg/kg	107	66	116
EP075(SIM)B: Polynuclear Aromatic Hydrocarbons (QCLot: 245620)								
EP075(SIM): Acenaphthene	83-32-9	0.5	mg/kg	<0.5	3 mg/kg	110	68	114
EP075(SIM): Acenaphthylene	208-96-8	0.5	mg/kg	<0.5	3 mg/kg	82.3	61	125
EP075(SIM): Anthracene	120-12-7	0.5	mg/kg	<0.5	3 mg/kg	111	68	116
EP075(SIM): Benz(a)anthracene	56-55-3	0.5	mg/kg	<0.5	3 mg/kg	100	62	116
EP075(SIM): Benzo(a)pyrene	50-32-8	0.5	mg/kg	<0.5	3 mg/kg	101	64	114
EP075(SIM): Benzo(b+j)fluoranthene	205-99-2 205-82-3	0.5	mg/kg	<0.5	3 mg/kg	98.9	64	114
EP075(SIM): Benzo(g.h.i)perylene	191-24-2	0.5	mg/kg	<0.5	3 mg/kg	104	59	117

Sub-Matrix: **SOIL**

Method: Compound	CAS Number	LOR	Unit	Method Blank (MB) Report	Laboratory Control Spike (LCS) Report			
					Spike	Spike Recovery (%)	Recovery Limits (%)	
				Result	Concentration	LCS	Low	High
EP075(SIM)B: Polynuclear Aromatic Hydrocarbons (QCLot: 245620) - continued								
EP075(SIM): Benzo(k)fluoranthene	207-08-9	0.5	mg/kg	<0.5	3 mg/kg	104	67	115
EP075(SIM): Chrysene	218-01-9	0.5	mg/kg	<0.5	3 mg/kg	113	63	119
EP075(SIM): Dibenz(a.h)anthracene	53-70-3	0.5	mg/kg	<0.5	3 mg/kg	106	62	114
EP075(SIM): Fluoranthene	206-44-0	0.5	mg/kg	<0.5	3 mg/kg	113	67	115
EP075(SIM): Fluorene	86-73-7	0.5	mg/kg	<0.5	3 mg/kg	110	62	120
EP075(SIM): Indeno(1.2.3.cd)pyrene	193-39-5	0.5	mg/kg	<0.5	3 mg/kg	109	62	116
EP075(SIM): Naphthalene	91-20-3	0.5	mg/kg	<0.5	3 mg/kg	108	65	119
EP075(SIM): Phenanthrene	85-01-8	0.5	mg/kg	<0.5	3 mg/kg	105	69	113
EP075(SIM): Pyrene	129-00-0	0.5	mg/kg	<0.5	3 mg/kg	116	66	116
EP080/071: Total Petroleum Hydrocarbons (QCLot: 244333)								
EP080: C6 - C9 Fraction	----	10	mg/kg	<10	36 mg/kg	93.6	66	130
EP080/071: Total Petroleum Hydrocarbons (QCLot: 245375)								
EP071: C10 - C14 Fraction	----	50	mg/kg	<50	658 mg/kg	116	65	131
EP071: C10 - C36 Fraction (sum)	----	50	mg/kg	<50	----	----	----	----
EP071: C15 - C28 Fraction	----	100	mg/kg	<100	3160 mg/kg	114	70	126
EP071: C29 - C36 Fraction	----	100	mg/kg	<100	1448 mg/kg	113	70	122
EP080/071: Total Petroleum Hydrocarbons (QCLot: 245619)								
EP071: C10 - C14 Fraction	----	50	mg/kg	<50	658 mg/kg	111	65	131
EP071: C10 - C36 Fraction (sum)	----	50	mg/kg	<50	----	----	----	----
EP071: C15 - C28 Fraction	----	100	mg/kg	<100	3160 mg/kg	110	70	126
EP071: C29 - C36 Fraction	----	100	mg/kg	<100	1448 mg/kg	112	70	122
EP080/071: Total Petroleum Hydrocarbons (QCLot: 245844)								
EP080: C6 - C9 Fraction	----	10	mg/kg	<10	36 mg/kg	102	66	130
EP080/071: Total Recoverable Hydrocarbons - NEPM 2013 Fractions (QCLot: 244333)								
EP080: C6 - C10 Fraction	C6_C10	10	mg/kg	<10	45 mg/kg	94.3	64	128
EP080/071: Total Recoverable Hydrocarbons - NEPM 2013 Fractions (QCLot: 245375)								
EP071: >C10 - C16 Fraction	>C10_C16	50	mg/kg	<50	1051 mg/kg	114	68	130
EP071: >C10 - C40 Fraction (sum)	----	50	mg/kg	<50	----	----	----	----
EP071: >C16 - C34 Fraction	----	100	mg/kg	<100	4124 mg/kg	115	72	116
EP071: >C34 - C40 Fraction	----	100	mg/kg	<100	161 mg/kg	108	38	132
EP080/071: Total Recoverable Hydrocarbons - NEPM 2013 Fractions (QCLot: 245619)								
EP071: >C10 - C16 Fraction	>C10_C16	50	mg/kg	<50	1051 mg/kg	116	68	130
EP071: >C10 - C40 Fraction (sum)	----	50	mg/kg	<50	----	----	----	----
EP071: >C16 - C34 Fraction	----	100	mg/kg	<100	4124 mg/kg	110	72	116
EP071: >C34 - C40 Fraction	----	100	mg/kg	<100	161 mg/kg	110	38	132
EP080/071: Total Recoverable Hydrocarbons - NEPM 2013 Fractions (QCLot: 245844)								
EP080: C6 - C10 Fraction	C6_C10	10	mg/kg	<10	45 mg/kg	97.5	64	128

Sub-Matrix: **SOIL**

Method: Compound	CAS Number	LOR	Unit	Method Blank (MB) Report: Result	Laboratory Control Spike (LCS) Report: Spike Concentration	Spike Recovery (%): LCS	Recovery Limits (%): Low	Recovery Limits (%): High
EP080: BTEXN (QCLot: 244333)								
EP080: Benzene	71-43-2	0.2	mg/kg	<0.2	2 mg/kg	95.2	74	124
EP080: Ethylbenzene	100-41-4	0.5	mg/kg	<0.5	2 mg/kg	96.1	72	124
EP080: meta- & para-Xylene	108-38-3 106-42-3	0.5	mg/kg	<0.5	4 mg/kg	96.1	72	132
EP080: Naphthalene	91-20-3	1	mg/kg	<1	0.5 mg/kg	90.9	66	132
EP080: ortho-Xylene	95-47-6	0.5	mg/kg	<0.5	2 mg/kg	97.2	76	130
EP080: Toluene	108-88-3	0.5	mg/kg	<0.5	2 mg/kg	97.1	75	129
EP080: BTEXN (QCLot: 245844)								
EP080: Benzene	71-43-2	0.2	mg/kg	<0.2	2 mg/kg	100.0	74	124
EP080: Ethylbenzene	100-41-4	0.5	mg/kg	<0.5	2 mg/kg	104	72	124
EP080: meta- & para-Xylene	108-38-3 106-42-3	0.5	mg/kg	<0.5	4 mg/kg	106	72	132
EP080: Naphthalene	91-20-3	1	mg/kg	<1	0.5 mg/kg	97.8	66	132
EP080: ortho-Xylene	95-47-6	0.5	mg/kg	<0.5	2 mg/kg	110	76	130
EP080: Toluene	108-88-3	0.5	mg/kg	<0.5	2 mg/kg	102	75	129

Sub-Matrix: **WATER**

Method: Compound	CAS Number	LOR	Unit	Method Blank (MB) Report: Result	Laboratory Control Spike (LCS) Report: Spike Concentration	Spike Recovery (%): LCS	Recovery Limits (%): Low	Recovery Limits (%): High
EG020T: Total Metals by ICP-MS (QCLot: 247282)								
EG020A-T: Aluminium	7429-90-5	0.01	mg/L	<0.01	0.5 mg/L	101	100	108
EG020A-T: Arsenic	7440-38-2	0.001	mg/L	<0.001	0.1 mg/L	104	94	116
EG020A-T: Cadmium	7440-43-9	0.0001	mg/L	<0.0001	0.1 mg/L	98.3	90	110
EG020A-T: Chromium	7440-47-3	0.001	mg/L	<0.001	0.1 mg/L	108	90	110
EG020A-T: Copper	7440-50-8	0.001	mg/L	<0.001	0.1 mg/L	94.0	91	109
EG020A-T: Iron	7439-89-6	0.05	mg/L	<0.05	0.5 mg/L	104	99	109
EG020A-T: Lead	7439-92-1	0.001	mg/L	<0.001	0.1 mg/L	97.2	91	111
EG020A-T: Nickel	7440-02-0	0.001	mg/L	<0.001	0.1 mg/L	93.9	91	111
EG020A-T: Selenium	7782-49-2	0.01	mg/L	<0.01	0.1 mg/L	94.3	86	110
EG020A-T: Zinc	7440-66-6	0.005	mg/L	<0.005	0.1 mg/L	98.8	91	109
EG035T: Total Recoverable Mercury by FIMS (QCLot: 243781)								
EG035T: Mercury	7439-97-6	0.0001	mg/L	<0.0001	0.01 mg/L	102	87	113
EP080/071: Total Petroleum Hydrocarbons (QCLot: 243720)								
EP080: C6 - C9 Fraction	----	20	µg/L	<20	360 µg/L	100.0	67	127
EP080/071: Total Petroleum Hydrocarbons (QCLot: 243816)								
EP071: C10 - C14 Fraction	----	50	µg/L	<50	3980 µg/L	56.5	53	123
EP071: C15 - C28 Fraction	----	100	µg/L	<100	17006 µg/L	71.4	57	133
EP071: C29 - C36 Fraction	----	50	µg/L	<50	8662 µg/L	65.7	55	141
EP080/071: Total Petroleum Hydrocarbons (QCLot: 245170)								

Sub-Matrix: **WATER**

Method: Compound	CAS Number	LOR	Unit	Method Blank (MB) Report: Result	Laboratory Control Spike (LCS) Report: Spike Concentration	Spike Recovery (%): LCS	Recovery Limits (%): Low	Recovery Limits (%): High
EP080/071: Total Petroleum Hydrocarbons (QCLot: 245170) - continued								
EP080: C6 - C9 Fraction	----	20	µg/L	<20	360 µg/L	104	67	127
EP080/071: Total Recoverable Hydrocarbons - NEPM 2013 Fractions (QCLot: 243720)								
EP080: C6 - C10 Fraction	C6_C10	20	µg/L	<20	450 µg/L	102	65	125
EP080/071: Total Recoverable Hydrocarbons - NEPM 2013 Fractions (QCLot: 243816)								
EP071: >C10 - C16 Fraction	>C10_C16	100	µg/L	<100	5753 µg/L	65.5	54	122
EP071: >C16 - C34 Fraction	----	100	µg/L	<100	24516 µg/L	64.8	56	132
EP071: >C34 - C40 Fraction	----	100	µg/L	<100	828 µg/L	70.9	51	137
EP080/071: Total Recoverable Hydrocarbons - NEPM 2013 Fractions (QCLot: 245170)								
EP080: C6 - C10 Fraction	C6_C10	20	µg/L	<20	450 µg/L	102	65	125
EP080: BTEXN (QCLot: 243720)								
EP080: Benzene	71-43-2	1	µg/L	<1	20 µg/L	106	76	120
EP080: Ethylbenzene	100-41-4	2	µg/L	<2	20 µg/L	101	72	124
EP080: meta- & para-Xylene	108-38-3 106-42-3	2	µg/L	<2	40 µg/L	99.8	72	130
EP080: Naphthalene	91-20-3	5	µg/L	<5	5 µg/L	91.3	71	129
EP080: ortho-Xylene	95-47-6	2	µg/L	<2	20 µg/L	103	75	127
EP080: Toluene	108-88-3	2	µg/L	<2	20 µg/L	102	76	124
EP080: BTEXN (QCLot: 245170)								
EP080: Benzene	71-43-2	1	µg/L	<1	20 µg/L	98.9	76	120
EP080: Ethylbenzene	100-41-4	2	µg/L	<2	20 µg/L	106	72	124
EP080: meta- & para-Xylene	108-38-3 106-42-3	2	µg/L	<2	40 µg/L	114	72	130
EP080: Naphthalene	91-20-3	5	µg/L	<5	5 µg/L	98.7	71	129
EP080: ortho-Xylene	95-47-6	2	µg/L	<2	20 µg/L	115	75	127
EP080: Toluene	108-88-3	2	µg/L	<2	20 µg/L	108	76	124

Matrix Spike (MS) Report

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

Sub-Matrix: **SOIL**

Laboratory sample ID	Client sample ID	Method: Compound	CAS Number	Matrix Spike (MS) Report: Spike Concentration	SpikeRecovery(%): MS	Recovery Limits (%): Low	Recovery Limits (%): High
EG005T: Total Metals by ICP-AES (QCLot: 244710)							
EM1515737-002	GW21(0.5-0.6)	EG005T: Arsenic	7440-38-2	50 mg/kg	94.7	78	124
		EG005T: Cadmium	7440-43-9	50 mg/kg	97.1	84	116
		EG005T: Chromium	7440-47-3	50 mg/kg	95.8	79	121
		EG005T: Copper	7440-50-8	50 mg/kg	92.8	82	124

Sub-Matrix: **SOIL**

				Matrix Spike (MS) Report			
				Spike	SpikeRecovery(%)	Recovery Limits (%)	
Laboratory sample ID	Client sample ID	Method: Compound	CAS Number	Concentration	MS	Low	High
EG005T: Total Metals by ICP-AES (QCLot: 244710) - continued							
EM1515737-002	GW21(0.5-0.6)	EG005T: Lead	7439-92-1	50 mg/kg	93.9	76	124
		EG005T: Nickel	7440-02-0	50 mg/kg	88.9	78	120
		EG005T: Selenium	7782-49-2	50 mg/kg	86.4	71	125
		EG005T: Zinc	7440-66-6	50 mg/kg	114	74	128
EG005T: Total Metals by ICP-AES (QCLot: 245668)							
EM1515707-002	Anonymous	EG005T: Arsenic	7440-38-2	50 mg/kg	86.3	78	124
		EG005T: Cadmium	7440-43-9	50 mg/kg	96.9	84	116
		EG005T: Chromium	7440-47-3	50 mg/kg	104	79	121
		EG005T: Copper	7440-50-8	50 mg/kg	97.5	82	124
		EG005T: Lead	7439-92-1	50 mg/kg	95.9	76	124
		EG005T: Nickel	7440-02-0	50 mg/kg	92.4	78	120
		EG005T: Selenium	7782-49-2	50 mg/kg	83.1	71	125
		EG005T: Zinc	7440-66-6	50 mg/kg	93.8	74	128
EG035T: Total Recoverable Mercury by FIMS (QCLot: 244711)							
EM1515737-002	GW21(0.5-0.6)	EG035T: Mercury	7439-97-6	5 mg/kg	87.6	76	116
EG035T: Total Recoverable Mercury by FIMS (QCLot: 245667)							
EM1515707-002	Anonymous	EG035T: Mercury	7439-97-6	5 mg/kg	88.4	76	116
EP074E: Halogenated Aliphatic Compounds (QCLot: 244334)							
EM1515737-002	GW21(0.5-0.6)	EP074: 1.1-Dichloroethene	75-35-4	2 mg/kg	88.0	29	141
		EP074: Trichloroethene	79-01-6	2 mg/kg	81.4	50	126
EP074E: Halogenated Aliphatic Compounds (QCLot: 245845)							
EM1515737-023	GW27(0.5-0.6)	EP074: 1.1-Dichloroethene	75-35-4	2 mg/kg	104	29	141
		EP074: Trichloroethene	79-01-6	2 mg/kg	86.6	50	126
EP074F: Halogenated Aromatic Compounds (QCLot: 244334)							
EM1515737-002	GW21(0.5-0.6)	EP074: Chlorobenzene	108-90-7	2 mg/kg	88.7	65	133
EP074F: Halogenated Aromatic Compounds (QCLot: 245845)							
EM1515737-023	GW27(0.5-0.6)	EP074: Chlorobenzene	108-90-7	2 mg/kg	99.1	65	133
EP075(SIM)B: Polynuclear Aromatic Hydrocarbons (QCLot: 245374)							
EM1515737-002	GW21(0.5-0.6)	EP075(SIM): Acenaphthene	83-32-9	3 mg/kg	102	67	117
		EP075(SIM): Pyrene	129-00-0	3 mg/kg	# 152	52	148
EP075(SIM)B: Polynuclear Aromatic Hydrocarbons (QCLot: 245620)							
EM1515831-001	Anonymous	EP075(SIM): Acenaphthene	83-32-9	3 mg/kg	105	67	117
		EP075(SIM): Pyrene	129-00-0	3 mg/kg	116	52	148
EP080/071: Total Petroleum Hydrocarbons (QCLot: 244333)							
EM1515737-002	GW21(0.5-0.6)	EP080: C6 - C9 Fraction	----	28 mg/kg	73.6	42	131

Sub-Matrix: **SOIL**

				Matrix Spike (MS) Report			
				Spike	SpikeRecovery(%)	Recovery Limits (%)	
Laboratory sample ID	Client sample ID	Method: Compound	CAS Number	Concentration	MS	Low	High
EP080/071: Total Petroleum Hydrocarbons (QCLot: 245375)							
EM1515711-024	Anonymous	EP071: C10 - C14 Fraction	----	658 mg/kg	106	53	123
		EP071: C15 - C28 Fraction	----	3160 mg/kg	105	70	124
		EP071: C29 - C36 Fraction	----	1448 mg/kg	104	64	118
EP080/071: Total Petroleum Hydrocarbons (QCLot: 245619)							
EM1515840-002	Anonymous	EP071: C10 - C14 Fraction	----	658 mg/kg	106	53	123
		EP071: C15 - C28 Fraction	----	3160 mg/kg	104	70	124
		EP071: C29 - C36 Fraction	----	1448 mg/kg	106	64	118
EP080/071: Total Petroleum Hydrocarbons (QCLot: 245844)							
EM1515737-023	GW27(0.5-0.6)	EP080: C6 - C9 Fraction	----	28 mg/kg	79.1	42	131
EP080/071: Total Recoverable Hydrocarbons - NEPM 2013 Fractions (QCLot: 244333)							
EM1515737-002	GW21(0.5-0.6)	EP080: C6 - C10 Fraction	C6_C10	33 mg/kg	73.2	39	129
EP080/071: Total Recoverable Hydrocarbons - NEPM 2013 Fractions (QCLot: 245375)							
EM1515711-024	Anonymous	EP071: >C10 - C16 Fraction	>C10_C16	1051 mg/kg	104	65	123
		EP071: >C16 - C34 Fraction	----	4124 mg/kg	106	67	121
		EP071: >C34 - C40 Fraction	----	161 mg/kg	99.8	44	126
EP080/071: Total Recoverable Hydrocarbons - NEPM 2013 Fractions (QCLot: 245619)							
EM1515840-002	Anonymous	EP071: >C10 - C16 Fraction	>C10_C16	1051 mg/kg	111	65	123
		EP071: >C16 - C34 Fraction	----	4124 mg/kg	104	67	121
		EP071: >C34 - C40 Fraction	----	161 mg/kg	109	44	126
EP080/071: Total Recoverable Hydrocarbons - NEPM 2013 Fractions (QCLot: 245844)							
EM1515737-023	GW27(0.5-0.6)	EP080: C6 - C10 Fraction	C6_C10	33 mg/kg	74.9	39	129
EP080: BTEXN (QCLot: 244333)							
EM1515737-002	GW21(0.5-0.6)	EP080: Benzene	71-43-2	2 mg/kg	96.1	50	136
		EP080: Toluene	108-88-3	2 mg/kg	92.9	56	139
EP080: BTEXN (QCLot: 245844)							
EM1515737-023	GW27(0.5-0.6)	EP080: Benzene	71-43-2	2 mg/kg	104	50	136
		EP080: Toluene	108-88-3	2 mg/kg	97.3	56	139

Sub-Matrix: **WATER**

				Matrix Spike (MS) Report			
				Spike	SpikeRecovery(%)	Recovery Limits (%)	
Laboratory sample ID	Client sample ID	Method: Compound	CAS Number	Concentration	MS	Low	High
EG020T: Total Metals by ICP-MS (QCLot: 247282)							
EM1515691-001	Anonymous	EG020A-T: Arsenic	7440-38-2	1 mg/L	115	82	118
		EG020A-T: Cadmium	7440-43-9	0.25 mg/L	110	75	129
		EG020A-T: Chromium	7440-47-3	1 mg/L	100	80	118
		EG020A-T: Copper	7440-50-8	1 mg/L	106	81	115
		EG020A-T: Lead	7439-92-1	1 mg/L	99.0	83	121

Sub-Matrix: **WATER**

				Matrix Spike (MS) Report			
				Spike	SpikeRecovery(%)	Recovery Limits (%)	
Laboratory sample ID	*Client sample ID*	*Method: Compound*	*CAS Number*	*Concentration*	*MS*	*Low*	*High*
EG020T: Total Metals by ICP-MS (QCLot: 247282) - continued							
EM1515691-001	Anonymous	EG020A-T: Nickel	7440-02-0	1 mg/L	109	80	118
		EG020A-T: Zinc	7440-66-6	1 mg/L	106	74	116
EG035T: Total Recoverable Mercury by FIMS (QCLot: 243781)							
EM1515686-014	Anonymous	EG035T: Mercury	7439-97-6	0.01 mg/L	105	70	130
EP080/071: Total Petroleum Hydrocarbons (QCLot: 243720)							
EM1515731-045	Anonymous	EP080: C6 - C9 Fraction	----	280 µg/L	77.6	43	125
EP080/071: Total Petroleum Hydrocarbons (QCLot: 245170)							
EM1515737-039	QC05	EP080: C6 - C9 Fraction	----	280 µg/L	106	43	125
EP080/071: Total Recoverable Hydrocarbons - NEPM 2013 Fractions (QCLot: 243720)							
EM1515731-045	Anonymous	EP080: C6 - C10 Fraction	C6_C10	330 µg/L	76.0	44	122
EP080/071: Total Recoverable Hydrocarbons - NEPM 2013 Fractions (QCLot: 245170)							
EM1515737-039	QC05	EP080: C6 - C10 Fraction	C6_C10	330 µg/L	111	44	122
EP080: BTEXN (QCLot: 243720)							
EM1515731-045	Anonymous	EP080: Benzene	71-43-2	20 µg/L	113	68	130
		EP080: Toluene	108-88-3	20 µg/L	103	72	132
EP080: BTEXN (QCLot: 245170)							
EM1515737-039	QC05	EP080: Benzene	71-43-2	20 µg/L	114	68	130
		EP080: Toluene	108-88-3	20 µg/L	121	72	132

ALS Environmental

QA/QC Compliance Assessment for DQO Reporting

Work Order	: **EM1515737**	Page	: 1 of 7
Client	: **AECOM Australia Pty Ltd**	Laboratory	: Environmental Division Melbourne
Contact	: MS AVERYLL COYNE	Telephone	: +61 7 3243 7123
Project	: 60431087	Date Samples Received	: 14-Oct-2015
Site	: Fishermans Bend	Issue Date	: 21-Oct-2015
Sampler	: NATHAN JENSEN, OLIVER TAYLOR	No. of samples received	: 40
Order number	: 60431087 1.4	No. of samples analysed	: 8

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.**
- **Matrix Spike outliers exist - please see following pages for full details.**
- **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 : Quality Control Samples

Duplicates, Method Blanks, Laboratory Control Samples and Matrix Spikes

Matrix: **SOIL**

Compound Group Name	Laboratory Sample ID	Client Sample ID	Analyte	CAS Number	Data	Limits	Comment
Matrix Spike (MS) Recoveries							
EP075(SIM)B: Polynuclear Aromatic Hydrocarbons	EM1515737--002	GW21(0.5-0.6)	**Pyrene**	129-00-0	152 %	52-148%	**Recovery greater than upper data quality objective**

Outliers : Frequency of Quality Control Samples

Matrix: **WATER**

Quality Control Sample Type	Count		Rate (%)		Quality Control Specification
Method	QC	Regular	Actual	Expected	
Laboratory Duplicates (DUP)					
TRH - Semivolatile Fraction	0	19	0.00	10.00	NEPM 2013 Schedule B(3) and ALS QCS3 requirement
Matrix Spikes (MS)					
TRH - Semivolatile Fraction	0	19	0.00	5.00	NEPM 2013 Schedule B(3) and ALS QCS3 requirement

Analysis Holding Time Compliance

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							
Soil Glass Jar - Unpreserved (EA055-103)							
GW21(0.5-0.6)	**13-Oct-2015**	**----**	----	----	**15-Oct-2015**	27-Oct-2015	✓
Soil Glass Jar - Unpreserved (EA055-103)							
GW21(2.8-2.9), GW22(2.5-2.6), GW27(0.5-0.6), GW30(3.5-3.6), GW26(3.0-3.1)	**13-Oct-2015**	**----**	----	----	**16-Oct-2015**	27-Oct-2015	✓
EG005T: Total Metals by ICP-AES							
Soil Glass Jar - Unpreserved (EG005T)							
GW21(0.5-0.6)	**13-Oct-2015**	**16-Oct-2015**	10-Apr-2016	✓	**16-Oct-2015**	10-Apr-2016	✓
Soil Glass Jar - Unpreserved (EG005T)							
GW27(0.5-0.6)	**13-Oct-2015**	**16-Oct-2015**	10-Apr-2016	✓	**19-Oct-2015**	10-Apr-2016	✓
EG035T: Total Recoverable Mercury by FIMS							
Soil Glass Jar - Unpreserved (EG035T)							
GW21(0.5-0.6), GW27(0.5-0.6)	**13-Oct-2015**	**16-Oct-2015**	10-Nov-2015	✓	**19-Oct-2015**	10-Nov-2015	✓

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
EP003: Total Organic Carbon (TOC) in Soil							
Pulp Bag (EP003)							
GW21(2.8-2.9), GW22(2.5-2.6), GW30(3.5-3.6), GW26(3.0-3.1)	**13-Oct-2015**	**19-Oct-2015**	10-Nov-2015	✓	**19-Oct-2015**	10-Nov-2015	✓
EP080/071: Total Petroleum Hydrocarbons							
Soil Glass Jar - Unpreserved (EP071)							
GW21(0.5-0.6), GW27(0.5-0.6)	**13-Oct-2015**	**16-Oct-2015**	27-Oct-2015	✓	**16-Oct-2015**	25-Nov-2015	✓
EP074A: Monocyclic Aromatic Hydrocarbons							
Soil Glass Jar - Unpreserved (EP074)							
GW21(0.5-0.6)	**13-Oct-2015**	**15-Oct-2015**	20-Oct-2015	✓	**15-Oct-2015**	20-Oct-2015	✓
Soil Glass Jar - Unpreserved (EP074)							
GW27(0.5-0.6)	**13-Oct-2015**	**16-Oct-2015**	20-Oct-2015	✓	**16-Oct-2015**	20-Oct-2015	✓
EP075(SIM)B: Polynuclear Aromatic Hydrocarbons							
Soil Glass Jar - Unpreserved (EP075(SIM))							
GW21(0.5-0.6), GW27(0.5-0.6)	**13-Oct-2015**	**16-Oct-2015**	27-Oct-2015	✓	**16-Oct-2015**	25-Nov-2015	✓
EP080/071: Total Petroleum Hydrocarbons							
Soil Glass Jar - Unpreserved (EP080)							
GW21(0.5-0.6)	**13-Oct-2015**	**15-Oct-2015**	27-Oct-2015	✓	**15-Oct-2015**	27-Oct-2015	✓
Soil Glass Jar - Unpreserved (EP080)							
GW27(0.5-0.6)	**13-Oct-2015**	**16-Oct-2015**	27-Oct-2015	✓	**16-Oct-2015**	27-Oct-2015	✓

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)							
QC04	**13-Oct-2015**	**19-Oct-2015**	10-Apr-2016	✓	**19-Oct-2015**	10-Apr-2016	✓
EG035T: Total Recoverable Mercury by FIMS							
Clear Plastic Bottle - Nitric Acid; Unfiltered (EG035T)							
QC04	**13-Oct-2015**	**----**	----	----	**15-Oct-2015**	10-Nov-2015	✓
EP080/071: Total Petroleum Hydrocarbons							
Amber Glass Bottle - Unpreserved (EP071)							
QC04	**13-Oct-2015**	**15-Oct-2015**	20-Oct-2015	✓	**15-Oct-2015**	24-Nov-2015	✓
EP080/071: Total Petroleum Hydrocarbons							
Amber VOC Vial - Sulfuric Acid (EP080)							
QC04	**13-Oct-2015**	**15-Oct-2015**	27-Oct-2015	✓	**15-Oct-2015**	27-Oct-2015	✓
Amber VOC Vial - Sulfuric Acid (EP080)							
QC05	**13-Oct-2015**	**16-Oct-2015**	27-Oct-2015	✓	**16-Oct-2015**	27-Oct-2015	✓

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	EA055-103	2	20	10.00	10.00	✓	NEPM 2013 Schedule B(3) and ALS QCS3 requirement
PAH/Phenols (SIM)	EP075(SIM)	1	9	11.11	10.00	✓	NEPM 2013 Schedule B(3) and ALS QCS3 requirement
Total Mercury by FIMS	EG035T	1	8	12.50	10.00	✓	NEPM 2013 Schedule B(3) and ALS QCS3 requirement
Total Metals by ICP-AES	EG005T	1	8	12.50	10.00	✓	NEPM 2013 Schedule B(3) and ALS QCS3 requirement
Total Organic Carbon	EP003	2	20	10.00	10.00	✓	NEPM 2013 Schedule B(3) and ALS QCS3 requirement
TRH - Semivolatile Fraction	EP071	2	14	14.29	10.00	✓	NEPM 2013 Schedule B(3) and ALS QCS3 requirement
TRH Volatiles/BTEX	EP080	1	5	20.00	10.00	✓	NEPM 2013 Schedule B(3) and ALS QCS3 requirement
Volatile Organic Compounds	EP074	1	5	20.00	10.00	✓	NEPM 2013 Schedule B(3) and ALS QCS3 requirement
Laboratory Control Samples (LCS)							
PAH/Phenols (SIM)	EP075(SIM)	1	9	11.11	5.00	✓	NEPM 2013 Schedule B(3) and ALS QCS3 requirement
Total Mercury by FIMS	EG035T	1	8	12.50	5.00	✓	NEPM 2013 Schedule B(3) and ALS QCS3 requirement
Total Metals by ICP-AES	EG005T	1	8	12.50	5.00	✓	NEPM 2013 Schedule B(3) and ALS QCS3 requirement
Total Organic Carbon	EP003	1	20	5.00	5.00	✓	NEPM 2013 Schedule B(3) and ALS QCS3 requirement
TRH - Semivolatile Fraction	EP071	1	14	7.14	5.00	✓	NEPM 2013 Schedule B(3) and ALS QCS3 requirement
TRH Volatiles/BTEX	EP080	1	5	20.00	5.00	✓	NEPM 2013 Schedule B(3) and ALS QCS3 requirement
Volatile Organic Compounds	EP074	1	5	20.00	5.00	✓	NEPM 2013 Schedule B(3) and ALS QCS3 requirement
Method Blanks (MB)							
PAH/Phenols (SIM)	EP075(SIM)	1	9	11.11	5.00	✓	NEPM 2013 Schedule B(3) and ALS QCS3 requirement
Total Mercury by FIMS	EG035T	1	8	12.50	5.00	✓	NEPM 2013 Schedule B(3) and ALS QCS3 requirement
Total Metals by ICP-AES	EG005T	1	8	12.50	5.00	✓	NEPM 2013 Schedule B(3) and ALS QCS3 requirement
Total Organic Carbon	EP003	1	20	5.00	5.00	✓	NEPM 2013 Schedule B(3) and ALS QCS3 requirement
TRH - Semivolatile Fraction	EP071	1	14	7.14	5.00	✓	NEPM 2013 Schedule B(3) and ALS QCS3 requirement
TRH Volatiles/BTEX	EP080	1	5	20.00	5.00	✓	NEPM 2013 Schedule B(3) and ALS QCS3 requirement
Volatile Organic Compounds	EP074	1	5	20.00	5.00	✓	NEPM 2013 Schedule B(3) and ALS QCS3 requirement
Matrix Spikes (MS)							
PAH/Phenols (SIM)	EP075(SIM)	1	9	11.11	5.00	✓	NEPM 2013 Schedule B(3) and ALS QCS3 requirement
Total Mercury by FIMS	EG035T	1	8	12.50	5.00	✓	NEPM 2013 Schedule B(3) and ALS QCS3 requirement
Total Metals by ICP-AES	EG005T	1	8	12.50	5.00	✓	NEPM 2013 Schedule B(3) and ALS QCS3 requirement
TRH - Semivolatile Fraction	EP071	1	14	7.14	5.00	✓	NEPM 2013 Schedule B(3) and ALS QCS3 requirement
TRH Volatiles/BTEX	EP080	1	5	20.00	5.00	✓	NEPM 2013 Schedule B(3) and ALS QCS3 requirement
Volatile Organic Compounds	EP074	1	5	20.00	5.00	✓	NEPM 2013 Schedule B(3) and ALS QCS3 requirement

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)							

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 Mercury by FIMS	EG035T	2	17	**11.76**	**10.00**	✓	NEPM 2013 Schedule B(3) and ALS QCS3 requirement
Total Metals by ICP-MS - Suite A	EG020A-T	2	20	**10.00**	**10.00**	✓	NEPM 2013 Schedule B(3) and ALS QCS3 requirement
TRH - Semivolatile Fraction	EP071	0	19	**0.00**	**10.00**	×	NEPM 2013 Schedule B(3) and ALS QCS3 requirement
TRH Volatiles/BTEX	EP080	2	20	**10.00**	**10.00**	✓	NEPM 2013 Schedule B(3) and ALS QCS3 requirement
Laboratory Control Samples (LCS)							
Total Mercury by FIMS	EG035T	1	17	**5.88**	**5.00**	✓	NEPM 2013 Schedule B(3) and ALS QCS3 requirement
Total Metals by ICP-MS - Suite A	EG020A-T	1	20	**5.00**	**5.00**	✓	NEPM 2013 Schedule B(3) and ALS QCS3 requirement
TRH - Semivolatile Fraction	EP071	1	19	**5.26**	**5.00**	✓	NEPM 2013 Schedule B(3) and ALS QCS3 requirement
TRH Volatiles/BTEX	EP080	1	20	**5.00**	**5.00**	✓	NEPM 2013 Schedule B(3) and ALS QCS3 requirement
Method Blanks (MB)							
Total Mercury by FIMS	EG035T	1	17	**5.88**	**5.00**	✓	NEPM 2013 Schedule B(3) and ALS QCS3 requirement
Total Metals by ICP-MS - Suite A	EG020A-T	1	20	**5.00**	**5.00**	✓	NEPM 2013 Schedule B(3) and ALS QCS3 requirement
TRH - Semivolatile Fraction	EP071	1	19	**5.26**	**5.00**	✓	NEPM 2013 Schedule B(3) and ALS QCS3 requirement
TRH Volatiles/BTEX	EP080	1	20	**5.00**	**5.00**	✓	NEPM 2013 Schedule B(3) and ALS QCS3 requirement
Matrix Spikes (MS)							
Total Mercury by FIMS	EG035T	1	17	**5.88**	**5.00**	✓	NEPM 2013 Schedule B(3) and ALS QCS3 requirement
Total Metals by ICP-MS - Suite A	EG020A-T	1	20	**5.00**	**5.00**	✓	NEPM 2013 Schedule B(3) and ALS QCS3 requirement
TRH - Semivolatile Fraction	EP071	0	19	**0.00**	**5.00**	×	NEPM 2013 Schedule B(3) and ALS QCS3 requirement
TRH Volatiles/BTEX	EP080	1	20	**5.00**	**5.00**	✓	NEPM 2013 Schedule B(3) and ALS QCS3 requirement

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	EA055-103	SOIL	In-house. A gravimetric procedure based on weight loss over a 12 hour drying period at 103-105 degrees C. This method is compliant with NEPM (2013) Schedule B(3) Section 7.1 and Table 1 (14 day holding time).
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 (2013) 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 (2013) Schedule B(3)
Total Organic Carbon	EP003	SOIL	In-house C-IR17. Dried and pulverised sample is reacted with acid to remove inorganic Carbonates, then combusted in a LECO furnace in the presence of strong oxidants / catalysts. The evolved (Organic) Carbon (as CO2) is automaticaly measured by infra-red detector.
TRH - Semivolatile Fraction	EP071	SOIL	(USEPA SW 846 - 8015A) Sample extracts are analysed by Capillary GC/FID and quantified against alkane standards over the range C10 - C40.
Volatile Organic Compounds	EP074	SOIL	(USEPA SW 846 - 8260B) Extracts are analysed by Purge and Trap, Capillary GC/MS. Quantification is by comparison against an established 5 point calibration curve. This method is compliant with NEPM (2013) Schedule B(3) (Method 501)
PAH/Phenols (SIM)	EP075(SIM)	SOIL	(USEPA SW 846 - 8270B) 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 (2013) Schedule B(3) (Method 502 and 507)
TRH Volatiles/BTEX	EP080	SOIL	(USEPA SW 846 - 8260B) Extracts are analysed by Purge and Trap, Capillary GC/MS. Quantification is by comparison against an established 5 point calibration curve.
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 (2013) Schedule B(3)
TRH - Semivolatile Fraction	EP071	WATER	USEPA SW 846 - 8015A 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 (2013) Schedule B(3)

Analytical Methods	Method	Matrix	Method Descriptions
TRH Volatiles/BTEX	EP080	WATER	USEPA SW 846 - 8260B 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 (2013) Schedule B(3)

Preparation Methods	Method	Matrix	Method Descriptions
Dry and Pulverise (up to 100g)	GEO30	SOIL	#
Methanolic Extraction of Soils for Purge and Trap	ORG16	SOIL	(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	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 (2013) Schedule B(3)

ALS Environmental

SAMPLE RECEIPT NOTIFICATION (SRN)

Work Order : **EM1515737**

Client	: **AECOM Australia Pty Ltd**	Laboratory	: Environmental Division Melbourne
Contact	: MS AVERYLL COYNE	Contact	: Carol Walsh
Address	: LEVEL 9 8 EXHIBITION ST MELBOURNE VIC 3000	Address	: 4 Westall Rd Springvale VIC Australia 3171
E-mail	: averyll.coyne@aecom.com	E-mail	: carol.walsh@alsglobal.com
Telephone	: +61 03 9653 1234	Telephone	: +61-3-8549 9608
Facsimile	: +61 03 9654 7117	Facsimile	: +61-3-8549 9601
Project	: 60431087	Page	: 1 of 4
Order number	: 60431087	Quote number	: EB2015AECOMAU0580 (EN/004/15)
C-O-C number	: ----	QC Level	: NEPM 2013 Schedule B(3) and ALS QCS3 requirement
Site	: Fishermans Bend		
Sampler	: NATHAN JENSEN, OLIVER TAYLOR		

Dates

Date Samples Received	: 14-Oct-2015 11:15 AM	Issue Date	: 14-Oct-2015
Client Requested Due Date	: 21-Oct-2015	Scheduled Reporting Date	: **21-Oct-2015**

Delivery Details

Mode of Delivery	: Carrier	Security Seal	: Intact.
No. of coolers/boxes	: 2	Temperature	: 5.3 - Ice present
Receipt Detail	:	No. of samples received / analysed	: 40 / 7

General Comments

- This report contains the following information:
  - Sample Container(s)/Preservation Non-Compliances
  - Summary of Sample(s) and Requested Analysis
  - Proactive Holding Time Report
  - Requested Deliverables
- **Please direct any queries related to sample condition / numbering / breakages to Client Services.**
- Sample Disposal - Aqueous (14 days), Solid (60 days) from date of completion of work order.
- **Analytical work for this work order will be conducted at ALS Springvale and ALS Brisbane**
- **Please refer to the Proactive Holding Time Report table below which summarises breaches of recommended holding times that have occurred prior to samples/instructions being received at the laboratory. The absence of this summary table indicates that all samples have been received within the recommended holding times for the analysis requested.**

Sample Container(s)/Preservation Non-Compliances

All comparisons are made against pretreatment/preservation AS, APHA, USEPA standards.

- **No sample container / preservation non-compliance exist.**

Summary of Sample(s) and Requested Analysis

Some items described below may be part of a laboratory process necessary for the execution of client requested tasks. Packages may contain additional analyses, such as the determination of moisture content and preparation tasks, that are included in the package.

Matrix: **SOIL**

Laboratory sample ID	Client sampling date / time	Client sample ID	(On Hold) SOIL No analysis requested	SOIL - EA055-103 Moisture Content	SOIL - EG005T (solids) Total Metals by ICP-AES	SOIL - EP003 Total Organic Carbon (TOC) in Soil	SOIL - S-02 8 Metals (incl. Digestion)	SOIL - S-10 TRH/VOC/PAH
EM1515737-001	[13-Oct-2015]	GW21(0.0-0.1)	✓					
EM1515737-002	[13-Oct-2015]	GW21(0.5-0.6)		✓	✓		✓	✓
EM1515737-003	[13-Oct-2015]	GW21(1.0-1.1)	✓					
EM1515737-004	[13-Oct-2015]	GW21(1.5-1.6)	✓					
EM1515737-005	[13-Oct-2015]	GW21(2.0-2.1)	✓					
EM1515737-006	[13-Oct-2015]	GW21(2.5-2.6)	✓					
EM1515737-007	[13-Oct-2015]	GW21(2.8-2.9)		✓		✓		
EM1515737-008	[13-Oct-2015]	GW21(3.4-3.5)	✓					
EM1515737-009	[13-Oct-2015]	GW21(4.0-4.1)	✓					
EM1515737-010	[13-Oct-2015]	GW22(0.0-0.1)	✓					
EM1515737-011	[13-Oct-2015]	GW22(0.5-0.6)	✓					
EM1515737-012	[13-Oct-2015]	GW22(1.0-1.1)	✓					
EM1515737-013	[13-Oct-2015]	GW22(1.5-1.6)	✓					
EM1515737-014	[13-Oct-2015]	GW22(2.0-2.1)	✓					
EM1515737-015	[13-Oct-2015]	GW22(2.5-2.6)		✓		✓		
EM1515737-016	[13-Oct-2015]	GW22(3.0-3.1)	✓					
EM1515737-017	[13-Oct-2015]	GW23(0.0-0.1)	✓					
EM1515737-018	[13-Oct-2015]	GW23(0.5-0.6)	✓					
EM1515737-019	[13-Oct-2015]	GW23(1.0-1.1)	✓					
EM1515737-020	[13-Oct-2015]	GW23(1.2-1.3)	✓					
EM1515737-021	[13-Oct-2015]	GW23(1.5-1.6)	✓					
EM1515737-022	[13-Oct-2015]	GW27(0.1-0.2)	✓					
EM1515737-023	[13-Oct-2015]	GW27(0.5-0.6)	✓					
EM1515737-024	[13-Oct-2015]	GW30(0.0-0.1)	✓					
EM1515737-025	[13-Oct-2015]	GW30(0.5-0.6)	✓					
EM1515737-026	[13-Oct-2015]	GW30(1.0-1.1)	✓					
EM1515737-027	[13-Oct-2015]	GW30(1.5-1.6)	✓					
EM1515737-028	[13-Oct-2015]	GW30(1.7-1.8)	✓					
EM1515737-029	[13-Oct-2015]	GW30(2.5-2.6)	✓					
EM1515737-030	[13-Oct-2015]	GW30(3.5-3.6)		✓		✓		
EM1515737-031	[13-Oct-2015]	GW30(4.4-4.5)	✓					
EM1515737-032	[13-Oct-2015]	GW30(5.1-5.2)	✓					
EM1515737-033	[13-Oct-2015]	GW26(1.9-2.0)	✓					
EM1515737-034	[13-Oct-2015]	GW26(2.1-2.2)	✓					
EM1515737-035	[13-Oct-2015]	GW26(3.0-3.1)		✓		✓		

			(On Hold) SOIL No analysis requested	SOIL - EA055-103 Moisture Content	SOIL - EG005T (solids) Total Metals by ICP-AES	SOIL - EP003 Total Organic Carbon (TOC) in Soil	SOIL - S-02 8 Metals (incl. Digestion)	SOIL - S-10 TRH/VOC/PAH
EM1515737-036	[13-Oct-2015]	GW26(4.0-4.1)	✓					
EM1515737-037	[13-Oct-2015]	GW26(5.0-5.1)	✓					
EM1515737-040	[13-Oct-2015]	GW22(4.0-4.1)	✓					

Matrix: **WATER**

Laboratory sample ID	*Client sampling date / time*	*Client sample ID*	WATER - W-05T TRH/BTEXN/8 Metals (Total)
EM1515737-038	[13-Oct-2015]	QC04	✓

Matrix: **WATER**

Laboratory sample ID	*Client sampling date / time*	*Client sample ID*	WATER - EG020T Total Recoverable Metals by ICPMS (including	WATER - W-18 TRH(C6 - C9)/BTEXN
EM1515737-038	[13-Oct-2015]	QC04	✓	
EM1515737-039	[13-Oct-2015]	QC05		✓

Proactive Holding Time Report

Sample(s) have been received within the recommended holding times for the requested analysis.

Requested Deliverables

AP_CUSTOMER SERVICE ANZ

- A4 - AU Tax Invoice (INV)	Email	AP_CustomerService.ANZ@aecom.com

AVERYLL COYNE

- *AU Certificate of Analysis - NATA (COA)	Email	averyll.coyne@aecom.com
- *AU Interpretive QC Report - DEFAULT (Anon QCI Rep) (QCI)	Email	averyll.coyne@aecom.com
- *AU QC Report - DEFAULT (Anon QC Rep) - NATA (QC)	Email	averyll.coyne@aecom.com
- A4 - AU Sample Receipt Notification - Environmental HT (SRN)	Email	averyll.coyne@aecom.com
- A4 - AU Tax Invoice (INV)	Email	averyll.coyne@aecom.com
- Chain of Custody (CoC) (COC)	Email	averyll.coyne@aecom.com
- EDI Format - ENMRG (ENMRG)	Email	averyll.coyne@aecom.com
- EDI Format - ESDAT (ESDAT)	Email	averyll.coyne@aecom.com
- EDI Format - HLAPro (HLAPro)	Email	averyll.coyne@aecom.com
- EDI Format - XTab (XTAB)	Email	averyll.coyne@aecom.com

ALS Environmental

SAMPLE RECEIPT NOTIFICATION (SRN)

Work Order : **EM1515737**

Client	: **AECOM Australia Pty Ltd**	Laboratory	: Environmental Division Melbourne
Contact	: MS AVERYLL COYNE	Contact	: Carsten Emrich
Address	: LEVEL 9 8 EXHIBITION ST MELBOURNE VIC 3000	Address	: 4 Westall Rd Springvale VIC Australia 3171
E-mail	: averyll.coyne@aecom.com	E-mail	: carsten.emrich@alsenviro.com
Telephone	: +61 03 9653 1234	Telephone	: +61 7 3243 7123
Facsimile	: +61 03 9654 7117	Facsimile	: +61-3-8549 9601
Project	: 60431087	Page	: 1 of 4
Order number	: 60431087	Quote number	: EB2015AECOMAU0580 (EN/004/15)
C-O-C number	: ----	QC Level	: NEPM 2013 Schedule B(3) and ALS QCS3 requirement
Site	: Fishermans Bend		
Sampler	: NATHAN JENSEN, OLIVER TAYLOR		

Dates

Date Samples Received	: 14-Oct-2015 11:15 AM	Issue Date	: 16-Oct-2015
Client Requested Due Date	: 21-Oct-2015	Scheduled Reporting Date	: **20-Oct-2015**

Delivery Details

Mode of Delivery	: Carrier	Security Seal	: Intact.
No. of coolers/boxes	: 2	Temperature	: 5.3 - Ice present
Receipt Detail	:	No. of samples received / analysed	: 40 / 8

General Comments

- This report contains the following information:
  - Sample Container(s)/Preservation Non-Compliances
  - Summary of Sample(s) and Requested Analysis
  - Proactive Holding Time Report
  - Requested Deliverables
- **Additional analysis instruction was received by ALS on 15/10/2015 at 3:47 PM.**
- **Please direct any queries related to sample condition / numbering / breakages to Client Services.**
- Sample Disposal - Aqueous (14 days), Solid (60 days) from date of completion of work order.
- **Analytical work for this work order will be conducted at ALS Springvale and ALS Brisbane**
- **Please refer to the Proactive Holding Time Report table below which summarises breaches of recommended holding times that have occurred prior to samples/instructions being received at the laboratory. The absence of this summary table indicates that all samples have been received within the recommended holding times for the analysis requested.**

Sample Container(s)/Preservation Non-Compliances

All comparisons are made against pretreatment/preservation AS, APHA, USEPA standards.

- **No sample container / preservation non-compliance exist.**

Summary of Sample(s) and Requested Analysis

Some items described below may be part of a laboratory process necessary for the execution of client requested tasks. Packages may contain additional analyses, such as the determination of moisture content and preparation tasks, that are included in the package.

Matrix: **SOIL**

Laboratory sample ID	Client sampling date / time	Client sample ID	(On Hold) SOIL No analysis requested	SOIL - EA055-103 Moisture Content	SOIL - EG005T (solids) Total Metals by ICP-AES	SOIL - EP003 Total Organic Carbon (TOC) in Soil	SOIL - S-02 8 Metals (incl. Digestion)	SOIL - S-10 TRH/VOC/PAH
EM1515737-001	[13-Oct-2015]	GW21(0.0-0.1)	✓					
EM1515737-002	[13-Oct-2015]	GW21(0.5-0.6)		✓	✓		✓	✓
EM1515737-003	[13-Oct-2015]	GW21(1.0-1.1)	✓					
EM1515737-004	[13-Oct-2015]	GW21(1.5-1.6)	✓					
EM1515737-005	[13-Oct-2015]	GW21(2.0-2.1)	✓					
EM1515737-006	[13-Oct-2015]	GW21(2.5-2.6)	✓					
EM1515737-007	[13-Oct-2015]	GW21(2.8-2.9)		✓		✓		
EM1515737-008	[13-Oct-2015]	GW21(3.4-3.5)	✓					
EM1515737-009	[13-Oct-2015]	GW21(4.0-4.1)	✓					
EM1515737-010	[13-Oct-2015]	GW22(0.0-0.1)	✓					
EM1515737-011	[13-Oct-2015]	GW22(0.5-0.6)	✓					
EM1515737-012	[13-Oct-2015]	GW22(1.0-1.1)	✓					
EM1515737-013	[13-Oct-2015]	GW22(1.5-1.6)	✓					
EM1515737-014	[13-Oct-2015]	GW22(2.0-2.1)	✓					
EM1515737-015	[13-Oct-2015]	GW22(2.5-2.6)		✓		✓		
EM1515737-016	[13-Oct-2015]	GW22(3.0-3.1)	✓					
EM1515737-017	[13-Oct-2015]	GW23(0.0-0.1)	✓					
EM1515737-018	[13-Oct-2015]	GW23(0.5-0.6)	✓					
EM1515737-019	[13-Oct-2015]	GW23(1.0-1.1)	✓					
EM1515737-020	[13-Oct-2015]	GW23(1.2-1.3)	✓					
EM1515737-021	[13-Oct-2015]	GW23(1.5-1.6)	✓					
EM1515737-022	[13-Oct-2015]	GW27(0.1-0.2)	✓					
EM1515737-023	[13-Oct-2015]	GW27(0.5-0.6)		✓	✓		✓	✓
EM1515737-024	[13-Oct-2015]	GW30(0.0-0.1)	✓					
EM1515737-025	[13-Oct-2015]	GW30(0.5-0.6)	✓					
EM1515737-026	[13-Oct-2015]	GW30(1.0-1.1)	✓					
EM1515737-027	[13-Oct-2015]	GW30(1.5-1.6)	✓					
EM1515737-028	[13-Oct-2015]	GW30(1.7-1.8)	✓					
EM1515737-029	[13-Oct-2015]	GW30(2.5-2.6)	✓					
EM1515737-030	[13-Oct-2015]	GW30(3.5-3.6)		✓		✓		
EM1515737-031	[13-Oct-2015]	GW30(4.4-4.5)	✓					
EM1515737-032	[13-Oct-2015]	GW30(5.1-5.2)	✓					
EM1515737-033	[13-Oct-2015]	GW26(1.9-2.0)	✓					
EM1515737-034	[13-Oct-2015]	GW26(2.1-2.2)	✓					
EM1515737-035	[13-Oct-2015]	GW26(3.0-3.1)		✓		✓		

			(On Hold) SOIL No analysis requested	SOIL - EA055-103 Moisture Content	SOIL - EG005T (solids) Total Metals by ICP-AES	SOIL - EP003 Total Organic Carbon (TOC) in Soil	SOIL - S-02 8 Metals (incl. Digestion)	SOIL - S-10 TRH/VOC/PAH
EM1515737-036	[13-Oct-2015]	GW26(4.0-4.1)	✓					
EM1515737-037	[13-Oct-2015]	GW26(5.0-5.1)	✓					
EM1515737-040	[13-Oct-2015]	GW22(4.0-4.1)	✓					

Matrix: **WATER**

Laboratory sample ID	*Client sampling date / time*	*Client sample ID*	WATER - W-05T TRH/BTEXN/8 Metals (Total)
EM1515737-038	[13-Oct-2015]	QC04	✓

Matrix: **WATER**

Laboratory sample ID	*Client sampling date / time*	*Client sample ID*	WATER - EG020T Total Recoverable Metals by ICPMS (including	WATER - W-18 TRH(C6 - C9)/BTEXN
EM1515737-038	[13-Oct-2015]	QC04	✓	
EM1515737-039	[13-Oct-2015]	QC05		✓

Proactive Holding Time Report

Sample(s) have been received within the recommended holding times for the requested analysis.

Requested Deliverables

AP_CUSTOMER SERVICE ANZ

- A4 - AU Tax Invoice (INV)	Email	AP_CustomerService.ANZ@aecom.com

AVERYLL COYNE

- *AU Certificate of Analysis - NATA (COA)	Email	averyll.coyne@aecom.com
- *AU Interpretive QC Report - DEFAULT (Anon QCI Rep) (QCI)	Email	averyll.coyne@aecom.com
- *AU QC Report - DEFAULT (Anon QC Rep) - NATA (QC)	Email	averyll.coyne@aecom.com
- A4 - AU Sample Receipt Notification - Environmental HT (SRN)	Email	averyll.coyne@aecom.com
- A4 - AU Tax Invoice (INV)	Email	averyll.coyne@aecom.com
- Chain of Custody (CoC) (COC)	Email	averyll.coyne@aecom.com
- EDI Format - ENMRG (ENMRG)	Email	averyll.coyne@aecom.com
- EDI Format - ESDAT (ESDAT)	Email	averyll.coyne@aecom.com
- EDI Format - HLAPro (HLAPro)	Email	averyll.coyne@aecom.com
- EDI Format - XTab (XTAB)	Email	averyll.coyne@aecom.com

ALS Environmental

CERTIFICATE OF ANALYSIS

Work Order	: **EM1515737**	Page	: 1 of 15
Amendment	: **1**		
Client	: **AECOM Australia Pty Ltd**	Laboratory	: Environmental Division Melbourne
Contact	: MS AVERYLL COYNE	Contact	: Carsten Emrich
Address	: LEVEL 9 8 EXHIBITION ST MELBOURNE VIC 3000	Address	: 4 Westall Rd Springvale VIC Australia 3171
E-mail	: averyll.coyne@aecom.com	E-mail	: carsten.emrich@alsenviro.com
Telephone	: +61 03 9653 1234	Telephone	: +61 7 3243 7123
Facsimile	: +61 03 9654 7117	Facsimile	: +61-3-8549 9601
Project	: 60431087	QC Level	: NEPM 2013 Schedule B(3) and ALS QCS3 requirement
Order number	: 60431087 1.4	Date Samples Received	: 14-Oct-2015 11:15
C-O-C number	: ----	Date Analysis Commenced	: 15-Oct-2015
Sampler	: NATHAN JENSEN, OLIVER TAYLOR	Issue Date	: 22-Oct-2015 15:39
Site	: Fishermans Bend		
		No. of samples received	: 40
Quote number	: ----	No. of samples analysed	: 8

This report supersedes any previous report(s) with this reference. Results apply to the sample(s) as submitted.

This Certificate of Analysis contains the following information:

- General Comments
- Analytical Results

Signatories

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

Signatories	*Position*	*Accreditation Category*
Andrew Epps	Senior Inorganic Chemist	Brisbane Inorganics
Bronwyn Sheen	Client Services Mananger	Melbourne Organics
Dilani Fernando	Senior Inorganic Chemist	Melbourne Inorganics
Eric Chau	Metals Team Leader	Melbourne Inorganics
Nancy Wang	Senior Semivolatile Instrument Chemist	Melbourne Inorganics Melbourne Organics
Satishkumar Trivedi	Acid Sulfate Soils Supervisor	Brisbane Acid Sulphate Soils

General Comments

The analytical procedures used by the Environmental Division have been developed from established internationally recognized procedures such as those published by the USEPA, APHA, AS and NEPM. In house developed procedures are employed in the absence of documented standards or by 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.

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.

- 21/10/2015 - This report has been amended and re-released to allow the reporting of additional analytical data.
- EP075(SIM): (EM1515737_002) Higher than expected matrix spike recovery for (Pyrene) due to sample matrix.
- Benzo(a)pyrene Toxicity Equivalent Quotient (TEQ) 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.

Analytical Results

Sub-Matrix: SOIL (Matrix: SOIL)			Client sample ID	GW21(0.5-0.6)	GW21(2.8-2.9)	GW22(2.5-2.6)	GW27(0.5-0.6)	GW30(3.5-3.6)
			Client sampling date / time	[13-Oct-2015]	[13-Oct-2015]	[13-Oct-2015]	[13-Oct-2015]	[13-Oct-2015]
Compound	CAS Number	LOR	Unit	EM1515737-002	EM1515737-007	EM1515737-015	EM1515737-023	EM1515737-030
				Result	Result	Result	Result	Result
EA001: pH in soil using 0.01M CaCl extract								
pH (CaCl2)	----	0.1	pH Unit	7.7	----	----	----	----
EA055: Moisture Content								
^ Moisture Content (dried @ 103°C)	----	1	%	14.0	16.8	18.7	15.4	23.4
ED040N: Sulfate - Calcium Phosphate Soluble (NEPM)								
Sulfate as SO4 2-	14808-79-8	50	mg/kg	<50	----	----	----	----
EG005T: Total Metals by ICP-AES								
Aluminium	7429-90-5	50	mg/kg	2030	----	----	10000	----
Iron	7439-89-6	50	mg/kg	4290	----	----	29900	----
Selenium	7782-49-2	5	mg/kg	<5	----	----	<5	----
Arsenic	7440-38-2	5	mg/kg	<5	----	----	10	----
Cadmium	7440-43-9	1	mg/kg	<1	----	----	4	----
Chromium	7440-47-3	2	mg/kg	5	----	----	38	----
Copper	7440-50-8	5	mg/kg	6	----	----	171	----
Lead	7439-92-1	5	mg/kg	24	----	----	396	----
Nickel	7440-02-0	2	mg/kg	5	----	----	63	----
Zinc	7440-66-6	5	mg/kg	36	----	----	3060	----
EG035T: Total Recoverable Mercury by FIMS								
Mercury	7439-97-6	0.1	mg/kg	<0.1	----	----	1.6	----
EP003: Total Organic Carbon (TOC) in Soil								
Total Organic Carbon	----	0.02	%	----	0.05	0.12	----	0.22
EP074A: Monocyclic Aromatic Hydrocarbons								
Styrene	100-42-5	0.5	mg/kg	<0.5	----	----	<0.5	----
Isopropylbenzene	98-82-8	0.5	mg/kg	<0.5	----	----	<0.5	----
n-Propylbenzene	103-65-1	0.5	mg/kg	<0.5	----	----	<0.5	----
1.3.5-Trimethylbenzene	108-67-8	0.5	mg/kg	<0.5	----	----	<0.5	----
sec-Butylbenzene	135-98-8	0.5	mg/kg	<0.5	----	----	<0.5	----
1.2.4-Trimethylbenzene	95-63-6	0.5	mg/kg	<0.5	----	----	<0.5	----
tert-Butylbenzene	98-06-6	0.5	mg/kg	<0.5	----	----	<0.5	----
p-Isopropyltoluene	99-87-6	0.5	mg/kg	<0.5	----	----	<0.5	----
n-Butylbenzene	104-51-8	0.5	mg/kg	<0.5	----	----	<0.5	----
EP074B: Oxygenated Compounds								
Vinyl Acetate	108-05-4	5	mg/kg	<5	----	----	<5	----
2-Butanone (MEK)	78-93-3	5	mg/kg	<5	----	----	<5	----
4-Methyl-2-pentanone (MIBK)	108-10-1	5	mg/kg	<5	----	----	<5	----

Analytical Results

Sub-Matrix: SOIL (Matrix: SOIL)				Client sample ID	GW21(0.5-0.6)	GW21(2.8-2.9)	GW22(2.5-2.6)	GW27(0.5-0.6)	GW30(3.5-3.6)
				Client sampling date / time	[13-Oct-2015]	[13-Oct-2015]	[13-Oct-2015]	[13-Oct-2015]	[13-Oct-2015]
Compound	CAS Number	LOR	Unit		EM1515737-002	EM1515737-007	EM1515737-015	EM1515737-023	EM1515737-030
					Result	Result	Result	Result	Result
EP074B: Oxygenated Compounds - Continued									
2-Hexanone (MBK)	591-78-6	5	mg/kg		<5	----	----	<5	----
EP074C: Sulfonated Compounds									
Carbon disulfide	75-15-0	0.5	mg/kg		<0.5	----	----	<0.5	----
EP074D: Fumigants									
2.2-Dichloropropane	594-20-7	0.5	mg/kg		<0.5	----	----	<0.5	----
1.2-Dichloropropane	78-87-5	0.5	mg/kg		<0.5	----	----	<0.5	----
cis-1.3-Dichloropropylene	10061-01-5	0.5	mg/kg		<0.5	----	----	<0.5	----
trans-1.3-Dichloropropylene	10061-02-6	0.5	mg/kg		<0.5	----	----	<0.5	----
1.2-Dibromoethane (EDB)	106-93-4	0.5	mg/kg		<0.5	----	----	<0.5	----
EP074E: Halogenated Aliphatic Compounds									
Dichlorodifluoromethane	75-71-8	5	mg/kg		<5	----	----	<5	----
Chloromethane	74-87-3	5	mg/kg		<5	----	----	<5	----
Vinyl chloride	75-01-4	5	mg/kg		<5	----	----	<5	----
Bromomethane	74-83-9	5	mg/kg		<5	----	----	<5	----
Chloroethane	75-00-3	5	mg/kg		<5	----	----	<5	----
Trichlorofluoromethane	75-69-4	5	mg/kg		<5	----	----	<5	----
1.1-Dichloroethene	75-35-4	0.5	mg/kg		<0.5	----	----	<0.5	----
Iodomethane	74-88-4	0.5	mg/kg		<0.5	----	----	<0.5	----
trans-1.2-Dichloroethene	156-60-5	0.5	mg/kg		<0.5	----	----	<0.5	----
1.1-Dichloroethane	75-34-3	0.5	mg/kg		<0.5	----	----	<0.5	----
cis-1.2-Dichloroethene	156-59-2	0.5	mg/kg		<0.5	----	----	<0.5	----
1.1.1-Trichloroethane	71-55-6	0.5	mg/kg		<0.5	----	----	<0.5	----
1.1-Dichloropropylene	563-58-6	0.5	mg/kg		<0.5	----	----	<0.5	----
Carbon Tetrachloride	56-23-5	0.5	mg/kg		<0.5	----	----	<0.5	----
1.2-Dichloroethane	107-06-2	0.5	mg/kg		<0.5	----	----	<0.5	----
Trichloroethene	79-01-6	0.5	mg/kg		<0.5	----	----	<0.5	----
Dibromomethane	74-95-3	0.5	mg/kg		<0.5	----	----	<0.5	----
1.1.2-Trichloroethane	79-00-5	0.5	mg/kg		<0.5	----	----	<0.5	----
1.3-Dichloropropane	142-28-9	0.5	mg/kg		<0.5	----	----	<0.5	----
Tetrachloroethene	127-18-4	0.5	mg/kg		<0.5	----	----	<0.5	----
1.1.1.2-Tetrachloroethane	630-20-6	0.5	mg/kg		<0.5	----	----	<0.5	----
trans-1.4-Dichloro-2-butene	110-57-6	0.5	mg/kg		<0.5	----	----	<0.5	----
cis-1.4-Dichloro-2-butene	1476-11-5	0.5	mg/kg		<0.5	----	----	<0.5	----
1.1.2.2-Tetrachloroethane	79-34-5	0.5	mg/kg		<0.5	----	----	<0.5	----

Analytical Results

Sub-Matrix: SOIL (Matrix: SOIL)				Client sample ID	GW21(0.5-0.6)	GW21(2.8-2.9)	GW22(2.5-2.6)	GW27(0.5-0.6)	GW30(3.5-3.6)
				Client sampling date / time	[13-Oct-2015]	[13-Oct-2015]	[13-Oct-2015]	[13-Oct-2015]	[13-Oct-2015]
Compound	CAS Number	LOR	Unit		EM1515737-002	EM1515737-007	EM1515737-015	EM1515737-023	EM1515737-030
					Result	Result	Result	Result	Result
EP074E: Halogenated Aliphatic Compounds - Continued									
1.2.3-Trichloropropane	96-18-4	0.5	mg/kg		<0.5	----	----	<0.5	----
Pentachloroethane	76-01-7	0.5	mg/kg		<0.5	----	----	<0.5	----
1.2-Dibromo-3-chloropropane	96-12-8	0.5	mg/kg		<0.5	----	----	<0.5	----
Hexachlorobutadiene	87-68-3	0.5	mg/kg		<0.5	----	----	<0.5	----
EP074F: Halogenated Aromatic Compounds									
Chlorobenzene	108-90-7	0.5	mg/kg		<0.5	----	----	<0.5	----
Bromobenzene	108-86-1	0.5	mg/kg		<0.5	----	----	<0.5	----
2-Chlorotoluene	95-49-8	0.5	mg/kg		<0.5	----	----	<0.5	----
4-Chlorotoluene	106-43-4	0.5	mg/kg		<0.5	----	----	<0.5	----
1.3-Dichlorobenzene	541-73-1	0.5	mg/kg		<0.5	----	----	<0.5	----
1.4-Dichlorobenzene	106-46-7	0.5	mg/kg		<0.5	----	----	<0.5	----
1.2-Dichlorobenzene	95-50-1	0.5	mg/kg		<0.5	----	----	<0.5	----
1.2.4-Trichlorobenzene	120-82-1	0.5	mg/kg		<0.5	----	----	<0.5	----
1.2.3-Trichlorobenzene	87-61-6	0.5	mg/kg		<0.5	----	----	<0.5	----
EP074G: Trihalomethanes									
Chloroform	67-66-3	0.5	mg/kg		<0.5	----	----	<0.5	----
Bromodichloromethane	75-27-4	0.5	mg/kg		<0.5	----	----	<0.5	----
Dibromochloromethane	124-48-1	0.5	mg/kg		<0.5	----	----	<0.5	----
Bromoform	75-25-2	0.5	mg/kg		<0.5	----	----	<0.5	----
EP075(SIM)B: Polynuclear Aromatic Hydrocarbons									
Naphthalene	91-20-3	0.5	mg/kg		<0.5	----	----	**0.6**	----
Acenaphthylene	208-96-8	0.5	mg/kg		<0.5	----	----	**1.2**	----
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		**1.4**	----	----	**5.2**	----
Anthracene	120-12-7	0.5	mg/kg		<0.5	----	----	**2.2**	----
Fluoranthene	206-44-0	0.5	mg/kg		**2.8**	----	----	**10.5**	----
Pyrene	129-00-0	0.5	mg/kg		**2.5**	----	----	**11.3**	----
Benz(a)anthracene	56-55-3	0.5	mg/kg		**1.2**	----	----	**5.8**	----
Chrysene	218-01-9	0.5	mg/kg		**1.0**	----	----	**5.7**	----
Benzo(b+j)fluoranthene	205-99-2 205-82-3	0.5	mg/kg		**1.3**	----	----	**9.4**	----
Benzo(k)fluoranthene	207-08-9	0.5	mg/kg		**0.5**	----	----	**2.9**	----
Benzo(a)pyrene	50-32-8	0.5	mg/kg		**1.0**	----	----	**7.1**	----
Indeno(1.2.3.cd)pyrene	193-39-5	0.5	mg/kg		**0.5**	----	----	**4.5**	----

Analytical Results

Sub-Matrix: SOIL (Matrix: SOIL)				Client sample ID	GW21(0.5-0.6)	GW21(2.8-2.9)	GW22(2.5-2.6)	GW27(0.5-0.6)	GW30(3.5-3.6)
				Client sampling date / time	[13-Oct-2015]	[13-Oct-2015]	[13-Oct-2015]	[13-Oct-2015]	[13-Oct-2015]
Compound	CAS Number	LOR	Unit		EM1515737-002	EM1515737-007	EM1515737-015	EM1515737-023	EM1515737-030
					Result	Result	Result	Result	Result
EP075(SIM)B: Polynuclear Aromatic Hydrocarbons - Continued									
Dibenz(a.h)anthracene	53-70-3	0.5	mg/kg		<0.5	----	----	**1.7**	----
Benzo(g.h.i)perylene	191-24-2	0.5	mg/kg		**0.6**	----	----	**5.2**	----
^ Sum of polycyclic aromatic hydrocarbons	----	0.5	mg/kg		**12.8**	----	----	**73.3**	----
^ Benzo(a)pyrene TEQ (zero)	----	0.5	mg/kg		**1.4**	----	----	**11.2**	----
^ Benzo(a)pyrene TEQ (half LOR)	----	0.5	mg/kg		**1.6**	----	----	**11.2**	----
^ Benzo(a)pyrene TEQ (LOR)	----	0.5	mg/kg		**1.9**	----	----	**11.2**	----
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	----	----	**570**	----
C29 - C36 Fraction	----	100	mg/kg		<100	----	----	**430**	----
^ C10 - C36 Fraction (sum)	----	50	mg/kg		<50	----	----	**1000**	----
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	>C10_C16	50	mg/kg		<50	----	----	**70**	----
>C16 - C34 Fraction	----	100	mg/kg		<100	----	----	**910**	----
>C34 - C40 Fraction	----	100	mg/kg		<100	----	----	**180**	----
^ >C10 - C40 Fraction (sum)	----	50	mg/kg		<50	----	----	**1160**	----
^ >C10 - C16 Fraction minus Naphthalene (F2)	----	50	mg/kg		<50	----	----	**70**	----
EP080: BTEXN									
Benzene	71-43-2	0.2	mg/kg		<0.2	----	----	<0.2	----
Toluene	108-88-3	0.5	mg/kg		<0.5	----	----	<0.5	----
Ethylbenzene	100-41-4	0.5	mg/kg		<0.5	----	----	<0.5	----
meta- & para-Xylene	108-38-3 106-42-3	0.5	mg/kg		<0.5	----	----	<0.5	----
ortho-Xylene	95-47-6	0.5	mg/kg		<0.5	----	----	<0.5	----
^ Sum of BTEX	----	0.2	mg/kg		<0.2	----	----	<0.2	----
^ Total Xylenes	1330-20-7	0.5	mg/kg		<0.5	----	----	<0.5	----
Naphthalene	91-20-3	1	mg/kg		<1	----	----	<1	----
EP074S: VOC Surrogates									
1.2-Dichloroethane-D4	17060-07-0	0.5	%		**86.0**	----	----	**82.1**	----
Toluene-D8	2037-26-5	0.5	%		**87.2**	----	----	**79.9**	----

Analytical Results

Sub-Matrix: SOIL (Matrix: SOIL)				Client sample ID	GW21(0.5-0.6)	GW21(2.8-2.9)	GW22(2.5-2.6)	GW27(0.5-0.6)	GW30(3.5-3.6)
				Client sampling date / time	[13-Oct-2015]	[13-Oct-2015]	[13-Oct-2015]	[13-Oct-2015]	[13-Oct-2015]
Compound	CAS Number	LOR	Unit		EM1515737-002	EM1515737-007	EM1515737-015	EM1515737-023	EM1515737-030
					Result	Result	Result	Result	Result
EP074S: VOC Surrogates - Continued									
4-Bromofluorobenzene	460-00-4	0.5	%		87.1	----	----	80.9	----
EP075(SIM)S: Phenolic Compound Surrogates									
Phenol-d6	13127-88-3	0.5	%		93.4	----	----	78.6	----
2-Chlorophenol-D4	93951-73-6	0.5	%		97.5	----	----	84.5	----
2.4.6-Tribromophenol	118-79-6	0.5	%		76.7	----	----	92.8	----
EP075(SIM)T: PAH Surrogates									
2-Fluorobiphenyl	321-60-8	0.5	%		104	----	----	117	----
Anthracene-d10	1719-06-8	0.5	%		113	----	----	108	----
4-Terphenyl-d14	1718-51-0	0.5	%		107	----	----	98.4	----
EP080S: TPH(V)/BTEX Surrogates									
1.2-Dichloroethane-D4	17060-07-0	0.2	%		79.1	----	----	78.3	----
Toluene-D8	2037-26-5	0.2	%		77.5	----	----	71.9	----
4-Bromofluorobenzene	460-00-4	0.2	%		85.3	----	----	83.0	----

Analytical Results

Sub-Matrix: SOIL (Matrix: SOIL)			Client sample ID	GW26(3.0-3.1)	----	----	----	----
			Client sampling date / time	[13-Oct-2015]	----	----	----	----
Compound	CAS Number	LOR	Unit	EM1515737-035	--------	--------	--------	--------
				Result	Result	Result	Result	Result
EA001: pH in soil using 0.01M CaCl extract								
pH (CaCl2)	----	0.1	pH Unit	----	----	----	----	----
EA055: Moisture Content								
^ Moisture Content (dried @ 103°C)	----	1	%	**18.8**	----	----	----	----
ED040N: Sulfate - Calcium Phosphate Soluble (NEPM)								
Sulfate as SO4 2-	14808-79-8	50	mg/kg	----	----	----	----	----
EG005T: Total Metals by ICP-AES								
Aluminium	7429-90-5	50	mg/kg	----	----	----	----	----
Iron	7439-89-6	50	mg/kg	----	----	----	----	----
Selenium	7782-49-2	5	mg/kg	----	----	----	----	----
Arsenic	7440-38-2	5	mg/kg	----	----	----	----	----
Cadmium	7440-43-9	1	mg/kg	----	----	----	----	----
Chromium	7440-47-3	2	mg/kg	----	----	----	----	----
Copper	7440-50-8	5	mg/kg	----	----	----	----	----
Lead	7439-92-1	5	mg/kg	----	----	----	----	----
Nickel	7440-02-0	2	mg/kg	----	----	----	----	----
Zinc	7440-66-6	5	mg/kg	----	----	----	----	----
EG035T: Total Recoverable Mercury by FIMS								
Mercury	7439-97-6	0.1	mg/kg	----	----	----	----	----
EP003: Total Organic Carbon (TOC) in Soil								
Total Organic Carbon	----	0.02	%	**0.12**	----	----	----	----
EP074A: Monocyclic Aromatic Hydrocarbons								
Styrene	100-42-5	0.5	mg/kg	----	----	----	----	----
Isopropylbenzene	98-82-8	0.5	mg/kg	----	----	----	----	----
n-Propylbenzene	103-65-1	0.5	mg/kg	----	----	----	----	----
1.3.5-Trimethylbenzene	108-67-8	0.5	mg/kg	----	----	----	----	----
sec-Butylbenzene	135-98-8	0.5	mg/kg	----	----	----	----	----
1.2.4-Trimethylbenzene	95-63-6	0.5	mg/kg	----	----	----	----	----
tert-Butylbenzene	98-06-6	0.5	mg/kg	----	----	----	----	----
p-Isopropyltoluene	99-87-6	0.5	mg/kg	----	----	----	----	----
n-Butylbenzene	104-51-8	0.5	mg/kg	----	----	----	----	----
EP074B: Oxygenated Compounds								
Vinyl Acetate	108-05-4	5	mg/kg	----	----	----	----	----
2-Butanone (MEK)	78-93-3	5	mg/kg	----	----	----	----	----
4-Methyl-2-pentanone (MIBK)	108-10-1	5	mg/kg	----	----	----	----	----

Analytical Results

Sub-Matrix: SOIL (Matrix: SOIL)			Client sample ID	GW26(3.0-3.1)	----	----	----	----
			Client sampling date / time	[13-Oct-2015]	----	----	----	----
Compound	CAS Number	LOR	Unit	EM1515737-035	--------	--------	--------	--------
				Result	Result	Result	Result	Result
EP074B: Oxygenated Compounds - Continued								
2-Hexanone (MBK)	591-78-6	5	mg/kg	----	----	----	----	----
EP074C: Sulfonated Compounds								
Carbon disulfide	75-15-0	0.5	mg/kg	----	----	----	----	----
EP074D: Fumigants								
2.2-Dichloropropane	594-20-7	0.5	mg/kg	----	----	----	----	----
1.2-Dichloropropane	78-87-5	0.5	mg/kg	----	----	----	----	----
cis-1.3-Dichloropropylene	10061-01-5	0.5	mg/kg	----	----	----	----	----
trans-1.3-Dichloropropylene	10061-02-6	0.5	mg/kg	----	----	----	----	----
1.2-Dibromoethane (EDB)	106-93-4	0.5	mg/kg	----	----	----	----	----
EP074E: Halogenated Aliphatic Compounds								
Dichlorodifluoromethane	75-71-8	5	mg/kg	----	----	----	----	----
Chloromethane	74-87-3	5	mg/kg	----	----	----	----	----
Vinyl chloride	75-01-4	5	mg/kg	----	----	----	----	----
Bromomethane	74-83-9	5	mg/kg	----	----	----	----	----
Chloroethane	75-00-3	5	mg/kg	----	----	----	----	----
Trichlorofluoromethane	75-69-4	5	mg/kg	----	----	----	----	----
1.1-Dichloroethene	75-35-4	0.5	mg/kg	----	----	----	----	----
Iodomethane	74-88-4	0.5	mg/kg	----	----	----	----	----
trans-1.2-Dichloroethene	156-60-5	0.5	mg/kg	----	----	----	----	----
1.1-Dichloroethane	75-34-3	0.5	mg/kg	----	----	----	----	----
cis-1.2-Dichloroethene	156-59-2	0.5	mg/kg	----	----	----	----	----
1.1.1-Trichloroethane	71-55-6	0.5	mg/kg	----	----	----	----	----
1.1-Dichloropropylene	563-58-6	0.5	mg/kg	----	----	----	----	----
Carbon Tetrachloride	56-23-5	0.5	mg/kg	----	----	----	----	----
1.2-Dichloroethane	107-06-2	0.5	mg/kg	----	----	----	----	----
Trichloroethene	79-01-6	0.5	mg/kg	----	----	----	----	----
Dibromomethane	74-95-3	0.5	mg/kg	----	----	----	----	----
1.1.2-Trichloroethane	79-00-5	0.5	mg/kg	----	----	----	----	----
1.3-Dichloropropane	142-28-9	0.5	mg/kg	----	----	----	----	----
Tetrachloroethene	127-18-4	0.5	mg/kg	----	----	----	----	----
1.1.1.2-Tetrachloroethane	630-20-6	0.5	mg/kg	----	----	----	----	----
trans-1.4-Dichloro-2-butene	110-57-6	0.5	mg/kg	----	----	----	----	----
cis-1.4-Dichloro-2-butene	1476-11-5	0.5	mg/kg	----	----	----	----	----
1.1.2.2-Tetrachloroethane	79-34-5	0.5	mg/kg	----	----	----	----	----

Analytical Results

Sub-Matrix: SOIL (Matrix: SOIL)				Client sample ID	GW26(3.0-3.1)	----	----	----	----
				Client sampling date / time	[13-Oct-2015]	----	----	----	----
Compound	CAS Number	LOR	Unit		EM1515737-035	--------	--------	--------	--------
					Result	Result	Result	Result	Result
EP074E: Halogenated Aliphatic Compounds - Continued									
1.2.3-Trichloropropane	96-18-4	0.5	mg/kg		----	----	----	----	----
Pentachloroethane	76-01-7	0.5	mg/kg		----	----	----	----	----
1.2-Dibromo-3-chloropropane	96-12-8	0.5	mg/kg		----	----	----	----	----
Hexachlorobutadiene	87-68-3	0.5	mg/kg		----	----	----	----	----
EP074F: Halogenated Aromatic Compounds									
Chlorobenzene	108-90-7	0.5	mg/kg		----	----	----	----	----
Bromobenzene	108-86-1	0.5	mg/kg		----	----	----	----	----
2-Chlorotoluene	95-49-8	0.5	mg/kg		----	----	----	----	----
4-Chlorotoluene	106-43-4	0.5	mg/kg		----	----	----	----	----
1.3-Dichlorobenzene	541-73-1	0.5	mg/kg		----	----	----	----	----
1.4-Dichlorobenzene	106-46-7	0.5	mg/kg		----	----	----	----	----
1.2-Dichlorobenzene	95-50-1	0.5	mg/kg		----	----	----	----	----
1.2.4-Trichlorobenzene	120-82-1	0.5	mg/kg		----	----	----	----	----
1.2.3-Trichlorobenzene	87-61-6	0.5	mg/kg		----	----	----	----	----
EP074G: Trihalomethanes									
Chloroform	67-66-3	0.5	mg/kg		----	----	----	----	----
Bromodichloromethane	75-27-4	0.5	mg/kg		----	----	----	----	----
Dibromochloromethane	124-48-1	0.5	mg/kg		----	----	----	----	----
Bromoform	75-25-2	0.5	mg/kg		----	----	----	----	----
EP075(SIM)B: Polynuclear Aromatic Hydrocarbons									
Naphthalene	91-20-3	0.5	mg/kg		----	----	----	----	----
Acenaphthylene	208-96-8	0.5	mg/kg		----	----	----	----	----
Acenaphthene	83-32-9	0.5	mg/kg		----	----	----	----	----
Fluorene	86-73-7	0.5	mg/kg		----	----	----	----	----
Phenanthrene	85-01-8	0.5	mg/kg		----	----	----	----	----
Anthracene	120-12-7	0.5	mg/kg		----	----	----	----	----
Fluoranthene	206-44-0	0.5	mg/kg		----	----	----	----	----
Pyrene	129-00-0	0.5	mg/kg		----	----	----	----	----
Benz(a)anthracene	56-55-3	0.5	mg/kg		----	----	----	----	----
Chrysene	218-01-9	0.5	mg/kg		----	----	----	----	----
Benzo(b+j)fluoranthene	205-99-2 205-82-3	0.5	mg/kg		----	----	----	----	----
Benzo(k)fluoranthene	207-08-9	0.5	mg/kg		----	----	----	----	----
Benzo(a)pyrene	50-32-8	0.5	mg/kg		----	----	----	----	----
Indeno(1.2.3.cd)pyrene	193-39-5	0.5	mg/kg		----	----	----	----	----

Analytical Results

Sub-Matrix: SOIL (Matrix: SOIL)				Client sample ID	GW26(3.0-3.1)	----	----	----	----
				Client sampling date / time	[13-Oct-2015]	----	----	----	----
Compound	CAS Number	LOR	Unit		EM1515737-035	--------	--------	--------	--------
					Result	Result	Result	Result	Result
EP075(SIM)B: Polynuclear Aromatic Hydrocarbons - Continued									
Dibenz(a.h)anthracene	53-70-3	0.5	mg/kg		----	----	----	----	----
Benzo(g.h.i)perylene	191-24-2	0.5	mg/kg		----	----	----	----	----
^ Sum of polycyclic aromatic hydrocarbons	----	0.5	mg/kg		----	----	----	----	----
^ Benzo(a)pyrene TEQ (zero)	----	0.5	mg/kg		----	----	----	----	----
^ Benzo(a)pyrene TEQ (half LOR)	----	0.5	mg/kg		----	----	----	----	----
^ Benzo(a)pyrene TEQ (LOR)	----	0.5	mg/kg		----	----	----	----	----
EP080/071: Total Petroleum Hydrocarbons									
C6 - C9 Fraction	----	10	mg/kg		----	----	----	----	----
C10 - C14 Fraction	----	50	mg/kg		----	----	----	----	----
C15 - C28 Fraction	----	100	mg/kg		----	----	----	----	----
C29 - C36 Fraction	----	100	mg/kg		----	----	----	----	----
^ C10 - C36 Fraction (sum)	----	50	mg/kg		----	----	----	----	----
EP080/071: Total Recoverable Hydrocarbons - NEPM 2013 Fractions									
C6 - C10 Fraction	C6_C10	10	mg/kg		----	----	----	----	----
^ C6 - C10 Fraction minus BTEX (F1)	C6_C10-BTEX	10	mg/kg		----	----	----	----	----
>C10 - C16 Fraction	>C10_C16	50	mg/kg		----	----	----	----	----
>C16 - C34 Fraction	----	100	mg/kg		----	----	----	----	----
>C34 - C40 Fraction	----	100	mg/kg		----	----	----	----	----
^ >C10 - C40 Fraction (sum)	----	50	mg/kg		----	----	----	----	----
^ >C10 - C16 Fraction minus Naphthalene (F2)	----	50	mg/kg		----	----	----	----	----
EP080: BTEXN									
Benzene	71-43-2	0.2	mg/kg		----	----	----	----	----
Toluene	108-88-3	0.5	mg/kg		----	----	----	----	----
Ethylbenzene	100-41-4	0.5	mg/kg		----	----	----	----	----
meta- & para-Xylene	108-38-3 106-42-3	0.5	mg/kg		----	----	----	----	----
ortho-Xylene	95-47-6	0.5	mg/kg		----	----	----	----	----
^ Sum of BTEX	----	0.2	mg/kg		----	----	----	----	----
^ Total Xylenes	1330-20-7	0.5	mg/kg		----	----	----	----	----
Naphthalene	91-20-3	1	mg/kg		----	----	----	----	----
EP074S: VOC Surrogates									
1.2-Dichloroethane-D4	17060-07-0	0.5	%		----	----	----	----	----
Toluene-D8	2037-26-5	0.5	%		----	----	----	----	----

Analytical Results

Sub-Matrix: SOIL (Matrix: SOIL)				Client sample ID	GW26(3.0-3.1)	----	----	----	----
				Client sampling date / time	[13-Oct-2015]	----	----	----	----
Compound	CAS Number	LOR	Unit		EM1515737-035	--------	--------	--------	--------
					Result	Result	Result	Result	Result
EP074S: VOC Surrogates - Continued									
4-Bromofluorobenzene	460-00-4	0.5	%		----	----	----	----	----
EP075(SIM)S: Phenolic Compound Surrogates									
Phenol-d6	13127-88-3	0.5	%		----	----	----	----	----
2-Chlorophenol-D4	93951-73-6	0.5	%		----	----	----	----	----
2.4.6-Tribromophenol	118-79-6	0.5	%		----	----	----	----	----
EP075(SIM)T: PAH Surrogates									
2-Fluorobiphenyl	321-60-8	0.5	%		----	----	----	----	----
Anthracene-d10	1719-06-8	0.5	%		----	----	----	----	----
4-Terphenyl-d14	1718-51-0	0.5	%		----	----	----	----	----
EP080S: TPH(V)/BTEX Surrogates									
1.2-Dichloroethane-D4	17060-07-0	0.2	%		----	----	----	----	----
Toluene-D8	2037-26-5	0.2	%		----	----	----	----	----
4-Bromofluorobenzene	460-00-4	0.2	%		----	----	----	----	----

Analytical Results

Sub-Matrix: WATER (Matrix: WATER)				Client sample ID	QC04	QC05	----	----	----
				Client sampling date / time	[13-Oct-2015]	[13-Oct-2015]	----	----	----
Compound	CAS Number	LOR	Unit		EM1515737-038	EM1515737-039	--------	--------	--------
					Result	Result	Result	Result	Result
EG020T: Total Metals by ICP-MS									
Aluminium	7429-90-5	0.01	mg/L		<0.01	----	----	----	----
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	----	----	----	----
Nickel	7440-02-0	0.001	mg/L		<0.001	----	----	----	----
Lead	7439-92-1	0.001	mg/L		<0.001	----	----	----	----
Zinc	7440-66-6	0.005	mg/L		<0.005	----	----	----	----
Selenium	7782-49-2	0.01	mg/L		<0.01	----	----	----	----
Iron	7439-89-6	0.05	mg/L		<0.05	----	----	----	----
EG035T: Total Recoverable Mercury by FIMS									
Mercury	7439-97-6	0.0001	mg/L		<0.0001	----	----	----	----
EP080/071: Total Petroleum Hydrocarbons									
C6 - C9 Fraction	----	20	µg/L		<20	<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	<20	----	----	----
^ **C6 - C10 Fraction minus BTEX (F1)**	C6_C10-BTEX	20	µg/L		<20	<20	----	----	----
>C10 - C16 Fraction	>C10_C16	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	<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	----	----	----

Analytical Results

Sub-Matrix: WATER (Matrix: WATER)				Client sample ID	QC04	QC05	----	----	----
				Client sampling date / time	[13-Oct-2015]	[13-Oct-2015]	----	----	----
Compound	CAS Number	LOR	Unit		EM1515737-038	EM1515737-039	--------	--------	--------
					Result	Result	Result	Result	Result
EP080: BTEXN - Continued									
^ **Total Xylenes**	1330-20-7	2	µg/L		<2	<2	----	----	----
^ **Sum of BTEX**	----	1	µg/L		<1	<1	----	----	----
Naphthalene	91-20-3	5	µg/L		<5	<5	----	----	----
EP080S: TPH(V)/BTEX Surrogates									
1.2-Dichloroethane-D4	17060-07-0	2	%		**105**	**93.4**	----	----	----
Toluene-D8	2037-26-5	2	%		**95.7**	**100**	----	----	----
4-Bromofluorobenzene	460-00-4	2	%		**92.4**	**107**	----	----	----

ALS Environmental

QUALITY CONTROL REPORT

Work Order	: **EM1515737**	Page	: 1 of 23
Amendment	: **1**		
Client	: **AECOM Australia Pty Ltd**	Laboratory	: Environmental Division Melbourne
Contact	: MS AVERYLL COYNE	Contact	: Carsten Emrich
Address	: LEVEL 9 8 EXHIBITION ST MELBOURNE VIC 3000	Address	: 4 Westall Rd Springvale VIC Australia 3171
E-mail	: averyll.coyne@aecom.com	E-mail	: carsten.emrich@alsenviro.com
Telephone	: +61 03 9653 1234	Telephone	: +61 7 3243 7123
Facsimile	: +61 03 9654 7117	Facsimile	: +61-3-8549 9601
Project	: 60431087	QC Level	: NEPM 2013 Schedule B(3) and ALS QCS3 requirement
Order number	: 60431087 1.4	Date Samples Received	: 14-Oct-2015
C-O-C number	: ----	Date Analysis Commenced	: 15-Oct-2015
Sampler	: NATHAN JENSEN, OLIVER TAYLOR	Issue Date	: 22-Oct-2015
Site	: Fishermans Bend	No. of samples received	: 40
Quote number	: ----	No. of samples analysed	: 8

This report supersedes any previous report(s) with this reference. Results apply to the sample(s) as submitted.

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

General Comments

The analytical procedures used by the Environmental Division have been developed from established internationally recognized procedures such as those published by the USEPA, APHA, AS and NEPM. In house developed procedures are employed in the absence of documented standards or by 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

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

NATA Accredited Laboratory 825

Accredited for compliance with ISO/IEC 17025.

Signatories

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

Signatories	Position	Accreditation Category
Andrew Epps	Senior Inorganic Chemist	Brisbane Inorganics
Bronwyn Sheen	Client Services Mananger	Melbourne Organics
Dilani Fernando	Senior Inorganic Chemist	Melbourne Inorganics
Eric Chau	Metals Team Leader	Melbourne Inorganics
Nancy Wang	Senior Semivolatile Instrument Chemist	Melbourne Inorganics
		Melbourne Organics
Satishkumar Trivedi	Acid Sulfate Soils Supervisor	Brisbane Acid Sulphate Soils

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	*Client sample ID*	*Method: Compound*	*CAS Number*	*LOR*	*Unit*	*Original Result*	*Duplicate Result*	*RPD (%)*	*Recovery Limits (%)*
EA001: pH in soil using 0.01M CaCl extract (QC Lot: 251010)									
EM1515593-002	Anonymous	EA001: pH (CaCl2)	----	0.1	pH Unit	7.9	7.9	0.00	0% - 20%
EA055: Moisture Content (QC Lot: 244359)									
EM1515727-007	Anonymous	EA055-103: Moisture Content (dried @ 103°C)	----	1	%	27.2	26.9	1.25	0% - 20%
EM1515740-002	Anonymous	EA055-103: Moisture Content (dried @ 103°C)	----	1	%	44.1	45.7	3.60	0% - 20%
EA055: Moisture Content (QC Lot: 245264)									
EM1515643-006	Anonymous	EA055-103: Moisture Content (dried @ 103°C)	----	1	%	15.8	15.8	0.00	0% - 50%
EA055: Moisture Content (QC Lot: 245676)									
EM1515737-023	GW27(0.5-0.6)	EA055-103: Moisture Content (dried @ 103°C)	----	1	%	15.4	17.2	10.9	0% - 50%
EM1515840-009	Anonymous	EA055-103: Moisture Content (dried @ 103°C)	----	1	%	12.2	13.4	9.41	0% - 50%
ED040N: Sulfate - Calcium Phosphate Soluble (NEPM) (QC Lot: 251011)									
EM1515593-066	Anonymous	ED040N: Sulfate as SO4 2-	14808-79-8	50	mg/kg	60	60	0.00	No Limit
EM1515925-002	Anonymous	ED040N: Sulfate as SO4 2-	14808-79-8	50	mg/kg	<50	<50	0.00	No Limit
EG005T: Total Metals by ICP-AES (QC Lot: 244710)									
EM1515727-009	Anonymous	EG005T: Cadmium	7440-43-9	1	mg/kg	<1	<1	0.00	No Limit
		EG005T: Chromium	7440-47-3	2	mg/kg	20	32	46.7	0% - 50%
		EG005T: Nickel	7440-02-0	2	mg/kg	10	8	19.7	No Limit
		EG005T: Arsenic	7440-38-2	5	mg/kg	<5	<5	0.00	No Limit
		EG005T: Copper	7440-50-8	5	mg/kg	46	28	48.8	No Limit
		EG005T: Lead	7439-92-1	5	mg/kg	19	15	21.7	No Limit
		EG005T: Selenium	7782-49-2	5	mg/kg	<5	<5	0.00	No Limit
		EG005T: Zinc	7440-66-6	5	mg/kg	34	22	42.5	No Limit
		EG005T: Aluminium	7429-90-5	50	mg/kg	13800	15500	12.1	0% - 20%
		EG005T: Iron	7439-89-6	50	mg/kg	44200	39300	11.7	0% - 20%
EG005T: Total Metals by ICP-AES (QC Lot: 245668)									
EM1515707-001	Anonymous	EG005T: Cadmium	7440-43-9	1	mg/kg	<1	<1	0.00	No Limit
		EG005T: Chromium	7440-47-3	2	mg/kg	13	15	14.3	No Limit
		EG005T: Nickel	7440-02-0	2	mg/kg	3	3	0.00	No Limit
		EG005T: Arsenic	7440-38-2	5	mg/kg	<5	<5	0.00	No Limit
		EG005T: Copper	7440-50-8	5	mg/kg	<5	<5	0.00	No Limit
		EG005T: Lead	7439-92-1	5	mg/kg	11	12	13.1	No Limit
		EG005T: Selenium	7782-49-2	5	mg/kg	<5	<5	0.00	No Limit
		EG005T: Zinc	7440-66-6	5	mg/kg	<5	<5	0.00	No Limit
		EG005T: Aluminium	7429-90-5	50	mg/kg	9010	9840	8.76	0% - 20%
		EG005T: Iron	7439-89-6	50	mg/kg	17100	20500	18.0	0% - 20%
EM1515766-007	Anonymous	EG005T: Cadmium	7440-43-9	1	mg/kg	<1	<1	0.00	No Limit

Sub-Matrix: **SOIL**

				Laboratory Duplicate (DUP) Report					
Laboratory sample ID	*Client sample ID*	*Method: Compound*	*CAS Number*	*LOR*	*Unit*	*Original Result*	*Duplicate Result*	*RPD (%)*	*Recovery Limits (%)*
EG005T: Total Metals by ICP-AES (QC Lot: 245668) - continued									
EM1515766-007	Anonymous	EG005T: Chromium	7440-47-3	2	mg/kg	27	25	9.38	0% - 50%
		EG005T: Nickel	7440-02-0	2	mg/kg	21	13	42.5	0% - 50%
		EG005T: Arsenic	7440-38-2	5	mg/kg	10	9	16.9	No Limit
		EG005T: Copper	7440-50-8	5	mg/kg	13	9	31.7	No Limit
		EG005T: Lead	7439-92-1	5	mg/kg	10	12	14.2	No Limit
		EG005T: Selenium	7782-49-2	5	mg/kg	<5	<5	0.00	No Limit
		EG005T: Zinc	7440-66-6	5	mg/kg	33	28	18.7	No Limit
		EG005T: Aluminium	7429-90-5	50	mg/kg	14200	13000	8.35	0% - 20%
		EG005T: Iron	7439-89-6	50	mg/kg	26000	23700	9.50	0% - 20%
EG035T: Total Recoverable Mercury by FIMS (QC Lot: 244711)									
EM1515727-009	Anonymous	EG035T: Mercury	7439-97-6	0.1	mg/kg	0.2	0.2	0.00	No Limit
EG035T: Total Recoverable Mercury by FIMS (QC Lot: 245667)									
EM1515707-001	Anonymous	EG035T: Mercury	7439-97-6	0.1	mg/kg	<0.1	<0.1	0.00	No Limit
EM1515766-007	Anonymous	EG035T: Mercury	7439-97-6	0.1	mg/kg	<0.1	<0.1	0.00	No Limit
EP003: Total Organic Carbon (TOC) in Soil (QC Lot: 247568)									
EM1515737-007	GW21(2.8-2.9)	EP003: Total Organic Carbon	----	0.02	%	0.05	0.04	0.00	No Limit
ES1533297-007	Anonymous	EP003: Total Organic Carbon	----	0.02	%	3.85	3.93	2.07	0% - 20%
EP074A: Monocyclic Aromatic Hydrocarbons (QC Lot: 244334)									
EM1515754-024	Anonymous	EP074: 1.2.4-Trimethylbenzene	95-63-6	0.5	mg/kg	<0.5	<0.5	0.00	No Limit
		EP074: 1.3.5-Trimethylbenzene	108-67-8	0.5	mg/kg	<0.5	<0.5	0.00	No Limit
		EP074: Isopropylbenzene	98-82-8	0.5	mg/kg	<0.5	<0.5	0.00	No Limit
		EP074: n-Butylbenzene	104-51-8	0.5	mg/kg	<0.5	<0.5	0.00	No Limit
		EP074: n-Propylbenzene	103-65-1	0.5	mg/kg	<0.5	<0.5	0.00	No Limit
		EP074: p-Isopropyltoluene	99-87-6	0.5	mg/kg	<0.5	<0.5	0.00	No Limit
		EP074: sec-Butylbenzene	135-98-8	0.5	mg/kg	<0.5	<0.5	0.00	No Limit
		EP074: Styrene	100-42-5	0.5	mg/kg	<0.5	<0.5	0.00	No Limit
		EP074: tert-Butylbenzene	98-06-6	0.5	mg/kg	<0.5	<0.5	0.00	No Limit
EP074A: Monocyclic Aromatic Hydrocarbons (QC Lot: 245845)									
EM1515674-009	Anonymous	EP074: 1.2.4-Trimethylbenzene	95-63-6	0.5	mg/kg	<0.5	<0.5	0.00	No Limit
		EP074: 1.3.5-Trimethylbenzene	108-67-8	0.5	mg/kg	<0.5	<0.5	0.00	No Limit
		EP074: Isopropylbenzene	98-82-8	0.5	mg/kg	<0.5	<0.5	0.00	No Limit
		EP074: n-Butylbenzene	104-51-8	0.5	mg/kg	<0.5	<0.5	0.00	No Limit
		EP074: n-Propylbenzene	103-65-1	0.5	mg/kg	<0.5	<0.5	0.00	No Limit
		EP074: p-Isopropyltoluene	99-87-6	0.5	mg/kg	<0.5	<0.5	0.00	No Limit
		EP074: sec-Butylbenzene	135-98-8	0.5	mg/kg	<0.5	<0.5	0.00	No Limit
		EP074: Styrene	100-42-5	0.5	mg/kg	<0.5	<0.5	0.00	No Limit
		EP074: tert-Butylbenzene	98-06-6	0.5	mg/kg	<0.5	<0.5	0.00	No Limit
EP074B: Oxygenated Compounds (QC Lot: 244334)									
EM1515754-024	Anonymous	EP074: 2-Butanone (MEK)	78-93-3	5	mg/kg	<5	<5	0.00	No Limit

Sub-Matrix: **SOIL**

				Laboratory Duplicate (DUP) Report					
Laboratory sample ID	*Client sample ID*	*Method: Compound*	*CAS Number*	*LOR*	*Unit*	*Original Result*	*Duplicate Result*	*RPD (%)*	*Recovery Limits (%)*
EP074B: Oxygenated Compounds (QC Lot: 244334) - continued									
EM1515754-024	Anonymous	EP074: 2-Hexanone (MBK)	591-78-6	5	mg/kg	<5	<5	0.00	No Limit
		EP074: 4-Methyl-2-pentanone (MIBK)	108-10-1	5	mg/kg	<5	<5	0.00	No Limit
		EP074: Vinyl Acetate	108-05-4	5	mg/kg	<5	<5	0.00	No Limit
EP074B: Oxygenated Compounds (QC Lot: 245845)									
EM1515674-009	Anonymous	EP074: 2-Butanone (MEK)	78-93-3	5	mg/kg	<5	<5	0.00	No Limit
		EP074: 2-Hexanone (MBK)	591-78-6	5	mg/kg	<5	<5	0.00	No Limit
		EP074: 4-Methyl-2-pentanone (MIBK)	108-10-1	5	mg/kg	<5	<5	0.00	No Limit
		EP074: Vinyl Acetate	108-05-4	5	mg/kg	<5	<5	0.00	No Limit
EP074C: Sulfonated Compounds (QC Lot: 244334)									
EM1515754-024	Anonymous	EP074: Carbon disulfide	75-15-0	0.5	mg/kg	<0.5	<0.5	0.00	No Limit
EP074C: Sulfonated Compounds (QC Lot: 245845)									
EM1515674-009	Anonymous	EP074: Carbon disulfide	75-15-0	0.5	mg/kg	<0.5	<0.5	0.00	No Limit
EP074D: Fumigants (QC Lot: 244334)									
EM1515754-024	Anonymous	EP074: 1.2-Dibromoethane (EDB)	106-93-4	0.5	mg/kg	<0.5	<0.5	0.00	No Limit
		EP074: 1.2-Dichloropropane	78-87-5	0.5	mg/kg	<0.5	<0.5	0.00	No Limit
		EP074: 2.2-Dichloropropane	594-20-7	0.5	mg/kg	<0.5	<0.5	0.00	No Limit
		EP074: cis-1.3-Dichloropropylene	10061-01-5	0.5	mg/kg	<0.5	<0.5	0.00	No Limit
		EP074: trans-1.3-Dichloropropylene	10061-02-6	0.5	mg/kg	<0.5	<0.5	0.00	No Limit
EP074D: Fumigants (QC Lot: 245845)									
EM1515674-009	Anonymous	EP074: 1.2-Dibromoethane (EDB)	106-93-4	0.5	mg/kg	<0.5	<0.5	0.00	No Limit
		EP074: 1.2-Dichloropropane	78-87-5	0.5	mg/kg	<0.5	<0.5	0.00	No Limit
		EP074: 2.2-Dichloropropane	594-20-7	0.5	mg/kg	<0.5	<0.5	0.00	No Limit
		EP074: cis-1.3-Dichloropropylene	10061-01-5	0.5	mg/kg	<0.5	<0.5	0.00	No Limit
		EP074: trans-1.3-Dichloropropylene	10061-02-6	0.5	mg/kg	<0.5	<0.5	0.00	No Limit
EP074E: Halogenated Aliphatic Compounds (QC Lot: 244334)									
EM1515754-024	Anonymous	EP074: 1.1.1.2-Tetrachloroethane	630-20-6	0.5	mg/kg	<0.5	<0.5	0.00	No Limit
		EP074: 1.1.1-Trichloroethane	71-55-6	0.5	mg/kg	<0.5	<0.5	0.00	No Limit
		EP074: 1.1.2.2-Tetrachloroethane	79-34-5	0.5	mg/kg	<0.5	<0.5	0.00	No Limit
		EP074: 1.1.2-Trichloroethane	79-00-5	0.5	mg/kg	<0.5	<0.5	0.00	No Limit
		EP074: 1.1-Dichloroethane	75-34-3	0.5	mg/kg	<0.5	<0.5	0.00	No Limit
		EP074: 1.1-Dichloroethene	75-35-4	0.5	mg/kg	<0.5	<0.5	0.00	No Limit
		EP074: 1.1-Dichloropropylene	563-58-6	0.5	mg/kg	<0.5	<0.5	0.00	No Limit
		EP074: 1.2.3-Trichloropropane	96-18-4	0.5	mg/kg	<0.5	<0.5	0.00	No Limit
		EP074: 1.2-Dibromo-3-chloropropane	96-12-8	0.5	mg/kg	<0.5	<0.5	0.00	No Limit
		EP074: 1.2-Dichloroethane	107-06-2	0.5	mg/kg	<0.5	<0.5	0.00	No Limit
		EP074: 1.3-Dichloropropane	142-28-9	0.5	mg/kg	<0.5	<0.5	0.00	No Limit
		EP074: Carbon Tetrachloride	56-23-5	0.5	mg/kg	<0.5	<0.5	0.00	No Limit
		EP074: cis-1.2-Dichloroethene	156-59-2	0.5	mg/kg	<0.5	<0.5	0.00	No Limit
		EP074: cis-1.4-Dichloro-2-butene	1476-11-5	0.5	mg/kg	<0.5	<0.5	0.00	No Limit

Sub-Matrix: **SOIL**

				Laboratory Duplicate (DUP) Report					
Laboratory sample ID	*Client sample ID*	*Method: Compound*	*CAS Number*	*LOR*	*Unit*	*Original Result*	*Duplicate Result*	*RPD (%)*	*Recovery Limits (%)*
EP074E: Halogenated Aliphatic Compounds (QC Lot: 244334) - continued									
EM1515754-024	Anonymous	EP074: Dibromomethane	74-95-3	0.5	mg/kg	<0.5	<0.5	0.00	No Limit
		EP074: Hexachlorobutadiene	87-68-3	0.5	mg/kg	<0.5	<0.5	0.00	No Limit
		EP074: Iodomethane	74-88-4	0.5	mg/kg	<0.5	<0.5	0.00	No Limit
		EP074: Pentachloroethane	76-01-7	0.5	mg/kg	<0.5	<0.5	0.00	No Limit
		EP074: Tetrachloroethene	127-18-4	0.5	mg/kg	<0.5	<0.5	0.00	No Limit
		EP074: trans-1.2-Dichloroethene	156-60-5	0.5	mg/kg	<0.5	<0.5	0.00	No Limit
		EP074: trans-1.4-Dichloro-2-butene	110-57-6	0.5	mg/kg	<0.5	<0.5	0.00	No Limit
		EP074: Trichloroethene	79-01-6	0.5	mg/kg	<0.5	<0.5	0.00	No Limit
		EP074: Bromomethane	74-83-9	5	mg/kg	<5	<5	0.00	No Limit
		EP074: Chloroethane	75-00-3	5	mg/kg	<5	<5	0.00	No Limit
		EP074: Chloromethane	74-87-3	5	mg/kg	<5	<5	0.00	No Limit
		EP074: Dichlorodifluoromethane	75-71-8	5	mg/kg	<5	<5	0.00	No Limit
		EP074: Trichlorofluoromethane	75-69-4	5	mg/kg	<5	<5	0.00	No Limit
		EP074: Vinyl chloride	75-01-4	5	mg/kg	<5	<5	0.00	No Limit
EP074E: Halogenated Aliphatic Compounds (QC Lot: 245845)									
EM1515674-009	Anonymous	EP074: 1.1.1.2-Tetrachloroethane	630-20-6	0.5	mg/kg	<0.5	<0.5	0.00	No Limit
		EP074: 1.1.1-Trichloroethane	71-55-6	0.5	mg/kg	<0.5	<0.5	0.00	No Limit
		EP074: 1.1.2.2-Tetrachloroethane	79-34-5	0.5	mg/kg	<0.5	<0.5	0.00	No Limit
		EP074: 1.1.2-Trichloroethane	79-00-5	0.5	mg/kg	<0.5	<0.5	0.00	No Limit
		EP074: 1.1-Dichloroethane	75-34-3	0.5	mg/kg	<0.5	<0.5	0.00	No Limit
		EP074: 1.1-Dichloroethene	75-35-4	0.5	mg/kg	<0.5	<0.5	0.00	No Limit
		EP074: 1.1-Dichloropropylene	563-58-6	0.5	mg/kg	<0.5	<0.5	0.00	No Limit
		EP074: 1.2.3-Trichloropropane	96-18-4	0.5	mg/kg	<0.5	<0.5	0.00	No Limit
		EP074: 1.2-Dibromo-3-chloropropane	96-12-8	0.5	mg/kg	<0.5	<0.5	0.00	No Limit
		EP074: 1.2-Dichloroethane	107-06-2	0.5	mg/kg	<0.5	<0.5	0.00	No Limit
		EP074: 1.3-Dichloropropane	142-28-9	0.5	mg/kg	<0.5	<0.5	0.00	No Limit
		EP074: Carbon Tetrachloride	56-23-5	0.5	mg/kg	<0.5	<0.5	0.00	No Limit
		EP074: cis-1.2-Dichloroethene	156-59-2	0.5	mg/kg	<0.5	<0.5	0.00	No Limit
		EP074: cis-1.4-Dichloro-2-butene	1476-11-5	0.5	mg/kg	<0.5	<0.5	0.00	No Limit
		EP074: Dibromomethane	74-95-3	0.5	mg/kg	<0.5	<0.5	0.00	No Limit
		EP074: Hexachlorobutadiene	87-68-3	0.5	mg/kg	<0.5	<0.5	0.00	No Limit
		EP074: Iodomethane	74-88-4	0.5	mg/kg	<0.5	<0.5	0.00	No Limit
		EP074: Pentachloroethane	76-01-7	0.5	mg/kg	<0.5	<0.5	0.00	No Limit
		EP074: Tetrachloroethene	127-18-4	0.5	mg/kg	<0.5	<0.5	0.00	No Limit
		EP074: trans-1.2-Dichloroethene	156-60-5	0.5	mg/kg	<0.5	<0.5	0.00	No Limit
		EP074: trans-1.4-Dichloro-2-butene	110-57-6	0.5	mg/kg	<0.5	<0.5	0.00	No Limit
		EP074: Trichloroethene	79-01-6	0.5	mg/kg	<0.5	<0.5	0.00	No Limit
		EP074: Bromomethane	74-83-9	5	mg/kg	<5	<5	0.00	No Limit
		EP074: Chloroethane	75-00-3	5	mg/kg	<5	<5	0.00	No Limit
		EP074: Chloromethane	74-87-3	5	mg/kg	<5	<5	0.00	No Limit

Sub-Matrix: **SOIL**

				Laboratory Duplicate (DUP) Report					
Laboratory sample ID	*Client sample ID*	*Method: Compound*	*CAS Number*	*LOR*	*Unit*	*Original Result*	*Duplicate Result*	*RPD (%)*	*Recovery Limits (%)*
EP074E: Halogenated Aliphatic Compounds (QC Lot: 245845) - continued									
EM1515674-009	Anonymous	EP074: Dichlorodifluoromethane	75-71-8	5	mg/kg	<5	<5	0.00	No Limit
		EP074: Trichlorofluoromethane	75-69-4	5	mg/kg	<5	<5	0.00	No Limit
		EP074: Vinyl chloride	75-01-4	5	mg/kg	<5	<5	0.00	No Limit
EP074F: Halogenated Aromatic Compounds (QC Lot: 244334)									
EM1515754-024	Anonymous	EP074: 1.2.3-Trichlorobenzene	87-61-6	0.5	mg/kg	<0.5	<0.5	0.00	No Limit
		EP074: 1.2.4-Trichlorobenzene	120-82-1	0.5	mg/kg	<0.5	<0.5	0.00	No Limit
		EP074: 1.2-Dichlorobenzene	95-50-1	0.5	mg/kg	<0.5	<0.5	0.00	No Limit
		EP074: 1.3-Dichlorobenzene	541-73-1	0.5	mg/kg	<0.5	<0.5	0.00	No Limit
		EP074: 1.4-Dichlorobenzene	106-46-7	0.5	mg/kg	<0.5	<0.5	0.00	No Limit
		EP074: 2-Chlorotoluene	95-49-8	0.5	mg/kg	<0.5	<0.5	0.00	No Limit
		EP074: 4-Chlorotoluene	106-43-4	0.5	mg/kg	<0.5	<0.5	0.00	No Limit
		EP074: Bromobenzene	108-86-1	0.5	mg/kg	<0.5	<0.5	0.00	No Limit
		EP074: Chlorobenzene	108-90-7	0.5	mg/kg	<0.5	<0.5	0.00	No Limit
EP074F: Halogenated Aromatic Compounds (QC Lot: 245845)									
EM1515674-009	Anonymous	EP074: 1.2.3-Trichlorobenzene	87-61-6	0.5	mg/kg	<0.5	<0.5	0.00	No Limit
		EP074: 1.2.4-Trichlorobenzene	120-82-1	0.5	mg/kg	<0.5	<0.5	0.00	No Limit
		EP074: 1.2-Dichlorobenzene	95-50-1	0.5	mg/kg	<0.5	<0.5	0.00	No Limit
		EP074: 1.3-Dichlorobenzene	541-73-1	0.5	mg/kg	<0.5	<0.5	0.00	No Limit
		EP074: 1.4-Dichlorobenzene	106-46-7	0.5	mg/kg	<0.5	<0.5	0.00	No Limit
		EP074: 2-Chlorotoluene	95-49-8	0.5	mg/kg	<0.5	<0.5	0.00	No Limit
		EP074: 4-Chlorotoluene	106-43-4	0.5	mg/kg	<0.5	<0.5	0.00	No Limit
		EP074: Bromobenzene	108-86-1	0.5	mg/kg	<0.5	<0.5	0.00	No Limit
		EP074: Chlorobenzene	108-90-7	0.5	mg/kg	<0.5	<0.5	0.00	No Limit
EP074G: Trihalomethanes (QC Lot: 244334)									
EM1515754-024	Anonymous	EP074: Bromodichloromethane	75-27-4	0.5	mg/kg	<0.5	<0.5	0.00	No Limit
		EP074: Bromoform	75-25-2	0.5	mg/kg	<0.5	<0.5	0.00	No Limit
		EP074: Chloroform	67-66-3	0.5	mg/kg	<0.5	<0.5	0.00	No Limit
		EP074: Dibromochloromethane	124-48-1	0.5	mg/kg	<0.5	<0.5	0.00	No Limit
EP074G: Trihalomethanes (QC Lot: 245845)									
EM1515674-009	Anonymous	EP074: Bromodichloromethane	75-27-4	0.5	mg/kg	<0.5	<0.5	0.00	No Limit
		EP074: Bromoform	75-25-2	0.5	mg/kg	<0.5	<0.5	0.00	No Limit
		EP074: Chloroform	67-66-3	0.5	mg/kg	<0.5	<0.5	0.00	No Limit
		EP074: Dibromochloromethane	124-48-1	0.5	mg/kg	<0.5	<0.5	0.00	No Limit
EP075(SIM)B: Polynuclear Aromatic Hydrocarbons (QC Lot: 245374)									
EM1515711-014	Anonymous	EP075(SIM): Acenaphthene	83-32-9	0.5	mg/kg	<0.5	<0.5	0.00	No Limit
		EP075(SIM): Acenaphthylene	208-96-8	0.5	mg/kg	<0.5	<0.5	0.00	No Limit
		EP075(SIM): Anthracene	120-12-7	0.5	mg/kg	<0.5	<0.5	0.00	No Limit
		EP075(SIM): Benz(a)anthracene	56-55-3	0.5	mg/kg	<0.5	<0.5	0.00	No Limit
		EP075(SIM): Benzo(a)pyrene	50-32-8	0.5	mg/kg	<0.5	<0.5	0.00	No Limit

Sub-Matrix: **SOIL**

				Laboratory Duplicate (DUP) Report					
Laboratory sample ID	*Client sample ID*	*Method: Compound*	*CAS Number*	*LOR*	*Unit*	*Original Result*	*Duplicate Result*	*RPD (%)*	*Recovery Limits (%)*
EP075(SIM)B: Polynuclear Aromatic Hydrocarbons (QC Lot: 245374) - continued									
EM1515711-014	Anonymous	EP075(SIM): Benzo(b+j)fluoranthene	205-99-2 205-82-3	0.5	mg/kg	<0.5	<0.5	0.00	No Limit
		EP075(SIM): Benzo(g.h.i)perylene	191-24-2	0.5	mg/kg	<0.5	<0.5	0.00	No Limit
		EP075(SIM): Benzo(k)fluoranthene	207-08-9	0.5	mg/kg	<0.5	<0.5	0.00	No Limit
		EP075(SIM): Chrysene	218-01-9	0.5	mg/kg	<0.5	<0.5	0.00	No Limit
		EP075(SIM): Dibenz(a.h)anthracene	53-70-3	0.5	mg/kg	<0.5	<0.5	0.00	No Limit
		EP075(SIM): Fluoranthene	206-44-0	0.5	mg/kg	<0.5	<0.5	0.00	No Limit
		EP075(SIM): Fluorene	86-73-7	0.5	mg/kg	<0.5	<0.5	0.00	No Limit
		EP075(SIM): Indeno(1.2.3.cd)pyrene	193-39-5	0.5	mg/kg	<0.5	<0.5	0.00	No Limit
		EP075(SIM): Naphthalene	91-20-3	0.5	mg/kg	<0.5	<0.5	0.00	No Limit
		EP075(SIM): Phenanthrene	85-01-8	0.5	mg/kg	<0.5	<0.5	0.00	No Limit
		EP075(SIM): Pyrene	129-00-0	0.5	mg/kg	<0.5	<0.5	0.00	No Limit
EP075(SIM)B: Polynuclear Aromatic Hydrocarbons (QC Lot: 245620)									
EM1515840-011	Anonymous	EP075(SIM): Acenaphthene	83-32-9	0.5	mg/kg	<0.5	<0.5	0.00	No Limit
		EP075(SIM): Acenaphthylene	208-96-8	0.5	mg/kg	<0.5	<0.5	0.00	No Limit
		EP075(SIM): Anthracene	120-12-7	0.5	mg/kg	<0.5	<0.5	0.00	No Limit
		EP075(SIM): Benz(a)anthracene	56-55-3	0.5	mg/kg	<0.5	<0.5	0.00	No Limit
		EP075(SIM): Benzo(a)pyrene	50-32-8	0.5	mg/kg	<0.5	<0.5	0.00	No Limit
		EP075(SIM): Benzo(b+j)fluoranthene	205-99-2 205-82-3	0.5	mg/kg	<0.5	<0.5	0.00	No Limit
		EP075(SIM): Benzo(g.h.i)perylene	191-24-2	0.5	mg/kg	<0.5	<0.5	0.00	No Limit
		EP075(SIM): Benzo(k)fluoranthene	207-08-9	0.5	mg/kg	<0.5	<0.5	0.00	No Limit
		EP075(SIM): Chrysene	218-01-9	0.5	mg/kg	<0.5	<0.5	0.00	No Limit
		EP075(SIM): Dibenz(a.h)anthracene	53-70-3	0.5	mg/kg	<0.5	<0.5	0.00	No Limit
		EP075(SIM): Fluoranthene	206-44-0	0.5	mg/kg	<0.5	<0.5	0.00	No Limit
		EP075(SIM): Fluorene	86-73-7	0.5	mg/kg	<0.5	<0.5	0.00	No Limit
		EP075(SIM): Indeno(1.2.3.cd)pyrene	193-39-5	0.5	mg/kg	<0.5	<0.5	0.00	No Limit
		EP075(SIM): Naphthalene	91-20-3	0.5	mg/kg	<0.5	<0.5	0.00	No Limit
		EP075(SIM): Phenanthrene	85-01-8	0.5	mg/kg	<0.5	<0.5	0.00	No Limit
		EP075(SIM): Pyrene	129-00-0	0.5	mg/kg	<0.5	<0.5	0.00	No Limit
EM1515737-023	GW27(0.5-0.6)	EP075(SIM): Acenaphthene	83-32-9	0.5	mg/kg	<0.5	<0.5	0.00	No Limit
		EP075(SIM): Acenaphthylene	208-96-8	0.5	mg/kg	1.2	1.1	13.5	No Limit
		EP075(SIM): Anthracene	120-12-7	0.5	mg/kg	2.2	1.5	37.2	No Limit
		EP075(SIM): Benz(a)anthracene	56-55-3	0.5	mg/kg	5.8	4.3	29.7	0% - 50%
		EP075(SIM): Benzo(a)pyrene	50-32-8	0.5	mg/kg	7.1	5.2	29.7	0% - 50%
		EP075(SIM): Benzo(b+j)fluoranthene	205-99-2 205-82-3	0.5	mg/kg	9.4	7.3	24.9	0% - 50%
		EP075(SIM): Benzo(g.h.i)perylene	191-24-2	0.5	mg/kg	5.2	4.1	24.6	0% - 50%
		EP075(SIM): Benzo(k)fluoranthene	207-08-9	0.5	mg/kg	2.9	2.4	21.8	No Limit
		EP075(SIM): Chrysene	218-01-9	0.5	mg/kg	5.7	4.2	29.9	0% - 50%

Sub-Matrix: **SOIL**

				Laboratory Duplicate (DUP) Report					
Laboratory sample ID	*Client sample ID*	*Method: Compound*	*CAS Number*	*LOR*	*Unit*	*Original Result*	*Duplicate Result*	*RPD (%)*	*Recovery Limits (%)*
EP075(SIM)B: Polynuclear Aromatic Hydrocarbons (QC Lot: 245620) - continued									
EM1515737-023	GW27(0.5-0.6)	EP075(SIM): Dibenz(a.h)anthracene	53-70-3	0.5	mg/kg	1.7	1.4	21.7	No Limit
		EP075(SIM): Fluoranthene	206-44-0	0.5	mg/kg	10.5	8.6	20.0	0% - 20%
		EP075(SIM): Fluorene	86-73-7	0.5	mg/kg	<0.5	<0.5	0.00	No Limit
		EP075(SIM): Indeno(1.2.3.cd)pyrene	193-39-5	0.5	mg/kg	4.5	3.4	25.4	No Limit
		EP075(SIM): Naphthalene	91-20-3	0.5	mg/kg	0.6	0.6	0.00	No Limit
		EP075(SIM): Phenanthrene	85-01-8	0.5	mg/kg	5.2	3.8	29.4	0% - 50%
		EP075(SIM): Pyrene	129-00-0	0.5	mg/kg	11.3	9.9	13.2	0% - 20%
EP080/071: Total Petroleum Hydrocarbons (QC Lot: 244333)									
EM1515754-024	Anonymous	EP080: C6 - C9 Fraction	----	10	mg/kg	<10	<10	0.00	No Limit
EP080/071: Total Petroleum Hydrocarbons (QC Lot: 245375)									
EM1515753-010	Anonymous	EP071: C15 - C28 Fraction	----	100	mg/kg	<100	<100	0.00	No Limit
		EP071: C29 - C36 Fraction	----	100	mg/kg	<100	<100	0.00	No Limit
		EP071: C10 - C14 Fraction	----	50	mg/kg	<50	<50	0.00	No Limit
		EP071: C10 - C36 Fraction (sum)	----	50	mg/kg	<50	<50	0.00	No Limit
EM1515711-014	Anonymous	EP071: C15 - C28 Fraction	----	100	mg/kg	<100	<100	0.00	No Limit
		EP071: C29 - C36 Fraction	----	100	mg/kg	<100	<100	0.00	No Limit
		EP071: C10 - C14 Fraction	----	50	mg/kg	<50	<50	0.00	No Limit
		EP071: C10 - C36 Fraction (sum)	----	50	mg/kg	<50	<50	0.00	No Limit
EP080/071: Total Petroleum Hydrocarbons (QC Lot: 245619)									
EM1515737-023	GW27(0.5-0.6)	EP071: C15 - C28 Fraction	----	100	mg/kg	570	480	15.7	No Limit
		EP071: C29 - C36 Fraction	----	100	mg/kg	430	380	12.5	No Limit
		EP071: C10 - C14 Fraction	----	50	mg/kg	<50	60	0.00	No Limit
		EP071: C10 - C36 Fraction (sum)	----	50	mg/kg	1000	920	8.33	0% - 20%
EP080/071: Total Petroleum Hydrocarbons (QC Lot: 245844)									
EM1515674-009	Anonymous	EP080: C6 - C9 Fraction	----	10	mg/kg	<10	<10	0.00	No Limit
EP080/071: Total Recoverable Hydrocarbons - NEPM 2013 Fractions (QC Lot: 244333)									
EM1515754-024	Anonymous	EP080: C6 - C10 Fraction	C6_C10	10	mg/kg	<10	<10	0.00	No Limit
EP080/071: Total Recoverable Hydrocarbons - NEPM 2013 Fractions (QC Lot: 245375)									
EM1515753-010	Anonymous	EP071: >C16 - C34 Fraction	----	100	mg/kg	<100	<100	0.00	No Limit
		EP071: >C34 - C40 Fraction	----	100	mg/kg	<100	<100	0.00	No Limit
		EP071: >C10 - C16 Fraction	>C10_C16	50	mg/kg	<50	<50	0.00	No Limit
		EP071: >C10 - C40 Fraction (sum)	----	50	mg/kg	<50	<50	0.00	No Limit
EM1515711-014	Anonymous	EP071: >C16 - C34 Fraction	----	100	mg/kg	<100	<100	0.00	No Limit
		EP071: >C34 - C40 Fraction	----	100	mg/kg	<100	<100	0.00	No Limit
		EP071: >C10 - C16 Fraction	>C10_C16	50	mg/kg	<50	<50	0.00	No Limit
		EP071: >C10 - C40 Fraction (sum)	----	50	mg/kg	<50	<50	0.00	No Limit
EP080/071: Total Recoverable Hydrocarbons - NEPM 2013 Fractions (QC Lot: 245619)									
EM1515737-023	GW27(0.5-0.6)	EP071: >C16 - C34 Fraction	----	100	mg/kg	910	790	14.0	No Limit
		EP071: >C34 - C40 Fraction	----	100	mg/kg	180	150	16.5	No Limit

Sub-Matrix: **SOIL**

Laboratory sample ID	Client sample ID	Method: Compound	CAS Number	Laboratory Duplicate (DUP) Report					
				LOR	Unit	Original Result	Duplicate Result	RPD (%)	Recovery Limits (%)
EP080/071: Total Recoverable Hydrocarbons - NEPM 2013 Fractions (QC Lot: 245619) - continued									
EM1515737-023	GW27(0.5-0.6)	EP071: >C10 - C16 Fraction	>C10_C16	50	mg/kg	70	60	16.3	No Limit
		EP071: >C10 - C40 Fraction (sum)	----	50	mg/kg	1160	1000	14.8	0% - 20%
EP080/071: Total Recoverable Hydrocarbons - NEPM 2013 Fractions (QC Lot: 245844)									
EM1515674-009	Anonymous	EP080: C6 - C10 Fraction	C6_C10	10	mg/kg	<10	<10	0.00	No Limit
EP080: BTEXN (QC Lot: 244333)									
EM1515754-024	Anonymous	EP080: Benzene	71-43-2	0.2	mg/kg	<0.2	<0.2	0.00	No Limit
		EP080: Ethylbenzene	100-41-4	0.5	mg/kg	<0.5	<0.5	0.00	No Limit
		EP080: meta- & para-Xylene	108-38-3 106-42-3	0.5	mg/kg	<0.5	<0.5	0.00	No Limit
		EP080: ortho-Xylene	95-47-6	0.5	mg/kg	<0.5	<0.5	0.00	No Limit
		EP080: Toluene	108-88-3	0.5	mg/kg	<0.5	<0.5	0.00	No Limit
		EP080: Naphthalene	91-20-3	1	mg/kg	<1	<1	0.00	No Limit
EP080: BTEXN (QC Lot: 245844)									
EM1515674-009	Anonymous	EP080: Benzene	71-43-2	0.2	mg/kg	<0.2	<0.2	0.00	No Limit
		EP080: Ethylbenzene	100-41-4	0.5	mg/kg	<0.5	<0.5	0.00	No Limit
		EP080: meta- & para-Xylene	108-38-3 106-42-3	0.5	mg/kg	<0.5	<0.5	0.00	No Limit
		EP080: ortho-Xylene	95-47-6	0.5	mg/kg	<0.5	<0.5	0.00	No Limit
		EP080: Toluene	108-88-3	0.5	mg/kg	<0.5	<0.5	0.00	No Limit
		EP080: Naphthalene	91-20-3	1	mg/kg	<1	<1	0.00	No Limit

Sub-Matrix: **WATER**

Laboratory sample ID	Client sample ID	Method: Compound	CAS Number	Laboratory Duplicate (DUP) Report					
				LOR	Unit	Original Result	Duplicate Result	RPD (%)	Recovery Limits (%)
EG020T: Total Metals by ICP-MS (QC Lot: 247282)									
EM1515721-007	Anonymous	EG020A-T: Cadmium	7440-43-9	0.0001	mg/L	0.0021	0.0020	7.67	0% - 20%
		EG020A-T: Arsenic	7440-38-2	0.001	mg/L	0.002	0.001	0.00	No Limit
		EG020A-T: Chromium	7440-47-3	0.001	mg/L	<0.001	<0.001	0.00	No Limit
		EG020A-T: Copper	7440-50-8	0.001	mg/L	0.010	0.010	0.00	No Limit
		EG020A-T: Lead	7439-92-1	0.001	mg/L	0.143	0.137	4.73	0% - 20%
		EG020A-T: Nickel	7440-02-0	0.001	mg/L	0.002	0.002	0.00	No Limit
		EG020A-T: Zinc	7440-66-6	0.005	mg/L	0.796	0.760	4.72	0% - 20%
		EG020A-T: Aluminium	7429-90-5	0.01	mg/L	0.06	0.06	0.00	No Limit
		EG020A-T: Selenium	7782-49-2	0.01	mg/L	<0.01	<0.01	0.00	No Limit
		EG020A-T: Iron	7439-89-6	0.05	mg/L	0.23	0.22	0.00	No Limit
EM1515691-001	Anonymous	EG020A-T: Cadmium	7440-43-9	0.0001	mg/L	0.0011	0.0011	0.00	No Limit
		EG020A-T: Arsenic	7440-38-2	0.001	mg/L	<0.010	<0.010	0.00	No Limit
		EG020A-T: Chromium	7440-47-3	0.001	mg/L	0.020	0.019	7.01	No Limit
		EG020A-T: Copper	7440-50-8	0.001	mg/L	0.266	0.270	1.54	0% - 20%
		EG020A-T: Lead	7439-92-1	0.001	mg/L	<0.010	<0.010	0.00	No Limit
		EG020A-T: Nickel	7440-02-0	0.001	mg/L	0.080	0.077	3.66	No Limit

Sub-Matrix: **WATER**

Laboratory sample ID	Client sample ID	Method: Compound	CAS Number	Laboratory Duplicate (DUP) Report					
				LOR	Unit	Original Result	Duplicate Result	RPD (%)	Recovery Limits (%)
EG020T: Total Metals by ICP-MS (QC Lot: 247282) - continued									
EM1515691-001	Anonymous	EG020A-T: Zinc	7440-66-6	0.005	mg/L	1.37	1.38	0.910	0% - 20%
		EG020A-T: Aluminium	7429-90-5	0.01	mg/L	5.26	4.88	7.35	0% - 20%
		EG020A-T: Selenium	7782-49-2	0.01	mg/L	<0.10	<0.10	0.00	No Limit
		EG020A-T: Iron	7439-89-6	0.05	mg/L	5.40	5.16	4.66	0% - 50%
EG035T: Total Recoverable Mercury by FIMS (QC Lot: 243781)									
EM1515676-014	Anonymous	EG035T: Mercury	7439-97-6	0.0001	mg/L	<0.0001	<0.0001	0.00	No Limit
EM1515703-008	Anonymous	EG035T: Mercury	7439-97-6	0.0001	mg/L	<0.0001	<0.0001	0.00	No Limit
EP080/071: Total Petroleum Hydrocarbons (QC Lot: 243720)									
EM1515695-001	Anonymous	EP080: C6 - C9 Fraction	----	20	µg/L	<20	<20	0.00	No Limit
EM1515696-004	Anonymous	EP080: C6 - C9 Fraction	----	20	µg/L	<20	<20	0.00	No Limit
EP080/071: Total Petroleum Hydrocarbons (QC Lot: 245170)									
EM1515711-028	Anonymous	EP080: C6 - C9 Fraction	----	20	µg/L	<20	<20	0.00	No Limit
EM1515777-005	Anonymous	EP080: C6 - C9 Fraction	----	20	µg/L	<20	<20	0.00	No Limit
EP080/071: Total Recoverable Hydrocarbons - NEPM 2013 Fractions (QC Lot: 243720)									
EM1515695-001	Anonymous	EP080: C6 - C10 Fraction	C6_C10	20	µg/L	<20	<20	0.00	No Limit
EM1515696-004	Anonymous	EP080: C6 - C10 Fraction	C6_C10	20	µg/L	<20	<20	0.00	No Limit
EP080/071: Total Recoverable Hydrocarbons - NEPM 2013 Fractions (QC Lot: 245170)									
EM1515711-028	Anonymous	EP080: C6 - C10 Fraction	C6_C10	20	µg/L	<20	<20	0.00	No Limit
EM1515777-005	Anonymous	EP080: C6 - C10 Fraction	C6_C10	20	µg/L	<20	<20	0.00	No Limit
EP080: BTEXN (QC Lot: 243720)									
EM1515695-001	Anonymous	EP080: Benzene	71-43-2	1	µg/L	<1	<1	0.00	No Limit
		EP080: Ethylbenzene	100-41-4	2	µg/L	<2	<2	0.00	No Limit
		EP080: meta- & para-Xylene	108-38-3 106-42-3	2	µg/L	<2	<2	0.00	No Limit
		EP080: ortho-Xylene	95-47-6	2	µg/L	<2	<2	0.00	No Limit
		EP080: Toluene	108-88-3	2	µg/L	<2	<2	0.00	No Limit
		EP080: Naphthalene	91-20-3	5	µg/L	<5	<5	0.00	No Limit
EM1515696-004	Anonymous	EP080: Benzene	71-43-2	1	µg/L	<1	<1	0.00	No Limit
		EP080: Ethylbenzene	100-41-4	2	µg/L	<2	<2	0.00	No Limit
		EP080: meta- & para-Xylene	108-38-3 106-42-3	2	µg/L	<2	<2	0.00	No Limit
		EP080: ortho-Xylene	95-47-6	2	µg/L	<2	<2	0.00	No Limit
		EP080: Toluene	108-88-3	2	µg/L	<2	<2	0.00	No Limit
		EP080: Naphthalene	91-20-3	5	µg/L	<5	<5	0.00	No Limit
EP080: BTEXN (QC Lot: 245170)									
EM1515711-028	Anonymous	EP080: Benzene	71-43-2	1	µg/L	<1	<1	0.00	No Limit
		EP080: Ethylbenzene	100-41-4	2	µg/L	<2	<2	0.00	No Limit
		EP080: meta- & para-Xylene	108-38-3 106-42-3	2	µg/L	<2	<2	0.00	No Limit

Sub-Matrix: **WATER**

				Laboratory Duplicate (DUP) Report					
Laboratory sample ID	*Client sample ID*	*Method: Compound*	*CAS Number*	*LOR*	*Unit*	*Original Result*	*Duplicate Result*	*RPD (%)*	*Recovery Limits (%)*
EP080: BTEXN (QC Lot: 245170) - continued									
EM1515711-028	Anonymous	EP080: ortho-Xylene	95-47-6	2	µg/L	<2	<2	0.00	No Limit
		EP080: Toluene	108-88-3	2	µg/L	<2	<2	0.00	No Limit
		EP080: Naphthalene	91-20-3	5	µg/L	<5	<5	0.00	No Limit
EM1515777-005	Anonymous	EP080: Benzene	71-43-2	1	µg/L	<1	<1	0.00	No Limit
		EP080: Ethylbenzene	100-41-4	2	µg/L	<2	<2	0.00	No Limit
		EP080: meta- & para-Xylene	108-38-3 106-42-3	2	µg/L	<2	<2	0.00	No Limit
		EP080: ortho-Xylene	95-47-6	2	µg/L	<2	<2	0.00	No Limit
		EP080: Toluene	108-88-3	2	µg/L	<2	<2	0.00	No Limit
		EP080: Naphthalene	91-20-3	5	µg/L	<5	<5	0.00	No Limit

Method Blank (MB) and Laboratory Control Spike (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 (%)	Recovery Limits (%)	
Method: Compound	CAS Number	LOR	Unit	Result	Concentration	LCS	Low	High
ED040N: Sulfate - Calcium Phosphate Soluble (NEPM) (QCLot: 251011)								
ED040N: Sulfate as SO4 2-	14808-79-8	50	mg/kg	<50	3000 mg/kg	96.7	86	110
EG005T: Total Metals by ICP-AES (QCLot: 244710)								
EG005T: Aluminium	7429-90-5	50	mg/kg	<50	6134 mg/kg	105	93	115
EG005T: Arsenic	7440-38-2	5	mg/kg	<5	21.7 mg/kg	83.8	79	113
EG005T: Cadmium	7440-43-9	1	mg/kg	<1	4.64 mg/kg	106	87	115
EG005T: Chromium	7440-47-3	2	mg/kg	<2	43.9 mg/kg	92.8	89	113
EG005T: Copper	7440-50-8	5	mg/kg	<5	32 mg/kg	92.1	90	116
EG005T: Iron	7439-89-6	50	mg/kg	<50	8400 mg/kg	98.2	96	112
EG005T: Lead	7439-92-1	5	mg/kg	<5	40 mg/kg	87.2	85	107
EG005T: Nickel	7440-02-0	2	mg/kg	<2	55 mg/kg	99.7	89	111
EG005T: Selenium	7782-49-2	5	mg/kg	<5	5.37 mg/kg	100	93	109
EG005T: Zinc	7440-66-6	5	mg/kg	<5	60.8 mg/kg	90.4	89	111
EG005T: Total Metals by ICP-AES (QCLot: 245668)								
EG005T: Aluminium	7429-90-5	50	mg/kg	<50	6134 mg/kg	108	93	115
EG005T: Arsenic	7440-38-2	5	mg/kg	<5	21.7 mg/kg	98.4	79	113
EG005T: Cadmium	7440-43-9	1	mg/kg	<1	4.64 mg/kg	95.2	87	115
EG005T: Chromium	7440-47-3	2	mg/kg	<2	43.9 mg/kg	106	89	113
EG005T: Copper	7440-50-8	5	mg/kg	<5	32 mg/kg	98.4	90	116
EG005T: Iron	7439-89-6	50	mg/kg	<50	8400 mg/kg	109	96	112
EG005T: Lead	7439-92-1	5	mg/kg	<5	40 mg/kg	95.7	85	107
EG005T: Nickel	7440-02-0	2	mg/kg	<2	55 mg/kg	98.5	89	111
EG005T: Selenium	7782-49-2	5	mg/kg	<5	5.37 mg/kg	101	93	109
EG005T: Zinc	7440-66-6	5	mg/kg	<5	60.8 mg/kg	97.7	89	111
EG035T: Total Recoverable Mercury by FIMS (QCLot: 244711)								
EG035T: Mercury	7439-97-6	0.1	mg/kg	<0.1	2.57 mg/kg	96.7	85	103
EG035T: Total Recoverable Mercury by FIMS (QCLot: 245667)								
EG035T: Mercury	7439-97-6	0.1	mg/kg	<0.1	2.57 mg/kg	90.6	85	103
EP003: Total Organic Carbon (TOC) in Soil (QCLot: 247568)								
EP003: Total Organic Carbon	----	0.02	%	<0.02	100 %	101	70	130
EP074A: Monocyclic Aromatic Hydrocarbons (QCLot: 244334)								
EP074: 1.2.4-Trimethylbenzene	95-63-6	0.5	mg/kg	<0.5	1 mg/kg	83.1	66	108
EP074: 1.3.5-Trimethylbenzene	108-67-8	0.5	mg/kg	<0.5	1 mg/kg	82.3	67	109
EP074: Isopropylbenzene	98-82-8	0.5	mg/kg	<0.5	1 mg/kg	87.7	69	119

Sub-Matrix: **SOIL**

Method: Compound	CAS Number	LOR	Unit	Method Blank (MB) Report	Laboratory Control Spike (LCS) Report			
					Spike	Spike Recovery (%)	Recovery Limits (%)	
				Result	Concentration	LCS	Low	High
EP074A: Monocyclic Aromatic Hydrocarbons (QCLot: 244334) - continued								
EP074: n-Butylbenzene	104-51-8	0.5	mg/kg	<0.5	1 mg/kg	72.9	58	110
EP074: n-Propylbenzene	103-65-1	0.5	mg/kg	<0.5	1 mg/kg	78.1	64	110
EP074: p-Isopropyltoluene	99-87-6	0.5	mg/kg	<0.5	1 mg/kg	81.7	65	111
EP074: sec-Butylbenzene	135-98-8	0.5	mg/kg	<0.5	1 mg/kg	83.4	66	110
EP074: Styrene	100-42-5	0.5	mg/kg	<0.5	1 mg/kg	86.9	72	118
EP074: tert-Butylbenzene	98-06-6	0.5	mg/kg	<0.5	1 mg/kg	85.5	67	111
EP074A: Monocyclic Aromatic Hydrocarbons (QCLot: 245845)								
EP074: 1.2.4-Trimethylbenzene	95-63-6	0.5	mg/kg	<0.5	1 mg/kg	83.6	66	108
EP074: 1.3.5-Trimethylbenzene	108-67-8	0.5	mg/kg	<0.5	1 mg/kg	83.1	67	109
EP074: Isopropylbenzene	98-82-8	0.5	mg/kg	<0.5	1 mg/kg	98.6	69	119
EP074: n-Butylbenzene	104-51-8	0.5	mg/kg	<0.5	1 mg/kg	81.1	58	110
EP074: n-Propylbenzene	103-65-1	0.5	mg/kg	<0.5	1 mg/kg	83.2	64	110
EP074: p-Isopropyltoluene	99-87-6	0.5	mg/kg	<0.5	1 mg/kg	85.6	65	111
EP074: sec-Butylbenzene	135-98-8	0.5	mg/kg	<0.5	1 mg/kg	83.4	66	110
EP074: Styrene	100-42-5	0.5	mg/kg	<0.5	1 mg/kg	96.7	72	118
EP074: tert-Butylbenzene	98-06-6	0.5	mg/kg	<0.5	1 mg/kg	87.9	67	111
EP074B: Oxygenated Compounds (QCLot: 244334)								
EP074: 2-Butanone (MEK)	78-93-3	5	mg/kg	<5	10 mg/kg	92.9	68	142
EP074: 2-Hexanone (MBK)	591-78-6	5	mg/kg	<5	10 mg/kg	97.5	62	128
EP074: 4-Methyl-2-pentanone (MIBK)	108-10-1	5	mg/kg	<5	10 mg/kg	105	67	123
EP074: Vinyl Acetate	108-05-4	5	mg/kg	<5	10 mg/kg	89.8	54	128
EP074B: Oxygenated Compounds (QCLot: 245845)								
EP074: 2-Butanone (MEK)	78-93-3	5	mg/kg	<5	10 mg/kg	106	68	142
EP074: 2-Hexanone (MBK)	591-78-6	5	mg/kg	<5	10 mg/kg	107	62	128
EP074: 4-Methyl-2-pentanone (MIBK)	108-10-1	5	mg/kg	<5	10 mg/kg	108	67	123
EP074: Vinyl Acetate	108-05-4	5	mg/kg	<5	10 mg/kg	111	54	128
EP074C: Sulfonated Compounds (QCLot: 244334)								
EP074: Carbon disulfide	75-15-0	0.5	mg/kg	<0.5	1 mg/kg	71.8	50	128
EP074C: Sulfonated Compounds (QCLot: 245845)								
EP074: Carbon disulfide	75-15-0	0.5	mg/kg	<0.5	1 mg/kg	83.2	50	128
EP074D: Fumigants (QCLot: 244334)								
EP074: 1.2-Dibromoethane (EDB)	106-93-4	0.5	mg/kg	<0.5	1 mg/kg	87.7	73	117
EP074: 1.2-Dichloropropane	78-87-5	0.5	mg/kg	<0.5	1 mg/kg	97.2	72	116
EP074: 2.2-Dichloropropane	594-20-7	0.5	mg/kg	<0.5	1 mg/kg	80.2	65	115
EP074: cis-1.3-Dichloropropylene	10061-01-5	0.5	mg/kg	<0.5	1 mg/kg	75.7	64	104
EP074: trans-1.3-Dichloropropylene	10061-02-6	0.5	mg/kg	<0.5	1 mg/kg	73.4	61	103
EP074D: Fumigants (QCLot: 245845)								
EP074: 1.2-Dibromoethane (EDB)	106-93-4	0.5	mg/kg	<0.5	1 mg/kg	92.4	73	117

Sub-Matrix: **SOIL**

Method: Compound	CAS Number	LOR	Unit	Method Blank (MB) Report	Laboratory Control Spike (LCS) Report			
					Spike	Spike Recovery (%)	Recovery Limits (%)	
				Result	Concentration	LCS	Low	High
EP074D: Fumigants (QCLot: 245845) - continued								
EP074: 1.2-Dichloropropane	78-87-5	0.5	mg/kg	<0.5	1 mg/kg	95.0	72	116
EP074: 2.2-Dichloropropane	594-20-7	0.5	mg/kg	<0.5	1 mg/kg	88.2	65	115
EP074: cis-1.3-Dichloropropylene	10061-01-5	0.5	mg/kg	<0.5	1 mg/kg	77.7	64	104
EP074: trans-1.3-Dichloropropylene	10061-02-6	0.5	mg/kg	<0.5	1 mg/kg	77.7	61	103
EP074E: Halogenated Aliphatic Compounds (QCLot: 244334)								
EP074: 1.1.1.2-Tetrachloroethane	630-20-6	0.5	mg/kg	<0.5	1 mg/kg	70.8	65	109
EP074: 1.1.1-Trichloroethane	71-55-6	0.5	mg/kg	<0.5	1 mg/kg	83.1	68	110
EP074: 1.1.2.2-Tetrachloroethane	79-34-5	0.5	mg/kg	<0.5	1 mg/kg	96.5	76	124
EP074: 1.1.2-Trichloroethane	79-00-5	0.5	mg/kg	<0.5	1 mg/kg	95.2	76	120
EP074: 1.1-Dichloroethane	75-34-3	0.5	mg/kg	<0.5	1 mg/kg	92.4	72	118
EP074: 1.1-Dichloroethene	75-35-4	0.5	mg/kg	<0.5	1 mg/kg	85.4	65	127
EP074: 1.1-Dichloropropylene	563-58-6	0.5	mg/kg	<0.5	1 mg/kg	93.0	70	116
EP074: 1.2.3-Trichloropropane	96-18-4	0.5	mg/kg	<0.5	1 mg/kg	93.1	75	123
EP074: 1.2-Dibromo-3-chloropropane	96-12-8	0.5	mg/kg	<0.5	1 mg/kg	68.3	54	106
EP074: 1.2-Dichloroethane	107-06-2	0.5	mg/kg	<0.5	1 mg/kg	93.7	75	119
EP074: 1.3-Dichloropropane	142-28-9	0.5	mg/kg	<0.5	1 mg/kg	89.4	78	120
EP074: Bromomethane	74-83-9	5	mg/kg	<5	10 mg/kg	71.3	43	133
EP074: Carbon Tetrachloride	56-23-5	0.5	mg/kg	<0.5	1 mg/kg	75.2	61	107
EP074: Chloroethane	75-00-3	5	mg/kg	<5	10 mg/kg	89.2	58	134
EP074: Chloromethane	74-87-3	5	mg/kg	<5	10 mg/kg	90.4	55	133
EP074: cis-1.2-Dichloroethene	156-59-2	0.5	mg/kg	<0.5	1 mg/kg	93.4	76	120
EP074: cis-1.4-Dichloro-2-butene	1476-11-5	0.5	mg/kg	<0.5	1 mg/kg	51.3	40	114
EP074: Dibromomethane	74-95-3	0.5	mg/kg	<0.5	1 mg/kg	91.0	74	114
EP074: Dichlorodifluoromethane	75-71-8	5	mg/kg	<5	10 mg/kg	72.9	45	123
EP074: Hexachlorobutadiene	87-68-3	0.5	mg/kg	<0.5	1 mg/kg	80.6	60	118
EP074: Iodomethane	74-88-4	0.5	mg/kg	<0.5	1 mg/kg	76.9	47	116
EP074: Pentachloroethane	76-01-7	0.5	mg/kg	<0.5	1 mg/kg	66.6	45	123
EP074: Tetrachloroethene	127-18-4	0.5	mg/kg	<0.5	1 mg/kg	86.4	69	121
EP074: trans-1.2-Dichloroethene	156-60-5	0.5	mg/kg	<0.5	1 mg/kg	91.0	70	118
EP074: trans-1.4-Dichloro-2-butene	110-57-6	0.5	mg/kg	<0.5	1 mg/kg	79.0	56	114
EP074: Trichloroethene	79-01-6	0.5	mg/kg	<0.5	1 mg/kg	89.1	72	116
EP074: Trichlorofluoromethane	75-69-4	5	mg/kg	<5	10 mg/kg	85.0	63	127
EP074: Vinyl chloride	75-01-4	5	mg/kg	<5	10 mg/kg	85.2	58	138
EP074E: Halogenated Aliphatic Compounds (QCLot: 245845)								
EP074: 1.1.1.2-Tetrachloroethane	630-20-6	0.5	mg/kg	<0.5	1 mg/kg	83.6	65	109
EP074: 1.1.1-Trichloroethane	71-55-6	0.5	mg/kg	<0.5	1 mg/kg	88.5	68	110
EP074: 1.1.2.2-Tetrachloroethane	79-34-5	0.5	mg/kg	<0.5	1 mg/kg	106	76	124
EP074: 1.1.2-Trichloroethane	79-00-5	0.5	mg/kg	<0.5	1 mg/kg	103	76	120
EP074: 1.1-Dichloroethane	75-34-3	0.5	mg/kg	<0.5	1 mg/kg	95.1	72	118

Sub-Matrix: **SOIL**

Method: Compound	CAS Number	LOR	Unit	Method Blank (MB) Report	Laboratory Control Spike (LCS) Report			
					Spike	Spike Recovery (%)	Recovery Limits (%)	
				Result	Concentration	LCS	Low	High
EP074E: Halogenated Aliphatic Compounds (QCLot: 245845) - continued								
EP074: 1.1-Dichloroethene	75-35-4	0.5	mg/kg	<0.5	1 mg/kg	96.2	65	127
EP074: 1.1-Dichloropropylene	563-58-6	0.5	mg/kg	<0.5	1 mg/kg	89.2	70	116
EP074: 1.2.3-Trichloropropane	96-18-4	0.5	mg/kg	<0.5	1 mg/kg	106	75	123
EP074: 1.2-Dibromo-3-chloropropane	96-12-8	0.5	mg/kg	<0.5	1 mg/kg	84.3	54	106
EP074: 1.2-Dichloroethane	107-06-2	0.5	mg/kg	<0.5	1 mg/kg	97.9	75	119
EP074: 1.3-Dichloropropane	142-28-9	0.5	mg/kg	<0.5	1 mg/kg	103	78	120
EP074: Bromomethane	74-83-9	5	mg/kg	<5	10 mg/kg	84.7	43	133
EP074: Carbon Tetrachloride	56-23-5	0.5	mg/kg	<0.5	1 mg/kg	86.1	61	107
EP074: Chloroethane	75-00-3	5	mg/kg	<5	10 mg/kg	109	58	134
EP074: Chloromethane	74-87-3	5	mg/kg	<5	10 mg/kg	114	55	133
EP074: cis-1.2-Dichloroethene	156-59-2	0.5	mg/kg	<0.5	1 mg/kg	101	76	120
EP074: cis-1.4-Dichloro-2-butene	1476-11-5	0.5	mg/kg	<0.5	1 mg/kg	87.6	40	114
EP074: Dibromomethane	74-95-3	0.5	mg/kg	<0.5	1 mg/kg	91.0	74	114
EP074: Dichlorodifluoromethane	75-71-8	5	mg/kg	<5	10 mg/kg	92.6	45	123
EP074: Hexachlorobutadiene	87-68-3	0.5	mg/kg	<0.5	1 mg/kg	93.0	60	118
EP074: Iodomethane	74-88-4	0.5	mg/kg	<0.5	1 mg/kg	73.2	47	116
EP074: Pentachloroethane	76-01-7	0.5	mg/kg	<0.5	1 mg/kg	79.8	45	123
EP074: Tetrachloroethene	127-18-4	0.5	mg/kg	<0.5	1 mg/kg	89.9	69	121
EP074: trans-1.2-Dichloroethene	156-60-5	0.5	mg/kg	<0.5	1 mg/kg	97.1	70	118
EP074: trans-1.4-Dichloro-2-butene	110-57-6	0.5	mg/kg	<0.5	1 mg/kg	94.0	56	114
EP074: Trichloroethene	79-01-6	0.5	mg/kg	<0.5	1 mg/kg	95.5	72	116
EP074: Trichlorofluoromethane	75-69-4	5	mg/kg	<5	10 mg/kg	102	63	127
EP074: Vinyl chloride	75-01-4	5	mg/kg	<5	10 mg/kg	103	58	138
EP074F: Halogenated Aromatic Compounds (QCLot: 244334)								
EP074: 1.2.3-Trichlorobenzene	87-61-6	0.5	mg/kg	<0.5	1 mg/kg	78.2	69	117
EP074: 1.2.4-Trichlorobenzene	120-82-1	0.5	mg/kg	<0.5	1 mg/kg	74.3	60	112
EP074: 1.2-Dichlorobenzene	95-50-1	0.5	mg/kg	<0.5	1 mg/kg	85.5	76	112
EP074: 1.3-Dichlorobenzene	541-73-1	0.5	mg/kg	<0.5	1 mg/kg	85.8	70	110
EP074: 1.4-Dichlorobenzene	106-46-7	0.5	mg/kg	<0.5	1 mg/kg	88.8	73	115
EP074: 2-Chlorotoluene	95-49-8	0.5	mg/kg	<0.5	1 mg/kg	83.8	69	113
EP074: 4-Chlorotoluene	106-43-4	0.5	mg/kg	<0.5	1 mg/kg	84.3	67	111
EP074: Bromobenzene	108-86-1	0.5	mg/kg	<0.5	1 mg/kg	85.8	63	117
EP074: Chlorobenzene	108-90-7	0.5	mg/kg	<0.5	1 mg/kg	90.2	79	115
EP074F: Halogenated Aromatic Compounds (QCLot: 245845)								
EP074: 1.2.3-Trichlorobenzene	87-61-6	0.5	mg/kg	<0.5	1 mg/kg	98.7	69	117
EP074: 1.2.4-Trichlorobenzene	120-82-1	0.5	mg/kg	<0.5	1 mg/kg	84.9	60	112
EP074: 1.2-Dichlorobenzene	95-50-1	0.5	mg/kg	<0.5	1 mg/kg	98.6	76	112
EP074: 1.3-Dichlorobenzene	541-73-1	0.5	mg/kg	<0.5	1 mg/kg	89.4	70	110
EP074: 1.4-Dichlorobenzene	106-46-7	0.5	mg/kg	<0.5	1 mg/kg	97.6	73	115

Sub-Matrix: **SOIL**

Method: Compound	CAS Number	LOR	Unit	Method Blank (MB) Report	Laboratory Control Spike (LCS) Report			
					Spike	Spike Recovery (%)	Recovery Limits (%)	
				Result	Concentration	LCS	Low	High
EP074F: Halogenated Aromatic Compounds (QCLot: 245845) - continued								
EP074: 2-Chlorotoluene	95-49-8	0.5	mg/kg	<0.5	1 mg/kg	87.0	69	113
EP074: 4-Chlorotoluene	106-43-4	0.5	mg/kg	<0.5	1 mg/kg	86.6	67	111
EP074: Bromobenzene	108-86-1	0.5	mg/kg	<0.5	1 mg/kg	90.8	63	117
EP074: Chlorobenzene	108-90-7	0.5	mg/kg	<0.5	1 mg/kg	97.8	79	115
EP074G: Trihalomethanes (QCLot: 244334)								
EP074: Bromodichloromethane	75-27-4	0.5	mg/kg	<0.5	1 mg/kg	75.2	65	107
EP074: Bromoform	75-25-2	0.5	mg/kg	<0.5	1 mg/kg	62.6	54	104
EP074: Chloroform	67-66-3	0.5	mg/kg	<0.5	1 mg/kg	90.2	75	117
EP074: Dibromochloromethane	124-48-1	0.5	mg/kg	<0.5	1 mg/kg	65.0	61	105
EP074G: Trihalomethanes (QCLot: 245845)								
EP074: Bromodichloromethane	75-27-4	0.5	mg/kg	<0.5	1 mg/kg	84.2	65	107
EP074: Bromoform	75-25-2	0.5	mg/kg	<0.5	1 mg/kg	85.2	54	104
EP074: Chloroform	67-66-3	0.5	mg/kg	<0.5	1 mg/kg	105	75	117
EP074: Dibromochloromethane	124-48-1	0.5	mg/kg	<0.5	1 mg/kg	86.3	61	105
EP075(SIM)B: Polynuclear Aromatic Hydrocarbons (QCLot: 245374)								
EP075(SIM): Acenaphthene	83-32-9	0.5	mg/kg	<0.5	3 mg/kg	106	68	114
EP075(SIM): Acenaphthylene	208-96-8	0.5	mg/kg	<0.5	3 mg/kg	91.1	61	125
EP075(SIM): Anthracene	120-12-7	0.5	mg/kg	<0.5	3 mg/kg	105	68	116
EP075(SIM): Benz(a)anthracene	56-55-3	0.5	mg/kg	<0.5	3 mg/kg	102	62	116
EP075(SIM): Benzo(a)pyrene	50-32-8	0.5	mg/kg	<0.5	3 mg/kg	98.4	64	114
EP075(SIM): Benzo(b+j)fluoranthene	205-99-2 205-82-3	0.5	mg/kg	<0.5	3 mg/kg	95.8	64	114
EP075(SIM): Benzo(g.h.i)perylene	191-24-2	0.5	mg/kg	<0.5	3 mg/kg	105	59	117
EP075(SIM): Benzo(k)fluoranthene	207-08-9	0.5	mg/kg	<0.5	3 mg/kg	105	67	115
EP075(SIM): Chrysene	218-01-9	0.5	mg/kg	<0.5	3 mg/kg	102	63	119
EP075(SIM): Dibenz(a.h)anthracene	53-70-3	0.5	mg/kg	<0.5	3 mg/kg	103	62	114
EP075(SIM): Fluoranthene	206-44-0	0.5	mg/kg	<0.5	3 mg/kg	101	67	115
EP075(SIM): Fluorene	86-73-7	0.5	mg/kg	<0.5	3 mg/kg	106	62	120
EP075(SIM): Indeno(1.2.3.cd)pyrene	193-39-5	0.5	mg/kg	<0.5	3 mg/kg	103	62	116
EP075(SIM): Naphthalene	91-20-3	0.5	mg/kg	<0.5	3 mg/kg	108	65	119
EP075(SIM): Phenanthrene	85-01-8	0.5	mg/kg	<0.5	3 mg/kg	104	69	113
EP075(SIM): Pyrene	129-00-0	0.5	mg/kg	<0.5	3 mg/kg	107	66	116
EP075(SIM)B: Polynuclear Aromatic Hydrocarbons (QCLot: 245620)								
EP075(SIM): Acenaphthene	83-32-9	0.5	mg/kg	<0.5	3 mg/kg	110	68	114
EP075(SIM): Acenaphthylene	208-96-8	0.5	mg/kg	<0.5	3 mg/kg	82.3	61	125
EP075(SIM): Anthracene	120-12-7	0.5	mg/kg	<0.5	3 mg/kg	111	68	116
EP075(SIM): Benz(a)anthracene	56-55-3	0.5	mg/kg	<0.5	3 mg/kg	100	62	116
EP075(SIM): Benzo(a)pyrene	50-32-8	0.5	mg/kg	<0.5	3 mg/kg	101	64	114

Sub-Matrix: **SOIL**

Method: Compound	CAS Number	LOR	Unit	Method Blank (MB) Report	Laboratory Control Spike (LCS) Report			
					Spike	Spike Recovery (%)	Recovery Limits (%)	
				Result	Concentration	LCS	Low	High
EP075(SIM)B: Polynuclear Aromatic Hydrocarbons (QCLot: 245620) - continued								
EP075(SIM): Benzo(b+j)fluoranthene	205-99-2 205-82-3	0.5	mg/kg	<0.5	3 mg/kg	98.9	64	114
EP075(SIM): Benzo(g.h.i)perylene	191-24-2	0.5	mg/kg	<0.5	3 mg/kg	104	59	117
EP075(SIM): Benzo(k)fluoranthene	207-08-9	0.5	mg/kg	<0.5	3 mg/kg	104	67	115
EP075(SIM): Chrysene	218-01-9	0.5	mg/kg	<0.5	3 mg/kg	113	63	119
EP075(SIM): Dibenz(a.h)anthracene	53-70-3	0.5	mg/kg	<0.5	3 mg/kg	106	62	114
EP075(SIM): Fluoranthene	206-44-0	0.5	mg/kg	<0.5	3 mg/kg	113	67	115
EP075(SIM): Fluorene	86-73-7	0.5	mg/kg	<0.5	3 mg/kg	110	62	120
EP075(SIM): Indeno(1.2.3.cd)pyrene	193-39-5	0.5	mg/kg	<0.5	3 mg/kg	109	62	116
EP075(SIM): Naphthalene	91-20-3	0.5	mg/kg	<0.5	3 mg/kg	108	65	119
EP075(SIM): Phenanthrene	85-01-8	0.5	mg/kg	<0.5	3 mg/kg	105	69	113
EP075(SIM): Pyrene	129-00-0	0.5	mg/kg	<0.5	3 mg/kg	116	66	116
EP080/071: Total Petroleum Hydrocarbons (QCLot: 244333)								
EP080: C6 - C9 Fraction	----	10	mg/kg	<10	36 mg/kg	93.6	66	130
EP080/071: Total Petroleum Hydrocarbons (QCLot: 245375)								
EP071: C10 - C14 Fraction	----	50	mg/kg	<50	658 mg/kg	116	65	131
EP071: C10 - C36 Fraction (sum)	----	50	mg/kg	<50	----	----	----	----
EP071: C15 - C28 Fraction	----	100	mg/kg	<100	3160 mg/kg	114	70	126
EP071: C29 - C36 Fraction	----	100	mg/kg	<100	1448 mg/kg	113	70	122
EP080/071: Total Petroleum Hydrocarbons (QCLot: 245619)								
EP071: C10 - C14 Fraction	----	50	mg/kg	<50	658 mg/kg	111	65	131
EP071: C10 - C36 Fraction (sum)	----	50	mg/kg	<50	----	----	----	----
EP071: C15 - C28 Fraction	----	100	mg/kg	<100	3160 mg/kg	110	70	126
EP071: C29 - C36 Fraction	----	100	mg/kg	<100	1448 mg/kg	112	70	122
EP080/071: Total Petroleum Hydrocarbons (QCLot: 245844)								
EP080: C6 - C9 Fraction	----	10	mg/kg	<10	36 mg/kg	102	66	130
EP080/071: Total Recoverable Hydrocarbons - NEPM 2013 Fractions (QCLot: 244333)								
EP080: C6 - C10 Fraction	C6_C10	10	mg/kg	<10	45 mg/kg	94.3	64	128
EP080/071: Total Recoverable Hydrocarbons - NEPM 2013 Fractions (QCLot: 245375)								
EP071: >C10 - C16 Fraction	>C10_C16	50	mg/kg	<50	1051 mg/kg	114	68	130
EP071: >C10 - C40 Fraction (sum)	----	50	mg/kg	<50	----	----	----	----
EP071: >C16 - C34 Fraction	----	100	mg/kg	<100	4124 mg/kg	115	72	116
EP071: >C34 - C40 Fraction	----	100	mg/kg	<100	161 mg/kg	108	38	132
EP080/071: Total Recoverable Hydrocarbons - NEPM 2013 Fractions (QCLot: 245619)								
EP071: >C10 - C16 Fraction	>C10_C16	50	mg/kg	<50	1051 mg/kg	116	68	130
EP071: >C10 - C40 Fraction (sum)	----	50	mg/kg	<50	----	----	----	----
EP071: >C16 - C34 Fraction	----	100	mg/kg	<100	4124 mg/kg	110	72	116
EP071: >C34 - C40 Fraction	----	100	mg/kg	<100	161 mg/kg	110	38	132

Sub-Matrix: **SOIL**

Method: Compound	CAS Number	LOR	Unit	Method Blank (MB) Report: Result	Laboratory Control Spike (LCS) Report: Spike Concentration	Spike Recovery (%): LCS	Recovery Limits (%): Low	Recovery Limits (%): High
EP080/071: Total Recoverable Hydrocarbons - NEPM 2013 Fractions (QCLot: 245844)								
EP080: C6 - C10 Fraction	C6_C10	10	mg/kg	<10	45 mg/kg	97.5	64	128
EP080: BTEXN (QCLot: 244333)								
EP080: Benzene	71-43-2	0.2	mg/kg	<0.2	2 mg/kg	95.2	74	124
EP080: Ethylbenzene	100-41-4	0.5	mg/kg	<0.5	2 mg/kg	96.1	72	124
EP080: meta- & para-Xylene	108-38-3 106-42-3	0.5	mg/kg	<0.5	4 mg/kg	96.1	72	132
EP080: Naphthalene	91-20-3	1	mg/kg	<1	0.5 mg/kg	90.9	66	132
EP080: ortho-Xylene	95-47-6	0.5	mg/kg	<0.5	2 mg/kg	97.2	76	130
EP080: Toluene	108-88-3	0.5	mg/kg	<0.5	2 mg/kg	97.1	75	129
EP080: BTEXN (QCLot: 245844)								
EP080: Benzene	71-43-2	0.2	mg/kg	<0.2	2 mg/kg	100.0	74	124
EP080: Ethylbenzene	100-41-4	0.5	mg/kg	<0.5	2 mg/kg	104	72	124
EP080: meta- & para-Xylene	108-38-3 106-42-3	0.5	mg/kg	<0.5	4 mg/kg	106	72	132
EP080: Naphthalene	91-20-3	1	mg/kg	<1	0.5 mg/kg	97.8	66	132
EP080: ortho-Xylene	95-47-6	0.5	mg/kg	<0.5	2 mg/kg	110	76	130
EP080: Toluene	108-88-3	0.5	mg/kg	<0.5	2 mg/kg	102	75	129

Sub-Matrix: **WATER**

Method: Compound	CAS Number	LOR	Unit	Method Blank (MB) Report: Result	Laboratory Control Spike (LCS) Report: Spike Concentration	Spike Recovery (%): LCS	Recovery Limits (%): Low	Recovery Limits (%): High
EG020T: Total Metals by ICP-MS (QCLot: 247282)								
EG020A-T: Aluminium	7429-90-5	0.01	mg/L	<0.01	0.5 mg/L	101	100	108
EG020A-T: Arsenic	7440-38-2	0.001	mg/L	<0.001	0.1 mg/L	104	94	116
EG020A-T: Cadmium	7440-43-9	0.0001	mg/L	<0.0001	0.1 mg/L	98.3	90	110
EG020A-T: Chromium	7440-47-3	0.001	mg/L	<0.001	0.1 mg/L	108	90	110
EG020A-T: Copper	7440-50-8	0.001	mg/L	<0.001	0.1 mg/L	94.0	91	109
EG020A-T: Iron	7439-89-6	0.05	mg/L	<0.05	0.5 mg/L	104	99	109
EG020A-T: Lead	7439-92-1	0.001	mg/L	<0.001	0.1 mg/L	97.2	91	111
EG020A-T: Nickel	7440-02-0	0.001	mg/L	<0.001	0.1 mg/L	93.9	91	111
EG020A-T: Selenium	7782-49-2	0.01	mg/L	<0.01	0.1 mg/L	94.3	86	110
EG020A-T: Zinc	7440-66-6	0.005	mg/L	<0.005	0.1 mg/L	98.8	91	109
EG035T: Total Recoverable Mercury by FIMS (QCLot: 243781)								
EG035T: Mercury	7439-97-6	0.0001	mg/L	<0.0001	0.01 mg/L	102	87	113
EP080/071: Total Petroleum Hydrocarbons (QCLot: 243720)								
EP080: C6 - C9 Fraction	----	20	µg/L	<20	360 µg/L	100.0	67	127
EP080/071: Total Petroleum Hydrocarbons (QCLot: 243816)								
EP071: C10 - C14 Fraction	----	50	µg/L	<50	3980 µg/L	56.5	53	123
EP071: C15 - C28 Fraction	----	100	µg/L	<100	17006 µg/L	71.4	57	133

Sub-Matrix: **WATER**

Method: Compound	CAS Number	LOR	Unit	Method Blank (MB) Report: Result	Laboratory Control Spike (LCS) Report: Spike Concentration	Spike Recovery (%): LCS	Recovery Limits (%): Low	Recovery Limits (%): High
EP080/071: Total Petroleum Hydrocarbons (QCLot: 243816) - continued								
EP071: C29 - C36 Fraction	----	50	µg/L	<50	8662 µg/L	65.7	55	141
EP080/071: Total Petroleum Hydrocarbons (QCLot: 245170)								
EP080: C6 - C9 Fraction	----	20	µg/L	<20	360 µg/L	104	67	127
EP080/071: Total Recoverable Hydrocarbons - NEPM 2013 Fractions (QCLot: 243720)								
EP080: C6 - C10 Fraction	C6_C10	20	µg/L	<20	450 µg/L	102	65	125
EP080/071: Total Recoverable Hydrocarbons - NEPM 2013 Fractions (QCLot: 243816)								
EP071: >C10 - C16 Fraction	>C10_C16	100	µg/L	<100	5753 µg/L	65.5	54	122
EP071: >C16 - C34 Fraction	----	100	µg/L	<100	24516 µg/L	64.8	56	132
EP071: >C34 - C40 Fraction	----	100	µg/L	<100	828 µg/L	70.9	51	137
EP080/071: Total Recoverable Hydrocarbons - NEPM 2013 Fractions (QCLot: 245170)								
EP080: C6 - C10 Fraction	C6_C10	20	µg/L	<20	450 µg/L	102	65	125
EP080: BTEXN (QCLot: 243720)								
EP080: Benzene	71-43-2	1	µg/L	<1	20 µg/L	106	76	120
EP080: Ethylbenzene	100-41-4	2	µg/L	<2	20 µg/L	101	72	124
EP080: meta- & para-Xylene	108-38-3 106-42-3	2	µg/L	<2	40 µg/L	99.8	72	130
EP080: Naphthalene	91-20-3	5	µg/L	<5	5 µg/L	91.3	71	129
EP080: ortho-Xylene	95-47-6	2	µg/L	<2	20 µg/L	103	75	127
EP080: Toluene	108-88-3	2	µg/L	<2	20 µg/L	102	76	124
EP080: BTEXN (QCLot: 245170)								
EP080: Benzene	71-43-2	1	µg/L	<1	20 µg/L	98.9	76	120
EP080: Ethylbenzene	100-41-4	2	µg/L	<2	20 µg/L	106	72	124
EP080: meta- & para-Xylene	108-38-3 106-42-3	2	µg/L	<2	40 µg/L	114	72	130
EP080: Naphthalene	91-20-3	5	µg/L	<5	5 µg/L	98.7	71	129
EP080: ortho-Xylene	95-47-6	2	µg/L	<2	20 µg/L	115	75	127
EP080: Toluene	108-88-3	2	µg/L	<2	20 µg/L	108	76	124

Matrix Spike (MS) Report

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

Sub-Matrix: **SOIL**

Laboratory sample ID	Client sample ID	Method: Compound	CAS Number	Matrix Spike (MS) Report: Spike Concentration	SpikeRecovery(%): MS	Recovery Limits (%): Low	Recovery Limits (%): High
ED040N: Sulfate - Calcium Phosphate Soluble (NEPM) (QCLot: 251011)							
EM1515593-059	Anonymous	ED040N: Sulfate as SO4 2-	14808-79-8	3000 mg/kg	95.9	84	116

Sub-Matrix: **SOIL**

				Matrix Spike (MS) Report			
				Spike	SpikeRecovery(%)	Recovery Limits (%)	
Laboratory sample ID	Client sample ID	Method: Compound	CAS Number	Concentration	MS	Low	High
EG005T: Total Metals by ICP-AES (QCLot: 244710)							
EM1515737-002	GW21(0.5-0.6)	EG005T: Arsenic	7440-38-2	50 mg/kg	94.7	78	124
		EG005T: Cadmium	7440-43-9	50 mg/kg	97.1	84	116
		EG005T: Chromium	7440-47-3	50 mg/kg	95.8	79	121
		EG005T: Copper	7440-50-8	50 mg/kg	92.8	82	124
		EG005T: Lead	7439-92-1	50 mg/kg	93.9	76	124
		EG005T: Nickel	7440-02-0	50 mg/kg	88.9	78	120
		EG005T: Selenium	7782-49-2	50 mg/kg	86.4	71	125
		EG005T: Zinc	7440-66-6	50 mg/kg	114	74	128
EG005T: Total Metals by ICP-AES (QCLot: 245668)							
EM1515707-002	Anonymous	EG005T: Arsenic	7440-38-2	50 mg/kg	86.3	78	124
		EG005T: Cadmium	7440-43-9	50 mg/kg	96.9	84	116
		EG005T: Chromium	7440-47-3	50 mg/kg	104	79	121
		EG005T: Copper	7440-50-8	50 mg/kg	97.5	82	124
		EG005T: Lead	7439-92-1	50 mg/kg	95.9	76	124
		EG005T: Nickel	7440-02-0	50 mg/kg	92.4	78	120
		EG005T: Selenium	7782-49-2	50 mg/kg	83.1	71	125
		EG005T: Zinc	7440-66-6	50 mg/kg	93.8	74	128
EG035T: Total Recoverable Mercury by FIMS (QCLot: 244711)							
EM1515737-002	GW21(0.5-0.6)	EG035T: Mercury	7439-97-6	5 mg/kg	87.6	76	116
EG035T: Total Recoverable Mercury by FIMS (QCLot: 245667)							
EM1515707-002	Anonymous	EG035T: Mercury	7439-97-6	5 mg/kg	88.4	76	116
EP074E: Halogenated Aliphatic Compounds (QCLot: 244334)							
EM1515737-002	GW21(0.5-0.6)	EP074: 1.1-Dichloroethene	75-35-4	2 mg/kg	88.0	29	141
		EP074: Trichloroethene	79-01-6	2 mg/kg	81.4	50	126
EP074E: Halogenated Aliphatic Compounds (QCLot: 245845)							
EM1515737-023	GW27(0.5-0.6)	EP074: 1.1-Dichloroethene	75-35-4	2 mg/kg	104	29	141
		EP074: Trichloroethene	79-01-6	2 mg/kg	86.6	50	126
EP074F: Halogenated Aromatic Compounds (QCLot: 244334)							
EM1515737-002	GW21(0.5-0.6)	EP074: Chlorobenzene	108-90-7	2 mg/kg	88.7	65	133
EP074F: Halogenated Aromatic Compounds (QCLot: 245845)							
EM1515737-023	GW27(0.5-0.6)	EP074: Chlorobenzene	108-90-7	2 mg/kg	99.1	65	133
EP075(SIM)B: Polynuclear Aromatic Hydrocarbons (QCLot: 245374)							
EM1515737-002	GW21(0.5-0.6)	EP075(SIM): Acenaphthene	83-32-9	3 mg/kg	102	67	117
		EP075(SIM): Pyrene	129-00-0	3 mg/kg	# 152	52	148
EP075(SIM)B: Polynuclear Aromatic Hydrocarbons (QCLot: 245620)							
EM1515831-001	Anonymous	EP075(SIM): Acenaphthene	83-32-9	3 mg/kg	105	67	117

Sub-Matrix: **SOIL**

				Matrix Spike (MS) Report			
				Spike	SpikeRecovery(%)	Recovery Limits (%)	
Laboratory sample ID	Client sample ID	Method: Compound	CAS Number	Concentration	MS	Low	High
EP075(SIM)B: Polynuclear Aromatic Hydrocarbons (QCLot: 245620) - continued							
EM1515831-001	Anonymous	EP075(SIM): Pyrene	129-00-0	3 mg/kg	116	52	148
EP080/071: Total Petroleum Hydrocarbons (QCLot: 244333)							
EM1515737-002	GW21(0.5-0.6)	EP080: C6 - C9 Fraction	----	28 mg/kg	73.6	42	131
EP080/071: Total Petroleum Hydrocarbons (QCLot: 245375)							
EM1515711-024	Anonymous	EP071: C10 - C14 Fraction	----	658 mg/kg	106	53	123
		EP071: C15 - C28 Fraction	----	3160 mg/kg	105	70	124
		EP071: C29 - C36 Fraction	----	1448 mg/kg	104	64	118
EP080/071: Total Petroleum Hydrocarbons (QCLot: 245619)							
EM1515840-002	Anonymous	EP071: C10 - C14 Fraction	----	658 mg/kg	106	53	123
		EP071: C15 - C28 Fraction	----	3160 mg/kg	104	70	124
		EP071: C29 - C36 Fraction	----	1448 mg/kg	106	64	118
EP080/071: Total Petroleum Hydrocarbons (QCLot: 245844)							
EM1515737-023	GW27(0.5-0.6)	EP080: C6 - C9 Fraction	----	28 mg/kg	79.1	42	131
EP080/071: Total Recoverable Hydrocarbons - NEPM 2013 Fractions (QCLot: 244333)							
EM1515737-002	GW21(0.5-0.6)	EP080: C6 - C10 Fraction	C6_C10	33 mg/kg	73.2	39	129
EP080/071: Total Recoverable Hydrocarbons - NEPM 2013 Fractions (QCLot: 245375)							
EM1515711-024	Anonymous	EP071: >C10 - C16 Fraction	>C10_C16	1051 mg/kg	104	65	123
		EP071: >C16 - C34 Fraction	----	4124 mg/kg	106	67	121
		EP071: >C34 - C40 Fraction	----	161 mg/kg	99.8	44	126
EP080/071: Total Recoverable Hydrocarbons - NEPM 2013 Fractions (QCLot: 245619)							
EM1515840-002	Anonymous	EP071: >C10 - C16 Fraction	>C10_C16	1051 mg/kg	111	65	123
		EP071: >C16 - C34 Fraction	----	4124 mg/kg	104	67	121
		EP071: >C34 - C40 Fraction	----	161 mg/kg	109	44	126
EP080/071: Total Recoverable Hydrocarbons - NEPM 2013 Fractions (QCLot: 245844)							
EM1515737-023	GW27(0.5-0.6)	EP080: C6 - C10 Fraction	C6_C10	33 mg/kg	74.9	39	129
EP080: BTEXN (QCLot: 244333)							
EM1515737-002	GW21(0.5-0.6)	EP080: Benzene	71-43-2	2 mg/kg	96.1	50	136
		EP080: Toluene	108-88-3	2 mg/kg	92.9	56	139
EP080: BTEXN (QCLot: 245844)							
EM1515737-023	GW27(0.5-0.6)	EP080: Benzene	71-43-2	2 mg/kg	104	50	136
		EP080: Toluene	108-88-3	2 mg/kg	97.3	56	139

Sub-Matrix: **WATER**

				Matrix Spike (MS) Report			
				Spike	SpikeRecovery(%)	Recovery Limits (%)	
Laboratory sample ID	Client sample ID	Method: Compound	CAS Number	Concentration	MS	Low	High
EG020T: Total Metals by ICP-MS (QCLot: 247282)							

Sub-Matrix: **WATER**

				Matrix Spike (MS) Report			
				Spike	SpikeRecovery(%)	Recovery Limits (%)	
Laboratory sample ID	Client sample ID	Method: Compound	CAS Number	Concentration	MS	Low	High
EG020T: Total Metals by ICP-MS (QCLot: 247282) - continued							
EM1515691-001	Anonymous	EG020A-T: Arsenic	7440-38-2	1 mg/L	115	82	118
		EG020A-T: Cadmium	7440-43-9	0.25 mg/L	110	75	129
		EG020A-T: Chromium	7440-47-3	1 mg/L	100	80	118
		EG020A-T: Copper	7440-50-8	1 mg/L	106	81	115
		EG020A-T: Lead	7439-92-1	1 mg/L	99.0	83	121
		EG020A-T: Nickel	7440-02-0	1 mg/L	109	80	118
		EG020A-T: Zinc	7440-66-6	1 mg/L	106	74	116
EG035T: Total Recoverable Mercury by FIMS (QCLot: 243781)							
EM1515686-014	Anonymous	EG035T: Mercury	7439-97-6	0.01 mg/L	105	70	130
EP080/071: Total Petroleum Hydrocarbons (QCLot: 243720)							
EM1515731-045	Anonymous	EP080: C6 - C9 Fraction	----	280 µg/L	77.6	43	125
EP080/071: Total Petroleum Hydrocarbons (QCLot: 245170)							
EM1515737-039	QC05	EP080: C6 - C9 Fraction	----	280 µg/L	106	43	125
EP080/071: Total Recoverable Hydrocarbons - NEPM 2013 Fractions (QCLot: 243720)							
EM1515731-045	Anonymous	EP080: C6 - C10 Fraction	C6_C10	330 µg/L	76.0	44	122
EP080/071: Total Recoverable Hydrocarbons - NEPM 2013 Fractions (QCLot: 245170)							
EM1515737-039	QC05	EP080: C6 - C10 Fraction	C6_C10	330 µg/L	111	44	122
EP080: BTEXN (QCLot: 243720)							
EM1515731-045	Anonymous	EP080: Benzene	71-43-2	20 µg/L	113	68	130
		EP080: Toluene	108-88-3	20 µg/L	103	72	132
EP080: BTEXN (QCLot: 245170)							
EM1515737-039	QC05	EP080: Benzene	71-43-2	20 µg/L	114	68	130
		EP080: Toluene	108-88-3	20 µg/L	121	72	132

ALS Environmental

QA/QC Compliance Assessment for DQO Reporting

Work Order	: **EM1515737**	Page	: 1 of 8
Amendment	: **1**		
Client	: **AECOM Australia Pty Ltd**	Laboratory	: Environmental Division Melbourne
Contact	: MS AVERYLL COYNE	Telephone	: +61 7 3243 7123
Project	: 60431087	Date Samples Received	: 14-Oct-2015
Site	: Fishermans Bend	Issue Date	: 22-Oct-2015
Sampler	: NATHAN JENSEN, OLIVER TAYLOR	No. of samples received	: 40
Order number	: 60431087 1.4	No. of samples analysed	: 8

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.**
- **Matrix Spike outliers exist - please see following pages for full details.**
- **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 : Quality Control Samples

Duplicates, Method Blanks, Laboratory Control Samples and Matrix Spikes

Matrix: **SOIL**

Compound Group Name	Laboratory Sample ID	Client Sample ID	Analyte	CAS Number	Data	Limits	Comment
Matrix Spike (MS) Recoveries							
EP075(SIM)B: Polynuclear Aromatic Hydrocarbons	EM1515737--002	GW21(0.5-0.6)	**Pyrene**	129-00-0	152 %	52-148%	**Recovery greater than upper data quality objective**

Outliers : Analysis Holding Time Compliance

Matrix: **SOIL**

Method / Container / Client Sample ID(s)	Extraction / Preparation			Analysis		
	Date extracted	Due for extraction	Days overdue	Date analysed	Due for analysis	Days overdue
EA001: pH in soil using 0.01M CaCl extract						
Soil Glass Jar - Unpreserved						
GW21(0.5-0.6)	21-Oct-2015	20-Oct-2015	**1**	----	----	----

Outliers : Frequency of Quality Control Samples

Matrix: **WATER**

Quality Control Sample Type / Method	Count		Rate (%)		Quality Control Specification
	QC	Regular	Actual	Expected	
Laboratory Duplicates (DUP)					
TRH - Semivolatile Fraction	0	19	0.00	10.00	NEPM 2013 Schedule B(3) and ALS QCS3 requirement
Matrix Spikes (MS)					
TRH - Semivolatile Fraction	0	19	0.00	5.00	NEPM 2013 Schedule B(3) and ALS QCS3 requirement

Analysis Holding Time Compliance

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
EA001: pH in soil using 0.01M CaCl extract							
Soil Glass Jar - Unpreserved (EA001)							
GW21(0.5-0.6)	**13-Oct-2015**	**21-Oct-2015**	20-Oct-2015	×	**21-Oct-2015**	22-Oct-2015	✓

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							
Soil Glass Jar - Unpreserved (EA055-103)							
GW21(0.5-0.6)	13-Oct-2015	----	----	----	15-Oct-2015	27-Oct-2015	✓
Soil Glass Jar - Unpreserved (EA055-103)							
GW21(2.8-2.9), GW22(2.5-2.6), GW27(0.5-0.6), GW30(3.5-3.6), GW26(3.0-3.1)	13-Oct-2015	----	----	----	16-Oct-2015	27-Oct-2015	✓
ED040N: Sulfate - Calcium Phosphate Soluble (NEPM)							
Soil Glass Jar - Unpreserved (ED040N)							
GW21(0.5-0.6)	13-Oct-2015	22-Oct-2015	10-Apr-2016	✓	22-Oct-2015	10-Apr-2016	✓
EG005T: Total Metals by ICP-AES							
Soil Glass Jar - Unpreserved (EG005T)							
GW21(0.5-0.6)	13-Oct-2015	16-Oct-2015	10-Apr-2016	✓	16-Oct-2015	10-Apr-2016	✓
Soil Glass Jar - Unpreserved (EG005T)							
GW27(0.5-0.6)	13-Oct-2015	16-Oct-2015	10-Apr-2016	✓	19-Oct-2015	10-Apr-2016	✓
EG035T: Total Recoverable Mercury by FIMS							
Soil Glass Jar - Unpreserved (EG035T)							
GW21(0.5-0.6), GW27(0.5-0.6)	13-Oct-2015	16-Oct-2015	10-Nov-2015	✓	19-Oct-2015	10-Nov-2015	✓
EP003: Total Organic Carbon (TOC) in Soil							
Pulp Bag (EP003)							
GW21(2.8-2.9), GW22(2.5-2.6), GW30(3.5-3.6), GW26(3.0-3.1)	13-Oct-2015	19-Oct-2015	10-Nov-2015	✓	19-Oct-2015	10-Nov-2015	✓
EP080/071: Total Petroleum Hydrocarbons							
Soil Glass Jar - Unpreserved (EP071)							
GW21(0.5-0.6), GW27(0.5-0.6)	13-Oct-2015	16-Oct-2015	27-Oct-2015	✓	16-Oct-2015	25-Nov-2015	✓
EP074A: Monocyclic Aromatic Hydrocarbons							
Soil Glass Jar - Unpreserved (EP074)							
GW21(0.5-0.6)	13-Oct-2015	15-Oct-2015	20-Oct-2015	✓	15-Oct-2015	20-Oct-2015	✓
Soil Glass Jar - Unpreserved (EP074)							
GW27(0.5-0.6)	13-Oct-2015	16-Oct-2015	20-Oct-2015	✓	16-Oct-2015	20-Oct-2015	✓
EP075(SIM)B: Polynuclear Aromatic Hydrocarbons							
Soil Glass Jar - Unpreserved (EP075(SIM))							
GW21(0.5-0.6), GW27(0.5-0.6)	13-Oct-2015	16-Oct-2015	27-Oct-2015	✓	16-Oct-2015	25-Nov-2015	✓
EP080/071: Total Petroleum Hydrocarbons							
Soil Glass Jar - Unpreserved (EP080)							
GW21(0.5-0.6)	13-Oct-2015	15-Oct-2015	27-Oct-2015	✓	15-Oct-2015	27-Oct-2015	✓
Soil Glass Jar - Unpreserved (EP080)							
GW27(0.5-0.6)	13-Oct-2015	16-Oct-2015	27-Oct-2015	✓	16-Oct-2015	27-Oct-2015	✓

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

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)							
QC04	**13-Oct-2015**	**19-Oct-2015**	10-Apr-2016	✓	**19-Oct-2015**	10-Apr-2016	✓
EG035T: Total Recoverable Mercury by FIMS							
Clear Plastic Bottle - Nitric Acid; Unfiltered (EG035T)							
QC04	**13-Oct-2015**	**----**	----	----	**15-Oct-2015**	10-Nov-2015	✓
EP080/071: Total Petroleum Hydrocarbons							
Amber Glass Bottle - Unpreserved (EP071)							
QC04	**13-Oct-2015**	**15-Oct-2015**	20-Oct-2015	✓	**15-Oct-2015**	24-Nov-2015	✓
EP080/071: Total Petroleum Hydrocarbons							
Amber VOC Vial - Sulfuric Acid (EP080)							
QC04	**13-Oct-2015**	**15-Oct-2015**	27-Oct-2015	✓	**15-Oct-2015**	27-Oct-2015	✓
Amber VOC Vial - Sulfuric Acid (EP080)							
QC05	**13-Oct-2015**	**16-Oct-2015**	27-Oct-2015	✓	**16-Oct-2015**	27-Oct-2015	✓

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	EA055-103	2	20	**10.00**	**10.00**	✓	NEPM 2013 Schedule B(3) and ALS QCS3 requirement
PAH/Phenols (SIM)	EP075(SIM)	1	9	**11.11**	**10.00**	✓	NEPM 2013 Schedule B(3) and ALS QCS3 requirement
pH in soil using a 0.01M CaCl2 extract	EA001	1	8	**12.50**	**10.00**	✓	NEPM 2013 Schedule B(3) and ALS QCS3 requirement
Sulfate - Calcium Phosphate Soluble	ED040N	2	15	**13.33**	**10.00**	✓	NEPM 2013 Schedule B(3) and ALS QCS3 requirement
Total Mercury by FIMS	EG035T	1	8	**12.50**	**10.00**	✓	NEPM 2013 Schedule B(3) and ALS QCS3 requirement
Total Metals by ICP-AES	EG005T	1	8	**12.50**	**10.00**	✓	NEPM 2013 Schedule B(3) and ALS QCS3 requirement
Total Organic Carbon	EP003	2	20	**10.00**	**10.00**	✓	NEPM 2013 Schedule B(3) and ALS QCS3 requirement
TRH - Semivolatile Fraction	EP071	2	14	**14.29**	**10.00**	✓	NEPM 2013 Schedule B(3) and ALS QCS3 requirement
TRH Volatiles/BTEX	EP080	1	5	**20.00**	**10.00**	✓	NEPM 2013 Schedule B(3) and ALS QCS3 requirement
Volatile Organic Compounds	EP074	1	5	**20.00**	**10.00**	✓	NEPM 2013 Schedule B(3) and ALS QCS3 requirement
Laboratory Control Samples (LCS)							
PAH/Phenols (SIM)	EP075(SIM)	1	9	**11.11**	**5.00**	✓	NEPM 2013 Schedule B(3) and ALS QCS3 requirement
Sulfate - Calcium Phosphate Soluble	ED040N	1	15	**6.67**	**5.00**	✓	NEPM 2013 Schedule B(3) and ALS QCS3 requirement
Total Mercury by FIMS	EG035T	1	8	**12.50**	**5.00**	✓	NEPM 2013 Schedule B(3) and ALS QCS3 requirement
Total Metals by ICP-AES	EG005T	1	8	**12.50**	**5.00**	✓	NEPM 2013 Schedule B(3) and ALS QCS3 requirement
Total Organic Carbon	EP003	1	20	**5.00**	**5.00**	✓	NEPM 2013 Schedule B(3) and ALS QCS3 requirement
TRH - Semivolatile Fraction	EP071	1	14	**7.14**	**5.00**	✓	NEPM 2013 Schedule B(3) and ALS QCS3 requirement
TRH Volatiles/BTEX	EP080	1	5	**20.00**	**5.00**	✓	NEPM 2013 Schedule B(3) and ALS QCS3 requirement
Volatile Organic Compounds	EP074	1	5	**20.00**	**5.00**	✓	NEPM 2013 Schedule B(3) and ALS QCS3 requirement
Method Blanks (MB)							
PAH/Phenols (SIM)	EP075(SIM)	1	9	**11.11**	**5.00**	✓	NEPM 2013 Schedule B(3) and ALS QCS3 requirement
Sulfate - Calcium Phosphate Soluble	ED040N	1	15	**6.67**	**5.00**	✓	NEPM 2013 Schedule B(3) and ALS QCS3 requirement
Total Mercury by FIMS	EG035T	1	8	**12.50**	**5.00**	✓	NEPM 2013 Schedule B(3) and ALS QCS3 requirement
Total Metals by ICP-AES	EG005T	1	8	**12.50**	**5.00**	✓	NEPM 2013 Schedule B(3) and ALS QCS3 requirement
Total Organic Carbon	EP003	1	20	**5.00**	**5.00**	✓	NEPM 2013 Schedule B(3) and ALS QCS3 requirement
TRH - Semivolatile Fraction	EP071	1	14	**7.14**	**5.00**	✓	NEPM 2013 Schedule B(3) and ALS QCS3 requirement
TRH Volatiles/BTEX	EP080	1	5	**20.00**	**5.00**	✓	NEPM 2013 Schedule B(3) and ALS QCS3 requirement
Volatile Organic Compounds	EP074	1	5	**20.00**	**5.00**	✓	NEPM 2013 Schedule B(3) and ALS QCS3 requirement
Matrix Spikes (MS)							
PAH/Phenols (SIM)	EP075(SIM)	1	9	**11.11**	**5.00**	✓	NEPM 2013 Schedule B(3) and ALS QCS3 requirement
Sulfate - Calcium Phosphate Soluble	ED040N	1	15	**6.67**	**5.00**	✓	NEPM 2013 Schedule B(3) and ALS QCS3 requirement
Total Mercury by FIMS	EG035T	1	8	**12.50**	**5.00**	✓	NEPM 2013 Schedule B(3) and ALS QCS3 requirement
Total Metals by ICP-AES	EG005T	1	8	**12.50**	**5.00**	✓	NEPM 2013 Schedule B(3) and ALS QCS3 requirement
TRH - Semivolatile Fraction	EP071	1	14	**7.14**	**5.00**	✓	NEPM 2013 Schedule B(3) and ALS QCS3 requirement
TRH Volatiles/BTEX	EP080	1	5	**20.00**	**5.00**	✓	NEPM 2013 Schedule B(3) and ALS QCS3 requirement
Volatile Organic Compounds	EP074	1	5	**20.00**	**5.00**	✓	NEPM 2013 Schedule B(3) and ALS QCS3 requirement

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)							
Total Mercury by FIMS	EG035T	2	17	**11.76**	**10.00**	✓	NEPM 2013 Schedule B(3) and ALS QCS3 requirement
Total Metals by ICP-MS - Suite A	EG020A-T	2	20	**10.00**	**10.00**	✓	NEPM 2013 Schedule B(3) and ALS QCS3 requirement
TRH - Semivolatile Fraction	EP071	0	19	**0.00**	**10.00**	×	NEPM 2013 Schedule B(3) and ALS QCS3 requirement
TRH Volatiles/BTEX	EP080	2	20	**10.00**	**10.00**	✓	NEPM 2013 Schedule B(3) and ALS QCS3 requirement
Laboratory Control Samples (LCS)							
Total Mercury by FIMS	EG035T	1	17	**5.88**	**5.00**	✓	NEPM 2013 Schedule B(3) and ALS QCS3 requirement
Total Metals by ICP-MS - Suite A	EG020A-T	1	20	**5.00**	**5.00**	✓	NEPM 2013 Schedule B(3) and ALS QCS3 requirement
TRH - Semivolatile Fraction	EP071	1	19	**5.26**	**5.00**	✓	NEPM 2013 Schedule B(3) and ALS QCS3 requirement
TRH Volatiles/BTEX	EP080	1	20	**5.00**	**5.00**	✓	NEPM 2013 Schedule B(3) and ALS QCS3 requirement
Method Blanks (MB)							
Total Mercury by FIMS	EG035T	1	17	**5.88**	**5.00**	✓	NEPM 2013 Schedule B(3) and ALS QCS3 requirement
Total Metals by ICP-MS - Suite A	EG020A-T	1	20	**5.00**	**5.00**	✓	NEPM 2013 Schedule B(3) and ALS QCS3 requirement
TRH - Semivolatile Fraction	EP071	1	19	**5.26**	**5.00**	✓	NEPM 2013 Schedule B(3) and ALS QCS3 requirement
TRH Volatiles/BTEX	EP080	1	20	**5.00**	**5.00**	✓	NEPM 2013 Schedule B(3) and ALS QCS3 requirement
Matrix Spikes (MS)							
Total Mercury by FIMS	EG035T	1	17	**5.88**	**5.00**	✓	NEPM 2013 Schedule B(3) and ALS QCS3 requirement
Total Metals by ICP-MS - Suite A	EG020A-T	1	20	**5.00**	**5.00**	✓	NEPM 2013 Schedule B(3) and ALS QCS3 requirement
TRH - Semivolatile Fraction	EP071	0	19	**0.00**	**5.00**	×	NEPM 2013 Schedule B(3) and ALS QCS3 requirement
TRH Volatiles/BTEX	EP080	1	20	**5.00**	**5.00**	✓	NEPM 2013 Schedule B(3) and ALS QCS3 requirement

Brief Method Summaries

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

Analytical Methods	Method	Matrix	Method Descriptions
pH in soil using a 0.01M CaCl2 extract	EA001	SOIL	In house: Referenced to Rayment and Higginson 4B1 (mod.) 10 g of soil is mixed with 50 mL of 0.01M CaCl2 and tumbled end over end for 1 hour. pH is measured from the continuous suspension. This method is compliant with NEPM (2013) Schedule B(3) (Method 103)
Moisture Content	EA055-103	SOIL	In-house. A gravimetric procedure based on weight loss over a 12 hour drying period at 103-105 degrees C. This method is compliant with NEPM (2013) Schedule B(3) Section 7.1 and Table 1 (14 day holding time).
Sulfate - Calcium Phosphate Soluble	ED040N	SOIL	In-house. The sample is extracted with a calcium phosphate solution. The phosphate ion displaces the adsorbed sulfate while calcium ions depress the extraction of interfering S from soil organic matter. SO4 in the extract is determined by ICPAES and reported as dry weight in the original soil. This method is compliant with NEPM (2013) Schedule B(3) (Method 406)
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 (2013) 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 (2013) Schedule B(3)
Total Organic Carbon	EP003	SOIL	In-house C-IR17. Dried and pulverised sample is reacted with acid to remove inorganic Carbonates, then combusted in a LECO furnace in the presence of strong oxidants / catalysts. The evolved (Organic) Carbon (as CO2) is automaticaly measured by infra-red detector.
TRH - Semivolatile Fraction	EP071	SOIL	(USEPA SW 846 - 8015A) Sample extracts are analysed by Capillary GC/FID and quantified against alkane standards over the range C10 - C40.
Volatile Organic Compounds	EP074	SOIL	(USEPA SW 846 - 8260B) Extracts are analysed by Purge and Trap, Capillary GC/MS. Quantification is by comparison against an established 5 point calibration curve. This method is compliant with NEPM (2013) Schedule B(3) (Method 501)
PAH/Phenols (SIM)	EP075(SIM)	SOIL	(USEPA SW 846 - 8270B) 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 (2013) Schedule B(3) (Method 502 and 507)
TRH Volatiles/BTEX	EP080	SOIL	(USEPA SW 846 - 8260B) Extracts are analysed by Purge and Trap, Capillary GC/MS. Quantification is by comparison against an established 5 point calibration curve.
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.

Analytical Methods	Method	Matrix	Method Descriptions
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 (2013) Schedule B(3)
TRH - Semivolatile Fraction	EP071	WATER	USEPA SW 846 - 8015A 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 (2013) Schedule B(3)
TRH Volatiles/BTEX	EP080	WATER	USEPA SW 846 - 8260B 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 (2013) Schedule B(3)

Preparation Methods	Method	Matrix	Method Descriptions
Dry and Pulverise (up to 100g)	GEO30	SOIL	#
Methanolic Extraction of Soils for Purge and Trap	ORG16	SOIL	(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	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 (2013) Schedule B(3)

SAMPLE RECEIPT NOTIFICATION (SRN)

Work Order : **EM1515737**
Amendment : **1**

Client	: **AECOM Australia Pty Ltd**	Laboratory	: Environmental Division Melbourne
Contact	: MS AVERYLL COYNE	Contact	: Carsten Emrich
Address	: LEVEL 9 8 EXHIBITION ST MELBOURNE VIC 3000	Address	: 4 Westall Rd Springvale VIC Australia 3171
E-mail	: averyll.coyne@aecom.com	E-mail	: carsten.emrich@alsenviro.com
Telephone	: +61 03 9653 1234	Telephone	: +61 7 3243 7123
Facsimile	: +61 03 9654 7117	Facsimile	: +61-3-8549 9601
Project	: 60431087	Page	: 1 of 4
Order number	: 60431087 1.4	Quote number	: EB2015AECOMAU0580 (EN/004/15)
C-O-C number	: ----	QC Level	: NEPM 2013 Schedule B(3) and ALS QCS3 requirement
Site	: Fishermans Bend		
Sampler	: NATHAN JENSEN, OLIVER TAYLOR		

Dates

Date Samples Received	: 14-Oct-2015 11:15 AM	Issue Date	: 21-Oct-2015
Client Requested Due Date	: 23-Oct-2015	Scheduled Reporting Date	: **23-Oct-2015**

Delivery Details

Mode of Delivery	: Carrier	Security Seal	: Intact.
No. of coolers/boxes	: 2	Temperature	: 5.3 - Ice present
Receipt Detail	:	No. of samples received / analysed	: 40 / 8

General Comments

- This report contains the following information:
  - Sample Container(s)/Preservation Non-Compliances
  - Summary of Sample(s) and Requested Analysis
  - Proactive Holding Time Report
  - Requested Deliverables
- **Additional analysis instruction was received by ALS on 15/10/2015 at 3:47 PM.**
- **Please direct any queries related to sample condition / numbering / breakages to Client Services.**
- Sample Disposal - Aqueous (14 days), Solid (60 days) from date of completion of work order.
- **Analytical work for this work order will be conducted at ALS Springvale and ALS Brisbane**
- **Please refer to the Proactive Holding Time Report table below which summarises breaches of recommended holding times that have occurred prior to samples/instructions being received at the laboratory. The absence of this summary table indicates that all samples have been received within the recommended holding times for the analysis requested.**

Sample Container(s)/Preservation Non-Compliances

All comparisons are made against pretreatment/preservation AS, APHA, USEPA standards.

- **No sample container / preservation non-compliance exist.**

Summary of Sample(s) and Requested Analysis

Some items described below may be part of a laboratory process necessary for the execution of client requested tasks. Packages may contain additional analyses, such as the determination of moisture content and preparation tasks, that are included in the package.

Matrix: **SOIL**

Laboratory sample ID	*Client sampling date / time*	*Client sample ID*	(On Hold) SOIL No analysis requested	SOIL - EA001 pH (CaCl)	SOIL - EA055-103 Moisture Content	SOIL - ED040N Calcium Phosphate Extractable Sulfate	SOIL - EG005T (solids) Total Metals by ICP-AES	SOIL - S-02 8 Metals (incl. Digestion)	SOIL - S-10 TRH/VOC/PAH
EM1515737-001	[13-Oct-2015]	GW21(0.0-0.1)	✓						
EM1515737-002	[13-Oct-2015]	GW21(0.5-0.6)		✓	✓	✓	✓	✓	✓
EM1515737-003	[13-Oct-2015]	GW21(1.0-1.1)	✓						
EM1515737-004	[13-Oct-2015]	GW21(1.5-1.6)	✓						
EM1515737-005	[13-Oct-2015]	GW21(2.0-2.1)	✓						
EM1515737-006	[13-Oct-2015]	GW21(2.5-2.6)	✓						
EM1515737-007	[13-Oct-2015]	GW21(2.8-2.9)			✓				
EM1515737-008	[13-Oct-2015]	GW21(3.4-3.5)	✓						
EM1515737-009	[13-Oct-2015]	GW21(4.0-4.1)	✓						
EM1515737-010	[13-Oct-2015]	GW22(0.0-0.1)	✓						
EM1515737-011	[13-Oct-2015]	GW22(0.5-0.6)	✓						
EM1515737-012	[13-Oct-2015]	GW22(1.0-1.1)	✓						
EM1515737-013	[13-Oct-2015]	GW22(1.5-1.6)	✓						
EM1515737-014	[13-Oct-2015]	GW22(2.0-2.1)	✓						
EM1515737-015	[13-Oct-2015]	GW22(2.5-2.6)			✓				
EM1515737-016	[13-Oct-2015]	GW22(3.0-3.1)	✓						
EM1515737-017	[13-Oct-2015]	GW23(0.0-0.1)	✓						
EM1515737-018	[13-Oct-2015]	GW23(0.5-0.6)	✓						
EM1515737-019	[13-Oct-2015]	GW23(1.0-1.1)	✓						
EM1515737-020	[13-Oct-2015]	GW23(1.2-1.3)	✓						
EM1515737-021	[13-Oct-2015]	GW23(1.5-1.6)	✓						
EM1515737-022	[13-Oct-2015]	GW27(0.1-0.2)	✓						
EM1515737-023	[13-Oct-2015]	GW27(0.5-0.6)			✓		✓	✓	✓
EM1515737-024	[13-Oct-2015]	GW30(0.0-0.1)	✓						
EM1515737-025	[13-Oct-2015]	GW30(0.5-0.6)	✓						
EM1515737-026	[13-Oct-2015]	GW30(1.0-1.1)	✓						
EM1515737-027	[13-Oct-2015]	GW30(1.5-1.6)	✓						
EM1515737-028	[13-Oct-2015]	GW30(1.7-1.8)	✓						
EM1515737-029	[13-Oct-2015]	GW30(2.5-2.6)	✓						
EM1515737-030	[13-Oct-2015]	GW30(3.5-3.6)			✓				
EM1515737-031	[13-Oct-2015]	GW30(4.4-4.5)	✓						
EM1515737-032	[13-Oct-2015]	GW30(5.1-5.2)	✓						
EM1515737-033	[13-Oct-2015]	GW26(1.9-2.0)	✓						
EM1515737-034	[13-Oct-2015]	GW26(2.1-2.2)	✓						
EM1515737-035	[13-Oct-2015]	GW26(3.0-3.1)			✓				

			(On Hold) SOIL No analysis requested	SOIL - EA001 pH (CaCl)	SOIL - EA055-103 Moisture Content	SOIL - ED040N Calcium Phosphate Extractable Sulfate	SOIL - EG005T (solids) Total Metals by ICP-AES	SOIL - S-02 8 Metals (incl. Digestion)	SOIL - S-10 TRH/VOC/PAH
EM1515737-036	[13-Oct-2015]	GW26(4.0-4.1)	✓						
EM1515737-037	[13-Oct-2015]	GW26(5.0-5.1)	✓						
EM1515737-040	[13-Oct-2015]	GW22(4.0-4.1)	✓						

Matrix: **SOIL**

Laboratory sample ID	*Client sampling date / time*	*Client sample ID*	SOIL - EP003 Total Organic Carbon (TOC) in Soil
EM1515737-007	[13-Oct-2015]	GW21(2.8-2.9)	✓
EM1515737-015	[13-Oct-2015]	GW22(2.5-2.6)	✓
EM1515737-030	[13-Oct-2015]	GW30(3.5-3.6)	✓
EM1515737-035	[13-Oct-2015]	GW26(3.0-3.1)	✓

Matrix: **WATER**

Laboratory sample ID	*Client sampling date / time*	*Client sample ID*	WATER - EG020T Total Recoverable Metals by ICPMS (including	WATER - W-05T TRH/BTEXN/8 Metals (Total)	WATER - W-18 TRH(C6 - C9)/BTEXN
EM1515737-038	[13-Oct-2015]	QC04	✓	✓	
EM1515737-039	[13-Oct-2015]	QC05			✓

Proactive Holding Time Report

Sample(s) have been received within the recommended holding times for the requested analysis.

Requested Deliverables

AP_CUSTOMER SERVICE ANZ

- A4 - AU Tax Invoice (INV)	Email	ap_customerservice.anz@aecom.com

AVERYLL COYNE

- *AU Certificate of Analysis - NATA (COA)	Email	averyll.coyne@aecom.com
- *AU Interpretive QC Report - DEFAULT (Anon QCI Rep) (QCI)	Email	averyll.coyne@aecom.com
- *AU QC Report - DEFAULT (Anon QC Rep) - NATA (QC)	Email	averyll.coyne@aecom.com
- A4 - AU Sample Receipt Notification - Environmental HT (SRN)	Email	averyll.coyne@aecom.com
- A4 - AU Tax Invoice (INV)	Email	averyll.coyne@aecom.com
- Chain of Custody (CoC) (COC)	Email	averyll.coyne@aecom.com
- EDI Format - ENMRG (ENMRG)	Email	averyll.coyne@aecom.com
- EDI Format - ESDAT (ESDAT)	Email	averyll.coyne@aecom.com
- EDI Format - HLAPro (HLAPro)	Email	averyll.coyne@aecom.com
- EDI Format - XTab (XTAB)	Email	averyll.coyne@aecom.com

Form:

AECOM

Chain of Custody & Analysis Request Form

AECOM - Melbourne
Level 9, 8 Exhibition Street
Melbourne VIC 3000
Tel: 03 9653 8072
Fax: 61 3 9653 1234
Email: averyll.coyne@aecom.com

Laboratory Details
Lab. Name: ALS
Lab. Address: 4 Westall Rd, Springvale
Contact Name:
Lab. Ref:
Tel: 8549 9600
Fax:
Preliminary Report by:
Final Report by:
Lab Quote No:

Project Name: Fishermans Bend
Project Number: 60431087
Purchase Order Number: NA

Sample collected by: Nathan Jensen and Oliver Taylor
Sample Results to be returned to: Averyll Coyne

Specifications:	(Tick)		
1. Urgent TAT required? (please circle: 24hr 48hr ___3___days)	☐ Yes	☑ No	☐ N/A
2. Fast TAT Guarantee Required?	☐ Yes	☑ No	☐ N/A
3. Is any sediment layer present in waters to be excluded from extractions?	☐ Yes	☑ No	☐ N/A
4. Special storage requirements?	☐ Yes	☑ No	☐ N/A
5. Preservation requirements?	☐ Yes	☑ No	☐ N/A
6. Other requirements? ☐ Fax ☐ Hard copy ☑ Email	☑ Yes	☐ No	☐ N/A
7. Report Format: email with QC reports	8. Project Manager: Averyll Coyne		tel: 9653 8072

Analysis Request

Lab. ID	Sample ID	Sampling Date & time (on)	Sampling Date & Time (off)	Matrix: soil	Matrix: water	Matrix: other	Preservation: filt'ed	Preservation: acid	Preservation: ice	Preservation: other	Container (No. & type)	TOC	Moisture Content	TRH(C6-C40)	Full VOC Scan (70 Analytes) - Code EP074(A-H)	PAH	Metals	Remarks & comments
1	GW21(0.0-0.1)	13/10/2015		x					x		Jar							Metals (As, Cd, Cr, Cu, Pb, Ni, Zn, Al, Fe, Se, Hg)
2	GW21(0.5-0.6)	13/10/2015		x					x		Jar			x	x	x	x	
3	GW21(1.0-1.1)	13/10/2015		x					x		Jar							
4	GW21(1.5-1.6)	13/10/2015		x					x		Jar							
5	GW21(2.0-2.1)	13/10/2015		x					x		Jar							
6	GW21(2.5-2.6)	13/10/2015		x					x		Jar							
7	GW21(2.8-2.9)	13/10/2015		x					x		Jar	x	x					
8	GW21(3.4-3.5)	13/10/2015		x					x		Jar							
9	GW21(4.0-4.1)	13/10/2015		x					x		Jar							
10	GW22(0.0-0.1)	13/10/2015		x					x		Jar							
11	GW22(0.5-0.6)	13/10/2015		x					x		Jar							
12	GW22(1.0-1.1)	13/10/2015		x					x		Jar							
13	GW22(1.5-1.6)	13/10/2015		x					x		Jar							
14	GW22(2.0-2.1)	13/10/2015		x					x		Jar							
15	GW22(2.5-2.6)	13/10/2015		x					x		Jar	x	x					
16	GW22(3.0-3.1)	13/10/2015		x					x		Jar							

Environmental Division
Melbourne
Work Order Reference
EM1515737

Telephone : +61-3-8549 9600

Relinquished By:	Received by:			
Name: Nathan Jensen	Date: 14/10/2015	Name: [illegible]	Date: 14/10/15	Received in good condition? Yes/No/NA
of: AECOM	Time: 9:00	of: ALS	Time: 11:15	Samples received chilled? Yes/No/NA
				Method of Shipment / Consignment Note No. / Transport Co:
Relinquished By:		**Received by:**		Received in good condition? Yes/No/NA; Samples received chilled? Yes/No/NA; Method of Shipment / Consignment Note No. / Transport Co:
Name:	Date:	Name:	Date:	
of:	Time:	of:	Time:	

Printed copies of this document are uncontrolled

Form:

AECOM

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Laboratory Details
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Contact Name:
Lab. Ref:
Tel: 8549 9600
Fax:
Preliminary Report by:
Final Report by:
Lab Quote No:

Project Name: Fishermans Bend
Project Number: 60431087
Purchase Order Number: NA

Sample collected by: Nathan Jensen and Oliver Taylor
Sample Results to be returned to: Averyll Coyne

Specifications:	(Tick)		
1. Urgent TAT required? (please circle: 24hr 48hr ___3___days)	☐ Yes	☐ No	☐ N/A
2. Fast TAT Guarantee Required?	☐ Yes	☑ No	☐ N/A
3. Is any sediment layer present in waters to be excluded from extractions?	☐ Yes	☑ No	☐ N/A
4. Special storage requirements?	☐ Yes	☑ No	☐ N/A
5. Preservation requirements?	☐ Yes	☑ No	☐ N/A
6. Other requirements? ☐ Fax ☐ Hard copy ☑ Email	☑ Yes	☐ No	☐ N/A
7. Report Format: Email with QC reports	8. Project Manager: Averyll Coyne		tel: 9653 8072

Lab. ID	Sample ID	Sampling Date & time (on)	Sampling Date & Time (off)	Matrix: soil	Matrix: water	Matrix: other	Preservation: filt'ed	Preservation: acid	Preservation: ice	Preservation: other	Container (No. & type)	Analysis Request: TOC	Analysis Request: Moisture Content	Remarks & comments
17	GW23(0.0-0.1)	13/10/2015		x					x		Jar			
18	GW23(0.5-0.6)	13/10/2015		x					x		Jar			
19	GW23(1.0-1.1)	13/10/2015		x					x		Jar			
20	GW23(1.2-1.3)	13/10/2015		x					x		Jar			
21	GW23(1.5-1.6)	13/10/2015		x					x		Jar			
22	GW27(0.1-0.2)	13/10/2015		x					x		Jar			
23	GW27(0.5-0.6)	13/10/2015		x					x		Jar			
24	GW30(0.0-0.1)	13/10/2015		x					x		Jar			
25	GW30(0.5-0.6)	13/10/2015		x					x		Jar			
26	GW30(1.0-1.1)	13/10/2015		x					x		Jar			
27	GW30(1.5-1.6)	13/10/2015		x					x		Jar			
28	GW30(1.7-1.8)	13/10/2015		x					x		Jar			
29	GW30(2.5-2.6)	13/10/2015		x					x		Jar			
30	GW30(3.5-3.6)	13/10/2015		x					x		Jar	x	x	
21	GW30(4.4-4.5)	13/10/2015		x					x		Jar			
32	GW30(5.1-5.2)	13/10/2015		x					x		Jar			

Relinquished By:	**Received by:**		
Name: Nathan Jensen	Date: 14/10/2015	Name: Manu	Date: 14/10
of: AECOM	Time:9:00	of: ALS	Time: 11:15
Relinquished By:		**Received by:**	
Name:	Date:	Name:	Date:
of:	Time:	of:	Time:

Received in good condition?	Yes/No/NA	**Method of Shipment**	
Samples received chilled?	Yes/No/NA	**Consignment Note No.**	
	Yes/No/NA	**Transport Co:**	
Received in good condition?	Yes/No/NA	**Method of Shipment**	
Samples received chilled?	Yes/No/NA	**Consignment Note No.**	
	Yes/No/NA	**Transport Co:**	

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Sample Results to be returned to: Averyll Coyne

Specifications:	(Tick)		
1. Urgent TAT required? (please circle: 24hr 48hr ___3___days)	☐ Yes	☐ No	☐ N/A
2. Fast TAT Guarantee Required?	☐ Yes	☑ No	☐ N/A
3. Is any sediment layer present in waters to be excluded from extractions?	☐ Yes	☑ No	☐ N/A
4. Special storage requirements?	☐ Yes	☑ No	☐ N/A
5. Preservation requirements?	☐ Yes	☑ No	☐ N/A
6. Other requirements? ☐ Fax ☐ Hard copy ☑ Email	☑ Yes	☐ No	☐ N/A
7. Report Format: Email with QC reports	8. Project Manager: Averyll Coyne		tel: 9653 8072

Lab. ID	Sample ID	Sampling Date & time (on)	Sampling Date & Time (off)	Matrix: soil	Matrix: water	Matrix: other	Preservation: filt'ed	Preservation: acid	Preservation: ice	Preservation: other	Container (No. & type)	TOC	Moisture Content	TRH, BTEX, Metals	TRHC6-C9	Remarks & comments
33	GW26(1.9-2.0)	13/10/2015		x					x		Jar					Metals (As, Cd, Cr, Cu, Pb, Ni, Zn, Al, Fe, Se, Hg)
34	GW26(2.1-2.2)	13/10/2015		x					x		Jar					
35	GW26(3.0-3.1)	13/10/2015		x					x		Jar	x	x			
36	GW26(4.0-4.1)	13/10/2015		x					x		Jar					
37	GW26(5.0-5.1)	13/10/2015		x					x		Jar					
38	QC04				x				x		Bottles			x		
39	QC05				x				x		Bottles				x	
40	GW22(4.0-4.1)	13/10/15		x												

Relinquished By:
Name: Nathan Jensen
Date: 14/10/2015
Time: 9:00
of: AECOM

Received by:
Name: [signature]
Date: 14/10
Time: 17:15
of: ALS

Relinquished By:
Name:
Date:
Time:
of:

Received by:
Name:
Date:
Time:
of:

Received in good condition?	Yes/No/NA	Method of Shipment	
Samples received chilled?	Yes/No/NA	Consignment Note No.	
	Yes/No/NA	Transport Co:	
Received in good condition?	Yes/No/NA	Method of Shipment	
Samples received chilled?	Yes/No/NA	Consignment Note No.	
	Yes/No/NA	Transport Co:	

Samantha Smith

From: Coyne, Averyll <Averyll.Coyne@aecom.com>
Sent: Thursday, 15 October 2015 3:47 PM
To: Bronwyn Sheen
Cc: Samples Melbourne
Subject: Fishermans Bend soil samples Day 3
Attachments: 60431087 COC Day 3A.pdf; 60431087 COC Day 3B.pdf; 60431087 COC Day 3C.pdf; 60431087 COC Day 3D.pdf; 60431087 COC Day 3E.PDF

Hi Bronwyn,

Please find attached the COC for soil samples that arrived at ALS this morning.

Please note that some of the samples have been inadvertently labelled on the jars as 'MW' as opposed to 'GW'. Please ensure all results are reported with the prefix 'GW' NOT 'MW'.

23.

Can I also please have sample GW27(0.5-0.6) on work order EM1515737 analysed for the following:

- TRH(C6-C40)
- Full VOC Scan (70 Analytes) - Code EP074(A-H)
- PAH
- Metals (As, Cd, Cr, Cu, Pb, Ni, Zn, Al, Fe, Se, Hg)

Kind Regards
Averyll

Averyll Coyne
Principal Environmental Scientist
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Averyll.Coyne@aecom.com

AECOM
Level 9, 8 Exhibition Street, Melbourne, VIC 3000
T +61 3 9653 1234 F +61 3 9654 7117
www.aecom.com

From: Coyne, Averyll
Sent: Thursday, 15 October 2015 11:06 AM
To: 'Bronwyn Sheen'
Cc: 'samples.melbourne@alsglobal.com'
Subject: Soil samples

Hi Bronwyn,

I will send a COC through for the Fishermans Bend soil samples shortly.

Cheers
Averyll

Averyll Coyne
Principal Environmental Scientist
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Averyll.Coyne@aecom.com

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Samantha Smith

From: Coyne, Averyll <Averyll.Coyne@aecom.com>
Sent: Wednesday, 14 October 2015 9:54 AM
To: Samples Melbourne
Cc: Bronwyn Sheen
Subject: FBURA Day2 - Soil samples arriving today
Attachments: 60431087 COC Day 2C.pdf; 60431087 COC Day 2A.pdf; 60431087 COC Day 2B.pdf

Please see attached the COC for soil samples arriving today.

Kind Regards
Averyll

Averyll Coyne
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Rosalinda Trbusic

Subject: FW: FBURA additional soil analysis

From: Coyne, Averyll [mailto:Averyll.Coyne@aecom.com]
Sent: Wednesday, 21 October 2015 3:04 PM
To: Bronwyn Sheen
Subject: FBURA additional soil analysis

Hi Bronwyn,

Can you please organise the following analysis to be undertaken?

- EM1515737 – GW21(0.5-0.6) – pH and Sulfate
EM1515593 – GW18(0.4-0.5), GW04(0.5-0.6) and QC06 – pH and Sulfate
EM1515910 – GW36(0.5-0.6), GW36(0.9-1.0), GW12(0.5-0.6) and GW12(0.9-1.0) – pH and Sulfate

Please phone me if you have any questions.

Kind Regards
Averyll

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ALS Environmental

CERTIFICATE OF ANALYSIS

Work Order	: **EM1515910**	Page	: 1 of 15
Client	: **AECOM Australia Pty Ltd**	Laboratory	: Environmental Division Melbourne
Contact	: MS AVERYLL COYNE	Contact	: Carol Walsh
Address	: LEVEL 9 8 EXHIBITION ST MELBOURNE VIC 3000	Address	: 4 Westall Rd Springvale VIC Australia 3171
E-mail	: averyll.coyne@aecom.com	E-mail	: carol.walsh@alsglobal.com
Telephone	: +61 03 9653 1234	Telephone	: +61-3-8549 9608
Facsimile	: +61 03 9654 7117	Facsimile	: +61-3-8549 9601
Project	: 60431087	QC Level	: NEPM 2013 Schedule B(3) and ALS QCS3 requirement
Order number	: 60431087 Task No 1.4	Date Samples Received	: 16-Oct-2015 17:45
C-O-C number	: ----	Date Analysis Commenced	: 20-Oct-2015
Sampler	: DUGALD CUNNINGHAM, MATTHEW SHEPPARD, NATHAN JENSEN	Issue Date	: 27-Oct-2015 15:25
Site	: Fishermans Bend		
		No. of samples received	: 51
Quote number	: ----	No. of samples analysed	: 10

This report supersedes any previous report(s) with this reference. Results apply to the sample(s) as submitted.

This Certificate of Analysis contains the following information:

- General Comments
- Analytical Results

Signatories

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

Signatories	*Position*	*Accreditation Category*
Chris Lemaitre	Non-Metals Team Leader	Melbourne Inorganics
Dilani Fernando	Senior Inorganic Chemist	Melbourne Inorganics
Herman Lin	Laboratory Manager	Melbourne Inorganics
Kim McCabe	Senior Inorganic Chemist	Brisbane Inorganics
Satishkumar Trivedi	Acid Sulfate Soils Supervisor	Brisbane Acid Sulphate Soils
Xing Lin	Senior Organic Chemist	Melbourne Organics

General Comments

The analytical procedures used by the Environmental Division have been developed from established internationally recognized procedures such as those published by the USEPA, APHA, AS and NEPM. In house developed procedures are employed in the absence of documented standards or by 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.

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.

- TOC (EP003) and Moisture (EA055-103) conducted by ALS Brisbane, NATA Site No. 818.
- EG035T: Mercury result for EM1515910 #16 has been confirmed by re-digestion and re-analysis.
- EG020T: Results for EM1515910-049 have been confirmed by re-preparation and re-analysis.
- Benzo(a)pyrene Toxicity Equivalent Quotient (TEQ) 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.

Analytical Results

Sub-Matrix: SOIL (Matrix: SOIL)			Client sample ID	GW04(3.3-3.4)	GW11(2.3-2.4)	GW36(0.5-0.6)	GW36(0.9-1.0)	GW36(1.6-1.7)
			Client sampling date / time	[15-Oct-2015]	[15-Oct-2015]	[15-Oct-2015]	[15-Oct-2015]	[15-Oct-2015]
Compound	CAS Number	LOR	Unit	EM1515910-003	EM1515910-011	EM1515910-016	EM1515910-017	EM1515910-019
				Result	Result	Result	Result	Result
EA001: pH in soil using 0.01M CaCl extract								
pH (CaCl2)	----	0.1	pH Unit	----	----	7.4	4.9	----
EA055: Moisture Content								
^ Moisture Content (dried @ 103°C)	----	1	%	17.4	16.6	22.6	11.4	18.5
ED040N: Sulfate - Calcium Phosphate Soluble (NEPM)								
Sulfate as SO4 2-	14808-79-8	50	mg/kg	----	----	4470	180	----
EG005T: Total Metals by ICP-AES								
Aluminium	7429-90-5	50	mg/kg	----	----	12800	3670	----
Iron	7439-89-6	50	mg/kg	----	----	30800	3800	----
Selenium	7782-49-2	5	mg/kg	----	----	<5	<5	----
Arsenic	7440-38-2	5	mg/kg	----	----	10	<5	----
Cadmium	7440-43-9	1	mg/kg	----	----	<1	<1	----
Chromium	7440-47-3	2	mg/kg	----	----	29	8	----
Copper	7440-50-8	5	mg/kg	----	----	28	<5	----
Lead	7439-92-1	5	mg/kg	----	----	67	11	----
Nickel	7440-02-0	2	mg/kg	----	----	22	4	----
Zinc	7440-66-6	5	mg/kg	----	----	89	27	----
EG035T: Total Recoverable Mercury by FIMS								
Mercury	7439-97-6	0.1	mg/kg	----	----	0.8	<0.1	----
EP003: Total Organic Carbon (TOC) in Soil								
Total Organic Carbon	----	0.02	%	0.51	0.06	----	----	0.17
EP074A: Monocyclic Aromatic Hydrocarbons								
Styrene	100-42-5	0.5	mg/kg	----	----	<0.5	<0.5	----
Isopropylbenzene	98-82-8	0.5	mg/kg	----	----	<0.5	<0.5	----
n-Propylbenzene	103-65-1	0.5	mg/kg	----	----	<0.5	<0.5	----
1.3.5-Trimethylbenzene	108-67-8	0.5	mg/kg	----	----	<0.5	<0.5	----
sec-Butylbenzene	135-98-8	0.5	mg/kg	----	----	<0.5	<0.5	----
1.2.4-Trimethylbenzene	95-63-6	0.5	mg/kg	----	----	<0.5	<0.5	----
tert-Butylbenzene	98-06-6	0.5	mg/kg	----	----	<0.5	<0.5	----
p-Isopropyltoluene	99-87-6	0.5	mg/kg	----	----	<0.5	<0.5	----
n-Butylbenzene	104-51-8	0.5	mg/kg	----	----	<0.5	<0.5	----
EP074B: Oxygenated Compounds								
Vinyl Acetate	108-05-4	5	mg/kg	----	----	<5	<5	----
2-Butanone (MEK)	78-93-3	5	mg/kg	----	----	<5	<5	----
4-Methyl-2-pentanone (MIBK)	108-10-1	5	mg/kg	----	----	<5	<5	----

Analytical Results

Sub-Matrix: SOIL (Matrix: SOIL)				Client sample ID	GW04(3.3-3.4)	GW11(2.3-2.4)	GW36(0.5-0.6)	GW36(0.9-1.0)	GW36(1.6-1.7)
				Client sampling date / time	[15-Oct-2015]	[15-Oct-2015]	[15-Oct-2015]	[15-Oct-2015]	[15-Oct-2015]
Compound	CAS Number	LOR	Unit		EM1515910-003	EM1515910-011	EM1515910-016	EM1515910-017	EM1515910-019
					Result	Result	Result	Result	Result
EP074B: Oxygenated Compounds - Continued									
2-Hexanone (MBK)	591-78-6	5	mg/kg		----	----	<5	<5	----
EP074C: Sulfonated Compounds									
Carbon disulfide	75-15-0	0.5	mg/kg		----	----	<0.5	<0.5	----
EP074D: Fumigants									
2.2-Dichloropropane	594-20-7	0.5	mg/kg		----	----	<0.5	<0.5	----
1.2-Dichloropropane	78-87-5	0.5	mg/kg		----	----	<0.5	<0.5	----
cis-1.3-Dichloropropylene	10061-01-5	0.5	mg/kg		----	----	<0.5	<0.5	----
trans-1.3-Dichloropropylene	10061-02-6	0.5	mg/kg		----	----	<0.5	<0.5	----
1.2-Dibromoethane (EDB)	106-93-4	0.5	mg/kg		----	----	<0.5	<0.5	----
EP074E: Halogenated Aliphatic Compounds									
Dichlorodifluoromethane	75-71-8	5	mg/kg		----	----	<5	<5	----
Chloromethane	74-87-3	5	mg/kg		----	----	<5	<5	----
Vinyl chloride	75-01-4	5	mg/kg		----	----	<5	<5	----
Bromomethane	74-83-9	5	mg/kg		----	----	<5	<5	----
Chloroethane	75-00-3	5	mg/kg		----	----	<5	<5	----
Trichlorofluoromethane	75-69-4	5	mg/kg		----	----	<5	<5	----
1.1-Dichloroethene	75-35-4	0.5	mg/kg		----	----	<0.5	<0.5	----
Iodomethane	74-88-4	0.5	mg/kg		----	----	<0.5	<0.5	----
trans-1.2-Dichloroethene	156-60-5	0.5	mg/kg		----	----	<0.5	<0.5	----
1.1-Dichloroethane	75-34-3	0.5	mg/kg		----	----	<0.5	<0.5	----
cis-1.2-Dichloroethene	156-59-2	0.5	mg/kg		----	----	<0.5	<0.5	----
1.1.1-Trichloroethane	71-55-6	0.5	mg/kg		----	----	<0.5	<0.5	----
1.1-Dichloropropylene	563-58-6	0.5	mg/kg		----	----	<0.5	<0.5	----
Carbon Tetrachloride	56-23-5	0.5	mg/kg		----	----	<0.5	<0.5	----
1.2-Dichloroethane	107-06-2	0.5	mg/kg		----	----	<0.5	<0.5	----
Trichloroethene	79-01-6	0.5	mg/kg		----	----	<0.5	<0.5	----
Dibromomethane	74-95-3	0.5	mg/kg		----	----	<0.5	<0.5	----
1.1.2-Trichloroethane	79-00-5	0.5	mg/kg		----	----	<0.5	<0.5	----
1.3-Dichloropropane	142-28-9	0.5	mg/kg		----	----	<0.5	<0.5	----
Tetrachloroethene	127-18-4	0.5	mg/kg		----	----	<0.5	<0.5	----
1.1.1.2-Tetrachloroethane	630-20-6	0.5	mg/kg		----	----	<0.5	<0.5	----
trans-1.4-Dichloro-2-butene	110-57-6	0.5	mg/kg		----	----	<0.5	<0.5	----
cis-1.4-Dichloro-2-butene	1476-11-5	0.5	mg/kg		----	----	<0.5	<0.5	----
1.1.2.2-Tetrachloroethane	79-34-5	0.5	mg/kg		----	----	<0.5	<0.5	----

Analytical Results

Sub-Matrix: SOIL (Matrix: SOIL)				Client sample ID	GW04(3.3-3.4)	GW11(2.3-2.4)	GW36(0.5-0.6)	GW36(0.9-1.0)	GW36(1.6-1.7)
				Client sampling date / time	[15-Oct-2015]	[15-Oct-2015]	[15-Oct-2015]	[15-Oct-2015]	[15-Oct-2015]
Compound	CAS Number	LOR	Unit		EM1515910-003	EM1515910-011	EM1515910-016	EM1515910-017	EM1515910-019
					Result	Result	Result	Result	Result
EP074E: Halogenated Aliphatic Compounds - Continued									
1.2.3-Trichloropropane	96-18-4	0.5	mg/kg		----	----	<0.5	<0.5	----
Pentachloroethane	76-01-7	0.5	mg/kg		----	----	<0.5	<0.5	----
1.2-Dibromo-3-chloropropane	96-12-8	0.5	mg/kg		----	----	<0.5	<0.5	----
Hexachlorobutadiene	87-68-3	0.5	mg/kg		----	----	<0.5	<0.5	----
EP074F: Halogenated Aromatic Compounds									
Chlorobenzene	108-90-7	0.5	mg/kg		----	----	<0.5	<0.5	----
Bromobenzene	108-86-1	0.5	mg/kg		----	----	<0.5	<0.5	----
2-Chlorotoluene	95-49-8	0.5	mg/kg		----	----	<0.5	<0.5	----
4-Chlorotoluene	106-43-4	0.5	mg/kg		----	----	<0.5	<0.5	----
1.3-Dichlorobenzene	541-73-1	0.5	mg/kg		----	----	<0.5	<0.5	----
1.4-Dichlorobenzene	106-46-7	0.5	mg/kg		----	----	<0.5	<0.5	----
1.2-Dichlorobenzene	95-50-1	0.5	mg/kg		----	----	<0.5	<0.5	----
1.2.4-Trichlorobenzene	120-82-1	0.5	mg/kg		----	----	<0.5	<0.5	----
1.2.3-Trichlorobenzene	87-61-6	0.5	mg/kg		----	----	<0.5	<0.5	----
EP074G: Trihalomethanes									
Chloroform	67-66-3	0.5	mg/kg		----	----	<0.5	<0.5	----
Bromodichloromethane	75-27-4	0.5	mg/kg		----	----	<0.5	<0.5	----
Dibromochloromethane	124-48-1	0.5	mg/kg		----	----	<0.5	<0.5	----
Bromoform	75-25-2	0.5	mg/kg		----	----	<0.5	<0.5	----
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		----	----	**2.8**	<0.5	----
Anthracene	120-12-7	0.5	mg/kg		----	----	**0.9**	<0.5	----
Fluoranthene	206-44-0	0.5	mg/kg		----	----	**2.9**	<0.5	----
Pyrene	129-00-0	0.5	mg/kg		----	----	**2.4**	<0.5	----
Benz(a)anthracene	56-55-3	0.5	mg/kg		----	----	**1.1**	<0.5	----
Chrysene	218-01-9	0.5	mg/kg		----	----	**1.1**	<0.5	----
Benzo(b+j)fluoranthene	205-99-2 205-82-3	0.5	mg/kg		----	----	**1.1**	<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		----	----	**0.8**	<0.5	----
Indeno(1.2.3.cd)pyrene	193-39-5	0.5	mg/kg		----	----	<0.5	<0.5	----

Analytical Results

Sub-Matrix: SOIL (Matrix: SOIL)				Client sample ID	GW04(3.3-3.4)	GW11(2.3-2.4)	GW36(0.5-0.6)	GW36(0.9-1.0)	GW36(1.6-1.7)
				Client sampling date / time	[15-Oct-2015]	[15-Oct-2015]	[15-Oct-2015]	[15-Oct-2015]	[15-Oct-2015]
Compound	CAS Number	LOR	Unit		EM1515910-003	EM1515910-011	EM1515910-016	EM1515910-017	EM1515910-019
					Result	Result	Result	Result	Result
EP075(SIM)B: Polynuclear Aromatic Hydrocarbons - Continued									
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		----	----	**13.6**	<0.5	----
^ Benzo(a)pyrene TEQ (zero)	----	0.5	mg/kg		----	----	**1.0**	<0.5	----
^ Benzo(a)pyrene TEQ (half LOR)	----	0.5	mg/kg		----	----	**1.3**	**0.6**	----
^ Benzo(a)pyrene TEQ (LOR)	----	0.5	mg/kg		----	----	**1.6**	**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	----
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	>C10_C16	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	----
Toluene	108-88-3	0.5	mg/kg		----	----	<0.5	<0.5	----
Ethylbenzene	100-41-4	0.5	mg/kg		----	----	<0.5	<0.5	----
meta- & para-Xylene	108-38-3 106-42-3	0.5	mg/kg		----	----	<0.5	<0.5	----
ortho-Xylene	95-47-6	0.5	mg/kg		----	----	<0.5	<0.5	----
^ Sum of BTEX	----	0.2	mg/kg		----	----	<0.2	<0.2	----
^ Total Xylenes	1330-20-7	0.5	mg/kg		----	----	<0.5	<0.5	----
Naphthalene	91-20-3	1	mg/kg		----	----	<1	<1	----
EP074S: VOC Surrogates									
1.2-Dichloroethane-D4	17060-07-0	0.5	%		----	----	**85.4**	**78.3**	----
Toluene-D8	2037-26-5	0.5	%		----	----	**86.6**	**77.7**	----

Analytical Results

Sub-Matrix: SOIL (Matrix: SOIL)				Client sample ID	GW04(3.3-3.4)	GW11(2.3-2.4)	GW36(0.5-0.6)	GW36(0.9-1.0)	GW36(1.6-1.7)
				Client sampling date / time	[15-Oct-2015]	[15-Oct-2015]	[15-Oct-2015]	[15-Oct-2015]	[15-Oct-2015]
Compound	CAS Number	LOR	Unit		EM1515910-003	EM1515910-011	EM1515910-016	EM1515910-017	EM1515910-019
					Result	Result	Result	Result	Result
EP074S: VOC Surrogates - Continued									
4-Bromofluorobenzene	460-00-4	0.5	%		----	----	84.6	76.3	----
EP075(SIM)S: Phenolic Compound Surrogates									
Phenol-d6	13127-88-3	0.5	%		----	----	78.9	87.5	----
2-Chlorophenol-D4	93951-73-6	0.5	%		----	----	88.4	93.7	----
2.4.6-Tribromophenol	118-79-6	0.5	%		----	----	53.2	67.8	----
EP075(SIM)T: PAH Surrogates									
2-Fluorobiphenyl	321-60-8	0.5	%		----	----	82.9	98.8	----
Anthracene-d10	1719-06-8	0.5	%		----	----	99.4	125	----
4-Terphenyl-d14	1718-51-0	0.5	%		----	----	91.6	110	----
EP080S: TPH(V)/BTEX Surrogates									
1.2-Dichloroethane-D4	17060-07-0	0.2	%		----	----	81.9	75.2	----
Toluene-D8	2037-26-5	0.2	%		----	----	79.7	71.6	----
4-Bromofluorobenzene	460-00-4	0.2	%		----	----	88.3	78.9	----

Analytical Results

Sub-Matrix: SOIL (Matrix: SOIL)			Client sample ID	GW12(0.5-0.6)	GW12(0.9-1.0)	----	----	----
			Client sampling date / time	[15-Oct-2015]	[15-Oct-2015]	----	----	----
Compound	CAS Number	LOR	Unit	EM1515910-042	EM1515910-043	--------	--------	--------
				Result	Result	Result	Result	Result
EA001: pH in soil using 0.01M CaCl extract								
pH (CaCl2)	----	0.1	pH Unit	**4.5**	**6.8**	----	----	----
EA055: Moisture Content								
^ Moisture Content (dried @ 103°C)	----	1	%	**4.0**	**18.8**	----	----	----
ED040N: Sulfate - Calcium Phosphate Soluble (NEPM)								
Sulfate as SO4 2-	14808-79-8	50	mg/kg	<50	<50	----	----	----
EG005T: Total Metals by ICP-AES								
Aluminium	7429-90-5	50	mg/kg	**560**	**90**	----	----	----
Iron	7439-89-6	50	mg/kg	**3250**	**120**	----	----	----
Selenium	7782-49-2	5	mg/kg	<5	<5	----	----	----
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	**5**	<2	----	----	----
Copper	7440-50-8	5	mg/kg	**19**	<5	----	----	----
Lead	7439-92-1	5	mg/kg	**104**	**8**	----	----	----
Nickel	7440-02-0	2	mg/kg	**4**	<2	----	----	----
Zinc	7440-66-6	5	mg/kg	**87**	**15**	----	----	----
EG035T: Total Recoverable Mercury by FIMS								
Mercury	7439-97-6	0.1	mg/kg	<0.1	<0.1	----	----	----
EP003: Total Organic Carbon (TOC) in Soil								
Total Organic Carbon	----	0.02	%	----	----	----	----	----
EP074A: Monocyclic Aromatic Hydrocarbons								
Styrene	100-42-5	0.5	mg/kg	<0.5	<0.5	----	----	----
Isopropylbenzene	98-82-8	0.5	mg/kg	<0.5	<0.5	----	----	----
n-Propylbenzene	103-65-1	0.5	mg/kg	<0.5	<0.5	----	----	----
1.3.5-Trimethylbenzene	108-67-8	0.5	mg/kg	<0.5	<0.5	----	----	----
sec-Butylbenzene	135-98-8	0.5	mg/kg	<0.5	<0.5	----	----	----
1.2.4-Trimethylbenzene	95-63-6	0.5	mg/kg	<0.5	<0.5	----	----	----
tert-Butylbenzene	98-06-6	0.5	mg/kg	<0.5	<0.5	----	----	----
p-Isopropyltoluene	99-87-6	0.5	mg/kg	<0.5	<0.5	----	----	----
n-Butylbenzene	104-51-8	0.5	mg/kg	<0.5	<0.5	----	----	----
EP074B: Oxygenated Compounds								
Vinyl Acetate	108-05-4	5	mg/kg	<5	<5	----	----	----
2-Butanone (MEK)	78-93-3	5	mg/kg	<5	<5	----	----	----
4-Methyl-2-pentanone (MIBK)	108-10-1	5	mg/kg	<5	<5	----	----	----

Analytical Results

Sub-Matrix: SOIL (Matrix: SOIL)			Client sample ID	GW12(0.5-0.6)	GW12(0.9-1.0)	----	----	----
			Client sampling date / time	[15-Oct-2015]	[15-Oct-2015]	----	----	----
Compound	CAS Number	LOR	Unit	EM1515910-042	EM1515910-043	--------	--------	--------
				Result	Result	Result	Result	Result
EP074B: Oxygenated Compounds - Continued								
2-Hexanone (MBK)	591-78-6	5	mg/kg	<5	<5	----	----	----
EP074C: Sulfonated Compounds								
Carbon disulfide	75-15-0	0.5	mg/kg	<0.5	<0.5	----	----	----
EP074D: Fumigants								
2.2-Dichloropropane	594-20-7	0.5	mg/kg	<0.5	<0.5	----	----	----
1.2-Dichloropropane	78-87-5	0.5	mg/kg	<0.5	<0.5	----	----	----
cis-1.3-Dichloropropylene	10061-01-5	0.5	mg/kg	<0.5	<0.5	----	----	----
trans-1.3-Dichloropropylene	10061-02-6	0.5	mg/kg	<0.5	<0.5	----	----	----
1.2-Dibromoethane (EDB)	106-93-4	0.5	mg/kg	<0.5	<0.5	----	----	----
EP074E: Halogenated Aliphatic Compounds								
Dichlorodifluoromethane	75-71-8	5	mg/kg	<5	<5	----	----	----
Chloromethane	74-87-3	5	mg/kg	<5	<5	----	----	----
Vinyl chloride	75-01-4	5	mg/kg	<5	<5	----	----	----
Bromomethane	74-83-9	5	mg/kg	<5	<5	----	----	----
Chloroethane	75-00-3	5	mg/kg	<5	<5	----	----	----
Trichlorofluoromethane	75-69-4	5	mg/kg	<5	<5	----	----	----
1.1-Dichloroethene	75-35-4	0.5	mg/kg	<0.5	<0.5	----	----	----
Iodomethane	74-88-4	0.5	mg/kg	<0.5	<0.5	----	----	----
trans-1.2-Dichloroethene	156-60-5	0.5	mg/kg	<0.5	<0.5	----	----	----
1.1-Dichloroethane	75-34-3	0.5	mg/kg	<0.5	<0.5	----	----	----
cis-1.2-Dichloroethene	156-59-2	0.5	mg/kg	<0.5	<0.5	----	----	----
1.1.1-Trichloroethane	71-55-6	0.5	mg/kg	<0.5	<0.5	----	----	----
1.1-Dichloropropylene	563-58-6	0.5	mg/kg	<0.5	<0.5	----	----	----
Carbon Tetrachloride	56-23-5	0.5	mg/kg	<0.5	<0.5	----	----	----
1.2-Dichloroethane	107-06-2	0.5	mg/kg	<0.5	<0.5	----	----	----
Trichloroethene	79-01-6	0.5	mg/kg	<0.5	<0.5	----	----	----
Dibromomethane	74-95-3	0.5	mg/kg	<0.5	<0.5	----	----	----
1.1.2-Trichloroethane	79-00-5	0.5	mg/kg	<0.5	<0.5	----	----	----
1.3-Dichloropropane	142-28-9	0.5	mg/kg	<0.5	<0.5	----	----	----
Tetrachloroethene	127-18-4	0.5	mg/kg	<0.5	<0.5	----	----	----
1.1.1.2-Tetrachloroethane	630-20-6	0.5	mg/kg	<0.5	<0.5	----	----	----
trans-1.4-Dichloro-2-butene	110-57-6	0.5	mg/kg	<0.5	<0.5	----	----	----
cis-1.4-Dichloro-2-butene	1476-11-5	0.5	mg/kg	<0.5	<0.5	----	----	----
1.1.2.2-Tetrachloroethane	79-34-5	0.5	mg/kg	<0.5	<0.5	----	----	----

Analytical Results

Sub-Matrix: SOIL (Matrix: SOIL)				Client sample ID	GW12(0.5-0.6)	GW12(0.9-1.0)	----	----	----
				Client sampling date / time	[15-Oct-2015]	[15-Oct-2015]	----	----	----
Compound	CAS Number	LOR	Unit		EM1515910-042	EM1515910-043	--------	--------	--------
					Result	Result	Result	Result	Result
EP074E: Halogenated Aliphatic Compounds - Continued									
1.2.3-Trichloropropane	96-18-4	0.5	mg/kg		<0.5	<0.5	----	----	----
Pentachloroethane	76-01-7	0.5	mg/kg		<0.5	<0.5	----	----	----
1.2-Dibromo-3-chloropropane	96-12-8	0.5	mg/kg		<0.5	<0.5	----	----	----
Hexachlorobutadiene	87-68-3	0.5	mg/kg		<0.5	<0.5	----	----	----
EP074F: Halogenated Aromatic Compounds									
Chlorobenzene	108-90-7	0.5	mg/kg		<0.5	<0.5	----	----	----
Bromobenzene	108-86-1	0.5	mg/kg		<0.5	<0.5	----	----	----
2-Chlorotoluene	95-49-8	0.5	mg/kg		<0.5	<0.5	----	----	----
4-Chlorotoluene	106-43-4	0.5	mg/kg		<0.5	<0.5	----	----	----
1.3-Dichlorobenzene	541-73-1	0.5	mg/kg		<0.5	<0.5	----	----	----
1.4-Dichlorobenzene	106-46-7	0.5	mg/kg		<0.5	<0.5	----	----	----
1.2-Dichlorobenzene	95-50-1	0.5	mg/kg		<0.5	<0.5	----	----	----
1.2.4-Trichlorobenzene	120-82-1	0.5	mg/kg		<0.5	<0.5	----	----	----
1.2.3-Trichlorobenzene	87-61-6	0.5	mg/kg		<0.5	<0.5	----	----	----
EP074G: Trihalomethanes									
Chloroform	67-66-3	0.5	mg/kg		<0.5	<0.5	----	----	----
Bromodichloromethane	75-27-4	0.5	mg/kg		<0.5	<0.5	----	----	----
Dibromochloromethane	124-48-1	0.5	mg/kg		<0.5	<0.5	----	----	----
Bromoform	75-25-2	0.5	mg/kg		<0.5	<0.5	----	----	----
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	----	----	----

Analytical Results

Sub-Matrix: SOIL (Matrix: SOIL)				Client sample ID	GW12(0.5-0.6)	GW12(0.9-1.0)	----	----	----
				Client sampling date / time	[15-Oct-2015]	[15-Oct-2015]	----	----	----
Compound	CAS Number	LOR	Unit		EM1515910-042	EM1515910-043	--------	--------	--------
					Result	Result	Result	Result	Result
EP075(SIM)B: Polynuclear Aromatic Hydrocarbons - Continued									
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		----	----	----	----	----
C10 - C14 Fraction	----	50	mg/kg		----	----	----	----	----
C15 - C28 Fraction	----	100	mg/kg		----	----	----	----	----
C29 - C36 Fraction	----	100	mg/kg		----	----	----	----	----
^ C10 - C36 Fraction (sum)	----	50	mg/kg		----	----	----	----	----
EP080/071: Total Recoverable Hydrocarbons - NEPM 2013 Fractions									
C6 - C10 Fraction	C6_C10	10	mg/kg		----	----	----	----	----
^ C6 - C10 Fraction minus BTEX (F1)	C6_C10-BTEX	10	mg/kg		----	----	----	----	----
>C10 - C16 Fraction	>C10_C16	50	mg/kg		----	----	----	----	----
>C16 - C34 Fraction	----	100	mg/kg		----	----	----	----	----
>C34 - C40 Fraction	----	100	mg/kg		----	----	----	----	----
^ >C10 - C40 Fraction (sum)	----	50	mg/kg		----	----	----	----	----
^ >C10 - C16 Fraction minus Naphthalene (F2)	----	50	mg/kg		----	----	----	----	----
EP080: BTEXN									
Benzene	71-43-2	0.2	mg/kg		----	----	----	----	----
Toluene	108-88-3	0.5	mg/kg		----	----	----	----	----
Ethylbenzene	100-41-4	0.5	mg/kg		----	----	----	----	----
meta- & para-Xylene	108-38-3 106-42-3	0.5	mg/kg		----	----	----	----	----
ortho-Xylene	95-47-6	0.5	mg/kg		----	----	----	----	----
^ Sum of BTEX	----	0.2	mg/kg		----	----	----	----	----
^ Total Xylenes	1330-20-7	0.5	mg/kg		----	----	----	----	----
Naphthalene	91-20-3	1	mg/kg		----	----	----	----	----
EP074S: VOC Surrogates									
1.2-Dichloroethane-D4	17060-07-0	0.5	%		**82.6**	**74.8**	----	----	----
Toluene-D8	2037-26-5	0.5	%		**83.5**	**76.1**	----	----	----

Analytical Results

Sub-Matrix: SOIL (Matrix: SOIL)				Client sample ID	GW12(0.5-0.6)	GW12(0.9-1.0)	----	----	----
				Client sampling date / time	[15-Oct-2015]	[15-Oct-2015]	----	----	----
Compound	CAS Number	LOR	Unit		EM1515910-042	EM1515910-043	--------	--------	--------
					Result	Result	Result	Result	Result
EP074S: VOC Surrogates - Continued									
4-Bromofluorobenzene	460-00-4	0.5	%		**80.5**	**74.9**	----	----	----
EP075(SIM)S: Phenolic Compound Surrogates									
Phenol-d6	13127-88-3	0.5	%		**86.0**	**86.6**	----	----	----
2-Chlorophenol-D4	93951-73-6	0.5	%		**91.4**	**91.5**	----	----	----
2.4.6-Tribromophenol	118-79-6	0.5	%		**67.5**	**65.3**	----	----	----
EP075(SIM)T: PAH Surrogates									
2-Fluorobiphenyl	321-60-8	0.5	%		**99.4**	**83.0**	----	----	----
Anthracene-d10	1719-06-8	0.5	%		**124**	**127**	----	----	----
4-Terphenyl-d14	1718-51-0	0.5	%		**110**	**111**	----	----	----
EP080S: TPH(V)/BTEX Surrogates									
1.2-Dichloroethane-D4	17060-07-0	0.2	%		----	----	----	----	----
Toluene-D8	2037-26-5	0.2	%		----	----	----	----	----
4-Bromofluorobenzene	460-00-4	0.2	%		----	----	----	----	----

Analytical Results

Sub-Matrix: WATER (Matrix: WATER)				Client sample ID	QC11	QC12	QC13	----	----
				Client sampling date / time	[15-Oct-2015]	[15-Oct-2015]	[15-Oct-2015]	----	----
Compound	CAS Number	LOR	Unit		EM1515910-049	EM1515910-050	EM1515910-051	--------	--------
					Result	Result	Result	Result	Result
EG020T: Total Metals by ICP-MS									
Aluminium	7429-90-5	0.01	mg/L		**0.09**	----	----	----	----
Arsenic	7440-38-2	0.001	mg/L		<0.001	----	----	----	----
Cadmium	7440-43-9	0.0001	mg/L		**0.0002**	----	----	----	----
Chromium	7440-47-3	0.001	mg/L		<0.001	----	----	----	----
Copper	7440-50-8	0.001	mg/L		**0.002**	----	----	----	----
Nickel	7440-02-0	0.001	mg/L		<0.001	----	----	----	----
Lead	7439-92-1	0.001	mg/L		**0.002**	----	----	----	----
Zinc	7440-66-6	0.005	mg/L		<0.005	----	----	----	----
Selenium	7782-49-2	0.01	mg/L		<0.01	----	----	----	----
Iron	7439-89-6	0.05	mg/L		**0.09**	----	----	----	----
EG035T: Total Recoverable Mercury by FIMS									
Mercury	7439-97-6	0.0001	mg/L		<0.0001	----	----	----	----
EP080/071: Total Petroleum Hydrocarbons									
C6 - C9 Fraction	----	20	µg/L		<20	<20	<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	<20	<20	----	----
^ **C6 - C10 Fraction minus BTEX (F1)**	C6_C10-BTEX	20	µg/L		<20	<20	<20	----	----
>C10 - C16 Fraction	>C10_C16	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	<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	----	----

Analytical Results

Sub-Matrix: WATER (Matrix: WATER)				Client sample ID	QC11	QC12	QC13	----	----
				Client sampling date / time	[15-Oct-2015]	[15-Oct-2015]	[15-Oct-2015]	----	----
Compound	CAS Number	LOR	Unit		EM1515910-049	EM1515910-050	EM1515910-051	--------	--------
					Result	Result	Result	Result	Result
EP080: BTEXN - Continued									
^ **Total Xylenes**	1330-20-7	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	----	----
EP080S: TPH(V)/BTEX Surrogates									
1.2-Dichloroethane-D4	17060-07-0	2	%		**98.0**	**99.4**	**94.8**	----	----
Toluene-D8	2037-26-5	2	%		**94.3**	**96.4**	**88.0**	----	----
4-Bromofluorobenzene	460-00-4	2	%		**103**	**107**	**100**	----	----

ALS Environmental

QUALITY CONTROL REPORT

Work Order	: **EM1515910**	Page	: 1 of 14
Client	: **AECOM Australia Pty Ltd**	Laboratory	: Environmental Division Melbourne
Contact	: MS AVERYLL COYNE	Contact	: Carol Walsh
Address	: LEVEL 9 8 EXHIBITION ST MELBOURNE VIC 3000	Address	: 4 Westall Rd Springvale VIC Australia 3171
E-mail	: averyll.coyne@aecom.com	E-mail	: carol.walsh@alsglobal.com
Telephone	: +61 03 9653 1234	Telephone	: +61-3-8549 9608
Facsimile	: +61 03 9654 7117	Facsimile	: +61-3-8549 9601
Project	: 60431087	QC Level	: NEPM 2013 Schedule B(3) and ALS QCS3 requirement
Order number	: 60431087 Task No 1.4	Date Samples Received	: 16-Oct-2015
C-O-C number	: ----	Date Analysis Commenced	: 20-Oct-2015
Sampler	: DUGALD CUNNINGHAM, MATTHEW SHEPPARD, NATHAN JENSEN	Issue Date	: 27-Oct-2015
Site	: Fishermans Bend	No. of samples received	: 51
Quote number	: ----	No. of samples analysed	: 10

This report supersedes any previous report(s) with this reference. Results apply to the sample(s) as submitted.

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

General Comments

The analytical procedures used by the Environmental Division have been developed from established internationally recognized procedures such as those published by the USEPA, APHA, AS and NEPM. In house developed procedures are employed in the absence of documented standards or by 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

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

NATA Accredited Laboratory 825

Accredited for compliance with ISO/IEC 17025.

Signatories

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

Signatories	Position	Accreditation Category
Chris Lemaitre	Non-Metals Team Leader	Melbourne Inorganics
Dilani Fernando	Senior Inorganic Chemist	Melbourne Inorganics
Herman Lin	Laboratory Manager	Melbourne Inorganics
Kim McCabe	Senior Inorganic Chemist	Brisbane Inorganics
Satishkumar Trivedi	Acid Sulfate Soils Supervisor	Brisbane Acid Sulphate Soils
Xing Lin	Senior Organic Chemist	Melbourne Organics

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	*Client sample ID*	*Method: Compound*	*CAS Number*	*LOR*	*Unit*	*Original Result*	*Duplicate Result*	*RPD (%)*	*Recovery Limits (%)*
EA001: pH in soil using 0.01M CaCl extract (QC Lot: 251010)									
EM1515593-002	Anonymous	EA001: pH (CaCl2)	----	0.1	pH Unit	7.9	7.9	0.00	0% - 20%
EA055: Moisture Content (QC Lot: 248584)									
EM1515910-016	GW36(0.5-0.6)	EA055-103: Moisture Content (dried @ 103°C)	----	1	%	22.6	19.4	14.9	0% - 20%
EM1515911-007	Anonymous	EA055-103: Moisture Content (dried @ 103°C)	----	1	%	2.2	2.0	10.3	No Limit
EA055: Moisture Content (QC Lot: 254986)									
EM1515910-003	GW04(3.3-3.4)	EA055-103: Moisture Content (dried @ 103°C)	----	1	%	17.4	17.1	1.48	0% - 50%
ED040N: Sulfate - Calcium Phosphate Soluble (NEPM) (QC Lot: 251011)									
EM1515593-066	Anonymous	ED040N: Sulfate as SO4 2-	14808-79-8	50	mg/kg	60	60	0.00	No Limit
EM1515925-002	Anonymous	ED040N: Sulfate as SO4 2-	14808-79-8	50	mg/kg	<50	<50	0.00	No Limit
EG005T: Total Metals by ICP-AES (QC Lot: 249314)									
EM1515910-016	GW36(0.5-0.6)	EG005T: Cadmium	7440-43-9	1	mg/kg	<1	<1	0.00	No Limit
		EG005T: Chromium	7440-47-3	2	mg/kg	29	30	4.58	0% - 50%
		EG005T: Nickel	7440-02-0	2	mg/kg	22	18	17.8	0% - 50%
		EG005T: Arsenic	7440-38-2	5	mg/kg	10	13	25.3	No Limit
		EG005T: Copper	7440-50-8	5	mg/kg	28	27	4.13	No Limit
		EG005T: Lead	7439-92-1	5	mg/kg	67	48	33.7	0% - 50%
		EG005T: Selenium	7782-49-2	5	mg/kg	<5	<5	0.00	No Limit
		EG005T: Zinc	7440-66-6	5	mg/kg	89	79	11.7	0% - 50%
		EG005T: Aluminium	7429-90-5	50	mg/kg	12800	13000	1.61	0% - 20%
		EG005T: Iron	7439-89-6	50	mg/kg	30800	35800	15.0	0% - 20%
EM1515911-009	Anonymous	EG005T: Cadmium	7440-43-9	1	mg/kg	<1	<1	0.00	No Limit
		EG005T: Chromium	7440-47-3	2	mg/kg	18	16	12.0	No Limit
		EG005T: Nickel	7440-02-0	2	mg/kg	78	83	6.37	0% - 20%
		EG005T: Arsenic	7440-38-2	5	mg/kg	<5	<5	0.00	No Limit
		EG005T: Copper	7440-50-8	5	mg/kg	30	37	23.1	No Limit
		EG005T: Lead	7439-92-1	5	mg/kg	<5	<5	0.00	No Limit
		EG005T: Selenium	7782-49-2	5	mg/kg	<5	<5	0.00	No Limit
		EG005T: Zinc	7440-66-6	5	mg/kg	38	39	4.19	No Limit
		EG005T: Aluminium	7429-90-5	50	mg/kg	19100	20800	8.22	0% - 20%
		EG005T: Iron	7439-89-6	50	mg/kg	36200	38200	5.46	0% - 20%
EG035T: Total Recoverable Mercury by FIMS (QC Lot: 249315)									
EM1515910-016	GW36(0.5-0.6)	EG035T: Mercury	7439-97-6	0.1	mg/kg	0.8	0.9	16.1	No Limit
EM1515911-009	Anonymous	EG035T: Mercury	7439-97-6	0.1	mg/kg	<0.1	<0.1	0.00	No Limit
EP003: Total Organic Carbon (TOC) in Soil (QC Lot: 256178)									
EB1531819-001	Anonymous	EP003: Total Organic Carbon	----	0.02	%	8.94	9.04	1.16	0% - 20%

Sub-Matrix: **SOIL**

				Laboratory Duplicate (DUP) Report					
Laboratory sample ID	*Client sample ID*	*Method: Compound*	*CAS Number*	*LOR*	*Unit*	*Original Result*	*Duplicate Result*	*RPD (%)*	*Recovery Limits (%)*
EP003: Total Organic Carbon (TOC) in Soil (QC Lot: 256178) - continued									
ES1534047-004	Anonymous	EP003: Total Organic Carbon	----	0.02	%	2.03	2.06	1.32	0% - 20%
EP074A: Monocyclic Aromatic Hydrocarbons (QC Lot: 248566)									
EM1515966-002	Anonymous	EP074: 1.2.4-Trimethylbenzene	95-63-6	0.5	mg/kg	<0.5	<0.5	0.00	No Limit
		EP074: 1.3.5-Trimethylbenzene	108-67-8	0.5	mg/kg	<0.5	<0.5	0.00	No Limit
		EP074: Isopropylbenzene	98-82-8	0.5	mg/kg	<0.5	<0.5	0.00	No Limit
		EP074: n-Butylbenzene	104-51-8	0.5	mg/kg	<0.5	<0.5	0.00	No Limit
		EP074: n-Propylbenzene	103-65-1	0.5	mg/kg	<0.5	<0.5	0.00	No Limit
		EP074: p-Isopropyltoluene	99-87-6	0.5	mg/kg	<0.5	<0.5	0.00	No Limit
		EP074: sec-Butylbenzene	135-98-8	0.5	mg/kg	<0.5	<0.5	0.00	No Limit
		EP074: Styrene	100-42-5	0.5	mg/kg	<0.5	<0.5	0.00	No Limit
		EP074: tert-Butylbenzene	98-06-6	0.5	mg/kg	<0.5	<0.5	0.00	No Limit
EP074B: Oxygenated Compounds (QC Lot: 248566)									
EM1515966-002	Anonymous	EP074: 2-Butanone (MEK)	78-93-3	5	mg/kg	<5	<5	0.00	No Limit
		EP074: 2-Hexanone (MBK)	591-78-6	5	mg/kg	<5	<5	0.00	No Limit
		EP074: 4-Methyl-2-pentanone (MIBK)	108-10-1	5	mg/kg	<5	<5	0.00	No Limit
		EP074: Vinyl Acetate	108-05-4	5	mg/kg	<5	<5	0.00	No Limit
EP074C: Sulfonated Compounds (QC Lot: 248566)									
EM1515966-002	Anonymous	EP074: Carbon disulfide	75-15-0	0.5	mg/kg	<0.5	<0.5	0.00	No Limit
EP074D: Fumigants (QC Lot: 248566)									
EM1515966-002	Anonymous	EP074: 1.2-Dibromoethane (EDB)	106-93-4	0.5	mg/kg	<0.5	<0.5	0.00	No Limit
		EP074: 1.2-Dichloropropane	78-87-5	0.5	mg/kg	<0.5	<0.5	0.00	No Limit
		EP074: 2.2-Dichloropropane	594-20-7	0.5	mg/kg	<0.5	<0.5	0.00	No Limit
		EP074: cis-1.3-Dichloropropylene	10061-01-5	0.5	mg/kg	<0.5	<0.5	0.00	No Limit
		EP074: trans-1.3-Dichloropropylene	10061-02-6	0.5	mg/kg	<0.5	<0.5	0.00	No Limit
EP074E: Halogenated Aliphatic Compounds (QC Lot: 248566)									
EM1515966-002	Anonymous	EP074: 1.1.1.2-Tetrachloroethane	630-20-6	0.5	mg/kg	<0.5	<0.5	0.00	No Limit
		EP074: 1.1.1-Trichloroethane	71-55-6	0.5	mg/kg	<0.5	<0.5	0.00	No Limit
		EP074: 1.1.2.2-Tetrachloroethane	79-34-5	0.5	mg/kg	<0.5	<0.5	0.00	No Limit
		EP074: 1.1.2-Trichloroethane	79-00-5	0.5	mg/kg	<0.5	<0.5	0.00	No Limit
		EP074: 1.1-Dichloroethane	75-34-3	0.5	mg/kg	<0.5	<0.5	0.00	No Limit
		EP074: 1.1-Dichloroethene	75-35-4	0.5	mg/kg	<0.5	<0.5	0.00	No Limit
		EP074: 1.1-Dichloropropylene	563-58-6	0.5	mg/kg	<0.5	<0.5	0.00	No Limit
		EP074: 1.2.3-Trichloropropane	96-18-4	0.5	mg/kg	<0.5	<0.5	0.00	No Limit
		EP074: 1.2-Dibromo-3-chloropropane	96-12-8	0.5	mg/kg	<0.5	<0.5	0.00	No Limit
		EP074: 1.2-Dichloroethane	107-06-2	0.5	mg/kg	<0.5	<0.5	0.00	No Limit
		EP074: 1.3-Dichloropropane	142-28-9	0.5	mg/kg	<0.5	<0.5	0.00	No Limit
		EP074: Carbon Tetrachloride	56-23-5	0.5	mg/kg	<0.5	<0.5	0.00	No Limit
		EP074: cis-1.2-Dichloroethene	156-59-2	0.5	mg/kg	<0.5	<0.5	0.00	No Limit
		EP074: cis-1.4-Dichloro-2-butene	1476-11-5	0.5	mg/kg	<0.5	<0.5	0.00	No Limit

Sub-Matrix: **SOIL**

				Laboratory Duplicate (DUP) Report					
Laboratory sample ID	*Client sample ID*	*Method: Compound*	*CAS Number*	*LOR*	*Unit*	*Original Result*	*Duplicate Result*	*RPD (%)*	*Recovery Limits (%)*
EP074E: Halogenated Aliphatic Compounds (QC Lot: 248566) - continued									
EM1515966-002	Anonymous	EP074: Dibromomethane	74-95-3	0.5	mg/kg	<0.5	<0.5	0.00	No Limit
		EP074: Hexachlorobutadiene	87-68-3	0.5	mg/kg	<0.5	<0.5	0.00	No Limit
		EP074: Iodomethane	74-88-4	0.5	mg/kg	<0.5	<0.5	0.00	No Limit
		EP074: Pentachloroethane	76-01-7	0.5	mg/kg	<0.5	<0.5	0.00	No Limit
		EP074: Tetrachloroethene	127-18-4	0.5	mg/kg	<0.5	<0.5	0.00	No Limit
		EP074: trans-1.2-Dichloroethene	156-60-5	0.5	mg/kg	<0.5	<0.5	0.00	No Limit
		EP074: trans-1.4-Dichloro-2-butene	110-57-6	0.5	mg/kg	<0.5	<0.5	0.00	No Limit
		EP074: Trichloroethene	79-01-6	0.5	mg/kg	<0.5	<0.5	0.00	No Limit
		EP074: Bromomethane	74-83-9	5	mg/kg	<5	<5	0.00	No Limit
		EP074: Chloroethane	75-00-3	5	mg/kg	<5	<5	0.00	No Limit
		EP074: Chloromethane	74-87-3	5	mg/kg	<5	<5	0.00	No Limit
		EP074: Dichlorodifluoromethane	75-71-8	5	mg/kg	<5	<5	0.00	No Limit
		EP074: Trichlorofluoromethane	75-69-4	5	mg/kg	<5	<5	0.00	No Limit
		EP074: Vinyl chloride	75-01-4	5	mg/kg	<5	<5	0.00	No Limit
EP074F: Halogenated Aromatic Compounds (QC Lot: 248566)									
EM1515966-002	Anonymous	EP074: 1.2.3-Trichlorobenzene	87-61-6	0.5	mg/kg	<0.5	<0.5	0.00	No Limit
		EP074: 1.2.4-Trichlorobenzene	120-82-1	0.5	mg/kg	<0.5	<0.5	0.00	No Limit
		EP074: 1.2-Dichlorobenzene	95-50-1	0.5	mg/kg	<0.5	<0.5	0.00	No Limit
		EP074: 1.3-Dichlorobenzene	541-73-1	0.5	mg/kg	<0.5	<0.5	0.00	No Limit
		EP074: 1.4-Dichlorobenzene	106-46-7	0.5	mg/kg	<0.5	<0.5	0.00	No Limit
		EP074: 2-Chlorotoluene	95-49-8	0.5	mg/kg	<0.5	<0.5	0.00	No Limit
		EP074: 4-Chlorotoluene	106-43-4	0.5	mg/kg	<0.5	<0.5	0.00	No Limit
		EP074: Bromobenzene	108-86-1	0.5	mg/kg	<0.5	<0.5	0.00	No Limit
		EP074: Chlorobenzene	108-90-7	0.5	mg/kg	<0.5	<0.5	0.00	No Limit
EP074G: Trihalomethanes (QC Lot: 248566)									
EM1515966-002	Anonymous	EP074: Bromodichloromethane	75-27-4	0.5	mg/kg	<0.5	<0.5	0.00	No Limit
		EP074: Bromoform	75-25-2	0.5	mg/kg	<0.5	<0.5	0.00	No Limit
		EP074: Chloroform	67-66-3	0.5	mg/kg	<0.5	<0.5	0.00	No Limit
		EP074: Dibromochloromethane	124-48-1	0.5	mg/kg	<0.5	<0.5	0.00	No Limit
EP075(SIM)B: Polynuclear Aromatic Hydrocarbons (QC Lot: 249202)									
EM1515977-035	Anonymous	EP075(SIM): Acenaphthene	83-32-9	0.5	mg/kg	<2.2	<2.2	0.00	No Limit
		EP075(SIM): Acenaphthylene	208-96-8	0.5	mg/kg	<2.2	<2.2	0.00	No Limit
		EP075(SIM): Anthracene	120-12-7	0.5	mg/kg	3.8	3.3	15.7	No Limit
		EP075(SIM): Benz(a)anthracene	56-55-3	0.5	mg/kg	8.3	8.6	3.49	No Limit
		EP075(SIM): Benzo(a)pyrene	50-32-8	0.5	mg/kg	8.8	8.6	2.92	No Limit
		EP075(SIM): Benzo(b+j)fluoranthene	205-99-2 205-82-3	0.5	mg/kg	10.4	10.4	0.00	No Limit
		EP075(SIM): Benzo(g.h.i)perylene	191-24-2	0.5	mg/kg	6.8	6.6	2.04	No Limit
		EP075(SIM): Benzo(k)fluoranthene	207-08-9	0.5	mg/kg	4.0	3.9	3.37	No Limit
		EP075(SIM): Chrysene	218-01-9	0.5	mg/kg	7.3	7.6	3.85	No Limit

Sub-Matrix: **SOIL**

				Laboratory Duplicate (DUP) Report					
Laboratory sample ID	Client sample ID	Method: Compound	CAS Number	LOR	Unit	Original Result	Duplicate Result	RPD (%)	Recovery Limits (%)
EP075(SIM)B: Polynuclear Aromatic Hydrocarbons (QC Lot: 249202) - continued									
EM1515977-035	Anonymous	EP075(SIM): Dibenz(a.h)anthracene	53-70-3	0.5	mg/kg	<2.2	<2.2	0.00	No Limit
		EP075(SIM): Fluoranthene	206-44-0	0.5	mg/kg	23.0	24.1	4.64	0% - 50%
		EP075(SIM): Fluorene	86-73-7	0.5	mg/kg	<2.2	<2.2	0.00	No Limit
		EP075(SIM): Indeno(1.2.3.cd)pyrene	193-39-5	0.5	mg/kg	5.1	5.0	2.72	No Limit
		EP075(SIM): Naphthalene	91-20-3	0.5	mg/kg	<2.2	<2.2	0.00	No Limit
		EP075(SIM): Phenanthrene	85-01-8	0.5	mg/kg	10.6	8.9	16.6	No Limit
		EP075(SIM): Pyrene	129-00-0	0.5	mg/kg	22.4	23.4	4.25	0% - 50%
EM1515911-005	Anonymous	EP075(SIM): Acenaphthene	83-32-9	0.5	mg/kg	<0.5	<0.5	0.00	No Limit
		EP075(SIM): Acenaphthylene	208-96-8	0.5	mg/kg	<0.5	<0.5	0.00	No Limit
		EP075(SIM): Anthracene	120-12-7	0.5	mg/kg	<0.5	<0.5	0.00	No Limit
		EP075(SIM): Benz(a)anthracene	56-55-3	0.5	mg/kg	<0.5	<0.5	0.00	No Limit
		EP075(SIM): Benzo(a)pyrene	50-32-8	0.5	mg/kg	<0.5	<0.5	0.00	No Limit
		EP075(SIM): Benzo(b+j)fluoranthene	205-99-2 205-82-3	0.5	mg/kg	<0.5	<0.5	0.00	No Limit
		EP075(SIM): Benzo(g.h.i)perylene	191-24-2	0.5	mg/kg	<0.5	<0.5	0.00	No Limit
		EP075(SIM): Benzo(k)fluoranthene	207-08-9	0.5	mg/kg	<0.5	<0.5	0.00	No Limit
		EP075(SIM): Chrysene	218-01-9	0.5	mg/kg	<0.5	<0.5	0.00	No Limit
		EP075(SIM): Dibenz(a.h)anthracene	53-70-3	0.5	mg/kg	<0.5	<0.5	0.00	No Limit
		EP075(SIM): Fluoranthene	206-44-0	0.5	mg/kg	<0.5	<0.5	0.00	No Limit
		EP075(SIM): Fluorene	86-73-7	0.5	mg/kg	<0.5	<0.5	0.00	No Limit
		EP075(SIM): Indeno(1.2.3.cd)pyrene	193-39-5	0.5	mg/kg	<0.5	<0.5	0.00	No Limit
		EP075(SIM): Naphthalene	91-20-3	0.5	mg/kg	<0.5	<0.5	0.00	No Limit
		EP075(SIM): Phenanthrene	85-01-8	0.5	mg/kg	<0.5	<0.5	0.00	No Limit
		EP075(SIM): Pyrene	129-00-0	0.5	mg/kg	<0.5	<0.5	0.00	No Limit
EP080/071: Total Petroleum Hydrocarbons (QC Lot: 255546)									
EM1515910-016	GW36(0.5-0.6)	EP071: C15 - C28 Fraction	----	100	mg/kg	<100	<100	0.00	No Limit
		EP071: C29 - C36 Fraction	----	100	mg/kg	<100	<100	0.00	No Limit
		EP071: C10 - C14 Fraction	----	50	mg/kg	<50	<50	0.00	No Limit
		EP071: C10 - C36 Fraction (sum)	----	50	mg/kg	<50	<50	0.00	No Limit
EP080/071: Total Recoverable Hydrocarbons - NEPM 2013 Fractions (QC Lot: 255546)									
EM1515910-016	GW36(0.5-0.6)	EP071: >C16 - C34 Fraction	----	100	mg/kg	<100	<100	0.00	No Limit
		EP071: >C34 - C40 Fraction	----	100	mg/kg	<100	<100	0.00	No Limit
		EP071: >C10 - C16 Fraction	>C10_C16	50	mg/kg	<50	<50	0.00	No Limit
		EP071: >C10 - C40 Fraction (sum)	----	50	mg/kg	<50	<50	0.00	No Limit

Sub-Matrix: **WATER**

				Laboratory Duplicate (DUP) Report					
Laboratory sample ID	Client sample ID	Method: Compound	CAS Number	LOR	Unit	Original Result	Duplicate Result	RPD (%)	Recovery Limits (%)
EG020T: Total Metals by ICP-MS (QC Lot: 250233)									
EM1515703-009	Anonymous	EG020A-T: Cadmium	7440-43-9	0.0001	mg/L	0.0002	<0.0001	78.8	No Limit
		EG020A-T: Arsenic	7440-38-2	0.001	mg/L	<0.001	<0.001	0.00	No Limit
		EG020A-T: Chromium	7440-47-3	0.001	mg/L	<0.001	<0.001	0.00	No Limit

Sub-Matrix: **WATER**

				Laboratory Duplicate (DUP) Report					
Laboratory sample ID	*Client sample ID*	*Method: Compound*	*CAS Number*	*LOR*	*Unit*	*Original Result*	*Duplicate Result*	*RPD (%)*	*Recovery Limits (%)*
EG020T: Total Metals by ICP-MS (QC Lot: 250233) - continued									
EM1515703-009	Anonymous	EG020A-T: Copper	7440-50-8	0.001	mg/L	0.017	0.017	0.00	0% - 50%
		EG020A-T: Lead	7439-92-1	0.001	mg/L	0.002	0.002	0.00	No Limit
		EG020A-T: Nickel	7440-02-0	0.001	mg/L	0.006	0.005	0.00	No Limit
		EG020A-T: Zinc	7440-66-6	0.005	mg/L	0.047	0.049	2.88	No Limit
		EG020A-T: Aluminium	7429-90-5	0.01	mg/L	0.11	0.12	0.00	0% - 50%
		EG020A-T: Selenium	7782-49-2	0.01	mg/L	<0.01	<0.01	0.00	No Limit
		EG020A-T: Iron	7439-89-6	0.05	mg/L	1.73	1.72	0.00	0% - 20%
EM1515894-016	Anonymous	EG020A-T: Cadmium	7440-43-9	0.0001	mg/L	<0.0001	<0.0001	0.00	No Limit
		EG020A-T: Arsenic	7440-38-2	0.001	mg/L	<0.001	<0.001	0.00	No Limit
		EG020A-T: Chromium	7440-47-3	0.001	mg/L	<0.001	<0.001	0.00	No Limit
		EG020A-T: Copper	7440-50-8	0.001	mg/L	0.005	0.006	0.00	No Limit
		EG020A-T: Lead	7439-92-1	0.001	mg/L	<0.001	<0.001	0.00	No Limit
		EG020A-T: Nickel	7440-02-0	0.001	mg/L	<0.001	<0.001	0.00	No Limit
		EG020A-T: Zinc	7440-66-6	0.005	mg/L	<0.005	<0.005	0.00	No Limit
		EG020A-T: Aluminium	7429-90-5	0.01	mg/L	<0.01	0.01	0.00	No Limit
		EG020A-T: Selenium	7782-49-2	0.01	mg/L	<0.01	<0.01	0.00	No Limit
		EG020A-T: Iron	7439-89-6	0.05	mg/L	<0.05	<0.05	0.00	No Limit
EG035T: Total Recoverable Mercury by FIMS (QC Lot: 250303)									
EM1515910-049	QC11	EG035T: Mercury	7439-97-6	0.0001	mg/L	<0.0001	<0.0001	0.00	No Limit
EM1515964-001	Anonymous	EG035T: Mercury	7439-97-6	0.0001	mg/L	<0.0001	<0.0001	0.00	No Limit
EP080/071: Total Petroleum Hydrocarbons (QC Lot: 249115)									
EM1515910-049	QC11	EP080: C6 - C9 Fraction	----	20	µg/L	<20	<20	0.00	No Limit
EM1515944-006	Anonymous	EP080: C6 - C9 Fraction	----	20	µg/L	300	290	0.00	0% - 50%
EP080/071: Total Recoverable Hydrocarbons - NEPM 2013 Fractions (QC Lot: 249115)									
EM1515910-049	QC11	EP080: C6 - C10 Fraction	C6_C10	20	µg/L	<20	<20	0.00	No Limit
EM1515944-006	Anonymous	EP080: C6 - C10 Fraction	C6_C10	20	µg/L	290	290	0.00	0% - 50%
EP080: BTEXN (QC Lot: 249115)									
EM1515910-049	QC11	EP080: Benzene	71-43-2	1	µg/L	<1	<1	0.00	No Limit
		EP080: Ethylbenzene	100-41-4	2	µg/L	<2	<2	0.00	No Limit
		EP080: meta- & para-Xylene	108-38-3 106-42-3	2	µg/L	<2	<2	0.00	No Limit
		EP080: ortho-Xylene	95-47-6	2	µg/L	<2	<2	0.00	No Limit
		EP080: Toluene	108-88-3	2	µg/L	<2	<2	0.00	No Limit
		EP080: Naphthalene	91-20-3	5	µg/L	<5	<5	0.00	No Limit
EM1515944-006	Anonymous	EP080: Benzene	71-43-2	1	µg/L	135	128	5.34	0% - 20%
		EP080: Ethylbenzene	100-41-4	2	µg/L	52	52	0.00	0% - 20%
		EP080: meta- & para-Xylene	108-38-3 106-42-3	2	µg/L	10	10	0.00	No Limit
		EP080: ortho-Xylene	95-47-6	2	µg/L	<2	<2	0.00	No Limit
		EP080: Toluene	108-88-3	2	µg/L	3	3	0.00	No Limit

Sub-Matrix: **WATER**

				Laboratory Duplicate (DUP) Report					
Laboratory sample ID	*Client sample ID*	*Method: Compound*	*CAS Number*	*LOR*	*Unit*	*Original Result*	*Duplicate Result*	*RPD (%)*	*Recovery Limits (%)*
EP080: BTEXN (QC Lot: 249115) - continued									
EM1515944-006	Anonymous	EP080: Naphthalene	91-20-3	5	µg/L	12	12	0.00	No Limit

Method Blank (MB) and Laboratory Control Spike (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 (%)	Recovery Limits (%)	
Method: Compound	CAS Number	LOR	Unit	Result	Concentration	LCS	Low	High
ED040N: Sulfate - Calcium Phosphate Soluble (NEPM) (QCLot: 251011)								
ED040N: Sulfate as SO4 2-	14808-79-8	50	mg/kg	<50	3000 mg/kg	96.7	86	110
EG005T: Total Metals by ICP-AES (QCLot: 249314)								
EG005T: Aluminium	7429-90-5	50	mg/kg	<50	6134 mg/kg	109	93	115
EG005T: Arsenic	7440-38-2	5	mg/kg	<5	21.7 mg/kg	101	79	113
EG005T: Cadmium	7440-43-9	1	mg/kg	<1	4.64 mg/kg	94.1	87	115
EG005T: Chromium	7440-47-3	2	mg/kg	<2	43.9 mg/kg	99.4	89	113
EG005T: Copper	7440-50-8	5	mg/kg	<5	32 mg/kg	98.3	90	116
EG005T: Iron	7439-89-6	50	mg/kg	<50	8400 mg/kg	100	96	112
EG005T: Lead	7439-92-1	5	mg/kg	<5	40 mg/kg	94.2	85	107
EG005T: Nickel	7440-02-0	2	mg/kg	<2	55 mg/kg	96.7	89	111
EG005T: Selenium	7782-49-2	5	mg/kg	<5	5.37 mg/kg	102	93	109
EG005T: Zinc	7440-66-6	5	mg/kg	<5	60.8 mg/kg	98.4	89	111
EG035T: Total Recoverable Mercury by FIMS (QCLot: 249315)								
EG035T: Mercury	7439-97-6	0.1	mg/kg	<0.1	2.57 mg/kg	98.1	85	103
EP003: Total Organic Carbon (TOC) in Soil (QCLot: 256178)								
EP003: Total Organic Carbon	----	0.02	%	<0.02	100 %	101	70	130
EP074A: Monocyclic Aromatic Hydrocarbons (QCLot: 248566)								
EP074: 1.2.4-Trimethylbenzene	95-63-6	0.5	mg/kg	<0.5	1 mg/kg	80.4	66	108
EP074: 1.3.5-Trimethylbenzene	108-67-8	0.5	mg/kg	<0.5	1 mg/kg	78.7	67	109
EP074: Isopropylbenzene	98-82-8	0.5	mg/kg	<0.5	1 mg/kg	82.7	69	119
EP074: n-Butylbenzene	104-51-8	0.5	mg/kg	<0.5	1 mg/kg	75.5	58	110
EP074: n-Propylbenzene	103-65-1	0.5	mg/kg	<0.5	1 mg/kg	76.6	64	110
EP074: p-Isopropyltoluene	99-87-6	0.5	mg/kg	<0.5	1 mg/kg	79.4	65	111
EP074: sec-Butylbenzene	135-98-8	0.5	mg/kg	<0.5	1 mg/kg	79.1	66	110
EP074: Styrene	100-42-5	0.5	mg/kg	<0.5	1 mg/kg	82.2	72	118
EP074: tert-Butylbenzene	98-06-6	0.5	mg/kg	<0.5	1 mg/kg	80.3	67	111
EP074B: Oxygenated Compounds (QCLot: 248566)								
EP074: 2-Butanone (MEK)	78-93-3	5	mg/kg	<5	10 mg/kg	89.8	68	142
EP074: 2-Hexanone (MBK)	591-78-6	5	mg/kg	<5	10 mg/kg	89.2	62	128
EP074: 4-Methyl-2-pentanone (MIBK)	108-10-1	5	mg/kg	<5	10 mg/kg	94.2	67	123
EP074: Vinyl Acetate	108-05-4	5	mg/kg	<5	10 mg/kg	87.8	54	128
EP074C: Sulfonated Compounds (QCLot: 248566)								
EP074: Carbon disulfide	75-15-0	0.5	mg/kg	<0.5	1 mg/kg	68.8	50	128

Sub-Matrix: **SOIL**

Method: Compound	CAS Number	LOR	Unit	Method Blank (MB) Report	Laboratory Control Spike (LCS) Report			
					Spike	Spike Recovery (%)	Recovery Limits (%)	
				Result	Concentration	LCS	Low	High
EP074D: Fumigants (QCLot: 248566)								
EP074: 1.2-Dibromoethane (EDB)	106-93-4	0.5	mg/kg	<0.5	1 mg/kg	80.9	73	117
EP074: 1.2-Dichloropropane	78-87-5	0.5	mg/kg	<0.5	1 mg/kg	92.2	72	116
EP074: 2.2-Dichloropropane	594-20-7	0.5	mg/kg	<0.5	1 mg/kg	83.4	65	115
EP074: cis-1.3-Dichloropropylene	10061-01-5	0.5	mg/kg	<0.5	1 mg/kg	73.6	64	104
EP074: trans-1.3-Dichloropropylene	10061-02-6	0.5	mg/kg	<0.5	1 mg/kg	71.4	61	103
EP074E: Halogenated Aliphatic Compounds (QCLot: 248566)								
EP074: 1.1.1.2-Tetrachloroethane	630-20-6	0.5	mg/kg	<0.5	1 mg/kg	69.0	65	109
EP074: 1.1.1-Trichloroethane	71-55-6	0.5	mg/kg	<0.5	1 mg/kg	81.0	68	110
EP074: 1.1.2.2-Tetrachloroethane	79-34-5	0.5	mg/kg	<0.5	1 mg/kg	87.6	76	124
EP074: 1.1.2-Trichloroethane	79-00-5	0.5	mg/kg	<0.5	1 mg/kg	88.7	76	120
EP074: 1.1-Dichloroethane	75-34-3	0.5	mg/kg	<0.5	1 mg/kg	92.2	72	118
EP074: 1.1-Dichloroethene	75-35-4	0.5	mg/kg	<0.5	1 mg/kg	79.3	65	127
EP074: 1.1-Dichloropropylene	563-58-6	0.5	mg/kg	<0.5	1 mg/kg	84.7	70	116
EP074: 1.2.3-Trichloropropane	96-18-4	0.5	mg/kg	<0.5	1 mg/kg	88.3	75	123
EP074: 1.2-Dibromo-3-chloropropane	96-12-8	0.5	mg/kg	<0.5	1 mg/kg	63.7	54	106
EP074: 1.2-Dichloroethane	107-06-2	0.5	mg/kg	<0.5	1 mg/kg	91.6	75	119
EP074: 1.3-Dichloropropane	142-28-9	0.5	mg/kg	<0.5	1 mg/kg	87.1	78	120
EP074: Bromomethane	74-83-9	5	mg/kg	<5	10 mg/kg	61.0	43	133
EP074: Carbon Tetrachloride	56-23-5	0.5	mg/kg	<0.5	1 mg/kg	72.2	61	107
EP074: Chloroethane	75-00-3	5	mg/kg	<5	10 mg/kg	84.4	58	134
EP074: Chloromethane	74-87-3	5	mg/kg	<5	10 mg/kg	79.2	55	133
EP074: cis-1.2-Dichloroethene	156-59-2	0.5	mg/kg	<0.5	1 mg/kg	89.9	76	120
EP074: cis-1.4-Dichloro-2-butene	1476-11-5	0.5	mg/kg	<0.5	1 mg/kg	51.6	40	114
EP074: Dibromomethane	74-95-3	0.5	mg/kg	<0.5	1 mg/kg	88.9	74	114
EP074: Dichlorodifluoromethane	75-71-8	5	mg/kg	<5	10 mg/kg	63.1	45	123
EP074: Hexachlorobutadiene	87-68-3	0.5	mg/kg	<0.5	1 mg/kg	85.3	60	118
EP074: Iodomethane	74-88-4	0.5	mg/kg	<0.5	1 mg/kg	53.4	47	116
EP074: Pentachloroethane	76-01-7	0.5	mg/kg	<0.5	1 mg/kg	61.5	45	123
EP074: Tetrachloroethene	127-18-4	0.5	mg/kg	<0.5	1 mg/kg	85.4	69	121
EP074: trans-1.2-Dichloroethene	156-60-5	0.5	mg/kg	<0.5	1 mg/kg	86.4	70	118
EP074: trans-1.4-Dichloro-2-butene	110-57-6	0.5	mg/kg	<0.5	1 mg/kg	75.5	56	114
EP074: Trichloroethene	79-01-6	0.5	mg/kg	<0.5	1 mg/kg	85.0	72	116
EP074: Trichlorofluoromethane	75-69-4	5	mg/kg	<5	10 mg/kg	81.0	63	127
EP074: Vinyl chloride	75-01-4	5	mg/kg	<5	10 mg/kg	79.2	58	138
EP074F: Halogenated Aromatic Compounds (QCLot: 248566)								
EP074: 1.2.3-Trichlorobenzene	87-61-6	0.5	mg/kg	<0.5	1 mg/kg	86.1	69	117
EP074: 1.2.4-Trichlorobenzene	120-82-1	0.5	mg/kg	<0.5	1 mg/kg	80.8	60	112
EP074: 1.2-Dichlorobenzene	95-50-1	0.5	mg/kg	<0.5	1 mg/kg	85.4	76	112
EP074: 1.3-Dichlorobenzene	541-73-1	0.5	mg/kg	<0.5	1 mg/kg	86.1	70	110

Sub-Matrix: **SOIL**

Method: Compound	CAS Number	LOR	Unit	Method Blank (MB) Report: Result	Laboratory Control Spike (LCS) Report: Spike Concentration	Spike Recovery (%): LCS	Recovery Limits (%): Low	Recovery Limits (%): High
EP074F: Halogenated Aromatic Compounds (QCLot: 248566) - continued								
EP074: 1.4-Dichlorobenzene	106-46-7	0.5	mg/kg	<0.5	1 mg/kg	85.1	73	115
EP074: 2-Chlorotoluene	95-49-8	0.5	mg/kg	<0.5	1 mg/kg	81.1	69	113
EP074: 4-Chlorotoluene	106-43-4	0.5	mg/kg	<0.5	1 mg/kg	78.7	67	111
EP074: Bromobenzene	108-86-1	0.5	mg/kg	<0.5	1 mg/kg	80.3	63	117
EP074: Chlorobenzene	108-90-7	0.5	mg/kg	<0.5	1 mg/kg	85.2	79	115
EP074G: Trihalomethanes (QCLot: 248566)								
EP074: Bromodichloromethane	75-27-4	0.5	mg/kg	<0.5	1 mg/kg	73.7	65	107
EP074: Bromoform	75-25-2	0.5	mg/kg	<0.5	1 mg/kg	61.0	54	104
EP074: Chloroform	67-66-3	0.5	mg/kg	<0.5	1 mg/kg	87.5	75	117
EP074: Dibromochloromethane	124-48-1	0.5	mg/kg	<0.5	1 mg/kg	64.4	61	105
EP075(SIM)B: Polynuclear Aromatic Hydrocarbons (QCLot: 249202)								
EP075(SIM): Acenaphthene	83-32-9	0.5	mg/kg	<0.5	3 mg/kg	107	68	114
EP075(SIM): Acenaphthylene	208-96-8	0.5	mg/kg	<0.5	3 mg/kg	107	61	125
EP075(SIM): Anthracene	120-12-7	0.5	mg/kg	<0.5	3 mg/kg	110	68	116
EP075(SIM): Benz(a)anthracene	56-55-3	0.5	mg/kg	<0.5	3 mg/kg	110	62	116
EP075(SIM): Benzo(a)pyrene	50-32-8	0.5	mg/kg	<0.5	3 mg/kg	103	64	114
EP075(SIM): Benzo(b+j)fluoranthene	205-99-2 205-82-3	0.5	mg/kg	<0.5	3 mg/kg	110	64	114
EP075(SIM): Benzo(g.h.i)perylene	191-24-2	0.5	mg/kg	<0.5	3 mg/kg	107	59	117
EP075(SIM): Benzo(k)fluoranthene	207-08-9	0.5	mg/kg	<0.5	3 mg/kg	109	67	115
EP075(SIM): Chrysene	218-01-9	0.5	mg/kg	<0.5	3 mg/kg	109	63	119
EP075(SIM): Dibenz(a.h)anthracene	53-70-3	0.5	mg/kg	<0.5	3 mg/kg	101	62	114
EP075(SIM): Fluoranthene	206-44-0	0.5	mg/kg	<0.5	3 mg/kg	112	67	115
EP075(SIM): Fluorene	86-73-7	0.5	mg/kg	<0.5	3 mg/kg	106	62	120
EP075(SIM): Indeno(1.2.3.cd)pyrene	193-39-5	0.5	mg/kg	<0.5	3 mg/kg	104	62	116
EP075(SIM): Naphthalene	91-20-3	0.5	mg/kg	<0.5	3 mg/kg	108	65	119
EP075(SIM): Phenanthrene	85-01-8	0.5	mg/kg	<0.5	3 mg/kg	108	69	113
EP075(SIM): Pyrene	129-00-0	0.5	mg/kg	<0.5	3 mg/kg	105	66	116
EP080/071: Total Petroleum Hydrocarbons (QCLot: 255540)								
EP080: C6 - C9 Fraction	----	10	mg/kg	<10	36 mg/kg	90.8	66	130
EP080/071: Total Petroleum Hydrocarbons (QCLot: 255546)								
EP071: C10 - C14 Fraction	----	50	mg/kg	<50	658 mg/kg	85.4	65	131
EP071: C10 - C36 Fraction (sum)	----	50	mg/kg	<50	----	----	----	----
EP071: C15 - C28 Fraction	----	100	mg/kg	<100	3160 mg/kg	90.0	70	126
EP071: C29 - C36 Fraction	----	100	mg/kg	<100	1448 mg/kg	93.0	70	122
EP080/071: Total Recoverable Hydrocarbons - NEPM 2013 Fractions (QCLot: 255540)								
EP080: C6 - C10 Fraction	C6_C10	10	mg/kg	<10	45 mg/kg	89.3	64	128
EP080/071: Total Recoverable Hydrocarbons - NEPM 2013 Fractions (QCLot: 255546)								

Sub-Matrix: **SOIL**

Method: Compound	CAS Number	LOR	Unit	Method Blank (MB) Report: Result	Laboratory Control Spike (LCS) Report: Spike Concentration	Spike Recovery (%): LCS	Recovery Limits (%): Low	Recovery Limits (%): High
EP080/071: Total Recoverable Hydrocarbons - NEPM 2013 Fractions (QCLot: 255546) - continued								
EP071: >C10 - C16 Fraction	>C10_C16	50	mg/kg	<50	1051 mg/kg	89.9	68	130
EP071: >C10 - C40 Fraction (sum)	----	50	mg/kg	<50	----	----	----	----
EP071: >C16 - C34 Fraction	----	100	mg/kg	<100	4124 mg/kg	91.7	72	116
EP071: >C34 - C40 Fraction	----	100	mg/kg	<100	161 mg/kg	72.0	38	132
EP080: BTEXN (QCLot: 255540)								
EP080: Benzene	71-43-2	0.2	mg/kg	<0.2	2 mg/kg	93.0	74	124
EP080: Ethylbenzene	100-41-4	0.5	mg/kg	<0.5	2 mg/kg	94.2	72	124
EP080: meta- & para-Xylene	108-38-3 106-42-3	0.5	mg/kg	<0.5	4 mg/kg	101	72	132
EP080: Naphthalene	91-20-3	1	mg/kg	<1	0.5 mg/kg	87.8	66	132
EP080: ortho-Xylene	95-47-6	0.5	mg/kg	<0.5	2 mg/kg	102	76	130
EP080: Toluene	108-88-3	0.5	mg/kg	<0.5	2 mg/kg	97.3	75	129

Sub-Matrix: **WATER**

Method: Compound	CAS Number	LOR	Unit	Method Blank (MB) Report: Result	Laboratory Control Spike (LCS) Report: Spike Concentration	Spike Recovery (%): LCS	Recovery Limits (%): Low	Recovery Limits (%): High
EG020T: Total Metals by ICP-MS (QCLot: 250233)								
EG020A-T: Aluminium	7429-90-5	0.01	mg/L	<0.01	0.5 mg/L	103	100	108
EG020A-T: Arsenic	7440-38-2	0.001	mg/L	<0.001	0.1 mg/L	104	94	116
EG020A-T: Cadmium	7440-43-9	0.0001	mg/L	<0.0001	0.1 mg/L	103	90	110
EG020A-T: Chromium	7440-47-3	0.001	mg/L	<0.001	0.1 mg/L	100	90	110
EG020A-T: Copper	7440-50-8	0.001	mg/L	<0.001	0.1 mg/L	102	91	109
EG020A-T: Iron	7439-89-6	0.05	mg/L	<0.05	0.5 mg/L	106	99	109
EG020A-T: Lead	7439-92-1	0.001	mg/L	<0.001	0.1 mg/L	97.4	91	111
EG020A-T: Nickel	7440-02-0	0.001	mg/L	<0.001	0.1 mg/L	101	91	111
EG020A-T: Selenium	7782-49-2	0.01	mg/L	<0.01	0.1 mg/L	95.6	86	110
EG020A-T: Zinc	7440-66-6	0.005	mg/L	<0.005	0.1 mg/L	97.6	91	109
EG035T: Total Recoverable Mercury by FIMS (QCLot: 250303)								
EG035T: Mercury	7439-97-6	0.0001	mg/L	<0.0001	0.01 mg/L	94.4	87	113
EP080/071: Total Petroleum Hydrocarbons (QCLot: 248334)								
EP071: C10 - C14 Fraction	----	50	µg/L	<50	3980 µg/L	57.1	53	123
EP071: C15 - C28 Fraction	----	100	µg/L	<100	17006 µg/L	73.6	57	133
EP071: C29 - C36 Fraction	----	50	µg/L	<50	8662 µg/L	68.8	55	141
EP080/071: Total Petroleum Hydrocarbons (QCLot: 249115)								
EP080: C6 - C9 Fraction	----	20	µg/L	<20	360 µg/L	106	67	127
EP080/071: Total Recoverable Hydrocarbons - NEPM 2013 Fractions (QCLot: 248334)								
EP071: >C10 - C16 Fraction	>C10_C16	100	µg/L	<100	5753 µg/L	67.2	54	122
EP071: >C16 - C34 Fraction	----	100	µg/L	<100	24516 µg/L	66.9	56	132
EP071: >C34 - C40 Fraction	----	100	µg/L	<100	828 µg/L	88.5	51	137

Sub-Matrix: **WATER**

Method: Compound	CAS Number	LOR	Unit	Method Blank (MB) Report: Result	Laboratory Control Spike (LCS) Report: Spike Concentration	Spike Recovery (%): LCS	Recovery Limits (%): Low	Recovery Limits (%): High
EP080/071: Total Recoverable Hydrocarbons - NEPM 2013 Fractions (QCLot: 249115)								
EP080: C6 - C10 Fraction	C6_C10	20	µg/L	<20	450 µg/L	103	65	125
EP080: BTEXN (QCLot: 249115)								
EP080: Benzene	71-43-2	1	µg/L	<1	20 µg/L	106	76	120
EP080: Ethylbenzene	100-41-4	2	µg/L	<2	20 µg/L	107	72	124
EP080: meta- & para-Xylene	108-38-3 106-42-3	2	µg/L	<2	40 µg/L	109	72	130
EP080: Naphthalene	91-20-3	5	µg/L	<5	5 µg/L	96.6	71	129
EP080: ortho-Xylene	95-47-6	2	µg/L	<2	20 µg/L	112	75	127
EP080: Toluene	108-88-3	2	µg/L	<2	20 µg/L	106	76	124

Matrix Spike (MS) Report

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

Sub-Matrix: **SOIL**

Laboratory sample ID	Client sample ID	Method: Compound	CAS Number	Matrix Spike (MS) Report: Spike Concentration	SpikeRecovery(%): MS	Recovery Limits (%): Low	Recovery Limits (%): High
ED040N: Sulfate - Calcium Phosphate Soluble (NEPM) (QCLot: 251011)							
EM1515593-059	Anonymous	ED040N: Sulfate as SO4 2-	14808-79-8	3000 mg/kg	95.9	84	116
EG005T: Total Metals by ICP-AES (QCLot: 249314)							
EM1515910-017	GW36(0.9-1.0)	EG005T: Arsenic	7440-38-2	50 mg/kg	107	78	124
		EG005T: Cadmium	7440-43-9	50 mg/kg	108	84	116
		EG005T: Chromium	7440-47-3	50 mg/kg	106	79	121
		EG005T: Copper	7440-50-8	50 mg/kg	105	82	124
		EG005T: Lead	7439-92-1	50 mg/kg	102	76	124
		EG005T: Nickel	7440-02-0	50 mg/kg	102	78	120
		EG005T: Selenium	7782-49-2	50 mg/kg	99.4	71	125
		EG005T: Zinc	7440-66-6	50 mg/kg	102	74	128
EG035T: Total Recoverable Mercury by FIMS (QCLot: 249315)							
EM1515910-017	GW36(0.9-1.0)	EG035T: Mercury	7439-97-6	5 mg/kg	104	76	116
EP074E: Halogenated Aliphatic Compounds (QCLot: 248566)							
EM1515966-003	Anonymous	EP074: 1.1-Dichloroethene	75-35-4	2 mg/kg	96.6	29	141
		EP074: Trichloroethene	79-01-6	2 mg/kg	74.3	50	126
EP074F: Halogenated Aromatic Compounds (QCLot: 248566)							
EM1515966-003	Anonymous	EP074: Chlorobenzene	108-90-7	2 mg/kg	94.6	65	133
EP075(SIM)B: Polynuclear Aromatic Hydrocarbons (QCLot: 249202)							
EM1515910-017	GW36(0.9-1.0)	EP075(SIM): Acenaphthene	83-32-9	3 mg/kg	99.9	67	117

Sub-Matrix: **SOIL**

				Matrix Spike (MS) Report			
				Spike	SpikeRecovery(%)	Recovery Limits (%)	
Laboratory sample ID	Client sample ID	Method: Compound	CAS Number	Concentration	MS	Low	High
EP075(SIM)B: Polynuclear Aromatic Hydrocarbons (QCLot: 249202) - continued							
EM1515910-017	GW36(0.9-1.0)	EP075(SIM): Pyrene	129-00-0	3 mg/kg	117	52	148
EP080/071: Total Petroleum Hydrocarbons (QCLot: 255546)							
EM1515910-017	GW36(0.9-1.0)	EP071: C10 - C14 Fraction	----	658 mg/kg	94.8	53	123
		EP071: C15 - C28 Fraction	----	3160 mg/kg	92.7	70	124
		EP071: C29 - C36 Fraction	----	1448 mg/kg	98.3	64	118
EP080/071: Total Recoverable Hydrocarbons - NEPM 2013 Fractions (QCLot: 255546)							
EM1515910-017	GW36(0.9-1.0)	EP071: >C10 - C16 Fraction	>C10_C16	1051 mg/kg	96.5	65	123
		EP071: >C16 - C34 Fraction	----	4124 mg/kg	93.8	67	121
		EP071: >C34 - C40 Fraction	----	161 mg/kg	110	44	126

Sub-Matrix: **WATER**

				Matrix Spike (MS) Report			
				Spike	SpikeRecovery(%)	Recovery Limits (%)	
Laboratory sample ID	Client sample ID	Method: Compound	CAS Number	Concentration	MS	Low	High
EG020T: Total Metals by ICP-MS (QCLot: 250233)							
EM1515703-008	Anonymous	EG020A-T: Arsenic	7440-38-2	1 mg/L	108	82	118
		EG020A-T: Cadmium	7440-43-9	0.25 mg/L	112	75	129
		EG020A-T: Chromium	7440-47-3	1 mg/L	99.0	80	118
		EG020A-T: Copper	7440-50-8	1 mg/L	102	81	115
		EG020A-T: Lead	7439-92-1	1 mg/L	98.8	83	121
		EG020A-T: Nickel	7440-02-0	1 mg/L	104	80	118
		EG020A-T: Zinc	7440-66-6	1 mg/L	99.8	74	116
EG035T: Total Recoverable Mercury by FIMS (QCLot: 250303)							
EM1515922-001	Anonymous	EG035T: Mercury	7439-97-6	0.01 mg/L	108	70	130
EP080/071: Total Petroleum Hydrocarbons (QCLot: 249115)							
EM1515911-001	Anonymous	EP080: C6 - C9 Fraction	----	280 µg/L	84.6	43	125
EP080/071: Total Recoverable Hydrocarbons - NEPM 2013 Fractions (QCLot: 249115)							
EM1515911-001	Anonymous	EP080: C6 - C10 Fraction	C6_C10	330 µg/L	83.7	44	122
EP080: BTEXN (QCLot: 249115)							
EM1515911-001	Anonymous	EP080: Benzene	71-43-2	20 µg/L	101	68	130
		EP080: Toluene	108-88-3	20 µg/L	102	72	132

ALS Environmental

QA/QC Compliance Assessment for DQO Reporting

Work Order	: **EM1515910**	Page	: 1 of 8
Client	: **AECOM Australia Pty Ltd**	Laboratory	: Environmental Division Melbourne
Contact	: MS AVERYLL COYNE	Telephone	: +61-3-8549 9608
Project	: 60431087	Date Samples Received	: 16-Oct-2015
Site	: Fishermans Bend	Issue Date	: 27-Oct-2015
Sampler	: DUGALD CUNNINGHAM, MATTHEW SHEPPARD, NATHAN JENSEN	No. of samples received	: 51
Order number	: 60431087 Task No 1.4	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.**
- **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: **SOIL**

Quality Control Sample Type / Method	Count QC	Count Regular	Rate (%) Actual	Rate (%) Expected	Quality Control Specification
Laboratory Duplicates (DUP)					
TRH Volatiles/BTEX	0	2	0.00	10.00	NEPM 2013 Schedule B(3) and ALS QCS3 requirement
Matrix Spikes (MS)					
TRH Volatiles/BTEX	0	2	0.00	5.00	NEPM 2013 Schedule B(3) and ALS QCS3 requirement

Matrix: **WATER**

Quality Control Sample Type / Method	Count QC	Count Regular	Rate (%) Actual	Rate (%) Expected	Quality Control Specification
Laboratory Duplicates (DUP)					
TRH - Semivolatile Fraction	0	19	0.00	10.00	NEPM 2013 Schedule B(3) and ALS QCS3 requirement
Matrix Spikes (MS)					
TRH - Semivolatile Fraction	0	19	0.00	5.00	NEPM 2013 Schedule B(3) and ALS QCS3 requirement

Analysis Holding Time Compliance

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: Date extracted	Extraction / Preparation: Due for extraction	Extraction / Preparation: Evaluation	Analysis: Date analysed	Analysis: Due for analysis	Analysis: Evaluation
EA001: pH in soil using 0.01M CaCl extract							
Soil Glass Jar - Unpreserved (EA001)							
GW36(0.5-0.6), GW36(0.9-1.0), GW12(0.5-0.6), GW12(0.9-1.0)	**15-Oct-2015**	**21-Oct-2015**	22-Oct-2015	✓	**21-Oct-2015**	22-Oct-2015	✓
EA055: Moisture Content							
Soil Glass Jar - Unpreserved (EA055-103)							
GW36(0.5-0.6), GW36(0.9-1.0), GW12(0.5-0.6), GW12(0.9-1.0)	**15-Oct-2015**	**----**	----	----	**20-Oct-2015**	29-Oct-2015	✓
Soil Glass Jar - Unpreserved (EA055-103)							
GW04(3.3-3.4), GW11(2.3-2.4), GW36(1.6-1.7)	**15-Oct-2015**	**----**	----	----	**23-Oct-2015**	29-Oct-2015	✓
ED040N: Sulfate - Calcium Phosphate Soluble (NEPM)							
Soil Glass Jar - Unpreserved (ED040N)							
GW36(0.5-0.6), GW36(0.9-1.0), GW12(0.5-0.6), GW12(0.9-1.0)	**15-Oct-2015**	**22-Oct-2015**	12-Apr-2016	✓	**22-Oct-2015**	12-Apr-2016	✓

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
EG005T: Total Metals by ICP-AES							
Soil Glass Jar - Unpreserved (EG005T)							
GW36(0.5-0.6), GW36(0.9-1.0), GW12(0.5-0.6), GW12(0.9-1.0)	**15-Oct-2015**	**21-Oct-2015**	12-Apr-2016	✓	**21-Oct-2015**	12-Apr-2016	✓
EG035T: Total Recoverable Mercury by FIMS							
Soil Glass Jar - Unpreserved (EG035T)							
GW36(0.5-0.6), GW36(0.9-1.0), GW12(0.5-0.6), GW12(0.9-1.0)	**15-Oct-2015**	**21-Oct-2015**	12-Nov-2015	✓	**22-Oct-2015**	12-Nov-2015	✓
EP003: Total Organic Carbon (TOC) in Soil							
Soil Glass Jar - Unpreserved (EP003)							
GW04(3.3-3.4), GW11(2.3-2.4), GW36(1.6-1.7)	**15-Oct-2015**	**26-Oct-2015**	12-Nov-2015	✓	**26-Oct-2015**	12-Nov-2015	✓
EP080/071: Total Petroleum Hydrocarbons							
Soil Glass Jar - Unpreserved (EP071)							
GW36(0.5-0.6), GW36(0.9-1.0)	**15-Oct-2015**	**26-Oct-2015**	29-Oct-2015	✓	**26-Oct-2015**	05-Dec-2015	✓
EP074A: Monocyclic Aromatic Hydrocarbons							
Soil Glass Jar - Unpreserved (EP074)							
GW36(0.5-0.6), GW36(0.9-1.0), GW12(0.5-0.6), GW12(0.9-1.0)	**15-Oct-2015**	**20-Oct-2015**	22-Oct-2015	✓	**22-Oct-2015**	22-Oct-2015	✓
EP075(SIM)B: Polynuclear Aromatic Hydrocarbons							
Soil Glass Jar - Unpreserved (EP075(SIM))							
GW36(0.5-0.6), GW36(0.9-1.0), GW12(0.5-0.6), GW12(0.9-1.0)	**15-Oct-2015**	**20-Oct-2015**	29-Oct-2015	✓	**21-Oct-2015**	29-Nov-2015	✓
EP080/071: Total Petroleum Hydrocarbons							
Soil Glass Jar - Unpreserved (EP080)							
GW36(0.5-0.6), GW36(0.9-1.0)	**15-Oct-2015**	**20-Oct-2015**	29-Oct-2015	✓	**26-Oct-2015**	29-Oct-2015	✓

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)							
QC11	**15-Oct-2015**	**21-Oct-2015**	12-Apr-2016	✓	**22-Oct-2015**	12-Apr-2016	✓
EG035T: Total Recoverable Mercury by FIMS							
Clear Plastic Bottle - Nitric Acid; Unfiltered (EG035T)							
QC11	**15-Oct-2015**	**----**	----	----	**21-Oct-2015**	12-Nov-2015	✓
EP080/071: Total Petroleum Hydrocarbons							
Amber Glass Bottle - Unpreserved (EP071)							
QC11	**15-Oct-2015**	**20-Oct-2015**	22-Oct-2015	✓	**21-Oct-2015**	29-Nov-2015	✓

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 Petroleum Hydrocarbons							
Amber VOC Vial - Sulfuric Acid (EP080)							
QC11, QC12, QC13	**15-Oct-2015**	**21-Oct-2015**	29-Oct-2015	✓	**22-Oct-2015**	29-Oct-2015	✓

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	EA055-103	2	20	**10.00**	**10.00**	✓	NEPM 2013 Schedule B(3) and ALS QCS3 requirement
PAH/Phenols (SIM)	EP075(SIM)	2	13	**15.38**	**10.00**	✓	NEPM 2013 Schedule B(3) and ALS QCS3 requirement
pH in soil using a 0.01M CaCl2 extract	EA001	1	8	**12.50**	**10.00**	✓	NEPM 2013 Schedule B(3) and ALS QCS3 requirement
Sulfate - Calcium Phosphate Soluble	ED040N	2	15	**13.33**	**10.00**	✓	NEPM 2013 Schedule B(3) and ALS QCS3 requirement
Total Mercury by FIMS	EG035T	2	20	**10.00**	**10.00**	✓	NEPM 2013 Schedule B(3) and ALS QCS3 requirement
Total Metals by ICP-AES	EG005T	2	20	**10.00**	**10.00**	✓	NEPM 2013 Schedule B(3) and ALS QCS3 requirement
Total Organic Carbon	EP003	2	13	**15.38**	**10.00**	✓	NEPM 2013 Schedule B(3) and ALS QCS3 requirement
TRH - Semivolatile Fraction	EP071	1	5	**20.00**	**10.00**	✓	NEPM 2013 Schedule B(3) and ALS QCS3 requirement
TRH Volatiles/BTEX	EP080	0	2	**0.00**	**10.00**	×	NEPM 2013 Schedule B(3) and ALS QCS3 requirement
Volatile Organic Compounds	EP074	1	8	**12.50**	**10.00**	✓	NEPM 2013 Schedule B(3) and ALS QCS3 requirement
Laboratory Control Samples (LCS)							
PAH/Phenols (SIM)	EP075(SIM)	1	13	**7.69**	**5.00**	✓	NEPM 2013 Schedule B(3) and ALS QCS3 requirement
Sulfate - Calcium Phosphate Soluble	ED040N	1	15	**6.67**	**5.00**	✓	NEPM 2013 Schedule B(3) and ALS QCS3 requirement
Total Mercury by FIMS	EG035T	1	20	**5.00**	**5.00**	✓	NEPM 2013 Schedule B(3) and ALS QCS3 requirement
Total Metals by ICP-AES	EG005T	1	20	**5.00**	**5.00**	✓	NEPM 2013 Schedule B(3) and ALS QCS3 requirement
Total Organic Carbon	EP003	1	13	**7.69**	**5.00**	✓	NEPM 2013 Schedule B(3) and ALS QCS3 requirement
TRH - Semivolatile Fraction	EP071	1	5	**20.00**	**5.00**	✓	NEPM 2013 Schedule B(3) and ALS QCS3 requirement
TRH Volatiles/BTEX	EP080	1	2	**50.00**	**5.00**	✓	NEPM 2013 Schedule B(3) and ALS QCS3 requirement
Volatile Organic Compounds	EP074	1	8	**12.50**	**5.00**	✓	NEPM 2013 Schedule B(3) and ALS QCS3 requirement
Method Blanks (MB)							
PAH/Phenols (SIM)	EP075(SIM)	1	13	**7.69**	**5.00**	✓	NEPM 2013 Schedule B(3) and ALS QCS3 requirement
Sulfate - Calcium Phosphate Soluble	ED040N	1	15	**6.67**	**5.00**	✓	NEPM 2013 Schedule B(3) and ALS QCS3 requirement
Total Mercury by FIMS	EG035T	1	20	**5.00**	**5.00**	✓	NEPM 2013 Schedule B(3) and ALS QCS3 requirement
Total Metals by ICP-AES	EG005T	1	20	**5.00**	**5.00**	✓	NEPM 2013 Schedule B(3) and ALS QCS3 requirement
Total Organic Carbon	EP003	1	13	**7.69**	**5.00**	✓	NEPM 2013 Schedule B(3) and ALS QCS3 requirement
TRH - Semivolatile Fraction	EP071	1	5	**20.00**	**5.00**	✓	NEPM 2013 Schedule B(3) and ALS QCS3 requirement
TRH Volatiles/BTEX	EP080	1	2	**50.00**	**5.00**	✓	NEPM 2013 Schedule B(3) and ALS QCS3 requirement
Volatile Organic Compounds	EP074	1	8	**12.50**	**5.00**	✓	NEPM 2013 Schedule B(3) and ALS QCS3 requirement
Matrix Spikes (MS)							
PAH/Phenols (SIM)	EP075(SIM)	1	13	**7.69**	**5.00**	✓	NEPM 2013 Schedule B(3) and ALS QCS3 requirement
Sulfate - Calcium Phosphate Soluble	ED040N	1	15	**6.67**	**5.00**	✓	NEPM 2013 Schedule B(3) and ALS QCS3 requirement
Total Mercury by FIMS	EG035T	1	20	**5.00**	**5.00**	✓	NEPM 2013 Schedule B(3) and ALS QCS3 requirement
Total Metals by ICP-AES	EG005T	1	20	**5.00**	**5.00**	✓	NEPM 2013 Schedule B(3) and ALS QCS3 requirement
TRH - Semivolatile Fraction	EP071	1	5	**20.00**	**5.00**	✓	NEPM 2013 Schedule B(3) and ALS QCS3 requirement
TRH Volatiles/BTEX	EP080	0	2	**0.00**	**5.00**	×	NEPM 2013 Schedule B(3) and ALS QCS3 requirement
Volatile Organic Compounds	EP074	1	8	**12.50**	**5.00**	✓	NEPM 2013 Schedule B(3) and ALS QCS3 requirement

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)							
Total Mercury by FIMS	EG035T	2	20	**10.00**	**10.00**	✓	NEPM 2013 Schedule B(3) and ALS QCS3 requirement
Total Metals by ICP-MS - Suite A	EG020A-T	2	20	**10.00**	**10.00**	✓	NEPM 2013 Schedule B(3) and ALS QCS3 requirement
TRH - Semivolatile Fraction	EP071	0	19	**0.00**	**10.00**	×	NEPM 2013 Schedule B(3) and ALS QCS3 requirement
TRH Volatiles/BTEX	EP080	2	20	**10.00**	**10.00**	✓	NEPM 2013 Schedule B(3) and ALS QCS3 requirement
Laboratory Control Samples (LCS)							
Total Mercury by FIMS	EG035T	1	20	**5.00**	**5.00**	✓	NEPM 2013 Schedule B(3) and ALS QCS3 requirement
Total Metals by ICP-MS - Suite A	EG020A-T	1	20	**5.00**	**5.00**	✓	NEPM 2013 Schedule B(3) and ALS QCS3 requirement
TRH - Semivolatile Fraction	EP071	1	19	**5.26**	**5.00**	✓	NEPM 2013 Schedule B(3) and ALS QCS3 requirement
TRH Volatiles/BTEX	EP080	1	20	**5.00**	**5.00**	✓	NEPM 2013 Schedule B(3) and ALS QCS3 requirement
Method Blanks (MB)							
Total Mercury by FIMS	EG035T	1	20	**5.00**	**5.00**	✓	NEPM 2013 Schedule B(3) and ALS QCS3 requirement
Total Metals by ICP-MS - Suite A	EG020A-T	1	20	**5.00**	**5.00**	✓	NEPM 2013 Schedule B(3) and ALS QCS3 requirement
TRH - Semivolatile Fraction	EP071	1	19	**5.26**	**5.00**	✓	NEPM 2013 Schedule B(3) and ALS QCS3 requirement
TRH Volatiles/BTEX	EP080	1	20	**5.00**	**5.00**	✓	NEPM 2013 Schedule B(3) and ALS QCS3 requirement
Matrix Spikes (MS)							
Total Mercury by FIMS	EG035T	1	20	**5.00**	**5.00**	✓	NEPM 2013 Schedule B(3) and ALS QCS3 requirement
Total Metals by ICP-MS - Suite A	EG020A-T	1	20	**5.00**	**5.00**	✓	NEPM 2013 Schedule B(3) and ALS QCS3 requirement
TRH - Semivolatile Fraction	EP071	0	19	**0.00**	**5.00**	×	NEPM 2013 Schedule B(3) and ALS QCS3 requirement
TRH Volatiles/BTEX	EP080	1	20	**5.00**	**5.00**	✓	NEPM 2013 Schedule B(3) and ALS QCS3 requirement

Brief Method Summaries

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

Analytical Methods	Method	Matrix	Method Descriptions
pH in soil using a 0.01M CaCl2 extract	EA001	SOIL	In house: Referenced to Rayment and Higginson 4B1 (mod.) 10 g of soil is mixed with 50 mL of 0.01M CaCl2 and tumbled end over end for 1 hour. pH is measured from the continuous suspension. This method is compliant with NEPM (2013) Schedule B(3) (Method 103)
Moisture Content	EA055-103	SOIL	In-house. A gravimetric procedure based on weight loss over a 12 hour drying period at 103-105 degrees C. This method is compliant with NEPM (2013) Schedule B(3) Section 7.1 and Table 1 (14 day holding time).
Sulfate - Calcium Phosphate Soluble	ED040N	SOIL	In-house. The sample is extracted with a calcium phosphate solution. The phosphate ion displaces the adsorbed sulfate while calcium ions depress the extraction of interfering S from soil organic matter. SO4 in the extract is determined by ICPAES and reported as dry weight in the original soil. This method is compliant with NEPM (2013) Schedule B(3) (Method 406)
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 (2013) 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 (2013) Schedule B(3)
Total Organic Carbon	EP003	SOIL	In-house C-IR17. Dried and pulverised sample is reacted with acid to remove inorganic Carbonates, then combusted in a LECO furnace in the presence of strong oxidants / catalysts. The evolved (Organic) Carbon (as CO2) is automaticaly measured by infra-red detector.
TRH - Semivolatile Fraction	EP071	SOIL	(USEPA SW 846 - 8015A) Sample extracts are analysed by Capillary GC/FID and quantified against alkane standards over the range C10 - C40.
Volatile Organic Compounds	EP074	SOIL	(USEPA SW 846 - 8260B) Extracts are analysed by Purge and Trap, Capillary GC/MS. Quantification is by comparison against an established 5 point calibration curve. This method is compliant with NEPM (2013) Schedule B(3) (Method 501)
PAH/Phenols (SIM)	EP075(SIM)	SOIL	(USEPA SW 846 - 8270B) 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 (2013) Schedule B(3) (Method 502 and 507)
TRH Volatiles/BTEX	EP080	SOIL	(USEPA SW 846 - 8260B) Extracts are analysed by Purge and Trap, Capillary GC/MS. Quantification is by comparison against an established 5 point calibration curve.
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.

Analytical Methods	Method	Matrix	Method Descriptions
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 (2013) Schedule B(3)
TRH - Semivolatile Fraction	EP071	WATER	USEPA SW 846 - 8015A 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 (2013) Schedule B(3)
TRH Volatiles/BTEX	EP080	WATER	USEPA SW 846 - 8260B 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 (2013) Schedule B(3)

Preparation Methods	Method	Matrix	Method Descriptions
Dry and Pulverise (up to 100g)	GEO30	SOIL	#
Methanolic Extraction of Soils for Purge and Trap	ORG16	SOIL	(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	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 (2013) Schedule B(3)

SAMPLE RECEIPT NOTIFICATION (SRN)

Work Order : **EM1515910**

Client	: **AECOM Australia Pty Ltd**	Laboratory	: Environmental Division Melbourne
Contact	: MS AVERYLL COYNE	Contact	: Carsten Emrich
Address	: LEVEL 9 8 EXHIBITION ST MELBOURNE VIC 3000	Address	: 4 Westall Rd Springvale VIC Australia 3171
E-mail	: averyll.coyne@aecom.com	E-mail	: carsten.emrich@alsenviro.com
Telephone	: +61 03 9653 1234	Telephone	: +61 7 3243 7123
Facsimile	: +61 03 9654 7117	Facsimile	: +61-3-8549 9601
Project	: 60431087	Page	: 1 of 4
Order number	:	Quote number	: EB2015AECOMAU0580 (EN/004/15)
C-O-C number	: ----	QC Level	: NEPM 2013 Schedule B(3) and ALS QCS3 requirement
Site	: Fishermans Bend		
Sampler	: DUGALD CUNNINGHAM, MATTHEW SHEPPARD, NATHAN JENSEN		

Dates

Date Samples Received	: 16-Oct-2015 5:45 PM	Issue Date	: 19-Oct-2015
Client Requested Due Date	: 27-Oct-2015	Scheduled Reporting Date	: **27-Oct-2015**

Delivery Details

Mode of Delivery	: Carrier	Security Seal	: Intact.
No. of coolers/boxes	: 4	Temperature	: 4.3°C - Ice present
Receipt Detail	:	No. of samples received / analysed	: 51 / 10

General Comments

- This report contains the following information:
  - Sample Container(s)/Preservation Non-Compliances
  - Summary of Sample(s) and Requested Analysis
  - Proactive Holding Time Report
  - Requested Deliverables
- **Please direct any queries related to sample condition / numbering / breakages to Client Services.**
- Sample Disposal - Aqueous (14 days), Solid (60 days) from date of completion of work order.
- **Analytical work for this work order will be conducted at ALS Springvale and ALS Brisbane.**
- **Please refer to the Proactive Holding Time Report table below which summarises breaches of recommended holding times that have occurred prior to samples/instructions being received at the laboratory. The absence of this summary table indicates that all samples have been received within the recommended holding times for the analysis requested.**

Sample Container(s)/Preservation Non-Compliances

All comparisons are made against pretreatment/preservation AS, APHA, USEPA standards.

- **No sample container / preservation non-compliance exist.**

Summary of Sample(s) and Requested Analysis

Some items described below may be part of a laboratory process necessary for the execution of client requested tasks. Packages may contain additional analyses, such as the determination of moisture content and preparation tasks, that are included in the package.

Matrix: **SOIL**

Laboratory sample ID	Client sampling date / time	Client sample ID	(On Hold) SOIL No analysis requested	SOIL - EA055-103 Moisture Content	SOIL - EG005T (solids) Total Metals by ICP-AES	SOIL - EP003 Total Organic Carbon (TOC) in Soil	SOIL - EP074 (solids) Volatile Organic Compounds	SOIL - EP075 SIM PAH only SIM - PAH only	SOIL - S-02 8 Metals (incl. Digestion)
EM1515910-001	[15-Oct-2015]	GW04(1.9-2.0)	✓						
EM1515910-002	[15-Oct-2015]	GW04(3.0-3.1)	✓						
EM1515910-003	[15-Oct-2015]	GW04(3.3-3.4)		✓		✓			
EM1515910-004	[15-Oct-2015]	GW04(4.0-4.1)	✓						
EM1515910-005	[15-Oct-2015]	GW04(5.0-5.1)	✓						
EM1515910-006	[15-Oct-2015]	GW11(0.0-0.1)	✓						
EM1515910-007	[15-Oct-2015]	GW11(0.5-0.6)	✓						
EM1515910-008	[15-Oct-2015]	GW11(0.9-1.0)	✓						
EM1515910-009	[15-Oct-2015]	GW11(1.4-1.5)	✓						
EM1515910-010	[15-Oct-2015]	GW11(1.7-1.8)	✓						
EM1515910-011	[15-Oct-2015]	GW11(2.3-2.4)		✓		✓			
EM1515910-012	[15-Oct-2015]	GW11(3.0-3.1)	✓						
EM1515910-013	[15-Oct-2015]	GW11(4.0-4.1)	✓						
EM1515910-014	[15-Oct-2015]	GW11(5.0-5.1)	✓						
EM1515910-015	[15-Oct-2015]	GW36(0.1-0.2)	✓						
EM1515910-016	[15-Oct-2015]	GW36(0.5-0.6)		✓	✓		✓	✓	✓
EM1515910-017	[15-Oct-2015]	GW36(0.9-1.0)		✓	✓		✓	✓	✓
EM1515910-018	[15-Oct-2015]	GW36(1.4-1.5)	✓						
EM1515910-019	[15-Oct-2015]	GW36(1.6-1.7)		✓		✓			
EM1515910-020	[15-Oct-2015]	GW36(1.9-2.0)	✓						
EM1515910-021	[15-Oct-2015]	GW36(2.5-2.6)	✓						
EM1515910-022	[15-Oct-2015]	GW36(3.0-3.1)	✓						
EM1515910-023	[15-Oct-2015]	GW36(4.0-4.1)	✓						
EM1515910-024	[15-Oct-2015]	GW36(5.0-5.1)	✓						
EM1515910-025	[15-Oct-2015]	GW07(0.0-0.1)	✓						
EM1515910-026	[15-Oct-2015]	GW07(0.5-0.6)	✓						
EM1515910-027	[15-Oct-2015]	GW07(0.9-1.0)	✓						
EM1515910-028	[15-Oct-2015]	GW07(1.4-1.5)	✓						
EM1515910-029	[15-Oct-2015]	GW05(0.0-0.1)	✓						
EM1515910-030	[15-Oct-2015]	GW05(0.4-0.5)	✓						
EM1515910-031	[15-Oct-2015]	GW05(0.9-1.0)	✓						
EM1515910-032	[15-Oct-2015]	GW05(1.4-1.5)	✓						
EM1515910-033	[15-Oct-2015]	GW06(0.0-0.1)	✓						
EM1515910-034	[15-Oct-2015]	GW06(0.5-0.6)	✓						
EM1515910-035	[15-Oct-2015]	GW06(0.9-1.0)	✓						

			(On Hold) SOIL No analysis requested	SOIL - EA055-103 Moisture Content	SOIL - EG005T (solids) Total Metals by ICP-AES	SOIL - EP003 Total Organic Carbon (TOC) in Soil	SOIL - EP074 (solids) Volatile Organic Compounds	SOIL - EP075 SIM PAH only SIM - PAH only	SOIL - S-02 8 Metals (incl. Digestion)
EM1515910-036	[15-Oct-2015]	GW06(1.4-1.5)	✓						
EM1515910-037	[15-Oct-2015]	GW09(0.0-0.1)	✓						
EM1515910-038	[15-Oct-2015]	GW09(0.5-0.6)	✓						
EM1515910-039	[15-Oct-2015]	GW09(0.9-1.0)	✓						
EM1515910-040	[15-Oct-2015]	GW09(1.4-1.5)	✓						
EM1515910-041	[15-Oct-2015]	GW12(0.0-0.1)	✓						
EM1515910-042	[15-Oct-2015]	GW12(0.5-0.6)		✓	✓		✓	✓	✓
EM1515910-043	[15-Oct-2015]	GW12(0.9-1.0)		✓	✓		✓	✓	✓
EM1515910-044	[15-Oct-2015]	GW12(1.4-1.5)	✓						
EM1515910-045	[15-Oct-2015]	GW01(0.0-0.1)	✓						
EM1515910-046	[15-Oct-2015]	GW01(0.5-0.6)	✓						
EM1515910-047	[15-Oct-2015]	GW01(0.9-1.0)	✓						
EM1515910-048	[15-Oct-2015]	GW01(1.2-1.3)	✓						

Matrix: **WATER**

Laboratory sample ID	*Client sampling date / time*	*Client sample ID*	WATER - EG020T Total Recoverable Metals by ICPMS (including	WATER - W-05T TRH/BTEXN/8 Metals (Total)	WATER - W-18 TRH(C6 - C9)/BTEXN
EM1515910-049	[15-Oct-2015]	QC11	✓	✓	
EM1515910-050	[15-Oct-2015]	QC12			✓
EM1515910-051	[15-Oct-2015]	QC13			✓

Proactive Holding Time Report

Sample(s) have been received within the recommended holding times for the requested analysis.

Requested Deliverables

AP_CUSTOMER SERVICE ANZ

- A4 - AU Tax Invoice (INV)	Email	ap_customerservice.anz@aecom.com

AVERYLL COYNE

- *AU Certificate of Analysis - NATA (COA)	Email	averyll.coyne@aecom.com
- *AU Interpretive QC Report - DEFAULT (Anon QCI Rep) (QCI)	Email	averyll.coyne@aecom.com
- *AU QC Report - DEFAULT (Anon QC Rep) - NATA (QC)	Email	averyll.coyne@aecom.com
- A4 - AU Sample Receipt Notification - Environmental HT (SRN)	Email	averyll.coyne@aecom.com
- A4 - AU Tax Invoice (INV)	Email	averyll.coyne@aecom.com
- Chain of Custody (CoC) (COC)	Email	averyll.coyne@aecom.com
- EDI Format - ENMRG (ENMRG)	Email	averyll.coyne@aecom.com
- EDI Format - ESDAT (ESDAT)	Email	averyll.coyne@aecom.com
- EDI Format - HLAPro (HLAPro)	Email	averyll.coyne@aecom.com
- EDI Format - XTab (XTAB)	Email	averyll.coyne@aecom.com

SAMPLE RECEIPT NOTIFICATION (SRN)

Work Order : **EM1515910**

Client	: **AECOM Australia Pty Ltd**	Laboratory	: Environmental Division Melbourne
Contact	: MS AVERYLL COYNE	Contact	: Carsten Emrich
Address	: LEVEL 9 8 EXHIBITION ST MELBOURNE VIC 3000	Address	: 4 Westall Rd Springvale VIC Australia 3171
E-mail	: averyll.coyne@aecom.com	E-mail	: carsten.emrich@alsenviro.com
Telephone	: +61 03 9653 1234	Telephone	: +61 7 3243 7123
Facsimile	: +61 03 9654 7117	Facsimile	: +61-3-8549 9601
Project	: 60431087	Page	: 1 of 4
Order number	: 60431087 Task No 1.4	Quote number	: EB2015AECOMAU0580 (EN/004/15)
C-O-C number	: ----	QC Level	: NEPM 2013 Schedule B(3) and ALS QCS3 requirement
Site	: Fishermans Bend		
Sampler	: DUGALD CUNNINGHAM, MATTHEW SHEPPARD, NATHAN JENSEN		

Dates

Date Samples Received	: 16-Oct-2015 5:45 PM	Issue Date	: 20-Oct-2015
Client Requested Due Date	: 27-Oct-2015	Scheduled Reporting Date	: **27-Oct-2015**

Delivery Details

Mode of Delivery	: Carrier	Security Seal	: Intact.
No. of coolers/boxes	: 4	Temperature	: 4.3°C - Ice present
Receipt Detail	:	No. of samples received / analysed	: 51 / 10

General Comments

- This report contains the following information:
  - Sample Container(s)/Preservation Non-Compliances
  - Summary of Sample(s) and Requested Analysis
  - Proactive Holding Time Report
  - Requested Deliverables
- **Please direct any queries related to sample condition / numbering / breakages to Client Services.**
- Sample Disposal - Aqueous (14 days), Solid (60 days) from date of completion of work order.
- **Analytical work for this work order will be conducted at ALS Springvale and ALS Brisbane.**
- **Please refer to the Proactive Holding Time Report table below which summarises breaches of recommended holding times that have occurred prior to samples/instructions being received at the laboratory. The absence of this summary table indicates that all samples have been received within the recommended holding times for the analysis requested.**

Sample Container(s)/Preservation Non-Compliances

All comparisons are made against pretreatment/preservation AS, APHA, USEPA standards.

- **No sample container / preservation non-compliance exist.**

Summary of Sample(s) and Requested Analysis

Some items described below may be part of a laboratory process necessary for the execution of client requested tasks. Packages may contain additional analyses, such as the determination of moisture content and preparation tasks, that are included in the package.

Matrix: **SOIL**

Laboratory sample ID	Client sampling date / time	Client sample ID	(On Hold) SOIL No analysis requested	SOIL - EA055-103 Moisture Content	SOIL - EG005T (solids) Total Metals by ICP-AES	SOIL - EP003 Total Organic Carbon (TOC) in Soil	SOIL - EP074 (solids) Volatile Organic Compounds	SOIL - EP075 SIM PAH only SIM - PAH only	SOIL - S-02 8 Metals (incl. Digestion)
EM1515910-001	[15-Oct-2015]	GW04(1.9-2.0)	✓						
EM1515910-002	[15-Oct-2015]	GW04(3.0-3.1)	✓						
EM1515910-003	[15-Oct-2015]	GW04(3.3-3.4)		✓		✓			
EM1515910-004	[15-Oct-2015]	GW04(4.0-4.1)	✓						
EM1515910-005	[15-Oct-2015]	GW04(5.0-5.1)	✓						
EM1515910-006	[15-Oct-2015]	GW11(0.0-0.1)	✓						
EM1515910-007	[15-Oct-2015]	GW11(0.5-0.6)	✓						
EM1515910-008	[15-Oct-2015]	GW11(0.9-1.0)	✓						
EM1515910-009	[15-Oct-2015]	GW11(1.4-1.5)	✓						
EM1515910-010	[15-Oct-2015]	GW11(1.7-1.8)	✓						
EM1515910-011	[15-Oct-2015]	GW11(2.3-2.4)		✓		✓			
EM1515910-012	[15-Oct-2015]	GW11(3.0-3.1)	✓						
EM1515910-013	[15-Oct-2015]	GW11(4.0-4.1)	✓						
EM1515910-014	[15-Oct-2015]	GW11(5.0-5.1)	✓						
EM1515910-015	[15-Oct-2015]	GW36(0.1-0.2)	✓						
EM1515910-016	[15-Oct-2015]	GW36(0.5-0.6)		✓	✓		✓	✓	✓
EM1515910-017	[15-Oct-2015]	GW36(0.9-1.0)		✓	✓		✓	✓	✓
EM1515910-018	[15-Oct-2015]	GW36(1.4-1.5)	✓						
EM1515910-019	[15-Oct-2015]	GW36(1.6-1.7)		✓		✓			
EM1515910-020	[15-Oct-2015]	GW36(1.9-2.0)	✓						
EM1515910-021	[15-Oct-2015]	GW36(2.5-2.6)	✓						
EM1515910-022	[15-Oct-2015]	GW36(3.0-3.1)	✓						
EM1515910-023	[15-Oct-2015]	GW36(4.0-4.1)	✓						
EM1515910-024	[15-Oct-2015]	GW36(5.0-5.1)	✓						
EM1515910-025	[15-Oct-2015]	GW07(0.0-0.1)	✓						
EM1515910-026	[15-Oct-2015]	GW07(0.5-0.6)	✓						
EM1515910-027	[15-Oct-2015]	GW07(0.9-1.0)	✓						
EM1515910-028	[15-Oct-2015]	GW07(1.4-1.5)	✓						
EM1515910-029	[15-Oct-2015]	GW05(0.0-0.1)	✓						
EM1515910-030	[15-Oct-2015]	GW05(0.4-0.5)	✓						
EM1515910-031	[15-Oct-2015]	GW05(0.9-1.0)	✓						
EM1515910-032	[15-Oct-2015]	GW05(1.4-1.5)	✓						
EM1515910-033	[15-Oct-2015]	GW06(0.0-0.1)	✓						
EM1515910-034	[15-Oct-2015]	GW06(0.5-0.6)	✓						
EM1515910-035	[15-Oct-2015]	GW06(0.9-1.0)	✓						

			(On Hold) SOIL No analysis requested	SOIL - EA055-103 Moisture Content	SOIL - EG005T (solids) Total Metals by ICP-AES	SOIL - EP003 Total Organic Carbon (TOC) in Soil	SOIL - EP074 (solids) Volatile Organic Compounds	SOIL - EP075 SIM PAH only SIM - PAH only	SOIL - S-02 8 Metals (incl. Digestion)
EM1515910-036	[15-Oct-2015]	GW06(1.4-1.5)	✓						
EM1515910-037	[15-Oct-2015]	GW09(0.0-0.1)	✓						
EM1515910-038	[15-Oct-2015]	GW09(0.5-0.6)	✓						
EM1515910-039	[15-Oct-2015]	GW09(0.9-1.0)	✓						
EM1515910-040	[15-Oct-2015]	GW09(1.4-1.5)	✓						
EM1515910-041	[15-Oct-2015]	GW12(0.0-0.1)	✓						
EM1515910-042	[15-Oct-2015]	GW12(0.5-0.6)		✓	✓		✓	✓	✓
EM1515910-043	[15-Oct-2015]	GW12(0.9-1.0)		✓	✓		✓	✓	✓
EM1515910-044	[15-Oct-2015]	GW12(1.4-1.5)	✓						
EM1515910-045	[15-Oct-2015]	GW01(0.0-0.1)	✓						
EM1515910-046	[15-Oct-2015]	GW01(0.5-0.6)	✓						
EM1515910-047	[15-Oct-2015]	GW01(0.9-1.0)	✓						
EM1515910-048	[15-Oct-2015]	GW01(1.2-1.3)	✓						

Matrix: **WATER**

Laboratory sample ID	*Client sampling date / time*	*Client sample ID*	WATER - EG020T Total Recoverable Metals by ICPMS (including	WATER - W-05T TRH/BTEXN/8 Metals (Total)	WATER - W-18 TRH(C6 - C9)/BTEXN
EM1515910-049	[15-Oct-2015]	QC11	✓	✓	
EM1515910-050	[15-Oct-2015]	QC12			✓
EM1515910-051	[15-Oct-2015]	QC13			✓

Proactive Holding Time Report

Sample(s) have been received within the recommended holding times for the requested analysis.

Requested Deliverables

AP_CUSTOMER SERVICE ANZ

- A4 - AU Tax Invoice (INV)	Email	ap_customerservice.anz@aecom.com

AVERYLL COYNE

- *AU Certificate of Analysis - NATA (COA)	Email	averyll.coyne@aecom.com
- *AU Interpretive QC Report - DEFAULT (Anon QCI Rep) (QCI)	Email	averyll.coyne@aecom.com
- *AU QC Report - DEFAULT (Anon QC Rep) - NATA (QC)	Email	averyll.coyne@aecom.com
- A4 - AU Sample Receipt Notification - Environmental HT (SRN)	Email	averyll.coyne@aecom.com
- A4 - AU Tax Invoice (INV)	Email	averyll.coyne@aecom.com
- Chain of Custody (CoC) (COC)	Email	averyll.coyne@aecom.com
- EDI Format - ENMRG (ENMRG)	Email	averyll.coyne@aecom.com
- EDI Format - ESDAT (ESDAT)	Email	averyll.coyne@aecom.com
- EDI Format - HLAPro (HLAPro)	Email	averyll.coyne@aecom.com
- EDI Format - XTab (XTAB)	Email	averyll.coyne@aecom.com

SAMPLE RECEIPT NOTIFICATION (SRN)

Work Order : **EM1515910**

Client	: **AECOM Australia Pty Ltd**	Laboratory	: Environmental Division Melbourne
Contact	: MS AVERYLL COYNE	Contact	: Carsten Emrich
Address	: LEVEL 9 8 EXHIBITION ST MELBOURNE VIC 3000	Address	: 4 Westall Rd Springvale VIC Australia 3171
E-mail	: averyll.coyne@aecom.com	E-mail	: carsten.emrich@alsenviro.com
Telephone	: +61 03 9653 1234	Telephone	: +61 7 3243 7123
Facsimile	: +61 03 9654 7117	Facsimile	: +61-3-8549 9601
Project	: 60431087	Page	: 1 of 4
Order number	: 60431087 Task No 1.4	Quote number	: EB2015AECOMAU0580 (EN/004/15)
C-O-C number	: ----	QC Level	: NEPM 2013 Schedule B(3) and ALS QCS3 requirement
Site	: Fishermans Bend		
Sampler	: DUGALD CUNNINGHAM, MATTHEW SHEPPARD, NATHAN JENSEN		

Dates

Date Samples Received	: 16-Oct-2015 5:45 PM	Issue Date	: 21-Oct-2015
Client Requested Due Date	: 27-Oct-2015	Scheduled Reporting Date	: **27-Oct-2015**

Delivery Details

Mode of Delivery	: Carrier	Security Seal	: Intact.
No. of coolers/boxes	: 4	Temperature	: 4.3°C - Ice present
Receipt Detail	:	No. of samples received / analysed	: 51 / 10

General Comments

- This report contains the following information:
  - Sample Container(s)/Preservation Non-Compliances
  - Summary of Sample(s) and Requested Analysis
  - Proactive Holding Time Report
  - Requested Deliverables
- **Additional analysis instruction was received by ALS on 21/10/2015 at 3:04 PM.**
- **Please direct any queries related to sample condition / numbering / breakages to Client Services.**
- Sample Disposal - Aqueous (14 days), Solid (60 days) from date of completion of work order.
- **Analytical work for this work order will be conducted at ALS Springvale and ALS Brisbane.**
- **Please refer to the Proactive Holding Time Report table below which summarises breaches of recommended holding times that have occurred prior to samples/instructions being received at the laboratory. The absence of this summary table indicates that all samples have been received within the recommended holding times for the analysis requested.**

Sample Container(s)/Preservation Non-Compliances

All comparisons are made against pretreatment/preservation AS, APHA, USEPA standards.

- **No sample container / preservation non-compliance exist.**

Summary of Sample(s) and Requested Analysis

Some items described below may be part of a laboratory process necessary for the execution of client requested tasks. Packages may contain additional analyses, such as the determination of moisture content and preparation tasks, that are included in the package.

Matrix: **SOIL**

Laboratory sample ID	Client sampling date / time	Client sample ID	(On Hold) SOIL No analysis requested	SOIL - EA001 pH (CaCl)	SOIL - EA055-103 Moisture Content	SOIL - ED040N Calcium Phosphate Extractable Sulfate	SOIL - EP003 Total Organic Carbon (TOC) in Soil	SOIL - EP075 SIM PAH only SIM - PAH only	SOIL - S-02 8 Metals (incl. Digestion)
EM1515910-001	[15-Oct-2015]	GW04(1.9-2.0)	✓						
EM1515910-002	[15-Oct-2015]	GW04(3.0-3.1)	✓						
EM1515910-003	[15-Oct-2015]	GW04(3.3-3.4)			✓		✓		
EM1515910-004	[15-Oct-2015]	GW04(4.0-4.1)	✓						
EM1515910-005	[15-Oct-2015]	GW04(5.0-5.1)	✓						
EM1515910-006	[15-Oct-2015]	GW11(0.0-0.1)	✓						
EM1515910-007	[15-Oct-2015]	GW11(0.5-0.6)	✓						
EM1515910-008	[15-Oct-2015]	GW11(0.9-1.0)	✓						
EM1515910-009	[15-Oct-2015]	GW11(1.4-1.5)	✓						
EM1515910-010	[15-Oct-2015]	GW11(1.7-1.8)	✓						
EM1515910-011	[15-Oct-2015]	GW11(2.3-2.4)			✓		✓		
EM1515910-012	[15-Oct-2015]	GW11(3.0-3.1)	✓						
EM1515910-013	[15-Oct-2015]	GW11(4.0-4.1)	✓						
EM1515910-014	[15-Oct-2015]	GW11(5.0-5.1)	✓						
EM1515910-015	[15-Oct-2015]	GW36(0.1-0.2)	✓						
EM1515910-016	[15-Oct-2015]	GW36(0.5-0.6)		✓	✓	✓		✓	✓
EM1515910-017	[15-Oct-2015]	GW36(0.9-1.0)		✓	✓	✓		✓	✓
EM1515910-018	[15-Oct-2015]	GW36(1.4-1.5)	✓						
EM1515910-019	[15-Oct-2015]	GW36(1.6-1.7)			✓		✓		
EM1515910-020	[15-Oct-2015]	GW36(1.9-2.0)	✓						
EM1515910-021	[15-Oct-2015]	GW36(2.5-2.6)	✓						
EM1515910-022	[15-Oct-2015]	GW36(3.0-3.1)	✓						
EM1515910-023	[15-Oct-2015]	GW36(4.0-4.1)	✓						
EM1515910-024	[15-Oct-2015]	GW36(5.0-5.1)	✓						
EM1515910-025	[15-Oct-2015]	GW07(0.0-0.1)	✓						
EM1515910-026	[15-Oct-2015]	GW07(0.5-0.6)	✓						
EM1515910-027	[15-Oct-2015]	GW07(0.9-1.0)	✓						
EM1515910-028	[15-Oct-2015]	GW07(1.4-1.5)	✓						
EM1515910-029	[15-Oct-2015]	GW05(0.0-0.1)	✓						
EM1515910-030	[15-Oct-2015]	GW05(0.4-0.5)	✓						
EM1515910-031	[15-Oct-2015]	GW05(0.9-1.0)	✓						
EM1515910-032	[15-Oct-2015]	GW05(1.4-1.5)	✓						
EM1515910-033	[15-Oct-2015]	GW06(0.0-0.1)	✓						
EM1515910-034	[15-Oct-2015]	GW06(0.5-0.6)	✓						
EM1515910-035	[15-Oct-2015]	GW06(0.9-1.0)	✓						

			(On Hold) SOIL No analysis requested	SOIL - EA001 pH (CaCl)	SOIL - EA055-103 Moisture Content	SOIL - ED040N Calcium Phosphate Extractable Sulfate	SOIL - EP003 Total Organic Carbon (TOC) in Soil	SOIL - EP075 SIM PAH only SIM - PAH only	SOIL - S-02 8 Metals (incl. Digestion)
EM1515910-036	[15-Oct-2015]	GW06(1.4-1.5)	✓						
EM1515910-037	[15-Oct-2015]	GW09(0.0-0.1)	✓						
EM1515910-038	[15-Oct-2015]	GW09(0.5-0.6)	✓						
EM1515910-039	[15-Oct-2015]	GW09(0.9-1.0)	✓						
EM1515910-040	[15-Oct-2015]	GW09(1.4-1.5)	✓						
EM1515910-041	[15-Oct-2015]	GW12(0.0-0.1)	✓						
EM1515910-042	[15-Oct-2015]	GW12(0.5-0.6)		✓	✓	✓		✓	✓
EM1515910-043	[15-Oct-2015]	GW12(0.9-1.0)		✓	✓	✓		✓	✓
EM1515910-044	[15-Oct-2015]	GW12(1.4-1.5)	✓						
EM1515910-045	[15-Oct-2015]	GW01(0.0-0.1)	✓						
EM1515910-046	[15-Oct-2015]	GW01(0.5-0.6)	✓						
EM1515910-047	[15-Oct-2015]	GW01(0.9-1.0)	✓						
EM1515910-048	[15-Oct-2015]	GW01(1.2-1.3)	✓						

Matrix: **SOIL**

Laboratory sample ID	*Client sampling date / time*	*Client sample ID*	SOIL - EG005T (solids) Total Metals by ICP-AES	SOIL - EP074 (solids) Volatile Organic Compounds
EM1515910-016	[15-Oct-2015]	GW36(0.5-0.6)	✓	✓
EM1515910-017	[15-Oct-2015]	GW36(0.9-1.0)	✓	✓
EM1515910-042	[15-Oct-2015]	GW12(0.5-0.6)	✓	✓
EM1515910-043	[15-Oct-2015]	GW12(0.9-1.0)	✓	✓

Matrix: **WATER**

Laboratory sample ID	Client sampling date / time	Client sample ID	WATER - EG020T Total Recoverable Metals by ICPMS (including	WATER - W-05T TRH/BTEXN/8 Metals (Total)	WATER - W-18 TRH(C6 - C9)/BTEXN
EM1515910-049	[15-Oct-2015]	QC11	✓	✓	
EM1515910-050	[15-Oct-2015]	QC12			✓
EM1515910-051	[15-Oct-2015]	QC13			✓

Proactive Holding Time Report

Sample(s) have been received within the recommended holding times for the requested analysis.

Requested Deliverables

AP_CUSTOMER SERVICE ANZ

- A4 - AU Tax Invoice (INV)	Email	ap_customerservice.anz@aecom.com

AVERYLL COYNE

- *AU Certificate of Analysis - NATA (COA)	Email	averyll.coyne@aecom.com
- *AU Interpretive QC Report - DEFAULT (Anon QCI Rep) (QCI)	Email	averyll.coyne@aecom.com
- *AU QC Report - DEFAULT (Anon QC Rep) - NATA (QC)	Email	averyll.coyne@aecom.com
- A4 - AU Sample Receipt Notification - Environmental HT (SRN)	Email	averyll.coyne@aecom.com
- A4 - AU Tax Invoice (INV)	Email	averyll.coyne@aecom.com
- Chain of Custody (CoC) (COC)	Email	averyll.coyne@aecom.com
- EDI Format - ENMRG (ENMRG)	Email	averyll.coyne@aecom.com
- EDI Format - ESDAT (ESDAT)	Email	averyll.coyne@aecom.com
- EDI Format - HLAPro (HLAPro)	Email	averyll.coyne@aecom.com
- EDI Format - XTab (XTAB)	Email	averyll.coyne@aecom.com

SAMPLE RECEIPT NOTIFICATION (SRN)

Work Order : **EM1515910**

Client	: **AECOM Australia Pty Ltd**	Laboratory	: Environmental Division Melbourne
Contact	: MS AVERYLL COYNE	Contact	: Carol Walsh
Address	: LEVEL 9 8 EXHIBITION ST MELBOURNE VIC 3000	Address	: 4 Westall Rd Springvale VIC Australia 3171
E-mail	: averyll.coyne@aecom.com	E-mail	: carol.walsh@alsglobal.com
Telephone	: +61 03 9653 1234	Telephone	: +61-3-8549 9608
Facsimile	: +61 03 9654 7117	Facsimile	: +61-3-8549 9601
Project	: 60431087	Page	: 1 of 4
Order number	: 60431087 Task No 1.4	Quote number	: EB2015AECOMAU0580 (EN/004/15)
C-O-C number	: ----	QC Level	: NEPM 2013 Schedule B(3) and ALS QCS3 requirement
Site	: Fishermans Bend		
Sampler	: DUGALD CUNNINGHAM, MATTHEW SHEPPARD, NATHAN JENSEN		

Dates

Date Samples Received	: 16-Oct-2015 5:45 PM	Issue Date	: 23-Oct-2015
Client Requested Due Date	: 27-Oct-2015	Scheduled Reporting Date	: **27-Oct-2015**

Delivery Details

Mode of Delivery	: Carrier	Security Seal	: Intact.
No. of coolers/boxes	: 4	Temperature	: 4.3°C - Ice present
Receipt Detail	:	No. of samples received / analysed	: 51 / 10

General Comments

- This report contains the following information:
  - Sample Container(s)/Preservation Non-Compliances
  - Summary of Sample(s) and Requested Analysis
  - Proactive Holding Time Report
  - Requested Deliverables
- **Additional analysis instruction was received by ALS on 21/10/2015 at 3:04 PM.**
- **Please direct any queries related to sample condition / numbering / breakages to Client Services.**
- Sample Disposal - Aqueous (14 days), Solid (60 days) from date of completion of work order.
- **Analytical work for this work order will be conducted at ALS Springvale and ALS Brisbane.**
- **Please refer to the Proactive Holding Time Report table below which summarises breaches of recommended holding times that have occurred prior to samples/instructions being received at the laboratory. The absence of this summary table indicates that all samples have been received within the recommended holding times for the analysis requested.**

Sample Container(s)/Preservation Non-Compliances

All comparisons are made against pretreatment/preservation AS, APHA, USEPA standards.

- **No sample container / preservation non-compliance exist.**

Summary of Sample(s) and Requested Analysis

Some items described below may be part of a laboratory process necessary for the execution of client requested tasks. Packages may contain additional analyses, such as the determination of moisture content and preparation tasks, that are included in the package.

Matrix: **SOIL**

Laboratory sample ID	Client sampling date / time	Client sample ID	(On Hold) SOIL No analysis requested	SOIL - EA001 pH (CaCl)	SOIL - EA055-103 Moisture Content	SOIL - EP003 Total Organic Carbon (TOC) in Soil	SOIL - EP075 SIM PAH only SIM - PAH only	SOIL - S-02 8 Metals (incl. Digestion)	SOIL - TPH only TRH (C6 - C40)
EM1515910-001	[15-Oct-2015]	GW04(1.9-2.0)	✓						
EM1515910-002	[15-Oct-2015]	GW04(3.0-3.1)	✓						
EM1515910-003	[15-Oct-2015]	GW04(3.3-3.4)			✓	✓			
EM1515910-004	[15-Oct-2015]	GW04(4.0-4.1)	✓						
EM1515910-005	[15-Oct-2015]	GW04(5.0-5.1)	✓						
EM1515910-006	[15-Oct-2015]	GW11(0.0-0.1)	✓						
EM1515910-007	[15-Oct-2015]	GW11(0.5-0.6)	✓						
EM1515910-008	[15-Oct-2015]	GW11(0.9-1.0)	✓						
EM1515910-009	[15-Oct-2015]	GW11(1.4-1.5)	✓						
EM1515910-010	[15-Oct-2015]	GW11(1.7-1.8)	✓						
EM1515910-011	[15-Oct-2015]	GW11(2.3-2.4)			✓	✓			
EM1515910-012	[15-Oct-2015]	GW11(3.0-3.1)	✓						
EM1515910-013	[15-Oct-2015]	GW11(4.0-4.1)	✓						
EM1515910-014	[15-Oct-2015]	GW11(5.0-5.1)	✓						
EM1515910-015	[15-Oct-2015]	GW36(0.1-0.2)	✓						
EM1515910-016	[15-Oct-2015]	GW36(0.5-0.6)		✓	✓		✓	✓	✓
EM1515910-017	[15-Oct-2015]	GW36(0.9-1.0)		✓	✓		✓	✓	✓
EM1515910-018	[15-Oct-2015]	GW36(1.4-1.5)	✓						
EM1515910-019	[15-Oct-2015]	GW36(1.6-1.7)			✓	✓			
EM1515910-020	[15-Oct-2015]	GW36(1.9-2.0)	✓						
EM1515910-021	[15-Oct-2015]	GW36(2.5-2.6)	✓						
EM1515910-022	[15-Oct-2015]	GW36(3.0-3.1)	✓						
EM1515910-023	[15-Oct-2015]	GW36(4.0-4.1)	✓						
EM1515910-024	[15-Oct-2015]	GW36(5.0-5.1)	✓						
EM1515910-025	[15-Oct-2015]	GW07(0.0-0.1)	✓						
EM1515910-026	[15-Oct-2015]	GW07(0.5-0.6)	✓						
EM1515910-027	[15-Oct-2015]	GW07(0.9-1.0)	✓						
EM1515910-028	[15-Oct-2015]	GW07(1.4-1.5)	✓						
EM1515910-029	[15-Oct-2015]	GW05(0.0-0.1)	✓						
EM1515910-030	[15-Oct-2015]	GW05(0.4-0.5)	✓						
EM1515910-031	[15-Oct-2015]	GW05(0.9-1.0)	✓						
EM1515910-032	[15-Oct-2015]	GW05(1.4-1.5)	✓						
EM1515910-033	[15-Oct-2015]	GW06(0.0-0.1)	✓						
EM1515910-034	[15-Oct-2015]	GW06(0.5-0.6)	✓						
EM1515910-035	[15-Oct-2015]	GW06(0.9-1.0)	✓						

			(On Hold) SOIL No analysis requested	SOIL - EA001 pH (CaCl)	SOIL - EA055-103 Moisture Content	SOIL - EP003 Total Organic Carbon (TOC) in Soil	SOIL - EP075 SIM PAH only SIM - PAH only	SOIL - S-02 8 Metals (incl. Digestion)	SOIL - TPH only TRH (C6 - C40)
EM1515910-036	[15-Oct-2015]	GW06(1.4-1.5)	✓						
EM1515910-037	[15-Oct-2015]	GW09(0.0-0.1)	✓						
EM1515910-038	[15-Oct-2015]	GW09(0.5-0.6)	✓						
EM1515910-039	[15-Oct-2015]	GW09(0.9-1.0)	✓						
EM1515910-040	[15-Oct-2015]	GW09(1.4-1.5)	✓						
EM1515910-041	[15-Oct-2015]	GW12(0.0-0.1)	✓						
EM1515910-042	[15-Oct-2015]	GW12(0.5-0.6)		✓	✓		✓	✓	
EM1515910-043	[15-Oct-2015]	GW12(0.9-1.0)		✓	✓		✓	✓	
EM1515910-044	[15-Oct-2015]	GW12(1.4-1.5)	✓						
EM1515910-045	[15-Oct-2015]	GW01(0.0-0.1)	✓						
EM1515910-046	[15-Oct-2015]	GW01(0.5-0.6)	✓						
EM1515910-047	[15-Oct-2015]	GW01(0.9-1.0)	✓						
EM1515910-048	[15-Oct-2015]	GW01(1.2-1.3)	✓						

Matrix: **SOIL**

Laboratory sample ID	*Client sampling date / time*	*Client sample ID*	SOIL - ED040N Calcium Phosphate Extractable Sulfate	SOIL - EG005T (solids) Total Metals by ICP-AES	SOIL - EP074 (solids) Volatile Organic Compounds
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EM1515910-017	[15-Oct-2015]	GW36(0.9-1.0)	✓	✓	✓
EM1515910-042	[15-Oct-2015]	GW12(0.5-0.6)	✓	✓	✓
EM1515910-043	[15-Oct-2015]	GW12(0.9-1.0)	✓	✓	✓

Matrix: **WATER**

Laboratory sample ID	Client sampling date / time	Client sample ID	WATER - EG020T Total Recoverable Metals by ICPMS (including	WATER - W-05T TRH/BTEXN/8 Metals (Total)	WATER - W-18 TRH(C6 - C9)/BTEXN
EM1515910-049	[15-Oct-2015]	QC11	✓	✓	
EM1515910-050	[15-Oct-2015]	QC12			✓
EM1515910-051	[15-Oct-2015]	QC13			✓

Proactive Holding Time Report

Sample(s) have been received within the recommended holding times for the requested analysis.

Requested Deliverables

AP_CUSTOMER SERVICE ANZ

- A4 - AU Tax Invoice (INV)	Email	ap_customerservice.anz@aecom.com

AVERYLL COYNE

- *AU Certificate of Analysis - NATA (COA)	Email	averyll.coyne@aecom.com
- *AU Interpretive QC Report - DEFAULT (Anon QCI Rep) (QCI)	Email	averyll.coyne@aecom.com
- *AU QC Report - DEFAULT (Anon QC Rep) - NATA (QC)	Email	averyll.coyne@aecom.com
- A4 - AU Sample Receipt Notification - Environmental HT (SRN)	Email	averyll.coyne@aecom.com
- A4 - AU Tax Invoice (INV)	Email	averyll.coyne@aecom.com
- Chain of Custody (CoC) (COC)	Email	averyll.coyne@aecom.com
- EDI Format - ENMRG (ENMRG)	Email	averyll.coyne@aecom.com
- EDI Format - ESDAT (ESDAT)	Email	averyll.coyne@aecom.com
- EDI Format - HLAPro (HLAPro)	Email	averyll.coyne@aecom.com
- EDI Format - XTab (XTAB)	Email	averyll.coyne@aecom.com

Samples received without CoC

CLIENT / SENDER:	AECOM
PROJECT:	60493108
CONTACT NAME:	
CONTACT NUMBER:	
CARRIER:	Courier
CONNOTE REFERENCE:	
SAMPLER:	
NUMBER OF SAMPLES/MATRIX:	Soil 1 90
Client services notified by:	

COC SEQUENCE NUMBER (Circle)

COC:	1	2	3	4	5	6	7
OF:	1	2	3	4	5	6	7

SAMPLES RECEIVED BY: [illegible] (AES)

DATE/TIME: 16/10 17:45

ANALYSIS RECEIVED BY:

DATE/TIME:

Comments

Environmental Division
Melbourne
Work Order Reference
EM1515910

SH 19/10 SH 19/10

Telephone : + 61-3-8549 9600

LAB ID	SAMPLE DETAILS: SAMPLE ID	DATE	MATRIX	NUMBER OF CONTAINERS	Additional Information
			TOTAL		

SH 19/10

Form:

AECOM

Chain of Custody & Analysis Request Form

AECOM - Melbourne
Level 9, 8 Exhibition Street
Melbourne VIC 3000
Tel: 03 9653 8072
Fax: 61 3 9653 1234
Email: averyll.coyne@aecom.com

Laboratory Details
Lab. Name: ALS
Lab. Address: 4 Westall Rd, Springvale
Contact Name:
Lab. Ref:
Tel: 8549 9600
Fax:
Preliminary Report by:
Final Report by:
Lab Quote No:

Project Name: Fishermans Bend
Project Number: 60431087
Purchase Order Number: NA

Sample collected by: Nathan Jensen, Dug Cunningham and Matt Sheppard
Sample Results to be returned to: Averyll Coyne

Specifications:

	(Tick)		
1. Urgent TAT required? (please circle: 24hr 48hr ___3___days)	☐ Yes	☑ No	☐ N/A
2. Fast TAT Guarantee Required?	☐ Yes	☑ No	☐ N/A
3. Is any sediment layer present in waters to be excluded from extractions?	☐ Yes	☑ No	☐ N/A
4. Special storage requirements?	☐ Yes	☑ No	☐ N/A
5. Preservation requirements: ☐ Fax ☐ Hard copy ☑ Email	☐ Yes	☑ No	☐ N/A
6. Other requirements?	☑ Yes	☐ No	☐ N/A

7. Report Format: Email with QC reports
8. Project Manager: Averyll Coyne tel: 9653 8072

Lab. ID	Sample ID	Sampling Date & time (on)	Sampling Date & Time (off)	Matrix: soil	Matrix: water	Matrix: other	Preservation: filt'ed	Preservation: acid	Preservation: ice	Preservation: other	Container (No. & type)	Analysis Request: TOC	Moisture Content	TRH(C6-C40)	Full VOC Scan (70 Analytes) - Code EP074(A-H)	PAH	Metals	TRH, BTEX and metals	Remarks & Comments
1	GW04(1.9-2.0)	15/10/2015		x					x		Jar								
2	GW04(3.0-3.1)	15/10/2015		x					x		Jar								
3	GW04(3.3-3.4)	15/10/2015		x					x		Jar	x	x						
4	GW04(4.0-4.1)	15/10/2015		x					x		Jar								
5	GW04(5.0-5.1)	15/10/2015		x					x		Jar								
6	GW11(0.0-0.1)	15/10/2015		x					x		Jar								
7	GW11(0.5-0.6)	15/10/2015		x					x		Jar								
8	GW11(0.9-1.0)	15/10/2015		x					x		Jar								
9	GW11(1.4-1.5)	15/10/2015		x					x		Jar								
10	GW11(1.7-1.8)	15/10/2015		x					x		Jar								
11	GW11(2.3-2.4)	15/10/2015		x					x		Jar	x	x						
12	GW11(3.0-3.1)	15/10/2015		x					x		Jar								
13	GW11(4.0-4.1)	15/10/2015		x					x		Jar								
14	GW11(5.0-5.1)	15/10/2015		x					x		Jar								
15	GW36(0.1-0.2)	15/10/2015		x					x		Jar								
16	GW36(0.5-0.6)	15/10/2015		x					x		Jar				x	x	x		

Metals (As, Cd, Cr, Cu, Pb, Ni, Zn, Al, Fe, Se, Hg)

SCANNED

Relinquished By:	**Received by:**	Received in good condition?	Yes/No/NA
Name: Nathan Jensen Date: 16/10/2015	Name: Date:	Samples received chilled?	Yes/No/NA
of: AECOM Time:9:00	of: ALS Time:		Yes/No/NA
Relinquished By:	**Received by:**	Received in good condition?	Yes/No/NA
Name: Date:	Name: Date:	Samples received chilled?	Yes/No/NA
of: Time:	of: Time:		Yes/No/NA

Method of Shipment			
Consignment Note No.			
Transport Co:			
Method of Shipment			
Consignment Note No.			
Transport Co:			

Form:

AECOM

Chain of Custody & Analysis Request Form

AECOM - Melbourne
Level 9, 8 Exhibition Street
Melbourne VIC 3000
Tel: 03 9653 8072
Fax: 61 3 9653 1234
Email: averyll.coyne@aecom.com

Laboratory Details
Lab. Name: ALS
Lab. Address: 4 Westall Rd, Springvale
Contact Name:
Lab. Ref:
Tel: 8549 9600
Fax:
Preliminary Report by:
Final Report by:
Lab Quote No:

Project Name: Fishermans Bend
Project Number: 60431087
Purchase Order Number: NA

Sample collected by: Nathan Jensen, Dug Cunningham and Matt Sheppard
Sample Results to be returned to: Averyll Coyne

Specifications:

	(Tick)		
1. Urgent TAT required? (please circle: 24hr 48hr ___3___days)	☐ Yes	☑ No	☐ N/A
2. Fast TAT Guarantee Required?	☐ Yes	☑ No	☐ N/A
3. Is any sediment layer present in waters to be excluded from extractions?	☐ Yes	☑ No	☐ N/A
4. Special storage requirements?	☐ Yes	☑ No	☐ N/A
5. Preservation requirements: ☐ Fax ☐ Hard copy ☑ Email	☐ Yes	☑ No	☐ N/A
6. Other requirements?	☑ Yes	☐ No	☐ N/A

7. Report Format: Email with QC reports
8. Project Manager: Averyll Coyne tel: 9653 8072

Lab. ID	Sample ID	Sampling Date & time (on)	Sampling Date & Time (off)	Matrix: soil	Matrix: water	Matrix: other	Preservation: filt'ed	Preservation: acid	Preservation: ice	Preservation: other	Container (No. & type)	TOC	Moisture Content	TRH(C6-C40)	Full VOC Scan (70 Analytes) - Code EP074(A-H)	PAH	Metals	TRH, BTEX and metals	Remarks & comments
17	GW36(0.9-1.0)	15/10/2015		x					x		Jar				x	x	x		Metals (As, Cd, Cr, Cu, Pb, Ni, Zn, Al, Fe, Se, Hg)
18	GW36(1.4-1.5)	15/10/2015		x					x		Jar								
19	GW36(1.6-1.7)	15/10/2015		x					x		Jar	x	x						
20	GW36(1.9-2.0)	15/10/2015		x					x		Jar								
21	GW36(2.5-2.6)	15/10/2015		x					x		Jar								
22	GW36(3.0-3.1)	15/10/2015		x					x		Jar								
23	GW36(4.0-4.1)	15/10/2015		x					x		Jar								
24	GW36(5.0-5.1)	15/10/2015		x					x		Jar								
25	GW07(0.0-0.1)	15/10/2015		x					x		Jar								
26	GW07(0.5-0.6)	15/10/2015		x					x		Jar								
27	GW07(0.9-1.0)	15/10/2015		x					x		Jar								
28	GW07(1.4-1.5)	15/10/2015		x					x		Jar								
29	GW05(0.0-0.1)	15/10/2015		x					x		Jar								
30	GW05(0.4-0.5)	15/10/2015		x					x		Jar								
31	GW05(0.9-1.0)	15/10/2015		x					x		Jar								
32	GW05(1.4-1.5)	15/10/2015		x					x		Jar								

Relinquished By:	**Received by:**	Received in good condition?	Yes/No/NA — Method of Shipment:
Name: Nathan Jensen Date: 16/10/2015	Name: Date:	Samples received chilled?	Yes/No/NA — Consignment Note No.
of: AECOM Time:9:00	of: ALS Time:		Yes/No/NA — Transport Co:
Relinquished By:	**Received by:**	Received in good condition?	Yes/No/NA — Method of Shipment
Name: Date:	Name: Date:	Samples received chilled?	Yes/No/NA — Consignment Note No.
of: Time:	of: Time:		Yes/No/NA — Transport Co:

Form:

AECOM

Chain of Custody & Analysis Request Form

AECOM - Melbourne
Level 9, 8 Exhibition Street
Melbourne VIC 3000
Tel: 03 9653 8072
Fax: 61 3 9653 1234
Email: averyll.coyne@aecom.com

Laboratory Details
Lab. Name: ALS
Lab. Address: 4 Westall Rd, Springvale
Contact Name:
Lab. Ref:
Tel: 8549 9600
Fax:
Preliminary Report by:
Final Report by:
Lab Quote No:

Project Name: Fishermans Bend
Project Number: 60431087
Purchase Order Number: NA

Sample collected by: Nathan Jensen, Dug Cunningham and Matt Sheppard
Sample Results to be returned to: Averyll Coyne

Specifications:

	(Tick)		
1. Urgent TAT required? (please circle: 24hr 48hr ___3___days)	☐ Yes	☑ No	☐ N/A
2. Fast TAT Guarantee Required?	☐ Yes	☑ No	☐ N/A
3. Is any sediment layer present in waters to be excluded from extractions?	☐ Yes	☑ No	☐ N/A
4. Special storage requirements?	☐ Yes	☑ No	☐ N/A
5. Preservation requirements? ☐ Fax ☐ Hard copy ☑ Email	☐ Yes	☑ No	☐ N/A
6. Other requirements?	☑ Yes	☐ No	☐ N/A

7. Report Format: Email with QC reports
8. Project Manager: Averyll Coyne tel: 9653 8072

Lab. ID	Sample ID	Sampling Date & time (on)	Sampling Date & Time (off)	Matrix: soil	Matrix: water	Matrix: other	Preservation: filt'ed	Preservation: acid	Preservation: ice	Preservation: other	Container (No. & type)	TOC	Moisture Content	TRH(C6-C40)	Full VOC Scan (70 Analytes) - Code EP074(A-H)	PAH	Metals	TRH, BTEX and metals	Remarks & comments
33	GW06(0.0-0.1)	15/10/2015		x					x		Jar								Metals (As, Cd, Cr, Cu, Pb, Ni, Zn, Al, Fe, Se, Hg)
34	GW06(0.5-0.6)	15/10/2015		x					x		Jar								
35	GW06(0.9-1.0)	15/10/2015		x					x		Jar								
36	GW06(1.4-1.5)	15/10/2015		x					x		Jar								
37	GW09(0.0-0.1)	15/10/2015		x					x		Jar								
38	GW09(0.5-0.6)	15/10/2015		x					x		Jar								
39	GW09(0.9-1.0)	15/10/2015		x					x		Jar								
40	GW09(1.4-1.5)	15/10/2015		x					x		Jar								
41	GW12(0.0-0.1)	15/10/2015		x					x		Jar								
42	GW12(0.5-0.6)	15/10/2015		x					x		Jar				x	x	x		
43	GW12(0.9-1.0)	15/10/2015		x					x		Jar				x	x	x		
44	GW12(1.4-1.5)	15/10/2015		x					x		Jar								
45	GW01(0.0-0.1)	15/10/2015		x					x		Jar								
46	GW01(0.5-0.6)	15/10/2015		x					x		Jar								
47	GW01(0.9-1.0)	15/10/2015		x					x		Jar								
48	GW01(1.2-1.3)	15/10/2015		x					x		Jar								

Relinquished By:
Name: Nathan Jensen Date: 16/10/2015
of: AECOM Time:9:00

Received by:
Name: Date:
of: ALS Time:

Received in good condition? Yes/No/NA
Samples received chilled? Yes/No/NA
Method of Shipment
Consignment Note No.
Transport Co:

Relinquished By:
Name: Date:
of: Time:

Received by:
Name: Date:
of: Time:

Received in good condition? Yes/No/NA
Samples received chilled? Yes/No/NA
Method of Shipment
Consignment Note No.
Transport Co:

Form:

AECOM

Chain of Custody & Analysis Request Form

AECOM - Melbourne
Level 9, 8 Exhibition Street
Melbourne VIC 3000
Tel: 03 9653 8072
Fax: 61 3 9653 1234
Email: averyll.coyne@aecom.com

Laboratory Details
Tel: 8549 9600
Lab. Name: ALS
Fax:
Lab. Address: 4 Westall Rd, Springvale
Preliminary Report by:
Contact Name:
Final Report by:
Lab. Ref:
Lab Quote No:

Project Name: Fishermans Bend
Project Number: 60431087
Purchase Order Number: NA

Sample collected by: Nathan Jensen, Dug Cunningham and Matt Sheppard
Sample Results to be returned to: Averyll Coyne

Specifications:	(Tick)		
1. Urgent TAT required? (please circle: 24hr 48hr ___3___days)	☐ Yes	☑ No	☐ N/A
2. Fast TAT Guarantee Required?	☐ Yes	☑ No	☐ N/A
3. Is any sediment layer present in waters to be excluded from extractions?	☐ Yes	☑ No	☐ N/A
4. Special storage requirements?	☐ Yes	☑ No	☐ N/A
5. Preservation requirements? ☐ Fax ☐ Hard copy ☑ Email	☐ Yes	☑ No	☐ N/A
6. Other requirements?	☑ Yes	☐ No	☐ N/A
7. Report Format: Email with QC reports	8. Project Manager: Averyll Coyne		tel: 9653 8072

Lab. ID	Sample ID	Sampling Date & time (on)	Sampling Date & Time (off)	Matrix: soil	Matrix: water	Matrix: other	Preservation: filt'ed	Preservation: acid	Preservation: ice	Preservation: other	Container (No. & type)	TOC	Moisture Content	TRH(C6-C40)	Full VOC Scan (70 Analytes) - Code EP074(A-H)	PAH	Metals	TRH, BTEX and metals	Remarks & comments
49	QC11	15/10/2015			x				x		Bottles							x	Metals (As, Cd, Cr, Cu, Pb, Ni, Zn, Al, Fe, Se, Hg)
50	QC12	15/10/2015			x				x		Bottles			x					
51	QC13	15/10/2015			x				x		Bottles			x					

Relinquished By:
Name: Nathan Jensen
Date: 16/10/2015
Time: 9:00
of: AECOM

Received by:
Name:
Date:
Time:
of: ALS

Received in good condition?	Yes/No/NA	Method of Shipment	
Samples received chilled?	Yes/No/NA	Consignment Note No.	
	Yes/No/NA	Transport Co:	

Relinquished By:
Name:
Date:
Time:
of:

Received by:
Name:
Date:
Time:
of:

Received in good condition?	Yes/No/NA	Method of Shipment	
Samples received chilled?	Yes/No/NA	Consignment Note No.	
	Yes/No/NA	Transport Co:	

Andrew Matheson

From: Coyne, Averyll <Averyll.Coyne@aecom.com>
Sent: Monday, 19 October 2015 3:57 PM
To: Samples Melbourne
Cc: Bronwyn Sheen
Subject: RE: Day 4 Fishermans Bend
Attachments: 60431087 COC Day 4A.pdf; 60431087 COC Day 4B.pdf; 60431087 COC Day 4C.pdf; 60431087 COC Day 4D.PDF

Hi Bronwyn,

Further to below, please see attached the updated COC.

Kind Regards
Averyll

Averyll Coyne
Principal Environmental Scientist
D +61 3 9653 8072 M +61 499 252 502
Averyll.Coyne@aecom.com

AECOM
Level 9, 8 Exhibition Street, Melbourne, VIC 3000
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www.aecom.com

From: Coyne, Averyll
Sent: Friday, 16 October 2015 6:37 PM
To: 'samples.melbourne@alsglobal.com'
Cc: 'Bronwyn Sheen'
Subject: Day 4 Fishermans Bend

Hi Bronwyn,

Please find attached the COC for samples that arrived this morning from Fishermans Bend.

I will need to add some analysis to this COC on Monday, however, in the meantime, please ensure those samples that are not marked for analysis are put on hold.

Kind Regards
Averyll

Averyll Coyne
Principal Environmental Scientist
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Averyll.Coyne@aecom.com

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www.aecom.com

Rosalinda Trbusic

Subject: FW: FBURA additional soil analysis

From: Coyne, Averyll [mailto:Averyll.Coyne@aecom.com]
Sent: Wednesday, 21 October 2015 3:04 PM
To: Bronwyn Sheen
Subject: FBURA additional soil analysis

Hi Bronwyn,

Can you please organise the following analysis to be undertaken?

EM1515737 – GW21(0.5-0.6) – pH and Sulfate
EM1515593 – GW18(0.4-0.5), GW04(0.5-0.6) and QC06 – pH and Sulfate
EM1515910 – GW36(0.5-0.6), GW36(0.9-1.0), GW12(0.5-0.6) and GW12(0.9-1.0) – pH and Sulfate

16 17 42 43

Please phone me if you have any questions.

Kind Regards
Averyll

Averyll Coyne
Principal Environmental Scientist
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Averyll.Coyne@aecom.com

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www.aecom.com

Andrew Matheson

From: Bronwyn Sheen
Sent: Friday, 23 October 2015 5:14 PM
To: Samples Melbourne
Subject: FW: Fishermans Bend - additional analysis

Importance: High

HI Andrew,
Can you please add the analysis to work orders EM1515910 & EM1515997.

Kind Regards,

Bronwyn Sheen

Client Services Manager - VIC
ALS | Environmental Division

2-4 Westall Road
Springvale VIC 3171 Australia

T +61 3 8549 9600
F +61 3 8549 9626
M +438 174 359

Please note I can be contacted in the office until 3pm each day and am available via mobile after this.
Emails received after 3pm will be actioned that evening.

From: Coyne, Averyll [mailto:Averyll.Coyne@aecom.com]
Sent: Friday, 23 October 2015 2:44 PM
To: Bronwyn Sheen
Subject: Fishermans Bend - additional analysis
Importance: High

Hi Bronwyn,

Can you please add the following soil analysis to the Fishermans Bend project?

EM15154910:
GW36(0.5-0.6) – TRH(C6-C40)
GW36(0.9-1.0) – TRH(C6-C40)

EM1515997:
GW14(0.5-0.6) – TRH(C6-C40)
GW14(0.9-1.0) – TRH(C6-C40)
GW10(0.5-0.6) – TRH(C6-C40)

Many Thanks
Averyll

Averyll Coyne
Principal Environmental Scientist
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Averyll.Coyne@aecom.com

AECOM
Level 9, 8 Exhibition Street, Melbourne, VIC 3000
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ALS Environmental

CERTIFICATE OF ANALYSIS

Work Order	: **EM1515997**	Page	: 1 of 10
Client	: **AECOM Australia Pty Ltd**	Laboratory	: Environmental Division Melbourne
Contact	: MS AVERYLL COYNE	Contact	: Carol Walsh
Address	: LEVEL 9 8 EXHIBITION ST MELBOURNE VIC 3000	Address	: 4 Westall Rd Springvale VIC Australia 3171
E-mail	: averyll.coyne@aecom.com	E-mail	: carol.walsh@alsglobal.com
Telephone	: +61 03 9653 1234	Telephone	: +61-3-8549 9608
Facsimile	: +61 03 9654 7117	Facsimile	: +61-3-8549 9601
Project	: 60431087	QC Level	: NEPM 2013 Schedule B(3) and ALS QCS3 requirement
Order number	: 60431087 Task 1.4	Date Samples Received	: 16-Oct-2015 17:45
C-O-C number	: ----	Date Analysis Commenced	: 21-Oct-2015
Sampler	: DUGALD CUNNINGHAM, MATTHEW SHEPPARD, NATHAN JENSEN	Issue Date	: 27-Oct-2015 15:07
Site	: ----		
		No. of samples received	: 25
Quote number	: ----	No. of samples analysed	: 6

This report supersedes any previous report(s) with this reference. Results apply to the sample(s) as submitted.

This Certificate of Analysis contains the following information:

- General Comments
- Analytical Results

Signatories

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

Signatories	*Position*	*Accreditation Category*
Chris Lemaitre	Non-Metals Team Leader	Melbourne Inorganics
Eric Chau	Metals Team Leader	Melbourne Inorganics
Nancy Wang	Senior Semivolatile Instrument Chemist	Melbourne Inorganics Melbourne Organics
Satishkumar Trivedi	Acid Sulfate Soils Supervisor	Brisbane Acid Sulphate Soils
Xing Lin	Senior Organic Chemist	Melbourne Organics

General Comments

The analytical procedures used by the Environmental Division have been developed from established internationally recognized procedures such as those published by the USEPA, APHA, AS and NEPM. In house developed procedures are employed in the absence of documented standards or by 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.

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.

- Benzo(a)pyrene Toxicity Equivalent Quotient (TEQ) 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.

Analytical Results

Sub-Matrix: SOIL (Matrix: SOIL)			Client sample ID	GW14(0.5-0.6)	GW14(0.9-1.0)	GW10(0.5-0.6)	GW37(5.3-5.4)	----
			Client sampling date / time	[16-Oct-2015]	[16-Oct-2015]	[16-Oct-2015]	[16-Oct-2015]	----
Compound	CAS Number	LOR	Unit	EM1515997-002	EM1515997-003	EM1515997-006	EM1515997-021	--------
				Result	Result	Result	Result	Result
EA001: pH in soil using 0.01M CaCl extract								
pH (CaCl2)	----	0.1	pH Unit	**10.2**	**8.2**	**5.2**	----	----
EA055: Moisture Content								
^ **Moisture Content (dried @ 103°C)**	----	1	%	**9.3**	**1.5**	**4.3**	----	----
ED040N: Sulfate - Calcium Phosphate Soluble (NEPM)								
Sulfate as SO4 2-	14808-79-8	50	mg/kg	**170**	<50	<50	----	----
EG005T: Total Metals by ICP-AES								
Aluminium	7429-90-5	50	mg/kg	**3250**	**190**	**120**	----	----
Iron	7439-89-6	50	mg/kg	**12000**	**180**	**160**	----	----
Selenium	7782-49-2	5	mg/kg	<5	<5	<5	----	----
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	**7**	<2	<2	----	----
Copper	7440-50-8	5	mg/kg	**14**	<5	<5	----	----
Lead	7439-92-1	5	mg/kg	**17**	<5	<5	----	----
Nickel	7440-02-0	2	mg/kg	**26**	<2	<2	----	----
Zinc	7440-66-6	5	mg/kg	**30**	<5	<5	----	----
EG035T: Total Recoverable Mercury by FIMS								
Mercury	7439-97-6	0.1	mg/kg	<0.1	<0.1	<0.1	----	----
EP003: Total Organic Carbon (TOC) in Soil								
Total Organic Carbon	----	0.02	%	----	----	----	**0.14**	----
EP074A: Monocyclic Aromatic Hydrocarbons								
Styrene	100-42-5	0.5	mg/kg	<0.5	<0.5	<0.5	----	----
Isopropylbenzene	98-82-8	0.5	mg/kg	<0.5	<0.5	<0.5	----	----
n-Propylbenzene	103-65-1	0.5	mg/kg	<0.5	<0.5	<0.5	----	----
1.3.5-Trimethylbenzene	108-67-8	0.5	mg/kg	<0.5	<0.5	<0.5	----	----
sec-Butylbenzene	135-98-8	0.5	mg/kg	<0.5	<0.5	<0.5	----	----
1.2.4-Trimethylbenzene	95-63-6	0.5	mg/kg	<0.5	<0.5	<0.5	----	----
tert-Butylbenzene	98-06-6	0.5	mg/kg	<0.5	<0.5	<0.5	----	----
p-Isopropyltoluene	99-87-6	0.5	mg/kg	<0.5	<0.5	<0.5	----	----
n-Butylbenzene	104-51-8	0.5	mg/kg	<0.5	<0.5	<0.5	----	----
EP074B: Oxygenated Compounds								
Vinyl Acetate	108-05-4	5	mg/kg	<5	<5	<5	----	----
2-Butanone (MEK)	78-93-3	5	mg/kg	<5	<5	<5	----	----
4-Methyl-2-pentanone (MIBK)	108-10-1	5	mg/kg	<5	<5	<5	----	----

Analytical Results

Sub-Matrix: SOIL (Matrix: SOIL)				Client sample ID	GW14(0.5-0.6)	GW14(0.9-1.0)	GW10(0.5-0.6)	GW37(5.3-5.4)	----
				Client sampling date / time	[16-Oct-2015]	[16-Oct-2015]	[16-Oct-2015]	[16-Oct-2015]	----
Compound	CAS Number	LOR	Unit		EM1515997-002	EM1515997-003	EM1515997-006	EM1515997-021	--------
					Result	Result	Result	Result	Result
EP074B: Oxygenated Compounds - Continued									
2-Hexanone (MBK)	591-78-6	5	mg/kg		<5	<5	<5	----	----
EP074C: Sulfonated Compounds									
Carbon disulfide	75-15-0	0.5	mg/kg		<0.5	<0.5	<0.5	----	----
EP074D: Fumigants									
2.2-Dichloropropane	594-20-7	0.5	mg/kg		<0.5	<0.5	<0.5	----	----
1.2-Dichloropropane	78-87-5	0.5	mg/kg		<0.5	<0.5	<0.5	----	----
cis-1.3-Dichloropropylene	10061-01-5	0.5	mg/kg		<0.5	<0.5	<0.5	----	----
trans-1.3-Dichloropropylene	10061-02-6	0.5	mg/kg		<0.5	<0.5	<0.5	----	----
1.2-Dibromoethane (EDB)	106-93-4	0.5	mg/kg		<0.5	<0.5	<0.5	----	----
EP074E: Halogenated Aliphatic Compounds									
Dichlorodifluoromethane	75-71-8	5	mg/kg		<5	<5	<5	----	----
Chloromethane	74-87-3	5	mg/kg		<5	<5	<5	----	----
Vinyl chloride	75-01-4	5	mg/kg		<5	<5	<5	----	----
Bromomethane	74-83-9	5	mg/kg		<5	<5	<5	----	----
Chloroethane	75-00-3	5	mg/kg		<5	<5	<5	----	----
Trichlorofluoromethane	75-69-4	5	mg/kg		<5	<5	<5	----	----
1.1-Dichloroethene	75-35-4	0.5	mg/kg		<0.5	<0.5	<0.5	----	----
Iodomethane	74-88-4	0.5	mg/kg		<0.5	<0.5	<0.5	----	----
trans-1.2-Dichloroethene	156-60-5	0.5	mg/kg		<0.5	<0.5	<0.5	----	----
1.1-Dichloroethane	75-34-3	0.5	mg/kg		<0.5	<0.5	<0.5	----	----
cis-1.2-Dichloroethene	156-59-2	0.5	mg/kg		<0.5	<0.5	<0.5	----	----
1.1.1-Trichloroethane	71-55-6	0.5	mg/kg		<0.5	<0.5	<0.5	----	----
1.1-Dichloropropylene	563-58-6	0.5	mg/kg		<0.5	<0.5	<0.5	----	----
Carbon Tetrachloride	56-23-5	0.5	mg/kg		<0.5	<0.5	<0.5	----	----
1.2-Dichloroethane	107-06-2	0.5	mg/kg		<0.5	<0.5	<0.5	----	----
Trichloroethene	79-01-6	0.5	mg/kg		<0.5	<0.5	<0.5	----	----
Dibromomethane	74-95-3	0.5	mg/kg		<0.5	<0.5	<0.5	----	----
1.1.2-Trichloroethane	79-00-5	0.5	mg/kg		<0.5	<0.5	<0.5	----	----
1.3-Dichloropropane	142-28-9	0.5	mg/kg		<0.5	<0.5	<0.5	----	----
Tetrachloroethene	127-18-4	0.5	mg/kg		<0.5	<0.5	<0.5	----	----
1.1.1.2-Tetrachloroethane	630-20-6	0.5	mg/kg		<0.5	<0.5	<0.5	----	----
trans-1.4-Dichloro-2-butene	110-57-6	0.5	mg/kg		<0.5	<0.5	<0.5	----	----
cis-1.4-Dichloro-2-butene	1476-11-5	0.5	mg/kg		<0.5	<0.5	<0.5	----	----
1.1.2.2-Tetrachloroethane	79-34-5	0.5	mg/kg		<0.5	<0.5	<0.5	----	----

Analytical Results

Sub-Matrix: SOIL (Matrix: SOIL)				Client sample ID	GW14(0.5-0.6)	GW14(0.9-1.0)	GW10(0.5-0.6)	GW37(5.3-5.4)	----
				Client sampling date / time	[16-Oct-2015]	[16-Oct-2015]	[16-Oct-2015]	[16-Oct-2015]	----
Compound	CAS Number	LOR	Unit		EM1515997-002	EM1515997-003	EM1515997-006	EM1515997-021	--------
					Result	Result	Result	Result	Result
EP074E: Halogenated Aliphatic Compounds - Continued									
1.2.3-Trichloropropane	96-18-4	0.5	mg/kg		<0.5	<0.5	<0.5	----	----
Pentachloroethane	76-01-7	0.5	mg/kg		<0.5	<0.5	<0.5	----	----
1.2-Dibromo-3-chloropropane	96-12-8	0.5	mg/kg		<0.5	<0.5	<0.5	----	----
Hexachlorobutadiene	87-68-3	0.5	mg/kg		<0.5	<0.5	<0.5	----	----
EP074F: Halogenated Aromatic Compounds									
Chlorobenzene	108-90-7	0.5	mg/kg		<0.5	<0.5	<0.5	----	----
Bromobenzene	108-86-1	0.5	mg/kg		<0.5	<0.5	<0.5	----	----
2-Chlorotoluene	95-49-8	0.5	mg/kg		<0.5	<0.5	<0.5	----	----
4-Chlorotoluene	106-43-4	0.5	mg/kg		<0.5	<0.5	<0.5	----	----
1.3-Dichlorobenzene	541-73-1	0.5	mg/kg		<0.5	<0.5	<0.5	----	----
1.4-Dichlorobenzene	106-46-7	0.5	mg/kg		<0.5	<0.5	<0.5	----	----
1.2-Dichlorobenzene	95-50-1	0.5	mg/kg		<0.5	<0.5	<0.5	----	----
1.2.4-Trichlorobenzene	120-82-1	0.5	mg/kg		<0.5	<0.5	<0.5	----	----
1.2.3-Trichlorobenzene	87-61-6	0.5	mg/kg		<0.5	<0.5	<0.5	----	----
EP074G: Trihalomethanes									
Chloroform	67-66-3	0.5	mg/kg		<0.5	<0.5	<0.5	----	----
Bromodichloromethane	75-27-4	0.5	mg/kg		<0.5	<0.5	<0.5	----	----
Dibromochloromethane	124-48-1	0.5	mg/kg		<0.5	<0.5	<0.5	----	----
Bromoform	75-25-2	0.5	mg/kg		<0.5	<0.5	<0.5	----	----
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	----	----

Analytical Results

Sub-Matrix: SOIL (Matrix: SOIL)				Client sample ID	GW14(0.5-0.6)	GW14(0.9-1.0)	GW10(0.5-0.6)	GW37(5.3-5.4)	----
				Client sampling date / time	[16-Oct-2015]	[16-Oct-2015]	[16-Oct-2015]	[16-Oct-2015]	----
Compound	CAS Number	LOR	Unit		EM1515997-002	EM1515997-003	EM1515997-006	EM1515997-021	--------
					Result	Result	Result	Result	Result
EP075(SIM)B: Polynuclear Aromatic Hydrocarbons - Continued									
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	>C10_C16	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	1330-20-7	0.5	mg/kg		<0.5	<0.5	<0.5	----	----
Naphthalene	91-20-3	1	mg/kg		<1	<1	<1	----	----
EP074S: VOC Surrogates									
1.2-Dichloroethane-D4	17060-07-0	0.5	%		**88.9**	**105**	**86.4**	----	----
Toluene-D8	2037-26-5	0.5	%		**90.3**	**98.6**	**85.5**	----	----

Analytical Results

Sub-Matrix: SOIL (Matrix: SOIL)				Client sample ID	GW14(0.5-0.6)	GW14(0.9-1.0)	GW10(0.5-0.6)	GW37(5.3-5.4)	----
				Client sampling date / time	[16-Oct-2015]	[16-Oct-2015]	[16-Oct-2015]	[16-Oct-2015]	----
Compound	CAS Number	LOR	Unit		EM1515997-002	EM1515997-003	EM1515997-006	EM1515997-021	--------
					Result	Result	Result	Result	Result
EP074S: VOC Surrogates - Continued									
4-Bromofluorobenzene	460-00-4	0.5	%		82.6	89.8	80.0	----	----
EP075(SIM)S: Phenolic Compound Surrogates									
Phenol-d6	13127-88-3	0.5	%		81.4	81.2	80.7	----	----
2-Chlorophenol-D4	93951-73-6	0.5	%		79.6	78.9	79.4	----	----
2.4.6-Tribromophenol	118-79-6	0.5	%		56.0	55.1	63.7	----	----
EP075(SIM)T: PAH Surrogates									
2-Fluorobiphenyl	321-60-8	0.5	%		89.1	89.3	90.0	----	----
Anthracene-d10	1719-06-8	0.5	%		108	112	109	----	----
4-Terphenyl-d14	1718-51-0	0.5	%		93.1	95.3	91.1	----	----
EP080S: TPH(V)/BTEX Surrogates									
1.2-Dichloroethane-D4	17060-07-0	0.2	%		85.9	101	83.5	----	----
Toluene-D8	2037-26-5	0.2	%		86.8	94.5	82.1	----	----
4-Bromofluorobenzene	460-00-4	0.2	%		84.1	91.2	81.5	----	----

Analytical Results

Sub-Matrix: WATER (Matrix: WATER)				Client sample ID	QC14	QC15	----	----	----
				Client sampling date / time	[16-Oct-2015]	[16-Oct-2015]	----	----	----
Compound	CAS Number	LOR	Unit		EM1515997-024	EM1515997-025	--------	--------	--------
					Result	Result	Result	Result	Result
EG020T: Total Metals by ICP-MS									
Aluminium	7429-90-5	0.01	mg/L		<0.01	----	----	----	----
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	----	----	----	----
Nickel	7440-02-0	0.001	mg/L		<0.001	----	----	----	----
Lead	7439-92-1	0.001	mg/L		<0.001	----	----	----	----
Zinc	7440-66-6	0.005	mg/L		<0.005	----	----	----	----
Selenium	7782-49-2	0.01	mg/L		<0.01	----	----	----	----
Iron	7439-89-6	0.05	mg/L		<0.05	----	----	----	----
EG035T: Total Recoverable Mercury by FIMS									
Mercury	7439-97-6	0.0001	mg/L		<0.0001	----	----	----	----
EP080/071: Total Petroleum Hydrocarbons									
C6 - C9 Fraction	----	20	µg/L		<20	<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	<20	----	----	----
^ C6 - C10 Fraction minus BTEX (F1)	C6_C10-BTEX	20	µg/L		<20	<20	----	----	----
>C10 - C16 Fraction	>C10_C16	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	<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	----	----	----

Analytical Results

Sub-Matrix: WATER (Matrix: WATER)				Client sample ID	QC14	QC15	----	----	----
				Client sampling date / time	[16-Oct-2015]	[16-Oct-2015]	----	----	----
Compound	CAS Number	LOR	Unit		EM1515997-024	EM1515997-025	--------	--------	--------
					Result	Result	Result	Result	Result
EP080: BTEXN - Continued									
^ **Total Xylenes**	1330-20-7	2	µg/L		<2	<2	----	----	----
^ **Sum of BTEX**	----	1	µg/L		<1	<1	----	----	----
Naphthalene	91-20-3	5	µg/L		<5	<5	----	----	----
EP080S: TPH(V)/BTEX Surrogates									
1.2-Dichloroethane-D4	17060-07-0	2	%		**107**	**112**	----	----	----
Toluene-D8	2037-26-5	2	%		**99.9**	**103**	----	----	----
4-Bromofluorobenzene	460-00-4	2	%		**99.7**	**101**	----	----	----

ALS Environmental

QUALITY CONTROL REPORT

Work Order	: **EM1515997**	Page	: 1 of 15
Client	: **AECOM Australia Pty Ltd**	Laboratory	: Environmental Division Melbourne
Contact	: MS AVERYLL COYNE	Contact	: Carol Walsh
Address	: LEVEL 9 8 EXHIBITION ST MELBOURNE VIC 3000	Address	: 4 Westall Rd Springvale VIC Australia 3171
E-mail	: averyll.coyne@aecom.com	E-mail	: carol.walsh@alsglobal.com
Telephone	: +61 03 9653 1234	Telephone	: +61-3-8549 9608
Facsimile	: +61 03 9654 7117	Facsimile	: +61-3-8549 9601
Project	: 60431087	QC Level	: NEPM 2013 Schedule B(3) and ALS QCS3 requirement
Order number	: 60431087 Task 1.4	Date Samples Received	: 16-Oct-2015
C-O-C number	: ----	Date Analysis Commenced	: 21-Oct-2015
Sampler	: DUGALD CUNNINGHAM, MATTHEW SHEPPARD, NATHAN JENSEN	Issue Date	: 27-Oct-2015
Site	: ----	No. of samples received	: 25
Quote number	: ----	No. of samples analysed	: 6

This report supersedes any previous report(s) with this reference. Results apply to the sample(s) as submitted.

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

General Comments

The analytical procedures used by the Environmental Division have been developed from established internationally recognized procedures such as those published by the USEPA, APHA, AS and NEPM. In house developed procedures are employed in the absence of documented standards or by 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

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

NATA Accredited Laboratory 825

Accredited for compliance with ISO/IEC 17025.

Signatories

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

Signatories	Position	Accreditation Category
Chris Lemaitre	Non-Metals Team Leader	Melbourne Inorganics
Eric Chau	Metals Team Leader	Melbourne Inorganics
Nancy Wang	Senior Semivolatile Instrument Chemist	Melbourne Inorganics
		Melbourne Organics
Satishkumar Trivedi	Acid Sulfate Soils Supervisor	Brisbane Acid Sulphate Soils
Xing Lin	Senior Organic Chemist	Melbourne Organics

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	*Client sample ID*	*Method: Compound*	*CAS Number*	*LOR*	*Unit*	*Original Result*	*Duplicate Result*	*RPD (%)*	*Recovery Limits (%)*
EA001: pH in soil using 0.01M CaCl extract (QC Lot: 249969)									
EM1515908-001	Anonymous	EA001: pH (CaCl2)	----	0.1	pH Unit	7.2	7.2	0.00	0% - 20%
EM1516014-004	Anonymous	EA001: pH (CaCl2)	----	0.1	pH Unit	7.4	7.3	1.36	0% - 20%
EA055: Moisture Content (QC Lot: 250439)									
EM1515997-002	GW14(0.5-0.6)	EA055-103: Moisture Content (dried @ 103°C)	----	1	%	9.3	9.4	0.00	No Limit
EM1516019-002	Anonymous	EA055-103: Moisture Content (dried @ 103°C)	----	1	%	17.1	16.6	2.70	0% - 50%
ED040N: Sulfate - Calcium Phosphate Soluble (NEPM) (QC Lot: 251011)									
EM1515593-066	Anonymous	ED040N: Sulfate as SO4 2-	14808-79-8	50	mg/kg	60	60	0.00	No Limit
EM1515925-002	Anonymous	ED040N: Sulfate as SO4 2-	14808-79-8	50	mg/kg	<50	<50	0.00	No Limit
EG005T: Total Metals by ICP-AES (QC Lot: 250445)									
EM1515959-001	Anonymous	EG005T: Cadmium	7440-43-9	1	mg/kg	<1	<1	0.00	No Limit
		EG005T: Chromium	7440-47-3	2	mg/kg	2	2	0.00	No Limit
		EG005T: Nickel	7440-02-0	2	mg/kg	<2	<2	0.00	No Limit
		EG005T: Arsenic	7440-38-2	5	mg/kg	<5	<5	0.00	No Limit
		EG005T: Copper	7440-50-8	5	mg/kg	<5	<5	0.00	No Limit
		EG005T: Lead	7439-92-1	5	mg/kg	<5	<5	0.00	No Limit
		EG005T: Selenium	7782-49-2	5	mg/kg	<5	<5	0.00	No Limit
		EG005T: Zinc	7440-66-6	5	mg/kg	<5	<5	0.00	No Limit
		EG005T: Aluminium	7429-90-5	50	mg/kg	2430	2200	9.80	0% - 20%
		EG005T: Iron	7439-89-6	50	mg/kg	2600	2350	10.1	0% - 20%
EM1515988-002	Anonymous	EG005T: Cadmium	7440-43-9	1	mg/kg	<1	<1	0.00	No Limit
		EG005T: Chromium	7440-47-3	2	mg/kg	17	17	0.00	No Limit
		EG005T: Nickel	7440-02-0	2	mg/kg	8	10	14.0	No Limit
		EG005T: Arsenic	7440-38-2	5	mg/kg	<5	5	0.00	No Limit
		EG005T: Copper	7440-50-8	5	mg/kg	14	14	0.00	No Limit
		EG005T: Lead	7439-92-1	5	mg/kg	32	33	3.57	No Limit
		EG005T: Selenium	7782-49-2	5	mg/kg	<5	<5	0.00	No Limit
		EG005T: Zinc	7440-66-6	5	mg/kg	85	74	13.0	0% - 50%
		EG005T: Aluminium	7429-90-5	50	mg/kg	10300	10100	2.03	0% - 20%
		EG005T: Iron	7439-89-6	50	mg/kg	14100	15100	6.38	0% - 20%
EG035T: Total Recoverable Mercury by FIMS (QC Lot: 250444)									
EM1515959-001	Anonymous	EG035T: Mercury	7439-97-6	0.1	mg/kg	<0.1	<0.1	0.00	No Limit
EM1515988-002	Anonymous	EG035T: Mercury	7439-97-6	0.1	mg/kg	<0.1	<0.1	0.00	No Limit
EP003: Total Organic Carbon (TOC) in Soil (QC Lot: 256508)									
EM1515997-021	GW37(5.3-5.4)	EP003: Total Organic Carbon	----	0.02	%	0.14	0.13	0.00	No Limit
EP074A: Monocyclic Aromatic Hydrocarbons (QC Lot: 249965)									

Sub-Matrix: **SOIL**

				Laboratory Duplicate (DUP) Report					
Laboratory sample ID	*Client sample ID*	*Method: Compound*	*CAS Number*	*LOR*	*Unit*	*Original Result*	*Duplicate Result*	*RPD (%)*	*Recovery Limits (%)*
EP074A: Monocyclic Aromatic Hydrocarbons (QC Lot: 249965) - continued									
EM1516002-001	Anonymous	EP074: 1.2.4-Trimethylbenzene	95-63-6	0.5	mg/kg	<0.5	<0.5	0.00	No Limit
		EP074: 1.3.5-Trimethylbenzene	108-67-8	0.5	mg/kg	<0.5	<0.5	0.00	No Limit
		EP074: Isopropylbenzene	98-82-8	0.5	mg/kg	<0.5	<0.5	0.00	No Limit
		EP074: n-Butylbenzene	104-51-8	0.5	mg/kg	<0.5	<0.5	0.00	No Limit
		EP074: n-Propylbenzene	103-65-1	0.5	mg/kg	<0.5	<0.5	0.00	No Limit
		EP074: p-Isopropyltoluene	99-87-6	0.5	mg/kg	<0.5	<0.5	0.00	No Limit
		EP074: sec-Butylbenzene	135-98-8	0.5	mg/kg	<0.5	<0.5	0.00	No Limit
		EP074: Styrene	100-42-5	0.5	mg/kg	<0.5	<0.5	0.00	No Limit
		EP074: tert-Butylbenzene	98-06-6	0.5	mg/kg	<0.5	<0.5	0.00	No Limit
EP074B: Oxygenated Compounds (QC Lot: 249965)									
EM1516002-001	Anonymous	EP074: 2-Butanone (MEK)	78-93-3	5	mg/kg	<5	<5	0.00	No Limit
		EP074: 2-Hexanone (MBK)	591-78-6	5	mg/kg	<5	<5	0.00	No Limit
		EP074: 4-Methyl-2-pentanone (MIBK)	108-10-1	5	mg/kg	<5	<5	0.00	No Limit
		EP074: Vinyl Acetate	108-05-4	5	mg/kg	<5	<5	0.00	No Limit
EP074C: Sulfonated Compounds (QC Lot: 249965)									
EM1516002-001	Anonymous	EP074: Carbon disulfide	75-15-0	0.5	mg/kg	<0.5	<0.5	0.00	No Limit
EP074D: Fumigants (QC Lot: 249965)									
EM1516002-001	Anonymous	EP074: 1.2-Dibromoethane (EDB)	106-93-4	0.5	mg/kg	<0.5	<0.5	0.00	No Limit
		EP074: 1.2-Dichloropropane	78-87-5	0.5	mg/kg	<0.5	<0.5	0.00	No Limit
		EP074: 2.2-Dichloropropane	594-20-7	0.5	mg/kg	<0.5	<0.5	0.00	No Limit
		EP074: cis-1.3-Dichloropropylene	10061-01-5	0.5	mg/kg	<0.5	<0.5	0.00	No Limit
		EP074: trans-1.3-Dichloropropylene	10061-02-6	0.5	mg/kg	<0.5	<0.5	0.00	No Limit
EP074E: Halogenated Aliphatic Compounds (QC Lot: 249965)									
EM1516002-001	Anonymous	EP074: 1.1.1.2-Tetrachloroethane	630-20-6	0.5	mg/kg	<0.5	<0.5	0.00	No Limit
		EP074: 1.1.1-Trichloroethane	71-55-6	0.5	mg/kg	<0.5	<0.5	0.00	No Limit
		EP074: 1.1.2.2-Tetrachloroethane	79-34-5	0.5	mg/kg	<0.5	<0.5	0.00	No Limit
		EP074: 1.1.2-Trichloroethane	79-00-5	0.5	mg/kg	<0.5	<0.5	0.00	No Limit
		EP074: 1.1-Dichloroethane	75-34-3	0.5	mg/kg	<0.5	<0.5	0.00	No Limit
		EP074: 1.1-Dichloroethene	75-35-4	0.5	mg/kg	<0.5	<0.5	0.00	No Limit
		EP074: 1.1-Dichloropropylene	563-58-6	0.5	mg/kg	<0.5	<0.5	0.00	No Limit
		EP074: 1.2.3-Trichloropropane	96-18-4	0.5	mg/kg	<0.5	<0.5	0.00	No Limit
		EP074: 1.2-Dibromo-3-chloropropane	96-12-8	0.5	mg/kg	<0.5	<0.5	0.00	No Limit
		EP074: 1.2-Dichloroethane	107-06-2	0.5	mg/kg	<0.5	<0.5	0.00	No Limit
		EP074: 1.3-Dichloropropane	142-28-9	0.5	mg/kg	<0.5	<0.5	0.00	No Limit
		EP074: Carbon Tetrachloride	56-23-5	0.5	mg/kg	<0.5	<0.5	0.00	No Limit
		EP074: cis-1.2-Dichloroethene	156-59-2	0.5	mg/kg	<0.5	<0.5	0.00	No Limit
		EP074: cis-1.4-Dichloro-2-butene	1476-11-5	0.5	mg/kg	<0.5	<0.5	0.00	No Limit
		EP074: Dibromomethane	74-95-3	0.5	mg/kg	<0.5	<0.5	0.00	No Limit
		EP074: Hexachlorobutadiene	87-68-3	0.5	mg/kg	<0.5	<0.5	0.00	No Limit

Sub-Matrix: **SOIL**

				Laboratory Duplicate (DUP) Report					
Laboratory sample ID	*Client sample ID*	*Method: Compound*	*CAS Number*	*LOR*	*Unit*	*Original Result*	*Duplicate Result*	*RPD (%)*	*Recovery Limits (%)*
EP074E: Halogenated Aliphatic Compounds (QC Lot: 249965) - continued									
EM1516002-001	Anonymous	EP074: Iodomethane	74-88-4	0.5	mg/kg	<0.5	<0.5	0.00	No Limit
		EP074: Pentachloroethane	76-01-7	0.5	mg/kg	<0.5	<0.5	0.00	No Limit
		EP074: Tetrachloroethene	127-18-4	0.5	mg/kg	<0.5	<0.5	0.00	No Limit
		EP074: trans-1.2-Dichloroethene	156-60-5	0.5	mg/kg	<0.5	<0.5	0.00	No Limit
		EP074: trans-1.4-Dichloro-2-butene	110-57-6	0.5	mg/kg	<0.5	<0.5	0.00	No Limit
		EP074: Trichloroethene	79-01-6	0.5	mg/kg	<0.5	<0.5	0.00	No Limit
		EP074: Bromomethane	74-83-9	5	mg/kg	<5	<5	0.00	No Limit
		EP074: Chloroethane	75-00-3	5	mg/kg	<5	<5	0.00	No Limit
		EP074: Chloromethane	74-87-3	5	mg/kg	<5	<5	0.00	No Limit
		EP074: Dichlorodifluoromethane	75-71-8	5	mg/kg	<5	<5	0.00	No Limit
		EP074: Trichlorofluoromethane	75-69-4	5	mg/kg	<5	<5	0.00	No Limit
		EP074: Vinyl chloride	75-01-4	5	mg/kg	<5	<5	0.00	No Limit
EP074F: Halogenated Aromatic Compounds (QC Lot: 249965)									
EM1516002-001	Anonymous	EP074: 1.2.3-Trichlorobenzene	87-61-6	0.5	mg/kg	<0.5	<0.5	0.00	No Limit
		EP074: 1.2.4-Trichlorobenzene	120-82-1	0.5	mg/kg	<0.5	<0.5	0.00	No Limit
		EP074: 1.2-Dichlorobenzene	95-50-1	0.5	mg/kg	<0.5	<0.5	0.00	No Limit
		EP074: 1.3-Dichlorobenzene	541-73-1	0.5	mg/kg	<0.5	<0.5	0.00	No Limit
		EP074: 1.4-Dichlorobenzene	106-46-7	0.5	mg/kg	<0.5	<0.5	0.00	No Limit
		EP074: 2-Chlorotoluene	95-49-8	0.5	mg/kg	<0.5	<0.5	0.00	No Limit
		EP074: 4-Chlorotoluene	106-43-4	0.5	mg/kg	<0.5	<0.5	0.00	No Limit
		EP074: Bromobenzene	108-86-1	0.5	mg/kg	<0.5	<0.5	0.00	No Limit
		EP074: Chlorobenzene	108-90-7	0.5	mg/kg	<0.5	<0.5	0.00	No Limit
EP074G: Trihalomethanes (QC Lot: 249965)									
EM1516002-001	Anonymous	EP074: Bromodichloromethane	75-27-4	0.5	mg/kg	<0.5	<0.5	0.00	No Limit
		EP074: Bromoform	75-25-2	0.5	mg/kg	<0.5	<0.5	0.00	No Limit
		EP074: Chloroform	67-66-3	0.5	mg/kg	<0.5	<0.5	0.00	No Limit
		EP074: Dibromochloromethane	124-48-1	0.5	mg/kg	<0.5	<0.5	0.00	No Limit
EP075(SIM)B: Polynuclear Aromatic Hydrocarbons (QC Lot: 250207)									
EM1515986-003	Anonymous	EP075(SIM): Acenaphthene	83-32-9	0.5	mg/kg	<0.5	<0.5	0.00	No Limit
		EP075(SIM): Acenaphthylene	208-96-8	0.5	mg/kg	<0.5	<0.5	0.00	No Limit
		EP075(SIM): Anthracene	120-12-7	0.5	mg/kg	<0.5	<0.5	0.00	No Limit
		EP075(SIM): Benz(a)anthracene	56-55-3	0.5	mg/kg	<0.5	<0.5	0.00	No Limit
		EP075(SIM): Benzo(a)pyrene	50-32-8	0.5	mg/kg	<0.5	<0.5	0.00	No Limit
		EP075(SIM): Benzo(b+j)fluoranthene	205-99-2 205-82-3	0.5	mg/kg	<0.5	<0.5	0.00	No Limit
		EP075(SIM): Benzo(g.h.i)perylene	191-24-2	0.5	mg/kg	<0.5	<0.5	0.00	No Limit
		EP075(SIM): Benzo(k)fluoranthene	207-08-9	0.5	mg/kg	<0.5	<0.5	0.00	No Limit
		EP075(SIM): Chrysene	218-01-9	0.5	mg/kg	<0.5	<0.5	0.00	No Limit
		EP075(SIM): Dibenz(a.h)anthracene	53-70-3	0.5	mg/kg	<0.5	<0.5	0.00	No Limit
		EP075(SIM): Fluoranthene	206-44-0	0.5	mg/kg	<0.5	<0.5	0.00	No Limit

Sub-Matrix: **SOIL**

				Laboratory Duplicate (DUP) Report					
Laboratory sample ID	Client sample ID	Method: Compound	CAS Number	LOR	Unit	Original Result	Duplicate Result	RPD (%)	Recovery Limits (%)
EP075(SIM)B: Polynuclear Aromatic Hydrocarbons (QC Lot: 250207) - continued									
EM1515986-003	Anonymous	EP075(SIM): Fluorene	86-73-7	0.5	mg/kg	<0.5	<0.5	0.00	No Limit
		EP075(SIM): Indeno(1.2.3.cd)pyrene	193-39-5	0.5	mg/kg	<0.5	<0.5	0.00	No Limit
		EP075(SIM): Naphthalene	91-20-3	0.5	mg/kg	<0.5	<0.5	0.00	No Limit
		EP075(SIM): Phenanthrene	85-01-8	0.5	mg/kg	<0.5	<0.5	0.00	No Limit
		EP075(SIM): Pyrene	129-00-0	0.5	mg/kg	<0.5	<0.5	0.00	No Limit
EM1515999-034	Anonymous	EP075(SIM): Acenaphthene	83-32-9	0.5	mg/kg	0.6	0.6	0.00	No Limit
		EP075(SIM): Acenaphthylene	208-96-8	0.5	mg/kg	<0.5	<0.5	0.00	No Limit
		EP075(SIM): Anthracene	120-12-7	0.5	mg/kg	<0.5	<0.5	0.00	No Limit
		EP075(SIM): Benz(a)anthracene	56-55-3	0.5	mg/kg	<0.5	<0.5	0.00	No Limit
		EP075(SIM): Benzo(a)pyrene	50-32-8	0.5	mg/kg	<0.5	<0.5	0.00	No Limit
		EP075(SIM): Benzo(b+j)fluoranthene	205-99-2 205-82-3	0.5	mg/kg	<0.5	<0.5	0.00	No Limit
		EP075(SIM): Benzo(g.h.i)perylene	191-24-2	0.5	mg/kg	<0.5	<0.5	0.00	No Limit
		EP075(SIM): Benzo(k)fluoranthene	207-08-9	0.5	mg/kg	<0.5	<0.5	0.00	No Limit
		EP075(SIM): Chrysene	218-01-9	0.5	mg/kg	<0.5	<0.5	0.00	No Limit
		EP075(SIM): Dibenz(a.h)anthracene	53-70-3	0.5	mg/kg	<0.5	<0.5	0.00	No Limit
		EP075(SIM): Fluoranthene	206-44-0	0.5	mg/kg	<0.5	<0.5	0.00	No Limit
		EP075(SIM): Fluorene	86-73-7	0.5	mg/kg	1.3	1.5	9.35	No Limit
		EP075(SIM): Indeno(1.2.3.cd)pyrene	193-39-5	0.5	mg/kg	<0.5	<0.5	0.00	No Limit
		EP075(SIM): Naphthalene	91-20-3	0.5	mg/kg	0.7	<0.5	29.6	No Limit
		EP075(SIM): Phenanthrene	85-01-8	0.5	mg/kg	1.6	1.8	9.61	No Limit
		EP075(SIM): Pyrene	129-00-0	0.5	mg/kg	<0.5	<0.5	0.00	No Limit
EP080/071: Total Petroleum Hydrocarbons (QC Lot: 255546)									
EM1515910-016	Anonymous	EP071: C15 - C28 Fraction	----	100	mg/kg	<100	<100	0.00	No Limit
		EP071: C29 - C36 Fraction	----	100	mg/kg	<100	<100	0.00	No Limit
		EP071: C10 - C14 Fraction	----	50	mg/kg	<50	<50	0.00	No Limit
		EP071: C10 - C36 Fraction (sum)	----	50	mg/kg	<50	<50	0.00	No Limit
EP080/071: Total Recoverable Hydrocarbons - NEPM 2013 Fractions (QC Lot: 255546)									
EM1515910-016	Anonymous	EP071: >C16 - C34 Fraction	----	100	mg/kg	<100	<100	0.00	No Limit
		EP071: >C34 - C40 Fraction	----	100	mg/kg	<100	<100	0.00	No Limit
		EP071: >C10 - C16 Fraction	>C10_C16	50	mg/kg	<50	<50	0.00	No Limit
		EP071: >C10 - C40 Fraction (sum)	----	50	mg/kg	<50	<50	0.00	No Limit

Sub-Matrix: **WATER**

				Laboratory Duplicate (DUP) Report					
Laboratory sample ID	Client sample ID	Method: Compound	CAS Number	LOR	Unit	Original Result	Duplicate Result	RPD (%)	Recovery Limits (%)
EG020T: Total Metals by ICP-MS (QC Lot: 250234)									
EM1515989-002	Anonymous	EG020A-T: Cadmium	7440-43-9	0.0001	mg/L	<0.0001	<0.0001	0.00	No Limit
		EG020A-T: Arsenic	7440-38-2	0.001	mg/L	<0.001	<0.001	0.00	No Limit
		EG020A-T: Chromium	7440-47-3	0.001	mg/L	<0.001	<0.001	0.00	No Limit
		EG020A-T: Copper	7440-50-8	0.001	mg/L	<0.001	<0.001	0.00	No Limit
		EG020A-T: Lead	7439-92-1	0.001	mg/L	<0.001	<0.001	0.00	No Limit

Sub-Matrix: **WATER**

				Laboratory Duplicate (DUP) Report					
Laboratory sample ID	*Client sample ID*	*Method: Compound*	*CAS Number*	*LOR*	*Unit*	*Original Result*	*Duplicate Result*	*RPD (%)*	*Recovery Limits (%)*
EG020T: Total Metals by ICP-MS (QC Lot: 250234) - continued									
EM1515989-002	Anonymous	EG020A-T: Nickel	7440-02-0	0.001	mg/L	<0.001	<0.001	0.00	No Limit
		EG020A-T: Zinc	7440-66-6	0.005	mg/L	<0.005	<0.005	0.00	No Limit
		EG020A-T: Aluminium	7429-90-5	0.01	mg/L	<0.01	<0.01	0.00	No Limit
		EG020A-T: Selenium	7782-49-2	0.01	mg/L	<0.01	<0.01	0.00	No Limit
		EG020A-T: Iron	7439-89-6	0.05	mg/L	<0.05	<0.05	0.00	No Limit
EG035T: Total Recoverable Mercury by FIMS (QC Lot: 250304)									
EM1515989-003	Anonymous	EG035T: Mercury	7439-97-6	0.0001	mg/L	<0.0001	<0.0001	0.00	No Limit
EP080/071: Total Petroleum Hydrocarbons (QC Lot: 249888)									
EM1515982-001	Anonymous	EP071: C15 - C28 Fraction	----	100	µg/L	170	230	30.5	No Limit
		EP071: C10 - C14 Fraction	----	50	µg/L	90	120	28.1	No Limit
		EP071: C29 - C36 Fraction	----	50	µg/L	<50	<50	0.00	No Limit
EM1515982-005	Anonymous	EP071: C15 - C28 Fraction	----	100	µg/L	2670	2480	7.24	0% - 20%
		EP071: C10 - C14 Fraction	----	50	µg/L	17100	15400	10.3	0% - 20%
		EP071: C29 - C36 Fraction	----	50	µg/L	510	470	7.90	0% - 50%
EP080/071: Total Petroleum Hydrocarbons (QC Lot: 250618)									
EM1515990-001	Anonymous	EP080: C6 - C9 Fraction	----	20	µg/L	260	260	0.00	0% - 50%
EM1516021-002	Anonymous	EP080: C6 - C9 Fraction	----	20	µg/L	60	60	0.00	No Limit
EP080/071: Total Recoverable Hydrocarbons - NEPM 2013 Fractions (QC Lot: 249888)									
EM1515982-001	Anonymous	EP071: >C10 - C16 Fraction	>C10_C16	100	µg/L	170	210	22.2	No Limit
		EP071: >C16 - C34 Fraction	----	100	µg/L	<100	140	33.5	No Limit
		EP071: >C34 - C40 Fraction	----	100	µg/L	<100	<100	0.00	No Limit
EM1515982-005	Anonymous	EP071: >C10 - C16 Fraction	>C10_C16	100	µg/L	8610	# 5750	39.7	0% - 20%
		EP071: >C16 - C34 Fraction	----	100	µg/L	2590	2310	11.2	0% - 20%
		EP071: >C34 - C40 Fraction	----	100	µg/L	340	360	4.92	No Limit
EP080/071: Total Recoverable Hydrocarbons - NEPM 2013 Fractions (QC Lot: 250618)									
EM1515990-001	Anonymous	EP080: C6 - C10 Fraction	C6_C10	20	µg/L	260	250	0.00	0% - 50%
EM1516021-002	Anonymous	EP080: C6 - C10 Fraction	C6_C10	20	µg/L	60	60	0.00	No Limit
EP080: BTEXN (QC Lot: 250618)									
EM1515990-001	Anonymous	EP080: Benzene	71-43-2	1	µg/L	<1	<1	0.00	No Limit
		EP080: Ethylbenzene	100-41-4	2	µg/L	<2	<2	0.00	No Limit
		EP080: meta- & para-Xylene	108-38-3 106-42-3	2	µg/L	<2	<2	0.00	No Limit
		EP080: ortho-Xylene	95-47-6	2	µg/L	<2	<2	0.00	No Limit
		EP080: Toluene	108-88-3	2	µg/L	<2	<2	0.00	No Limit
		EP080: Naphthalene	91-20-3	5	µg/L	<5	<5	0.00	No Limit
EM1516021-002	Anonymous	EP080: Benzene	71-43-2	1	µg/L	<1	<1	0.00	No Limit
		EP080: Ethylbenzene	100-41-4	2	µg/L	<2	<2	0.00	No Limit
		EP080: meta- & para-Xylene	108-38-3 106-42-3	2	µg/L	<2	<2	0.00	No Limit

Sub-Matrix: **WATER**

				Laboratory Duplicate (DUP) Report					
Laboratory sample ID	*Client sample ID*	*Method: Compound*	*CAS Number*	*LOR*	*Unit*	*Original Result*	*Duplicate Result*	*RPD (%)*	*Recovery Limits (%)*
EP080: BTEXN (QC Lot: 250618) - continued									
EM1516021-002	Anonymous	EP080: ortho-Xylene	95-47-6	2	µg/L	<2	<2	0.00	No Limit
		EP080: Toluene	108-88-3	2	µg/L	<2	<2	0.00	No Limit
		EP080: Naphthalene	91-20-3	5	µg/L	<5	<5	0.00	No Limit

Method Blank (MB) and Laboratory Control Spike (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 (%)	Recovery Limits (%)	
Method: Compound	CAS Number	LOR	Unit	Result	Concentration	LCS	Low	High
ED040N: Sulfate - Calcium Phosphate Soluble (NEPM) (QCLot: 251011)								
ED040N: Sulfate as SO4 2-	14808-79-8	50	mg/kg	<50	3000 mg/kg	96.7	86	110
EG005T: Total Metals by ICP-AES (QCLot: 250445)								
EG005T: Aluminium	7429-90-5	50	mg/kg	<50	6134 mg/kg	106	93	115
EG005T: Arsenic	7440-38-2	5	mg/kg	<5	21.7 mg/kg	91.3	79	113
EG005T: Cadmium	7440-43-9	1	mg/kg	<1	4.64 mg/kg	90.6	87	115
EG005T: Chromium	7440-47-3	2	mg/kg	<2	43.9 mg/kg	95.6	89	113
EG005T: Copper	7440-50-8	5	mg/kg	<5	32 mg/kg	93.2	90	116
EG005T: Iron	7439-89-6	50	mg/kg	<50	8400 mg/kg	101	96	112
EG005T: Lead	7439-92-1	5	mg/kg	<5	40 mg/kg	90.7	85	107
EG005T: Nickel	7440-02-0	2	mg/kg	<2	55 mg/kg	94.3	89	111
EG005T: Selenium	7782-49-2	5	mg/kg	<5	5.37 mg/kg	104	93	109
EG005T: Zinc	7440-66-6	5	mg/kg	<5	60.8 mg/kg	90.1	89	111
EG035T: Total Recoverable Mercury by FIMS (QCLot: 250444)								
EG035T: Mercury	7439-97-6	0.1	mg/kg	<0.1	2.57 mg/kg	95.8	85	103
EP003: Total Organic Carbon (TOC) in Soil (QCLot: 256508)								
EP003: Total Organic Carbon	----	0.02	%	<0.02	100 %	102	70	130
EP074A: Monocyclic Aromatic Hydrocarbons (QCLot: 249965)								
EP074: 1.2.4-Trimethylbenzene	95-63-6	0.5	mg/kg	<0.5	1 mg/kg	94.9	66	108
EP074: 1.3.5-Trimethylbenzene	108-67-8	0.5	mg/kg	<0.5	1 mg/kg	94.7	67	109
EP074: Isopropylbenzene	98-82-8	0.5	mg/kg	<0.5	1 mg/kg	92.3	69	119
EP074: n-Butylbenzene	104-51-8	0.5	mg/kg	<0.5	1 mg/kg	83.5	58	110
EP074: n-Propylbenzene	103-65-1	0.5	mg/kg	<0.5	1 mg/kg	92.4	64	110
EP074: p-Isopropyltoluene	99-87-6	0.5	mg/kg	<0.5	1 mg/kg	90.2	65	111
EP074: sec-Butylbenzene	135-98-8	0.5	mg/kg	<0.5	1 mg/kg	93.1	66	110
EP074: Styrene	100-42-5	0.5	mg/kg	<0.5	1 mg/kg	92.5	72	118
EP074: tert-Butylbenzene	98-06-6	0.5	mg/kg	<0.5	1 mg/kg	96.0	67	111
EP074B: Oxygenated Compounds (QCLot: 249965)								
EP074: 2-Butanone (MEK)	78-93-3	5	mg/kg	<5	10 mg/kg	89.4	68	142
EP074: 2-Hexanone (MBK)	591-78-6	5	mg/kg	<5	10 mg/kg	94.0	62	128
EP074: 4-Methyl-2-pentanone (MIBK)	108-10-1	5	mg/kg	<5	10 mg/kg	94.6	67	123
EP074: Vinyl Acetate	108-05-4	5	mg/kg	<5	10 mg/kg	93.1	54	128
EP074C: Sulfonated Compounds (QCLot: 249965)								
EP074: Carbon disulfide	75-15-0	0.5	mg/kg	<0.5	1 mg/kg	82.8	50	128

Sub-Matrix: **SOIL**

Method: Compound	CAS Number	LOR	Unit	Method Blank (MB) Report	Laboratory Control Spike (LCS) Report			
					Spike	Spike Recovery (%)	Recovery Limits (%)	
				Result	Concentration	LCS	Low	High
EP074D: Fumigants (QCLot: 249965)								
EP074: 1.2-Dibromoethane (EDB)	106-93-4	0.5	mg/kg	<0.5	1 mg/kg	92.4	73	117
EP074: 1.2-Dichloropropane	78-87-5	0.5	mg/kg	<0.5	1 mg/kg	95.2	72	116
EP074: 2.2-Dichloropropane	594-20-7	0.5	mg/kg	<0.5	1 mg/kg	93.6	65	115
EP074: cis-1.3-Dichloropropylene	10061-01-5	0.5	mg/kg	<0.5	1 mg/kg	86.3	64	104
EP074: trans-1.3-Dichloropropylene	10061-02-6	0.5	mg/kg	<0.5	1 mg/kg	83.9	61	103
EP074E: Halogenated Aliphatic Compounds (QCLot: 249965)								
EP074: 1.1.1.2-Tetrachloroethane	630-20-6	0.5	mg/kg	<0.5	1 mg/kg	87.6	65	109
EP074: 1.1.1-Trichloroethane	71-55-6	0.5	mg/kg	<0.5	1 mg/kg	91.0	68	110
EP074: 1.1.2.2-Tetrachloroethane	79-34-5	0.5	mg/kg	<0.5	1 mg/kg	92.6	76	124
EP074: 1.1.2-Trichloroethane	79-00-5	0.5	mg/kg	<0.5	1 mg/kg	98.0	76	120
EP074: 1.1-Dichloroethane	75-34-3	0.5	mg/kg	<0.5	1 mg/kg	96.6	72	118
EP074: 1.1-Dichloroethene	75-35-4	0.5	mg/kg	<0.5	1 mg/kg	94.0	65	127
EP074: 1.1-Dichloropropylene	563-58-6	0.5	mg/kg	<0.5	1 mg/kg	92.5	70	116
EP074: 1.2.3-Trichloropropane	96-18-4	0.5	mg/kg	<0.5	1 mg/kg	96.0	75	123
EP074: 1.2-Dibromo-3-chloropropane	96-12-8	0.5	mg/kg	<0.5	1 mg/kg	81.2	54	106
EP074: 1.2-Dichloroethane	107-06-2	0.5	mg/kg	<0.5	1 mg/kg	97.7	75	119
EP074: 1.3-Dichloropropane	142-28-9	0.5	mg/kg	<0.5	1 mg/kg	97.8	78	120
EP074: Bromomethane	74-83-9	5	mg/kg	<5	10 mg/kg	74.7	43	133
EP074: Carbon Tetrachloride	56-23-5	0.5	mg/kg	<0.5	1 mg/kg	84.9	61	107
EP074: Chloroethane	75-00-3	5	mg/kg	<5	10 mg/kg	97.0	58	134
EP074: Chloromethane	74-87-3	5	mg/kg	<5	10 mg/kg	95.5	55	133
EP074: cis-1.2-Dichloroethene	156-59-2	0.5	mg/kg	<0.5	1 mg/kg	97.4	76	120
EP074: cis-1.4-Dichloro-2-butene	1476-11-5	0.5	mg/kg	<0.5	1 mg/kg	73.5	40	114
EP074: Dibromomethane	74-95-3	0.5	mg/kg	<0.5	1 mg/kg	87.0	74	114
EP074: Dichlorodifluoromethane	75-71-8	5	mg/kg	<5	10 mg/kg	75.3	45	123
EP074: Hexachlorobutadiene	87-68-3	0.5	mg/kg	<0.5	1 mg/kg	92.5	60	118
EP074: Iodomethane	74-88-4	0.5	mg/kg	<0.5	1 mg/kg	60.1	47	116
EP074: Pentachloroethane	76-01-7	0.5	mg/kg	<0.5	1 mg/kg	84.0	45	123
EP074: Tetrachloroethene	127-18-4	0.5	mg/kg	<0.5	1 mg/kg	91.5	69	121
EP074: trans-1.2-Dichloroethene	156-60-5	0.5	mg/kg	<0.5	1 mg/kg	95.7	70	118
EP074: trans-1.4-Dichloro-2-butene	110-57-6	0.5	mg/kg	<0.5	1 mg/kg	90.1	56	114
EP074: Trichloroethene	79-01-6	0.5	mg/kg	<0.5	1 mg/kg	92.8	72	116
EP074: Trichlorofluoromethane	75-69-4	5	mg/kg	<5	10 mg/kg	91.7	63	127
EP074: Vinyl chloride	75-01-4	5	mg/kg	<5	10 mg/kg	88.0	58	138
EP074F: Halogenated Aromatic Compounds (QCLot: 249965)								
EP074: 1.2.3-Trichlorobenzene	87-61-6	0.5	mg/kg	<0.5	1 mg/kg	97.5	69	117
EP074: 1.2.4-Trichlorobenzene	120-82-1	0.5	mg/kg	<0.5	1 mg/kg	91.8	60	112
EP074: 1.2-Dichlorobenzene	95-50-1	0.5	mg/kg	<0.5	1 mg/kg	97.4	76	112
EP074: 1.3-Dichlorobenzene	541-73-1	0.5	mg/kg	<0.5	1 mg/kg	94.3	70	110

Sub-Matrix: **SOIL**

Method: Compound	CAS Number	LOR	Unit	Method Blank (MB) Report: Result	Laboratory Control Spike (LCS) Report: Spike Concentration	Spike Recovery (%): LCS	Recovery Limits (%): Low	Recovery Limits (%): High
EP074F: Halogenated Aromatic Compounds (QCLot: 249965) - continued								
EP074: 1.4-Dichlorobenzene	106-46-7	0.5	mg/kg	<0.5	1 mg/kg	93.9	73	115
EP074: 2-Chlorotoluene	95-49-8	0.5	mg/kg	<0.5	1 mg/kg	97.1	69	113
EP074: 4-Chlorotoluene	106-43-4	0.5	mg/kg	<0.5	1 mg/kg	95.7	67	111
EP074: Bromobenzene	108-86-1	0.5	mg/kg	<0.5	1 mg/kg	102	63	117
EP074: Chlorobenzene	108-90-7	0.5	mg/kg	<0.5	1 mg/kg	96.2	79	115
EP074G: Trihalomethanes (QCLot: 249965)								
EP074: Bromodichloromethane	75-27-4	0.5	mg/kg	<0.5	1 mg/kg	84.5	65	107
EP074: Bromoform	75-25-2	0.5	mg/kg	<0.5	1 mg/kg	73.7	54	104
EP074: Chloroform	67-66-3	0.5	mg/kg	<0.5	1 mg/kg	97.0	75	117
EP074: Dibromochloromethane	124-48-1	0.5	mg/kg	<0.5	1 mg/kg	80.4	61	105
EP075(SIM)B: Polynuclear Aromatic Hydrocarbons (QCLot: 250207)								
EP075(SIM): Acenaphthene	83-32-9	0.5	mg/kg	<0.5	3 mg/kg	105	68	114
EP075(SIM): Acenaphthylene	208-96-8	0.5	mg/kg	<0.5	3 mg/kg	90.6	61	125
EP075(SIM): Anthracene	120-12-7	0.5	mg/kg	<0.5	3 mg/kg	105	68	116
EP075(SIM): Benz(a)anthracene	56-55-3	0.5	mg/kg	<0.5	3 mg/kg	95.3	62	116
EP075(SIM): Benzo(a)pyrene	50-32-8	0.5	mg/kg	<0.5	3 mg/kg	96.2	64	114
EP075(SIM): Benzo(b+j)fluoranthene	205-99-2 205-82-3	0.5	mg/kg	<0.5	3 mg/kg	91.6	64	114
EP075(SIM): Benzo(g.h.i)perylene	191-24-2	0.5	mg/kg	<0.5	3 mg/kg	97.5	59	117
EP075(SIM): Benzo(k)fluoranthene	207-08-9	0.5	mg/kg	<0.5	3 mg/kg	108	67	115
EP075(SIM): Chrysene	218-01-9	0.5	mg/kg	<0.5	3 mg/kg	116	63	119
EP075(SIM): Dibenz(a.h)anthracene	53-70-3	0.5	mg/kg	<0.5	3 mg/kg	96.9	62	114
EP075(SIM): Fluoranthene	206-44-0	0.5	mg/kg	<0.5	3 mg/kg	105	67	115
EP075(SIM): Fluorene	86-73-7	0.5	mg/kg	<0.5	3 mg/kg	96.7	62	120
EP075(SIM): Indeno(1.2.3.cd)pyrene	193-39-5	0.5	mg/kg	<0.5	3 mg/kg	101	62	116
EP075(SIM): Naphthalene	91-20-3	0.5	mg/kg	<0.5	3 mg/kg	107	65	119
EP075(SIM): Phenanthrene	85-01-8	0.5	mg/kg	<0.5	3 mg/kg	105	69	113
EP075(SIM): Pyrene	129-00-0	0.5	mg/kg	<0.5	3 mg/kg	107	66	116
EP080/071: Total Petroleum Hydrocarbons (QCLot: 255539)								
EP080: C6 - C9 Fraction	----	10	mg/kg	<10	36 mg/kg	88.7	66	130
EP080/071: Total Petroleum Hydrocarbons (QCLot: 255546)								
EP071: C10 - C14 Fraction	----	50	mg/kg	<50	658 mg/kg	85.4	65	131
EP071: C10 - C36 Fraction (sum)	----	50	mg/kg	<50	----	----	----	----
EP071: C15 - C28 Fraction	----	100	mg/kg	<100	3160 mg/kg	90.0	70	126
EP071: C29 - C36 Fraction	----	100	mg/kg	<100	1448 mg/kg	93.0	70	122
EP080/071: Total Recoverable Hydrocarbons - NEPM 2013 Fractions (QCLot: 255539)								
EP080: C6 - C10 Fraction	C6_C10	10	mg/kg	<10	45 mg/kg	88.2	64	128
EP080/071: Total Recoverable Hydrocarbons - NEPM 2013 Fractions (QCLot: 255546)								

Sub-Matrix: **SOIL**

Method: Compound	CAS Number	LOR	Unit	Method Blank (MB) Report: Result	Laboratory Control Spike (LCS) Report: Spike Concentration	Spike Recovery (%): LCS	Recovery Limits (%): Low	Recovery Limits (%): High
EP080/071: Total Recoverable Hydrocarbons - NEPM 2013 Fractions (QCLot: 255546) - continued								
EP071: >C10 - C16 Fraction	>C10_C16	50	mg/kg	<50	1051 mg/kg	89.9	68	130
EP071: >C10 - C40 Fraction (sum)	----	50	mg/kg	<50	----	----	----	----
EP071: >C16 - C34 Fraction	----	100	mg/kg	<100	4124 mg/kg	91.7	72	116
EP071: >C34 - C40 Fraction	----	100	mg/kg	<100	161 mg/kg	72.0	38	132
EP080: BTEXN (QCLot: 255539)								
EP080: Benzene	71-43-2	0.2	mg/kg	<0.2	2 mg/kg	93.4	74	124
EP080: Ethylbenzene	100-41-4	0.5	mg/kg	<0.5	2 mg/kg	91.2	72	124
EP080: meta- & para-Xylene	108-38-3 106-42-3	0.5	mg/kg	<0.5	4 mg/kg	90.7	72	132
EP080: Naphthalene	91-20-3	1	mg/kg	<1	0.5 mg/kg	95.8	66	132
EP080: ortho-Xylene	95-47-6	0.5	mg/kg	<0.5	2 mg/kg	94.0	76	130
EP080: Toluene	108-88-3	0.5	mg/kg	<0.5	2 mg/kg	94.2	75	129

Sub-Matrix: **WATER**

Method: Compound	CAS Number	LOR	Unit	Method Blank (MB) Report: Result	Laboratory Control Spike (LCS) Report: Spike Concentration	Spike Recovery (%): LCS	Recovery Limits (%): Low	Recovery Limits (%): High
EG020T: Total Metals by ICP-MS (QCLot: 250234)								
EG020A-T: Aluminium	7429-90-5	0.01	mg/L	<0.01	0.5 mg/L	103	100	108
EG020A-T: Arsenic	7440-38-2	0.001	mg/L	<0.001	0.1 mg/L	104	94	116
EG020A-T: Cadmium	7440-43-9	0.0001	mg/L	<0.0001	0.1 mg/L	100	90	110
EG020A-T: Chromium	7440-47-3	0.001	mg/L	<0.001	0.1 mg/L	99.7	90	110
EG020A-T: Copper	7440-50-8	0.001	mg/L	<0.001	0.1 mg/L	105	91	109
EG020A-T: Iron	7439-89-6	0.05	mg/L	<0.05	0.5 mg/L	99.8	99	109
EG020A-T: Lead	7439-92-1	0.001	mg/L	<0.001	0.1 mg/L	96.1	91	111
EG020A-T: Nickel	7440-02-0	0.001	mg/L	<0.001	0.1 mg/L	96.3	91	111
EG020A-T: Selenium	7782-49-2	0.01	mg/L	<0.01	0.1 mg/L	101	86	110
EG020A-T: Zinc	7440-66-6	0.005	mg/L	<0.005	0.1 mg/L	93.7	91	109
EG035T: Total Recoverable Mercury by FIMS (QCLot: 250304)								
EG035T: Mercury	7439-97-6	0.0001	mg/L	<0.0001	0.01 mg/L	110	87	113
EP080/071: Total Petroleum Hydrocarbons (QCLot: 249888)								
EP071: C10 - C14 Fraction	----	50	µg/L	<50	3980 µg/L	68.6	53	123
EP071: C15 - C28 Fraction	----	100	µg/L	<100	17006 µg/L	79.1	57	133
EP071: C29 - C36 Fraction	----	50	µg/L	<50	8662 µg/L	72.5	55	141
EP080/071: Total Petroleum Hydrocarbons (QCLot: 250618)								
EP080: C6 - C9 Fraction	----	20	µg/L	<20	360 µg/L	94.2	67	127
EP080/071: Total Recoverable Hydrocarbons - NEPM 2013 Fractions (QCLot: 249888)								
EP071: >C10 - C16 Fraction	>C10_C16	100	µg/L	<100	5753 µg/L	79.2	54	122
EP071: >C16 - C34 Fraction	----	100	µg/L	<100	24516 µg/L	71.8	56	132
EP071: >C34 - C40 Fraction	----	100	µg/L	<100	828 µg/L	86.7	51	137

Sub-Matrix: **WATER**

Method: Compound	CAS Number	LOR	Unit	Method Blank (MB) Report: Result	Laboratory Control Spike (LCS) Report: Spike Concentration	Spike Recovery (%): LCS	Recovery Limits (%): Low	Recovery Limits (%): High
EP080/071: Total Recoverable Hydrocarbons - NEPM 2013 Fractions (QCLot: 250618)								
EP080: C6 - C10 Fraction	C6_C10	20	µg/L	<20	450 µg/L	94.5	65	125
EP080: BTEXN (QCLot: 250618)								
EP080: Benzene	71-43-2	1	µg/L	<1	20 µg/L	105	76	120
EP080: Ethylbenzene	100-41-4	2	µg/L	<2	20 µg/L	95.8	72	124
EP080: meta- & para-Xylene	108-38-3 106-42-3	2	µg/L	<2	40 µg/L	96.5	72	130
EP080: Naphthalene	91-20-3	5	µg/L	<5	5 µg/L	110	71	129
EP080: ortho-Xylene	95-47-6	2	µg/L	<2	20 µg/L	99.8	75	127
EP080: Toluene	108-88-3	2	µg/L	<2	20 µg/L	98.9	76	124

Matrix Spike (MS) Report

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

Sub-Matrix: **SOIL**

Laboratory sample ID	Client sample ID	Method: Compound	CAS Number	Matrix Spike (MS) Report: Spike Concentration	SpikeRecovery(%): MS	Recovery Limits (%): Low	Recovery Limits (%): High
ED040N: Sulfate - Calcium Phosphate Soluble (NEPM) (QCLot: 251011)							
EM1515593-059	Anonymous	ED040N: Sulfate as SO4 2-	14808-79-8	3000 mg/kg	95.9	84	116
EG005T: Total Metals by ICP-AES (QCLot: 250445)							
EM1515959-002	Anonymous	EG005T: Arsenic	7440-38-2	50 mg/kg	104	78	124
		EG005T: Cadmium	7440-43-9	50 mg/kg	107	84	116
		EG005T: Chromium	7440-47-3	50 mg/kg	108	79	121
		EG005T: Copper	7440-50-8	50 mg/kg	105	82	124
		EG005T: Lead	7439-92-1	50 mg/kg	104	76	124
		EG005T: Nickel	7440-02-0	50 mg/kg	102	78	120
		EG005T: Selenium	7782-49-2	50 mg/kg	98.4	71	125
		EG005T: Zinc	7440-66-6	50 mg/kg	101	74	128
EG035T: Total Recoverable Mercury by FIMS (QCLot: 250444)							
EM1515959-002	Anonymous	EG035T: Mercury	7439-97-6	5 mg/kg	99.8	76	116
EP074E: Halogenated Aliphatic Compounds (QCLot: 249965)							
EM1515997-003	GW14(0.9-1.0)	EP074: 1.1-Dichloroethene	75-35-4	2 mg/kg	97.6	29	141
		EP074: Trichloroethene	79-01-6	2 mg/kg	100	50	126
EP074F: Halogenated Aromatic Compounds (QCLot: 249965)							
EM1515997-003	GW14(0.9-1.0)	EP074: Chlorobenzene	108-90-7	2 mg/kg	104	65	133
EP075(SIM)B: Polynuclear Aromatic Hydrocarbons (QCLot: 250207)							
EM1515986-011	Anonymous	EP075(SIM): Acenaphthene	83-32-9	3 mg/kg	96.5	67	117

Sub-Matrix: **SOIL**

				Matrix Spike (MS) Report			
				Spike	SpikeRecovery(%)	Recovery Limits (%)	
Laboratory sample ID	Client sample ID	Method: Compound	CAS Number	Concentration	MS	Low	High
EP075(SIM)B: Polynuclear Aromatic Hydrocarbons (QCLot: 250207) - continued							
EM1515986-011	Anonymous	EP075(SIM): Pyrene	129-00-0	3 mg/kg	118	52	148
EP080/071: Total Petroleum Hydrocarbons (QCLot: 255539)							
EM1515997-003	GW14(0.9-1.0)	EP080: C6 - C9 Fraction	----	28 mg/kg	65.4	42	131
EP080/071: Total Petroleum Hydrocarbons (QCLot: 255546)							
EM1515910-017	Anonymous	EP071: C10 - C14 Fraction	----	658 mg/kg	94.8	53	123
		EP071: C15 - C28 Fraction	----	3160 mg/kg	92.7	70	124
		EP071: C29 - C36 Fraction	----	1448 mg/kg	98.3	64	118
EP080/071: Total Recoverable Hydrocarbons - NEPM 2013 Fractions (QCLot: 255539)							
EM1515997-003	GW14(0.9-1.0)	EP080: C6 - C10 Fraction	C6_C10	33 mg/kg	62.3	39	129
EP080/071: Total Recoverable Hydrocarbons - NEPM 2013 Fractions (QCLot: 255546)							
EM1515910-017	Anonymous	EP071: >C10 - C16 Fraction	>C10_C16	1051 mg/kg	96.5	65	123
		EP071: >C16 - C34 Fraction	----	4124 mg/kg	93.8	67	121
		EP071: >C34 - C40 Fraction	----	161 mg/kg	110	44	126
EP080: BTEXN (QCLot: 255539)							
EM1515997-003	GW14(0.9-1.0)	EP080: Benzene	71-43-2	2 mg/kg	107	50	136
		EP080: Toluene	108-88-3	2 mg/kg	99.6	56	139

Sub-Matrix: **WATER**

				Matrix Spike (MS) Report			
				Spike	SpikeRecovery(%)	Recovery Limits (%)	
Laboratory sample ID	Client sample ID	Method: Compound	CAS Number	Concentration	MS	Low	High
EG020T: Total Metals by ICP-MS (QCLot: 250234)							
EM1515989-002	Anonymous	EG020A-T: Arsenic	7440-38-2	1 mg/L	110	82	118
		EG020A-T: Cadmium	7440-43-9	0.25 mg/L	116	75	129
		EG020A-T: Chromium	7440-47-3	1 mg/L	102	80	118
		EG020A-T: Copper	7440-50-8	1 mg/L	106	81	115
		EG020A-T: Lead	7439-92-1	1 mg/L	101	83	121
		EG020A-T: Nickel	7440-02-0	1 mg/L	110	80	118
		EG020A-T: Zinc	7440-66-6	1 mg/L	104	74	116
EG035T: Total Recoverable Mercury by FIMS (QCLot: 250304)							
EM1515989-004	Anonymous	EG035T: Mercury	7439-97-6	0.01 mg/L	99.6	70	130
EP080/071: Total Petroleum Hydrocarbons (QCLot: 249888)							
EM1515982-004	Anonymous	EP071: C10 - C14 Fraction	----	3980 µg/L	90.0	50	130
		EP071: C15 - C28 Fraction	----	17006 µg/L	112	54	136
		EP071: C29 - C36 Fraction	----	8662 µg/L	98.2	50	142
EP080/071: Total Petroleum Hydrocarbons (QCLot: 250618)							
EM1515993-001	Anonymous	EP080: C6 - C9 Fraction	----	280 µg/L	89.9	43	125

Sub-Matrix: **WATER**

				Matrix Spike (MS) Report			
				Spike	SpikeRecovery(%)	Recovery Limits (%)	
Laboratory sample ID	*Client sample ID*	*Method: Compound*	*CAS Number*	*Concentration*	*MS*	*Low*	*High*
EP080/071: Total Recoverable Hydrocarbons - NEPM 2013 Fractions (QCLot: 249888)							
EM1515982-004	Anonymous	EP071: >C10 - C16 Fraction	>C10_C16	5753 µg/L	110	50	128
		EP071: >C16 - C34 Fraction	----	24516 µg/L	100.0	50	150
		EP071: >C34 - C40 Fraction	----	828 µg/L	115	51	159
EP080/071: Total Recoverable Hydrocarbons - NEPM 2013 Fractions (QCLot: 250618)							
EM1515993-001	Anonymous	EP080: C6 - C10 Fraction	C6_C10	330 µg/L	84.1	44	122
EP080: BTEXN (QCLot: 250618)							
EM1515993-001	Anonymous	EP080: Benzene	71-43-2	20 µg/L	103	68	130
		EP080: Toluene	108-88-3	20 µg/L	105	72	132

ALS Environmental

QA/QC Compliance Assessment for DQO Reporting

Work Order	: **EM1515997**	Page	: 1 of 7
Client	: **AECOM Australia Pty Ltd**	Laboratory	: Environmental Division Melbourne
Contact	: MS AVERYLL COYNE	Telephone	: +61-3-8549 9608
Project	: 60431087	Date Samples Received	: 16-Oct-2015
Site	: ----	Issue Date	: 27-Oct-2015
Sampler	: DUGALD CUNNINGHAM, MATTHEW SHEPPARD, NATHAN JENSEN	No. of samples received	: 25
Order number	: 60431087 Task 1.4	No. of samples analysed	: 6

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 Laboratory Control outliers occur.**
- **NO Matrix Spike outliers occur.**
- **Duplicate outliers exist - please see following pages for full details.**
- **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 : Quality Control Samples

Duplicates, Method Blanks, Laboratory Control Samples and Matrix Spikes

Matrix: **WATER**

Compound Group Name	Laboratory Sample ID	Client Sample ID	Analyte	CAS Number	Data	Limits	Comment
Duplicate (DUP) RPDs							
EP080/071: Total Recoverable Hydrocarbons - NEPM 2	EM1515982--005	Anonymous	**>C10 - C16 Fraction**	>C10_C16	39.7 %	0% - 20%	**RPD exceeds LOR based limits**

Outliers : Frequency of Quality Control Samples

Matrix: **SOIL**

Quality Control Sample Type	Count		Rate (%)		Quality Control Specification
Method	QC	Regular	Actual	Expected	
Laboratory Duplicates (DUP)					
TRH Volatiles/BTEX	0	3	0.00	10.00	NEPM 2013 Schedule B(3) and ALS QCS3 requirement

Analysis Holding Time Compliance

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
EA001: pH in soil using 0.01M CaCl extract							
Soil Glass Jar - Unpreserved (EA001)							
GW14(0.5-0.6), GW14(0.9-1.0), GW10(0.5-0.6)	**16-Oct-2015**	**21-Oct-2015**	23-Oct-2015	✓	**21-Oct-2015**	21-Oct-2015	✓
EA055: Moisture Content							
Soil Glass Jar - Unpreserved (EA055-103)							
GW14(0.5-0.6), GW14(0.9-1.0), GW10(0.5-0.6)	**16-Oct-2015**	**----**	----	----	**21-Oct-2015**	30-Oct-2015	✓
ED040N: Sulfate - Calcium Phosphate Soluble (NEPM)							
Soil Glass Jar - Unpreserved (ED040N)							
GW14(0.5-0.6), GW14(0.9-1.0), GW10(0.5-0.6)	**16-Oct-2015**	**22-Oct-2015**	13-Apr-2016	✓	**22-Oct-2015**	13-Apr-2016	✓
EG005T: Total Metals by ICP-AES							
Soil Glass Jar - Unpreserved (EG005T)							
GW14(0.5-0.6), GW14(0.9-1.0), GW10(0.5-0.6)	**16-Oct-2015**	**21-Oct-2015**	13-Apr-2016	✓	**22-Oct-2015**	13-Apr-2016	✓

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)							
GW14(0.5-0.6), GW14(0.9-1.0), GW10(0.5-0.6)	**16-Oct-2015**	**21-Oct-2015**	13-Nov-2015	✓	**22-Oct-2015**	13-Nov-2015	✓
EP003: Total Organic Carbon (TOC) in Soil							
Soil Glass Jar - Unpreserved (EP003)							
GW37(5.3-5.4)	**16-Oct-2015**	**26-Oct-2015**	13-Nov-2015	✓	**26-Oct-2015**	13-Nov-2015	✓
EP080/071: Total Petroleum Hydrocarbons							
Soil Glass Jar - Unpreserved (EP071)							
GW14(0.5-0.6), GW14(0.9-1.0), GW10(0.5-0.6)	**16-Oct-2015**	**26-Oct-2015**	30-Oct-2015	✓	**26-Oct-2015**	05-Dec-2015	✓
EP074A: Monocyclic Aromatic Hydrocarbons							
Soil Glass Jar - Unpreserved (EP074)							
GW14(0.5-0.6), GW14(0.9-1.0), GW10(0.5-0.6)	**16-Oct-2015**	**21-Oct-2015**	23-Oct-2015	✓	**22-Oct-2015**	23-Oct-2015	✓
EP075(SIM)B: Polynuclear Aromatic Hydrocarbons							
Soil Glass Jar - Unpreserved (EP075(SIM))							
GW14(0.5-0.6), GW14(0.9-1.0), GW10(0.5-0.6)	**16-Oct-2015**	**21-Oct-2015**	30-Oct-2015	✓	**21-Oct-2015**	30-Nov-2015	✓
EP080/071: Total Petroleum Hydrocarbons							
Soil Glass Jar - Unpreserved (EP080)							
GW14(0.5-0.6), GW14(0.9-1.0), GW10(0.5-0.6)	**16-Oct-2015**	**21-Oct-2015**	30-Oct-2015	✓	**22-Oct-2015**	30-Oct-2015	✓

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)							
QC14	**16-Oct-2015**	**21-Oct-2015**	13-Apr-2016	✓	**22-Oct-2015**	13-Apr-2016	✓
EG035T: Total Recoverable Mercury by FIMS							
Clear Plastic Bottle - Nitric Acid; Unfiltered (EG035T)							
QC14	**16-Oct-2015**	**----**	----	----	**21-Oct-2015**	13-Nov-2015	✓
EP080/071: Total Petroleum Hydrocarbons							
Amber Glass Bottle - Unpreserved (EP071)							
QC14	**16-Oct-2015**	**21-Oct-2015**	23-Oct-2015	✓	**22-Oct-2015**	30-Nov-2015	✓
EP080/071: Total Petroleum Hydrocarbons							
Amber VOC Vial - Sulfuric Acid (EP080)							
QC14, QC15	**16-Oct-2015**	**22-Oct-2015**	30-Oct-2015	✓	**22-Oct-2015**	30-Oct-2015	✓

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	EA055-103	2	16	**12.50**	**10.00**	✓	NEPM 2013 Schedule B(3) and ALS QCS3 requirement
PAH/Phenols (SIM)	EP075(SIM)	2	12	**16.67**	**10.00**	✓	NEPM 2013 Schedule B(3) and ALS QCS3 requirement
pH in soil using a 0.01M CaCl2 extract	EA001	2	11	**18.18**	**10.00**	✓	NEPM 2013 Schedule B(3) and ALS QCS3 requirement
Sulfate - Calcium Phosphate Soluble	ED040N	2	15	**13.33**	**10.00**	✓	NEPM 2013 Schedule B(3) and ALS QCS3 requirement
Total Mercury by FIMS	EG035T	2	16	**12.50**	**10.00**	✓	NEPM 2013 Schedule B(3) and ALS QCS3 requirement
Total Metals by ICP-AES	EG005T	2	16	**12.50**	**10.00**	✓	NEPM 2013 Schedule B(3) and ALS QCS3 requirement
Total Organic Carbon	EP003	1	1	**100.00**	**10.00**	✓	NEPM 2013 Schedule B(3) and ALS QCS3 requirement
TRH - Semivolatile Fraction	EP071	1	5	**20.00**	**10.00**	✓	NEPM 2013 Schedule B(3) and ALS QCS3 requirement
TRH Volatiles/BTEX	EP080	0	3	**0.00**	**10.00**	×	NEPM 2013 Schedule B(3) and ALS QCS3 requirement
Volatile Organic Compounds	EP074	1	6	**16.67**	**10.00**	✓	NEPM 2013 Schedule B(3) and ALS QCS3 requirement
Laboratory Control Samples (LCS)							
PAH/Phenols (SIM)	EP075(SIM)	1	12	**8.33**	**5.00**	✓	NEPM 2013 Schedule B(3) and ALS QCS3 requirement
Sulfate - Calcium Phosphate Soluble	ED040N	1	15	**6.67**	**5.00**	✓	NEPM 2013 Schedule B(3) and ALS QCS3 requirement
Total Mercury by FIMS	EG035T	1	16	**6.25**	**5.00**	✓	NEPM 2013 Schedule B(3) and ALS QCS3 requirement
Total Metals by ICP-AES	EG005T	1	16	**6.25**	**5.00**	✓	NEPM 2013 Schedule B(3) and ALS QCS3 requirement
Total Organic Carbon	EP003	1	1	**100.00**	**5.00**	✓	NEPM 2013 Schedule B(3) and ALS QCS3 requirement
TRH - Semivolatile Fraction	EP071	1	5	**20.00**	**5.00**	✓	NEPM 2013 Schedule B(3) and ALS QCS3 requirement
TRH Volatiles/BTEX	EP080	1	3	**33.33**	**5.00**	✓	NEPM 2013 Schedule B(3) and ALS QCS3 requirement
Volatile Organic Compounds	EP074	1	6	**16.67**	**5.00**	✓	NEPM 2013 Schedule B(3) and ALS QCS3 requirement
Method Blanks (MB)							
PAH/Phenols (SIM)	EP075(SIM)	1	12	**8.33**	**5.00**	✓	NEPM 2013 Schedule B(3) and ALS QCS3 requirement
Sulfate - Calcium Phosphate Soluble	ED040N	1	15	**6.67**	**5.00**	✓	NEPM 2013 Schedule B(3) and ALS QCS3 requirement
Total Mercury by FIMS	EG035T	1	16	**6.25**	**5.00**	✓	NEPM 2013 Schedule B(3) and ALS QCS3 requirement
Total Metals by ICP-AES	EG005T	1	16	**6.25**	**5.00**	✓	NEPM 2013 Schedule B(3) and ALS QCS3 requirement
Total Organic Carbon	EP003	1	1	**100.00**	**5.00**	✓	NEPM 2013 Schedule B(3) and ALS QCS3 requirement
TRH - Semivolatile Fraction	EP071	1	5	**20.00**	**5.00**	✓	NEPM 2013 Schedule B(3) and ALS QCS3 requirement
TRH Volatiles/BTEX	EP080	1	3	**33.33**	**5.00**	✓	NEPM 2013 Schedule B(3) and ALS QCS3 requirement
Volatile Organic Compounds	EP074	1	6	**16.67**	**5.00**	✓	NEPM 2013 Schedule B(3) and ALS QCS3 requirement
Matrix Spikes (MS)							
PAH/Phenols (SIM)	EP075(SIM)	1	12	**8.33**	**5.00**	✓	NEPM 2013 Schedule B(3) and ALS QCS3 requirement
Sulfate - Calcium Phosphate Soluble	ED040N	1	15	**6.67**	**5.00**	✓	NEPM 2013 Schedule B(3) and ALS QCS3 requirement
Total Mercury by FIMS	EG035T	1	16	**6.25**	**5.00**	✓	NEPM 2013 Schedule B(3) and ALS QCS3 requirement
Total Metals by ICP-AES	EG005T	1	16	**6.25**	**5.00**	✓	NEPM 2013 Schedule B(3) and ALS QCS3 requirement
TRH - Semivolatile Fraction	EP071	1	5	**20.00**	**5.00**	✓	NEPM 2013 Schedule B(3) and ALS QCS3 requirement
TRH Volatiles/BTEX	EP080	1	3	**33.33**	**5.00**	✓	NEPM 2013 Schedule B(3) and ALS QCS3 requirement
Volatile Organic Compounds	EP074	1	6	**16.67**	**5.00**	✓	NEPM 2013 Schedule B(3) and ALS QCS3 requirement

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)							
Total Mercury by FIMS	EG035T	1	6	**16.67**	**10.00**	✓	NEPM 2013 Schedule B(3) and ALS QCS3 requirement
Total Metals by ICP-MS - Suite A	EG020A-T	1	5	**20.00**	**10.00**	✓	NEPM 2013 Schedule B(3) and ALS QCS3 requirement
TRH - Semivolatile Fraction	EP071	2	20	**10.00**	**10.00**	✓	NEPM 2013 Schedule B(3) and ALS QCS3 requirement
TRH Volatiles/BTEX	EP080	2	15	**13.33**	**10.00**	✓	NEPM 2013 Schedule B(3) and ALS QCS3 requirement
Laboratory Control Samples (LCS)							
Total Mercury by FIMS	EG035T	1	6	**16.67**	**5.00**	✓	NEPM 2013 Schedule B(3) and ALS QCS3 requirement
Total Metals by ICP-MS - Suite A	EG020A-T	1	5	**20.00**	**5.00**	✓	NEPM 2013 Schedule B(3) and ALS QCS3 requirement
TRH - Semivolatile Fraction	EP071	1	20	**5.00**	**5.00**	✓	NEPM 2013 Schedule B(3) and ALS QCS3 requirement
TRH Volatiles/BTEX	EP080	1	15	**6.67**	**5.00**	✓	NEPM 2013 Schedule B(3) and ALS QCS3 requirement
Method Blanks (MB)							
Total Mercury by FIMS	EG035T	1	6	**16.67**	**5.00**	✓	NEPM 2013 Schedule B(3) and ALS QCS3 requirement
Total Metals by ICP-MS - Suite A	EG020A-T	1	5	**20.00**	**5.00**	✓	NEPM 2013 Schedule B(3) and ALS QCS3 requirement
TRH - Semivolatile Fraction	EP071	1	20	**5.00**	**5.00**	✓	NEPM 2013 Schedule B(3) and ALS QCS3 requirement
TRH Volatiles/BTEX	EP080	1	15	**6.67**	**5.00**	✓	NEPM 2013 Schedule B(3) and ALS QCS3 requirement
Matrix Spikes (MS)							
Total Mercury by FIMS	EG035T	1	6	**16.67**	**5.00**	✓	NEPM 2013 Schedule B(3) and ALS QCS3 requirement
Total Metals by ICP-MS - Suite A	EG020A-T	1	5	**20.00**	**5.00**	✓	NEPM 2013 Schedule B(3) and ALS QCS3 requirement
TRH - Semivolatile Fraction	EP071	1	20	**5.00**	**5.00**	✓	NEPM 2013 Schedule B(3) and ALS QCS3 requirement
TRH Volatiles/BTEX	EP080	1	15	**6.67**	**5.00**	✓	NEPM 2013 Schedule B(3) and ALS QCS3 requirement

Brief Method Summaries

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

Analytical Methods	Method	Matrix	Method Descriptions
pH in soil using a 0.01M CaCl2 extract	EA001	SOIL	In house: Referenced to Rayment and Higginson 4B1 (mod.) 10 g of soil is mixed with 50 mL of 0.01M CaCl2 and tumbled end over end for 1 hour. pH is measured from the continuous suspension. This method is compliant with NEPM (2013) Schedule B(3) (Method 103)
Moisture Content	EA055-103	SOIL	In-house. A gravimetric procedure based on weight loss over a 12 hour drying period at 103-105 degrees C. This method is compliant with NEPM (2013) Schedule B(3) Section 7.1 and Table 1 (14 day holding time).
Sulfate - Calcium Phosphate Soluble	ED040N	SOIL	In-house. The sample is extracted with a calcium phosphate solution. The phosphate ion displaces the adsorbed sulfate while calcium ions depress the extraction of interfering S from soil organic matter. SO4 in the extract is determined by ICPAES and reported as dry weight in the original soil. This method is compliant with NEPM (2013) Schedule B(3) (Method 406)
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 (2013) 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 (2013) Schedule B(3)
Total Organic Carbon	EP003	SOIL	In-house C-IR17. Dried and pulverised sample is reacted with acid to remove inorganic Carbonates, then combusted in a LECO furnace in the presence of strong oxidants / catalysts. The evolved (Organic) Carbon (as CO2) is automaticaly measured by infra-red detector.
TRH - Semivolatile Fraction	EP071	SOIL	(USEPA SW 846 - 8015A) Sample extracts are analysed by Capillary GC/FID and quantified against alkane standards over the range C10 - C40.
Volatile Organic Compounds	EP074	SOIL	(USEPA SW 846 - 8260B) Extracts are analysed by Purge and Trap, Capillary GC/MS. Quantification is by comparison against an established 5 point calibration curve. This method is compliant with NEPM (2013) Schedule B(3) (Method 501)
PAH/Phenols (SIM)	EP075(SIM)	SOIL	(USEPA SW 846 - 8270B) 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 (2013) Schedule B(3) (Method 502 and 507)
TRH Volatiles/BTEX	EP080	SOIL	(USEPA SW 846 - 8260B) Extracts are analysed by Purge and Trap, Capillary GC/MS. Quantification is by comparison against an established 5 point calibration curve.
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.

Analytical Methods	Method	Matrix	Method Descriptions
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 (2013) Schedule B(3)
TRH - Semivolatile Fraction	EP071	WATER	USEPA SW 846 - 8015A 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 (2013) Schedule B(3)
TRH Volatiles/BTEX	EP080	WATER	USEPA SW 846 - 8260B 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 (2013) Schedule B(3)

Preparation Methods	Method	Matrix	Method Descriptions
Dry and Pulverise (up to 100g)	GEO30	SOIL	#
Methanolic Extraction of Soils for Purge and Trap	ORG16	SOIL	(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	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 (2013) Schedule B(3)

SAMPLE RECEIPT NOTIFICATION (SRN)

Work Order : **EM1515997**

Client	: **AECOM Australia Pty Ltd**	Laboratory	: Environmental Division Melbourne
Contact	: MS AVERYLL COYNE	Contact	: Carol Walsh
Address	: LEVEL 9 8 EXHIBITION ST MELBOURNE VIC 3000	Address	: 4 Westall Rd Springvale VIC Australia 3171
E-mail	: averyll.coyne@aecom.com	E-mail	: carol.walsh@alsglobal.com
Telephone	: +61 03 9653 1234	Telephone	: +61-3-8549 9608
Facsimile	: +61 03 9654 7117	Facsimile	: +61-3-8549 9601
Project	: 60431087	Page	: 1 of 3
Order number	: 60431087 Task 1.4	Quote number	: EB2015AECOMAU0580 (EN/004/15)
C-O-C number	: ----	QC Level	: NEPM 2013 Schedule B(3) and ALS QCS3 requirement
Site	: ----		
Sampler	: DUGALD CUNNINGHAM, MATTHEW SHEPPARD, NATHAN JENSEN		

Dates

Date Samples Received	: 16-Oct-2015 5:45 PM	Issue Date	: 23-Oct-2015
Client Requested Due Date	: 27-Oct-2015	Scheduled Reporting Date	: **26-Oct-2015**

Delivery Details

Mode of Delivery	: Carrier	Security Seal	: Intact.
No. of coolers/boxes	: 4	Temperature	: 4.3 - Ice present
Receipt Detail	:	No. of samples received / analysed	: 25 / 6

General Comments

- This report contains the following information:
  - Sample Container(s)/Preservation Non-Compliances
  - Summary of Sample(s) and Requested Analysis
  - Proactive Holding Time Report
  - Requested Deliverables
- **Please direct any queries related to sample condition / numbering / breakages to Client Services.**
- Sample Disposal - Aqueous (14 days), Solid (60 days) from date of completion of work order.
- **Analytical work for this work order will be conducted at ALS Springvale.**
- **For sample QC15, TPH(C6-C40) has been requested; only VOC vials have been received and so only the volatile fraction of TPH (C6-C9) plus BTEX analysis (ALS suite W-18) has been booked in.**
- **Please refer to the Proactive Holding Time Report table below which summarises breaches of recommended holding times that have occurred prior to samples/instructions being received at the laboratory. The absence of this summary table indicates that all samples have been received within the recommended holding times for the analysis requested.**

Sample Container(s)/Preservation Non-Compliances

All comparisons are made against pretreatment/preservation AS, APHA, USEPA standards.

- **No sample container / preservation non-compliance exist.**

Summary of Sample(s) and Requested Analysis

Some items described below may be part of a laboratory process necessary for the execution of client requested tasks. Packages may contain additional analyses, such as the determination of moisture content and preparation tasks, that are included in the package.

Matrix: **SOIL**

Laboratory sample ID	Client sampling date / time	Client sample ID	(On Hold) SOIL No analysis requested	SOIL - EA001 pH (CaCl)	SOIL - EA055-103 Moisture Content	SOIL - ED040N Calcium Phosphate Extractable Sulfate	SOIL - EP075 SIM PAH only SIM - PAH only	SOIL - S-02 8 Metals (incl. Digestion)	SOIL - TPH only TRH (C6 - C40)
EM1515997-001	[16-Oct-2015]	GW14(0.4-0.5)	✓						
EM1515997-002	[16-Oct-2015]	GW14(0.5-0.6)		✓	✓	✓	✓	✓	✓
EM1515997-003	[16-Oct-2015]	GW14(0.9-1.0)		✓	✓	✓	✓	✓	✓
EM1515997-004	[16-Oct-2015]	GW14(1.4-1.5)	✓						
EM1515997-005	[16-Oct-2015]	GW10(0.1-0.2)	✓						
EM1515997-006	[16-Oct-2015]	GW10(0.5-0.6)		✓	✓	✓	✓	✓	✓
EM1515997-007	[16-Oct-2015]	GW10(0.9-1.0)	✓						
EM1515997-008	[16-Oct-2015]	GW10(1.4-1.5)	✓						
EM1515997-009	[16-Oct-2015]	GW19(0.1-0.2)	✓						
EM1515997-010	[16-Oct-2015]	GW19(0.5-0.6)	✓						
EM1515997-011	[16-Oct-2015]	GW19(0.9-1.0)	✓						
EM1515997-012	[16-Oct-2015]	GW19(1.4-1.5)	✓						
EM1515997-013	[16-Oct-2015]	GW38(0.3-0.4)	✓						
EM1515997-014	[16-Oct-2015]	GW38(0.5-0.6)	✓						
EM1515997-015	[16-Oct-2015]	GW38(0.9-1.0)	✓						
EM1515997-016	[16-Oct-2015]	GW38(1.4-1.5)	✓						
EM1515997-017	[16-Oct-2015]	GW08(0.2-0.3)	✓						
EM1515997-018	[16-Oct-2015]	GW08(0.5-0.6)	✓						
EM1515997-019	[16-Oct-2015]	GW08(0.9-1.0)	✓						
EM1515997-020	[16-Oct-2015]	GW08(1.4-1.5)	✓						
EM1515997-021	[16-Oct-2015]	GW37(5.3-5.4)			✓				
EM1515997-022	[16-Oct-2015]	GW37(6.0-6.1)	✓						
EM1515997-023	[16-Oct-2015]	GW37(6.8-6.9)	✓						

Matrix: **SOIL**

Laboratory sample ID	*Client sampling date / time*	*Client sample ID*	SOIL - EG005T (solids) Total Metals by ICP-AES	SOIL - EP003 Total Organic Carbon (TOC) in Soil	SOIL - EP074 (solids) Volatile Organic Compounds
EM1515997-002	[16-Oct-2015]	GW14(0.5-0.6)	✓		✓
EM1515997-003	[16-Oct-2015]	GW14(0.9-1.0)	✓		✓
EM1515997-006	[16-Oct-2015]	GW10(0.5-0.6)	✓		✓
EM1515997-021	[16-Oct-2015]	GW37(5.3-5.4)		✓	

Matrix: **WATER**

Laboratory sample ID	*Client sampling date / time*	*Client sample ID*	WATER - EG020T Total Recoverable Metals by ICPMS (including	WATER - W-05T TRH/BTEXN/8 Metals (Total)	WATER - W-18 TRH(C6 - C9)/BTEXN
EM1515997-024	[16-Oct-2015]	QC14	✓	✓	
EM1515997-025	[16-Oct-2015]	QC15			✓

Proactive Holding Time Report

Sample(s) have been received within the recommended holding times for the requested analysis.

Requested Deliverables

AP_CUSTOMER SERVICE ANZ

- A4 - AU Tax Invoice (INV)	Email	ap_customerservice.anz@aecom.com

AVERYLL COYNE

- *AU Certificate of Analysis - NATA (COA)	Email	averyll.coyne@aecom.com
- *AU Interpretive QC Report - DEFAULT (Anon QCI Rep) (QCI)	Email	averyll.coyne@aecom.com
- *AU QC Report - DEFAULT (Anon QC Rep) - NATA (QC)	Email	averyll.coyne@aecom.com
- A4 - AU Sample Receipt Notification - Environmental HT (SRN)	Email	averyll.coyne@aecom.com
- A4 - AU Tax Invoice (INV)	Email	averyll.coyne@aecom.com
- Chain of Custody (CoC) (COC)	Email	averyll.coyne@aecom.com
- EDI Format - ENMRG (ENMRG)	Email	averyll.coyne@aecom.com
- EDI Format - ESDAT (ESDAT)	Email	averyll.coyne@aecom.com
- EDI Format - HLAPro (HLAPro)	Email	averyll.coyne@aecom.com
- EDI Format - XTab (XTAB)	Email	averyll.coyne@aecom.com

COC Received : 20/10, 14:00

AECOM

Form:

Chain of Custody & Analysis Request Form

AECOM - Melbourne
Level 9, 8 Exhibition Street
Melbourne VIC 3000

Tel: 03 9653 8072
Fax: 61 3 9653 1234
Email: averyll.coyne@aecom.com

Laboratory Details
Lab. Name: ALS
Lab. Address: 4 Westall Rd, Springvale
Contact Name:
Lab. Ref:
Tel: 8549 9600
Fax:
Preliminary Report by:
Final Report by:
Lab Quote No:

Project Name: Fishermans Bend
Project Number: 60431087
Purchase Order Number: NA

Sample collected by: Nathan Jensen, Doug Cunningham and Matt Sheppard
Sample Results to be returned to: Averyll Coyne

Specifications:	(Tick)		
1. Urgent TAT required? (please circle: 24hr 48hr ___3___days)	☐ Yes	☑ No	☐ N/A
2. Fast TAT Guarantee Required?	☐ Yes	☑ No	☐ N/A
3. Is any sediment layer present in waters to be excluded from extractions?	☐ Yes	☑ No	☐ N/A
4. Special storage requirements?	☐ Yes	☑ No	☐ N/A
5. Preservation requirements: ☐ Fax ☐ Hard copy ☑ Email	☐ Yes	☑ No	☐ N/A
6. Other requirements?	☑ Yes	☐ No	☐ N/A

7. Report Format: Email with QC reports
8. Project Manager: Averyll Coyne tel: 9653 8072

Lab. ID	Sample ID	Sampling Date & time (on)	Sampling Date & Time (off)	Matrix: soil	water	other	Preservation: filt'ed	acid	ice	other	Container (No. & type)	Analysis Request: TOC	Moisture Content	TRH(C6-C40)	Full VOC Scan (70 Analytes) - Code EP074(A-H)	PAH	Metals	TRH, BTEX and metals	pH and sulfate	Remarks & comments
1	GW14(0.4-0.5)	16/10/2015		x					x		Jar									Metals (As, Cd, Cr, Cu, Pb, Ni, Zn, Al, Fe, Se, Hg)
2	GW14(0.5-0.6)	16/10/2015		x					x		Jar				x	x	x		x	
3	GW14(0.9-1.0)	16/10/2015		x					x		Jar				x	x	x		x	
4	GW14(1.4-1.5)	16/10/2015		x					x		Jar									
5	GW10(0.1-0.2)	16/10/2015		x					x		Jar									
6	GW10(0.5-0.6)	16/10/2015		x					x		Jar				x	x	x		x	
7	GW10(0.9-1.0)	16/10/2015		x					x		Jar									
8	GW10(1.4-1.5)	16/10/2015		x					x		Jar									
9	GW19(0.1-0.2)	16/10/2015		x					x		Jar									
10	GW19(0.5-0.6)	16/10/2015		x					x		Jar									
11	GW19(0.9-1.0)	16/10/2015		x					x		Jar									
12	GW19(1.4-1.5)	16/10/2015		x					x		Jar									
13	GW38(0.3-0.4)	16/10/2015		x					x		Jar									
14	GW38(0.5-0.6)	16/10/2015		x					x		Jar									
15	GW38(0.9-1.0)	16/10/2015		x					x		Jar									
16	GW38(1.4-1.5)	16/10/2015		x					x		Jar									

Relinquished By:
Name: Nathan Jensen
Date: 16/10/2015
Time: 9:00
of: AECOM

Received by:
Name:
Date:
Time:
of: ALS

Received in good condition?	Yes/No/NA	Method of Shipment	
Samples received chilled?	Yes/No/NA	Consignment Note No.	
	Yes/No/NA	Transport Co:	

Relinquished By:
Name:
Date:
Time:
of:

Received by:
Name:
Date:
Time:
of:

Received in good condition?	Yes/No/NA	Method of Shipment	
Samples received chilled?	Yes/No/NA	Consignment Note No.	
	Yes/No/NA	Transport Co:	

Environmental Division
Melbourne
Work Order Reference
EM1515997

Telephone : +61-3-8549 9600

20/10

Environment

AECOM

Form:

Chain of Custody & Analysis Request Form

AECOM - Melbourne
Level 9, 8 Exhibition Street
Melbourne VIC 3000
Tel: 03 9653 8072
Fax: 61 3 9653 1234
Email: averyll.coyne@aecom.com

Laboratory Details
Lab. Name: ALS
Lab. Address: 4 Westall Rd, Springvale
Contact Name:
Lab. Ref:
Tel: 8549 9600
Fax:
Preliminary Report by:
Final Report by:
Lab Quote No:

Project Name: Fishermans Bend
Project Number: 60431087
Purchase Order Number: NA

Sample collected by: Nathan Jensen, Dug Cunningham and Matt Sheppard
Sample Results to be returned to: Averyll Coyne

Specifications:	(Tick)		
1. Urgent TAT required? (please circle: 24hr 48hr ___3___days)	☐ Yes	☑ No	☐ N/A
2. Fast TAT Guarantee Required?	☐ Yes	☑ No	☐ N/A
3. Is any sediment layer present in waters to be excluded from extractions?	☐ Yes	☑ No	☐ N/A
4. Special storage requirements?	☐ Yes	☑ No	☐ N/A
5. Preservation requirements: ☐ Fax ☐ Hard copy ☑ Email	☐ Yes	☑ No	☐ N/A
6. Other requirements?	☑ Yes	☐ No	☐ N/A
7. Report Format: Email with QC reports	8. Project Manager: Averyll Coyne		tel: 9653 8072

Lab. ID	Sample ID	Sampling Date & time (on)	Sampling Date & Time (off)	Matrix: soil	Matrix: water	Matrix: other	Preservation: filt'ed	Preservation: acid	Preservation: ice	Preservation: other	Container (No. & type)	TOC	Moisture Content	TRH(C6-C40)	Full VOC Scan (70 Analytes) - Code EP074(A-H)	PAH	Metals	TRH, BTEX and metals	Remarks & comments
~~1~~ 17	GW08(0.2-0.3)	16/10/2015		x					x		Jar								Metals (As, Cd, Cr, Cu, Pb, Ni, Zn, Al, Fe, Se, Hg)
~~2~~ 18	GW08(0.5-0.6)	16/10/2015		x					x		Jar								
~~3~~ 19	GW08(0.9-1.0)	16/10/2015		x					x		Jar								
~~4~~ 20	GW08(1.4-1.5)	16/10/2015		x					x		Jar								
~~5~~ 21	GW37(5.3-5.4)	16/10/2015		x					x		Jar								
~~6~~ 22	GW37(6.0-6.1)	16/10/2015		x					x		Jar								
~~7~~ 23	GW6.8-6.9)	16/10/2015		x					x		Jar								
~~8~~ 24	QC14	16/10/2015			x				x		Bottles							x	
~~9~~ 25	QC15	16/10/2015			x				x		Bottles			x.					
~~10~~		16/10/2015		x					x		Jar								
~~11~~		16/10/2015		x					x		Jar								
~~12~~		16/10/2015		x					x		Jar								
~~13~~		16/10/2015		x					x		Jar								
~~14~~		16/10/2015		x					x		Jar								
~~15~~		16/10/2015		x					x		Jar								
~~16~~		16/10/2015		x					x		Jar								

Relinquished By:
Name: Nathan Jensen
Date: 16/10/2015
Time: 9:00
of: AECOM

Received by:
Name:
Date:
Time:
of: ALS

Relinquished By:
Name:
Date:
Time:
of:

Received by:
Name:
Date:
Time:
of:

Received in good condition?	Yes/No/NA	Method of Shipment	
Samples received chilled?	Yes/No/NA	Consignment Note No.	
	Yes/No/NA	Transport Co:	
Received in good condition?	Yes/No/NA	Method of Shipment	
Samples received chilled?	Yes/No/NA	Consignment Note No.	
	Yes/No/NA	Transport Co:	

Andrew Matheson

From: Bronwyn Sheen
Sent: Thursday, 22 October 2015 10:51 AM
To: Samples Melbourne
Subject: FW: Additional analysis request EM1515997
Attachments: EM1515997_COC.pdf

Hi Andrew,
Further analysis for EM1515997.
Thanks

Kind Regards,

Bronwyn Sheen

Client Services Manager - VIC
ALS | Environmental Division

2-4 Westall Road
Springvale VIC 3171 Australia

T +61 3 8549 9600
F +61 3 8549 9626
M +438 174 359

Please note I can be contacted in the office until 3pm each day and am available via mobile after this.
Emails received after 3pm will be actioned that evening.

From: Coyne, Averyll [mailto:Averyll.Coyne@aecom.com]
Sent: Thursday, 22 October 2015 10:30 AM
To: Bronwyn Sheen
Subject: Additional analysis request EM1515997

Hi Bronwyn,

Can you please organise TOC and MC analysis on sample GW37(5.3-5.4) in batch EM1515997?

Kind Regards
Averyll

Averyll Coyne
Principal Environmental Scientist
D +61 3 9653 8072 M +61 499 252 502
Averyll.Coyne@aecom.com

AECOM
Level 9, 8 Exhibition Street, Melbourne, VIC 3000
T +61 3 9653 1234 F +61 3 9654 7117
www.aecom.com

Andrew Matheson

From: Bronwyn Sheen
Sent: Friday, 23 October 2015 5:14 PM
To: Samples Melbourne
Subject: FW: Fishermans Bend - additional analysis

Importance: High

HI Andrew,
Can you please add the analysis to work orders EM1515910 & EM1515997.

Kind Regards,

Bronwyn Sheen

Client Services Manager - VIC
ALS | Environmental Division

2-4 Westall Road
Springvale VIC 3171 Australia

T +61 3 8549 9600
F +61 3 8549 9626
M +438 174 359

Please note I can be contacted in the office until 3pm each day and am available via mobile after this. Emails received after 3pm will be actioned that evening.

From: Coyne, Averyll [mailto:Averyll.Coyne@aecom.com]
Sent: Friday, 23 October 2015 2:44 PM
To: Bronwyn Sheen
Subject: Fishermans Bend - additional analysis
Importance: High

Hi Bronwyn,

Can you please add the following soil analysis to the Fishermans Bend project?

EM15154910:
GW36(0.5-0.6) – TRH(C6-C40)
GW36(0.9-1.0) – TRH(C6-C40)

EM1515997:
GW14(0.5-0.6) – TRH(C6-C40)
GW14(0.9-1.0) – TRH(C6-C40)
GW10(0.5-0.6) – TRH(C6-C40)

Many Thanks
Averyll

Averyll Coyne
Principal Environmental Scientist
D +61 3 9653 8072 M +61 499 252 502
Averyll.Coyne@aecom.com

AECOM
Level 9, 8 Exhibition Street, Melbourne, VIC 3000
T +61 3 9653 1234 F +61 3 9654 7117
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ALS Environmental

CERTIFICATE OF ANALYSIS

Work Order	: **EM1516063**	Page	: 1 of 4
Client	: **AECOM Australia Pty Ltd**	Laboratory	: Environmental Division Melbourne
Contact	: MS AVERYLL COYNE	Contact	: Carol Walsh
Address	: LEVEL 9 8 EXHIBITION ST MELBOURNE VIC 3000	Address	: 4 Westall Rd Springvale VIC Australia 3171
E-mail	: averyll.coyne@aecom.com	E-mail	: carol.walsh@alsglobal.com
Telephone	: +61 03 9653 1234	Telephone	: +61-3-8549 9608
Facsimile	: +61 03 9654 7117	Facsimile	: +61-3-8549 9601
Project	: 60431087	QC Level	: NEPM 2013 Schedule B(3) and ALS QCS3 requirement
Order number	: 60431087 Task 1.4	Date Samples Received	: 16-Oct-2015 17:45
C-O-C number	: ----	Date Analysis Commenced	: 23-Oct-2015
Sampler	: DUGALD CUNNINGHAM, MATTHEW SHEPPARD, NATHAN JENSEN	Issue Date	: 29-Oct-2015 19:29
Site	: ----		
		No. of samples received	: 24
Quote number	: ----	No. of samples analysed	: 6

This report supersedes any previous report(s) with this reference. Results apply to the sample(s) as submitted.

This Certificate of Analysis contains the following information:

- General Comments
- Analytical Results

NATA Accredited Laboratory 825

Accredited for compliance with ISO/IEC 17025.

Signatories

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

Signatories	*Position*	*Accreditation Category*
Greg Vogel	Laboratory Manager	Brisbane Acid Sulphate Soils
Greg Vogel	Laboratory Manager	Brisbane Inorganics
Nancy Wang	Senior Semivolatile Instrument Chemist	Melbourne Organics

General Comments

The analytical procedures used by the Environmental Division have been developed from established internationally recognized procedures such as those published by the USEPA, APHA, AS and NEPM. In house developed procedures are employed in the absence of documented standards or by 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.

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.

Analytical Results

Sub-Matrix: SOIL (Matrix: SOIL)				Client sample ID	GW05(3.6-3.7)	GW07(3.0-3.1)	GW03(3.0-3.1)	GW23(2.3-2.4)	GW10(2.9-3.0)
				Client sampling date / time	[15-Oct-2015]	[16-Oct-2015]	[15-Oct-2015]	[16-Oct-2015]	[16-Oct-2015]
Compound	CAS Number	LOR	Unit		EM1516063-028	EM1516063-032	EM1516063-037	EM1516063-040	EM1516063-046
					Result	Result	Result	Result	Result
EA055: Moisture Content									
^ **Moisture Content (dried @ 103°C)**	----	1	%		**29.2**	**19.2**	**16.2**	**4.5**	**8.9**
EP003: Total Organic Carbon (TOC) in Soil									
Total Organic Carbon	----	0.02	%		**8.46**	**0.70**	**3.22**	<0.02	**0.08**

Analytical Results

Sub-Matrix: WATER (Matrix: WATER)				Client sample ID	QC16	----	----	----	----
				Client sampling date / time	[16-Oct-2015]	----	----	----	----
Compound	CAS Number	LOR	Unit		EM1516063-049	--------	--------	--------	--------
					Result	Result	Result	Result	Result
EP080/071: Total Petroleum Hydrocarbons									
C6 - C9 Fraction	----	20	µg/L		<20	----	----	----	----
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	----	----	----	----
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**	1330-20-7	2	µg/L		<2	----	----	----	----
^ **Sum of BTEX**	----	1	µg/L		<1	----	----	----	----
Naphthalene	91-20-3	5	µg/L		<5	----	----	----	----
EP080S: TPH(V)/BTEX Surrogates									
1.2-Dichloroethane-D4	17060-07-0	2	%		**100.0**	----	----	----	----
Toluene-D8	2037-26-5	2	%		**97.2**	----	----	----	----
4-Bromofluorobenzene	460-00-4	2	%		**102**	----	----	----	----

ALS Environmental

QUALITY CONTROL REPORT

Work Order	: **EM1516063**	Page	: 1 of 4
Client	: **AECOM Australia Pty Ltd**	Laboratory	: Environmental Division Melbourne
Contact	: MS AVERYLL COYNE	Contact	: Carol Walsh
Address	: LEVEL 9 8 EXHIBITION ST MELBOURNE VIC 3000	Address	: 4 Westall Rd Springvale VIC Australia 3171
E-mail	: averyll.coyne@aecom.com	E-mail	: carol.walsh@alsglobal.com
Telephone	: +61 03 9653 1234	Telephone	: +61-3-8549 9608
Facsimile	: +61 03 9654 7117	Facsimile	: +61-3-8549 9601
Project	: 60431087	QC Level	: NEPM 2013 Schedule B(3) and ALS QCS3 requirement
Order number	: 60431087 Task 1.4	Date Samples Received	: 16-Oct-2015
C-O-C number	: ----	Date Analysis Commenced	: 23-Oct-2015
Sampler	: DUGALD CUNNINGHAM, MATTHEW SHEPPARD, NATHAN JENSEN	Issue Date	: 29-Oct-2015
Site	: ----	No. of samples received	: 24
Quote number	: ----	No. of samples analysed	: 6

This report supersedes any previous report(s) with this reference. Results apply to the sample(s) as submitted.

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

NATA WORLD RECOGNISED ACCREDITATION

NATA Accredited Laboratory 825

Accredited for compliance with ISO/IEC 17025.

Signatories

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

Signatories	*Position*	*Accreditation Category*
Greg Vogel	Laboratory Manager	Brisbane Acid Sulphate Soils
Greg Vogel	Laboratory Manager	Brisbane Inorganics
Nancy Wang	Senior Semivolatile Instrument Chemist	Melbourne Organics

General Comments

The analytical procedures used by the Environmental Division have been developed from established internationally recognized procedures such as those published by the USEPA, APHA, AS and NEPM. In house developed procedures are employed in the absence of documented standards or by 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

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	Client sample ID	Method: Compound	CAS Number	LOR	Unit	Original Result	Duplicate Result	RPD (%)	Recovery Limits (%)
EA055: Moisture Content (QC Lot: 259376)									
EM1516063-028	GW05(3.6-3.7)	EA055-103: Moisture Content (dried @ 103°C)	----	1	%	29.2	29.2	0.00	0% - 20%
EP003: Total Organic Carbon (TOC) in Soil (QC Lot: 260376)									
EM1516063-028	GW05(3.6-3.7)	EP003: Total Organic Carbon	----	0.02	%	8.46	8.50	0.567	0% - 20%

Sub-Matrix: **WATER**

				Laboratory Duplicate (DUP) Report					
Laboratory sample ID	Client sample ID	Method: Compound	CAS Number	LOR	Unit	Original Result	Duplicate Result	RPD (%)	Recovery Limits (%)
EP080/071: Total Petroleum Hydrocarbons (QC Lot: 251747)									
EM1515976-056	Anonymous	EP080: C6 - C9 Fraction	----	20	µg/L	<20	<20	0.00	No Limit
EM1516049-004	Anonymous	EP080: C6 - C9 Fraction	----	20	µg/L	<20	<20	0.00	No Limit
EP080/071: Total Recoverable Hydrocarbons - NEPM 2013 Fractions (QC Lot: 251747)									
EM1515976-056	Anonymous	EP080: C6 - C10 Fraction	C6_C10	20	µg/L	<20	<20	0.00	No Limit
EM1516049-004	Anonymous	EP080: C6 - C10 Fraction	C6_C10	20	µg/L	<20	<20	0.00	No Limit
EP080: BTEXN (QC Lot: 251747)									
EM1515976-056	Anonymous	EP080: Benzene	71-43-2	1	µg/L	<1	<1	0.00	No Limit
		EP080: Ethylbenzene	100-41-4	2	µg/L	<2	<2	0.00	No Limit
		EP080: meta- & para-Xylene	108-38-3 106-42-3	2	µg/L	<2	<2	0.00	No Limit
		EP080: ortho-Xylene	95-47-6	2	µg/L	<2	<2	0.00	No Limit
		EP080: Toluene	108-88-3	2	µg/L	<2	<2	0.00	No Limit
		EP080: Naphthalene	91-20-3	5	µg/L	<5	<5	0.00	No Limit
EM1516049-004	Anonymous	EP080: Benzene	71-43-2	1	µg/L	<1	<1	0.00	No Limit
		EP080: Ethylbenzene	100-41-4	2	µg/L	<2	<2	0.00	No Limit
		EP080: meta- & para-Xylene	108-38-3 106-42-3	2	µg/L	<2	<2	0.00	No Limit
		EP080: ortho-Xylene	95-47-6	2	µg/L	<2	<2	0.00	No Limit
		EP080: Toluene	108-88-3	2	µg/L	<2	<2	0.00	No Limit
		EP080: Naphthalene	91-20-3	5	µg/L	<5	<5	0.00	No Limit

Method Blank (MB) and Laboratory Control Spike (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 (%)	Recovery Limits (%)	
Method: Compound	CAS Number	LOR	Unit	Result	Concentration	LCS	Low	High
EP003: Total Organic Carbon (TOC) in Soil (QCLot: 260376)								
EP003: Total Organic Carbon	----	0.02	%	<0.02	100 %	102	70	130

Sub-Matrix: **WATER**

				Method Blank (MB) Report	Laboratory Control Spike (LCS) Report			
					Spike	Spike Recovery (%)	Recovery Limits (%)	
Method: Compound	CAS Number	LOR	Unit	Result	Concentration	LCS	Low	High
EP080/071: Total Petroleum Hydrocarbons (QCLot: 251747)								
EP080: C6 - C9 Fraction	----	20	µg/L	<20	360 µg/L	101	67	127
EP080/071: Total Recoverable Hydrocarbons - NEPM 2013 Fractions (QCLot: 251747)								
EP080: C6 - C10 Fraction	C6_C10	20	µg/L	<20	450 µg/L	98.5	65	125
EP080: BTEXN (QCLot: 251747)								
EP080: Benzene	71-43-2	1	µg/L	<1	20 µg/L	102	76	120
EP080: Ethylbenzene	100-41-4	2	µg/L	<2	20 µg/L	106	72	124
EP080: meta- & para-Xylene	108-38-3 106-42-3	2	µg/L	<2	40 µg/L	104	72	130
EP080: Naphthalene	91-20-3	5	µg/L	<5	5 µg/L	102	71	129
EP080: ortho-Xylene	95-47-6	2	µg/L	<2	20 µg/L	106	75	127
EP080: Toluene	108-88-3	2	µg/L	<2	20 µg/L	107	76	124

Matrix Spike (MS) Report

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

Sub-Matrix: **WATER**

				Matrix Spike (MS) Report			
				Spike	SpikeRecovery(%)	Recovery Limits (%)	
Laboratory sample ID	Client sample ID	Method: Compound	CAS Number	Concentration	MS	Low	High
EP080/071: Total Petroleum Hydrocarbons (QCLot: 251747)							
EM1515996-092	Anonymous	EP080: C6 - C9 Fraction	----	280 µg/L	87.6	43	125
EP080/071: Total Recoverable Hydrocarbons - NEPM 2013 Fractions (QCLot: 251747)							
EM1515996-092	Anonymous	EP080: C6 - C10 Fraction	C6_C10	330 µg/L	85.2	44	122
EP080: BTEXN (QCLot: 251747)							
EM1515996-092	Anonymous	EP080: Benzene	71-43-2	20 µg/L	100	68	130
		EP080: Toluene	108-88-3	20 µg/L	105	72	132

ALS Environmental

QA/QC Compliance Assessment for DQO Reporting

Work Order	: **EM1516063**	Page	: 1 of 4
Client	: **AECOM Australia Pty Ltd**	Laboratory	: Environmental Division Melbourne
Contact	: MS AVERYLL COYNE	Telephone	: +61-3-8549 9608
Project	: 60431087	Date Samples Received	: 16-Oct-2015
Site	: ----	Issue Date	: 29-Oct-2015
Sampler	: DUGALD CUNNINGHAM, MATTHEW SHEPPARD, NATHAN JENSEN	No. of samples received	: 24
Order number	: 60431087 Task 1.4	No. of samples analysed	: 6

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

- **NO Quality Control Sample Frequency Outliers exist.**

Analysis Holding Time Compliance

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							
Soil Glass Jar - Unpreserved (EA055-103)							
GW05(3.6-3.7), GW03(3.0-3.1)	**15-Oct-2015**	**----**	----	----	**28-Oct-2015**	29-Oct-2015	✓
Soil Glass Jar - Unpreserved (EA055-103)							
GW07(3.0-3.1), GW23(2.3-2.4), GW10(2.9-3.0)	**16-Oct-2015**	**----**	----	----	**28-Oct-2015**	30-Oct-2015	✓
EP003: Total Organic Carbon (TOC) in Soil							
Pulp Bag (EP003)							
GW05(3.6-3.7), GW07(3.0-3.1), GW03(3.0-3.1), GW23(2.3-2.4), GW10(2.9-3.0)	**16-Oct-2015**	**29-Oct-2015**	13-Nov-2015	✓	**29-Oct-2015**	13-Nov-2015	✓

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 Petroleum Hydrocarbons							
Amber VOC Vial - Sulfuric Acid (EP080)							
QC16	**16-Oct-2015**	**23-Oct-2015**	30-Oct-2015	✓	**23-Oct-2015**	30-Oct-2015	✓

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	EA055-103	1	5	**20.00**	**10.00**	✓	NEPM 2013 Schedule B(3) and ALS QCS3 requirement
Total Organic Carbon	EP003	1	7	**14.29**	**10.00**	✓	NEPM 2013 Schedule B(3) and ALS QCS3 requirement
Laboratory Control Samples (LCS)							
Total Organic Carbon	EP003	1	7	**14.29**	**5.00**	✓	NEPM 2013 Schedule B(3) and ALS QCS3 requirement
Method Blanks (MB)							
Total Organic Carbon	EP003	1	7	**14.29**	**5.00**	✓	NEPM 2013 Schedule B(3) and ALS QCS3 requirement

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)							
TRH Volatiles/BTEX	EP080	2	15	**13.33**	**10.00**	✓	NEPM 2013 Schedule B(3) and ALS QCS3 requirement
Laboratory Control Samples (LCS)							
TRH Volatiles/BTEX	EP080	1	15	**6.67**	**5.00**	✓	NEPM 2013 Schedule B(3) and ALS QCS3 requirement
Method Blanks (MB)							
TRH Volatiles/BTEX	EP080	1	15	**6.67**	**5.00**	✓	NEPM 2013 Schedule B(3) and ALS QCS3 requirement
Matrix Spikes (MS)							
TRH Volatiles/BTEX	EP080	1	15	**6.67**	**5.00**	✓	NEPM 2013 Schedule B(3) and ALS QCS3 requirement

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	EA055-103	SOIL	In-house. A gravimetric procedure based on weight loss over a 12 hour drying period at 103-105 degrees C. This method is compliant with NEPM (2013) Schedule B(3) Section 7.1 and Table 1 (14 day holding time).
Total Organic Carbon	EP003	SOIL	In-house C-IR17. Dried and pulverised sample is reacted with acid to remove inorganic Carbonates, then combusted in a LECO furnace in the presence of strong oxidants / catalysts. The evolved (Organic) Carbon (as CO2) is automaticaly measured by infra-red detector.
TRH Volatiles/BTEX	EP080	WATER	USEPA SW 846 - 8260B 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 (2013) Schedule B(3)

Preparation Methods	Method	Matrix	Method Descriptions
Dry and Pulverise (up to 100g)	GEO30	SOIL	#

SAMPLE RECEIPT NOTIFICATION (SRN)

Work Order : **EM1516063**

Client	: **AECOM Australia Pty Ltd**	Laboratory	: Environmental Division Melbourne
Contact	: MS AVERYLL COYNE	Contact	: Carsten Emrich
Address	: LEVEL 9 8 EXHIBITION ST MELBOURNE VIC 3000	Address	: 4 Westall Rd Springvale VIC Australia 3171
E-mail	: averyll.coyne@aecom.com	E-mail	: carsten.emrich@alsenviro.com
Telephone	: +61 03 9653 1234	Telephone	: +61 7 3243 7123
Facsimile	: +61 03 9654 7117	Facsimile	: +61-3-8549 9601
Project	: 60431087	Page	: 1 of 3
Order number	: 60431087 Task 1.4	Quote number	: EB2015AECOMAU0580 (EN/004/15)
C-O-C number	: ----	QC Level	: NEPM 2013 Schedule B(3) and ALS QCS3 requirement
Site	: ----		
Sampler	: DUGALD CUNNINGHAM, MATTHEW SHEPPARD, NATHAN JENSEN		

Dates

Date Samples Received	: 16-Oct-2015 5:45 PM	Issue Date	: 21-Oct-2015
Client Requested Due Date	: 28-Oct-2015	Scheduled Reporting Date	: **28-Oct-2015**

Delivery Details

Mode of Delivery	: Carrier	Security Seal	: Intact.
No. of coolers/boxes	: 4	Temperature	: 4.3 - Ice present
Receipt Detail	:	No. of samples received / analysed	: 24 / 1

General Comments

- This report contains the following information:
  - Sample Container(s)/Preservation Non-Compliances
  - Summary of Sample(s) and Requested Analysis
  - Proactive Holding Time Report
  - Requested Deliverables
- **Please direct any queries related to sample condition / numbering / breakages to Client Services.**
- Sample Disposal - Aqueous (14 days), Solid (60 days) from date of completion of work order.
- **Analytical work for this work order will be conducted at ALS Springvale.**
- **For sample QC16, TPH(C6-C40) has been requested; only VOC vials have been received and so only the volatile fraction of TPH (C6-C9) plus BTEX analysis (ALS suite W-18) has been booked in.**
- **Please refer to the Proactive Holding Time Report table below which summarises breaches of recommended holding times that have occurred prior to samples/instructions being received at the laboratory. The absence of this summary table indicates that all samples have been received within the recommended holding times for the analysis requested.**

Sample Container(s)/Preservation Non-Compliances

All comparisons are made against pretreatment/preservation AS, APHA, USEPA standards.

- **No sample container / preservation non-compliance exist.**

Summary of Sample(s) and Requested Analysis

Some items described below may be part of a laboratory process necessary for the execution of client requested tasks. Packages may contain additional analyses, such as the determination of moisture content and preparation tasks, that are included in the package.

Matrix: **SOIL**

Laboratory sample ID	*Client sampling date / time*	*Client sample ID*	(On Hold) SOIL No analysis requested
EM1516063-026	[15-Oct-2015]	GW05(2.0-2.1)	✓
EM1516063-027	[15-Oct-2015]	GW05(3.0-3.1)	✓
EM1516063-028	[15-Oct-2015]	GW05(3.6-3.7)	✓
EM1516063-029	[15-Oct-2015]	GW05(4.2-4.3)	✓
EM1516063-030	[16-Oct-2015]	GW07(1.5-1.6)	✓
EM1516063-031	[16-Oct-2015]	GW07(1.9-2.0)	✓
EM1516063-032	[16-Oct-2015]	GW07(3.0-3.1)	✓
EM1516063-033	[16-Oct-2015]	GW07(4.0-4.1)	✓
EM1516063-034	[16-Oct-2015]	GW07(5.0-5.1)	✓
EM1516063-035	[15-Oct-2015]	GW03(1.5-1.6)	✓
EM1516063-036	[15-Oct-2015]	GW03(2.0-2.1)	✓
EM1516063-037	[15-Oct-2015]	GW03(3.0-3.1)	✓
EM1516063-038	[15-Oct-2015]	GW03(4.0-4.1)	✓
EM1516063-039	[15-Oct-2015]	GW03(5.0-5.1)	✓
EM1516063-040	[16-Oct-2015]	GW23(2.3-2.4)	✓
EM1516063-041	[16-Oct-2015]	GW23(3.0-3.1)	✓
EM1516063-042	[16-Oct-2015]	GW23(4.0-4.1)	✓
EM1516063-043	[16-Oct-2015]	GW10(1.5-1.6)	✓
EM1516063-044	[16-Oct-2015]	GW10(2.0-2.1)	✓
EM1516063-045	[16-Oct-2015]	GW10(2.3-2.4)	✓
EM1516063-046	[16-Oct-2015]	GW10(2.9-3.0)	✓
EM1516063-047	[16-Oct-2015]	GW10(4.0-4.1)	✓
EM1516063-048	[16-Oct-2015]	GW10(5.0-5.1)	✓

Matrix: **WATER**

Laboratory sample ID	*Client sampling date / time*	*Client sample ID*	WATER - W-18 TRH(C6 - C9)/BTEXN
EM1516063-049	[16-Oct-2015]	QC16	✓

Proactive Holding Time Report

Sample(s) have been received within the recommended holding times for the requested analysis.

Requested Deliverables

AP_CUSTOMER SERVICE ANZ

- A4 - AU Tax Invoice (INV)	Email	ap_customerservice.anz@aecom.com

AVERYLL COYNE

- *AU Certificate of Analysis - NATA (COA)	Email	averyll.coyne@aecom.com
- *AU Interpretive QC Report - DEFAULT (Anon QCI Rep) (QCI)	Email	averyll.coyne@aecom.com
- *AU QC Report - DEFAULT (Anon QC Rep) - NATA (QC)	Email	averyll.coyne@aecom.com
- A4 - AU Sample Receipt Notification - Environmental HT (SRN)	Email	averyll.coyne@aecom.com
- A4 - AU Tax Invoice (INV)	Email	averyll.coyne@aecom.com
- Chain of Custody (CoC) (COC)	Email	averyll.coyne@aecom.com
- EDI Format - ENMRG (ENMRG)	Email	averyll.coyne@aecom.com
- EDI Format - ESDAT (ESDAT)	Email	averyll.coyne@aecom.com
- EDI Format - HLAPro (HLAPro)	Email	averyll.coyne@aecom.com
- EDI Format - XTab (XTAB)	Email	averyll.coyne@aecom.com

SAMPLE RECEIPT NOTIFICATION (SRN)

Work Order : **EM1516063**

Client	: **AECOM Australia Pty Ltd**	Laboratory	: Environmental Division Melbourne
Contact	: MS AVERYLL COYNE	Contact	: Carol Walsh
Address	: LEVEL 9 8 EXHIBITION ST MELBOURNE VIC 3000	Address	: 4 Westall Rd Springvale VIC Australia 3171
E-mail	: averyll.coyne@aecom.com	E-mail	: carol.walsh@alsglobal.com
Telephone	: +61 03 9653 1234	Telephone	: +61-3-8549 9608
Facsimile	: +61 03 9654 7117	Facsimile	: +61-3-8549 9601
Project	: 60431087	Page	: 1 of 3
Order number	: 60431087 Task 1.4	Quote number	: EB2015AECOMAU0580 (EN/004/15)
C-O-C number	: ----	QC Level	: NEPM 2013 Schedule B(3) and ALS QCS3 requirement
Site	: ----		
Sampler	: DUGALD CUNNINGHAM, MATTHEW SHEPPARD, NATHAN JENSEN		

Dates

Date Samples Received	: 16-Oct-2015 5:45 PM	Issue Date	: 23-Oct-2015
Client Requested Due Date	: 30-Oct-2015	Scheduled Reporting Date	: **30-Oct-2015**

Delivery Details

Mode of Delivery	: Carrier	Security Seal	: Intact.
No. of coolers/boxes	: 4	Temperature	: 4.3 - Ice present
Receipt Detail	:	No. of samples received / analysed	: 24 / 6

General Comments

- This report contains the following information:
  - Sample Container(s)/Preservation Non-Compliances
  - Summary of Sample(s) and Requested Analysis
  - Proactive Holding Time Report
  - Requested Deliverables
- **Please direct any queries related to sample condition / numbering / breakages to Client Services.**
- Sample Disposal - Aqueous (14 days), Solid (60 days) from date of completion of work order.
- **Analytical work for this work order will be conducted at ALS Springvale and ALS Brisbane**
- **For sample QC16, TPH(C6-C40) has been requested; only VOC vials have been received and so only the volatile fraction of TPH (C6-C9) plus BTEX analysis (ALS suite W-18) has been booked in.**
- **Please refer to the Proactive Holding Time Report table below which summarises breaches of recommended holding times that have occurred prior to samples/instructions being received at the laboratory. The absence of this summary table indicates that all samples have been received within the recommended holding times for the analysis requested.**

Sample Container(s)/Preservation Non-Compliances

All comparisons are made against pretreatment/preservation AS, APHA, USEPA standards.

- **No sample container / preservation non-compliance exist.**

Summary of Sample(s) and Requested Analysis

Some items described below may be part of a laboratory process necessary for the execution of client requested tasks. Packages may contain additional analyses, such as the determination of moisture content and preparation tasks, that are included in the package.

Matrix: **SOIL**

Laboratory sample ID	Client sampling date / time	Client sample ID	(On Hold) SOIL No analysis requested	SOIL - EA055-103 Moisture Content	SOIL - EP003 Total Organic Carbon (TOC) in Soil
EM1516063-026	[15-Oct-2015]	GW05(2.0-2.1)	✓		
EM1516063-027	[15-Oct-2015]	GW05(3.0-3.1)	✓		
EM1516063-028	[15-Oct-2015]	GW05(3.6-3.7)		✓	✓
EM1516063-029	[15-Oct-2015]	GW05(4.2-4.3)	✓		
EM1516063-030	[16-Oct-2015]	GW07(1.5-1.6)	✓		
EM1516063-031	[16-Oct-2015]	GW07(1.9-2.0)	✓		
EM1516063-032	[16-Oct-2015]	GW07(3.0-3.1)		✓	✓
EM1516063-033	[16-Oct-2015]	GW07(4.0-4.1)	✓		
EM1516063-034	[16-Oct-2015]	GW07(5.0-5.1)	✓		
EM1516063-035	[15-Oct-2015]	GW03(1.5-1.6)	✓		
EM1516063-036	[15-Oct-2015]	GW03(2.0-2.1)	✓		
EM1516063-037	[15-Oct-2015]	GW03(3.0-3.1)		✓	✓
EM1516063-038	[15-Oct-2015]	GW03(4.0-4.1)	✓		
EM1516063-039	[15-Oct-2015]	GW03(5.0-5.1)	✓		
EM1516063-040	[16-Oct-2015]	GW23(2.3-2.4)		✓	✓
EM1516063-041	[16-Oct-2015]	GW23(3.0-3.1)	✓		
EM1516063-042	[16-Oct-2015]	GW23(4.0-4.1)	✓		
EM1516063-043	[16-Oct-2015]	GW10(1.5-1.6)	✓		
EM1516063-044	[16-Oct-2015]	GW10(2.0-2.1)	✓		
EM1516063-045	[16-Oct-2015]	GW10(2.3-2.4)	✓		
EM1516063-046	[16-Oct-2015]	GW10(2.9-3.0)		✓	✓
EM1516063-047	[16-Oct-2015]	GW10(4.0-4.1)	✓		
EM1516063-048	[16-Oct-2015]	GW10(5.0-5.1)	✓		

Matrix: **WATER**

Laboratory sample ID	Client sampling date / time	Client sample ID	WATER - W-18 TRH(C6 - C9)/BTEXN
EM1516063-049	[16-Oct-2015]	QC16	✓

Proactive Holding Time Report

Sample(s) have been received within the recommended holding times for the requested analysis.

Requested Deliverables

AP_CUSTOMER SERVICE ANZ

- A4 - AU Tax Invoice (INV)	Email	ap_customerservice.anz@aecom.com

AVERYLL COYNE

- *AU Certificate of Analysis - NATA (COA)	Email	averyll.coyne@aecom.com
- *AU Interpretive QC Report - DEFAULT (Anon QCI Rep) (QCI)	Email	averyll.coyne@aecom.com
- *AU QC Report - DEFAULT (Anon QC Rep) - NATA (QC)	Email	averyll.coyne@aecom.com
- A4 - AU Sample Receipt Notification - Environmental HT (SRN)	Email	averyll.coyne@aecom.com
- A4 - AU Tax Invoice (INV)	Email	averyll.coyne@aecom.com
- Chain of Custody (CoC) (COC)	Email	averyll.coyne@aecom.com
- EDI Format - ENMRG (ENMRG)	Email	averyll.coyne@aecom.com
- EDI Format - ESDAT (ESDAT)	Email	averyll.coyne@aecom.com
- EDI Format - HLAPro (HLAPro)	Email	averyll.coyne@aecom.com
- EDI Format - XTab (XTAB)	Email	averyll.coyne@aecom.com

RE-SCANNED

Form:

AECOM

Chain of Custody & Analysis Request Form

AECOM - Melbourne
Level 9, 8 Exhibition Street
Melbourne VIC 3000
Tel: 03 9653 8072
Fax: 61 3 9653 1234
Email: averyll.coyne@aecom.com

Laboratory Details
Lab. Name: ALS
Lab. Address: 4 Westall Rd, Springvale
Contact Name:
Lab. Ref:
Tel: 8549 9600
Fax:
Preliminary Report by:
Final Report by:
Lab Quote No:

Project Name: Fishermans Bend
Project Number: 60431087
Purchase Order Number: NA

Sample collected by: Nathan Jensen, Dug Cunningham and Matt Sheppard
Sample Results to be returned to: Averyll Coyne

Specifications:

	(Tick)
1. Urgent TAT required? (please circle: 24hr 48hr 3 days)	☐ Yes ☑ No ☐ N/A
2. Fast TAT Guarantee Required?	☐ Yes ☑ No ☐ N/A
3. Is any sediment layer present in waters to be excluded from extractions?	☐ Yes ☑ No ☐ N/A
4. Special storage requirements?	☐ Yes ☑ No ☐ N/A
5. Preservation requirements? ☐ Fax ☐ Hard copy ☑ Email	☐ Yes ☑ No ☐ N/A
6. Other requirements?	☑ Yes ☐ No ☐ N/A

7. Report Format: Email with QC reports
8. Project Manager: Averyll Coyne tel: 9653 8072

Lab. ID	Sample ID	Sampling Date & time (on)	Sampling Date & Time (off)	Matrix: soil	Matrix: water	Matrix: other	Preservation: filt'ed	Preservation: acid	Preservation: ice	Preservation: other	Container (No. & type)	TOC	Moisture Content	TRH(C6-C40)	Full VOC Scan (70 Analytes) - Code EP074(A-H)	PAH	Metals	TRH, BTEX and metals	pH and sulfate	Remarks & comments
1 26	GW05(2.0-2.1)	15/10/2015		x					x		Jar									Please hold
2 27	GW05(3.0-3.1)	15/10/2015		x					x		Jar									Please hold
3 28	GW05(3.6-3.7)	15/10/2015		x					x		Jar	X	X							Please hold
4 29	GW05(4.2-4.3)	15/10/2015		x					x		Jar									** Please hold
5 30	GW07(1.5-1.6)	16/10/2015		x					x		Jar									Please hold
6 31	GW07(1.9-2.0)	16/10/2015		x					x		Jar									Please hold
7 32	GW07(3.0-3.1)	16/10/2015		x					x		Jar	X	X							Please hold
8 33	GW07(4.0-4.1)	16/10/2015		x					x		Jar									** Please hold
9 34	GW07(5.0-5.1)	16/10/2015		x					x		Jar									** Please hold
10 35	GW03(1.5-1.6)	15/10/2015		x					x		Jar									Please hold
11 36	GW03(2.0-2.1)	15/10/2015		x					x		Jar									Please hold
12 37	GW03(3.0-3.1)	15/10/2015		x					x		Jar	X	X							Please hold
13 38	GW03(4.0-4.1)	15/10/2015		x					x		Jar									Please hold
14 39	GW03(5.0.-5.1)	15/10/2015		x					x		Jar									Please hold
15 40	GW23(2.3-2.4)	16/10/2015		x					x		Jar	X	X							Please hold
16 41	GW23(3.0-3.1)	16/10/2015		x					x		Jar									Please hold

Relinquished By:
Name: Nathan Jensen
Date: 19/10/2015
Time: 9:00
of: AECOM

Received by:
Name:
Date:
Time:
of: ALS

Relinquished By:
Name:
Date:
Time:
of:

Received by:
Name:
Date:
Time:
of:

Received in good condition?	Yes/No/NA	Method of Shipment	
Samples received chilled?	Yes/No/NA	Consignment Note No.	
	Yes/No/NA	Transport Co:	
Received in good condition?	Yes/No/NA	Method of Shipment	
Samples received chilled?	Yes/No/NA	Consignment Note No.	
	Yes/No/NA	Transport Co:	

Environmental Division
Melbourne
Work Order Reference
EM1516063

Telephone : + 61-3-8549 9600

PR 21/10

Form:

AECOM

Chain of Custody & Analysis Request Form

AECOM - Melbourne
Level 9, 8 Exhibition Street
Melbourne VIC 3000
Tel: 03 9653 8072
Fax: 61 3 9653 1234
Email: averyll.coyne@aecom.com

Laboratory Details
Lab. Name: ALS
Lab. Address: 4 Westall Rd, Springvale
Contact Name:
Lab. Ref:
Tel: 8549 9600
Fax:
Preliminary Report by:
Final Report by:
Lab Quote No:

Project Name: Fishermans Bend
Project Number: 60431087
Purchase Order Number: NA

Sample collected by: Nathan Jensen, Dug Cunningham and Matt Sheppard
Sample Results to be returned to: Averyll Coyne

Specifications:	(Tick)		
1. Urgent TAT required? (please circle: 24hr 48hr ___3___days)	☐ Yes	☑ No	☐ N/A
2. Fast TAT Guarantee Required?	☐ Yes	☑ No	☐ N/A
3. Is any sediment layer present in waters to be excluded from extractions?	☐ Yes	☑ No	☐ N/A
4. Special storage requirements?	☐ Yes	☑ No	☐ N/A
5. Preservation requirements? ☐ Fax ☐ Hard copy ☑ Email	☐ Yes	☑ No	☐ N/A
6. Other requirements?	☑ Yes	☐ No	☐ N/A
7. Report Format: Email with QC reports	8. Project Manager: Averyll Coyne		tel: 9653 8072

Lab. ID	Sample ID	Sampling Date & time (on)	Sampling Date & Time (off)	Matrix: soil	Matrix: water	Matrix: other	Preservation: filt'ed	Preservation: acid	Preservation: ice	Preservation: other	Container (No. & type)	TOC	Moisture Content	TRH(C6-C40)	Full VOC Scan (70 Analytes) - Code EP074(A-H)	PAH	Metals	TRH, BTEX and metals	Remarks & comments
17 42	GW23(4.0-4.1)	16/10/2015		x					x		Jar								Please hold
18 43	GW10(1.5-1.6)	16/10/2015		x					x		Jar								Please hold
19 44	GW10(2.0-2.1)	16/10/2015		x					x		Jar								Please hold
20 45	GW10(2.3-2.4)	16/10/2015		x					x		Jar								Please hold
21 46	GW10(2.9-3.0)	16/10/2015		x					x		Jar	X	X						Please hold
22 47	GW10(4.0-4.1)	16/10/2015		x					x		Jar								** Please hold
23 48	GW10(5.0-5.1)	16/10/2015		x					x		Jar								** Please hold
24 49	QC16	16/10/2015			x				x		Bottles			x					

Relinquished By:
Name: Nathan Jensen
Date: 19/10/2015
Time:9:00
of: AECOM

Received by:
Name:
Date:
Time:
of: ALS

Relinquished By:
Name:
Date:
Time:
of:

Received by:
Name:
Date:
Time:
of:

Received in good condition?	Yes/No/NA	Method of Shipment	
Samples received chilled?	Yes/No/NA	Consignment Note No.	
	Yes/No/NA	Transport Co:	
Received in good condition?	Yes/No/NA	Method of Shipment	
Samples received chilled?	Yes/No/NA	Consignment Note No.	
	Yes/No/NA	Transport Co:	

From: Coyne, Averyll [mailto:Averyll.Coyne@aecom.com]
Sent: Wednesday, 21 October 2015 2:06 PM
To: Bronwyn Sheen
Cc: Samples Melbourne
Subject: FBURA COC for samples sent to ALS on Monday 19 Oct

Hi Bronwyn,

As discussed, please find attached the COC for soil samples sent to ALS on Monday this week.

Everything is on hold with the exception of QC16 at this stage. I will be in touch shortly to request some TOC and MC analysis on this batch.

Kind Regards
Averyll

Averyll Coyne
Principal Environmental Scientist
D +61 3 9653 8072 M +61 499 252 502
Averyll.Coyne@aecom.com

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Level 9, 8 Exhibition Street, Melbourne, VIC 3000
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www.aecom.com

Peter Ravlic

From: Coyne, Averyll <Averyll.Coyne@aecom.com>
Sent: Friday, 23 October 2015 11:02 AM
To: Bronwyn Sheen
Subject: Additional analysis request - EM1516063
Attachments: EM1516063_COC.pdf

Hi Bronwyn,

Can you please organise TOC and MC analysis for the following samples in batch EM1516063:

28 GW05(3.6-3.7)
32 GW07(3.0-3.1)
37 GW03(3.0-3.1)
40 GW23(2.3-2.4)
46 GW10(~~3.0-3.1~~) 2.9-3.0

Kind Regards
Averyll

Averyll Coyne
Principal Environmental Scientist
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ALS Environmental

CERTIFICATE OF ANALYSIS

Work Order	: **EM1516274**	Page	: 1 of 7
Client	: **AECOM Australia Pty Ltd**	Laboratory	: Environmental Division Melbourne
Contact	: MS AVERYLL COYNE	Contact	: Carol Walsh
Address	: LEVEL 9 8 EXHIBITION ST MELBOURNE VIC 3000	Address	: 4 Westall Rd Springvale VIC Australia 3171
E-mail	: averyll.coyne@aecom.com	E-mail	: carol.walsh@alsglobal.com
Telephone	: +61 03 9653 1234	Telephone	: +61-3-8549 9608
Facsimile	: +61 03 9654 7117	Facsimile	: +61-3-8549 9601
Project	: 60431087	QC Level	: NEPM 2013 Schedule B(3) and ALS QCS3 requirement
Order number	: ----	Date Samples Received	: 26-Oct-2015 10:50
C-O-C number	: ----	Date Analysis Commenced	: 27-Oct-2015
Sampler	: DUGALD CUNNINGHAM	Issue Date	: 29-Oct-2015 17:43
Site	: Fishermans Bend		
		No. of samples received	: 12
Quote number	: ----	No. of samples analysed	: 2

This report supersedes any previous report(s) with this reference. Results apply to the sample(s) as submitted.

This Certificate of Analysis contains the following information:

- General Comments
- Analytical Results

NATA Accredited Laboratory 825

Accredited for compliance with ISO/IEC 17025.

Signatories

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

Signatories	*Position*	*Accreditation Category*
Dilani Fernando	Senior Inorganic Chemist	Melbourne Inorganics
Nancy Wang	Senior Semivolatile Instrument Chemist	Melbourne Organics

General Comments

The analytical procedures used by the Environmental Division have been developed from established internationally recognized procedures such as those published by the USEPA, APHA, AS and NEPM. In house developed procedures are employed in the absence of documented standards or by 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.

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.

- Benzo(a)pyrene Toxicity Equivalent Quotient (TEQ) 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.

Analytical Results

Sub-Matrix: SOIL (Matrix: SOIL)			Client sample ID	GW02(0.5-0.6)	GW02(1.0-1.1)	----	----	----
			Client sampling date / time	[23-Oct-2015]	[23-Oct-2015]	----	----	----
Compound	CAS Number	LOR	Unit	EM1516274-002	EM1516274-003	--------	--------	--------
				Result	Result	Result	Result	Result
EA001: pH in soil using 0.01M CaCl extract								
pH (CaCl2)	----	0.1	pH Unit	**7.9**	**7.9**	----	----	----
EA055: Moisture Content								
^ Moisture Content (dried @ 103°C)	----	1	%	**12.3**	**14.3**	----	----	----
ED040N: Sulfate - Calcium Phosphate Soluble (NEPM)								
Sulfate as SO4 2-	14808-79-8	50	mg/kg	**290**	**120**	----	----	----
EG005T: Total Metals by ICP-AES								
Aluminium	7429-90-5	50	mg/kg	**10500**	**12700**	----	----	----
Iron	7439-89-6	50	mg/kg	**44400**	**29800**	----	----	----
Selenium	7782-49-2	5	mg/kg	<5	<5	----	----	----
Arsenic	7440-38-2	5	mg/kg	**22**	**14**	----	----	----
Cadmium	7440-43-9	1	mg/kg	<1	<1	----	----	----
Chromium	7440-47-3	2	mg/kg	**41**	**36**	----	----	----
Copper	7440-50-8	5	mg/kg	**173**	**21**	----	----	----
Lead	7439-92-1	5	mg/kg	**215**	**24**	----	----	----
Nickel	7440-02-0	2	mg/kg	**67**	**49**	----	----	----
Zinc	7440-66-6	5	mg/kg	**263**	**81**	----	----	----
EG035T: Total Recoverable Mercury by FIMS								
Mercury	7439-97-6	0.1	mg/kg	**0.3**	<0.1	----	----	----
EP074A: Monocyclic Aromatic Hydrocarbons								
Styrene	100-42-5	0.5	mg/kg	<0.5	<0.5	----	----	----
Isopropylbenzene	98-82-8	0.5	mg/kg	<0.5	<0.5	----	----	----
n-Propylbenzene	103-65-1	0.5	mg/kg	<0.5	<0.5	----	----	----
1.3.5-Trimethylbenzene	108-67-8	0.5	mg/kg	<0.5	<0.5	----	----	----
sec-Butylbenzene	135-98-8	0.5	mg/kg	<0.5	<0.5	----	----	----
1.2.4-Trimethylbenzene	95-63-6	0.5	mg/kg	<0.5	<0.5	----	----	----
tert-Butylbenzene	98-06-6	0.5	mg/kg	<0.5	<0.5	----	----	----
p-Isopropyltoluene	99-87-6	0.5	mg/kg	<0.5	<0.5	----	----	----
n-Butylbenzene	104-51-8	0.5	mg/kg	<0.5	<0.5	----	----	----
EP074B: Oxygenated Compounds								
Vinyl Acetate	108-05-4	5	mg/kg	<5	<5	----	----	----
2-Butanone (MEK)	78-93-3	5	mg/kg	<5	<5	----	----	----
4-Methyl-2-pentanone (MIBK)	108-10-1	5	mg/kg	<5	<5	----	----	----
2-Hexanone (MBK)	591-78-6	5	mg/kg	<5	<5	----	----	----
EP074C: Sulfonated Compounds								

Analytical Results

Sub-Matrix: SOIL (Matrix: SOIL)			Client sample ID	GW02(0.5-0.6)	GW02(1.0-1.1)	----	----	----
			Client sampling date / time	[23-Oct-2015]	[23-Oct-2015]	----	----	----
Compound	CAS Number	LOR	Unit	EM1516274-002	EM1516274-003	--------	--------	--------
				Result	Result	Result	Result	Result
EP074C: Sulfonated Compounds - Continued								
Carbon disulfide	75-15-0	0.5	mg/kg	<0.5	<0.5	----	----	----
EP074D: Fumigants								
2.2-Dichloropropane	594-20-7	0.5	mg/kg	<0.5	<0.5	----	----	----
1.2-Dichloropropane	78-87-5	0.5	mg/kg	<0.5	<0.5	----	----	----
cis-1.3-Dichloropropylene	10061-01-5	0.5	mg/kg	<0.5	<0.5	----	----	----
trans-1.3-Dichloropropylene	10061-02-6	0.5	mg/kg	<0.5	<0.5	----	----	----
1.2-Dibromoethane (EDB)	106-93-4	0.5	mg/kg	<0.5	<0.5	----	----	----
EP074E: Halogenated Aliphatic Compounds								
Dichlorodifluoromethane	75-71-8	5	mg/kg	<5	<5	----	----	----
Chloromethane	74-87-3	5	mg/kg	<5	<5	----	----	----
Vinyl chloride	75-01-4	5	mg/kg	<5	<5	----	----	----
Bromomethane	74-83-9	5	mg/kg	<5	<5	----	----	----
Chloroethane	75-00-3	5	mg/kg	<5	<5	----	----	----
Trichlorofluoromethane	75-69-4	5	mg/kg	<5	<5	----	----	----
1.1-Dichloroethene	75-35-4	0.5	mg/kg	<0.5	<0.5	----	----	----
Iodomethane	74-88-4	0.5	mg/kg	<0.5	<0.5	----	----	----
trans-1.2-Dichloroethene	156-60-5	0.5	mg/kg	<0.5	<0.5	----	----	----
1.1-Dichloroethane	75-34-3	0.5	mg/kg	<0.5	<0.5	----	----	----
cis-1.2-Dichloroethene	156-59-2	0.5	mg/kg	<0.5	<0.5	----	----	----
1.1.1-Trichloroethane	71-55-6	0.5	mg/kg	<0.5	<0.5	----	----	----
1.1-Dichloropropylene	563-58-6	0.5	mg/kg	<0.5	<0.5	----	----	----
Carbon Tetrachloride	56-23-5	0.5	mg/kg	<0.5	<0.5	----	----	----
1.2-Dichloroethane	107-06-2	0.5	mg/kg	<0.5	<0.5	----	----	----
Trichloroethene	79-01-6	0.5	mg/kg	<0.5	<0.5	----	----	----
Dibromomethane	74-95-3	0.5	mg/kg	<0.5	<0.5	----	----	----
1.1.2-Trichloroethane	79-00-5	0.5	mg/kg	<0.5	<0.5	----	----	----
1.3-Dichloropropane	142-28-9	0.5	mg/kg	<0.5	<0.5	----	----	----
Tetrachloroethene	127-18-4	0.5	mg/kg	<0.5	<0.5	----	----	----
1.1.1.2-Tetrachloroethane	630-20-6	0.5	mg/kg	<0.5	<0.5	----	----	----
trans-1.4-Dichloro-2-butene	110-57-6	0.5	mg/kg	<0.5	<0.5	----	----	----
cis-1.4-Dichloro-2-butene	1476-11-5	0.5	mg/kg	<0.5	<0.5	----	----	----
1.1.2.2-Tetrachloroethane	79-34-5	0.5	mg/kg	<0.5	<0.5	----	----	----
1.2.3-Trichloropropane	96-18-4	0.5	mg/kg	<0.5	<0.5	----	----	----
Pentachloroethane	76-01-7	0.5	mg/kg	<0.5	<0.5	----	----	----

Analytical Results

Sub-Matrix: SOIL (Matrix: SOIL)			Client sample ID	GW02(0.5-0.6)	GW02(1.0-1.1)	----	----	----
			Client sampling date / time	[23-Oct-2015]	[23-Oct-2015]	----	----	----
Compound	CAS Number	LOR	Unit	EM1516274-002	EM1516274-003	--------	--------	--------
				Result	Result	Result	Result	Result
EP074E: Halogenated Aliphatic Compounds - Continued								
1.2-Dibromo-3-chloropropane	96-12-8	0.5	mg/kg	<0.5	<0.5	----	----	----
Hexachlorobutadiene	87-68-3	0.5	mg/kg	<0.5	<0.5	----	----	----
EP074F: Halogenated Aromatic Compounds								
Chlorobenzene	108-90-7	0.5	mg/kg	<0.5	<0.5	----	----	----
Bromobenzene	108-86-1	0.5	mg/kg	<0.5	<0.5	----	----	----
2-Chlorotoluene	95-49-8	0.5	mg/kg	<0.5	<0.5	----	----	----
4-Chlorotoluene	106-43-4	0.5	mg/kg	<0.5	<0.5	----	----	----
1.3-Dichlorobenzene	541-73-1	0.5	mg/kg	<0.5	<0.5	----	----	----
1.4-Dichlorobenzene	106-46-7	0.5	mg/kg	<0.5	<0.5	----	----	----
1.2-Dichlorobenzene	95-50-1	0.5	mg/kg	<0.5	<0.5	----	----	----
1.2.4-Trichlorobenzene	120-82-1	0.5	mg/kg	<0.5	<0.5	----	----	----
1.2.3-Trichlorobenzene	87-61-6	0.5	mg/kg	<0.5	<0.5	----	----	----
EP074G: Trihalomethanes								
Chloroform	67-66-3	0.5	mg/kg	<0.5	<0.5	----	----	----
Bromodichloromethane	75-27-4	0.5	mg/kg	<0.5	<0.5	----	----	----
Dibromochloromethane	124-48-1	0.5	mg/kg	<0.5	<0.5	----	----	----
Bromoform	75-25-2	0.5	mg/kg	<0.5	<0.5	----	----	----
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	1.8	<0.5	----	----	----
Anthracene	120-12-7	0.5	mg/kg	1.0	<0.5	----	----	----
Fluoranthene	206-44-0	0.5	mg/kg	4.0	<0.5	----	----	----
Pyrene	129-00-0	0.5	mg/kg	4.1	<0.5	----	----	----
Benz(a)anthracene	56-55-3	0.5	mg/kg	1.9	<0.5	----	----	----
Chrysene	218-01-9	0.5	mg/kg	1.8	<0.5	----	----	----
Benzo(b+j)fluoranthene	205-99-2 205-82-3	0.5	mg/kg	2.4	<0.5	----	----	----
Benzo(k)fluoranthene	207-08-9	0.5	mg/kg	0.9	<0.5	----	----	----
Benzo(a)pyrene	50-32-8	0.5	mg/kg	2.0	<0.5	----	----	----
Indeno(1.2.3.cd)pyrene	193-39-5	0.5	mg/kg	1.1	<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	1.4	<0.5	----	----	----

Analytical Results

Sub-Matrix: SOIL (Matrix: SOIL)				Client sample ID	GW02(0.5-0.6)	GW02(1.0-1.1)	----	----	----
				Client sampling date / time	[23-Oct-2015]	[23-Oct-2015]	----	----	----
Compound	CAS Number	LOR	Unit		EM1516274-002	EM1516274-003	--------	--------	--------
					Result	Result	Result	Result	Result
EP075(SIM)B: Polynuclear Aromatic Hydrocarbons - Continued									
^ **Sum of polycyclic aromatic hydrocarbons**	----	0.5	mg/kg		**22.4**	<0.5	----	----	----
^ **Benzo(a)pyrene TEQ (zero)**	----	0.5	mg/kg		**2.7**	<0.5	----	----	----
^ **Benzo(a)pyrene TEQ (half LOR)**	----	0.5	mg/kg		**2.9**	**0.6**	----	----	----
^ **Benzo(a)pyrene TEQ (LOR)**	----	0.5	mg/kg		**3.2**	**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		**140**	<100	----	----	----
C29 - C36 Fraction	----	100	mg/kg		**140**	<100	----	----	----
^ **C10 - C36 Fraction (sum)**	----	50	mg/kg		**280**	<50	----	----	----
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	>C10_C16	50	mg/kg		<50	<50	----	----	----
>C16 - C34 Fraction	----	100	mg/kg		**250**	<100	----	----	----
>C34 - C40 Fraction	----	100	mg/kg		<100	<100	----	----	----
^ **>C10 - C40 Fraction (sum)**	----	50	mg/kg		**250**	<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	----	----	----
Toluene	108-88-3	0.5	mg/kg		<0.5	<0.5	----	----	----
Ethylbenzene	100-41-4	0.5	mg/kg		<0.5	<0.5	----	----	----
meta- & para-Xylene	108-38-3 106-42-3	0.5	mg/kg		<0.5	<0.5	----	----	----
ortho-Xylene	95-47-6	0.5	mg/kg		<0.5	<0.5	----	----	----
^ **Sum of BTEX**	----	0.2	mg/kg		<0.2	<0.2	----	----	----
^ **Total Xylenes**	1330-20-7	0.5	mg/kg		<0.5	<0.5	----	----	----
Naphthalene	91-20-3	1	mg/kg		<1	<1	----	----	----
EP074S: VOC Surrogates									
1.2-Dichloroethane-D4	17060-07-0	0.5	%		**79.6**	**91.7**	----	----	----
Toluene-D8	2037-26-5	0.5	%		**81.6**	**92.4**	----	----	----
4-Bromofluorobenzene	460-00-4	0.5	%		**75.3**	**85.1**	----	----	----
EP075(SIM)S: Phenolic Compound Surrogates									

Analytical Results

Sub-Matrix: SOIL (Matrix: SOIL)				Client sample ID	GW02(0.5-0.6)	GW02(1.0-1.1)	----	----	----
				Client sampling date / time	[23-Oct-2015]	[23-Oct-2015]	----	----	----
Compound	CAS Number	LOR	Unit		EM1516274-002	EM1516274-003	--------	--------	--------
					Result	Result	Result	Result	Result
EP075(SIM)S: Phenolic Compound Surrogates - Continued									
Phenol-d6	13127-88-3	0.5	%		**85.9**	**89.2**	----	----	----
2-Chlorophenol-D4	93951-73-6	0.5	%		**90.2**	**93.7**	----	----	----
2.4.6-Tribromophenol	118-79-6	0.5	%		**63.0**	**62.6**	----	----	----
EP075(SIM)T: PAH Surrogates									
2-Fluorobiphenyl	321-60-8	0.5	%		**92.9**	**96.7**	----	----	----
Anthracene-d10	1719-06-8	0.5	%		**109**	**123**	----	----	----
4-Terphenyl-d14	1718-51-0	0.5	%		**105**	**108**	----	----	----
EP080S: TPH(V)/BTEX Surrogates									
1.2-Dichloroethane-D4	17060-07-0	0.2	%		**76.2**	**87.9**	----	----	----
Toluene-D8	2037-26-5	0.2	%		**75.0**	**84.8**	----	----	----
4-Bromofluorobenzene	460-00-4	0.2	%		**74.2**	**83.8**	----	----	----

ALS Environmental

QUALITY CONTROL REPORT

Work Order	: **EM1516274**	Page	: 1 of 13
Client	: **AECOM Australia Pty Ltd**	Laboratory	: Environmental Division Melbourne
Contact	: MS AVERYLL COYNE	Contact	: Carol Walsh
Address	: LEVEL 9 8 EXHIBITION ST MELBOURNE VIC 3000	Address	: 4 Westall Rd Springvale VIC Australia 3171
E-mail	: averyll.coyne@aecom.com	E-mail	: carol.walsh@alsglobal.com
Telephone	: +61 03 9653 1234	Telephone	: +61-3-8549 9608
Facsimile	: +61 03 9654 7117	Facsimile	: +61-3-8549 9601
Project	: 60431087	QC Level	: NEPM 2013 Schedule B(3) and ALS QCS3 requirement
Order number	: ----	Date Samples Received	: 26-Oct-2015
C-O-C number	: ----	Date Analysis Commenced	: 27-Oct-2015
Sampler	: DUGALD CUNNINGHAM	Issue Date	: 29-Oct-2015
Site	: Fishermans Bend	No. of samples received	: 12
Quote number	: ----	No. of samples analysed	: 2

This report supersedes any previous report(s) with this reference. Results apply to the sample(s) as submitted.

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

NATA WORLD RECOGNISED ACCREDITATION

NATA Accredited Laboratory 825

Accredited for compliance with ISO/IEC 17025.

Signatories

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

Signatories	*Position*	*Accreditation Category*
Dilani Fernando	Senior Inorganic Chemist	Melbourne Inorganics
Nancy Wang	Senior Semivolatile Instrument Chemist	Melbourne Organics

General Comments

The analytical procedures used by the Environmental Division have been developed from established internationally recognized procedures such as those published by the USEPA, APHA, AS and NEPM. In house developed procedures are employed in the absence of documented standards or by 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

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	*Client sample ID*	*Method: Compound*	*CAS Number*	*LOR*	*Unit*	*Original Result*	*Duplicate Result*	*RPD (%)*	*Recovery Limits (%)*
EA001: pH in soil using 0.01M CaCl extract (QC Lot: 257778)									
EM1516226-001	Anonymous	EA001: pH (CaCl2)	----	0.1	pH Unit	7.7	7.7	0.00	0% - 20%
EM1516226-045	Anonymous	EA001: pH (CaCl2)	----	0.1	pH Unit	6.5	6.6	1.53	0% - 20%
EA055: Moisture Content (QC Lot: 256976)									
EM1516195-006	Anonymous	EA055-103: Moisture Content (dried @ 103°C)	----	1	%	11.2	9.5	16.2	0% - 50%
EM1516258-006	Anonymous	EA055-103: Moisture Content (dried @ 103°C)	----	1	%	24.7	23.9	3.29	0% - 20%
EA055: Moisture Content (QC Lot: 256977)									
EM1516274-003	GW02(1.0-1.1)	EA055-103: Moisture Content (dried @ 103°C)	----	1	%	14.3	16.2	12.8	0% - 50%
ED040N: Sulfate - Calcium Phosphate Soluble (NEPM) (QC Lot: 258491)									
EM1516195-005	Anonymous	ED040N: Sulfate as SO4 2-	14808-79-8	50	mg/kg	80	80	0.00	No Limit
EG005T: Total Metals by ICP-AES (QC Lot: 257294)									
EM1516195-062	Anonymous	EG005T: Cadmium	7440-43-9	1	mg/kg	<1	<1	0.00	No Limit
		EG005T: Chromium	7440-47-3	2	mg/kg	3	4	0.00	No Limit
		EG005T: Nickel	7440-02-0	2	mg/kg	<2	<2	0.00	No Limit
		EG005T: Arsenic	7440-38-2	5	mg/kg	<5	<5	0.00	No Limit
		EG005T: Copper	7440-50-8	5	mg/kg	<5	<5	0.00	No Limit
		EG005T: Lead	7439-92-1	5	mg/kg	<5	<5	0.00	No Limit
		EG005T: Selenium	7782-49-2	5	mg/kg	<5	<5	0.00	No Limit
		EG005T: Zinc	7440-66-6	5	mg/kg	<5	<5	0.00	No Limit
		EG005T: Aluminium	7429-90-5	50	mg/kg	1690	1590	6.16	0% - 20%
		EG005T: Iron	7439-89-6	50	mg/kg	1490	1460	2.33	0% - 20%
EM1516263-003	Anonymous	EG005T: Arsenic	7440-38-2	5	mg/kg	<5	<5	0.00	No Limit
		EG005T: Selenium	7782-49-2	5	mg/kg	<5	<5	0.00	No Limit
		EG005T: Aluminium	7429-90-5	50	mg/kg	6620	6060	8.74	0% - 20%
		EG005T: Iron	7439-89-6	50	mg/kg	14400	14000	2.60	0% - 20%
EG035T: Total Recoverable Mercury by FIMS (QC Lot: 257295)									
EM1516195-062	Anonymous	EG035T: Mercury	7439-97-6	0.1	mg/kg	<0.1	<0.1	0.00	No Limit
EM1516263-003	Anonymous	EG035T: Mercury	7439-97-6	0.1	mg/kg	0.6	0.3	59.5	No Limit
EP074A: Monocyclic Aromatic Hydrocarbons (QC Lot: 257420)									
EM1516179-035	Anonymous	EP074: 1.2.4-Trimethylbenzene	95-63-6	0.5	mg/kg	<0.5	<0.5	0.00	No Limit
		EP074: 1.3.5-Trimethylbenzene	108-67-8	0.5	mg/kg	<0.5	<0.5	0.00	No Limit
		EP074: Isopropylbenzene	98-82-8	0.5	mg/kg	<0.5	<0.5	0.00	No Limit
		EP074: n-Butylbenzene	104-51-8	0.5	mg/kg	<0.5	<0.5	0.00	No Limit
		EP074: n-Propylbenzene	103-65-1	0.5	mg/kg	<0.5	<0.5	0.00	No Limit
		EP074: p-Isopropyltoluene	99-87-6	0.5	mg/kg	<0.5	<0.5	0.00	No Limit
		EP074: sec-Butylbenzene	135-98-8	0.5	mg/kg	<0.5	<0.5	0.00	No Limit

Sub-Matrix: **SOIL**

				Laboratory Duplicate (DUP) Report					
Laboratory sample ID	*Client sample ID*	*Method: Compound*	*CAS Number*	*LOR*	*Unit*	*Original Result*	*Duplicate Result*	*RPD (%)*	*Recovery Limits (%)*
EP074A: Monocyclic Aromatic Hydrocarbons (QC Lot: 257420) - continued									
EM1516179-035	Anonymous	EP074: Styrene	100-42-5	0.5	mg/kg	<0.5	<0.5	0.00	No Limit
		EP074: tert-Butylbenzene	98-06-6	0.5	mg/kg	<0.5	<0.5	0.00	No Limit
EM1516179-063	Anonymous	EP074: 1.2.4-Trimethylbenzene	95-63-6	0.5	mg/kg	<0.5	<0.5	0.00	No Limit
		EP074: 1.3.5-Trimethylbenzene	108-67-8	0.5	mg/kg	<0.5	<0.5	0.00	No Limit
		EP074: Isopropylbenzene	98-82-8	0.5	mg/kg	<0.5	<0.5	0.00	No Limit
		EP074: n-Butylbenzene	104-51-8	0.5	mg/kg	<0.5	<0.5	0.00	No Limit
		EP074: n-Propylbenzene	103-65-1	0.5	mg/kg	<0.5	<0.5	0.00	No Limit
		EP074: p-Isopropyltoluene	99-87-6	0.5	mg/kg	<0.5	<0.5	0.00	No Limit
		EP074: sec-Butylbenzene	135-98-8	0.5	mg/kg	<0.5	<0.5	0.00	No Limit
		EP074: Styrene	100-42-5	0.5	mg/kg	<0.5	<0.5	0.00	No Limit
		EP074: tert-Butylbenzene	98-06-6	0.5	mg/kg	<0.5	<0.5	0.00	No Limit
EP074B: Oxygenated Compounds (QC Lot: 257420)									
EM1516179-035	Anonymous	EP074: 2-Butanone (MEK)	78-93-3	5	mg/kg	<5	<5	0.00	No Limit
		EP074: 2-Hexanone (MBK)	591-78-6	5	mg/kg	<5	<5	0.00	No Limit
		EP074: 4-Methyl-2-pentanone (MIBK)	108-10-1	5	mg/kg	<5	<5	0.00	No Limit
		EP074: Vinyl Acetate	108-05-4	5	mg/kg	<5	<5	0.00	No Limit
EM1516179-063	Anonymous	EP074: 2-Butanone (MEK)	78-93-3	5	mg/kg	<5	<5	0.00	No Limit
		EP074: 2-Hexanone (MBK)	591-78-6	5	mg/kg	<5	<5	0.00	No Limit
		EP074: 4-Methyl-2-pentanone (MIBK)	108-10-1	5	mg/kg	<5	<5	0.00	No Limit
		EP074: Vinyl Acetate	108-05-4	5	mg/kg	<5	<5	0.00	No Limit
EP074C: Sulfonated Compounds (QC Lot: 257420)									
EM1516179-035	Anonymous	EP074: Carbon disulfide	75-15-0	0.5	mg/kg	<0.5	<0.5	0.00	No Limit
EM1516179-063	Anonymous	EP074: Carbon disulfide	75-15-0	0.5	mg/kg	<0.5	<0.5	0.00	No Limit
EP074D: Fumigants (QC Lot: 257420)									
EM1516179-035	Anonymous	EP074: 1.2-Dibromoethane (EDB)	106-93-4	0.5	mg/kg	<0.5	<0.5	0.00	No Limit
		EP074: 1.2-Dichloropropane	78-87-5	0.5	mg/kg	<0.5	<0.5	0.00	No Limit
		EP074: 2.2-Dichloropropane	594-20-7	0.5	mg/kg	<0.5	<0.5	0.00	No Limit
		EP074: cis-1.3-Dichloropropylene	10061-01-5	0.5	mg/kg	<0.5	<0.5	0.00	No Limit
		EP074: trans-1.3-Dichloropropylene	10061-02-6	0.5	mg/kg	<0.5	<0.5	0.00	No Limit
EM1516179-063	Anonymous	EP074: 1.2-Dibromoethane (EDB)	106-93-4	0.5	mg/kg	<0.5	<0.5	0.00	No Limit
		EP074: 1.2-Dichloropropane	78-87-5	0.5	mg/kg	<0.5	<0.5	0.00	No Limit
		EP074: 2.2-Dichloropropane	594-20-7	0.5	mg/kg	<0.5	<0.5	0.00	No Limit
		EP074: cis-1.3-Dichloropropylene	10061-01-5	0.5	mg/kg	<0.5	<0.5	0.00	No Limit
		EP074: trans-1.3-Dichloropropylene	10061-02-6	0.5	mg/kg	<0.5	<0.5	0.00	No Limit
EP074E: Halogenated Aliphatic Compounds (QC Lot: 257420)									
EM1516179-035	Anonymous	EP074: 1.1.1.2-Tetrachloroethane	630-20-6	0.5	mg/kg	<0.5	<0.5	0.00	No Limit
		EP074: 1.1.1-Trichloroethane	71-55-6	0.5	mg/kg	<0.5	<0.5	0.00	No Limit
		EP074: 1.1.2.2-Tetrachloroethane	79-34-5	0.5	mg/kg	<0.5	<0.5	0.00	No Limit
		EP074: 1.1.2-Trichloroethane	79-00-5	0.5	mg/kg	<0.5	<0.5	0.00	No Limit

Sub-Matrix: **SOIL**

				Laboratory Duplicate (DUP) Report					
Laboratory sample ID	*Client sample ID*	*Method: Compound*	*CAS Number*	*LOR*	*Unit*	*Original Result*	*Duplicate Result*	*RPD (%)*	*Recovery Limits (%)*
EP074E: Halogenated Aliphatic Compounds (QC Lot: 257420) - continued									
EM1516179-035	Anonymous	EP074: 1.1-Dichloroethane	75-34-3	0.5	mg/kg	<0.5	<0.5	0.00	No Limit
		EP074: 1.1-Dichloroethene	75-35-4	0.5	mg/kg	<0.5	<0.5	0.00	No Limit
		EP074: 1.1-Dichloropropylene	563-58-6	0.5	mg/kg	<0.5	<0.5	0.00	No Limit
		EP074: 1.2.3-Trichloropropane	96-18-4	0.5	mg/kg	<0.5	<0.5	0.00	No Limit
		EP074: 1.2-Dibromo-3-chloropropane	96-12-8	0.5	mg/kg	<0.5	<0.5	0.00	No Limit
		EP074: 1.2-Dichloroethane	107-06-2	0.5	mg/kg	<0.5	<0.5	0.00	No Limit
		EP074: 1.3-Dichloropropane	142-28-9	0.5	mg/kg	<0.5	<0.5	0.00	No Limit
		EP074: Carbon Tetrachloride	56-23-5	0.5	mg/kg	<0.5	<0.5	0.00	No Limit
		EP074: cis-1.2-Dichloroethene	156-59-2	0.5	mg/kg	<0.5	<0.5	0.00	No Limit
		EP074: cis-1.4-Dichloro-2-butene	1476-11-5	0.5	mg/kg	<0.5	<0.5	0.00	No Limit
		EP074: Dibromomethane	74-95-3	0.5	mg/kg	<0.5	<0.5	0.00	No Limit
		EP074: Hexachlorobutadiene	87-68-3	0.5	mg/kg	<0.5	<0.5	0.00	No Limit
		EP074: Iodomethane	74-88-4	0.5	mg/kg	<0.5	<0.5	0.00	No Limit
		EP074: Pentachloroethane	76-01-7	0.5	mg/kg	<0.5	<0.5	0.00	No Limit
		EP074: Tetrachloroethene	127-18-4	0.5	mg/kg	<0.5	<0.5	0.00	No Limit
		EP074: trans-1.2-Dichloroethene	156-60-5	0.5	mg/kg	<0.5	<0.5	0.00	No Limit
		EP074: trans-1.4-Dichloro-2-butene	110-57-6	0.5	mg/kg	<0.5	<0.5	0.00	No Limit
		EP074: Trichloroethene	79-01-6	0.5	mg/kg	<0.5	<0.5	0.00	No Limit
		EP074: Bromomethane	74-83-9	5	mg/kg	<5	<5	0.00	No Limit
		EP074: Chloroethane	75-00-3	5	mg/kg	<5	<5	0.00	No Limit
		EP074: Chloromethane	74-87-3	5	mg/kg	<5	<5	0.00	No Limit
		EP074: Dichlorodifluoromethane	75-71-8	5	mg/kg	<5	<5	0.00	No Limit
		EP074: Trichlorofluoromethane	75-69-4	5	mg/kg	<5	<5	0.00	No Limit
		EP074: Vinyl chloride	75-01-4	5	mg/kg	<5	<5	0.00	No Limit
EM1516179-063	Anonymous	EP074: 1.1.1.2-Tetrachloroethane	630-20-6	0.5	mg/kg	<0.5	<0.5	0.00	No Limit
		EP074: 1.1.1-Trichloroethane	71-55-6	0.5	mg/kg	<0.5	<0.5	0.00	No Limit
		EP074: 1.1.2.2-Tetrachloroethane	79-34-5	0.5	mg/kg	<0.5	<0.5	0.00	No Limit
		EP074: 1.1.2-Trichloroethane	79-00-5	0.5	mg/kg	<0.5	<0.5	0.00	No Limit
		EP074: 1.1-Dichloroethane	75-34-3	0.5	mg/kg	<0.5	<0.5	0.00	No Limit
		EP074: 1.1-Dichloroethene	75-35-4	0.5	mg/kg	<0.5	<0.5	0.00	No Limit
		EP074: 1.1-Dichloropropylene	563-58-6	0.5	mg/kg	<0.5	<0.5	0.00	No Limit
		EP074: 1.2.3-Trichloropropane	96-18-4	0.5	mg/kg	<0.5	<0.5	0.00	No Limit
		EP074: 1.2-Dibromo-3-chloropropane	96-12-8	0.5	mg/kg	<0.5	<0.5	0.00	No Limit
		EP074: 1.2-Dichloroethane	107-06-2	0.5	mg/kg	<0.5	<0.5	0.00	No Limit
		EP074: 1.3-Dichloropropane	142-28-9	0.5	mg/kg	<0.5	<0.5	0.00	No Limit
		EP074: Carbon Tetrachloride	56-23-5	0.5	mg/kg	<0.5	<0.5	0.00	No Limit
		EP074: cis-1.2-Dichloroethene	156-59-2	0.5	mg/kg	<0.5	<0.5	0.00	No Limit
		EP074: cis-1.4-Dichloro-2-butene	1476-11-5	0.5	mg/kg	<0.5	<0.5	0.00	No Limit
		EP074: Dibromomethane	74-95-3	0.5	mg/kg	<0.5	<0.5	0.00	No Limit
		EP074: Hexachlorobutadiene	87-68-3	0.5	mg/kg	<0.5	<0.5	0.00	No Limit

Sub-Matrix: **SOIL**

				Laboratory Duplicate (DUP) Report					
Laboratory sample ID	*Client sample ID*	*Method: Compound*	*CAS Number*	*LOR*	*Unit*	*Original Result*	*Duplicate Result*	*RPD (%)*	*Recovery Limits (%)*
EP074E: Halogenated Aliphatic Compounds (QC Lot: 257420) - continued									
EM1516179-063	Anonymous	EP074: Iodomethane	74-88-4	0.5	mg/kg	<0.5	<0.5	0.00	No Limit
		EP074: Pentachloroethane	76-01-7	0.5	mg/kg	<0.5	<0.5	0.00	No Limit
		EP074: Tetrachloroethene	127-18-4	0.5	mg/kg	<0.5	<0.5	0.00	No Limit
		EP074: trans-1.2-Dichloroethene	156-60-5	0.5	mg/kg	<0.5	<0.5	0.00	No Limit
		EP074: trans-1.4-Dichloro-2-butene	110-57-6	0.5	mg/kg	<0.5	<0.5	0.00	No Limit
		EP074: Trichloroethene	79-01-6	0.5	mg/kg	<0.5	<0.5	0.00	No Limit
		EP074: Bromomethane	74-83-9	5	mg/kg	<5	<5	0.00	No Limit
		EP074: Chloroethane	75-00-3	5	mg/kg	<5	<5	0.00	No Limit
		EP074: Chloromethane	74-87-3	5	mg/kg	<5	<5	0.00	No Limit
		EP074: Dichlorodifluoromethane	75-71-8	5	mg/kg	<5	<5	0.00	No Limit
		EP074: Trichlorofluoromethane	75-69-4	5	mg/kg	<5	<5	0.00	No Limit
		EP074: Vinyl chloride	75-01-4	5	mg/kg	<5	<5	0.00	No Limit
EP074F: Halogenated Aromatic Compounds (QC Lot: 257420)									
EM1516179-035	Anonymous	EP074: 1.2.3-Trichlorobenzene	87-61-6	0.5	mg/kg	<0.5	<0.5	0.00	No Limit
		EP074: 1.2.4-Trichlorobenzene	120-82-1	0.5	mg/kg	<0.5	<0.5	0.00	No Limit
		EP074: 1.2-Dichlorobenzene	95-50-1	0.5	mg/kg	<0.5	<0.5	0.00	No Limit
		EP074: 1.3-Dichlorobenzene	541-73-1	0.5	mg/kg	<0.5	<0.5	0.00	No Limit
		EP074: 1.4-Dichlorobenzene	106-46-7	0.5	mg/kg	<0.5	<0.5	0.00	No Limit
		EP074: 2-Chlorotoluene	95-49-8	0.5	mg/kg	<0.5	<0.5	0.00	No Limit
		EP074: 4-Chlorotoluene	106-43-4	0.5	mg/kg	<0.5	<0.5	0.00	No Limit
		EP074: Bromobenzene	108-86-1	0.5	mg/kg	<0.5	<0.5	0.00	No Limit
		EP074: Chlorobenzene	108-90-7	0.5	mg/kg	<0.5	<0.5	0.00	No Limit
EM1516179-063	Anonymous	EP074: 1.2.3-Trichlorobenzene	87-61-6	0.5	mg/kg	<0.5	<0.5	0.00	No Limit
		EP074: 1.2.4-Trichlorobenzene	120-82-1	0.5	mg/kg	<0.5	<0.5	0.00	No Limit
		EP074: 1.2-Dichlorobenzene	95-50-1	0.5	mg/kg	<0.5	<0.5	0.00	No Limit
		EP074: 1.3-Dichlorobenzene	541-73-1	0.5	mg/kg	<0.5	<0.5	0.00	No Limit
		EP074: 1.4-Dichlorobenzene	106-46-7	0.5	mg/kg	<0.5	<0.5	0.00	No Limit
		EP074: 2-Chlorotoluene	95-49-8	0.5	mg/kg	<0.5	<0.5	0.00	No Limit
		EP074: 4-Chlorotoluene	106-43-4	0.5	mg/kg	<0.5	<0.5	0.00	No Limit
		EP074: Bromobenzene	108-86-1	0.5	mg/kg	<0.5	<0.5	0.00	No Limit
		EP074: Chlorobenzene	108-90-7	0.5	mg/kg	<0.5	<0.5	0.00	No Limit
EP074G: Trihalomethanes (QC Lot: 257420)									
EM1516179-035	Anonymous	EP074: Bromodichloromethane	75-27-4	0.5	mg/kg	<0.5	<0.5	0.00	No Limit
		EP074: Bromoform	75-25-2	0.5	mg/kg	<0.5	<0.5	0.00	No Limit
		EP074: Chloroform	67-66-3	0.5	mg/kg	<0.5	<0.5	0.00	No Limit
		EP074: Dibromochloromethane	124-48-1	0.5	mg/kg	<0.5	<0.5	0.00	No Limit
EM1516179-063	Anonymous	EP074: Bromodichloromethane	75-27-4	0.5	mg/kg	<0.5	<0.5	0.00	No Limit
		EP074: Bromoform	75-25-2	0.5	mg/kg	<0.5	<0.5	0.00	No Limit
		EP074: Chloroform	67-66-3	0.5	mg/kg	<0.5	<0.5	0.00	No Limit
		EP074: Dibromochloromethane	124-48-1	0.5	mg/kg	<0.5	<0.5	0.00	No Limit

Sub-Matrix: **SOIL**

				Laboratory Duplicate (DUP) Report					
Laboratory sample ID	*Client sample ID*	*Method: Compound*	*CAS Number*	*LOR*	*Unit*	*Original Result*	*Duplicate Result*	*RPD (%)*	*Recovery Limits (%)*
EP075(SIM)B: Polynuclear Aromatic Hydrocarbons (QC Lot: 257316)									
EM1516275-002	Anonymous	EP075(SIM): Acenaphthene	83-32-9	0.5	mg/kg	<0.5	<0.5	0.00	No Limit
		EP075(SIM): Acenaphthylene	208-96-8	0.5	mg/kg	<0.5	<0.5	0.00	No Limit
		EP075(SIM): Anthracene	120-12-7	0.5	mg/kg	<0.5	<0.5	0.00	No Limit
		EP075(SIM): Benz(a)anthracene	56-55-3	0.5	mg/kg	<0.5	<0.5	0.00	No Limit
		EP075(SIM): Benzo(a)pyrene	50-32-8	0.5	mg/kg	<0.5	<0.5	0.00	No Limit
		EP075(SIM): Benzo(b+j)fluoranthene	205-99-2 205-82-3	0.5	mg/kg	<0.5	<0.5	0.00	No Limit
		EP075(SIM): Benzo(g.h.i)perylene	191-24-2	0.5	mg/kg	<0.5	<0.5	0.00	No Limit
		EP075(SIM): Benzo(k)fluoranthene	207-08-9	0.5	mg/kg	<0.5	<0.5	0.00	No Limit
		EP075(SIM): Chrysene	218-01-9	0.5	mg/kg	<0.5	<0.5	0.00	No Limit
		EP075(SIM): Dibenz(a.h)anthracene	53-70-3	0.5	mg/kg	<0.5	<0.5	0.00	No Limit
		EP075(SIM): Fluoranthene	206-44-0	0.5	mg/kg	<0.5	<0.5	0.00	No Limit
		EP075(SIM): Fluorene	86-73-7	0.5	mg/kg	<0.5	<0.5	0.00	No Limit
		EP075(SIM): Indeno(1.2.3.cd)pyrene	193-39-5	0.5	mg/kg	<0.5	<0.5	0.00	No Limit
		EP075(SIM): Naphthalene	91-20-3	0.5	mg/kg	<0.5	<0.5	0.00	No Limit
		EP075(SIM): Phenanthrene	85-01-8	0.5	mg/kg	<0.5	<0.5	0.00	No Limit
		EP075(SIM): Pyrene	129-00-0	0.5	mg/kg	<0.5	<0.5	0.00	No Limit
EM1516235-054	Anonymous	EP075(SIM): Acenaphthene	83-32-9	0.5	mg/kg	1.9	0.9	71.6	No Limit
		EP075(SIM): Acenaphthylene	208-96-8	0.5	mg/kg	0.6	<0.5	25.0	No Limit
		EP075(SIM): Anthracene	120-12-7	0.5	mg/kg	<0.5	<0.5	0.00	No Limit
		EP075(SIM): Benz(a)anthracene	56-55-3	0.5	mg/kg	<0.5	<0.5	0.00	No Limit
		EP075(SIM): Benzo(a)pyrene	50-32-8	0.5	mg/kg	<0.5	<0.5	0.00	No Limit
		EP075(SIM): Benzo(b+j)fluoranthene	205-99-2 205-82-3	0.5	mg/kg	<0.5	<0.5	0.00	No Limit
		EP075(SIM): Benzo(g.h.i)perylene	191-24-2	0.5	mg/kg	<0.5	<0.5	0.00	No Limit
		EP075(SIM): Benzo(k)fluoranthene	207-08-9	0.5	mg/kg	<0.5	<0.5	0.00	No Limit
		EP075(SIM): Chrysene	218-01-9	0.5	mg/kg	<0.5	<0.5	0.00	No Limit
		EP075(SIM): Dibenz(a.h)anthracene	53-70-3	0.5	mg/kg	<0.5	<0.5	0.00	No Limit
		EP075(SIM): Fluoranthene	206-44-0	0.5	mg/kg	<0.5	<0.5	0.00	No Limit
		EP075(SIM): Fluorene	86-73-7	0.5	mg/kg	3.4	2.6	29.7	No Limit
		EP075(SIM): Indeno(1.2.3.cd)pyrene	193-39-5	0.5	mg/kg	<0.5	<0.5	0.00	No Limit
		EP075(SIM): Naphthalene	91-20-3	0.5	mg/kg	<0.5	<0.5	0.00	No Limit
		EP075(SIM): Phenanthrene	85-01-8	0.5	mg/kg	6.5	4.4	38.2	0% - 50%
		EP075(SIM): Pyrene	129-00-0	0.5	mg/kg	<0.5	<0.5	0.00	No Limit
EP080/071: Total Petroleum Hydrocarbons (QC Lot: 257314)									
EM1516235-054	Anonymous	EP071: C15 - C28 Fraction	----	100	mg/kg	1810	1360	28.1	0% - 50%
		EP071: C29 - C36 Fraction	----	100	mg/kg	<100	<100	0.00	No Limit
		EP071: C10 - C14 Fraction	----	50	mg/kg	1570	# 1150	30.4	0% - 20%
		EP071: C10 - C36 Fraction (sum)	----	50	mg/kg	3380	# 2510	29.5	0% - 20%
EM1516275-002	Anonymous	EP071: C15 - C28 Fraction	----	100	mg/kg	580	630	7.62	No Limit

Sub-Matrix: **SOIL**

				Laboratory Duplicate (DUP) Report					
Laboratory sample ID	*Client sample ID*	*Method: Compound*	*CAS Number*	*LOR*	*Unit*	*Original Result*	*Duplicate Result*	*RPD (%)*	*Recovery Limits (%)*
EP080/071: Total Petroleum Hydrocarbons (QC Lot: 257314) - continued									
EM1516275-002	Anonymous	EP071: C29 - C36 Fraction	----	100	mg/kg	<100	<100	0.00	No Limit
		EP071: C10 - C14 Fraction	----	50	mg/kg	100	110	0.00	No Limit
		EP071: C10 - C36 Fraction (sum)	----	50	mg/kg	680	740	8.45	0% - 50%
EP080/071: Total Petroleum Hydrocarbons (QC Lot: 257419)									
EM1516179-035	Anonymous	EP080: C6 - C9 Fraction	----	10	mg/kg	<10	<10	0.00	No Limit
EM1516179-063	Anonymous	EP080: C6 - C9 Fraction	----	10	mg/kg	<10	<10	0.00	No Limit
EP080/071: Total Recoverable Hydrocarbons - NEPM 2013 Fractions (QC Lot: 257314)									
EM1516235-054	Anonymous	EP071: >C16 - C34 Fraction	----	100	mg/kg	950	720	27.6	No Limit
		EP071: >C34 - C40 Fraction	----	100	mg/kg	<100	<100	0.00	No Limit
		EP071: >C10 - C16 Fraction	>C10_C16	50	mg/kg	2140	# 1590	29.4	0% - 20%
		EP071: >C10 - C40 Fraction (sum)	----	50	mg/kg	3090	# 2310	28.9	0% - 20%
EM1516275-002	Anonymous	EP071: >C16 - C34 Fraction	----	100	mg/kg	440	480	7.31	No Limit
		EP071: >C34 - C40 Fraction	----	100	mg/kg	<100	<100	0.00	No Limit
		EP071: >C10 - C16 Fraction	>C10_C16	50	mg/kg	280	300	7.67	No Limit
		EP071: >C10 - C40 Fraction (sum)	----	50	mg/kg	720	780	8.00	0% - 50%
EP080/071: Total Recoverable Hydrocarbons - NEPM 2013 Fractions (QC Lot: 257419)									
EM1516179-035	Anonymous	EP080: C6 - C10 Fraction	C6_C10	10	mg/kg	<10	<10	0.00	No Limit
EM1516179-063	Anonymous	EP080: C6 - C10 Fraction	C6_C10	10	mg/kg	<10	<10	0.00	No Limit
EP080: BTEXN (QC Lot: 257419)									
EM1516179-035	Anonymous	EP080: Benzene	71-43-2	0.2	mg/kg	<0.2	<0.2	0.00	No Limit
		EP080: Ethylbenzene	100-41-4	0.5	mg/kg	<0.5	<0.5	0.00	No Limit
		EP080: meta- & para-Xylene	108-38-3 106-42-3	0.5	mg/kg	<0.5	<0.5	0.00	No Limit
		EP080: ortho-Xylene	95-47-6	0.5	mg/kg	<0.5	<0.5	0.00	No Limit
		EP080: Toluene	108-88-3	0.5	mg/kg	<0.5	<0.5	0.00	No Limit
		EP080: Naphthalene	91-20-3	1	mg/kg	<1	<1	0.00	No Limit
EM1516179-063	Anonymous	EP080: Benzene	71-43-2	0.2	mg/kg	<0.2	<0.2	0.00	No Limit
		EP080: Ethylbenzene	100-41-4	0.5	mg/kg	<0.5	<0.5	0.00	No Limit
		EP080: meta- & para-Xylene	108-38-3 106-42-3	0.5	mg/kg	<0.5	<0.5	0.00	No Limit
		EP080: ortho-Xylene	95-47-6	0.5	mg/kg	<0.5	<0.5	0.00	No Limit
		EP080: Toluene	108-88-3	0.5	mg/kg	<0.5	<0.5	0.00	No Limit
		EP080: Naphthalene	91-20-3	1	mg/kg	<1	<1	0.00	No Limit

Method Blank (MB) and Laboratory Control Spike (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 (%)	Recovery Limits (%)	
Method: Compound	CAS Number	LOR	Unit	Result	Concentration	LCS	Low	High
ED040N: Sulfate - Calcium Phosphate Soluble (NEPM) (QCLot: 258491)								
ED040N: Sulfate as SO4 2-	14808-79-8	50	mg/kg	<50	3000 mg/kg	103	86	110
EG005T: Total Metals by ICP-AES (QCLot: 257294)								
EG005T: Aluminium	7429-90-5	50	mg/kg	<50	6134 mg/kg	102	93	115
EG005T: Arsenic	7440-38-2	5	mg/kg	<5	21.7 mg/kg	98.4	79	113
EG005T: Cadmium	7440-43-9	1	mg/kg	<1	4.64 mg/kg	97.4	87	115
EG005T: Chromium	7440-47-3	2	mg/kg	<2	43.9 mg/kg	97.4	89	113
EG005T: Copper	7440-50-8	5	mg/kg	<5	32 mg/kg	95.5	90	116
EG005T: Iron	7439-89-6	50	mg/kg	<50	8400 mg/kg	99.7	96	112
EG005T: Lead	7439-92-1	5	mg/kg	<5	40 mg/kg	88.5	85	107
EG005T: Nickel	7440-02-0	2	mg/kg	<2	55 mg/kg	100	89	111
EG005T: Selenium	7782-49-2	5	mg/kg	<5	5.37 mg/kg	99.1	93	109
EG005T: Zinc	7440-66-6	5	mg/kg	<5	60.8 mg/kg	92.9	89	111
EG035T: Total Recoverable Mercury by FIMS (QCLot: 257295)								
EG035T: Mercury	7439-97-6	0.1	mg/kg	<0.1	2.57 mg/kg	96.5	85	103
EP074A: Monocyclic Aromatic Hydrocarbons (QCLot: 257420)								
EP074: 1.2.4-Trimethylbenzene	95-63-6	0.5	mg/kg	<0.5	1 mg/kg	89.5	66	108
EP074: 1.3.5-Trimethylbenzene	108-67-8	0.5	mg/kg	<0.5	1 mg/kg	90.4	67	109
EP074: Isopropylbenzene	98-82-8	0.5	mg/kg	<0.5	1 mg/kg	89.7	69	119
EP074: n-Butylbenzene	104-51-8	0.5	mg/kg	<0.5	1 mg/kg	79.9	58	110
EP074: n-Propylbenzene	103-65-1	0.5	mg/kg	<0.5	1 mg/kg	89.6	64	110
EP074: p-Isopropyltoluene	99-87-6	0.5	mg/kg	<0.5	1 mg/kg	85.6	65	111
EP074: sec-Butylbenzene	135-98-8	0.5	mg/kg	<0.5	1 mg/kg	89.3	66	110
EP074: Styrene	100-42-5	0.5	mg/kg	<0.5	1 mg/kg	86.6	72	118
EP074: tert-Butylbenzene	98-06-6	0.5	mg/kg	<0.5	1 mg/kg	90.4	67	111
EP074B: Oxygenated Compounds (QCLot: 257420)								
EP074: 2-Butanone (MEK)	78-93-3	5	mg/kg	<5	10 mg/kg	90.2	68	142
EP074: 2-Hexanone (MBK)	591-78-6	5	mg/kg	<5	10 mg/kg	93.8	62	128
EP074: 4-Methyl-2-pentanone (MIBK)	108-10-1	5	mg/kg	<5	10 mg/kg	90.8	67	123
EP074: Vinyl Acetate	108-05-4	5	mg/kg	<5	10 mg/kg	90.5	54	128
EP074C: Sulfonated Compounds (QCLot: 257420)								
EP074: Carbon disulfide	75-15-0	0.5	mg/kg	<0.5	1 mg/kg	81.6	50	128
EP074D: Fumigants (QCLot: 257420)								
EP074: 1.2-Dibromoethane (EDB)	106-93-4	0.5	mg/kg	<0.5	1 mg/kg	90.6	73	117

Sub-Matrix: **SOIL**

Method: Compound	CAS Number	LOR	Unit	Method Blank (MB) Report	Laboratory Control Spike (LCS) Report			
					Spike	Spike Recovery (%)	Recovery Limits (%)	
				Result	Concentration	LCS	Low	High
EP074D: Fumigants (QCLot: 257420) - continued								
EP074: 1.2-Dichloropropane	78-87-5	0.5	mg/kg	<0.5	1 mg/kg	90.4	72	116
EP074: 2.2-Dichloropropane	594-20-7	0.5	mg/kg	<0.5	1 mg/kg	87.8	65	115
EP074: cis-1.3-Dichloropropylene	10061-01-5	0.5	mg/kg	<0.5	1 mg/kg	79.9	64	104
EP074: trans-1.3-Dichloropropylene	10061-02-6	0.5	mg/kg	<0.5	1 mg/kg	77.5	61	103
EP074E: Halogenated Aliphatic Compounds (QCLot: 257420)								
EP074: 1.1.1.2-Tetrachloroethane	630-20-6	0.5	mg/kg	<0.5	1 mg/kg	83.1	65	109
EP074: 1.1.1-Trichloroethane	71-55-6	0.5	mg/kg	<0.5	1 mg/kg	85.8	68	110
EP074: 1.1.2.2-Tetrachloroethane	79-34-5	0.5	mg/kg	<0.5	1 mg/kg	90.1	76	124
EP074: 1.1.2-Trichloroethane	79-00-5	0.5	mg/kg	<0.5	1 mg/kg	94.3	76	120
EP074: 1.1-Dichloroethane	75-34-3	0.5	mg/kg	<0.5	1 mg/kg	91.8	72	118
EP074: 1.1-Dichloroethene	75-35-4	0.5	mg/kg	<0.5	1 mg/kg	88.6	65	127
EP074: 1.1-Dichloropropylene	563-58-6	0.5	mg/kg	<0.5	1 mg/kg	88.0	70	116
EP074: 1.2.3-Trichloropropane	96-18-4	0.5	mg/kg	<0.5	1 mg/kg	91.0	75	123
EP074: 1.2-Dibromo-3-chloropropane	96-12-8	0.5	mg/kg	<0.5	1 mg/kg	77.5	54	106
EP074: 1.2-Dichloroethane	107-06-2	0.5	mg/kg	<0.5	1 mg/kg	93.2	75	119
EP074: 1.3-Dichloropropane	142-28-9	0.5	mg/kg	<0.5	1 mg/kg	92.9	78	120
EP074: Bromomethane	74-83-9	5	mg/kg	<5	10 mg/kg	75.2	43	133
EP074: Carbon Tetrachloride	56-23-5	0.5	mg/kg	<0.5	1 mg/kg	80.1	61	107
EP074: Chloroethane	75-00-3	5	mg/kg	<5	10 mg/kg	96.6	58	134
EP074: Chloromethane	74-87-3	5	mg/kg	<5	10 mg/kg	94.1	55	133
EP074: cis-1.2-Dichloroethene	156-59-2	0.5	mg/kg	<0.5	1 mg/kg	93.2	76	120
EP074: cis-1.4-Dichloro-2-butene	1476-11-5	0.5	mg/kg	<0.5	1 mg/kg	67.7	40	114
EP074: Dibromomethane	74-95-3	0.5	mg/kg	<0.5	1 mg/kg	85.8	74	114
EP074: Dichlorodifluoromethane	75-71-8	5	mg/kg	<5	10 mg/kg	71.2	45	123
EP074: Hexachlorobutadiene	87-68-3	0.5	mg/kg	<0.5	1 mg/kg	90.4	60	118
EP074: Iodomethane	74-88-4	0.5	mg/kg	<0.5	1 mg/kg	53.6	47	116
EP074: Pentachloroethane	76-01-7	0.5	mg/kg	<0.5	1 mg/kg	77.5	45	123
EP074: Tetrachloroethene	127-18-4	0.5	mg/kg	<0.5	1 mg/kg	87.1	69	121
EP074: trans-1.2-Dichloroethene	156-60-5	0.5	mg/kg	<0.5	1 mg/kg	89.3	70	118
EP074: trans-1.4-Dichloro-2-butene	110-57-6	0.5	mg/kg	<0.5	1 mg/kg	82.3	56	114
EP074: Trichloroethene	79-01-6	0.5	mg/kg	<0.5	1 mg/kg	89.9	72	116
EP074: Trichlorofluoromethane	75-69-4	5	mg/kg	<5	10 mg/kg	88.1	63	127
EP074: Vinyl chloride	75-01-4	5	mg/kg	<5	10 mg/kg	91.2	58	138
EP074F: Halogenated Aromatic Compounds (QCLot: 257420)								
EP074: 1.2.3-Trichlorobenzene	87-61-6	0.5	mg/kg	<0.5	1 mg/kg	90.8	69	117
EP074: 1.2.4-Trichlorobenzene	120-82-1	0.5	mg/kg	<0.5	1 mg/kg	86.5	60	112
EP074: 1.2-Dichlorobenzene	95-50-1	0.5	mg/kg	<0.5	1 mg/kg	91.7	76	112
EP074: 1.3-Dichlorobenzene	541-73-1	0.5	mg/kg	<0.5	1 mg/kg	90.8	70	110
EP074: 1.4-Dichlorobenzene	106-46-7	0.5	mg/kg	<0.5	1 mg/kg	89.8	73	115

Sub-Matrix: **SOIL**

Method: Compound	CAS Number	LOR	Unit	Method Blank (MB) Report: Result	Laboratory Control Spike (LCS) Report: Spike Concentration	Spike Recovery (%): LCS	Recovery Limits (%): Low	Recovery Limits (%): High
EP074F: Halogenated Aromatic Compounds (QCLot: 257420) - continued								
EP074: 2-Chlorotoluene	95-49-8	0.5	mg/kg	<0.5	1 mg/kg	93.3	69	113
EP074: 4-Chlorotoluene	106-43-4	0.5	mg/kg	<0.5	1 mg/kg	91.4	67	111
EP074: Bromobenzene	108-86-1	0.5	mg/kg	<0.5	1 mg/kg	100	63	117
EP074: Chlorobenzene	108-90-7	0.5	mg/kg	<0.5	1 mg/kg	91.8	79	115
EP074G: Trihalomethanes (QCLot: 257420)								
EP074: Bromodichloromethane	75-27-4	0.5	mg/kg	<0.5	1 mg/kg	80.4	65	107
EP074: Bromoform	75-25-2	0.5	mg/kg	<0.5	1 mg/kg	69.4	54	104
EP074: Chloroform	67-66-3	0.5	mg/kg	<0.5	1 mg/kg	92.1	75	117
EP074: Dibromochloromethane	124-48-1	0.5	mg/kg	<0.5	1 mg/kg	75.7	61	105
EP075(SIM)B: Polynuclear Aromatic Hydrocarbons (QCLot: 257316)								
EP075(SIM): Acenaphthene	83-32-9	0.5	mg/kg	<0.5	3 mg/kg	105	68	114
EP075(SIM): Acenaphthylene	208-96-8	0.5	mg/kg	<0.5	3 mg/kg	84.9	61	125
EP075(SIM): Anthracene	120-12-7	0.5	mg/kg	<0.5	3 mg/kg	110	68	116
EP075(SIM): Benz(a)anthracene	56-55-3	0.5	mg/kg	<0.5	3 mg/kg	89.8	62	116
EP075(SIM): Benzo(a)pyrene	50-32-8	0.5	mg/kg	<0.5	3 mg/kg	93.7	64	114
EP075(SIM): Benzo(b+j)fluoranthene	205-99-2 205-82-3	0.5	mg/kg	<0.5	3 mg/kg	83.4	64	114
EP075(SIM): Benzo(g.h.i)perylene	191-24-2	0.5	mg/kg	<0.5	3 mg/kg	96.8	59	117
EP075(SIM): Benzo(k)fluoranthene	207-08-9	0.5	mg/kg	<0.5	3 mg/kg	112	67	115
EP075(SIM): Chrysene	218-01-9	0.5	mg/kg	<0.5	3 mg/kg	110	63	119
EP075(SIM): Dibenz(a.h)anthracene	53-70-3	0.5	mg/kg	<0.5	3 mg/kg	94.0	62	114
EP075(SIM): Fluoranthene	206-44-0	0.5	mg/kg	<0.5	3 mg/kg	113	67	115
EP075(SIM): Fluorene	86-73-7	0.5	mg/kg	<0.5	3 mg/kg	103	62	120
EP075(SIM): Indeno(1.2.3.cd)pyrene	193-39-5	0.5	mg/kg	<0.5	3 mg/kg	97.0	62	116
EP075(SIM): Naphthalene	91-20-3	0.5	mg/kg	<0.5	3 mg/kg	94.8	65	119
EP075(SIM): Phenanthrene	85-01-8	0.5	mg/kg	<0.5	3 mg/kg	105	69	113
EP075(SIM): Pyrene	129-00-0	0.5	mg/kg	<0.5	3 mg/kg	107	66	116
EP080/071: Total Petroleum Hydrocarbons (QCLot: 257314)								
EP071: C10 - C14 Fraction	----	50	mg/kg	<50	658 mg/kg	83.7	65	131
EP071: C10 - C36 Fraction (sum)	----	50	mg/kg	<50	----	----	----	----
EP071: C15 - C28 Fraction	----	100	mg/kg	<100	3160 mg/kg	88.9	70	126
EP071: C29 - C36 Fraction	----	100	mg/kg	<100	1448 mg/kg	90.0	70	122
EP080/071: Total Petroleum Hydrocarbons (QCLot: 257419)								
EP080: C6 - C9 Fraction	----	10	mg/kg	<10	36 mg/kg	88.3	66	130
EP080/071: Total Recoverable Hydrocarbons - NEPM 2013 Fractions (QCLot: 257314)								
EP071: >C10 - C16 Fraction	>C10_C16	50	mg/kg	<50	1051 mg/kg	88.5	68	130
EP071: >C10 - C40 Fraction (sum)	----	50	mg/kg	<50	----	----	----	----
EP071: >C16 - C34 Fraction	----	100	mg/kg	<100	4124 mg/kg	89.8	72	116

Sub-Matrix: **SOIL**

Method: Compound	CAS Number	LOR	Unit	Method Blank (MB) Report: Result	Laboratory Control Spike (LCS) Report: Spike Concentration	Spike Recovery (%): LCS	Recovery Limits (%): Low	Recovery Limits (%): High
EP080/071: Total Recoverable Hydrocarbons - NEPM 2013 Fractions (QCLot: 257314) - continued								
EP071: >C34 - C40 Fraction	----	100	mg/kg	<100	161 mg/kg	68.9	38	132
EP080/071: Total Recoverable Hydrocarbons - NEPM 2013 Fractions (QCLot: 257419)								
EP080: C6 - C10 Fraction	C6_C10	10	mg/kg	<10	45 mg/kg	86.8	64	128
EP080: BTEXN (QCLot: 257419)								
EP080: Benzene	71-43-2	0.2	mg/kg	<0.2	2 mg/kg	94.1	74	124
EP080: Ethylbenzene	100-41-4	0.5	mg/kg	<0.5	2 mg/kg	90.3	72	124
EP080: meta- & para-Xylene	108-38-3 106-42-3	0.5	mg/kg	<0.5	4 mg/kg	88.8	72	132
EP080: Naphthalene	91-20-3	1	mg/kg	<1	0.5 mg/kg	97.8	66	132
EP080: ortho-Xylene	95-47-6	0.5	mg/kg	<0.5	2 mg/kg	92.3	76	130
EP080: Toluene	108-88-3	0.5	mg/kg	<0.5	2 mg/kg	92.2	75	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**

Laboratory sample ID	Client sample ID	Method: Compound	CAS Number	Matrix Spike (MS) Report: Spike Concentration	SpikeRecovery(%): MS	Recovery Limits (%): Low	Recovery Limits (%): High
ED040N: Sulfate - Calcium Phosphate Soluble (NEPM) (QCLot: 258491)							
EM1516274-002	GW02(0.5-0.6)	ED040N: Sulfate as SO4 2-	14808-79-8	3000 mg/kg	104	84	116
EG005T: Total Metals by ICP-AES (QCLot: 257294)							
EM1516195-073	Anonymous	EG005T: Arsenic	7440-38-2	50 mg/kg	106	78	124
		EG005T: Cadmium	7440-43-9	50 mg/kg	108	84	116
		EG005T: Chromium	7440-47-3	50 mg/kg	106	79	121
		EG005T: Copper	7440-50-8	50 mg/kg	102	82	124
		EG005T: Lead	7439-92-1	50 mg/kg	100	76	124
		EG005T: Nickel	7440-02-0	50 mg/kg	101	78	120
		EG005T: Selenium	7782-49-2	50 mg/kg	99.0	71	125
		EG005T: Zinc	7440-66-6	50 mg/kg	103	74	128
EG035T: Total Recoverable Mercury by FIMS (QCLot: 257295)							
EM1516195-073	Anonymous	EG035T: Mercury	7439-97-6	5 mg/kg	86.6	76	116
EP074E: Halogenated Aliphatic Compounds (QCLot: 257420)							
EM1516179-037	Anonymous	EP074: 1.1-Dichloroethene	75-35-4	2 mg/kg	86.0	29	141
		EP074: Trichloroethene	79-01-6	2 mg/kg	80.2	50	126
EP074F: Halogenated Aromatic Compounds (QCLot: 257420)							
EM1516179-037	Anonymous	EP074: Chlorobenzene	108-90-7	2 mg/kg	91.4	65	133

Sub-Matrix: **SOIL**

				Matrix Spike (MS) Report			
				Spike	SpikeRecovery(%)	Recovery Limits (%)	
Laboratory sample ID	*Client sample ID*	*Method: Compound*	*CAS Number*	*Concentration*	*MS*	*Low*	*High*
EP075(SIM)B: Polynuclear Aromatic Hydrocarbons (QCLot: 257316)							
EM1516235-053	Anonymous	EP075(SIM): Acenaphthene	83-32-9	3 mg/kg	102	67	117
		EP075(SIM): Pyrene	129-00-0	3 mg/kg	114	52	148
EP080/071: Total Petroleum Hydrocarbons (QCLot: 257314)							
EM1516235-055	Anonymous	EP071: C10 - C14 Fraction	----	658 mg/kg	# 120	53	123
		EP071: C15 - C28 Fraction	----	3160 mg/kg	105	70	124
		EP071: C29 - C36 Fraction	----	1448 mg/kg	104	64	118
EP080/071: Total Petroleum Hydrocarbons (QCLot: 257419)							
EM1516179-037	Anonymous	EP080: C6 - C9 Fraction	----	28 mg/kg	67.1	42	131
EP080/071: Total Recoverable Hydrocarbons - NEPM 2013 Fractions (QCLot: 257314)							
EM1516235-055	Anonymous	EP071: >C10 - C16 Fraction	>C10_C16	1051 mg/kg	# 118	65	123
		EP071: >C16 - C34 Fraction	----	4124 mg/kg	102	67	121
		EP071: >C34 - C40 Fraction	----	161 mg/kg	83.3	44	126
EP080/071: Total Recoverable Hydrocarbons - NEPM 2013 Fractions (QCLot: 257419)							
EM1516179-037	Anonymous	EP080: C6 - C10 Fraction	C6_C10	33 mg/kg	63.0	39	129
EP080: BTEXN (QCLot: 257419)							
EM1516179-037	Anonymous	EP080: Benzene	71-43-2	2 mg/kg	89.4	50	136
		EP080: Toluene	108-88-3	2 mg/kg	89.5	56	139

ALS Environmental

QA/QC Compliance Assessment for DQO Reporting

Work Order	: **EM1516274**	Page	: 1 of 5
Client	: **AECOM Australia Pty Ltd**	Laboratory	: Environmental Division Melbourne
Contact	: MS AVERYLL COYNE	Telephone	: +61-3-8549 9608
Project	: 60431087	Date Samples Received	: 26-Oct-2015
Site	: Fishermans Bend	Issue Date	: 29-Oct-2015
Sampler	: DUGALD CUNNINGHAM	No. of samples received	: 12
Order number	: ----	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 Laboratory Control outliers occur.**
- **NO Matrix Spike outliers occur.**
- **Duplicate outliers exist - please see following pages for full details.**
- **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

- **NO Quality Control Sample Frequency Outliers exist.**

Outliers : Quality Control Samples

Duplicates, Method Blanks, Laboratory Control Samples and Matrix Spikes

Matrix: **SOIL**

Compound Group Name	Laboratory Sample ID	Client Sample ID	Analyte	CAS Number	Data	Limits	Comment
Duplicate (DUP) RPDs							
EP080/071: Total Petroleum Hydrocarbons	EM1516235--054	Anonymous	**C10 - C14 Fraction**	----	30.4 %	0% - 20%	**RPD exceeds LOR based limits**
EP080/071: Total Petroleum Hydrocarbons	EM1516235--054	Anonymous	**C10 - C36 Fraction (sum)**	----	29.5 %	0% - 20%	**RPD exceeds LOR based limits**
EP080/071: Total Recoverable Hydrocarbons - NEPM 2	EM1516235--054	Anonymous	**>C10 - C16 Fraction**	>C10_C16	29.4 %	0% - 20%	**RPD exceeds LOR based limits**
EP080/071: Total Recoverable Hydrocarbons - NEPM 2	EM1516235--054	Anonymous	**>C10 - C40 Fraction (sum)**	----	28.9 %	0% - 20%	**RPD exceeds LOR based limits**

Analysis Holding Time Compliance

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
EA001: pH in soil using 0.01M CaCl extract								
Soil Glass Jar - Unpreserved (EA001)								
GW02(0.5-0.6),	GW02(1.0-1.1)	**23-Oct-2015**	**28-Oct-2015**	30-Oct-2015	✓	**28-Oct-2015**	28-Oct-2015	✓
EA055: Moisture Content								
Soil Glass Jar - Unpreserved (EA055-103)								
GW02(0.5-0.6),	GW02(1.0-1.1)	**23-Oct-2015**	**----**	----	----	**27-Oct-2015**	06-Nov-2015	✓
ED040N: Sulfate - Calcium Phosphate Soluble (NEPM)								
Soil Glass Jar - Unpreserved (ED040N)								
GW02(0.5-0.6),	GW02(1.0-1.1)	**23-Oct-2015**	**28-Oct-2015**	20-Apr-2016	✓	**29-Oct-2015**	20-Apr-2016	✓
EG005T: Total Metals by ICP-AES								
Soil Glass Jar - Unpreserved (EG005T)								
GW02(0.5-0.6),	GW02(1.0-1.1)	**23-Oct-2015**	**28-Oct-2015**	20-Apr-2016	✓	**28-Oct-2015**	20-Apr-2016	✓
EG035T: Total Recoverable Mercury by FIMS								
Soil Glass Jar - Unpreserved (EG035T)								
GW02(0.5-0.6),	GW02(1.0-1.1)	**23-Oct-2015**	**28-Oct-2015**	20-Nov-2015	✓	**28-Oct-2015**	20-Nov-2015	✓
EP080/071: Total Petroleum Hydrocarbons								
Soil Glass Jar - Unpreserved (EP071)								
GW02(0.5-0.6),	GW02(1.0-1.1)	**23-Oct-2015**	**27-Oct-2015**	06-Nov-2015	✓	**28-Oct-2015**	06-Dec-2015	✓

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
EP074A: Monocyclic Aromatic Hydrocarbons							
Soil Glass Jar - Unpreserved (EP074)							
GW02(0.5-0.6), GW02(1.0-1.1)	**23-Oct-2015**	**27-Oct-2015**	30-Oct-2015	✓	**27-Oct-2015**	30-Oct-2015	✓
EP075(SIM)B: Polynuclear Aromatic Hydrocarbons							
Soil Glass Jar - Unpreserved (EP075(SIM))							
GW02(0.5-0.6), GW02(1.0-1.1)	**23-Oct-2015**	**27-Oct-2015**	06-Nov-2015	✓	**28-Oct-2015**	06-Dec-2015	✓
EP080/071: Total Petroleum Hydrocarbons							
Soil Glass Jar - Unpreserved (EP080)							
GW02(0.5-0.6), GW02(1.0-1.1)	**23-Oct-2015**	**27-Oct-2015**	06-Nov-2015	✓	**27-Oct-2015**	06-Nov-2015	✓

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	EA055-103	2	20	**10.00**	**10.00**	✓	NEPM 2013 Schedule B(3) and ALS QCS3 requirement
PAH/Phenols (SIM)	EP075(SIM)	2	15	**13.33**	**10.00**	✓	NEPM 2013 Schedule B(3) and ALS QCS3 requirement
pH in soil using a 0.01M CaCl2 extract	EA001	2	20	**10.00**	**10.00**	✓	NEPM 2013 Schedule B(3) and ALS QCS3 requirement
Sulfate - Calcium Phosphate Soluble	ED040N	1	3	**33.33**	**10.00**	✓	NEPM 2013 Schedule B(3) and ALS QCS3 requirement
Total Mercury by FIMS	EG035T	2	18	**11.11**	**10.00**	✓	NEPM 2013 Schedule B(3) and ALS QCS3 requirement
Total Metals by ICP-AES	EG005T	2	19	**10.53**	**10.00**	✓	NEPM 2013 Schedule B(3) and ALS QCS3 requirement
TRH - Semivolatile Fraction	EP071	2	14	**14.29**	**10.00**	✓	NEPM 2013 Schedule B(3) and ALS QCS3 requirement
TRH Volatiles/BTEX	EP080	2	17	**11.76**	**10.00**	✓	NEPM 2013 Schedule B(3) and ALS QCS3 requirement
Volatile Organic Compounds	EP074	2	17	**11.76**	**10.00**	✓	NEPM 2013 Schedule B(3) and ALS QCS3 requirement
Laboratory Control Samples (LCS)							
PAH/Phenols (SIM)	EP075(SIM)	1	15	**6.67**	**5.00**	✓	NEPM 2013 Schedule B(3) and ALS QCS3 requirement
Sulfate - Calcium Phosphate Soluble	ED040N	1	3	**33.33**	**5.00**	✓	NEPM 2013 Schedule B(3) and ALS QCS3 requirement
Total Mercury by FIMS	EG035T	1	18	**5.56**	**5.00**	✓	NEPM 2013 Schedule B(3) and ALS QCS3 requirement
Total Metals by ICP-AES	EG005T	1	19	**5.26**	**5.00**	✓	NEPM 2013 Schedule B(3) and ALS QCS3 requirement
TRH - Semivolatile Fraction	EP071	1	14	**7.14**	**5.00**	✓	NEPM 2013 Schedule B(3) and ALS QCS3 requirement
TRH Volatiles/BTEX	EP080	1	17	**5.88**	**5.00**	✓	NEPM 2013 Schedule B(3) and ALS QCS3 requirement
Volatile Organic Compounds	EP074	1	17	**5.88**	**5.00**	✓	NEPM 2013 Schedule B(3) and ALS QCS3 requirement
Method Blanks (MB)							
PAH/Phenols (SIM)	EP075(SIM)	1	15	**6.67**	**5.00**	✓	NEPM 2013 Schedule B(3) and ALS QCS3 requirement
Sulfate - Calcium Phosphate Soluble	ED040N	1	3	**33.33**	**5.00**	✓	NEPM 2013 Schedule B(3) and ALS QCS3 requirement
Total Mercury by FIMS	EG035T	1	18	**5.56**	**5.00**	✓	NEPM 2013 Schedule B(3) and ALS QCS3 requirement
Total Metals by ICP-AES	EG005T	1	19	**5.26**	**5.00**	✓	NEPM 2013 Schedule B(3) and ALS QCS3 requirement
TRH - Semivolatile Fraction	EP071	1	14	**7.14**	**5.00**	✓	NEPM 2013 Schedule B(3) and ALS QCS3 requirement
TRH Volatiles/BTEX	EP080	1	17	**5.88**	**5.00**	✓	NEPM 2013 Schedule B(3) and ALS QCS3 requirement
Volatile Organic Compounds	EP074	1	17	**5.88**	**5.00**	✓	NEPM 2013 Schedule B(3) and ALS QCS3 requirement
Matrix Spikes (MS)							
PAH/Phenols (SIM)	EP075(SIM)	1	15	**6.67**	**5.00**	✓	NEPM 2013 Schedule B(3) and ALS QCS3 requirement
Sulfate - Calcium Phosphate Soluble	ED040N	1	3	**33.33**	**5.00**	✓	NEPM 2013 Schedule B(3) and ALS QCS3 requirement
Total Mercury by FIMS	EG035T	1	18	**5.56**	**5.00**	✓	NEPM 2013 Schedule B(3) and ALS QCS3 requirement
Total Metals by ICP-AES	EG005T	1	19	**5.26**	**5.00**	✓	NEPM 2013 Schedule B(3) and ALS QCS3 requirement
TRH - Semivolatile Fraction	EP071	1	14	**7.14**	**5.00**	✓	NEPM 2013 Schedule B(3) and ALS QCS3 requirement
TRH Volatiles/BTEX	EP080	1	17	**5.88**	**5.00**	✓	NEPM 2013 Schedule B(3) and ALS QCS3 requirement
Volatile Organic Compounds	EP074	1	17	**5.88**	**5.00**	✓	NEPM 2013 Schedule B(3) and ALS QCS3 requirement

Brief Method Summaries

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

Analytical Methods	Method	Matrix	Method Descriptions
pH in soil using a 0.01M CaCl2 extract	EA001	SOIL	In house: Referenced to Rayment and Higginson 4B1 (mod.) 10 g of soil is mixed with 50 mL of 0.01M CaCl2 and tumbled end over end for 1 hour. pH is measured from the continuous suspension. This method is compliant with NEPM (2013) Schedule B(3) (Method 103)
Moisture Content	EA055-103	SOIL	In-house. A gravimetric procedure based on weight loss over a 12 hour drying period at 103-105 degrees C. This method is compliant with NEPM (2013) Schedule B(3) Section 7.1 and Table 1 (14 day holding time).
Sulfate - Calcium Phosphate Soluble	ED040N	SOIL	In-house. The sample is extracted with a calcium phosphate solution. The phosphate ion displaces the adsorbed sulfate while calcium ions depress the extraction of interfering S from soil organic matter. SO4 in the extract is determined by ICPAES and reported as dry weight in the original soil. This method is compliant with NEPM (2013) Schedule B(3) (Method 406)
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 (2013) 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 (2013) Schedule B(3)
TRH - Semivolatile Fraction	EP071	SOIL	(USEPA SW 846 - 8015A) Sample extracts are analysed by Capillary GC/FID and quantified against alkane standards over the range C10 - C40.
Volatile Organic Compounds	EP074	SOIL	(USEPA SW 846 - 8260B) Extracts are analysed by Purge and Trap, Capillary GC/MS. Quantification is by comparison against an established 5 point calibration curve. This method is compliant with NEPM (2013) Schedule B(3) (Method 501)
PAH/Phenols (SIM)	EP075(SIM)	SOIL	(USEPA SW 846 - 8270B) 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 (2013) Schedule B(3) (Method 502 and 507)
TRH Volatiles/BTEX	EP080	SOIL	(USEPA SW 846 - 8260B) Extracts are analysed by Purge and Trap, Capillary GC/MS. Quantification is by comparison against an established 5 point calibration curve.

Preparation Methods	Method	Matrix	Method Descriptions
Methanolic Extraction of Soils for Purge and Trap	ORG16	SOIL	(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.

SAMPLE RECEIPT NOTIFICATION (SRN)

Work Order : **EM1516274**

Client	: **AECOM Australia Pty Ltd**	Laboratory	: Environmental Division Melbourne
Contact	: MS AVERYLL COYNE	Contact	: Carol Walsh
Address	: LEVEL 9 8 EXHIBITION ST MELBOURNE VIC 3000	Address	: 4 Westall Rd Springvale VIC Australia 3171
E-mail	: averyll.coyne@aecom.com	E-mail	: carol.walsh@alsglobal.com
Telephone	: +61 03 9653 1234	Telephone	: +61-3-8549 9608
Facsimile	: +61 03 9654 7117	Facsimile	: +61-3-8549 9601
Project	: 60431087	Page	: 1 of 2
Order number	: ----	Quote number	: EB2015AECOMAU0580 (EN/004/15)
C-O-C number	: ----	QC Level	: NEPM 2013 Schedule B(3) and ALS QCS3 requirement
Site	: Fishermans Bend		
Sampler	: DUGALD CUNNINGHAM		

Dates

Date Samples Received	: 26-Oct-2015 10:50 AM	Issue Date	: 27-Oct-2015
Client Requested Due Date	: 02-Nov-2015	Scheduled Reporting Date	: **02-Nov-2015**

Delivery Details

Mode of Delivery	: Undefined	Security Seal	: Intact.
No. of coolers/boxes	: 1	Temperature	: 3.6°C - Ice present
Receipt Detail	:	No. of samples received / analysed	: 12 / 2

General Comments

- This report contains the following information:
  - Sample Container(s)/Preservation Non-Compliances
  - Summary of Sample(s) and Requested Analysis
  - Proactive Holding Time Report
  - Requested Deliverables
- **Please direct any queries related to sample condition / numbering / breakages to Client Services.**
- Sample Disposal - Aqueous (14 days), Solid (60 days) from date of completion of work order.
- **Analytical work for this work order will be conducted at ALS Springvale.**
- **Please refer to the Proactive Holding Time Report table below which summarises breaches of recommended holding times that have occurred prior to samples/instructions being received at the laboratory. The absence of this summary table indicates that all samples have been received within the recommended holding times for the analysis requested.**

Sample Container(s)/Preservation Non-Compliances

All comparisons are made against pretreatment/preservation AS, APHA, USEPA standards.

- **No sample container / preservation non-compliance exist.**

Summary of Sample(s) and Requested Analysis

Some items described below may be part of a laboratory process necessary for the execution of client requested tasks. Packages may contain additional analyses, such as the determination of moisture content and preparation tasks, that are included in the package.

Matrix: **SOIL**

Laboratory sample ID	Client sampling date / time	Client sample ID	(On Hold) SOIL No analysis requested	SOIL - EA001 pH (CaCl)	SOIL - EA055-103 Moisture Content	SOIL - ED040N Calcium Phosphate Extractable Sulfate	SOIL - EG005T (solids) Total Metals by ICP-AES	SOIL - S-02 8 Metals (incl. Digestion)	SOIL - S-10 TRH/VOC/PAH
EM1516274-001	[23-Oct-2015]	GW02(0.0-0.1)	✓						
EM1516274-002	[23-Oct-2015]	GW02(0.5-0.6)		✓	✓	✓	✓	✓	✓
EM1516274-003	[23-Oct-2015]	GW02(1.0-1.1)		✓	✓	✓	✓	✓	✓
EM1516274-004	[23-Oct-2015]	GW02(1.5-1.6)	✓						
EM1516274-005	[23-Oct-2015]	GW13(0.2-0.3)	✓						
EM1516274-006	[23-Oct-2015]	GW16(0.1-0.2)	✓						
EM1516274-007	[23-Oct-2015]	GW16(0.5-0.6)	✓						
EM1516274-008	[23-Oct-2015]	GW16(1.0-1.1)	✓						
EM1516274-009	[23-Oct-2015]	GW16(1.4-1.5)	✓						
EM1516274-010	[23-Oct-2015]	GW29(0.1-0.2)	✓						
EM1516274-011	[23-Oct-2015]	GW29(1.0-1.1)	✓						
EM1516274-012	[23-Oct-2015]	GW29(1.5-1.6)	✓						

Proactive Holding Time Report

Sample(s) have been received within the recommended holding times for the requested analysis.

Requested Deliverables

AP_CUSTOMER SERVICE ANZ

- A4 - AU Tax Invoice (INV)	Email	ap_customerservice.anz@aecom.com

AVERYLL COYNE

- *AU Certificate of Analysis - NATA (COA)	Email	averyll.coyne@aecom.com
- *AU Interpretive QC Report - DEFAULT (Anon QCI Rep) (QCI)	Email	averyll.coyne@aecom.com
- *AU QC Report - DEFAULT (Anon QC Rep) - NATA (QC)	Email	averyll.coyne@aecom.com
- A4 - AU Sample Receipt Notification - Environmental HT (SRN)	Email	averyll.coyne@aecom.com
- A4 - AU Tax Invoice (INV)	Email	averyll.coyne@aecom.com
- Chain of Custody (CoC) (COC)	Email	averyll.coyne@aecom.com
- EDI Format - ENMRG (ENMRG)	Email	averyll.coyne@aecom.com
- EDI Format - ESDAT (ESDAT)	Email	averyll.coyne@aecom.com
- EDI Format - HLAPro (HLAPro)	Email	averyll.coyne@aecom.com
- EDI Format - XTab (XTAB)	Email	averyll.coyne@aecom.com

COC received at 11:39 on 26/10

Form: AECOM

Chain of Custody & Analysis Request Form

AECOM - Melbourne
Level 9, 8 Exhibition Street
Melbourne VIC 3000
Tel: 03 9653 8072
Fax: 61 3 9653 1234
Email: averyll.coyne@aecom.com

Laboratory Details
Lab. Name: ALS
Lab. Address: 4 Westall Rd, Springvale
Contact Name:
Lab. Ref:
Tel: 8549 9600
Fax:
Preliminary Report by:
Final Report by:
Lab Quote No:

Project Name: Fishermans Bend
Project Number: 60431087
Purchase Order Number: NA

Sample collected by: Dug Cunningham
Sample Results to be returned to: Averyll Coyne

Specifications:

	(Tick)		
1. Urgent TAT required? (please circle: 24hr 48hr 3 days)	☐ Yes	☑ No	☐ N/A
2. Fast TAT Guarantee Required?	☐ Yes	☑ No	☐ N/A
3. Is any sediment layer present in waters to be excluded from extractions?	☐ Yes	☑ No	☐ N/A
4. Special storage requirements?	☐ Yes	☑ No	☐ N/A
5. Preservation requirements: ☐ Fax ☐ Hard copy ☑ Email	☐ Yes	☑ No	☐ N/A
6. Other requirements?	☑ Yes	☐ No	☐ N/A

7. Report Format: Email with QC reports
8. Project Manager: Averyll Coyne tel: 9653 8072

Lab. ID	Sample ID	Sampling Date & time (on)	Sampling Date & Time (off)	Matrix: soil	Matrix: water	Matrix: other	Preservation: filt'ed	Preservation: acid	Preservation: ice	Preservation: other	Container (No. & type)	TOC	Moisture Content	TRH(C6-C40)	Full VOC Scan (70 Analytes) - Code EP074(A-H)	PAH	Metals	TRH, BTEX and metals	pH and sulfate	Remarks & comments
1	GW02(0.0-0.1)	23/10/2015		x					x		Jar									Please hold
2	GW02(0.5-0.6)	23/10/2015		x					x		Jar			x	x	x	x		x	
3	GW02(1.0-1.1)	23/10/2015		x					x		Jar			x	x	x	x		x	Please hold
4	GW02(1.5-1.6)	23/10/2015		x					x		Jar									Please hold
5	GW13(0.2-0.3)	23/10/2015		x					x		Jar									Please hold
6	GW16(0.1-0.2)	23/10/2015		x					x		Jar									Please hold
7	GW16(0.5-0.6)	23/10/2015		x					x		Jar									Please hold
8	GW16(1.0-1.1)	23/10/2015		x					x		Jar									Please hold
9	GW16(1.4-1.5)	23/10/2015		x					x		Jar									Please hold
10	GW29(0.1-0.2)	23/10/2015		x					x		Jar									Please hold
11	GW29(1.0-1.1)	23/10/2015		x					x		Jar									Please hold
12	GW29(1.5-1.6)	23/10/2015		x					x		Jar									Please hold

Metals (As, Cd, Cr, Cu, Pb, Ni, Zn, Al, Fe, Se, Hg)

Relinquished By:
Name: Dug Cunningham Date: 26/10/2015
of: AECOM Time: 9:00

Received by:
Name: [illegible] Date: 26/10
of: ALS Time: 10:30

Relinquished By:
Name: Date:
of: Time:

Received by:
Name: Date:
of: Time:

Received in good condition?	Yes/No/NA	Method of Shipment	
Samples received chilled?	Yes/No/NA	Consignment Note No.	
	Yes/No/NA	Transport Co:	
Received in good condition?	Yes/No/NA	Method of Shipment	
Samples received chilled?	Yes/No/NA	Consignment Note No.	
	Yes/No/NA	Transport Co:	

Environmental Division
Melbourne
Work Order Reference
EM1516274

Telephone : +61-3-8549 9600

ALS Environmental

CERTIFICATE OF ANALYSIS

Work Order	: **EM1516331**	Page	: 1 of 4
Client	: **AECOM Australia Pty Ltd**	Laboratory	: Environmental Division Melbourne
Contact	: MS AVERYLL COYNE	Contact	: Carol Walsh
Address	: LEVEL 9 8 EXHIBITION ST MELBOURNE VIC 3000	Address	: 4 Westall Rd Springvale VIC Australia 3171
E-mail	: averyll.coyne@aecom.com	E-mail	: carol.walsh@alsglobal.com
Telephone	: +61 03 9653 1234	Telephone	: +61-3-8549 9608
Facsimile	: +61 03 9654 7117	Facsimile	: +61-3-8549 9601
Project	: 60431087	QC Level	: NEPM 2013 Schedule B(3) and ALS QCS3 requirement
Order number	: 60431087 Task 1.4	Date Samples Received	: 27-Oct-2015 15:45
C-O-C number	: ----	Date Analysis Commenced	: 30-Oct-2015
Sampler	: MATTHEW SHEPPARD	Issue Date	: 04-Nov-2015 22:45
Site	: Fishermans Bend		
		No. of samples received	: 24
Quote number	: ----	No. of samples analysed	: 6

This report supersedes any previous report(s) with this reference. Results apply to the sample(s) as submitted.

This Certificate of Analysis contains the following information:

- General Comments
- Analytical Results

NATA Accredited Laboratory 825

Accredited for compliance with ISO/IEC 17025.

Signatories

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

Signatories	*Position*	*Accreditation Category*
Andrew Epps	Senior Inorganic Chemist	Brisbane Inorganics
Dilani Fernando	Senior Inorganic Chemist	Melbourne Inorganics
Satishkumar Trivedi	Acid Sulfate Soils Supervisor	Brisbane Acid Sulphate Soils
Xing Lin	Senior Organic Chemist	Melbourne Organics

General Comments

The analytical procedures used by the Environmental Division have been developed from established internationally recognized procedures such as those published by the USEPA, APHA, AS and NEPM. In house developed procedures are employed in the absence of documented standards or by 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.

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.

Analytical Results

Sub-Matrix: SOIL (Matrix: SOIL)				Client sample ID	GW19(3.2-3.3)	GW14(2.9-3.0)	GW29(3.1-3.2)	GW38(5.0-5.1)	----
				Client sampling date / time	[26-Oct-2015]	[26-Oct-2015]	[26-Oct-2015]	[27-Oct-2015]	----
Compound	CAS Number	LOR	Unit		EM1516331-004	EM1516331-009	EM1516331-014	EM1516331-020	--------
					Result	Result	Result	Result	Result
EA055: Moisture Content									
^ **Moisture Content (dried @ 103°C)**	----	1	%		**22.4**	**18.6**	**21.7**	**23.6**	**----**
EP003: Total Organic Carbon (TOC) in Soil									
Total Organic Carbon	----	0.02	%		**0.27**	**0.04**	**0.05**	**0.03**	**----**

Analytical Results

Sub-Matrix: WATER (Matrix: WATER)				Client sample ID	QC17	QC18	----	----	----
				Client sampling date / time	[27-Oct-2015]	[27-Oct-2015]	----	----	----
Compound	CAS Number	LOR	Unit		EM1516331-023	EM1516331-024	--------	--------	--------
					Result	Result	Result	Result	Result
EG020T: Total Metals by ICP-MS									
Aluminium	7429-90-5	0.01	mg/L		----	<0.01	----	----	----
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	----	----	----
Nickel	7440-02-0	0.001	mg/L		----	<0.001	----	----	----
Lead	7439-92-1	0.001	mg/L		----	<0.001	----	----	----
Zinc	7440-66-6	0.005	mg/L		----	<0.005	----	----	----
Selenium	7782-49-2	0.01	mg/L		----	<0.01	----	----	----
Iron	7439-89-6	0.05	mg/L		----	<0.05	----	----	----
EG035T: Total Recoverable Mercury by FIMS									
Mercury	7439-97-6	0.0001	mg/L		----	<0.0001	----	----	----
EP080/071: Total Petroleum Hydrocarbons									
C6 - C9 Fraction	----	20	µg/L		<20	<20	----	----	----
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	----	----	----
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**	1330-20-7	2	µg/L		<2	<2	----	----	----
^ **Sum of BTEX**	----	1	µg/L		<1	<1	----	----	----
Naphthalene	91-20-3	5	µg/L		<5	<5	----	----	----
EP080S: TPH(V)/BTEX Surrogates									
1.2-Dichloroethane-D4	17060-07-0	2	%		**104**	**103**	----	----	----
Toluene-D8	2037-26-5	2	%		**106**	**97.8**	----	----	----
4-Bromofluorobenzene	460-00-4	2	%		**96.1**	**94.0**	----	----	----

ALS Environmental

QUALITY CONTROL REPORT

Work Order	: **EM1516331**	Page	: 1 of 6
Client	: **AECOM Australia Pty Ltd**	Laboratory	: Environmental Division Melbourne
Contact	: MS AVERYLL COYNE	Contact	: Carol Walsh
Address	: LEVEL 9 8 EXHIBITION ST MELBOURNE VIC 3000	Address	: 4 Westall Rd Springvale VIC Australia 3171
E-mail	: averyll.coyne@aecom.com	E-mail	: carol.walsh@alsglobal.com
Telephone	: +61 03 9653 1234	Telephone	: +61-3-8549 9608
Facsimile	: +61 03 9654 7117	Facsimile	: +61-3-8549 9601
Project	: 60431087	QC Level	: NEPM 2013 Schedule B(3) and ALS QCS3 requirement
Order number	: 60431087 Task 1.4	Date Samples Received	: 27-Oct-2015
C-O-C number	: ----	Date Analysis Commenced	: 30-Oct-2015
Sampler	: MATTHEW SHEPPARD	Issue Date	: 04-Nov-2015
Site	: Fishermans Bend	No. of samples received	: 24
Quote number	: ----	No. of samples analysed	: 6

This report supersedes any previous report(s) with this reference. Results apply to the sample(s) as submitted.

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

NATA WORLD RECOGNISED ACCREDITATION

NATA Accredited Laboratory 825

Accredited for compliance with ISO/IEC 17025.

Signatories

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

Signatories	*Position*	*Accreditation Category*
Andrew Epps	Senior Inorganic Chemist	Brisbane Inorganics
Dilani Fernando	Senior Inorganic Chemist	Melbourne Inorganics
Satishkumar Trivedi	Acid Sulfate Soils Supervisor	Brisbane Acid Sulphate Soils
Xing Lin	Senior Organic Chemist	Melbourne Organics

General Comments

The analytical procedures used by the Environmental Division have been developed from established internationally recognized procedures such as those published by the USEPA, APHA, AS and NEPM. In house developed procedures are employed in the absence of documented standards or by 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

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	*Client sample ID*	*Method: Compound*	*CAS Number*	*LOR*	*Unit*	*Original Result*	*Duplicate Result*	*RPD (%)*	*Recovery Limits (%)*
EA055: Moisture Content (QC Lot: 265666)									
EM1516331-004	GW19(3.2-3.3)	EA055-103: Moisture Content (dried @ 103°C)	----	1	%	22.4	22.7	1.18	0% - 20%
EP003: Total Organic Carbon (TOC) in Soil (QC Lot: 263868)									
EM1516255-001	Anonymous	EP003: Total Organic Carbon	----	0.02	%	0.73	0.69	5.40	0% - 20%
ES1534667-004	Anonymous	EP003: Total Organic Carbon	----	0.02	%	0.10	0.14	30.5	No Limit

Sub-Matrix: **WATER**

				Laboratory Duplicate (DUP) Report					
Laboratory sample ID	*Client sample ID*	*Method: Compound*	*CAS Number*	*LOR*	*Unit*	*Original Result*	*Duplicate Result*	*RPD (%)*	*Recovery Limits (%)*
EG020T: Total Metals by ICP-MS (QC Lot: 263328)									
EM1516284-001	Anonymous	EG020A-T: Cadmium	7440-43-9	0.0001	mg/L	<0.0001	<0.0001	0.00	No Limit
		EG020A-T: Arsenic	7440-38-2	0.001	mg/L	<0.001	<0.001	0.00	No Limit
		EG020A-T: Chromium	7440-47-3	0.001	mg/L	<0.001	<0.001	0.00	No Limit
		EG020A-T: Copper	7440-50-8	0.001	mg/L	1.06	1.05	0.334	0% - 20%
		EG020A-T: Lead	7439-92-1	0.001	mg/L	0.002	0.002	0.00	No Limit
		EG020A-T: Nickel	7440-02-0	0.001	mg/L	0.002	0.002	0.00	No Limit
		EG020A-T: Zinc	7440-66-6	0.005	mg/L	0.066	0.066	0.00	0% - 50%
		EG020A-T: Aluminium	7429-90-5	0.01	mg/L	0.04	0.04	0.00	No Limit
		EG020A-T: Selenium	7782-49-2	0.01	mg/L	<0.01	<0.01	0.00	No Limit
		EG020A-T: Iron	7439-89-6	0.05	mg/L	0.14	0.14	0.00	No Limit
EM1516342-001	Anonymous	EG020A-T: Cadmium	7440-43-9	0.0001	mg/L	<0.0001	<0.0001	0.00	No Limit
		EG020A-T: Arsenic	7440-38-2	0.001	mg/L	<0.001	<0.001	0.00	No Limit
		EG020A-T: Chromium	7440-47-3	0.001	mg/L	<0.001	<0.001	0.00	No Limit
		EG020A-T: Copper	7440-50-8	0.001	mg/L	<0.001	<0.001	0.00	No Limit
		EG020A-T: Lead	7439-92-1	0.001	mg/L	<0.001	<0.001	0.00	No Limit
		EG020A-T: Nickel	7440-02-0	0.001	mg/L	<0.001	<0.001	0.00	No Limit
		EG020A-T: Zinc	7440-66-6	0.005	mg/L	<0.005	<0.005	0.00	No Limit
		EG020A-T: Aluminium	7429-90-5	0.01	mg/L	<0.01	<0.01	0.00	No Limit
		EG020A-T: Selenium	7782-49-2	0.01	mg/L	<0.01	<0.01	0.00	No Limit
		EG020A-T: Iron	7439-89-6	0.05	mg/L	84.4	83.0	1.73	0% - 20%
EG035T: Total Recoverable Mercury by FIMS (QC Lot: 263395)									
EM1516331-024	QC18	EG035T: Mercury	7439-97-6	0.0001	mg/L	<0.0001	<0.0001	0.00	No Limit
EM1516360-010	Anonymous	EG035T: Mercury	7439-97-6	0.0001	mg/L	<0.0001	<0.0001	0.00	No Limit
EP080/071: Total Petroleum Hydrocarbons (QC Lot: 261355)									
EM1516331-024	QC18	EP080: C6 - C9 Fraction	----	20	µg/L	<20	<20	0.00	No Limit
EM1516169-001	Anonymous	EP080: C6 - C9 Fraction	----	20	µg/L	<20	<20	0.00	No Limit
EP080/071: Total Recoverable Hydrocarbons - NEPM 2013 Fractions (QC Lot: 261355)									
EM1516331-024	QC18	EP080: C6 - C10 Fraction	C6_C10	20	µg/L	<20	<20	0.00	No Limit

Sub-Matrix: **WATER**

				Laboratory Duplicate (DUP) Report					
Laboratory sample ID	*Client sample ID*	*Method: Compound*	*CAS Number*	*LOR*	*Unit*	*Original Result*	*Duplicate Result*	*RPD (%)*	*Recovery Limits (%)*
EP080/071: Total Recoverable Hydrocarbons - NEPM 2013 Fractions (QC Lot: 261355) - continued									
EM1516169-001	Anonymous	EP080: C6 - C10 Fraction	C6_C10	20	µg/L	<20	<20	0.00	No Limit
EP080: BTEXN (QC Lot: 261355)									
EM1516331-024	QC18	EP080: Benzene	71-43-2	1	µg/L	<1	<1	0.00	No Limit
		EP080: Ethylbenzene	100-41-4	2	µg/L	<2	<2	0.00	No Limit
		EP080: meta- & para-Xylene	108-38-3 106-42-3	2	µg/L	<2	<2	0.00	No Limit
		EP080: ortho-Xylene	95-47-6	2	µg/L	<2	<2	0.00	No Limit
		EP080: Toluene	108-88-3	2	µg/L	<2	<2	0.00	No Limit
		EP080: Naphthalene	91-20-3	5	µg/L	<5	<5	0.00	No Limit
EM1516169-001	Anonymous	EP080: Benzene	71-43-2	1	µg/L	<1	<1	0.00	No Limit
		EP080: Ethylbenzene	100-41-4	2	µg/L	<2	<2	0.00	No Limit
		EP080: meta- & para-Xylene	108-38-3 106-42-3	2	µg/L	<2	<2	0.00	No Limit
		EP080: ortho-Xylene	95-47-6	2	µg/L	<2	<2	0.00	No Limit
		EP080: Toluene	108-88-3	2	µg/L	<2	<2	0.00	No Limit
		EP080: Naphthalene	91-20-3	5	µg/L	<5	<5	0.00	No Limit

Method Blank (MB) and Laboratory Control Spike (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 (%)	Recovery Limits (%)	
Method: Compound	CAS Number	LOR	Unit	Result	Concentration	LCS	Low	High
EP003: Total Organic Carbon (TOC) in Soil (QCLot: 263868)								
EP003: Total Organic Carbon	----	0.02	%	<0.02	100 %	98.4	70	130

Sub-Matrix: **WATER**

				Method Blank (MB) Report	Laboratory Control Spike (LCS) Report			
					Spike	Spike Recovery (%)	Recovery Limits (%)	
Method: Compound	CAS Number	LOR	Unit	Result	Concentration	LCS	Low	High
EG020T: Total Metals by ICP-MS (QCLot: 263328)								
EG020A-T: Aluminium	7429-90-5	0.01	mg/L	<0.01	0.5 mg/L	103	100	108
EG020A-T: Arsenic	7440-38-2	0.001	mg/L	<0.001	0.1 mg/L	104	94	116
EG020A-T: Cadmium	7440-43-9	0.0001	mg/L	<0.0001	0.1 mg/L	98.8	90	110
EG020A-T: Chromium	7440-47-3	0.001	mg/L	<0.001	0.1 mg/L	99.5	90	110
EG020A-T: Copper	7440-50-8	0.001	mg/L	<0.001	0.1 mg/L	101	91	109
EG020A-T: Iron	7439-89-6	0.05	mg/L	<0.05	0.5 mg/L	105	99	109
EG020A-T: Lead	7439-92-1	0.001	mg/L	<0.001	0.1 mg/L	101	91	111
EG020A-T: Nickel	7440-02-0	0.001	mg/L	<0.001	0.1 mg/L	102	91	111
EG020A-T: Selenium	7782-49-2	0.01	mg/L	<0.01	0.1 mg/L	104	86	110
EG020A-T: Zinc	7440-66-6	0.005	mg/L	<0.005	0.1 mg/L	98.8	91	109
EG035T: Total Recoverable Mercury by FIMS (QCLot: 263395)								
EG035T: Mercury	7439-97-6	0.0001	mg/L	<0.0001	0.01 mg/L	91.9	87	113
EP080/071: Total Petroleum Hydrocarbons (QCLot: 261355)								
EP080: C6 - C9 Fraction	----	20	µg/L	<20	360 µg/L	97.0	67	127
EP080/071: Total Recoverable Hydrocarbons - NEPM 2013 Fractions (QCLot: 261355)								
EP080: C6 - C10 Fraction	C6_C10	20	µg/L	<20	450 µg/L	96.9	65	125
EP080: BTEXN (QCLot: 261355)								
EP080: Benzene	71-43-2	1	µg/L	<1	20 µg/L	103	76	120
EP080: Ethylbenzene	100-41-4	2	µg/L	<2	20 µg/L	99.1	72	124
EP080: meta- & para-Xylene	108-38-3 106-42-3	2	µg/L	<2	40 µg/L	99.6	72	130
EP080: Naphthalene	91-20-3	5	µg/L	<5	5 µg/L	108	71	129
EP080: ortho-Xylene	95-47-6	2	µg/L	<2	20 µg/L	101	75	127
EP080: Toluene	108-88-3	2	µg/L	<2	20 µg/L	101	76	124

Matrix Spike (MS) Report

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

Sub-Matrix: **WATER**

				Matrix Spike (MS) Report			
				Spike	SpikeRecovery(%)	Recovery Limits (%)	
Laboratory sample ID	Client sample ID	Method: Compound	CAS Number	Concentration	MS	Low	High
EG020T: Total Metals by ICP-MS (QCLot: 263328)							
EM1516284-001	Anonymous	EG020A-T: Arsenic	7440-38-2	1 mg/L	101	82	118
		EG020A-T: Cadmium	7440-43-9	0.25 mg/L	101	75	129
		EG020A-T: Chromium	7440-47-3	1 mg/L	97.7	80	118
		EG020A-T: Copper	7440-50-8	1 mg/L	92.5	81	115
		EG020A-T: Lead	7439-92-1	1 mg/L	98.0	83	121
		EG020A-T: Nickel	7440-02-0	1 mg/L	99.1	80	118
		EG020A-T: Zinc	7440-66-6	1 mg/L	95.1	74	116
EG035T: Total Recoverable Mercury by FIMS (QCLot: 263395)							
EM1516342-001	Anonymous	EG035T: Mercury	7439-97-6	0.01 mg/L	97.9	70	130
EP080/071: Total Petroleum Hydrocarbons (QCLot: 261355)							
EM1516179-034	Anonymous	EP080: C6 - C9 Fraction	----	280 µg/L	71.6	43	125
EP080/071: Total Recoverable Hydrocarbons - NEPM 2013 Fractions (QCLot: 261355)							
EM1516179-034	Anonymous	EP080: C6 - C10 Fraction	C6_C10	330 µg/L	69.5	44	122
EP080: BTEXN (QCLot: 261355)							
EM1516179-034	Anonymous	EP080: Benzene	71-43-2	20 µg/L	97.8	68	130
		EP080: Toluene	108-88-3	20 µg/L	98.5	72	132

ALS Environmental

QA/QC Compliance Assessment for DQO Reporting

Work Order	: **EM1516331**	Page	: 1 of 4
Client	: **AECOM Australia Pty Ltd**	Laboratory	: Environmental Division Melbourne
Contact	: MS AVERYLL COYNE	Telephone	: +61-3-8549 9608
Project	: 60431087	Date Samples Received	: 27-Oct-2015
Site	: Fishermans Bend	Issue Date	: 04-Nov-2015
Sampler	: MATTHEW SHEPPARD	No. of samples received	: 24
Order number	: 60431087 Task 1.4	No. of samples analysed	: 6

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

- **NO Quality Control Sample Frequency Outliers exist.**

Analysis Holding Time Compliance

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							
Soil Glass Jar - Unpreserved (EA055-103) GW19(3.2-3.3), GW14(2.9-3.0), GW29(3.1-3.2)	**26-Oct-2015**	**----**	----	----	**04-Nov-2015**	09-Nov-2015	✓
Soil Glass Jar - Unpreserved (EA055-103) GW38(5.0-5.1)	**27-Oct-2015**	**----**	----	----	**04-Nov-2015**	10-Nov-2015	✓
EP003: Total Organic Carbon (TOC) in Soil							
Soil Glass Jar - Unpreserved (EP003) GW19(3.2-3.3), GW14(2.9-3.0), GW29(3.1-3.2)	**26-Oct-2015**	**02-Nov-2015**	23-Nov-2015	✓	**02-Nov-2015**	23-Nov-2015	✓
Soil Glass Jar - Unpreserved (EP003) GW38(5.0-5.1)	**27-Oct-2015**	**02-Nov-2015**	24-Nov-2015	✓	**02-Nov-2015**	24-Nov-2015	✓

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) QC18	**27-Oct-2015**	**02-Nov-2015**	24-Apr-2016	✓	**02-Nov-2015**	24-Apr-2016	✓
EG035T: Total Recoverable Mercury by FIMS							
Clear Plastic Bottle - Nitric Acid; Unfiltered (EG035T) QC18	**27-Oct-2015**	**----**	----	----	**02-Nov-2015**	24-Nov-2015	✓
EP080S: TPH(V)/BTEX Surrogates							
Amber VOC Vial - Sulfuric Acid (EP080) QC17, QC18	**27-Oct-2015**	**30-Oct-2015**	10-Nov-2015	✓	**30-Oct-2015**	10-Nov-2015	✓

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	EA055-103	1	4	**25.00**	**10.00**	✓	NEPM 2013 Schedule B(3) and ALS QCS3 requirement
Total Organic Carbon	EP003	2	19	**10.53**	**10.00**	✓	NEPM 2013 Schedule B(3) and ALS QCS3 requirement
Laboratory Control Samples (LCS)							
Total Organic Carbon	EP003	1	19	**5.26**	**5.00**	✓	NEPM 2013 Schedule B(3) and ALS QCS3 requirement
Method Blanks (MB)							
Total Organic Carbon	EP003	1	19	**5.26**	**5.00**	✓	NEPM 2013 Schedule B(3) and ALS QCS3 requirement

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)							
Total Mercury by FIMS	EG035T	2	20	**10.00**	**10.00**	✓	NEPM 2013 Schedule B(3) and ALS QCS3 requirement
Total Metals by ICP-MS - Suite A	EG020A-T	2	19	**10.53**	**10.00**	✓	NEPM 2013 Schedule B(3) and ALS QCS3 requirement
TRH Volatiles/BTEX	EP080	2	18	**11.11**	**10.00**	✓	NEPM 2013 Schedule B(3) and ALS QCS3 requirement
Laboratory Control Samples (LCS)							
Total Mercury by FIMS	EG035T	1	20	**5.00**	**5.00**	✓	NEPM 2013 Schedule B(3) and ALS QCS3 requirement
Total Metals by ICP-MS - Suite A	EG020A-T	1	19	**5.26**	**5.00**	✓	NEPM 2013 Schedule B(3) and ALS QCS3 requirement
TRH Volatiles/BTEX	EP080	1	18	**5.56**	**5.00**	✓	NEPM 2013 Schedule B(3) and ALS QCS3 requirement
Method Blanks (MB)							
Total Mercury by FIMS	EG035T	1	20	**5.00**	**5.00**	✓	NEPM 2013 Schedule B(3) and ALS QCS3 requirement
Total Metals by ICP-MS - Suite A	EG020A-T	1	19	**5.26**	**5.00**	✓	NEPM 2013 Schedule B(3) and ALS QCS3 requirement
TRH Volatiles/BTEX	EP080	1	18	**5.56**	**5.00**	✓	NEPM 2013 Schedule B(3) and ALS QCS3 requirement
Matrix Spikes (MS)							
Total Mercury by FIMS	EG035T	1	20	**5.00**	**5.00**	✓	NEPM 2013 Schedule B(3) and ALS QCS3 requirement
Total Metals by ICP-MS - Suite A	EG020A-T	1	19	**5.26**	**5.00**	✓	NEPM 2013 Schedule B(3) and ALS QCS3 requirement
TRH Volatiles/BTEX	EP080	1	18	**5.56**	**5.00**	✓	NEPM 2013 Schedule B(3) and ALS QCS3 requirement

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	EA055-103	SOIL	In-house. A gravimetric procedure based on weight loss over a 12 hour drying period at 103-105 degrees C. This method is compliant with NEPM (2013) Schedule B(3) Section 7.1 and Table 1 (14 day holding time).
Total Organic Carbon	EP003	SOIL	In-house C-IR17. Dried and pulverised sample is reacted with acid to remove inorganic Carbonates, then combusted in a LECO furnace in the presence of strong oxidants / catalysts. The evolved (Organic) Carbon (as CO2) is automaticaly measured by infra-red detector.
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 (2013) Schedule B(3)
TRH Volatiles/BTEX	EP080	WATER	USEPA SW 846 - 8260B 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 (2013) Schedule B(3)

Preparation Methods	Method	Matrix	Method Descriptions
Dry and Pulverise (up to 100g)	GEO30	SOIL	#
Digestion for Total Recoverable Metals	EN25	WATER	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 (2013) Schedule B(3)

ALS Environmental

SAMPLE RECEIPT NOTIFICATION (SRN)

Work Order : **EM1516331**

Client	: **AECOM Australia Pty Ltd**	Laboratory	: Environmental Division Melbourne
Contact	: MS AVERYLL COYNE	Contact	: Carol Walsh
Address	: LEVEL 9 8 EXHIBITION ST MELBOURNE VIC 3000	Address	: 4 Westall Rd Springvale VIC Australia 3171
E-mail	: averyll.coyne@aecom.com	E-mail	: carol.walsh@alsglobal.com
Telephone	: +61 03 9653 1234	Telephone	: +61-3-8549 9608
Facsimile	: +61 03 9654 7117	Facsimile	: +61-3-8549 9601
Project	: 60431087	Page	: 1 of 3
Order number	: ----	Quote number	: EB2015AECOMAU0580 (EN/004/15)
C-O-C number	: ----	QC Level	: NEPM 2013 Schedule B(3) and ALS QCS3 requirement
Site	: Fishermans Bend		
Sampler	: MATTHEW SHEPPARD		

Dates

Date Samples Received	: 27-Oct-2015 3:45 PM	Issue Date	: 28-Oct-2015
Client Requested Due Date	: 04-Nov-2015	Scheduled Reporting Date	: **04-Nov-2015**

Delivery Details

Mode of Delivery	: Carrier	Security Seal	: Intact.
No. of coolers/boxes	: 1	Temperature	: 5.2°C - Ice present
Receipt Detail	:	No. of samples received / analysed	: 24 / 6

General Comments

- This report contains the following information:
  - Sample Container(s)/Preservation Non-Compliances
  - Summary of Sample(s) and Requested Analysis
  - Proactive Holding Time Report
  - Requested Deliverables
- **Analysis instruction was received by ALS on 27/10/2015 at 11:34 AM.**
- **Please direct any queries related to sample condition / numbering / breakages to Client Services.**
- Sample Disposal - Aqueous (14 days), Solid (60 days) from date of completion of work order.
- **Analytical work for this work order will be conducted at ALS Springvale and ALS Brisbane.**
- **For samples QC17 & QC18, TPH/BTEX has been requested; only VOC vials have been received and so only the volatile fraction of TPH (C6-C9) plus BTEX analysis (ALS suite W-18) has been booked in.**
- **Please refer to the Proactive Holding Time Report table below which summarises breaches of recommended holding times that have occurred prior to samples/instructions being received at the laboratory. The absence of this summary table indicates that all samples have been received within the recommended holding times for the analysis requested.**

Sample Container(s)/Preservation Non-Compliances

All comparisons are made against pretreatment/preservation AS, APHA, USEPA standards.

- **No sample container / preservation non-compliance exist.**

Summary of Sample(s) and Requested Analysis

Some items described below may be part of a laboratory process necessary for the execution of client requested tasks. Packages may contain additional analyses, such as the determination of moisture content and preparation tasks, that are included in the package.

Matrix: **SOIL**

Laboratory sample ID	Client sampling date / time	Client sample ID	(On Hold) SOIL No analysis requested	SOIL - EA055-103 Moisture Content	SOIL - EP003 Total Organic Carbon (TOC) in Soil
EM1516331-001	[26-Oct-2015]	GW19(1.5-1.6)	✓		
EM1516331-002	[26-Oct-2015]	GW19(1.9-2.0)	✓		
EM1516331-003	[26-Oct-2015]	GW19(2.9-3.0)	✓		
EM1516331-004	[26-Oct-2015]	GW19(3.2-3.3)		✓	✓
EM1516331-005	[26-Oct-2015]	GW19(3.9-4.0)	✓		
EM1516331-006	[26-Oct-2015]	GW19(4.9-5.0)	✓		
EM1516331-007	[26-Oct-2015]	GW14(1.5-1.6)	✓		
EM1516331-008	[26-Oct-2015]	GW14(2.2-2.3)	✓		
EM1516331-009	[26-Oct-2015]	GW14(2.9-3.0)		✓	✓
EM1516331-010	[26-Oct-2015]	GW14(3.1-3.2)	✓		
EM1516331-011	[26-Oct-2015]	GW14(3.9-4.0)	✓		
EM1516331-012	[26-Oct-2015]	GW29(1.5-1.6)	✓		
EM1516331-013	[26-Oct-2015]	GW29(2.9-3.0)	✓		
EM1516331-014	[26-Oct-2015]	GW29(3.1-3.2)		✓	✓
EM1516331-015	[26-Oct-2015]	GW29(3.9-4.0)	✓		
EM1516331-016	[27-Oct-2015]	GW38(1.5-1.6)	✓		
EM1516331-017	[27-Oct-2015]	GW38(1.9-2.0)	✓		
EM1516331-018	[27-Oct-2015]	GW38(2.9-3.0)	✓		
EM1516331-019	[27-Oct-2015]	GW38(3.9-4.0)	✓		
EM1516331-020	[27-Oct-2015]	GW38(5.0-5.1)		✓	✓
EM1516331-021	[27-Oct-2015]	GW38(5.9-6.0)	✓		
EM1516331-022	[27-Oct-2015]	GW38(6.9-7.0)	✓		

Matrix: **WATER**

Laboratory sample ID	*Client sampling date / time*	*Client sample ID*	WATER - EG020T Total Recoverable Metals by ICPMS (including	WATER - W-02T 8 metals (Total)	WATER - W-18 TRH(C6 - C9)/BTEXN
EM1516331-023	[27-Oct-2015]	QC17			✓
EM1516331-024	[27-Oct-2015]	QC18	✓	✓	✓

Proactive Holding Time Report

Sample(s) have been received within the recommended holding times for the requested analysis.

Requested Deliverables

AP_CUSTOMER SERVICE ANZ

- A4 - AU Tax Invoice (INV)	Email	ap_customerservice.anz@aecom.com

AVERYLL COYNE

- *AU Certificate of Analysis - NATA (COA)	Email	averyll.coyne@aecom.com
- *AU Interpretive QC Report - DEFAULT (Anon QCI Rep) (QCI)	Email	averyll.coyne@aecom.com
- *AU QC Report - DEFAULT (Anon QC Rep) - NATA (QC)	Email	averyll.coyne@aecom.com
- A4 - AU Sample Receipt Notification - Environmental HT (SRN)	Email	averyll.coyne@aecom.com
- A4 - AU Tax Invoice (INV)	Email	averyll.coyne@aecom.com
- Chain of Custody (CoC) (COC)	Email	averyll.coyne@aecom.com
- EDI Format - ENMRG (ENMRG)	Email	averyll.coyne@aecom.com
- EDI Format - EQUIS V5 AECOM (EQUIS_V5_AECOM)	Email	averyll.coyne@aecom.com
- EDI Format - ESDAT (ESDAT)	Email	averyll.coyne@aecom.com
- EDI Format - HLAPro (HLAPro)	Email	averyll.coyne@aecom.com
- EDI Format - XTab (XTAB)	Email	averyll.coyne@aecom.com

Form:

AECOM

Chain of Custody & Analysis Request Form

AECOM - Melbourne
Level 9, 8 Exhibition Street
Melbourne VIC 3000
Tel: 03 9653 8072
Fax: 61 3 9653 1234
Email: averyll.coyne@aecom.com

Laboratory Details
Lab. Name: ALS
Lab. Address: 4 Westall Rd, Springvale
Contact Name:
Lab. Ref:
Tel: 8549 9600
Fax:
Preliminary Report by:
Final Report by:
Lab Quote No:

Project Name: Fishermans Bend
Project Number: 60431087
Purchase Order Number: NA

Sample collected by: Matthew Sheppard
Sample Results to be returned to: Averyll Coyne

Specifications:	(Tick)		
1. Urgent TAT required? (please circle: 24hr 48hr ___3___days)	☐ Yes	☑ No	☐ N/A
2. Fast TAT Guarantee Required?	☐ Yes	☑ No	☐ N/A
3. Is any sediment layer present in waters to be excluded from extractions?	☐ Yes	☑ No	☐ N/A
4. Special storage requirements?	☐ Yes	☑ No	☐ N/A
5. Preservation requirements: ☐ Fax ☐ Hard copy ☑ Email	☐ Yes	☑ No	☐ N/A
6. Other requirements?	☑ Yes	☐ No	☐ N/A
7. Report Format: Email with QC reports	8. Project Manager: Averyll Coyne		tel: 9653 8072

Lab. ID	Sample ID	Sampling Date & time (on)	Sampling Date & Time (off)	Matrix: soil	Matrix: water	Matrix: other	Preservation: filt'ed	Preservation: acid	Preservation: ice	Preservation: other	Container (No. & type)	TOC	Moisture Content	TRH(C6-C40)	Full VOC Scan (70 Analytes) - Code EP074(A-H)	PAH	Metals	TRH, BTEX and metals	pH and sulfate	Remarks & comments
1	GW19(1.5-1.6)	26/10/2015		x					x		Jar									Metals (As, Cd, Cr, Cu, Pb, Ni, Zn, Al, Fe, Se, Hg)
2	GW19(1.9-2.0)	26/10/2015		x					x		Jar									
3	GW19(2.9-3.0)	26/10/2015		x					x		Jar									
4	GW19(3.2-3.3)	26/10/2015		x					x		Jar	x	x							
5	GW19(3.9-4.0)	26/10/2015		x					x		Jar									
6	GW19(4.9-5.0)	26/10/2015		x					x		Jar									
7	GW14(1.5-1.6)	26/10/2015		x					x		Jar									
8	GW14(2.2-2.3)	26/10/2015		x					x		Jar									
9	GW14(2.9-3.0)	26/10/2015		x					x		Jar	x	x							
10	GW14(3.1-3.2)	26/10/2015		x					x		Jar									
11	GW14(3.9-4.0)	26/10/2015		x					x		Jar									
12	GW29(1.5-1.6)	26/10/2015		x					x		Jar									
13	GW29(2.9-3.0)	26/10/2015		x					x		Jar									
14	GW29(3.1-3.2)	26/10/2015		x					x		Jar	x	x							
15	GW29(3.9-4.0)	26/10/2015		x					x		Jar									
16	GW38(1.5-1.6)	27/10/2015		x					x		Jar									

Relinquished By:
Name: Matthew Sheppard
Date: 27/10/2015
Time: 9:00
of: AECOM

Received by:
Name: [signature]
Date: 27/10
Time: 13:41
of: ALS

Relinquished By:
Name:
Date:
Time:
of:

Received by:
Name:
Date:
Time:
of:

Received in good condition?	Yes/No/NA	Method of Shipment	
Samples received chilled?	Yes/No/NA	Consignment Note No.	
	Yes/No/NA	Transport Co:	
Received in good condition?	Yes/No/NA	Method of Shipment	
Samples received chilled?	Yes/No/NA	Consignment Note No.	
	Yes/No/NA	Transport Co:	

Environmental Division
Melbourne
Work Order Reference
EM1516331

Telephone : +61-3-8549 9600

Form:

AECOM

Chain of Custody & Analysis Request Form

AECOM - Melbourne
Level 9, 8 Exhibition Street
Melbourne VIC 3000
Tel: 03 9653 8072
Fax: 61 3 9653 1234
Email: averyll.coyne@aecom.com

Laboratory Details
Lab. Name: ALS
Lab. Address: 4 Westall Rd, Springvale
Contact Name:
Lab. Ref:
Tel: 8549 9600
Fax:
Preliminary Report by:
Final Report by:
Lab Quote No:

Project Name: Fishermans Bend
Project Number: 60431087
Purchase Order Number: NA

Sample collected by: Matthew Sheppard
Sample Results to be returned to: Averyll Coyne

Specifications:

	(Tick)		
1. Urgent TAT required? (please circle: 24hr 48hr ___3___days)	☐ Yes	☑ No	☐ N/A
2. Fast TAT Guarantee Required?	☐ Yes	☑ No	☐ N/A
3. Is any sediment layer present in waters to be excluded from extractions?	☐ Yes	☑ No	☐ N/A
4. Special storage requirements?	☐ Yes	☑ No	☐ N/A
5. Preservation requirements: ☐ Fax ☐ Hard copy ☑ Email	☐ Yes	☑ No	☐ N/A
6. Other requirements?	☑ Yes	☐ No	☐ N/A

7. Report Format: Email with QC reports
8. Project Manager: Averyll Coyne tel: 9653 8072

Analysis Request

Lab. ID	Sample ID	Sampling Date & time (on)	Sampling Date & Time (off)	Matrix: soil	Matrix: water	Matrix: other	Preservation: filt'ed	Preservation: acid	Preservation: ice	Preservation: other	Container (No. & type)	TOC	Moisture Content	TRH(C6-C40)	Full VOC Scan (70 Analytes) - Code EP074(A-H)	PAH	Metals	TRH, BTEX and metals	pH and sulfate	Remarks & comments
17	GW38(1.9-2.0)	27/10/2015		x					x		Jar									Metals (As, Cd, Cr, Cu, Pb, Ni, Zn, Al, Fe, Se, Hg)
18	GW38(2.9-3.0)	27/10/2015		x					x		Jar									
19	GW38(3.9-4.0)	27/10/2015		x					x		Jar									
20	GW38(5.0-5.1)	27/10/2015		x					x		Jar	x	x							
21	GW38(5.9-6.0)	27/10/2015		x					x		Jar									
22	GW38(6.9-7.0)	27/10/2015		x					x		Jar									
23	QC17				x				x		Bottles			x						
24	QC18				x				x		Bottles							x		

Relinquished By:
Name: Dug Cunningham
Date: 27/10/2015
Time: 9:00
of: AECOM

Received by:
Name: [illegible]
Date: 27/10
Time: 15:45
of: ALS

Relinquished By:
Name:
Date:
Time:
of:

Received by:
Name:
Date:
Time:
of:

Received in good condition?	Yes/No/NA	Method of Shipment	
Samples received chilled?	Yes/No/NA	Consignment Note No.	
	Yes/No/NA	Transport Co:	
Received in good condition?	Yes/No/NA	Method of Shipment	
Samples received chilled?	Yes/No/NA	Consignment Note No.	
	Yes/No/NA	Transport Co:	

Andrew Matheson

From: Coyne, Averyll <Averyll.Coyne@aecom.com>
Sent: Tuesday, 27 October 2015 11:34 AM
To: Bronwyn Sheen
Cc: Samples Melbourne
Subject: RE: FBURA Day 7 - Soil samples to be received today
Attachments: 60431087 COC Day 7A.pdf; 60431087 COC Day 7B.PDF

Apologies Bronwyn. Minor amendment. Please see attached.

Averyll Coyne
Principal Environmental Scientist
D +61 3 9653 8072 M +61 499 252 502
Averyll.Coyne@aecom.com

AECOM
Level 9, 8 Exhibition Street, Melbourne, VIC 3000
T +61 3 9653 1234 F +61 3 9654 7117
www.aecom.com

From: Coyne, Averyll
Sent: Tuesday, 27 October 2015 11:31 AM
To: 'Bronwyn Sheen'
Cc: 'samples.melbourne@alsglobal.com'
Subject: FBURA Day 7 - Soil samples to be received today

Hi Bronwyn,

Please find attached the COC for soil samples collected on Day 7 at the Fishermans Bend site. These will arrive at ALS today.

Kind Regards
Averyll

Averyll Coyne
Principal Environmental Scientist
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ALS Environmental

CERTIFICATE OF ANALYSIS

Work Order	: **EM1516378**	Page	: 1 of 4
Client	: **AECOM Australia Pty Ltd**	Laboratory	: Environmental Division Melbourne
Contact	: MS AVERYLL COYNE	Contact	: Carol Walsh
Address	: LEVEL 9 8 EXHIBITION ST MELBOURNE VIC 3000	Address	: 4 Westall Rd Springvale VIC Australia 3171
E-mail	: averyll.coyne@aecom.com	E-mail	: carol.walsh@alsglobal.com
Telephone	: +61 03 9653 1234	Telephone	: +61-3-8549 9608
Facsimile	: +61 03 9654 7117	Facsimile	: +61-3-8549 9601
Project	: 60431087	QC Level	: NEPM 2013 Schedule B(3) and ALS QCS3 requirement
Order number	: ----	Date Samples Received	: 30-Oct-2015 16:55
C-O-C number	: ----	Date Analysis Commenced	: 02-Nov-2015
Sampler	: DUGALD CUNNINGHAM, OLIVER TAYLOR	Issue Date	: 10-Nov-2015 09:27
Site	: Fishermans Bend		
		No. of samples received	: 19
Quote number	: ----	No. of samples analysed	: 6

This report supersedes any previous report(s) with this reference. Results apply to the sample(s) as submitted.

This Certificate of Analysis contains the following information:

- General Comments
- Analytical Results

NATA Accredited Laboratory 825

Accredited for compliance with ISO/IEC 17025.

Signatories

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

Signatories	*Position*	*Accreditation Category*
Dilani Fernando	Senior Inorganic Chemist	Melbourne Inorganics
Kim McCabe	Senior Inorganic Chemist	Brisbane Acid Sulphate Soils
Kim McCabe	Senior Inorganic Chemist	Brisbane Inorganics
Nancy Wang	Senior Semivolatile Instrument Chemist	Melbourne Organics

General Comments

The analytical procedures used by the Environmental Division have been developed from established internationally recognized procedures such as those published by the USEPA, APHA, AS and NEPM. In house developed procedures are employed in the absence of documented standards or by 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.

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.

Analytical Results

Sub-Matrix: SOIL (Matrix: SOIL)				Client sample ID	GW11(4.4-4.5)	GW15(3.3-3.4)	GW09(3.0-3.1)	GW33(2.5-2.6)	----
				Client sampling date / time	[30-Oct-2015]	[30-Oct-2015]	[30-Oct-2015]	[30-Oct-2015]	----
Compound	CAS Number	LOR	Unit		EM1516378-002	EM1516378-006	EM1516378-010	EM1516378-013	--------
					Result	Result	Result	Result	Result
EA055: Moisture Content									
Moisture Content (dried @ 103°C)	----	1	%		19.8	37.1	12.0	16.5	----
EP003: Total Organic Carbon (TOC) in Soil									
Total Organic Carbon	----	0.02	%		0.07	2.13	0.08	3.64	----

Analytical Results

Sub-Matrix: WATER (Matrix: WATER)				Client sample ID	QC25	QC26	----	----	----
				Client sampling date / time	[30-Oct-2015]	[30-Oct-2015]	----	----	----
Compound	CAS Number	LOR	Unit		EM1516378-018	EM1516378-019	--------	--------	--------
					Result	Result	Result	Result	Result
EG020T: Total Metals by ICP-MS									
Aluminium	7429-90-5	0.01	mg/L		----	<0.01	----	----	----
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	----	----	----
Nickel	7440-02-0	0.001	mg/L		----	<0.001	----	----	----
Lead	7439-92-1	0.001	mg/L		----	<0.001	----	----	----
Zinc	7440-66-6	0.005	mg/L		----	<0.005	----	----	----
Selenium	7782-49-2	0.01	mg/L		----	<0.01	----	----	----
Iron	7439-89-6	0.05	mg/L		----	<0.05	----	----	----
EG035T: Total Recoverable Mercury by FIMS									
Mercury	7439-97-6	0.0001	mg/L		----	<0.0001	----	----	----
EP080/071: Total Petroleum Hydrocarbons									
C6 - C9 Fraction	----	20	µg/L		<20	<20	----	----	----
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	----	----	----
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**	1330-20-7	2	µg/L		<2	<2	----	----	----
^ **Sum of BTEX**	----	1	µg/L		<1	<1	----	----	----
Naphthalene	91-20-3	5	µg/L		<5	<5	----	----	----
EP080S: TPH(V)/BTEX Surrogates									
1.2-Dichloroethane-D4	17060-07-0	2	%		**95.7**	**104**	----	----	----
Toluene-D8	2037-26-5	2	%		**95.9**	**101**	----	----	----
4-Bromofluorobenzene	460-00-4	2	%		**102**	**118**	----	----	----

ALS Environmental

QUALITY CONTROL REPORT

Work Order	: **EM1516378**	Page	: 1 of 6
Client	: **AECOM Australia Pty Ltd**	Laboratory	: Environmental Division Melbourne
Contact	: MS AVERYLL COYNE	Contact	: Carol Walsh
Address	: LEVEL 9 8 EXHIBITION ST MELBOURNE VIC 3000	Address	: 4 Westall Rd Springvale VIC Australia 3171
E-mail	: averyll.coyne@aecom.com	E-mail	: carol.walsh@alsglobal.com
Telephone	: +61 03 9653 1234	Telephone	: +61-3-8549 9608
Facsimile	: +61 03 9654 7117	Facsimile	: +61-3-8549 9601
Project	: 60431087	QC Level	: NEPM 2013 Schedule B(3) and ALS QCS3 requirement
Order number	: ----	Date Samples Received	: 30-Oct-2015
C-O-C number	: ----	Date Analysis Commenced	: 02-Nov-2015
Sampler	: DUGALD CUNNINGHAM, OLIVER TAYLOR	Issue Date	: 10-Nov-2015
Site	: Fishermans Bend	No. of samples received	: 19
Quote number	: ----	No. of samples analysed	: 6

This report supersedes any previous report(s) with this reference. Results apply to the sample(s) as submitted.

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

NATA WORLD RECOGNISED ACCREDITATION

NATA Accredited Laboratory 825

Accredited for compliance with ISO/IEC 17025.

Signatories

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

Signatories	*Position*	*Accreditation Category*
Dilani Fernando	Senior Inorganic Chemist	Melbourne Inorganics
Kim McCabe	Senior Inorganic Chemist	Brisbane Acid Sulphate Soils
Kim McCabe	Senior Inorganic Chemist	Brisbane Inorganics
Nancy Wang	Senior Semivolatile Instrument Chemist	Melbourne Organics

General Comments

The analytical procedures used by the Environmental Division have been developed from established internationally recognized procedures such as those published by the USEPA, APHA, AS and NEPM. In house developed procedures are employed in the absence of documented standards or by 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

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	*Client sample ID*	*Method: Compound*	*CAS Number*	*LOR*	*Unit*	*Original Result*	*Duplicate Result*	*RPD (%)*	*Recovery Limits (%)*
EA055: Moisture Content (QC Lot: 266346)									
EB1532520-001	Anonymous	EA055-103: Moisture Content (dried @ 103°C)	----	1	%	20.2	19.6	2.84	0% - 20%
EB1532520-011	Anonymous	EA055-103: Moisture Content (dried @ 103°C)	----	1	%	2.6	2.7	0.00	No Limit
EP003: Total Organic Carbon (TOC) in Soil (QC Lot: 270860)									
EM1516378-002	GW11(4.4-4.5)	EP003: Total Organic Carbon	----	0.02	%	0.07	0.06	15.8	No Limit

Sub-Matrix: **WATER**

				Laboratory Duplicate (DUP) Report					
Laboratory sample ID	*Client sample ID*	*Method: Compound*	*CAS Number*	*LOR*	*Unit*	*Original Result*	*Duplicate Result*	*RPD (%)*	*Recovery Limits (%)*
EG020T: Total Metals by ICP-MS (QC Lot: 268690)									
EM1516378-019	QC26	EG020A-T: Cadmium	7440-43-9	0.0001	mg/L	<0.0001	<0.0001	0.00	No Limit
		EG020A-T: Arsenic	7440-38-2	0.001	mg/L	<0.001	<0.001	0.00	No Limit
		EG020A-T: Chromium	7440-47-3	0.001	mg/L	<0.001	<0.001	0.00	No Limit
		EG020A-T: Copper	7440-50-8	0.001	mg/L	<0.001	<0.001	0.00	No Limit
		EG020A-T: Lead	7439-92-1	0.001	mg/L	<0.001	<0.001	0.00	No Limit
		EG020A-T: Nickel	7440-02-0	0.001	mg/L	<0.001	<0.001	0.00	No Limit
		EG020A-T: Zinc	7440-66-6	0.005	mg/L	<0.005	<0.005	0.00	No Limit
		EG020A-T: Aluminium	7429-90-5	0.01	mg/L	<0.01	<0.01	0.00	No Limit
		EG020A-T: Selenium	7782-49-2	0.01	mg/L	<0.01	<0.01	0.00	No Limit
		EG020A-T: Iron	7439-89-6	0.05	mg/L	<0.05	<0.05	0.00	No Limit
EM1516516-005	Anonymous	EG020A-T: Cadmium	7440-43-9	0.0001	mg/L	0.0003	0.0002	49.1	No Limit
		EG020A-T: Arsenic	7440-38-2	0.001	mg/L	0.107	0.109	1.82	0% - 20%
		EG020A-T: Chromium	7440-47-3	0.001	mg/L	0.061	0.061	0.00	0% - 20%
		EG020A-T: Copper	7440-50-8	0.001	mg/L	0.002	0.002	0.00	No Limit
		EG020A-T: Lead	7439-92-1	0.001	mg/L	0.001	<0.001	0.00	No Limit
		EG020A-T: Nickel	7440-02-0	0.001	mg/L	0.172	0.177	3.04	0% - 20%
		EG020A-T: Zinc	7440-66-6	0.005	mg/L	0.033	0.024	30.6	No Limit
		EG020A-T: Aluminium	7429-90-5	0.01	mg/L	0.11	0.14	17.9	0% - 50%
		EG020A-T: Selenium	7782-49-2	0.01	mg/L	<0.01	<0.01	0.00	No Limit
		EG020A-T: Iron	7439-89-6	0.05	mg/L	10.2	10.4	1.84	0% - 20%
EG035T: Total Recoverable Mercury by FIMS (QC Lot: 263395)									
EM1516331-024	Anonymous	EG035T: Mercury	7439-97-6	0.0001	mg/L	<0.0001	<0.0001	0.00	No Limit
EM1516360-010	Anonymous	EG035T: Mercury	7439-97-6	0.0001	mg/L	<0.0001	<0.0001	0.00	No Limit
EP080/071: Total Petroleum Hydrocarbons (QC Lot: 266948)									
EM1516491-020	Anonymous	EP080: C6 - C9 Fraction	----	20	µg/L	<20	<20	0.00	No Limit
EM1516515-002	Anonymous	EP080: C6 - C9 Fraction	----	20	µg/L	<20	<20	0.00	No Limit
EP080/071: Total Recoverable Hydrocarbons - NEPM 2013 Fractions (QC Lot: 266948)									
EM1516491-020	Anonymous	EP080: C6 - C10 Fraction	C6_C10	20	µg/L	<20	<20	0.00	No Limit

Sub-Matrix: **WATER**

				Laboratory Duplicate (DUP) Report					
Laboratory sample ID	*Client sample ID*	*Method: Compound*	*CAS Number*	*LOR*	*Unit*	*Original Result*	*Duplicate Result*	*RPD (%)*	*Recovery Limits (%)*
EP080/071: Total Recoverable Hydrocarbons - NEPM 2013 Fractions (QC Lot: 266948) - continued									
EM1516515-002	Anonymous	EP080: C6 - C10 Fraction	C6_C10	20	µg/L	<20	<20	0.00	No Limit
EP080: BTEXN (QC Lot: 266948)									
EM1516491-020	Anonymous	EP080: Benzene	71-43-2	1	µg/L	<1	<1	0.00	No Limit
		EP080: Ethylbenzene	100-41-4	2	µg/L	<2	<2	0.00	No Limit
		EP080: meta- & para-Xylene	108-38-3 106-42-3	2	µg/L	<2	<2	0.00	No Limit
		EP080: ortho-Xylene	95-47-6	2	µg/L	<2	<2	0.00	No Limit
		EP080: Toluene	108-88-3	2	µg/L	<2	<2	0.00	No Limit
		EP080: Naphthalene	91-20-3	5	µg/L	<5	<5	0.00	No Limit
EM1516515-002	Anonymous	EP080: Benzene	71-43-2	1	µg/L	<1	<1	0.00	No Limit
		EP080: Ethylbenzene	100-41-4	2	µg/L	<2	<2	0.00	No Limit
		EP080: meta- & para-Xylene	108-38-3 106-42-3	2	µg/L	<2	<2	0.00	No Limit
		EP080: ortho-Xylene	95-47-6	2	µg/L	<2	<2	0.00	No Limit
		EP080: Toluene	108-88-3	2	µg/L	<2	<2	0.00	No Limit
		EP080: Naphthalene	91-20-3	5	µg/L	<5	<5	0.00	No Limit

Method Blank (MB) and Laboratory Control Spike (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 (%)	Recovery Limits (%)	
Method: Compound	CAS Number	LOR	Unit	Result	Concentration	LCS	Low	High
EP003: Total Organic Carbon (TOC) in Soil (QCLot: 270860)								
EP003: Total Organic Carbon	----	0.02	%	<0.02	100 %	98.7	70	130

Sub-Matrix: **WATER**

				Method Blank (MB) Report	Laboratory Control Spike (LCS) Report			
					Spike	Spike Recovery (%)	Recovery Limits (%)	
Method: Compound	CAS Number	LOR	Unit	Result	Concentration	LCS	Low	High
EG020T: Total Metals by ICP-MS (QCLot: 268690)								
EG020A-T: Aluminium	7429-90-5	0.01	mg/L	<0.01	0.5 mg/L	103	100	108
EG020A-T: Arsenic	7440-38-2	0.001	mg/L	<0.001	0.1 mg/L	104	94	116
EG020A-T: Cadmium	7440-43-9	0.0001	mg/L	<0.0001	0.1 mg/L	102	90	110
EG020A-T: Chromium	7440-47-3	0.001	mg/L	<0.001	0.1 mg/L	98.6	90	110
EG020A-T: Copper	7440-50-8	0.001	mg/L	<0.001	0.1 mg/L	96.7	91	109
EG020A-T: Iron	7439-89-6	0.05	mg/L	<0.05	0.5 mg/L	102	99	109
EG020A-T: Lead	7439-92-1	0.001	mg/L	<0.001	0.1 mg/L	97.1	91	111
EG020A-T: Nickel	7440-02-0	0.001	mg/L	<0.001	0.1 mg/L	96.2	91	111
EG020A-T: Selenium	7782-49-2	0.01	mg/L	<0.01	0.1 mg/L	96.2	86	110
EG020A-T: Zinc	7440-66-6	0.005	mg/L	<0.005	0.1 mg/L	104	91	109
EG035T: Total Recoverable Mercury by FIMS (QCLot: 263395)								
EG035T: Mercury	7439-97-6	0.0001	mg/L	<0.0001	0.01 mg/L	91.9	87	113
EP080/071: Total Petroleum Hydrocarbons (QCLot: 266948)								
EP080: C6 - C9 Fraction	----	20	µg/L	<20	360 µg/L	107	67	127
EP080/071: Total Recoverable Hydrocarbons - NEPM 2013 Fractions (QCLot: 266948)								
EP080: C6 - C10 Fraction	C6_C10	20	µg/L	<20	450 µg/L	106	65	125
EP080: BTEXN (QCLot: 266948)								
EP080: Benzene	71-43-2	1	µg/L	<1	20 µg/L	104	76	120
EP080: Ethylbenzene	100-41-4	2	µg/L	<2	20 µg/L	104	72	124
EP080: meta- & para-Xylene	108-38-3 106-42-3	2	µg/L	<2	40 µg/L	104	72	130
EP080: Naphthalene	91-20-3	5	µg/L	<5	5 µg/L	90.4	71	129
EP080: ortho-Xylene	95-47-6	2	µg/L	<2	20 µg/L	106	75	127
EP080: Toluene	108-88-3	2	µg/L	<2	20 µg/L	106	76	124

Matrix Spike (MS) Report

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

Sub-Matrix: **WATER**

				Matrix Spike (MS) Report			
				Spike	SpikeRecovery(%)	Recovery Limits (%)	
Laboratory sample ID	*Client sample ID*	*Method: Compound*	*CAS Number*	*Concentration*	*MS*	*Low*	*High*
EG020T: Total Metals by ICP-MS (QCLot: 268690)							
EM1516378-019	QC26	EG020A-T: Arsenic	7440-38-2	1 mg/L	113	82	118
		EG020A-T: Cadmium	7440-43-9	0.25 mg/L	117	75	129
		EG020A-T: Chromium	7440-47-3	1 mg/L	101	80	118
		EG020A-T: Copper	7440-50-8	1 mg/L	105	81	115
		EG020A-T: Lead	7439-92-1	1 mg/L	98.5	83	121
		EG020A-T: Nickel	7440-02-0	1 mg/L	110	80	118
		EG020A-T: Zinc	7440-66-6	1 mg/L	109	74	116
EG035T: Total Recoverable Mercury by FIMS (QCLot: 263395)							
EM1516342-001	Anonymous	EG035T: Mercury	7439-97-6	0.01 mg/L	97.9	70	130
EP080/071: Total Petroleum Hydrocarbons (QCLot: 266948)							
EM1516490-026	Anonymous	EP080: C6 - C9 Fraction	----	280 µg/L	83.3	43	125
EP080/071: Total Recoverable Hydrocarbons - NEPM 2013 Fractions (QCLot: 266948)							
EM1516490-026	Anonymous	EP080: C6 - C10 Fraction	C6_C10	330 µg/L	81.3	44	122
EP080: BTEXN (QCLot: 266948)							
EM1516490-026	Anonymous	EP080: Benzene	71-43-2	20 µg/L	103	68	130
		EP080: Toluene	108-88-3	20 µg/L	104	72	132

ALS Environmental

QA/QC Compliance Assessment to assist with Quality Review

Work Order	: **EM1516378**	Page	: 1 of 4
Client	: **AECOM Australia Pty Ltd**	Laboratory	: Environmental Division Melbourne
Contact	: MS AVERYLL COYNE	Telephone	: +61-3-8549 9608
Project	: 60431087	Date Samples Received	: 30-Oct-2015
Site	: Fishermans Bend	Issue Date	: 10-Nov-2015
Sampler	: DUGALD CUNNINGHAM, OLIVER TAYLOR	No. of samples received	: 19
Order number	: ----	No. of samples analysed	: 6

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

- **NO Quality Control Sample Frequency Outliers exist.**

Analysis Holding Time Compliance

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							
Soil Glass Jar - Unpreserved (EA055-103)							
GW11(4.4-4.5), GW15(3.3-3.4), GW09(3.0-3.1), GW33(2.5-2.6)	**30-Oct-2015**	**----**	----	----	**04-Nov-2015**	13-Nov-2015	✓
EP003: Total Organic Carbon (TOC) in Soil							
Pulp Bag (EP003)							
GW11(4.4-4.5)	**30-Oct-2015**	**09-Nov-2015**	27-Nov-2015	✓	**09-Nov-2015**	27-Nov-2015	✓
Soil Glass Jar - Unpreserved (EP003)							
GW15(3.3-3.4), GW09(3.0-3.1), GW33(2.5-2.6)	**30-Oct-2015**	**09-Nov-2015**	27-Nov-2015	✓	**09-Nov-2015**	27-Nov-2015	✓

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)							
QC26	**30-Oct-2015**	**06-Nov-2015**	27-Apr-2016	✓	**06-Nov-2015**	27-Apr-2016	✓
EG035T: Total Recoverable Mercury by FIMS							
Clear Plastic Bottle - Nitric Acid; Unfiltered (EG035T)							
QC26	**30-Oct-2015**	**----**	----	----	**02-Nov-2015**	27-Nov-2015	✓
EP080/071: Total Petroleum Hydrocarbons							
Amber VOC Vial - Sulfuric Acid (EP080)							
QC25, QC26	**30-Oct-2015**	**05-Nov-2015**	13-Nov-2015	✓	**05-Nov-2015**	13-Nov-2015	✓

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	EA055-103	2	20	10.00	10.00	✓	NEPM 2013 Schedule B(3) and ALS QCS3 requirement
Total Organic Carbon	EP003	1	4	25.00	10.00	✓	NEPM 2013 Schedule B(3) and ALS QCS3 requirement
Laboratory Control Samples (LCS)							
Total Organic Carbon	EP003	1	4	25.00	5.00	✓	NEPM 2013 Schedule B(3) and ALS QCS3 requirement
Method Blanks (MB)							
Total Organic Carbon	EP003	1	4	25.00	5.00	✓	NEPM 2013 Schedule B(3) and ALS QCS3 requirement

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)							
Total Mercury by FIMS	EG035T	2	20	10.00	10.00	✓	NEPM 2013 Schedule B(3) and ALS QCS3 requirement
Total Metals by ICP-MS - Suite A	EG020A-T	2	20	10.00	10.00	✓	NEPM 2013 Schedule B(3) and ALS QCS3 requirement
TRH Volatiles/BTEX	EP080	2	20	10.00	10.00	✓	NEPM 2013 Schedule B(3) and ALS QCS3 requirement
Laboratory Control Samples (LCS)							
Total Mercury by FIMS	EG035T	1	20	5.00	5.00	✓	NEPM 2013 Schedule B(3) and ALS QCS3 requirement
Total Metals by ICP-MS - Suite A	EG020A-T	1	20	5.00	5.00	✓	NEPM 2013 Schedule B(3) and ALS QCS3 requirement
TRH Volatiles/BTEX	EP080	1	20	5.00	5.00	✓	NEPM 2013 Schedule B(3) and ALS QCS3 requirement
Method Blanks (MB)							
Total Mercury by FIMS	EG035T	1	20	5.00	5.00	✓	NEPM 2013 Schedule B(3) and ALS QCS3 requirement
Total Metals by ICP-MS - Suite A	EG020A-T	1	20	5.00	5.00	✓	NEPM 2013 Schedule B(3) and ALS QCS3 requirement
TRH Volatiles/BTEX	EP080	1	20	5.00	5.00	✓	NEPM 2013 Schedule B(3) and ALS QCS3 requirement
Matrix Spikes (MS)							
Total Mercury by FIMS	EG035T	1	20	5.00	5.00	✓	NEPM 2013 Schedule B(3) and ALS QCS3 requirement
Total Metals by ICP-MS - Suite A	EG020A-T	1	20	5.00	5.00	✓	NEPM 2013 Schedule B(3) and ALS QCS3 requirement
TRH Volatiles/BTEX	EP080	1	20	5.00	5.00	✓	NEPM 2013 Schedule B(3) and ALS QCS3 requirement

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	EA055-103	SOIL	In-house. A gravimetric procedure based on weight loss over a 12 hour drying period at 103-105 degrees C. This method is compliant with NEPM (2013) Schedule B(3) Section 7.1 and Table 1 (14 day holding time).
Total Organic Carbon	EP003	SOIL	In-house C-IR17. Dried and pulverised sample is reacted with acid to remove inorganic Carbonates, then combusted in a LECO furnace in the presence of strong oxidants / catalysts. The evolved (Organic) Carbon (as CO2) is automaticaly measured by infra-red detector.
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 (2013) Schedule B(3)
TRH Volatiles/BTEX	EP080	WATER	USEPA SW 846 - 8260B 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 (2013) Schedule B(3)

Preparation Methods	Method	Matrix	Method Descriptions
Dry and Pulverise (up to 100g)	GEO30	SOIL	#
Digestion for Total Recoverable Metals	EN25	WATER	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 (2013) Schedule B(3)

SAMPLE RECEIPT NOTIFICATION (SRN)

Work Order : **EM1516378**

Client	: **AECOM Australia Pty Ltd**	Laboratory	: Environmental Division Melbourne
Contact	: MS AVERYLL COYNE	Contact	: Carol Walsh
Address	: LEVEL 9 8 EXHIBITION ST MELBOURNE VIC 3000	Address	: 4 Westall Rd Springvale VIC Australia 3171
E-mail	: averyll.coyne@aecom.com	E-mail	: carol.walsh@alsglobal.com
Telephone	: +61 03 9653 1234	Telephone	: +61-3-8549 9608
Facsimile	: +61 03 9654 7117	Facsimile	: +61-3-8549 9601
Project	: 60431087	Page	: 1 of 3
Order number	: ----	Quote number	: EB2015AECOMAU0580 (EN/004/15)
C-O-C number	: ----	QC Level	: NEPM 2013 Schedule B(3) and ALS QCS3 requirement
Site	: Fishermans Bend		
Sampler	: DUGALD CUNNINGHAM, OLIVER TAYLOR		

Dates

Date Samples Received	: 30-Oct-2015 4:55 PM	Issue Date	: 02-Nov-2015
Client Requested Due Date	: 10-Nov-2015	Scheduled Reporting Date	: **10-Nov-2015**

Delivery Details

Mode of Delivery	: Undefined	Security Seal	: Intact.
No. of coolers/boxes	: 1	Temperature	: 5.7°C - Ice present
Receipt Detail	:	No. of samples received / analysed	: 19 / 6

General Comments

- This report contains the following information:
  - Sample Container(s)/Preservation Non-Compliances
  - Summary of Sample(s) and Requested Analysis
  - Proactive Holding Time Report
  - Requested Deliverables
- **Please direct any queries related to sample condition / numbering / breakages to Client Services.**
- Sample Disposal - Aqueous (14 days), Solid (60 days) from date of completion of work order.
- **Analytical work for this work order will be conducted at ALS Springvale and ALS Brisbane.**
- **For sample QC25 & QC26 TPH/BTEX has been requested; only VOC vials have been received and so only the volatile fraction of TPH (C6-C9) plus BTEX analysis (ALS suite W-18) has been booked in.**
- **Please refer to the Proactive Holding Time Report table below which summarises breaches of recommended holding times that have occurred prior to samples/instructions being received at the laboratory. The absence of this summary table indicates that all samples have been received within the recommended holding times for the analysis requested.**

Sample Container(s)/Preservation Non-Compliances

All comparisons are made against pretreatment/preservation AS, APHA, USEPA standards.

- **No sample container / preservation non-compliance exist.**

Summary of Sample(s) and Requested Analysis

Some items described below may be part of a laboratory process necessary for the execution of client requested tasks. Packages may contain additional analyses, such as the determination of moisture content and preparation tasks, that are included in the package.

Matrix: **SOIL**

Laboratory sample ID	Client sampling date / time	Client sample ID	(On Hold) SOIL No analysis requested	SOIL - EA055-103 Moisture Content	SOIL - EP003 Total Organic Carbon (TOC) in Soil
EM1516378-001	[30-Oct-2015]	GW11(2.4-2.5)	✓		
EM1516378-002	[30-Oct-2015]	GW11(4.4-4.5)		✓	✓
EM1516378-003	[30-Oct-2015]	GW11(5.0-5.1)	✓		
EM1516378-004	[30-Oct-2015]	GW15(1.8-1.9)	✓		
EM1516378-005	[30-Oct-2015]	GW15(3.0-3.1)	✓		
EM1516378-006	[30-Oct-2015]	GW15(3.3-3.4)		✓	✓
EM1516378-007	[30-Oct-2015]	GW15(4.5-4.6)	✓		
EM1516378-008	[30-Oct-2015]	GW15(5.2-5.3)	✓		
EM1516378-009	[30-Oct-2015]	GW09(2.0-2.1)	✓		
EM1516378-010	[30-Oct-2015]	GW09(3.0-3.1)		✓	✓
EM1516378-011	[30-Oct-2015]	GW09(4.0-4.1)	✓		
EM1516378-012	[30-Oct-2015]	GW09(5.0-5.1)	✓		
EM1516378-013	[30-Oct-2015]	GW33(2.5-2.6)		✓	✓
EM1516378-014	[30-Oct-2015]	GW33(3.0-3.1)	✓		
EM1516378-015	[30-Oct-2015]	GW33(3.4-3.5)	✓		
EM1516378-016	[30-Oct-2015]	GW33(4.0-4.1)	✓		
EM1516378-017	[30-Oct-2015]	GW33(5.0-5.1)	✓		

Matrix: **WATER**

Laboratory sample ID	Client sampling date / time	Client sample ID	WATER - EG020T Total Recoverable Metals by ICPMS (including	WATER - W-02T 8 metals (Total)	WATER - W-18 TRH(C6 - C9)/BTEXN
EM1516378-018	[30-Oct-2015]	QC25			✓
EM1516378-019	[30-Oct-2015]	QC26	✓	✓	✓

Proactive Holding Time Report

Sample(s) have been received within the recommended holding times for the requested analysis.

Requested Deliverables

AP_CUSTOMER SERVICE ANZ

- A4 - AU Tax Invoice (INV)	Email	ap_customerservice.anz@aecom.com

AVERYLL COYNE

- *AU Certificate of Analysis - NATA (COA)	Email	averyll.coyne@aecom.com
- *AU Interpretive QC Report - DEFAULT (Anon QCI Rep) (QCI)	Email	averyll.coyne@aecom.com
- *AU QC Report - DEFAULT (Anon QC Rep) - NATA (QC)	Email	averyll.coyne@aecom.com
- A4 - AU Sample Receipt Notification - Environmental HT (SRN)	Email	averyll.coyne@aecom.com
- A4 - AU Tax Invoice (INV)	Email	averyll.coyne@aecom.com
- Chain of Custody (CoC) (COC)	Email	averyll.coyne@aecom.com
- EDI Format - ENMRG (ENMRG)	Email	averyll.coyne@aecom.com
- EDI Format - ESDAT (ESDAT)	Email	averyll.coyne@aecom.com
- EDI Format - HLAPro (HLAPro)	Email	averyll.coyne@aecom.com
- EDI Format - XTab (XTAB)	Email	averyll.coyne@aecom.com

SCANNED

Form:

AECOM

Chain of Custody & Analysis Request Form

AECOM - Melbourne
Level 9, 8 Exhibition Street
Melbourne VIC 3000
Tel: 03 9653 8072
Fax: 61 3 9653 1234
Email: averyll.coyne@aecom.com

Laboratory Details
Lab. Name: ALS
Lab. Address: 4 Westall Rd, Springvale
Contact Name:
Lab. Ref:
Tel: 8549 9600
Fax:
Preliminary Report by:
Final Report by:
Lab Quote No:

Environmental Division
Melbourne
Work Order Reference
EM1516378

Telephone : + 61-3-8549 9600

Project Name: Fishermans Bend
Project Number: 60431087
Purchase Order Number: NA

Sample collected by: Dug Cunningham and Oliver Taylor
Sample Results to be returned to: Averyll Coyne

Specifications:

	(Tick)		
1. Urgent TAT required? (please circle: 24hr 48hr ___3___days)	☐ Yes	☑ No	☐ N/A
2. Fast TAT Guarantee Required?	☐ Yes	☑ No	☐ N/A
3. Is any sediment layer present in waters to be excluded from extractions?	☐ Yes	☑ No	☐ N/A
4. Special storage requirements?	☐ Yes	☑ No	☐ N/A
5. Preservation requirements ☐ Fax ☐ Hard copy ☑ Email	☐ Yes	☑ No	☐ N/A
6. Other requirements?	☑ Yes	☐ No	☐ N/A

7. Report Format: Email with QC reports
8. Project Manager: Averyll Coyne tel: 9653 8072

Lab. ID	Sample ID	Sampling Date & time (on)	Sampling Date & Time (off)	Matrix: soil	Matrix: water	Matrix: other	Preservation: filtered	Preservation: acid	Preservation: ice	Preservation: other	Container (No. & type)	TOC	Moisture Content	TRH(C6-C40)	Full VOC Scan (70 Analytes) - Code EP074(A-H)	PAH	Metals	TRH, BTEX and metals	pH and sulfate	Remarks & comment
1	GW11(2.4-2.5)	30/10/2015		x					x		Jar									Please hold
2	GW11(4.4-4.5)	30/10/2015		x					x		Jar	x	x							
3	GW11(5.0-5.1)	30/10/2015		x					x		Jar									Please hold
4	GW15(1.8-1.9)	30/10/2015		x					x		Jar									Please hold
5	GW15(3.0-3.1)	30/10/2015		x					x		Jar									Please hold
6	GW15(3.3-3.4)	30/10/2015		x					x		Jar	x	x							
7	GW15(4.5-4.6)	30/10/2015		x					x		Jar									Please hold
8	GW15(5.2-5.3)	30/10/2015		x					x		Jar									Please hold
9	GW09(2.0-2.1)	30/10/2015		x					x		Jar									Please hold
10	GW09(3.0-3.1)	30/10/2015		x					x		Jar	x	x							
11	GW09(4.0-4.1)	30/10/2015		x					x		Jar									Please hold
12	GW09(5.0-5.1)	30/10/2015		x					x		Jar									Please hold
13	GW33(2.5-2.6)	30/10/2015		x					x		Jar	x	x							
14	GW33(3.0-3.1)	30/10/2015		x					x		Jar									Please hold
15	GW33(3.4-3.5)	30/10/2015		x					x		Jar									Please hold
16	GW33(4.0-4.1)	30/10/2015		x					x		Jar									Please hold
17	GW33(5.0-5.1)	30/10/2015		x					x		Jar									Please hold
18	QC25	30/10/2015			x				x		Bottles			x						
19	QC26	30/10/2015			x				x		Bottles							x		

Metals (As, Cd, Cr, Cu, Pb, Ni, Zn, Al, Fe, Se, Hg)

Relinquished By:	Received by:		
Name: Oliver Taylor	Name:	Date: 30/10	Received in good condition? Yes/No/NA — Method of Shipment
Date: 30/10/2015			Samples received chilled? Yes/No/NA — Consignment Note No.
of: AECOM	of: ALS	Time: 16:55	Yes/No/NA — Transport Co:
Time:5:00			
Relinquished By:	**Received by:**		Received in good condition? Yes/No/NA — Method of Shipment
Name:	Name:	Date:	Samples received chilled? Yes/No/NA — Consignment Note No.
Date:			Yes/No/NA — Transport Co:
of:	of:	Time:	
Time:			

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Revision: Oct 09
BMS-PM-DV-F046

Environment

ALS Environmental

CERTIFICATE OF ANALYSIS

Work Order	: **EM1516404**	Page	: 1 of 4
Client	: **AECOM Australia Pty Ltd**	Laboratory	: Environmental Division Melbourne
Contact	: MS AVERYLL COYNE	Contact	: Carol Walsh
Address	: LEVEL 9 8 EXHIBITION ST MELBOURNE VIC 3000	Address	: 4 Westall Rd Springvale VIC Australia 3171
E-mail	: averyll.coyne@aecom.com	E-mail	: carol.walsh@alsglobal.com
Telephone	: +61 03 9653 1234	Telephone	: +61-3-8549 9608
Facsimile	: +61 03 9654 7117	Facsimile	: +61-3-8549 9601
Project	: 60431087	QC Level	: NEPM 2013 Schedule B(3) and ALS QCS3 requirement
Order number	: 60431087 Task 1.4	Date Samples Received	: 28-Oct-2015 10:20
C-O-C number	: ----	Date Analysis Commenced	: 02-Nov-2015
Sampler	: MATTHEW SHEPPARD	Issue Date	: 06-Nov-2015 12:58
Site	: Fishermans Bend		
		No. of samples received	: 14
Quote number	: ----	No. of samples analysed	: 5

This report supersedes any previous report(s) with this reference. Results apply to the sample(s) as submitted.

This Certificate of Analysis contains the following information:

- General Comments
- Analytical Results

NATA Accredited Laboratory 825

Accredited for compliance with ISO/IEC 17025.

Signatories

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

Signatories	*Position*	*Accreditation Category*
Dilani Fernando	Senior Inorganic Chemist	Melbourne Inorganics
Kim McCabe	Senior Inorganic Chemist	Brisbane Inorganics
Nancy Wang	Senior Semivolatile Instrument Chemist	Melbourne Organics
Satishkumar Trivedi	Acid Sulfate Soils Supervisor	Brisbane Acid Sulphate Soils

General Comments

The analytical procedures used by the Environmental Division have been developed from established internationally recognized procedures such as those published by the USEPA, APHA, AS and NEPM. In house developed procedures are employed in the absence of documented standards or by 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.

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.

Analytical Results

Sub-Matrix: SOIL (Matrix: SOIL)				Client sample ID	GW08(3.1-3.2)	GW16(2.2-2.3)	GW02(3.9-4.0)	----	----
				Client sampling date / time	[27-Oct-2015]	[27-Oct-2015]	[27-Oct-2015]	----	----
Compound	CAS Number	LOR	Unit		EM1516404-003	EM1516404-006	EM1516404-012	--------	--------
					Result	Result	Result	Result	Result
EA055: Moisture Content									
^ **Moisture Content (dried @ 103°C)**	----	1	%		**17.4**	**18.6**	**52.6**	**----**	**----**
EP003: Total Organic Carbon (TOC) in Soil									
Total Organic Carbon	----	0.02	%		**0.07**	**0.06**	**18.1**	**----**	**----**

Analytical Results

Sub-Matrix: WATER (Matrix: WATER)				Client sample ID	QC19	QC20	----	----	----
				Client sampling date / time	[27-Oct-2015]	[27-Oct-2015]	----	----	----
Compound	CAS Number	LOR	Unit		EM1516404-013	EM1516404-014	--------	--------	--------
					Result	Result	Result	Result	Result
EG020T: Total Metals by ICP-MS									
Aluminium	7429-90-5	0.01	mg/L		----	<0.01	----	----	----
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	----	----	----
Nickel	7440-02-0	0.001	mg/L		----	<0.001	----	----	----
Lead	7439-92-1	0.001	mg/L		----	<0.001	----	----	----
Zinc	7440-66-6	0.005	mg/L		----	<0.005	----	----	----
Selenium	7782-49-2	0.01	mg/L		----	<0.01	----	----	----
Iron	7439-89-6	0.05	mg/L		----	<0.05	----	----	----
EG035T: Total Recoverable Mercury by FIMS									
Mercury	7439-97-6	0.0001	mg/L		----	<0.0001	----	----	----
EP080/071: Total Petroleum Hydrocarbons									
C6 - C9 Fraction	----	20	µg/L		<20	<20	----	----	----
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	----	----	----
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	1330-20-7	2	µg/L		<2	<2	----	----	----
^ Sum of BTEX	----	1	µg/L		<1	<1	----	----	----
Naphthalene	91-20-3	5	µg/L		<5	<5	----	----	----
EP080S: TPH(V)/BTEX Surrogates									
1.2-Dichloroethane-D4	17060-07-0	2	%		**106**	**107**	----	----	----
Toluene-D8	2037-26-5	2	%		**94.8**	**98.1**	----	----	----
4-Bromofluorobenzene	460-00-4	2	%		**98.5**	**98.5**	----	----	----

ALS Environmental

QUALITY CONTROL REPORT

Work Order	: **EM1516404**	Page	: 1 of 6
Client	: **AECOM Australia Pty Ltd**	Laboratory	: Environmental Division Melbourne
Contact	: MS AVERYLL COYNE	Contact	: Carol Walsh
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Facsimile	: +61 03 9654 7117	Facsimile	: +61-3-8549 9601
Project	: 60431087	QC Level	: NEPM 2013 Schedule B(3) and ALS QCS3 requirement
Order number	: 60431087 Task 1.4	Date Samples Received	: 28-Oct-2015
C-O-C number	: ----	Date Analysis Commenced	: 02-Nov-2015
Sampler	: MATTHEW SHEPPARD	Issue Date	: 06-Nov-2015
Site	: Fishermans Bend	No. of samples received	: 14
Quote number	: ----	No. of samples analysed	: 5

This report supersedes any previous report(s) with this reference. Results apply to the sample(s) as submitted.

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

NATA WORLD RECOGNISED ACCREDITATION

NATA Accredited Laboratory 825

Accredited for compliance with ISO/IEC 17025.

Signatories

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

Signatories	*Position*	*Accreditation Category*
Dilani Fernando	Senior Inorganic Chemist	Melbourne Inorganics
Kim McCabe	Senior Inorganic Chemist	Brisbane Inorganics
Nancy Wang	Senior Semivolatile Instrument Chemist	Melbourne Organics
Satishkumar Trivedi	Acid Sulfate Soils Supervisor	Brisbane Acid Sulphate Soils

General Comments

The analytical procedures used by the Environmental Division have been developed from established internationally recognized procedures such as those published by the USEPA, APHA, AS and NEPM. In house developed procedures are employed in the absence of documented standards or by 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

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	*Client sample ID*	*Method: Compound*	*CAS Number*	*LOR*	*Unit*	*Original Result*	*Duplicate Result*	*RPD (%)*	*Recovery Limits (%)*
EA055: Moisture Content (QC Lot: 266347)									
EM1516404-003	GW08(3.1-3.2)	EA055-103: Moisture Content (dried @ 103°C)	----	1	%	17.4	17.5	0.00	0% - 50%
EP003: Total Organic Carbon (TOC) in Soil (QC Lot: 265288)									
EM1516404-003	GW08(3.1-3.2)	EP003: Total Organic Carbon	----	0.02	%	0.07	0.08	0.00	No Limit

Sub-Matrix: **WATER**

				Laboratory Duplicate (DUP) Report					
Laboratory sample ID	*Client sample ID*	*Method: Compound*	*CAS Number*	*LOR*	*Unit*	*Original Result*	*Duplicate Result*	*RPD (%)*	*Recovery Limits (%)*
EG020T: Total Metals by ICP-MS (QC Lot: 267358)									
EM1516287-001	Anonymous	EG020A-T: Cadmium	7440-43-9	0.0001	mg/L	0.0001	<0.0001	0.00	No Limit
		EG020A-T: Arsenic	7440-38-2	0.001	mg/L	0.008	0.008	0.00	No Limit
		EG020A-T: Chromium	7440-47-3	0.001	mg/L	0.002	0.002	0.00	No Limit
		EG020A-T: Copper	7440-50-8	0.001	mg/L	0.002	0.002	0.00	No Limit
		EG020A-T: Lead	7439-92-1	0.001	mg/L	0.007	0.007	0.00	No Limit
		EG020A-T: Nickel	7440-02-0	0.001	mg/L	0.008	0.008	0.00	No Limit
		EG020A-T: Zinc	7440-66-6	0.005	mg/L	0.032	0.037	16.8	No Limit
		EG020A-T: Aluminium	7429-90-5	0.01	mg/L	0.38	0.36	4.01	0% - 20%
		EG020A-T: Selenium	7782-49-2	0.01	mg/L	<0.01	<0.01	0.00	No Limit
		EG020A-T: Iron	7439-89-6	0.05	mg/L	79.0	75.6	4.35	0% - 20%
EM1516287-010	Anonymous	EG020A-T: Cadmium	7440-43-9	0.0001	mg/L	0.0018	0.0014	31.4	0% - 50%
		EG020A-T: Arsenic	7440-38-2	0.001	mg/L	0.002	0.002	0.00	No Limit
		EG020A-T: Chromium	7440-47-3	0.001	mg/L	<0.001	<0.001	0.00	No Limit
		EG020A-T: Copper	7440-50-8	0.001	mg/L	<0.001	0.001	0.00	No Limit
		EG020A-T: Lead	7439-92-1	0.001	mg/L	0.004	0.003	0.00	No Limit
		EG020A-T: Nickel	7440-02-0	0.001	mg/L	0.020	0.021	0.00	0% - 50%
		EG020A-T: Zinc	7440-66-6	0.005	mg/L	0.186	0.186	0.00	0% - 20%
		EG020A-T: Aluminium	7429-90-5	0.01	mg/L	0.60	0.63	4.92	0% - 20%
		EG020A-T: Selenium	7782-49-2	0.01	mg/L	0.01	0.01	0.00	No Limit
		EG020A-T: Iron	7439-89-6	0.05	mg/L	1.98	1.92	2.93	0% - 20%
EG035T: Total Recoverable Mercury by FIMS (QC Lot: 263395)									
EM1516331-024	Anonymous	EG035T: Mercury	7439-97-6	0.0001	mg/L	<0.0001	<0.0001	0.00	No Limit
EM1516360-010	Anonymous	EG035T: Mercury	7439-97-6	0.0001	mg/L	<0.0001	<0.0001	0.00	No Limit
EP080/071: Total Petroleum Hydrocarbons (QC Lot: 266947)									
EM1516473-019	Anonymous	EP080: C6 - C9 Fraction	----	20	µg/L	<20	<20	0.00	No Limit
EP080/071: Total Recoverable Hydrocarbons - NEPM 2013 Fractions (QC Lot: 266947)									
EM1516473-019	Anonymous	EP080: C6 - C10 Fraction	C6_C10	20	µg/L	<20	<20	0.00	No Limit
EP080: BTEXN (QC Lot: 266947)									
EM1516473-019	Anonymous	EP080: Benzene	71-43-2	1	µg/L	<1	<1	0.00	No Limit

Sub-Matrix: **WATER**

				Laboratory Duplicate (DUP) Report					
Laboratory sample ID	*Client sample ID*	*Method: Compound*	*CAS Number*	*LOR*	*Unit*	*Original Result*	*Duplicate Result*	*RPD (%)*	*Recovery Limits (%)*
EP080: BTEXN (QC Lot: 266947) - continued									
EM1516473-019	Anonymous	EP080: Ethylbenzene	100-41-4	2	µg/L	<2	<2	0.00	No Limit
		EP080: meta- & para-Xylene	108-38-3 106-42-3	2	µg/L	<2	<2	0.00	No Limit
		EP080: ortho-Xylene	95-47-6	2	µg/L	<2	<2	0.00	No Limit
		EP080: Toluene	108-88-3	2	µg/L	<2	<2	0.00	No Limit
		EP080: Naphthalene	91-20-3	5	µg/L	<5	<5	0.00	No Limit

Method Blank (MB) and Laboratory Control Spike (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 (%)	Recovery Limits (%)	
Method: Compound	CAS Number	LOR	Unit	Result	Concentration	LCS	Low	High
EP003: Total Organic Carbon (TOC) in Soil (QCLot: 265288)								
EP003: Total Organic Carbon	----	0.02	%	<0.02	100 %	95.2	70	130

Sub-Matrix: **WATER**

				Method Blank (MB) Report	Laboratory Control Spike (LCS) Report			
					Spike	Spike Recovery (%)	Recovery Limits (%)	
Method: Compound	CAS Number	LOR	Unit	Result	Concentration	LCS	Low	High
EG020T: Total Metals by ICP-MS (QCLot: 267358)								
EG020A-T: Aluminium	7429-90-5	0.01	mg/L	<0.01	0.5 mg/L	104	100	108
EG020A-T: Arsenic	7440-38-2	0.001	mg/L	<0.001	0.1 mg/L	104	94	116
EG020A-T: Cadmium	7440-43-9	0.0001	mg/L	<0.0001	0.1 mg/L	107	90	110
EG020A-T: Chromium	7440-47-3	0.001	mg/L	<0.001	0.1 mg/L	97.6	90	110
EG020A-T: Copper	7440-50-8	0.001	mg/L	<0.001	0.1 mg/L	99.7	91	109
EG020A-T: Iron	7439-89-6	0.05	mg/L	<0.05	0.5 mg/L	107	99	109
EG020A-T: Lead	7439-92-1	0.001	mg/L	<0.001	0.1 mg/L	96.6	91	111
EG020A-T: Nickel	7440-02-0	0.001	mg/L	<0.001	0.1 mg/L	103	91	111
EG020A-T: Selenium	7782-49-2	0.01	mg/L	<0.01	0.1 mg/L	105	86	110
EG020A-T: Zinc	7440-66-6	0.005	mg/L	<0.005	0.1 mg/L	106	91	109
EG035T: Total Recoverable Mercury by FIMS (QCLot: 263395)								
EG035T: Mercury	7439-97-6	0.0001	mg/L	<0.0001	0.01 mg/L	91.9	87	113
EP080/071: Total Petroleum Hydrocarbons (QCLot: 266947)								
EP080: C6 - C9 Fraction	----	20	µg/L	<20	360 µg/L	92.1	67	127
EP080/071: Total Recoverable Hydrocarbons - NEPM 2013 Fractions (QCLot: 266947)								
EP080: C6 - C10 Fraction	C6_C10	20	µg/L	<20	450 µg/L	88.9	65	125
EP080: BTEXN (QCLot: 266947)								
EP080: Benzene	71-43-2	1	µg/L	<1	20 µg/L	99.6	76	120
EP080: Ethylbenzene	100-41-4	2	µg/L	<2	20 µg/L	96.4	72	124
EP080: meta- & para-Xylene	108-38-3 106-42-3	2	µg/L	<2	40 µg/L	97.2	72	130
EP080: Naphthalene	91-20-3	5	µg/L	<5	5 µg/L	97.2	71	129
EP080: ortho-Xylene	95-47-6	2	µg/L	<2	20 µg/L	95.6	75	127
EP080: Toluene	108-88-3	2	µg/L	<2	20 µg/L	99.8	76	124

Matrix Spike (MS) Report

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

Sub-Matrix: **WATER**

				Matrix Spike (MS) Report			
				Spike	SpikeRecovery(%)	Recovery Limits (%)	
Laboratory sample ID	*Client sample ID*	*Method: Compound*	*CAS Number*	*Concentration*	*MS*	*Low*	*High*
EG020T: Total Metals by ICP-MS (QCLot: 267358)							
EM1516287-001	Anonymous	EG020A-T: Arsenic	7440-38-2	1 mg/L	107	82	118
		EG020A-T: Cadmium	7440-43-9	0.25 mg/L	87.9	75	129
		EG020A-T: Chromium	7440-47-3	1 mg/L	101	80	118
		EG020A-T: Copper	7440-50-8	1 mg/L	107	81	115
		EG020A-T: Lead	7439-92-1	1 mg/L	110	83	121
		EG020A-T: Nickel	7440-02-0	1 mg/L	110	80	118
		EG020A-T: Zinc	7440-66-6	1 mg/L	106	74	116
EG035T: Total Recoverable Mercury by FIMS (QCLot: 263395)							
EM1516342-001	Anonymous	EG035T: Mercury	7439-97-6	0.01 mg/L	97.9	70	130
EP080/071: Total Petroleum Hydrocarbons (QCLot: 266947)							
EM1516404-014	QC20	EP080: C6 - C9 Fraction	----	280 µg/L	67.7	43	125
EP080/071: Total Recoverable Hydrocarbons - NEPM 2013 Fractions (QCLot: 266947)							
EM1516404-014	QC20	EP080: C6 - C10 Fraction	C6_C10	330 µg/L	64.3	44	122
EP080: BTEXN (QCLot: 266947)							
EM1516404-014	QC20	EP080: Benzene	71-43-2	20 µg/L	86.3	68	130
		EP080: Toluene	108-88-3	20 µg/L	86.7	72	132

ALS Environmental

QA/QC Compliance Assessment for DQO Reporting

Work Order	: **EM1516404**	Page	: 1 of 4
Client	: **AECOM Australia Pty Ltd**	Laboratory	: Environmental Division Melbourne
Contact	: MS AVERYLL COYNE	Telephone	: +61-3-8549 9608
Project	: 60431087	Date Samples Received	: 28-Oct-2015
Site	: Fishermans Bend	Issue Date	: 06-Nov-2015
Sampler	: MATTHEW SHEPPARD	No. of samples received	: 14
Order number	: 60431087 Task 1.4	No. of samples analysed	: 5

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

- **NO Quality Control Sample Frequency Outliers exist.**

Analysis Holding Time Compliance

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							
Soil Glass Jar - Unpreserved (EA055-103)							
GW08(3.1-3.2), GW16(2.2-2.3), GW02(3.9-4.0)	**27-Oct-2015**	**----**	----	----	**04-Nov-2015**	10-Nov-2015	✓
EP003: Total Organic Carbon (TOC) in Soil							
Soil Glass Jar - Unpreserved (EP003)							
GW08(3.1-3.2), GW16(2.2-2.3), GW02(3.9-4.0)	**27-Oct-2015**	**03-Nov-2015**	24-Nov-2015	✓	**03-Nov-2015**	24-Nov-2015	✓

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)							
QC20	**27-Oct-2015**	**05-Nov-2015**	24-Apr-2016	✓	**05-Nov-2015**	24-Apr-2016	✓
EG035T: Total Recoverable Mercury by FIMS							
Clear Plastic Bottle - Nitric Acid; Unfiltered (EG035T)							
QC20	**27-Oct-2015**	**----**	----	----	**02-Nov-2015**	24-Nov-2015	✓
EP080/071: Total Petroleum Hydrocarbons							
Amber TOC Vial - Sulfuric Acid (EP080)							
QC20	**27-Oct-2015**	**05-Nov-2015**	10-Nov-2015	✓	**05-Nov-2015**	10-Nov-2015	✓
Amber VOC Vial - Sulfuric Acid (EP080)							
QC19	**27-Oct-2015**	**05-Nov-2015**	10-Nov-2015	✓	**05-Nov-2015**	10-Nov-2015	✓

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	EA055-103	1	8	12.50	10.00	✓	NEPM 2013 Schedule B(3) and ALS QCS3 requirement
Total Organic Carbon	EP003	1	3	33.33	10.00	✓	NEPM 2013 Schedule B(3) and ALS QCS3 requirement
Laboratory Control Samples (LCS)							
Total Organic Carbon	EP003	1	3	33.33	5.00	✓	NEPM 2013 Schedule B(3) and ALS QCS3 requirement
Method Blanks (MB)							
Total Organic Carbon	EP003	1	3	33.33	5.00	✓	NEPM 2013 Schedule B(3) and ALS QCS3 requirement

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)							
Total Mercury by FIMS	EG035T	2	20	10.00	10.00	✓	NEPM 2013 Schedule B(3) and ALS QCS3 requirement
Total Metals by ICP-MS - Suite A	EG020A-T	2	20	10.00	10.00	✓	NEPM 2013 Schedule B(3) and ALS QCS3 requirement
TRH Volatiles/BTEX	EP080	1	7	14.29	10.00	✓	NEPM 2013 Schedule B(3) and ALS QCS3 requirement
Laboratory Control Samples (LCS)							
Total Mercury by FIMS	EG035T	1	20	5.00	5.00	✓	NEPM 2013 Schedule B(3) and ALS QCS3 requirement
Total Metals by ICP-MS - Suite A	EG020A-T	1	20	5.00	5.00	✓	NEPM 2013 Schedule B(3) and ALS QCS3 requirement
TRH Volatiles/BTEX	EP080	1	7	14.29	5.00	✓	NEPM 2013 Schedule B(3) and ALS QCS3 requirement
Method Blanks (MB)							
Total Mercury by FIMS	EG035T	1	20	5.00	5.00	✓	NEPM 2013 Schedule B(3) and ALS QCS3 requirement
Total Metals by ICP-MS - Suite A	EG020A-T	1	20	5.00	5.00	✓	NEPM 2013 Schedule B(3) and ALS QCS3 requirement
TRH Volatiles/BTEX	EP080	1	7	14.29	5.00	✓	NEPM 2013 Schedule B(3) and ALS QCS3 requirement
Matrix Spikes (MS)							
Total Mercury by FIMS	EG035T	1	20	5.00	5.00	✓	NEPM 2013 Schedule B(3) and ALS QCS3 requirement
Total Metals by ICP-MS - Suite A	EG020A-T	1	20	5.00	5.00	✓	NEPM 2013 Schedule B(3) and ALS QCS3 requirement
TRH Volatiles/BTEX	EP080	1	7	14.29	5.00	✓	NEPM 2013 Schedule B(3) and ALS QCS3 requirement

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	EA055-103	SOIL	In-house. A gravimetric procedure based on weight loss over a 12 hour drying period at 103-105 degrees C. This method is compliant with NEPM (2013) Schedule B(3) Section 7.1 and Table 1 (14 day holding time).
Total Organic Carbon	EP003	SOIL	In-house C-IR17. Dried and pulverised sample is reacted with acid to remove inorganic Carbonates, then combusted in a LECO furnace in the presence of strong oxidants / catalysts. The evolved (Organic) Carbon (as CO2) is automaticaly measured by infra-red detector.
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 (2013) Schedule B(3)
TRH Volatiles/BTEX	EP080	WATER	USEPA SW 846 - 8260B 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 (2013) Schedule B(3)

Preparation Methods	Method	Matrix	Method Descriptions
Dry and Pulverise (up to 100g)	GEO30	SOIL	#
Digestion for Total Recoverable Metals	EN25	WATER	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 (2013) Schedule B(3)

SAMPLE RECEIPT NOTIFICATION (SRN)

Work Order : **EM1516404**

Client	: **AECOM Australia Pty Ltd**	Laboratory	: Environmental Division Melbourne
Contact	: MS AVERYLL COYNE	Contact	: Carol Walsh
Address	: LEVEL 9 8 EXHIBITION ST MELBOURNE VIC 3000	Address	: 4 Westall Rd Springvale VIC Australia 3171
E-mail	: averyll.coyne@aecom.com	E-mail	: carol.walsh@alsglobal.com
Telephone	: +61 03 9653 1234	Telephone	: +61-3-8549 9608
Facsimile	: +61 03 9654 7117	Facsimile	: +61-3-8549 9601
Project	: 60431087	Page	: 1 of 3
Order number	: ----	Quote number	: EB2015AECOMAU0580 (EN/004/15)
C-O-C number	: ----	QC Level	: NEPM 2013 Schedule B(3) and ALS QCS3 requirement
Site	: Fishermans Bend		
Sampler	: MATTHEW SHEPPARD		

Dates

Date Samples Received	: 28-Oct-2015 10:20 AM	Issue Date	: 29-Oct-2015
Client Requested Due Date	: 06-Nov-2015	Scheduled Reporting Date	: **09-Nov-2015**

Delivery Details

Mode of Delivery	: Undefined	Security Seal	: Intact.
No. of coolers/boxes	: 1	Temperature	: 5.1°C - Ice present
Receipt Detail	:	No. of samples received / analysed	: 14 / 5

General Comments

- This report contains the following information:
  - Sample Container(s)/Preservation Non-Compliances
  - Summary of Sample(s) and Requested Analysis
  - Proactive Holding Time Report
  - Requested Deliverables
- **Please direct any queries related to sample condition / numbering / breakages to Client Services.**
- Sample Disposal - Aqueous (14 days), Solid (60 days) from date of completion of work order.
- **Analytical work for this work order will be conducted at ALS Springvale and ALS Brisbane.**
- **Please refer to the Proactive Holding Time Report table below which summarises breaches of recommended holding times that have occurred prior to samples/instructions being received at the laboratory. The absence of this summary table indicates that all samples have been received within the recommended holding times for the analysis requested.**

Sample Container(s)/Preservation Non-Compliances

All comparisons are made against pretreatment/preservation AS, APHA, USEPA standards.

- **No sample container / preservation non-compliance exist.**

Summary of Sample(s) and Requested Analysis

Some items described below may be part of a laboratory process necessary for the execution of client requested tasks. Packages may contain additional analyses, such as the determination of moisture content and preparation tasks, that are included in the package.

Matrix: **SOIL**

Laboratory sample ID	Client sampling date / time	Client sample ID	(On Hold) SOIL No analysis requested	SOIL - EA055-103 Moisture Content	SOIL - EP003 Total Organic Carbon (TOC) in Soil
EM1516404-001	[27-Oct-2015]	GW08(1.9-2.0)	✓		
EM1516404-002	[27-Oct-2015]	GW08(2.9-3.0)	✓		
EM1516404-003	[27-Oct-2015]	GW08(3.1-3.2)		✓	✓
EM1516404-004	[27-Oct-2015]	GW08(3.9-4.0)	✓		
EM1516404-005	[27-Oct-2015]	GW16(1.9-2.0)	✓		
EM1516404-006	[27-Oct-2015]	GW16(2.2-2.3)		✓	✓
EM1516404-007	[27-Oct-2015]	GW16(2.9-3.0)	✓		
EM1516404-008	[27-Oct-2015]	GW16(3.9-4.0)	✓		
EM1516404-009	[27-Oct-2015]	GW02(1.6-1.7)	✓		
EM1516404-010	[27-Oct-2015]	GW02(2.0-2.1)	✓		
EM1516404-011	[27-Oct-2015]	GW02(2.9-3.0)	✓		
EM1516404-012	[27-Oct-2015]	GW02(3.9-4.0)		✓	✓

Matrix: **WATER**

Laboratory sample ID	Client sampling date / time	Client sample ID	WATER - EG020T Total Recoverable Metals by ICPMS (including	WATER - W-02T 8 metals (Total)	WATER - W-18 TRH(C6 - C9)/BTEXN
EM1516404-013	[27-Oct-2015]	QC19			✓
EM1516404-014	[27-Oct-2015]	QC20	✓	✓	✓

Proactive Holding Time Report

Sample(s) have been received within the recommended holding times for the requested analysis.

Requested Deliverables

AP_CUSTOMER SERVICE ANZ

- A4 - AU Tax Invoice (INV)	Email	ap_customerservice.anz@aecom.com

AVERYLL COYNE

- *AU Certificate of Analysis - NATA (COA)	Email	averyll.coyne@aecom.com
- *AU Interpretive QC Report - DEFAULT (Anon QCI Rep) (QCI)	Email	averyll.coyne@aecom.com
- *AU QC Report - DEFAULT (Anon QC Rep) - NATA (QC)	Email	averyll.coyne@aecom.com
- A4 - AU Sample Receipt Notification - Environmental HT (SRN)	Email	averyll.coyne@aecom.com
- A4 - AU Tax Invoice (INV)	Email	averyll.coyne@aecom.com
- Chain of Custody (CoC) (COC)	Email	averyll.coyne@aecom.com
- EDI Format - ENMRG (ENMRG)	Email	averyll.coyne@aecom.com
- EDI Format - ESDAT (ESDAT)	Email	averyll.coyne@aecom.com
- EDI Format - HLAPro (HLAPro)	Email	averyll.coyne@aecom.com
- EDI Format - XTab (XTAB)	Email	averyll.coyne@aecom.com

COC Received at 17:11 on 28/10

Form:

AECOM

Chain of Custody & Analysis Request Form

AECOM - Melbourne
Level 9, 8 Exhibition Street
Melbourne VIC 3000
Tel: 03 9653 8072
Fax: 61 3 9653 1234
Email: averyll.coyne@aecom.com

Laboratory Details
Lab. Name: ALS
Lab. Address: 4 Westall Rd, Springvale
Contact Name:
Lab. Ref:
Tel: 8549 9600
Fax:
Preliminary Report by:
Final Report by:
Lab Quote No:

Project Name: Fishermans Bend
Project Number: 60431087
Purchase Order Number: NA

Sample collected by: Matthew Sheppard
Sample Results to be returned to: Averyll Coyne

Specifications:

	(Tick)		
1. Urgent TAT required? (please circle: 24hr 48hr ___3___days)	☐ Yes	☑ No	☐ N/A
2. Fast TAT Guarantee Required?	☐ Yes	☑ No	☐ N/A
3. Is any sediment layer present in waters to be excluded from extractions?	☐ Yes	☑ No	☐ N/A
4. Special storage requirements?	☐ Yes	☑ No	☐ N/A
5. Preservation requirements: ☐ Fax ☐ Hard copy ☑ Email	☐ Yes	☑ No	☐ N/A
6. Other requirements?	☑ Yes	☐ No	☐ N/A

7. Report Format: Email with QC reports
8. Project Manager: Averyll Coyne tel: 9653 8072

Lab. ID	Sample ID	Sampling Date & time (on)	Sampling Date & Time (off)	Matrix: soil	Matrix: water	Matrix: other	Preservation: filt'ed	Preservation: acid	Preservation: ice	Preservation: other	Container (No. & type)	TOC	Moisture Content	TRH(C6-C40)	Full VOC Scan (70 Analytes) - Code EP074(A-H)	PAH	Metals	TRH, BTEX and metals	pH and sulfate	Remarks & comments
1	GW08(1.9-2.0)	27/10/2015		x					x		Jar									Metals (As, Cd, Cr, Cu, Pb, Ni, Zn, Al, Fe, Se, Hg)
2	GW08(2.9-3.0)	27/10/2015		x					x		Jar									
3	GW08(3.1-3.2)	27/10/2015		x					x		Jar	x	x							
4	GW08(3.9-4.0)	27/10/2015		x					x		Jar									
5	GW16(1.9-2.0)	27/10/2015		x					x		Jar									
6	GW16(2.2-2.3)	27/10/2015		x					x		Jar	x	x							
7	GW16(2.9-3.0)	27/10/2015		x					x		Jar									
8	GW16(3.9-4.0)	27/10/2015		x					x		Jar									
9	GW02(1.6-1.7)	27/10/2015		x					x		Jar									
10	GW02(2.0-2.1)	27/10/2015		x					x		Jar									
11	GW02(2.9-3.0)	27/10/2015		x					x		Jar									
12	GW02(3.9-4.0)	27/10/2015		x					x		Jar	x	x							
13	QC19	27/10/2015			x				x		Bottles			x						
14	QC20	27/10/2015			x				x		Bottles							x		

Environmental Division
Melbourne
Work Order Reference
EM1516404

Telephone : +61-3-8549 9600

Relinquished By:	Received by:		
Name: Matthew Sheppard	Name: [signature]	Date: 28/10	Received in good condition? Yes/No/NA
Date: 28/10/2015			Samples received chilled? Yes/No/NA
of: AECOM Time: 9:00	of: ALS	Time: 18:20	Method of Shipment / Consignment Note No. / Transport Co:
Relinquished By:	**Received by:**		
Name: Date:	Name: Date:		Received in good condition? Yes/No/NA; Samples received chilled? Yes/No/NA; Method of Shipment / Consignment Note No. / Transport Co:
of: Time:	of: Time:		

ALS Environmental

CERTIFICATE OF ANALYSIS

Work Order	: **EM1516473**	Page	: 1 of 3
Client	: **AECOM Australia Pty Ltd**	Laboratory	: Environmental Division Melbourne
Contact	: MS AVERYLL COYNE	Contact	: Carol Walsh
Address	: LEVEL 9 8 EXHIBITION ST MELBOURNE VIC 3000	Address	: 4 Westall Rd Springvale VIC Australia 3171
E-mail	: averyll.coyne@aecom.com	E-mail	: carol.walsh@alsglobal.com
Telephone	: +61 03 9653 1234	Telephone	: +61-3-8549 9608
Facsimile	: +61 03 9654 7117	Facsimile	: +61-3-8549 9601
Project	: 60431087	QC Level	: NEPM 2013 Schedule B(3) and ALS QCS3 requirement
Order number	: 60431087 Task 1.4	Date Samples Received	: 29-Oct-2015 11:55
C-O-C number	: ----	Date Analysis Commenced	: 02-Nov-2015
Sampler	: MATTHEW SHEPPARD	Issue Date	: 06-Nov-2015 15:41
Site	: Fishermans Bend		
		No. of samples received	: 19
Quote number	: ----	No. of samples analysed	: 2

This report supersedes any previous report(s) with this reference. Results apply to the sample(s) as submitted.

This Certificate of Analysis contains the following information:

- General Comments
- Analytical Results

NATA Accredited Laboratory 825

Accredited for compliance with ISO/IEC 17025.

Signatories

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

Signatories	*Position*	*Accreditation Category*
Dilani Fernando	Senior Inorganic Chemist	Melbourne Inorganics
Nancy Wang	Senior Semivolatile Instrument Chemist	Melbourne Organics

General Comments

The analytical procedures used by the Environmental Division have been developed from established internationally recognized procedures such as those published by the USEPA, APHA, AS and NEPM. In house developed procedures are employed in the absence of documented standards or by 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.

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.

Analytical Results

Sub-Matrix: WATER (Matrix: WATER)				Client sample ID	QC21	QC22	----	----	----
				Client sampling date / time	[28-Oct-2015]	[28-Oct-2015]	----	----	----
Compound	CAS Number	LOR	Unit		EM1516473-018	EM1516473-019	--------	--------	--------
					Result	Result	Result	Result	Result
EG020T: Total Metals by ICP-MS									
Aluminium	7429-90-5	0.01	mg/L		----	<0.01	----	----	----
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	----	----	----
Nickel	7440-02-0	0.001	mg/L		----	<0.001	----	----	----
Lead	7439-92-1	0.001	mg/L		----	<0.001	----	----	----
Zinc	7440-66-6	0.005	mg/L		----	<0.005	----	----	----
Selenium	7782-49-2	0.01	mg/L		----	<0.01	----	----	----
Iron	7439-89-6	0.05	mg/L		----	<0.05	----	----	----
EG035T: Total Recoverable Mercury by FIMS									
Mercury	7439-97-6	0.0001	mg/L		----	<0.0001	----	----	----
EP080/071: Total Petroleum Hydrocarbons									
C6 - C9 Fraction	----	20	µg/L		<20	<20	----	----	----
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	----	----	----
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**	1330-20-7	2	µg/L		<2	<2	----	----	----
^ **Sum of BTEX**	----	1	µg/L		<1	<1	----	----	----
Naphthalene	91-20-3	5	µg/L		<5	<5	----	----	----
EP080S: TPH(V)/BTEX Surrogates									
1.2-Dichloroethane-D4	17060-07-0	2	%		**107**	**110**	----	----	----
Toluene-D8	2037-26-5	2	%		**98.9**	**98.1**	----	----	----
4-Bromofluorobenzene	460-00-4	2	%		**97.8**	**98.1**	----	----	----

ALS Environmental

QUALITY CONTROL REPORT

Work Order	: **EM1516473**	Page	: 1 of 5
Client	: **AECOM Australia Pty Ltd**	Laboratory	: Environmental Division Melbourne
Contact	: MS AVERYLL COYNE	Contact	: Carol Walsh
Address	: LEVEL 9 8 EXHIBITION ST MELBOURNE VIC 3000	Address	: 4 Westall Rd Springvale VIC Australia 3171
E-mail	: averyll.coyne@aecom.com	E-mail	: carol.walsh@alsglobal.com
Telephone	: +61 03 9653 1234	Telephone	: +61-3-8549 9608
Facsimile	: +61 03 9654 7117	Facsimile	: +61-3-8549 9601
Project	: 60431087	QC Level	: NEPM 2013 Schedule B(3) and ALS QCS3 requirement
Order number	: 60431087 Task 1.4	Date Samples Received	: 29-Oct-2015
C-O-C number	: ----	Date Analysis Commenced	: 02-Nov-2015
Sampler	: MATTHEW SHEPPARD	Issue Date	: 06-Nov-2015
Site	: Fishermans Bend	No. of samples received	: 19
Quote number	: ----	No. of samples analysed	: 2

This report supersedes any previous report(s) with this reference. Results apply to the sample(s) as submitted.

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

NATA WORLD RECOGNISED ACCREDITATION

NATA Accredited Laboratory 825

Accredited for compliance with ISO/IEC 17025.

Signatories

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

Signatories	*Position*	*Accreditation Category*
Dilani Fernando	Senior Inorganic Chemist	Melbourne Inorganics
Nancy Wang	Senior Semivolatile Instrument Chemist	Melbourne Organics

General Comments

The analytical procedures used by the Environmental Division have been developed from established internationally recognized procedures such as those published by the USEPA, APHA, AS and NEPM. In house developed procedures are employed in the absence of documented standards or by 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

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	*Client sample ID*	*Method: Compound*	*CAS Number*	*LOR*	*Unit*	*Original Result*	*Duplicate Result*	*RPD (%)*	*Recovery Limits (%)*
EG020T: Total Metals by ICP-MS (QC Lot: 267362)									
EM1516446-004	Anonymous	EG020A-T: Cadmium	7440-43-9	0.0001	mg/L	0.100	0.0848	16.4	0% - 20%
		EG020A-T: Arsenic	7440-38-2	0.001	mg/L	1.66	1.53	7.97	0% - 20%
		EG020A-T: Chromium	7440-47-3	0.001	mg/L	0.064	0.063	1.68	0% - 20%
		EG020A-T: Copper	7440-50-8	0.001	mg/L	1.24	1.11	10.8	0% - 20%
		EG020A-T: Lead	7439-92-1	0.001	mg/L	25.9	25.7	0.833	0% - 20%
		EG020A-T: Nickel	7440-02-0	0.001	mg/L	0.048	0.047	0.00	0% - 20%
		EG020A-T: Zinc	7440-66-6	0.005	mg/L	44.2	37.8	15.5	0% - 20%
		EG020A-T: Aluminium	7429-90-5	0.01	mg/L	44.2	42.1	4.80	0% - 20%
		EG020A-T: Selenium	7782-49-2	0.01	mg/L	0.02	0.02	0.00	No Limit
		EG020A-T: Iron	7439-89-6	0.05	mg/L	99.6	91.9	8.05	0% - 20%
EM1516473-019	QC22	EG020A-T: Cadmium	7440-43-9	0.0001	mg/L	<0.0001	<0.0001	0.00	No Limit
		EG020A-T: Arsenic	7440-38-2	0.001	mg/L	<0.001	<0.001	0.00	No Limit
		EG020A-T: Chromium	7440-47-3	0.001	mg/L	<0.001	<0.001	0.00	No Limit
		EG020A-T: Copper	7440-50-8	0.001	mg/L	<0.001	<0.001	0.00	No Limit
		EG020A-T: Lead	7439-92-1	0.001	mg/L	<0.001	<0.001	0.00	No Limit
		EG020A-T: Nickel	7440-02-0	0.001	mg/L	<0.001	<0.001	0.00	No Limit
		EG020A-T: Zinc	7440-66-6	0.005	mg/L	<0.005	<0.005	0.00	No Limit
		EG020A-T: Aluminium	7429-90-5	0.01	mg/L	<0.01	<0.01	0.00	No Limit
		EG020A-T: Selenium	7782-49-2	0.01	mg/L	<0.01	<0.01	0.00	No Limit
		EG020A-T: Iron	7439-89-6	0.05	mg/L	<0.05	<0.05	0.00	No Limit
EG035T: Total Recoverable Mercury by FIMS (QC Lot: 263396)									
EM1516424-005	Anonymous	EG035T: Mercury	7439-97-6	0.0001	mg/L	<0.0001	<0.0001	0.00	No Limit
EM1516446-006	Anonymous	EG035T: Mercury	7439-97-6	0.0001	mg/L	<0.0001	<0.0001	0.00	No Limit
EP080/071: Total Petroleum Hydrocarbons (QC Lot: 266947)									
EM1516473-019	QC22	EP080: C6 - C9 Fraction	----	20	µg/L	<20	<20	0.00	No Limit
EP080/071: Total Recoverable Hydrocarbons - NEPM 2013 Fractions (QC Lot: 266947)									
EM1516473-019	QC22	EP080: C6 - C10 Fraction	C6_C10	20	µg/L	<20	<20	0.00	No Limit
EP080: BTEXN (QC Lot: 266947)									
EM1516473-019	QC22	EP080: Benzene	71-43-2	1	µg/L	<1	<1	0.00	No Limit
		EP080: Ethylbenzene	100-41-4	2	µg/L	<2	<2	0.00	No Limit
		EP080: meta- & para-Xylene	108-38-3 106-42-3	2	µg/L	<2	<2	0.00	No Limit
		EP080: ortho-Xylene	95-47-6	2	µg/L	<2	<2	0.00	No Limit
		EP080: Toluene	108-88-3	2	µg/L	<2	<2	0.00	No Limit
		EP080: Naphthalene	91-20-3	5	µg/L	<5	<5	0.00	No Limit

Method Blank (MB) and Laboratory Control Spike (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 (%)	Recovery Limits (%)	
Method: Compound	CAS Number	LOR	Unit	Result	Concentration	LCS	Low	High
EG020T: Total Metals by ICP-MS (QCLot: 267362)								
EG020A-T: Aluminium	7429-90-5	0.01	mg/L	<0.01	0.5 mg/L	106	100	108
EG020A-T: Arsenic	7440-38-2	0.001	mg/L	<0.001	0.1 mg/L	105	94	116
EG020A-T: Cadmium	7440-43-9	0.0001	mg/L	<0.0001	0.1 mg/L	102	90	110
EG020A-T: Chromium	7440-47-3	0.001	mg/L	<0.001	0.1 mg/L	97.9	90	110
EG020A-T: Copper	7440-50-8	0.001	mg/L	<0.001	0.1 mg/L	98.1	91	109
EG020A-T: Iron	7439-89-6	0.05	mg/L	<0.05	0.5 mg/L	104	99	109
EG020A-T: Lead	7439-92-1	0.001	mg/L	<0.001	0.1 mg/L	96.7	91	111
EG020A-T: Nickel	7440-02-0	0.001	mg/L	<0.001	0.1 mg/L	99.2	91	111
EG020A-T: Selenium	7782-49-2	0.01	mg/L	<0.01	0.1 mg/L	96.2	86	110
EG020A-T: Zinc	7440-66-6	0.005	mg/L	<0.005	0.1 mg/L	105	91	109
EG035T: Total Recoverable Mercury by FIMS (QCLot: 263396)								
EG035T: Mercury	7439-97-6	0.0001	mg/L	<0.0001	0.01 mg/L	92.5	87	113
EP080/071: Total Petroleum Hydrocarbons (QCLot: 266947)								
EP080: C6 - C9 Fraction	----	20	µg/L	<20	360 µg/L	92.1	67	127
EP080/071: Total Recoverable Hydrocarbons - NEPM 2013 Fractions (QCLot: 266947)								
EP080: C6 - C10 Fraction	C6_C10	20	µg/L	<20	450 µg/L	88.9	65	125
EP080: BTEXN (QCLot: 266947)								
EP080: Benzene	71-43-2	1	µg/L	<1	20 µg/L	99.6	76	120
EP080: Ethylbenzene	100-41-4	2	µg/L	<2	20 µg/L	96.4	72	124
EP080: meta- & para-Xylene	108-38-3 106-42-3	2	µg/L	<2	40 µg/L	97.2	72	130
EP080: Naphthalene	91-20-3	5	µg/L	<5	5 µg/L	97.2	71	129
EP080: ortho-Xylene	95-47-6	2	µg/L	<2	20 µg/L	95.6	75	127
EP080: Toluene	108-88-3	2	µg/L	<2	20 µg/L	99.8	76	124

Matrix Spike (MS) Report

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

Sub-Matrix: **WATER**

				Matrix Spike (MS) Report			
				Spike	SpikeRecovery(%)	Recovery Limits (%)	
Laboratory sample ID	Client sample ID	Method: Compound	CAS Number	Concentration	MS	Low	High
EG020T: Total Metals by ICP-MS (QCLot: 267362)							
EM1516446-004	Anonymous	EG020A-T: Arsenic	7440-38-2	1 mg/L	93.7	82	118

Sub-Matrix: **WATER**

				Matrix Spike (MS) Report			
				Spike	SpikeRecovery(%)	Recovery Limits (%)	
Laboratory sample ID	Client sample ID	Method: Compound	CAS Number	Concentration	MS	Low	High
EG020T: Total Metals by ICP-MS (QCLot: 267362) - continued							
EM1516446-004	Anonymous	EG020A-T: Cadmium	7440-43-9	0.25 mg/L	97.9	75	129
		EG020A-T: Chromium	7440-47-3	1 mg/L	92.0	80	118
		EG020A-T: Copper	7440-50-8	1 mg/L	95.2	81	115
		EG020A-T: Lead	7439-92-1	1 mg/L	# Not Determined	83	121
		EG020A-T: Nickel	7440-02-0	1 mg/L	100.0	80	118
		EG020A-T: Zinc	7440-66-6	1 mg/L	# Not Determined	74	116
EG035T: Total Recoverable Mercury by FIMS (QCLot: 263396)							
EM1516424-006	Anonymous	EG035T: Mercury	7439-97-6	0.01 mg/L	97.6	70	130
EP080/071: Total Petroleum Hydrocarbons (QCLot: 266947)							
EM1516404-014	Anonymous	EP080: C6 - C9 Fraction	----	280 µg/L	67.7	43	125
EP080/071: Total Recoverable Hydrocarbons - NEPM 2013 Fractions (QCLot: 266947)							
EM1516404-014	Anonymous	EP080: C6 - C10 Fraction	C6_C10	330 µg/L	64.3	44	122
EP080: BTEXN (QCLot: 266947)							
EM1516404-014	Anonymous	EP080: Benzene	71-43-2	20 µg/L	86.3	68	130
		EP080: Toluene	108-88-3	20 µg/L	86.7	72	132

ALS Environmental

QA/QC Compliance Assessment for DQO Reporting

Work Order	: **EM1516473**	Page	: 1 of 4
Client	: **AECOM Australia Pty Ltd**	Laboratory	: Environmental Division Melbourne
Contact	: MS AVERYLL COYNE	Telephone	: +61-3-8549 9608
Project	: 60431087	Date Samples Received	: 29-Oct-2015
Site	: Fishermans Bend	Issue Date	: 06-Nov-2015
Sampler	: MATTHEW SHEPPARD	No. of samples received	: 19
Order number	: 60431087 Task 1.4	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.**
- **Matrix Spike outliers exist - please see following pages for full details.**
- **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

- **NO Quality Control Sample Frequency Outliers exist.**

Outliers : Quality Control Samples

Duplicates, Method Blanks, Laboratory Control Samples and Matrix Spikes

Matrix: **WATER**

Compound Group Name	Laboratory Sample ID	Client Sample ID	Analyte	CAS Number	Data	Limits	Comment
Matrix Spike (MS) Recoveries							
EG020T: Total Metals by ICP-MS	EM1516446--004	Anonymous	**Lead**	7439-92-1	Not Determined	----	**MS recovery not determined, background level greater than or equal to 4x spike level.**
EG020T: Total Metals by ICP-MS	EM1516446--004	Anonymous	**Zinc**	7440-66-6	Not Determined	----	**MS recovery not determined, background level greater than or equal to 4x spike level.**

Analysis Holding Time Compliance

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
EG020T: Total Metals by ICP-MS							
Clear Plastic Bottle - Nitric Acid; Unfiltered (EG020A-T)							
QC22	**28-Oct-2015**	**05-Nov-2015**	25-Apr-2016	✓	**05-Nov-2015**	25-Apr-2016	✓
EG035T: Total Recoverable Mercury by FIMS							
Clear Plastic Bottle - Nitric Acid; Unfiltered (EG035T)							
QC22	**28-Oct-2015**	**----**	----	----	**02-Nov-2015**	25-Nov-2015	✓
EP080/071: Total Petroleum Hydrocarbons							
Amber VOC Vial - Sulfuric Acid (EP080)							
QC21, QC22	**28-Oct-2015**	**05-Nov-2015**	11-Nov-2015	✓	**05-Nov-2015**	11-Nov-2015	✓

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)							
Total Mercury by FIMS	EG035T	2	20	**10.00**	**10.00**	✓	NEPM 2013 Schedule B(3) and ALS QCS3 requirement
Total Metals by ICP-MS - Suite A	EG020A-T	2	16	**12.50**	**10.00**	✓	NEPM 2013 Schedule B(3) and ALS QCS3 requirement
TRH Volatiles/BTEX	EP080	1	7	**14.29**	**10.00**	✓	NEPM 2013 Schedule B(3) and ALS QCS3 requirement
Laboratory Control Samples (LCS)							
Total Mercury by FIMS	EG035T	1	20	**5.00**	**5.00**	✓	NEPM 2013 Schedule B(3) and ALS QCS3 requirement
Total Metals by ICP-MS - Suite A	EG020A-T	1	16	**6.25**	**5.00**	✓	NEPM 2013 Schedule B(3) and ALS QCS3 requirement
TRH Volatiles/BTEX	EP080	1	7	**14.29**	**5.00**	✓	NEPM 2013 Schedule B(3) and ALS QCS3 requirement
Method Blanks (MB)							
Total Mercury by FIMS	EG035T	1	20	**5.00**	**5.00**	✓	NEPM 2013 Schedule B(3) and ALS QCS3 requirement
Total Metals by ICP-MS - Suite A	EG020A-T	1	16	**6.25**	**5.00**	✓	NEPM 2013 Schedule B(3) and ALS QCS3 requirement
TRH Volatiles/BTEX	EP080	1	7	**14.29**	**5.00**	✓	NEPM 2013 Schedule B(3) and ALS QCS3 requirement
Matrix Spikes (MS)							
Total Mercury by FIMS	EG035T	1	20	**5.00**	**5.00**	✓	NEPM 2013 Schedule B(3) and ALS QCS3 requirement
Total Metals by ICP-MS - Suite A	EG020A-T	1	16	**6.25**	**5.00**	✓	NEPM 2013 Schedule B(3) and ALS QCS3 requirement
TRH Volatiles/BTEX	EP080	1	7	**14.29**	**5.00**	✓	NEPM 2013 Schedule B(3) and ALS QCS3 requirement

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
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 (2013) Schedule B(3)
TRH Volatiles/BTEX	EP080	WATER	USEPA SW 846 - 8260B 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 (2013) Schedule B(3)

Preparation Methods	Method	Matrix	Method Descriptions
Digestion for Total Recoverable Metals	EN25	WATER	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 (2013) Schedule B(3)

SAMPLE RECEIPT NOTIFICATION (SRN)

Work Order : **EM1516473**

Client	: **AECOM Australia Pty Ltd**	Laboratory	: Environmental Division Melbourne
Contact	: MS AVERYLL COYNE	Contact	: Carol Walsh
Address	: LEVEL 9 8 EXHIBITION ST MELBOURNE VIC 3000	Address	: 4 Westall Rd Springvale VIC Australia 3171
E-mail	: averyll.coyne@aecom.com	E-mail	: carol.walsh@alsglobal.com
Telephone	: +61 03 9653 1234	Telephone	: +61-3-8549 9608
Facsimile	: +61 03 9654 7117	Facsimile	: +61-3-8549 9601
Project	: 60431087	Page	: 1 of 3
Order number	: ----	Quote number	: EB2015AECOMAU0580 (EN/004/15)
C-O-C number	: ----	QC Level	: NEPM 2013 Schedule B(3) and ALS QCS3 requirement
Site	: Fishermans Bend		
Sampler	: MATTHEW SHEPPARD		

Dates

Date Samples Received	: 29-Oct-2015 11:55 AM	Issue Date	: 30-Oct-2015
Client Requested Due Date	: 06-Nov-2015	Scheduled Reporting Date	: **06-Nov-2015**

Delivery Details

Mode of Delivery	: Undefined	Security Seal	: Intact.
No. of coolers/boxes	: 1	Temperature	: 6.6°C - Ice present
Receipt Detail	:	No. of samples received / analysed	: 19 / 2

General Comments

- This report contains the following information:
  - Sample Container(s)/Preservation Non-Compliances
  - Summary of Sample(s) and Requested Analysis
  - Proactive Holding Time Report
  - Requested Deliverables
- **Please direct any queries related to sample condition / numbering / breakages to Client Services.**
- Sample Disposal - Aqueous (14 days), Solid (60 days) from date of completion of work order.
- **Analytical work for this work order will be conducted at ALS Springvale.**
- **Please refer to the Proactive Holding Time Report table below which summarises breaches of recommended holding times that have occurred prior to samples/instructions being received at the laboratory. The absence of this summary table indicates that all samples have been received within the recommended holding times for the analysis requested.**

Sample Container(s)/Preservation Non-Compliances

All comparisons are made against pretreatment/preservation AS, APHA, USEPA standards.

- **No sample container / preservation non-compliance exist.**

Summary of Sample(s) and Requested Analysis

Some items described below may be part of a laboratory process necessary for the execution of client requested tasks. Packages may contain additional analyses, such as the determination of moisture content and preparation tasks, that are included in the package.

Matrix: **SOIL**

Laboratory sample ID	Client sampling date / time	Client sample ID	(On Hold) SOIL No analysis requested
EM1516473-001	[28-Oct-2015]	GW13(0.0-0.1)	✓
EM1516473-002	[28-Oct-2015]	GW13(0.4-0.5)	✓
EM1516473-003	[28-Oct-2015]	GW13(0.9-1.0)	✓
EM1516473-004	[28-Oct-2015]	GW13(1.4-1.5)	✓
EM1516473-005	[28-Oct-2015]	GW09(0.0-0.1)	✓
EM1516473-006	[28-Oct-2015]	GW09(0.4-0.5)	✓
EM1516473-007	[28-Oct-2015]	GW09(1.7-1.8)	✓
EM1516473-008	[28-Oct-2015]	GW33(0.0-0.1)	✓
EM1516473-009	[28-Oct-2015]	GW33(0.5-0.6)	✓
EM1516473-010	[28-Oct-2015]	GW11(0.2-0.3)	✓
EM1516473-011	[28-Oct-2015]	GW11(0.4-0.5)	✓
EM1516473-012	[28-Oct-2015]	GW11(0.9-1.0)	✓
EM1516473-013	[28-Oct-2015]	GW11(1.4-1.5)	✓
EM1516473-014	[28-Oct-2015]	GW15(0.0-0.1)	✓
EM1516473-015	[28-Oct-2015]	GW15(0.5-0.6)	✓
EM1516473-016	[28-Oct-2015]	GW15(0.9-1.0)	✓
EM1516473-017	[28-Oct-2015]	GW15(1.7-1.8)	✓

Matrix: **WATER**

Laboratory sample ID	Client sampling date / time	Client sample ID	WATER - EG020T Total Recoverable Metals by ICPMS (including	WATER - W-02T 8 metals (Total)	WATER - W-18 TRH(C6 - C9)/BTEXN
EM1516473-018	[28-Oct-2015]	QC21			✓
EM1516473-019	[28-Oct-2015]	QC22	✓	✓	✓

Proactive Holding Time Report

Sample(s) have been received within the recommended holding times for the requested analysis.

Requested Deliverables

AP_CUSTOMER SERVICE ANZ

- A4 - AU Tax Invoice (INV)	Email	ap_customerservice.anz@aecom.com

AVERYLL COYNE

- *AU Certificate of Analysis - NATA (COA)	Email	averyll.coyne@aecom.com
- *AU Interpretive QC Report - DEFAULT (Anon QCI Rep) (QCI)	Email	averyll.coyne@aecom.com
- *AU QC Report - DEFAULT (Anon QC Rep) - NATA (QC)	Email	averyll.coyne@aecom.com
- A4 - AU Sample Receipt Notification - Environmental HT (SRN)	Email	averyll.coyne@aecom.com
- A4 - AU Tax Invoice (INV)	Email	averyll.coyne@aecom.com
- Chain of Custody (CoC) (COC)	Email	averyll.coyne@aecom.com
- EDI Format - ENMRG (ENMRG)	Email	averyll.coyne@aecom.com
- EDI Format - ESDAT (ESDAT)	Email	averyll.coyne@aecom.com
- EDI Format - HLAPro (HLAPro)	Email	averyll.coyne@aecom.com
- EDI Format - XTab (XTAB)	Email	averyll.coyne@aecom.com

Form:

AECOM

Chain of Custody & Analysis Request Form

AECOM - Melbourne
Level 9, 8 Exhibition Street
Melbourne VIC 3000
Tel: 03 9653 8072
Fax: 61 3 9653 1234
Email: averyll.coyne@aecom.com

Laboratory Details Tel: 8549 9600
Lab. Name: ALS Fax:
Lab. Address: 4 Westall Rd, Springvale Preliminary Report by:
Contact Name: Final Report by:
Lab. Ref: Lab Quote No:

Project Name: Fishermans Bend **Project Number: 60431087** **Purchase Order Number: NA**

Sample collected by: Matthew Sheppard **Sample Results to be returned to:** Averyll Coyne

Specifications:	(Tick)		
1. Urgent TAT required? (please circle: 24hr 48hr ___3___ days)	☐ Yes	☑ No	☐ N/A
2. Fast TAT Guarantee Required?	☐ Yes	☑ No	☐ N/A
3. Is any sediment layer present in waters to be excluded from extractions?	☐ Yes	☑ No	☐ N/A
4. Special storage requirements?	☐ Yes	☑ No	☐ N/A
5. Preservation requirements ☐ Fax ☐ Hard copy ☑ Email	☐ Yes	☑ No	☐ N/A
6. Other requirements?	☑ Yes	☐ No	☐ N/A

7. Report Format: Email with QC reports 8. Project Manager: Averyll Coyne tel: 9653 8072

Lab. ID	Sample ID	Sampling Date & time (on)	Sampling Date & Time (off)	Matrix: soil	Matrix: water	Matrix: other	Preservation: filt'ed	Preservation: acid	Preservation: ice	Preservation: other	Container (No. & type)	TOC	Moisture Content	TRH(C6-C40)	Full VOC Scan (70 Analytes) - Code EP074(A-H)	PAH	Metals	TRH, BTEX and metals	pH and sulfate	Remarks & comments
1	GW13(0.0-0.1)	28/10/2015		x					x		Jar									Please hold
2	GW13(0.4-0.5)	28/10/2015		x					x		Jar									Please hold
3	GW13(0.9-1.0)	28/10/2015		x					x		Jar									Please hold
4	GW13(1.4-1.5)	28/10/2015		x					x		Jar									Please hold
5	GW09(0.0-0.1)	28/10/2015		x					x		Jar									Please hold
6	GW09(0.4-0.5)	28/10/2015		x					x		Jar									Please hold
7	GW09(1.7-1.8)	28/10/2015		x					x		Jar									Please hold
8	GW33(0.0-0.1)	28/10/2015		x					x		Jar									Please hold
9	GW33(0.5-0.6)	28/10/2015	AM 3:19	x					x		Jar									Please hold
10	GW11(0.2-0.3)	28/10/2015		x					x		Jar									Please hold
11	GW11(0.4-0.5)	28/10/2015		x					x		Jar									Please hold
12	GW11(0.9-1.0)	28/10/2015	1.0-1.1	x					x		Jar									Please hold
13	GW11(1.4-1.5)	28/10/2015		x					x		Jar									Please hold
14	GW15(0.0-0.1)	28/10/2015		x					x		Jar									Please hold
15	GW15(0.5-0.6)	28/10/2015		x					x		Jar									Please hold
16	GW15(0.9-1.0)	28/10/2015		x					x		Jar									Please hold
17	GW15(1.7-1.8)	28/10/2015		x					x		Jar									Please hold
18	QC21	28/10/2015			x						Bottles			x						
19	QC22	28/10/2015			x						Bottles							x		

Relinquished By:	Received by:		
Name: Matthew Sheppard	Date: 29/10/2015	Name:	Date: 29/10
of: AECOM	Time: 9:00	of: ALS	Time: 11:37
Relinquished By:		**Received by:**	
Name:	Date:	Name:	Date:
of:	Time:	of:	Time:

Received in good condition?	Yes/No/NA	Method of Shipment	
Samples received chilled?	Yes/No/NA	Consignment Note No.	
	Yes/No/NA	Transport Co:	
Received in good condition?	Yes/No/NA	Method of Shipment	
Samples received chilled?	Yes/No/NA	Consignment Note No.	
	Yes/No/NA	Transport Co:	

Printed copies of this document are uncontrolled

Environmental Division
Melbourne
Work Order Reference
EM1516473

Telephone : + 61-3-8549 9600

Revision: Oct 09
BMS-PM-DV-F046

Environment

ALS Environmental

CERTIFICATE OF ANALYSIS

Work Order	: **EM1516495**	Page	: 1 of 15
Client	: **AECOM Australia Pty Ltd**	Laboratory	: Environmental Division Melbourne
Contact	: MS AVERYLL COYNE	Contact	: Carol Walsh
Address	: LEVEL 9 8 EXHIBITION ST MELBOURNE VIC 3000	Address	: 4 Westall Rd Springvale VIC Australia 3171
E-mail	: averyll.coyne@aecom.com	E-mail	: carol.walsh@alsglobal.com
Telephone	: +61 03 9653 1234	Telephone	: +61-3-8549 9608
Facsimile	: +61 03 9654 7117	Facsimile	: +61-3-8549 9601
Project	: 60431087	QC Level	: NEPM 2013 Schedule B(3) and ALS QCS3 requirement
Order number	: ----	Date Samples Received	: 30-Oct-2015 10:40
C-O-C number	: ----	Date Analysis Commenced	: 02-Nov-2015
Sampler	: MATTHEW SHEPPARD, OLIVER TAYLOR	Issue Date	: 09-Nov-2015 17:03
Site	: Fishermans Bend		
		No. of samples received	: 27
Quote number	: ----	No. of samples analysed	: 9

This report supersedes any previous report(s) with this reference. Results apply to the sample(s) as submitted.

This Certificate of Analysis contains the following information:

- General Comments
- Analytical Results

Signatories

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

Signatories	Position	Accreditation Category
Dilani Fernando	Senior Inorganic Chemist	Melbourne Inorganics
Nancy Wang	Senior Semivolatile Instrument Chemist	Melbourne Inorganics Melbourne Organics
Satishkumar Trivedi	Acid Sulfate Soils Supervisor	Brisbane Acid Sulphate Soils Brisbane Inorganics
Xing Lin	Senior Organic Chemist	Melbourne Organics

General Comments

The analytical procedures used by the Environmental Division have been developed from established internationally recognized procedures such as those published by the USEPA, APHA, AS and NEPM. In house developed procedures are employed in the absence of documented standards or by 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.

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.

- EP074/080: Unable to determine matrix spike recovery for (EM1516495_024) due to high level contaminants.
- EP075(SIM): Particular samples (EM1516495_022, 024) required dilution prior to analysis due to matrix interferences. LOR values have been adjusted accordingly.
- Benzo(a)pyrene Toxicity Equivalent Quotient (TEQ) 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.

Analytical Results

Sub-Matrix: SOIL (Matrix: SOIL)			Client sample ID	GW17(2.2-2.3)	GW13(2.9-3.0)	GW06(2.9-3.0)	GW12(2.9-3.0)	GW31(3.9-4.0)
			Client sampling date / time	[29-Oct-2015]	[29-Oct-2015]	[29-Oct-2015]	[29-Oct-2015]	[29-Oct-2015]
Compound	CAS Number	LOR	Unit	EM1516495-003	EM1516495-007	EM1516495-011	EM1516495-015	EM1516495-020
				Result	Result	Result	Result	Result
EA001: pH in soil using 0.01M CaCl extract								
pH (CaCl2)	----	0.1	pH Unit	----	----	----	----	----
EA055: Moisture Content								
Moisture Content (dried @ 103°C)	----	1	%	25.0	19.1	15.6	13.4	18.5
ED040N: Sulfate - Calcium Phosphate Soluble (NEPM)								
Sulfate as SO4 2-	14808-79-8	50	mg/kg	----	----	----	----	----
EG005T: Total Metals by ICP-AES								
Aluminium	7429-90-5	50	mg/kg	----	----	----	----	----
Iron	7439-89-6	50	mg/kg	----	----	----	----	----
Selenium	7782-49-2	5	mg/kg	----	----	----	----	----
Arsenic	7440-38-2	5	mg/kg	----	----	----	----	----
Cadmium	7440-43-9	1	mg/kg	----	----	----	----	----
Chromium	7440-47-3	2	mg/kg	----	----	----	----	----
Copper	7440-50-8	5	mg/kg	----	----	----	----	----
Lead	7439-92-1	5	mg/kg	----	----	----	----	----
Nickel	7440-02-0	2	mg/kg	----	----	----	----	----
Zinc	7440-66-6	5	mg/kg	----	----	----	----	----
EG035T: Total Recoverable Mercury by FIMS								
Mercury	7439-97-6	0.1	mg/kg	----	----	----	----	----
EP003: Total Organic Carbon (TOC) in Soil								
Total Organic Carbon	----	0.02	%	0.45	0.06	0.11	0.07	0.09
EP074A: Monocyclic Aromatic Hydrocarbons								
Styrene	100-42-5	0.5	mg/kg	----	----	----	----	----
Isopropylbenzene	98-82-8	0.5	mg/kg	----	----	----	----	----
n-Propylbenzene	103-65-1	0.5	mg/kg	----	----	----	----	----
1.3.5-Trimethylbenzene	108-67-8	0.5	mg/kg	----	----	----	----	----
sec-Butylbenzene	135-98-8	0.5	mg/kg	----	----	----	----	----
1.2.4-Trimethylbenzene	95-63-6	0.5	mg/kg	----	----	----	----	----
tert-Butylbenzene	98-06-6	0.5	mg/kg	----	----	----	----	----
p-Isopropyltoluene	99-87-6	0.5	mg/kg	----	----	----	----	----
n-Butylbenzene	104-51-8	0.5	mg/kg	----	----	----	----	----
EP074B: Oxygenated Compounds								
Vinyl Acetate	108-05-4	5	mg/kg	----	----	----	----	----
2-Butanone (MEK)	78-93-3	5	mg/kg	----	----	----	----	----
4-Methyl-2-pentanone (MIBK)	108-10-1	5	mg/kg	----	----	----	----	----

Analytical Results

Sub-Matrix: SOIL (Matrix: SOIL)				Client sample ID	GW17(2.2-2.3)	GW13(2.9-3.0)	GW06(2.9-3.0)	GW12(2.9-3.0)	GW31(3.9-4.0)
				Client sampling date / time	[29-Oct-2015]	[29-Oct-2015]	[29-Oct-2015]	[29-Oct-2015]	[29-Oct-2015]
Compound	CAS Number	LOR	Unit		EM1516495-003	EM1516495-007	EM1516495-011	EM1516495-015	EM1516495-020
					Result	Result	Result	Result	Result
EP074B: Oxygenated Compounds - Continued									
2-Hexanone (MBK)	591-78-6	5	mg/kg		----	----	----	----	----
EP074C: Sulfonated Compounds									
Carbon disulfide	75-15-0	0.5	mg/kg		----	----	----	----	----
EP074D: Fumigants									
2.2-Dichloropropane	594-20-7	0.5	mg/kg		----	----	----	----	----
1.2-Dichloropropane	78-87-5	0.5	mg/kg		----	----	----	----	----
cis-1.3-Dichloropropylene	10061-01-5	0.5	mg/kg		----	----	----	----	----
trans-1.3-Dichloropropylene	10061-02-6	0.5	mg/kg		----	----	----	----	----
1.2-Dibromoethane (EDB)	106-93-4	0.5	mg/kg		----	----	----	----	----
EP074E: Halogenated Aliphatic Compounds									
Dichlorodifluoromethane	75-71-8	5	mg/kg		----	----	----	----	----
Chloromethane	74-87-3	5	mg/kg		----	----	----	----	----
Vinyl chloride	75-01-4	5	mg/kg		----	----	----	----	----
Bromomethane	74-83-9	5	mg/kg		----	----	----	----	----
Chloroethane	75-00-3	5	mg/kg		----	----	----	----	----
Trichlorofluoromethane	75-69-4	5	mg/kg		----	----	----	----	----
1.1-Dichloroethene	75-35-4	0.5	mg/kg		----	----	----	----	----
Iodomethane	74-88-4	0.5	mg/kg		----	----	----	----	----
trans-1.2-Dichloroethene	156-60-5	0.5	mg/kg		----	----	----	----	----
1.1-Dichloroethane	75-34-3	0.5	mg/kg		----	----	----	----	----
cis-1.2-Dichloroethene	156-59-2	0.5	mg/kg		----	----	----	----	----
1.1.1-Trichloroethane	71-55-6	0.5	mg/kg		----	----	----	----	----
1.1-Dichloropropylene	563-58-6	0.5	mg/kg		----	----	----	----	----
Carbon Tetrachloride	56-23-5	0.5	mg/kg		----	----	----	----	----
1.2-Dichloroethane	107-06-2	0.5	mg/kg		----	----	----	----	----
Trichloroethene	79-01-6	0.5	mg/kg		----	----	----	----	----
Dibromomethane	74-95-3	0.5	mg/kg		----	----	----	----	----
1.1.2-Trichloroethane	79-00-5	0.5	mg/kg		----	----	----	----	----
1.3-Dichloropropane	142-28-9	0.5	mg/kg		----	----	----	----	----
Tetrachloroethene	127-18-4	0.5	mg/kg		----	----	----	----	----
1.1.1.2-Tetrachloroethane	630-20-6	0.5	mg/kg		----	----	----	----	----
trans-1.4-Dichloro-2-butene	110-57-6	0.5	mg/kg		----	----	----	----	----
cis-1.4-Dichloro-2-butene	1476-11-5	0.5	mg/kg		----	----	----	----	----
1.1.2.2-Tetrachloroethane	79-34-5	0.5	mg/kg		----	----	----	----	----

Analytical Results

Sub-Matrix: SOIL (Matrix: SOIL)				Client sample ID	GW17(2.2-2.3)	GW13(2.9-3.0)	GW06(2.9-3.0)	GW12(2.9-3.0)	GW31(3.9-4.0)
				Client sampling date / time	[29-Oct-2015]	[29-Oct-2015]	[29-Oct-2015]	[29-Oct-2015]	[29-Oct-2015]
Compound	CAS Number	LOR	Unit		EM1516495-003	EM1516495-007	EM1516495-011	EM1516495-015	EM1516495-020
					Result	Result	Result	Result	Result
EP074E: Halogenated Aliphatic Compounds - Continued									
1.2.3-Trichloropropane	96-18-4	0.5	mg/kg		----	----	----	----	----
Pentachloroethane	76-01-7	0.5	mg/kg		----	----	----	----	----
1.2-Dibromo-3-chloropropane	96-12-8	0.5	mg/kg		----	----	----	----	----
Hexachlorobutadiene	87-68-3	0.5	mg/kg		----	----	----	----	----
EP074F: Halogenated Aromatic Compounds									
Chlorobenzene	108-90-7	0.5	mg/kg		----	----	----	----	----
Bromobenzene	108-86-1	0.5	mg/kg		----	----	----	----	----
2-Chlorotoluene	95-49-8	0.5	mg/kg		----	----	----	----	----
4-Chlorotoluene	106-43-4	0.5	mg/kg		----	----	----	----	----
1.3-Dichlorobenzene	541-73-1	0.5	mg/kg		----	----	----	----	----
1.4-Dichlorobenzene	106-46-7	0.5	mg/kg		----	----	----	----	----
1.2-Dichlorobenzene	95-50-1	0.5	mg/kg		----	----	----	----	----
1.2.4-Trichlorobenzene	120-82-1	0.5	mg/kg		----	----	----	----	----
1.2.3-Trichlorobenzene	87-61-6	0.5	mg/kg		----	----	----	----	----
EP074G: Trihalomethanes									
Chloroform	67-66-3	0.5	mg/kg		----	----	----	----	----
Bromodichloromethane	75-27-4	0.5	mg/kg		----	----	----	----	----
Dibromochloromethane	124-48-1	0.5	mg/kg		----	----	----	----	----
Bromoform	75-25-2	0.5	mg/kg		----	----	----	----	----
EP075(SIM)B: Polynuclear Aromatic Hydrocarbons									
Naphthalene	91-20-3	0.5	mg/kg		----	----	----	----	----
Acenaphthylene	208-96-8	0.5	mg/kg		----	----	----	----	----
Acenaphthene	83-32-9	0.5	mg/kg		----	----	----	----	----
Fluorene	86-73-7	0.5	mg/kg		----	----	----	----	----
Phenanthrene	85-01-8	0.5	mg/kg		----	----	----	----	----
Anthracene	120-12-7	0.5	mg/kg		----	----	----	----	----
Fluoranthene	206-44-0	0.5	mg/kg		----	----	----	----	----
Pyrene	129-00-0	0.5	mg/kg		----	----	----	----	----
Benz(a)anthracene	56-55-3	0.5	mg/kg		----	----	----	----	----
Chrysene	218-01-9	0.5	mg/kg		----	----	----	----	----
Benzo(b+j)fluoranthene	205-99-2 205-82-3	0.5	mg/kg		----	----	----	----	----
Benzo(k)fluoranthene	207-08-9	0.5	mg/kg		----	----	----	----	----
Benzo(a)pyrene	50-32-8	0.5	mg/kg		----	----	----	----	----
Indeno(1.2.3.cd)pyrene	193-39-5	0.5	mg/kg		----	----	----	----	----

Analytical Results

Sub-Matrix: SOIL (Matrix: SOIL)				Client sample ID	GW17(2.2-2.3)	GW13(2.9-3.0)	GW06(2.9-3.0)	GW12(2.9-3.0)	GW31(3.9-4.0)
				Client sampling date / time	[29-Oct-2015]	[29-Oct-2015]	[29-Oct-2015]	[29-Oct-2015]	[29-Oct-2015]
Compound	CAS Number	LOR	Unit		EM1516495-003	EM1516495-007	EM1516495-011	EM1516495-015	EM1516495-020
					Result	Result	Result	Result	Result
EP075(SIM)B: Polynuclear Aromatic Hydrocarbons - Continued									
Dibenz(a.h)anthracene	53-70-3	0.5	mg/kg		----	----	----	----	----
Benzo(g.h.i)perylene	191-24-2	0.5	mg/kg		----	----	----	----	----
^ Sum of polycyclic aromatic hydrocarbons	----	0.5	mg/kg		----	----	----	----	----
^ Benzo(a)pyrene TEQ (zero)	----	0.5	mg/kg		----	----	----	----	----
^ Benzo(a)pyrene TEQ (half LOR)	----	0.5	mg/kg		----	----	----	----	----
^ Benzo(a)pyrene TEQ (LOR)	----	0.5	mg/kg		----	----	----	----	----
EP080/071: Total Petroleum Hydrocarbons									
C6 - C9 Fraction	----	10	mg/kg		----	----	----	----	----
C10 - C14 Fraction	----	50	mg/kg		----	----	----	----	----
C15 - C28 Fraction	----	100	mg/kg		----	----	----	----	----
C29 - C36 Fraction	----	100	mg/kg		----	----	----	----	----
^ C10 - C36 Fraction (sum)	----	50	mg/kg		----	----	----	----	----
EP080/071: Total Recoverable Hydrocarbons - NEPM 2013 Fractions									
C6 - C10 Fraction	C6_C10	10	mg/kg		----	----	----	----	----
^ C6 - C10 Fraction minus BTEX (F1)	C6_C10-BTEX	10	mg/kg		----	----	----	----	----
>C10 - C16 Fraction	----	50	mg/kg		----	----	----	----	----
>C16 - C34 Fraction	----	100	mg/kg		----	----	----	----	----
>C34 - C40 Fraction	----	100	mg/kg		----	----	----	----	----
^ >C10 - C40 Fraction (sum)	----	50	mg/kg		----	----	----	----	----
^ >C10 - C16 Fraction minus Naphthalene (F2)	----	50	mg/kg		----	----	----	----	----
EP080: BTEXN									
Benzene	71-43-2	0.2	mg/kg		----	----	----	----	----
Toluene	108-88-3	0.5	mg/kg		----	----	----	----	----
Ethylbenzene	100-41-4	0.5	mg/kg		----	----	----	----	----
meta- & para-Xylene	108-38-3 106-42-3	0.5	mg/kg		----	----	----	----	----
ortho-Xylene	95-47-6	0.5	mg/kg		----	----	----	----	----
^ Sum of BTEX	----	0.2	mg/kg		----	----	----	----	----
^ Total Xylenes	1330-20-7	0.5	mg/kg		----	----	----	----	----
Naphthalene	91-20-3	1	mg/kg		----	----	----	----	----
EP074S: VOC Surrogates									
1.2-Dichloroethane-D4	17060-07-0	0.5	%		----	----	----	----	----
Toluene-D8	2037-26-5	0.5	%		----	----	----	----	----

Analytical Results

Sub-Matrix: SOIL (Matrix: SOIL)			Client sample ID	GW17(2.2-2.3)	GW13(2.9-3.0)	GW06(2.9-3.0)	GW12(2.9-3.0)	GW31(3.9-4.0)
			Client sampling date / time	[29-Oct-2015]	[29-Oct-2015]	[29-Oct-2015]	[29-Oct-2015]	[29-Oct-2015]
Compound	CAS Number	LOR	Unit	EM1516495-003	EM1516495-007	EM1516495-011	EM1516495-015	EM1516495-020
				Result	Result	Result	Result	Result
EP074S: VOC Surrogates - Continued								
4-Bromofluorobenzene	460-00-4	0.5	%	----	----	----	----	----
EP075(SIM)S: Phenolic Compound Surrogates								
Phenol-d6	13127-88-3	0.5	%	----	----	----	----	----
2-Chlorophenol-D4	93951-73-6	0.5	%	----	----	----	----	----
2.4.6-Tribromophenol	118-79-6	0.5	%	----	----	----	----	----
EP075(SIM)T: PAH Surrogates								
2-Fluorobiphenyl	321-60-8	0.5	%	----	----	----	----	----
Anthracene-d10	1719-06-8	0.5	%	----	----	----	----	----
4-Terphenyl-d14	1718-51-0	0.5	%	----	----	----	----	----
EP080S: TPH(V)/BTEX Surrogates								
1.2-Dichloroethane-D4	17060-07-0	0.2	%	----	----	----	----	----
Toluene-D8	2037-26-5	0.2	%	----	----	----	----	----
4-Bromofluorobenzene	460-00-4	0.2	%	----	----	----	----	----

Analytical Results

Sub-Matrix: SOIL (Matrix: SOIL)			Client sample ID	GW01(2.5-2.6)	GW01(4.5-4.6)	----	----	----
			Client sampling date / time	[29-Oct-2015]	[29-Oct-2015]	----	----	----
Compound	CAS Number	LOR	Unit	EM1516495-022	EM1516495-024	--------	--------	--------
				Result	Result	Result	Result	Result
EA001: pH in soil using 0.01M CaCl extract								
pH (CaCl2)	----	0.1	pH Unit	**11.5**	**11.3**	----	----	----
EA055: Moisture Content								
Moisture Content (dried @ 103°C)	----	1	%	**18.4**	**42.4**	----	----	----
ED040N: Sulfate - Calcium Phosphate Soluble (NEPM)								
Sulfate as SO4 2-	14808-79-8	50	mg/kg	**2330**	**2900**	----	----	----
EG005T: Total Metals by ICP-AES								
Aluminium	7429-90-5	50	mg/kg	**1760**	**6870**	----	----	----
Iron	7439-89-6	50	mg/kg	**61400**	**62300**	----	----	----
Selenium	7782-49-2	5	mg/kg	<5	<5	----	----	----
Arsenic	7440-38-2	5	mg/kg	**12**	**25**	----	----	----
Cadmium	7440-43-9	1	mg/kg	**2**	**5**	----	----	----
Chromium	7440-47-3	2	mg/kg	**42**	**95**	----	----	----
Copper	7440-50-8	5	mg/kg	**148**	**1640**	----	----	----
Lead	7439-92-1	5	mg/kg	**182**	**664**	----	----	----
Nickel	7440-02-0	2	mg/kg	**40**	**88**	----	----	----
Zinc	7440-66-6	5	mg/kg	**965**	**2690**	----	----	----
EG035T: Total Recoverable Mercury by FIMS								
Mercury	7439-97-6	0.1	mg/kg	**0.4**	**0.4**	----	----	----
EP003: Total Organic Carbon (TOC) in Soil								
Total Organic Carbon	----	0.02	%	**3.26**	----	----	----	----
EP074A: Monocyclic Aromatic Hydrocarbons								
Styrene	100-42-5	0.5	mg/kg	<0.5	<0.5	----	----	----
Isopropylbenzene	98-82-8	0.5	mg/kg	**3.9**	**3.5**	----	----	----
n-Propylbenzene	103-65-1	0.5	mg/kg	**6.8**	**5.8**	----	----	----
1.3.5-Trimethylbenzene	108-67-8	0.5	mg/kg	**2.6**	**8.5**	----	----	----
sec-Butylbenzene	135-98-8	0.5	mg/kg	**3.9**	**2.4**	----	----	----
1.2.4-Trimethylbenzene	95-63-6	0.5	mg/kg	**10.9**	**26.3**	----	----	----
tert-Butylbenzene	98-06-6	0.5	mg/kg	<0.5	<0.5	----	----	----
p-Isopropyltoluene	99-87-6	0.5	mg/kg	**1.9**	**2.9**	----	----	----
n-Butylbenzene	104-51-8	0.5	mg/kg	**6.6**	**5.7**	----	----	----
EP074B: Oxygenated Compounds								
Vinyl Acetate	108-05-4	5	mg/kg	<5	<5	----	----	----
2-Butanone (MEK)	78-93-3	5	mg/kg	<5	<5	----	----	----
4-Methyl-2-pentanone (MIBK)	108-10-1	5	mg/kg	<5	<5	----	----	----

Analytical Results

Sub-Matrix: SOIL (Matrix: SOIL)			Client sample ID	GW01(2.5-2.6)	GW01(4.5-4.6)	----	----	----
			Client sampling date / time	[29-Oct-2015]	[29-Oct-2015]	----	----	----
Compound	CAS Number	LOR	Unit	EM1516495-022	EM1516495-024	--------	--------	--------
				Result	Result	Result	Result	Result
EP074B: Oxygenated Compounds - Continued								
2-Hexanone (MBK)	591-78-6	5	mg/kg	<5	<5	----	----	----
EP074C: Sulfonated Compounds								
Carbon disulfide	75-15-0	0.5	mg/kg	<0.5	<0.5	----	----	----
EP074D: Fumigants								
2.2-Dichloropropane	594-20-7	0.5	mg/kg	<0.5	<0.5	----	----	----
1.2-Dichloropropane	78-87-5	0.5	mg/kg	<0.5	<0.5	----	----	----
cis-1.3-Dichloropropylene	10061-01-5	0.5	mg/kg	<0.5	<0.5	----	----	----
trans-1.3-Dichloropropylene	10061-02-6	0.5	mg/kg	<0.5	<0.5	----	----	----
1.2-Dibromoethane (EDB)	106-93-4	0.5	mg/kg	<0.5	<0.5	----	----	----
EP074E: Halogenated Aliphatic Compounds								
Dichlorodifluoromethane	75-71-8	5	mg/kg	<5	<5	----	----	----
Chloromethane	74-87-3	5	mg/kg	<5	<5	----	----	----
Vinyl chloride	75-01-4	5	mg/kg	<5	<5	----	----	----
Bromomethane	74-83-9	5	mg/kg	<5	<5	----	----	----
Chloroethane	75-00-3	5	mg/kg	<5	<5	----	----	----
Trichlorofluoromethane	75-69-4	5	mg/kg	<5	<5	----	----	----
1.1-Dichloroethene	75-35-4	0.5	mg/kg	<0.5	<0.5	----	----	----
Iodomethane	74-88-4	0.5	mg/kg	<0.5	<0.5	----	----	----
trans-1.2-Dichloroethene	156-60-5	0.5	mg/kg	<0.5	<0.5	----	----	----
1.1-Dichloroethane	75-34-3	0.5	mg/kg	<0.5	<0.5	----	----	----
cis-1.2-Dichloroethene	156-59-2	0.5	mg/kg	<0.5	<0.5	----	----	----
1.1.1-Trichloroethane	71-55-6	0.5	mg/kg	<0.5	<0.5	----	----	----
1.1-Dichloropropylene	563-58-6	0.5	mg/kg	<0.5	<0.5	----	----	----
Carbon Tetrachloride	56-23-5	0.5	mg/kg	<0.5	<0.5	----	----	----
1.2-Dichloroethane	107-06-2	0.5	mg/kg	<0.5	<0.5	----	----	----
Trichloroethene	79-01-6	0.5	mg/kg	<0.5	<0.5	----	----	----
Dibromomethane	74-95-3	0.5	mg/kg	<0.5	<0.5	----	----	----
1.1.2-Trichloroethane	79-00-5	0.5	mg/kg	<0.5	<0.5	----	----	----
1.3-Dichloropropane	142-28-9	0.5	mg/kg	<0.5	<0.5	----	----	----
Tetrachloroethene	127-18-4	0.5	mg/kg	<0.5	<0.5	----	----	----
1.1.1.2-Tetrachloroethane	630-20-6	0.5	mg/kg	<0.5	<0.5	----	----	----
trans-1.4-Dichloro-2-butene	110-57-6	0.5	mg/kg	<0.5	<0.5	----	----	----
cis-1.4-Dichloro-2-butene	1476-11-5	0.5	mg/kg	<0.5	<0.5	----	----	----
1.1.2.2-Tetrachloroethane	79-34-5	0.5	mg/kg	<0.5	<0.5	----	----	----

Analytical Results

Sub-Matrix: SOIL (Matrix: SOIL)				Client sample ID	GW01(2.5-2.6)	GW01(4.5-4.6)	----	----	----
				Client sampling date / time	[29-Oct-2015]	[29-Oct-2015]	----	----	----
Compound	CAS Number	LOR	Unit		EM1516495-022	EM1516495-024	--------	--------	--------
					Result	Result	Result	Result	Result
EP074E: Halogenated Aliphatic Compounds - Continued									
1.2.3-Trichloropropane	96-18-4	0.5	mg/kg		<0.5	<0.5	----	----	----
Pentachloroethane	76-01-7	0.5	mg/kg		<0.5	<0.5	----	----	----
1.2-Dibromo-3-chloropropane	96-12-8	0.5	mg/kg		<0.5	<0.5	----	----	----
Hexachlorobutadiene	87-68-3	0.5	mg/kg		<0.5	<0.5	----	----	----
EP074F: Halogenated Aromatic Compounds									
Chlorobenzene	108-90-7	0.5	mg/kg		<0.5	<0.5	----	----	----
Bromobenzene	108-86-1	0.5	mg/kg		<0.5	<0.5	----	----	----
2-Chlorotoluene	95-49-8	0.5	mg/kg		<0.5	<0.5	----	----	----
4-Chlorotoluene	106-43-4	0.5	mg/kg		<0.5	<0.5	----	----	----
1.3-Dichlorobenzene	541-73-1	0.5	mg/kg		<0.5	**0.6**	----	----	----
1.4-Dichlorobenzene	106-46-7	0.5	mg/kg		<0.5	**1.3**	----	----	----
1.2-Dichlorobenzene	95-50-1	0.5	mg/kg		<0.5	<0.5	----	----	----
1.2.4-Trichlorobenzene	120-82-1	0.5	mg/kg		<0.5	<0.5	----	----	----
1.2.3-Trichlorobenzene	87-61-6	0.5	mg/kg		<0.5	<0.5	----	----	----
EP074G: Trihalomethanes									
Chloroform	67-66-3	0.5	mg/kg		<0.5	<0.5	----	----	----
Bromodichloromethane	75-27-4	0.5	mg/kg		<0.5	<0.5	----	----	----
Dibromochloromethane	124-48-1	0.5	mg/kg		<0.5	<0.5	----	----	----
Bromoform	75-25-2	0.5	mg/kg		<0.5	<0.5	----	----	----
EP075(SIM)B: Polynuclear Aromatic Hydrocarbons									
Naphthalene	91-20-3	0.5	mg/kg		**18.7**	**28.4**	----	----	----
Acenaphthylene	208-96-8	0.5	mg/kg		<2.3	<2.3	----	----	----
Acenaphthene	83-32-9	0.5	mg/kg		<2.3	<2.3	----	----	----
Fluorene	86-73-7	0.5	mg/kg		<2.3	<2.3	----	----	----
Phenanthrene	85-01-8	0.5	mg/kg		**2.4**	**3.7**	----	----	----
Anthracene	120-12-7	0.5	mg/kg		<2.3	<2.3	----	----	----
Fluoranthene	206-44-0	0.5	mg/kg		<2.3	<2.3	----	----	----
Pyrene	129-00-0	0.5	mg/kg		**2.4**	**3.6**	----	----	----
Benz(a)anthracene	56-55-3	0.5	mg/kg		**2.4**	**3.7**	----	----	----
Chrysene	218-01-9	0.5	mg/kg		<2.3	<2.3	----	----	----
Benzo(b+j)fluoranthene	205-99-2 205-82-3	0.5	mg/kg		<2.3	**2.6**	----	----	----
Benzo(k)fluoranthene	207-08-9	0.5	mg/kg		<2.3	**2.6**	----	----	----
Benzo(a)pyrene	50-32-8	0.5	mg/kg		<2.3	<2.3	----	----	----
Indeno(1.2.3.cd)pyrene	193-39-5	0.5	mg/kg		<2.3	<2.3	----	----	----

Analytical Results

Sub-Matrix: SOIL (Matrix: SOIL)				Client sample ID	GW01(2.5-2.6)	GW01(4.5-4.6)	----	----	----
				Client sampling date / time	[29-Oct-2015]	[29-Oct-2015]	----	----	----
Compound	CAS Number	LOR	Unit		EM1516495-022	EM1516495-024	--------	--------	--------
					Result	Result	Result	Result	Result
EP075(SIM)B: Polynuclear Aromatic Hydrocarbons - Continued									
Dibenz(a.h)anthracene	53-70-3	0.5	mg/kg		<2.3	<2.3	----	----	----
Benzo(g.h.i)perylene	191-24-2	0.5	mg/kg		<2.3	<2.3	----	----	----
^ Sum of polycyclic aromatic hydrocarbons	----	0.5	mg/kg		25.9	44.6	----	----	----
^ Benzo(a)pyrene TEQ (zero)	----	0.5	mg/kg		<1.4	<1.5	----	----	----
^ Benzo(a)pyrene TEQ (half LOR)	----	0.5	mg/kg		<1.4	<1.5	----	----	----
^ Benzo(a)pyrene TEQ (LOR)	----	0.5	mg/kg		<1.4	2.0	----	----	----
EP080/071: Total Petroleum Hydrocarbons									
C6 - C9 Fraction	----	10	mg/kg		137	194	----	----	----
C10 - C14 Fraction	----	50	mg/kg		2420	2280	----	----	----
C15 - C28 Fraction	----	100	mg/kg		8950	14400	----	----	----
C29 - C36 Fraction	----	100	mg/kg		5950	10700	----	----	----
^ C10 - C36 Fraction (sum)	----	50	mg/kg		17300	27400	----	----	----
EP080/071: Total Recoverable Hydrocarbons - NEPM 2013 Fractions									
C6 - C10 Fraction	C6_C10	10	mg/kg		195	266	----	----	----
^ C6 - C10 Fraction minus BTEX (F1)	C6_C10-BTEX	10	mg/kg		184	175	----	----	----
>C10 - C16 Fraction	----	50	mg/kg		2320	2250	----	----	----
>C16 - C34 Fraction	----	100	mg/kg		13800	23100	----	----	----
>C34 - C40 Fraction	----	100	mg/kg		1850	3820	----	----	----
^ >C10 - C40 Fraction (sum)	----	50	mg/kg		18000	29200	----	----	----
^ >C10 - C16 Fraction minus Naphthalene (F2)	----	50	mg/kg		2310	2230	----	----	----
EP080: BTEXN									
Benzene	71-43-2	0.2	mg/kg		<0.2	<0.2	----	----	----
Toluene	108-88-3	0.5	mg/kg		1.0	42.8	----	----	----
Ethylbenzene	100-41-4	0.5	mg/kg		1.6	8.8	----	----	----
meta- & para-Xylene	108-38-3 106-42-3	0.5	mg/kg		6.8	32.5	----	----	----
ortho-Xylene	95-47-6	0.5	mg/kg		1.6	7.3	----	----	----
^ Sum of BTEX	----	0.2	mg/kg		11.0	91.4	----	----	----
^ Total Xylenes	1330-20-7	0.5	mg/kg		8.4	39.8	----	----	----
Naphthalene	91-20-3	1	mg/kg		11	18	----	----	----
EP074S: VOC Surrogates									
1.2-Dichloroethane-D4	17060-07-0	0.5	%		82.7	70.4	----	----	----
Toluene-D8	2037-26-5	0.5	%		91.2	80.5	----	----	----

Analytical Results

Sub-Matrix: SOIL (Matrix: SOIL)				Client sample ID	GW01(2.5-2.6)	GW01(4.5-4.6)	----	----	----
				Client sampling date / time	[29-Oct-2015]	[29-Oct-2015]	----	----	----
Compound	CAS Number	LOR	Unit		EM1516495-022	EM1516495-024	--------	--------	--------
					Result	Result	Result	Result	Result
EP074S: VOC Surrogates - Continued									
4-Bromofluorobenzene	460-00-4	0.5	%		83.0	68.2	----	----	----
EP075(SIM)S: Phenolic Compound Surrogates									
Phenol-d6	13127-88-3	0.5	%		77.6	87.5	----	----	----
2-Chlorophenol-D4	93951-73-6	0.5	%		78.3	81.8	----	----	----
2.4.6-Tribromophenol	118-79-6	0.5	%		52.9	59.8	----	----	----
EP075(SIM)T: PAH Surrogates									
2-Fluorobiphenyl	321-60-8	0.5	%		103	96.6	----	----	----
Anthracene-d10	1719-06-8	0.5	%		111	107	----	----	----
4-Terphenyl-d14	1718-51-0	0.5	%		105	107	----	----	----
EP080S: TPH(V)/BTEX Surrogates									
1.2-Dichloroethane-D4	17060-07-0	0.2	%		79.8	67.8	----	----	----
Toluene-D8	2037-26-5	0.2	%		86.2	76.2	----	----	----
4-Bromofluorobenzene	460-00-4	0.2	%		86.6	70.8	----	----	----

Analytical Results

Sub-Matrix: WATER (Matrix: WATER)				Client sample ID	QC23	QC24	----	----	----
				Client sampling date / time	[29-Oct-2015]	[29-Oct-2015]	----	----	----
Compound	CAS Number	LOR	Unit		EM1516495-025	EM1516495-026	--------	--------	--------
					Result	Result	Result	Result	Result
EG020T: Total Metals by ICP-MS									
Aluminium	7429-90-5	0.01	mg/L		----	<0.01	----	----	----
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	----	----	----
Nickel	7440-02-0	0.001	mg/L		----	<0.001	----	----	----
Lead	7439-92-1	0.001	mg/L		----	<0.001	----	----	----
Zinc	7440-66-6	0.005	mg/L		----	<0.005	----	----	----
Selenium	7782-49-2	0.01	mg/L		----	<0.01	----	----	----
Iron	7439-89-6	0.05	mg/L		----	<0.05	----	----	----
EG035T: Total Recoverable Mercury by FIMS									
Mercury	7439-97-6	0.0001	mg/L		----	<0.0001	----	----	----
EP080/071: Total Petroleum Hydrocarbons									
C6 - C9 Fraction	----	20	µg/L		<20	<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	<20	----	----	----
^ C6 - C10 Fraction minus BTEX (F1)	C6_C10-BTEX	20	µg/L		<20	<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	<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	----	----	----

Analytical Results

Sub-Matrix: WATER (Matrix: WATER)				Client sample ID	QC23	QC24	----	----	----
				Client sampling date / time	[29-Oct-2015]	[29-Oct-2015]	----	----	----
Compound	CAS Number	LOR	Unit		EM1516495-025	EM1516495-026	--------	--------	--------
					Result	Result	Result	Result	Result
EP080: BTEXN - Continued									
^ **Total Xylenes**	1330-20-7	2	µg/L		<2	<2	----	----	----
^ **Sum of BTEX**	----	1	µg/L		<1	<1	----	----	----
Naphthalene	91-20-3	5	µg/L		<5	<5	----	----	----
EP080S: TPH(V)/BTEX Surrogates									
1.2-Dichloroethane-D4	17060-07-0	2	%		**105**	**102**	----	----	----
Toluene-D8	2037-26-5	2	%		**108**	**102**	----	----	----
4-Bromofluorobenzene	460-00-4	2	%		**119**	**109**	----	----	----

ALS Environmental

QUALITY CONTROL REPORT

Work Order	: **EM1516495**	Page	: 1 of 15
Client	: **AECOM Australia Pty Ltd**	Laboratory	: Environmental Division Melbourne
Contact	: MS AVERYLL COYNE	Contact	: Carol Walsh
Address	: LEVEL 9 8 EXHIBITION ST MELBOURNE VIC 3000	Address	: 4 Westall Rd Springvale VIC Australia 3171
E-mail	: averyll.coyne@aecom.com	E-mail	: carol.walsh@alsglobal.com
Telephone	: +61 03 9653 1234	Telephone	: +61-3-8549 9608
Facsimile	: +61 03 9654 7117	Facsimile	: +61-3-8549 9601
Project	: 60431087	QC Level	: NEPM 2013 Schedule B(3) and ALS QCS3 requirement
Order number	: ----	Date Samples Received	: 30-Oct-2015
C-O-C number	: ----	Date Analysis Commenced	: 02-Nov-2015
Sampler	: MATTHEW SHEPPARD, OLIVER TAYLOR	Issue Date	: 09-Nov-2015
Site	: Fishermans Bend	No. of samples received	: 27
Quote number	: ----	No. of samples analysed	: 9

This report supersedes any previous report(s) with this reference. Results apply to the sample(s) as submitted.

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

General Comments

The analytical procedures used by the Environmental Division have been developed from established internationally recognized procedures such as those published by the USEPA, APHA, AS and NEPM. In house developed procedures are employed in the absence of documented standards or by 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

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

Signatories

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

Signatories	Position	Accreditation Category
Dilani Fernando	Senior Inorganic Chemist	Melbourne Inorganics
Nancy Wang	Senior Semivolatile Instrument Chemist	Melbourne Inorganics
		Melbourne Organics
Satishkumar Trivedi	Acid Sulfate Soils Supervisor	Brisbane Acid Sulphate Soils
		Brisbane Inorganics
Xing Lin	Senior Organic Chemist	Melbourne Organics

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	*Client sample ID*	*Method: Compound*	*CAS Number*	*LOR*	*Unit*	*Original Result*	*Duplicate Result*	*RPD (%)*	*Recovery Limits (%)*
EA001: pH in soil using 0.01M CaCl extract (QC Lot: 265605)									
EM1516472-002	Anonymous	EA001: pH (CaCl2)	----	0.1	pH Unit	8.6	8.7	1.16	0% - 20%
EM1516513-009	Anonymous	EA001: pH (CaCl2)	----	0.1	pH Unit	6.7	6.7	0.00	0% - 20%
EA055: Moisture Content (QC Lot: 263860)									
EM1516491-026	Anonymous	EA055-103: Moisture Content (dried @ 103°C)	----	1	%	15.0	14.8	1.71	0% - 50%
EM1516547-004	Anonymous	EA055-103: Moisture Content (dried @ 103°C)	----	1	%	14.6	15.0	2.71	0% - 50%
EA055: Moisture Content (QC Lot: 266347)									
EM1516404-003	Anonymous	EA055-103: Moisture Content (dried @ 103°C)	----	1	%	17.4	17.5	0.00	0% - 50%
ED040N: Sulfate - Calcium Phosphate Soluble (NEPM) (QC Lot: 267903)									
EM1516495-022	GW01(2.5-2.6)	ED040N: Sulfate as SO4 2-	14808-79-8	50	mg/kg	2330	2320	0.00	0% - 20%
EG005T: Total Metals by ICP-AES (QC Lot: 266185)									
EM1516392-001	Anonymous	EG005T: Cadmium	7440-43-9	1	mg/kg	<1	<1	0.00	No Limit
		EG005T: Chromium	7440-47-3	2	mg/kg	20	17	15.3	0% - 50%
		EG005T: Nickel	7440-02-0	2	mg/kg	8	7	0.00	No Limit
		EG005T: Arsenic	7440-38-2	5	mg/kg	7	<5	31.1	No Limit
		EG005T: Copper	7440-50-8	5	mg/kg	18	16	8.05	No Limit
		EG005T: Lead	7439-92-1	5	mg/kg	46	41	11.9	No Limit
		EG005T: Selenium	7782-49-2	5	mg/kg	<5	<5	0.00	No Limit
		EG005T: Zinc	7440-66-6	5	mg/kg	197	173	13.0	0% - 20%
		EG005T: Aluminium	7429-90-5	50	mg/kg	8460	7930	6.52	0% - 20%
		EG005T: Iron	7439-89-6	50	mg/kg	20000	19200	4.10	0% - 20%
EM1516392-039	Anonymous	EG005T: Cadmium	7440-43-9	1	mg/kg	<1	<1	0.00	No Limit
		EG005T: Chromium	7440-47-3	2	mg/kg	23	24	0.00	0% - 50%
		EG005T: Nickel	7440-02-0	2	mg/kg	8	8	0.00	No Limit
		EG005T: Arsenic	7440-38-2	5	mg/kg	5	<5	0.00	No Limit
		EG005T: Copper	7440-50-8	5	mg/kg	16	16	0.00	No Limit
		EG005T: Lead	7439-92-1	5	mg/kg	67	64	6.01	0% - 50%
		EG005T: Selenium	7782-49-2	5	mg/kg	<5	<5	0.00	No Limit
		EG005T: Zinc	7440-66-6	5	mg/kg	172	161	6.50	0% - 20%
		EG005T: Aluminium	7429-90-5	50	mg/kg	12800	12200	4.75	0% - 20%
		EG005T: Iron	7439-89-6	50	mg/kg	22300	18400	19.0	0% - 20%
EG035T: Total Recoverable Mercury by FIMS (QC Lot: 266186)									
EM1516392-001	Anonymous	EG035T: Mercury	7439-97-6	0.1	mg/kg	<0.1	<0.1	0.00	No Limit
EM1516392-039	Anonymous	EG035T: Mercury	7439-97-6	0.1	mg/kg	<0.1	0.1	0.00	No Limit
EP003: Total Organic Carbon (TOC) in Soil (QC Lot: 268204)									
EB1533461-001	Anonymous	EP003: Total Organic Carbon	----	0.02	%	1.16	1.20	3.06	0% - 20%

Sub-Matrix: **SOIL**

				Laboratory Duplicate (DUP) Report					
Laboratory sample ID	*Client sample ID*	*Method: Compound*	*CAS Number*	*LOR*	*Unit*	*Original Result*	*Duplicate Result*	*RPD (%)*	*Recovery Limits (%)*
EP074A: Monocyclic Aromatic Hydrocarbons (QC Lot: 265602)									
EM1516495-022	GW01(2.5-2.6)	EP074: 1.2.4-Trimethylbenzene	95-63-6	0.5	mg/kg	10.9	11.7	7.30	0% - 20%
		EP074: 1.3.5-Trimethylbenzene	108-67-8	0.5	mg/kg	2.6	2.6	0.00	No Limit
		EP074: Isopropylbenzene	98-82-8	0.5	mg/kg	3.9	4.5	16.2	No Limit
		EP074: n-Butylbenzene	104-51-8	0.5	mg/kg	6.6	8.1	19.8	0% - 50%
		EP074: n-Propylbenzene	103-65-1	0.5	mg/kg	6.8	8.2	19.4	0% - 50%
		EP074: p-Isopropyltoluene	99-87-6	0.5	mg/kg	1.9	2.2	14.7	No Limit
		EP074: sec-Butylbenzene	135-98-8	0.5	mg/kg	3.9	4.8	20.2	No Limit
		EP074: Styrene	100-42-5	0.5	mg/kg	<0.5	<0.5	0.00	No Limit
		EP074: tert-Butylbenzene	98-06-6	0.5	mg/kg	<0.5	<0.5	0.00	No Limit
EP074B: Oxygenated Compounds (QC Lot: 265602)									
EM1516495-022	GW01(2.5-2.6)	EP074: 2-Butanone (MEK)	78-93-3	5	mg/kg	<5	<5	0.00	No Limit
		EP074: 2-Hexanone (MBK)	591-78-6	5	mg/kg	<5	<5	0.00	No Limit
		EP074: 4-Methyl-2-pentanone (MIBK)	108-10-1	5	mg/kg	<5	<5	0.00	No Limit
		EP074: Vinyl Acetate	108-05-4	5	mg/kg	<5	<5	0.00	No Limit
EP074C: Sulfonated Compounds (QC Lot: 265602)									
EM1516495-022	GW01(2.5-2.6)	EP074: Carbon disulfide	75-15-0	0.5	mg/kg	<0.5	<0.5	0.00	No Limit
EP074D: Fumigants (QC Lot: 265602)									
EM1516495-022	GW01(2.5-2.6)	EP074: 1.2-Dibromoethane (EDB)	106-93-4	0.5	mg/kg	<0.5	<0.5	0.00	No Limit
		EP074: 1.2-Dichloropropane	78-87-5	0.5	mg/kg	<0.5	<0.5	0.00	No Limit
		EP074: 2.2-Dichloropropane	594-20-7	0.5	mg/kg	<0.5	<0.5	0.00	No Limit
		EP074: cis-1.3-Dichloropropylene	10061-01-5	0.5	mg/kg	<0.5	<0.5	0.00	No Limit
		EP074: trans-1.3-Dichloropropylene	10061-02-6	0.5	mg/kg	<0.5	<0.5	0.00	No Limit
EP074E: Halogenated Aliphatic Compounds (QC Lot: 265602)									
EM1516495-022	GW01(2.5-2.6)	EP074: 1.1.1.2-Tetrachloroethane	630-20-6	0.5	mg/kg	<0.5	<0.5	0.00	No Limit
		EP074: 1.1.1-Trichloroethane	71-55-6	0.5	mg/kg	<0.5	<0.5	0.00	No Limit
		EP074: 1.1.2.2-Tetrachloroethane	79-34-5	0.5	mg/kg	<0.5	<0.5	0.00	No Limit
		EP074: 1.1.2-Trichloroethane	79-00-5	0.5	mg/kg	<0.5	<0.5	0.00	No Limit
		EP074: 1.1-Dichloroethane	75-34-3	0.5	mg/kg	<0.5	<0.5	0.00	No Limit
		EP074: 1.1-Dichloroethene	75-35-4	0.5	mg/kg	<0.5	<0.5	0.00	No Limit
		EP074: 1.1-Dichloropropylene	563-58-6	0.5	mg/kg	<0.5	<0.5	0.00	No Limit
		EP074: 1.2.3-Trichloropropane	96-18-4	0.5	mg/kg	<0.5	<0.5	0.00	No Limit
		EP074: 1.2-Dibromo-3-chloropropane	96-12-8	0.5	mg/kg	<0.5	<0.5	0.00	No Limit
		EP074: 1.2-Dichloroethane	107-06-2	0.5	mg/kg	<0.5	<0.5	0.00	No Limit
		EP074: 1.3-Dichloropropane	142-28-9	0.5	mg/kg	<0.5	<0.5	0.00	No Limit
		EP074: Carbon Tetrachloride	56-23-5	0.5	mg/kg	<0.5	<0.5	0.00	No Limit
		EP074: cis-1.2-Dichloroethene	156-59-2	0.5	mg/kg	<0.5	<0.5	0.00	No Limit
		EP074: cis-1.4-Dichloro-2-butene	1476-11-5	0.5	mg/kg	<0.5	<0.5	0.00	No Limit
		EP074: Dibromomethane	74-95-3	0.5	mg/kg	<0.5	<0.5	0.00	No Limit
		EP074: Hexachlorobutadiene	87-68-3	0.5	mg/kg	<0.5	<0.5	0.00	No Limit

Sub-Matrix: **SOIL**

				Laboratory Duplicate (DUP) Report					
Laboratory sample ID	*Client sample ID*	*Method: Compound*	*CAS Number*	*LOR*	*Unit*	*Original Result*	*Duplicate Result*	*RPD (%)*	*Recovery Limits (%)*
EP074E: Halogenated Aliphatic Compounds (QC Lot: 265602) - continued									
EM1516495-022	GW01(2.5-2.6)	EP074: Iodomethane	74-88-4	0.5	mg/kg	<0.5	<0.5	0.00	No Limit
		EP074: Pentachloroethane	76-01-7	0.5	mg/kg	<0.5	<0.5	0.00	No Limit
		EP074: Tetrachloroethene	127-18-4	0.5	mg/kg	<0.5	<0.5	0.00	No Limit
		EP074: trans-1.2-Dichloroethene	156-60-5	0.5	mg/kg	<0.5	<0.5	0.00	No Limit
		EP074: trans-1.4-Dichloro-2-butene	110-57-6	0.5	mg/kg	<0.5	<0.5	0.00	No Limit
		EP074: Trichloroethene	79-01-6	0.5	mg/kg	<0.5	<0.5	0.00	No Limit
		EP074: Bromomethane	74-83-9	5	mg/kg	<5	<5	0.00	No Limit
		EP074: Chloroethane	75-00-3	5	mg/kg	<5	<5	0.00	No Limit
		EP074: Chloromethane	74-87-3	5	mg/kg	<5	<5	0.00	No Limit
		EP074: Dichlorodifluoromethane	75-71-8	5	mg/kg	<5	<5	0.00	No Limit
		EP074: Trichlorofluoromethane	75-69-4	5	mg/kg	<5	<5	0.00	No Limit
		EP074: Vinyl chloride	75-01-4	5	mg/kg	<5	<5	0.00	No Limit
EP074F: Halogenated Aromatic Compounds (QC Lot: 265602)									
EM1516495-022	GW01(2.5-2.6)	EP074: 1.2.3-Trichlorobenzene	87-61-6	0.5	mg/kg	<0.5	<0.5	0.00	No Limit
		EP074: 1.2.4-Trichlorobenzene	120-82-1	0.5	mg/kg	<0.5	<0.5	0.00	No Limit
		EP074: 1.2-Dichlorobenzene	95-50-1	0.5	mg/kg	<0.5	<0.5	0.00	No Limit
		EP074: 1.3-Dichlorobenzene	541-73-1	0.5	mg/kg	<0.5	<0.5	0.00	No Limit
		EP074: 1.4-Dichlorobenzene	106-46-7	0.5	mg/kg	<0.5	<0.5	0.00	No Limit
		EP074: 2-Chlorotoluene	95-49-8	0.5	mg/kg	<0.5	<0.5	0.00	No Limit
		EP074: 4-Chlorotoluene	106-43-4	0.5	mg/kg	<0.5	<0.5	0.00	No Limit
		EP074: Bromobenzene	108-86-1	0.5	mg/kg	<0.5	<0.5	0.00	No Limit
		EP074: Chlorobenzene	108-90-7	0.5	mg/kg	<0.5	<0.5	0.00	No Limit
EP074G: Trihalomethanes (QC Lot: 265602)									
EM1516495-022	GW01(2.5-2.6)	EP074: Bromodichloromethane	75-27-4	0.5	mg/kg	<0.5	<0.5	0.00	No Limit
		EP074: Bromoform	75-25-2	0.5	mg/kg	<0.5	<0.5	0.00	No Limit
		EP074: Chloroform	67-66-3	0.5	mg/kg	<0.5	<0.5	0.00	No Limit
		EP074: Dibromochloromethane	124-48-1	0.5	mg/kg	<0.5	<0.5	0.00	No Limit
EP075(SIM)B: Polynuclear Aromatic Hydrocarbons (QC Lot: 265713)									
EM1516495-022	GW01(2.5-2.6)	EP075(SIM): Acenaphthene	83-32-9	0.5	mg/kg	<2.3	<2.2	0.00	No Limit
		EP075(SIM): Acenaphthylene	208-96-8	0.5	mg/kg	<2.3	<2.2	0.00	No Limit
		EP075(SIM): Anthracene	120-12-7	0.5	mg/kg	<2.3	<2.2	0.00	No Limit
		EP075(SIM): Benz(a)anthracene	56-55-3	0.5	mg/kg	2.4	<2.2	7.65	No Limit
		EP075(SIM): Benzo(a)pyrene	50-32-8	0.5	mg/kg	<2.3	<2.2	0.00	No Limit
		EP075(SIM): Benzo(b+j)fluoranthene	205-99-2 205-82-3	0.5	mg/kg	<2.3	<2.2	0.00	No Limit
		EP075(SIM): Benzo(g.h.i)perylene	191-24-2	0.5	mg/kg	<2.3	<2.2	0.00	No Limit
		EP075(SIM): Benzo(k)fluoranthene	207-08-9	0.5	mg/kg	<2.3	<2.2	0.00	No Limit
		EP075(SIM): Chrysene	218-01-9	0.5	mg/kg	<2.3	<2.2	0.00	No Limit
		EP075(SIM): Dibenz(a.h)anthracene	53-70-3	0.5	mg/kg	<2.3	<2.2	0.00	No Limit
		EP075(SIM): Fluoranthene	206-44-0	0.5	mg/kg	<2.3	<2.2	0.00	No Limit

Sub-Matrix: **SOIL**

				Laboratory Duplicate (DUP) Report					
Laboratory sample ID	*Client sample ID*	*Method: Compound*	*CAS Number*	*LOR*	*Unit*	*Original Result*	*Duplicate Result*	*RPD (%)*	*Recovery Limits (%)*
EP075(SIM)B: Polynuclear Aromatic Hydrocarbons (QC Lot: 265713) - continued									
EM1516495-022	GW01(2.5-2.6)	EP075(SIM): Fluorene	86-73-7	0.5	mg/kg	<2.3	<2.2	0.00	No Limit
		EP075(SIM): Indeno(1.2.3.cd)pyrene	193-39-5	0.5	mg/kg	<2.3	<2.2	0.00	No Limit
		EP075(SIM): Naphthalene	91-20-3	0.5	mg/kg	18.7	19.1	2.12	No Limit
		EP075(SIM): Phenanthrene	85-01-8	0.5	mg/kg	2.4	2.6	7.54	No Limit
		EP075(SIM): Pyrene	129-00-0	0.5	mg/kg	2.4	2.5	0.00	No Limit
EM1516534-022	Anonymous	EP075(SIM): Acenaphthene	83-32-9	0.5	mg/kg	<0.5	<0.5	0.00	No Limit
		EP075(SIM): Acenaphthylene	208-96-8	0.5	mg/kg	<0.5	<0.5	0.00	No Limit
		EP075(SIM): Anthracene	120-12-7	0.5	mg/kg	<0.5	1.4	96.5	No Limit
		EP075(SIM): Benz(a)anthracene	56-55-3	0.5	mg/kg	4.2	3.0	33.8	No Limit
		EP075(SIM): Benzo(a)pyrene	50-32-8	0.5	mg/kg	3.9	2.7	35.7	No Limit
		EP075(SIM): Benzo(b+j)fluoranthene	205-99-2 205-82-3	0.5	mg/kg	4.2	2.9	36.9	No Limit
		EP075(SIM): Benzo(g.h.i)perylene	191-24-2	0.5	mg/kg	1.6	1.1	31.9	No Limit
		EP075(SIM): Benzo(k)fluoranthene	207-08-9	0.5	mg/kg	1.6	1.1	37.2	No Limit
		EP075(SIM): Chrysene	218-01-9	0.5	mg/kg	3.5	2.5	30.8	No Limit
		EP075(SIM): Dibenz(a.h)anthracene	53-70-3	0.5	mg/kg	<0.5	<0.5	0.00	No Limit
		EP075(SIM): Fluoranthene	206-44-0	0.5	mg/kg	5.5	5.6	0.00	0% - 50%
		EP075(SIM): Fluorene	86-73-7	0.5	mg/kg	<0.5	<0.5	0.00	No Limit
		EP075(SIM): Indeno(1.2.3.cd)pyrene	193-39-5	0.5	mg/kg	1.4	1.0	34.9	No Limit
		EP075(SIM): Naphthalene	91-20-3	0.5	mg/kg	<0.5	<0.5	0.00	No Limit
		EP075(SIM): Phenanthrene	85-01-8	0.5	mg/kg	0.6	3.6	146	No Limit
		EP075(SIM): Pyrene	129-00-0	0.5	mg/kg	5.2	5.8	11.2	0% - 50%
EP080/071: Total Petroleum Hydrocarbons (QC Lot: 265603)									
EM1516495-022	GW01(2.5-2.6)	EP080: C6 - C9 Fraction	----	10	mg/kg	137	153	11.1	0% - 50%
EP080/071: Total Petroleum Hydrocarbons (QC Lot: 265714)									
EM1516495-022	GW01(2.5-2.6)	EP071: C15 - C28 Fraction	----	100	mg/kg	8950	9210	2.87	0% - 20%
		EP071: C29 - C36 Fraction	----	100	mg/kg	5950	6160	3.43	0% - 20%
		EP071: C10 - C14 Fraction	----	50	mg/kg	2420	2520	3.76	0% - 20%
		EP071: C10 - C36 Fraction (sum)	----	50	mg/kg	17300	17900	3.24	0% - 20%
EM1516534-022	Anonymous	EP071: C15 - C28 Fraction	----	100	mg/kg	<100	<100	0.00	No Limit
		EP071: C29 - C36 Fraction	----	100	mg/kg	<100	<100	0.00	No Limit
		EP071: C10 - C14 Fraction	----	50	mg/kg	<50	<50	0.00	No Limit
		EP071: C10 - C36 Fraction (sum)	----	50	mg/kg	<50	<50	0.00	No Limit
EP080/071: Total Recoverable Hydrocarbons - NEPM 2013 Fractions (QC Lot: 265603)									
EM1516495-022	GW01(2.5-2.6)	EP080: C6 - C10 Fraction	C6_C10	10	mg/kg	195	216	10.1	0% - 20%
EP080/071: Total Recoverable Hydrocarbons - NEPM 2013 Fractions (QC Lot: 265714)									
EM1516495-022	GW01(2.5-2.6)	EP071: >C16 - C34 Fraction	----	100	mg/kg	13800	14200	3.08	0% - 20%
		EP071: >C34 - C40 Fraction	----	100	mg/kg	1850	1950	5.16	0% - 50%
		EP071: >C10 - C16 Fraction	----	50	mg/kg	2320	2410	3.48	0% - 20%

Sub-Matrix: **SOIL**

				Laboratory Duplicate (DUP) Report					
Laboratory sample ID	Client sample ID	Method: Compound	CAS Number	LOR	Unit	Original Result	Duplicate Result	RPD (%)	Recovery Limits (%)
EP080/071: Total Recoverable Hydrocarbons - NEPM 2013 Fractions (QC Lot: 265714) - continued									
EM1516495-022	GW01(2.5-2.6)	EP071: >C10 - C40 Fraction (sum)	----	50	mg/kg	18000	18600	3.23	0% - 20%
EM1516534-022	Anonymous	EP071: >C16 - C34 Fraction	----	100	mg/kg	100	120	10.2	No Limit
		EP071: >C34 - C40 Fraction	----	100	mg/kg	<100	<100	0.00	No Limit
		EP071: >C10 - C16 Fraction	----	50	mg/kg	<50	<50	0.00	No Limit
		EP071: >C10 - C40 Fraction (sum)	----	50	mg/kg	100	120	18.2	No Limit
EP080: BTEXN (QC Lot: 265603)									
EM1516495-022	GW01(2.5-2.6)	EP080: Benzene	71-43-2	0.2	mg/kg	<0.2	<0.2	0.00	No Limit
		EP080: Ethylbenzene	100-41-4	0.5	mg/kg	1.6	1.5	9.29	No Limit
		EP080: meta- & para-Xylene	108-38-3 106-42-3	0.5	mg/kg	6.8	6.2	8.18	0% - 50%
		EP080: ortho-Xylene	95-47-6	0.5	mg/kg	1.6	1.5	0.00	No Limit
		EP080: Toluene	108-88-3	0.5	mg/kg	1.0	0.9	0.00	No Limit
		EP080: Naphthalene	91-20-3	1	mg/kg	11	16	32.8	0% - 50%

Sub-Matrix: **WATER**

				Laboratory Duplicate (DUP) Report					
Laboratory sample ID	Client sample ID	Method: Compound	CAS Number	LOR	Unit	Original Result	Duplicate Result	RPD (%)	Recovery Limits (%)
EG020T: Total Metals by ICP-MS (QC Lot: 268690)									
EM1516378-019	Anonymous	EG020A-T: Cadmium	7440-43-9	0.0001	mg/L	<0.0001	<0.0001	0.00	No Limit
		EG020A-T: Arsenic	7440-38-2	0.001	mg/L	<0.001	<0.001	0.00	No Limit
		EG020A-T: Chromium	7440-47-3	0.001	mg/L	<0.001	<0.001	0.00	No Limit
		EG020A-T: Copper	7440-50-8	0.001	mg/L	<0.001	<0.001	0.00	No Limit
		EG020A-T: Lead	7439-92-1	0.001	mg/L	<0.001	<0.001	0.00	No Limit
		EG020A-T: Nickel	7440-02-0	0.001	mg/L	<0.001	<0.001	0.00	No Limit
		EG020A-T: Zinc	7440-66-6	0.005	mg/L	<0.005	<0.005	0.00	No Limit
		EG020A-T: Aluminium	7429-90-5	0.01	mg/L	<0.01	<0.01	0.00	No Limit
		EG020A-T: Selenium	7782-49-2	0.01	mg/L	<0.01	<0.01	0.00	No Limit
		EG020A-T: Iron	7439-89-6	0.05	mg/L	<0.05	<0.05	0.00	No Limit
EM1516516-005	Anonymous	EG020A-T: Cadmium	7440-43-9	0.0001	mg/L	0.0003	0.0002	49.1	No Limit
		EG020A-T: Arsenic	7440-38-2	0.001	mg/L	0.107	0.109	1.82	0% - 20%
		EG020A-T: Chromium	7440-47-3	0.001	mg/L	0.061	0.061	0.00	0% - 20%
		EG020A-T: Copper	7440-50-8	0.001	mg/L	0.002	0.002	0.00	No Limit
		EG020A-T: Lead	7439-92-1	0.001	mg/L	0.001	<0.001	0.00	No Limit
		EG020A-T: Nickel	7440-02-0	0.001	mg/L	0.172	0.177	3.04	0% - 20%
		EG020A-T: Zinc	7440-66-6	0.005	mg/L	0.033	0.024	30.6	No Limit
		EG020A-T: Aluminium	7429-90-5	0.01	mg/L	0.11	0.14	17.9	0% - 50%
		EG020A-T: Selenium	7782-49-2	0.01	mg/L	<0.01	<0.01	0.00	No Limit
		EG020A-T: Iron	7439-89-6	0.05	mg/L	10.2	10.4	1.84	0% - 20%
EG035T: Total Recoverable Mercury by FIMS (QC Lot: 268846)									
EM1516392-042	Anonymous	EG035T: Mercury	7439-97-6	0.0001	mg/L	<0.0001	<0.0001	0.00	No Limit
EM1516606-001	Anonymous	EG035T: Mercury	7439-97-6	0.0001	mg/L	<0.0001	<0.0001	0.00	No Limit

Sub-Matrix: **WATER**

				Laboratory Duplicate (DUP) Report					
Laboratory sample ID	*Client sample ID*	*Method: Compound*	*CAS Number*	*LOR*	*Unit*	*Original Result*	*Duplicate Result*	*RPD (%)*	*Recovery Limits (%)*
EP080/071: Total Petroleum Hydrocarbons (QC Lot: 263786)									
EM1516566-002	Anonymous	EP071: C15 - C28 Fraction	----	100	µg/L	180	120	42.8	No Limit
		EP071: C10 - C14 Fraction	----	50	µg/L	70	<50	37.8	No Limit
		EP071: C29 - C36 Fraction	----	50	µg/L	80	<50	48.8	No Limit
EM1516516-005	Anonymous	EP071: C15 - C28 Fraction	----	100	µg/L	2000	2140	6.62	0% - 20%
		EP071: C10 - C14 Fraction	----	50	µg/L	1430	1320	8.32	0% - 20%
		EP071: C29 - C36 Fraction	----	50	µg/L	<50	60	23.3	No Limit
EP080/071: Total Petroleum Hydrocarbons (QC Lot: 266948)									
EM1516491-020	Anonymous	EP080: C6 - C9 Fraction	----	20	µg/L	<20	<20	0.00	No Limit
EM1516515-002	Anonymous	EP080: C6 - C9 Fraction	----	20	µg/L	<20	<20	0.00	No Limit
EP080/071: Total Recoverable Hydrocarbons - NEPM 2013 Fractions (QC Lot: 263786)									
EM1516566-002	Anonymous	EP071: >C10 - C16 Fraction	----	100	µg/L	<100	<100	0.00	No Limit
		EP071: >C16 - C34 Fraction	----	100	µg/L	200	120	49.3	No Limit
		EP071: >C34 - C40 Fraction	----	100	µg/L	<100	<100	0.00	No Limit
EM1516516-005	Anonymous	EP071: >C10 - C16 Fraction	----	100	µg/L	1750	1650	5.97	0% - 50%
		EP071: >C16 - C34 Fraction	----	100	µg/L	1580	1750	10.6	0% - 50%
		EP071: >C34 - C40 Fraction	----	100	µg/L	<100	<100	0.00	No Limit
EP080/071: Total Recoverable Hydrocarbons - NEPM 2013 Fractions (QC Lot: 266948)									
EM1516491-020	Anonymous	EP080: C6 - C10 Fraction	C6_C10	20	µg/L	<20	<20	0.00	No Limit
EM1516515-002	Anonymous	EP080: C6 - C10 Fraction	C6_C10	20	µg/L	<20	<20	0.00	No Limit
EP080: BTEXN (QC Lot: 266948)									
EM1516491-020	Anonymous	EP080: Benzene	71-43-2	1	µg/L	<1	<1	0.00	No Limit
		EP080: Ethylbenzene	100-41-4	2	µg/L	<2	<2	0.00	No Limit
		EP080: meta- & para-Xylene	108-38-3 106-42-3	2	µg/L	<2	<2	0.00	No Limit
		EP080: ortho-Xylene	95-47-6	2	µg/L	<2	<2	0.00	No Limit
		EP080: Toluene	108-88-3	2	µg/L	<2	<2	0.00	No Limit
		EP080: Naphthalene	91-20-3	5	µg/L	<5	<5	0.00	No Limit
EM1516515-002	Anonymous	EP080: Benzene	71-43-2	1	µg/L	<1	<1	0.00	No Limit
		EP080: Ethylbenzene	100-41-4	2	µg/L	<2	<2	0.00	No Limit
		EP080: meta- & para-Xylene	108-38-3 106-42-3	2	µg/L	<2	<2	0.00	No Limit
		EP080: ortho-Xylene	95-47-6	2	µg/L	<2	<2	0.00	No Limit
		EP080: Toluene	108-88-3	2	µg/L	<2	<2	0.00	No Limit
		EP080: Naphthalene	91-20-3	5	µg/L	<5	<5	0.00	No Limit

Method Blank (MB) and Laboratory Control Spike (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 (%)	Recovery Limits (%)	
Method: Compound	CAS Number	LOR	Unit	Result	Concentration	LCS	Low	High
ED040N: Sulfate - Calcium Phosphate Soluble (NEPM) (QCLot: 267903)								
ED040N: Sulfate as SO4 2-	14808-79-8	50	mg/kg	<50	3000 mg/kg	96.8	86	110
EG005T: Total Metals by ICP-AES (QCLot: 266185)								
EG005T: Aluminium	7429-90-5	50	mg/kg	<50	6134 mg/kg	102	93	115
EG005T: Arsenic	7440-38-2	5	mg/kg	<5	21.7 mg/kg	101	79	113
EG005T: Cadmium	7440-43-9	1	mg/kg	<1	4.64 mg/kg	96.3	87	115
EG005T: Chromium	7440-47-3	2	mg/kg	<2	43.9 mg/kg	108	89	113
EG005T: Copper	7440-50-8	5	mg/kg	<5	32 mg/kg	101	90	116
EG005T: Iron	7439-89-6	50	mg/kg	<50	8400 mg/kg	102	96	112
EG005T: Lead	7439-92-1	5	mg/kg	<5	40 mg/kg	94.2	85	107
EG005T: Nickel	7440-02-0	2	mg/kg	<2	55 mg/kg	101	89	111
EG005T: Selenium	7782-49-2	5	mg/kg	<5	5.37 mg/kg	102	93	109
EG005T: Zinc	7440-66-6	5	mg/kg	<5	60.8 mg/kg	97.8	89	111
EG035T: Total Recoverable Mercury by FIMS (QCLot: 266186)								
EG035T: Mercury	7439-97-6	0.1	mg/kg	<0.1	2.57 mg/kg	88.0	85	103
EP003: Total Organic Carbon (TOC) in Soil (QCLot: 268204)								
EP003: Total Organic Carbon	----	0.02	%	<0.02	100 %	98.9	70	130
EP074A: Monocyclic Aromatic Hydrocarbons (QCLot: 265602)								
EP074: 1.2.4-Trimethylbenzene	95-63-6	0.5	mg/kg	<0.5	1 mg/kg	95.8	66	108
EP074: 1.3.5-Trimethylbenzene	108-67-8	0.5	mg/kg	<0.5	1 mg/kg	95.5	67	109
EP074: Isopropylbenzene	98-82-8	0.5	mg/kg	<0.5	1 mg/kg	98.9	69	119
EP074: n-Butylbenzene	104-51-8	0.5	mg/kg	<0.5	1 mg/kg	101	58	110
EP074: n-Propylbenzene	103-65-1	0.5	mg/kg	<0.5	1 mg/kg	97.4	64	110
EP074: p-Isopropyltoluene	99-87-6	0.5	mg/kg	<0.5	1 mg/kg	103	65	111
EP074: sec-Butylbenzene	135-98-8	0.5	mg/kg	<0.5	1 mg/kg	99.8	66	110
EP074: Styrene	100-42-5	0.5	mg/kg	<0.5	1 mg/kg	99.4	72	118
EP074: tert-Butylbenzene	98-06-6	0.5	mg/kg	<0.5	1 mg/kg	100	67	111
EP074B: Oxygenated Compounds (QCLot: 265602)								
EP074: 2-Butanone (MEK)	78-93-3	5	mg/kg	<5	10 mg/kg	123	68	142
EP074: 2-Hexanone (MBK)	591-78-6	5	mg/kg	<5	10 mg/kg	104	62	128
EP074: 4-Methyl-2-pentanone (MIBK)	108-10-1	5	mg/kg	<5	10 mg/kg	84.6	67	123
EP074: Vinyl Acetate	108-05-4	5	mg/kg	<5	10 mg/kg	96.3	54	128
EP074C: Sulfonated Compounds (QCLot: 265602)								
EP074: Carbon disulfide	75-15-0	0.5	mg/kg	<0.5	1 mg/kg	84.3	50	128

Sub-Matrix: **SOIL**

Method: Compound	CAS Number	LOR	Unit	Method Blank (MB) Report	Laboratory Control Spike (LCS) Report			
					Spike	Spike Recovery (%)	Recovery Limits (%)	
				Result	Concentration	LCS	Low	High
EP074D: Fumigants (QCLot: 265602)								
EP074: 1.2-Dibromoethane (EDB)	106-93-4	0.5	mg/kg	<0.5	1 mg/kg	86.5	73	117
EP074: 1.2-Dichloropropane	78-87-5	0.5	mg/kg	<0.5	1 mg/kg	89.3	72	116
EP074: 2.2-Dichloropropane	594-20-7	0.5	mg/kg	<0.5	1 mg/kg	93.0	65	115
EP074: cis-1.3-Dichloropropylene	10061-01-5	0.5	mg/kg	<0.5	1 mg/kg	84.6	64	104
EP074: trans-1.3-Dichloropropylene	10061-02-6	0.5	mg/kg	<0.5	1 mg/kg	84.6	61	103
EP074E: Halogenated Aliphatic Compounds (QCLot: 265602)								
EP074: 1.1.1.2-Tetrachloroethane	630-20-6	0.5	mg/kg	<0.5	1 mg/kg	84.4	65	109
EP074: 1.1.1-Trichloroethane	71-55-6	0.5	mg/kg	<0.5	1 mg/kg	96.6	68	110
EP074: 1.1.2.2-Tetrachloroethane	79-34-5	0.5	mg/kg	<0.5	1 mg/kg	91.4	76	124
EP074: 1.1.2-Trichloroethane	79-00-5	0.5	mg/kg	<0.5	1 mg/kg	87.8	76	120
EP074: 1.1-Dichloroethane	75-34-3	0.5	mg/kg	<0.5	1 mg/kg	95.6	72	118
EP074: 1.1-Dichloroethene	75-35-4	0.5	mg/kg	<0.5	1 mg/kg	92.6	65	127
EP074: 1.1-Dichloropropylene	563-58-6	0.5	mg/kg	<0.5	1 mg/kg	96.1	70	116
EP074: 1.2.3-Trichloropropane	96-18-4	0.5	mg/kg	<0.5	1 mg/kg	84.6	75	123
EP074: 1.2-Dibromo-3-chloropropane	96-12-8	0.5	mg/kg	<0.5	1 mg/kg	79.1	54	106
EP074: 1.2-Dichloroethane	107-06-2	0.5	mg/kg	<0.5	1 mg/kg	96.0	75	119
EP074: 1.3-Dichloropropane	142-28-9	0.5	mg/kg	<0.5	1 mg/kg	95.8	78	120
EP074: Bromomethane	74-83-9	5	mg/kg	<5	10 mg/kg	84.4	43	133
EP074: Carbon Tetrachloride	56-23-5	0.5	mg/kg	<0.5	1 mg/kg	92.8	61	107
EP074: Chloroethane	75-00-3	5	mg/kg	<5	10 mg/kg	96.4	58	134
EP074: Chloromethane	74-87-3	5	mg/kg	<5	10 mg/kg	94.4	55	133
EP074: cis-1.2-Dichloroethene	156-59-2	0.5	mg/kg	<0.5	1 mg/kg	99.0	76	120
EP074: cis-1.4-Dichloro-2-butene	1476-11-5	0.5	mg/kg	<0.5	1 mg/kg	80.6	40	114
EP074: Dibromomethane	74-95-3	0.5	mg/kg	<0.5	1 mg/kg	84.9	74	114
EP074: Dichlorodifluoromethane	75-71-8	5	mg/kg	<5	10 mg/kg	69.0	45	123
EP074: Hexachlorobutadiene	87-68-3	0.5	mg/kg	<0.5	1 mg/kg	118	60	118
EP074: Iodomethane	74-88-4	0.5	mg/kg	<0.5	1 mg/kg	67.0	47	116
EP074: Pentachloroethane	76-01-7	0.5	mg/kg	<0.5	1 mg/kg	85.6	45	123
EP074: Tetrachloroethene	127-18-4	0.5	mg/kg	<0.5	1 mg/kg	99.5	69	121
EP074: trans-1.2-Dichloroethene	156-60-5	0.5	mg/kg	<0.5	1 mg/kg	95.4	70	118
EP074: trans-1.4-Dichloro-2-butene	110-57-6	0.5	mg/kg	<0.5	1 mg/kg	81.4	56	114
EP074: Trichloroethene	79-01-6	0.5	mg/kg	<0.5	1 mg/kg	101	72	116
EP074: Trichlorofluoromethane	75-69-4	5	mg/kg	<5	10 mg/kg	93.1	63	127
EP074: Vinyl chloride	75-01-4	5	mg/kg	<5	10 mg/kg	94.2	58	138
EP074F: Halogenated Aromatic Compounds (QCLot: 265602)								
EP074: 1.2.3-Trichlorobenzene	87-61-6	0.5	mg/kg	<0.5	1 mg/kg	111	69	117
EP074: 1.2.4-Trichlorobenzene	120-82-1	0.5	mg/kg	<0.5	1 mg/kg	108	60	112
EP074: 1.2-Dichlorobenzene	95-50-1	0.5	mg/kg	<0.5	1 mg/kg	99.0	76	112
EP074: 1.3-Dichlorobenzene	541-73-1	0.5	mg/kg	<0.5	1 mg/kg	104	70	110

Sub-Matrix: **SOIL**

Method: Compound	CAS Number	LOR	Unit	Method Blank (MB) Report: Result	Laboratory Control Spike (LCS) Report: Spike Concentration	Spike Recovery (%): LCS	Recovery Limits (%): Low	Recovery Limits (%): High
EP074F: Halogenated Aromatic Compounds (QCLot: 265602) - continued								
EP074: 1.4-Dichlorobenzene	106-46-7	0.5	mg/kg	<0.5	1 mg/kg	106	73	115
EP074: 2-Chlorotoluene	95-49-8	0.5	mg/kg	<0.5	1 mg/kg	101	69	113
EP074: 4-Chlorotoluene	106-43-4	0.5	mg/kg	<0.5	1 mg/kg	98.9	67	111
EP074: Bromobenzene	108-86-1	0.5	mg/kg	<0.5	1 mg/kg	95.1	63	117
EP074: Chlorobenzene	108-90-7	0.5	mg/kg	<0.5	1 mg/kg	97.4	79	115
EP074G: Trihalomethanes (QCLot: 265602)								
EP074: Bromodichloromethane	75-27-4	0.5	mg/kg	<0.5	1 mg/kg	94.0	65	107
EP074: Bromoform	75-25-2	0.5	mg/kg	<0.5	1 mg/kg	79.9	54	104
EP074: Chloroform	67-66-3	0.5	mg/kg	<0.5	1 mg/kg	94.0	75	117
EP074: Dibromochloromethane	124-48-1	0.5	mg/kg	<0.5	1 mg/kg	82.6	61	105
EP075(SIM)B: Polynuclear Aromatic Hydrocarbons (QCLot: 265713)								
EP075(SIM): Acenaphthene	83-32-9	0.5	mg/kg	<0.5	3 mg/kg	105	68	114
EP075(SIM): Acenaphthylene	208-96-8	0.5	mg/kg	<0.5	3 mg/kg	88.7	61	125
EP075(SIM): Anthracene	120-12-7	0.5	mg/kg	<0.5	3 mg/kg	105	68	116
EP075(SIM): Benz(a)anthracene	56-55-3	0.5	mg/kg	<0.5	3 mg/kg	98.4	62	116
EP075(SIM): Benzo(a)pyrene	50-32-8	0.5	mg/kg	<0.5	3 mg/kg	98.3	64	114
EP075(SIM): Benzo(b+j)fluoranthene	205-99-2 205-82-3	0.5	mg/kg	<0.5	3 mg/kg	93.7	64	114
EP075(SIM): Benzo(g.h.i)perylene	191-24-2	0.5	mg/kg	<0.5	3 mg/kg	81.0	59	117
EP075(SIM): Benzo(k)fluoranthene	207-08-9	0.5	mg/kg	<0.5	3 mg/kg	107	67	115
EP075(SIM): Chrysene	218-01-9	0.5	mg/kg	<0.5	3 mg/kg	102	63	119
EP075(SIM): Dibenz(a.h)anthracene	53-70-3	0.5	mg/kg	<0.5	3 mg/kg	84.2	62	114
EP075(SIM): Fluoranthene	206-44-0	0.5	mg/kg	<0.5	3 mg/kg	110	67	115
EP075(SIM): Fluorene	86-73-7	0.5	mg/kg	<0.5	3 mg/kg	101	62	120
EP075(SIM): Indeno(1.2.3.cd)pyrene	193-39-5	0.5	mg/kg	<0.5	3 mg/kg	84.2	62	116
EP075(SIM): Naphthalene	91-20-3	0.5	mg/kg	<0.5	3 mg/kg	97.3	65	119
EP075(SIM): Phenanthrene	85-01-8	0.5	mg/kg	<0.5	3 mg/kg	101	69	113
EP075(SIM): Pyrene	129-00-0	0.5	mg/kg	<0.5	3 mg/kg	109	66	116
EP080/071: Total Petroleum Hydrocarbons (QCLot: 265603)								
EP080: C6 - C9 Fraction	----	10	mg/kg	<10	36 mg/kg	90.7	66	130
EP080/071: Total Petroleum Hydrocarbons (QCLot: 265714)								
EP071: C10 - C14 Fraction	----	50	mg/kg	<50	658 mg/kg	91.7	65	131
EP071: C10 - C36 Fraction (sum)	----	50	mg/kg	<50	----	----	----	----
EP071: C15 - C28 Fraction	----	100	mg/kg	<100	3160 mg/kg	91.3	70	126
EP071: C29 - C36 Fraction	----	100	mg/kg	<100	1448 mg/kg	91.4	70	122
EP080/071: Total Recoverable Hydrocarbons - NEPM 2013 Fractions (QCLot: 265603)								
EP080: C6 - C10 Fraction	C6_C10	10	mg/kg	<10	45 mg/kg	89.8	64	128
EP080/071: Total Recoverable Hydrocarbons - NEPM 2013 Fractions (QCLot: 265714)								

Sub-Matrix: **SOIL**

Method: Compound	CAS Number	LOR	Unit	Method Blank (MB) Report: Result	Laboratory Control Spike (LCS) Report: Spike Concentration	Spike Recovery (%): LCS	Recovery Limits (%): Low	Recovery Limits (%): High
EP080/071: Total Recoverable Hydrocarbons - NEPM 2013 Fractions (QCLot: 265714) - continued								
EP071: >C10 - C16 Fraction	----	50	mg/kg	<50	1051 mg/kg	93.5	68	130
EP071: >C10 - C40 Fraction (sum)	----	50	mg/kg	<50	----	----	----	----
EP071: >C16 - C34 Fraction	----	100	mg/kg	<100	4124 mg/kg	90.0	72	116
EP071: >C34 - C40 Fraction	----	100	mg/kg	<100	161 mg/kg	84.8	38	132
EP080: BTEXN (QCLot: 265603)								
EP080: Benzene	71-43-2	0.2	mg/kg	<0.2	2 mg/kg	86.7	74	124
EP080: Ethylbenzene	100-41-4	0.5	mg/kg	<0.5	2 mg/kg	94.8	72	124
EP080: meta- & para-Xylene	108-38-3 106-42-3	0.5	mg/kg	<0.5	4 mg/kg	102	72	132
EP080: Naphthalene	91-20-3	1	mg/kg	<1	0.5 mg/kg	91.1	66	132
EP080: ortho-Xylene	95-47-6	0.5	mg/kg	<0.5	2 mg/kg	103	76	130
EP080: Toluene	108-88-3	0.5	mg/kg	<0.5	2 mg/kg	95.5	75	129

Sub-Matrix: **WATER**

Method: Compound	CAS Number	LOR	Unit	Method Blank (MB) Report: Result	Laboratory Control Spike (LCS) Report: Spike Concentration	Spike Recovery (%): LCS	Recovery Limits (%): Low	Recovery Limits (%): High
EG020T: Total Metals by ICP-MS (QCLot: 268690)								
EG020A-T: Aluminium	7429-90-5	0.01	mg/L	<0.01	0.5 mg/L	103	100	108
EG020A-T: Arsenic	7440-38-2	0.001	mg/L	<0.001	0.1 mg/L	104	94	116
EG020A-T: Cadmium	7440-43-9	0.0001	mg/L	<0.0001	0.1 mg/L	102	90	110
EG020A-T: Chromium	7440-47-3	0.001	mg/L	<0.001	0.1 mg/L	98.6	90	110
EG020A-T: Copper	7440-50-8	0.001	mg/L	<0.001	0.1 mg/L	96.7	91	109
EG020A-T: Iron	7439-89-6	0.05	mg/L	<0.05	0.5 mg/L	102	99	109
EG020A-T: Lead	7439-92-1	0.001	mg/L	<0.001	0.1 mg/L	97.1	91	111
EG020A-T: Nickel	7440-02-0	0.001	mg/L	<0.001	0.1 mg/L	96.2	91	111
EG020A-T: Selenium	7782-49-2	0.01	mg/L	<0.01	0.1 mg/L	96.2	86	110
EG020A-T: Zinc	7440-66-6	0.005	mg/L	<0.005	0.1 mg/L	104	91	109
EG035T: Total Recoverable Mercury by FIMS (QCLot: 268846)								
EG035T: Mercury	7439-97-6	0.0001	mg/L	<0.0001	0.01 mg/L	103	87	113
EP080/071: Total Petroleum Hydrocarbons (QCLot: 263786)								
EP071: C10 - C14 Fraction	----	50	µg/L	<50	3980 µg/L	67.7	53	123
EP071: C15 - C28 Fraction	----	100	µg/L	<100	17006 µg/L	90.0	57	133
EP071: C29 - C36 Fraction	----	50	µg/L	<50	8662 µg/L	82.0	55	141
EP080/071: Total Petroleum Hydrocarbons (QCLot: 266948)								
EP080: C6 - C9 Fraction	----	20	µg/L	<20	360 µg/L	107	67	127
EP080/071: Total Recoverable Hydrocarbons - NEPM 2013 Fractions (QCLot: 263786)								
EP071: >C10 - C16 Fraction	----	100	µg/L	<100	5753 µg/L	80.7	54	122
EP071: >C16 - C34 Fraction	----	100	µg/L	<100	24516 µg/L	80.9	56	132
EP071: >C34 - C40 Fraction	----	100	µg/L	<100	828 µg/L	91.3	51	137

Sub-Matrix: **WATER**

Method: Compound	CAS Number	LOR	Unit	Method Blank (MB) Report: Result	Laboratory Control Spike (LCS) Report: Spike Concentration	Spike Recovery (%): LCS	Recovery Limits (%): Low	Recovery Limits (%): High
EP080/071: Total Recoverable Hydrocarbons - NEPM 2013 Fractions (QCLot: 266948)								
EP080: C6 - C10 Fraction	C6_C10	20	µg/L	<20	450 µg/L	106	65	125
EP080: BTEXN (QCLot: 266948)								
EP080: Benzene	71-43-2	1	µg/L	<1	20 µg/L	104	76	120
EP080: Ethylbenzene	100-41-4	2	µg/L	<2	20 µg/L	104	72	124
EP080: meta- & para-Xylene	108-38-3 106-42-3	2	µg/L	<2	40 µg/L	104	72	130
EP080: Naphthalene	91-20-3	5	µg/L	<5	5 µg/L	90.4	71	129
EP080: ortho-Xylene	95-47-6	2	µg/L	<2	20 µg/L	106	75	127
EP080: Toluene	108-88-3	2	µg/L	<2	20 µg/L	106	76	124

Matrix Spike (MS) Report

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

Sub-Matrix: **SOIL**

Laboratory sample ID	Client sample ID	Method: Compound	CAS Number	Matrix Spike (MS) Report: Spike Concentration	SpikeRecovery(%): MS	Recovery Limits (%): Low	Recovery Limits (%): High
ED040N: Sulfate - Calcium Phosphate Soluble (NEPM) (QCLot: 267903)							
EM1516495-024	GW01(4.5-4.6)	ED040N: Sulfate as SO4 2-	14808-79-8	3000 mg/kg	91.8	84	116
EG005T: Total Metals by ICP-AES (QCLot: 266185)							
EM1516392-009	Anonymous	EG005T: Arsenic	7440-38-2	50 mg/kg	91.0	78	124
		EG005T: Cadmium	7440-43-9	50 mg/kg	95.2	84	116
		EG005T: Chromium	7440-47-3	50 mg/kg	92.6	79	121
		EG005T: Copper	7440-50-8	50 mg/kg	# 82.4	82	124
		EG005T: Lead	7439-92-1	50 mg/kg	90.9	76	124
		EG005T: Nickel	7440-02-0	50 mg/kg	87.6	78	120
		EG005T: Selenium	7782-49-2	50 mg/kg	85.7	71	125
		EG005T: Zinc	7440-66-6	50 mg/kg	# Not Determined	74	128
EG035T: Total Recoverable Mercury by FIMS (QCLot: 266186)							
EM1516392-009	Anonymous	EG035T: Mercury	7439-97-6	5 mg/kg	87.8	76	116
EP074E: Halogenated Aliphatic Compounds (QCLot: 265602)							
EM1516495-024	GW01(4.5-4.6)	EP074: 1.1-Dichloroethene	75-35-4	2 mg/kg	72.8	29	141
		EP074: Trichloroethene	79-01-6	2 mg/kg	60.5	50	126
EP074F: Halogenated Aromatic Compounds (QCLot: 265602)							
EM1516495-024	GW01(4.5-4.6)	EP074: Chlorobenzene	108-90-7	2 mg/kg	77.5	65	133
EP075(SIM)B: Polynuclear Aromatic Hydrocarbons (QCLot: 265713)							

Sub-Matrix: **SOIL**

				Matrix Spike (MS) Report			
				Spike	SpikeRecovery(%)	Recovery Limits (%)	
Laboratory sample ID	Client sample ID	Method: Compound	CAS Number	Concentration	MS	Low	High
EP075(SIM)B: Polynuclear Aromatic Hydrocarbons (QCLot: 265713) - continued							
EM1516495-024	GW01(4.5-4.6)	EP075(SIM): Acenaphthene	83-32-9	3 mg/kg	75.1	67	117
		EP075(SIM): Pyrene	129-00-0	3 mg/kg	120	52	148
EP080/071: Total Petroleum Hydrocarbons (QCLot: 265603)							
EM1516495-024	GW01(4.5-4.6)	EP080: C6 - C9 Fraction	----	28 mg/kg	# Not Determined	42	131
EP080/071: Total Petroleum Hydrocarbons (QCLot: 265714)							
EM1516513-007	Anonymous	EP071: C10 - C14 Fraction	----	658 mg/kg	94.9	53	123
		EP071: C15 - C28 Fraction	----	3160 mg/kg	92.0	70	124
		EP071: C29 - C36 Fraction	----	1448 mg/kg	91.6	64	118
EP080/071: Total Recoverable Hydrocarbons - NEPM 2013 Fractions (QCLot: 265603)							
EM1516495-024	GW01(4.5-4.6)	EP080: C6 - C10 Fraction	C6_C10	33 mg/kg	# Not Determined	39	129
EP080/071: Total Recoverable Hydrocarbons - NEPM 2013 Fractions (QCLot: 265714)							
EM1516513-007	Anonymous	EP071: >C10 - C16 Fraction	----	1051 mg/kg	95.6	65	123
		EP071: >C16 - C34 Fraction	----	4124 mg/kg	90.5	67	121
		EP071: >C34 - C40 Fraction	----	161 mg/kg	83.6	44	126
EP080: BTEXN (QCLot: 265603)							
EM1516495-024	GW01(4.5-4.6)	EP080: Benzene	71-43-2	2 mg/kg	75.2	50	136
		EP080: Toluene	108-88-3	2 mg/kg	# Not Determined	56	139

Sub-Matrix: **WATER**

				Matrix Spike (MS) Report			
				Spike	SpikeRecovery(%)	Recovery Limits (%)	
Laboratory sample ID	Client sample ID	Method: Compound	CAS Number	Concentration	MS	Low	High
EG020T: Total Metals by ICP-MS (QCLot: 268690)							
EM1516378-019	Anonymous	EG020A-T: Arsenic	7440-38-2	1 mg/L	113	82	118
		EG020A-T: Cadmium	7440-43-9	0.25 mg/L	117	75	129
		EG020A-T: Chromium	7440-47-3	1 mg/L	101	80	118
		EG020A-T: Copper	7440-50-8	1 mg/L	105	81	115
		EG020A-T: Lead	7439-92-1	1 mg/L	98.5	83	121
		EG020A-T: Nickel	7440-02-0	1 mg/L	110	80	118
		EG020A-T: Zinc	7440-66-6	1 mg/L	109	74	116
EG035T: Total Recoverable Mercury by FIMS (QCLot: 268846)							
EM1516495-026	QC24	EG035T: Mercury	7439-97-6	0.01 mg/L	91.7	70	130
EP080/071: Total Petroleum Hydrocarbons (QCLot: 263786)							
EM1516566-003	Anonymous	EP071: C10 - C14 Fraction	----	3980 µg/L	63.4	50	130
		EP071: C15 - C28 Fraction	----	17006 µg/L	83.8	54	136

Sub-Matrix: **WATER**

				Matrix Spike (MS) Report			
				Spike	SpikeRecovery(%)	Recovery Limits (%)	
Laboratory sample ID	Client sample ID	Method: Compound	CAS Number	Concentration	MS	Low	High
EP080/071: Total Petroleum Hydrocarbons (QCLot: 263786) - continued							
EM1516566-003	Anonymous	EP071: C29 - C36 Fraction	----	8662 µg/L	80.7	50	142
EP080/071: Total Petroleum Hydrocarbons (QCLot: 266948)							
EM1516490-026	Anonymous	EP080: C6 - C9 Fraction	----	280 µg/L	83.3	43	125
EP080/071: Total Recoverable Hydrocarbons - NEPM 2013 Fractions (QCLot: 263786)							
EM1516566-003	Anonymous	EP071: >C10 - C16 Fraction	----	5753 µg/L	72.8	50	128
		EP071: >C16 - C34 Fraction	----	24516 µg/L	77.8	50	150
		EP071: >C34 - C40 Fraction	----	828 µg/L	83.5	51	159
EP080/071: Total Recoverable Hydrocarbons - NEPM 2013 Fractions (QCLot: 266948)							
EM1516490-026	Anonymous	EP080: C6 - C10 Fraction	C6_C10	330 µg/L	81.3	44	122
EP080: BTEXN (QCLot: 266948)							
EM1516490-026	Anonymous	EP080: Benzene	71-43-2	20 µg/L	103	68	130
		EP080: Toluene	108-88-3	20 µg/L	104	72	132

ALS Environmental

QA/QC Compliance Assessment to assist with Quality Review

Work Order	: **EM1516495**	Page	: 1 of 7
Client	: **AECOM Australia Pty Ltd**	Laboratory	: Environmental Division Melbourne
Contact	: MS AVERYLL COYNE	Telephone	: +61-3-8549 9608
Project	: 60431087	Date Samples Received	: 30-Oct-2015
Site	: Fishermans Bend	Issue Date	: 09-Nov-2015
Sampler	: MATTHEW SHEPPARD, OLIVER TAYLOR	No. of samples received	: 27
Order number	: ----	No. of samples analysed	: 9

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.**
- **Matrix Spike outliers exist - please see following pages for full details.**
- **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

- **NO Quality Control Sample Frequency Outliers exist.**

Outliers : Quality Control Samples

Duplicates, Method Blanks, Laboratory Control Samples and Matrix Spikes

Matrix: **SOIL**

Compound Group Name	Laboratory Sample ID	Client Sample ID	Analyte	CAS Number	Data	Limits	Comment
Matrix Spike (MS) Recoveries							
EG005T: Total Metals by ICP-AES	EM1516392--009	Anonymous	**Zinc**	7440-66-6	Not Determined	----	**MS recovery not determined, background level greater than or equal to 4x spike level.**
EP080/071: Total Petroleum Hydrocarbons	EM1516495--024	GW01(4.5-4.6)	**C6 - C9 Fraction**	----	Not Determined	----	**MS recovery not determined, background level greater than or equal to 4x spike level.**
EP080/071: Total Recoverable Hydrocarbons - NEPM 2	EM1516495--024	GW01(4.5-4.6)	**C6 - C10 Fraction**	C6_C10	Not Determined	----	**MS recovery not determined, background level greater than or equal to 4x spike level.**
EP080: BTEXN	EM1516495--024	GW01(4.5-4.6)	**Toluene**	108-88-3	Not Determined	----	**MS recovery not determined, background level greater than or equal to 4x spike level.**

Analysis Holding Time Compliance

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
EA001: pH in soil using 0.01M CaCl extract							
Soil Glass Jar - Unpreserved (EA001)							
GW01(2.5-2.6), GW01(4.5-4.6)	**29-Oct-2015**	**04-Nov-2015**	05-Nov-2015	✓	**04-Nov-2015**	04-Nov-2015	✓
EA055: Moisture Content							
Soil Glass Jar - Unpreserved (EA055-103)							
GW01(2.5-2.6), GW01(4.5-4.6)	**29-Oct-2015**	**----**	----	----	**02-Nov-2015**	12-Nov-2015	✓
Soil Glass Jar - Unpreserved (EA055-103)							
GW17(2.2-2.3), GW13(2.9-3.0), GW06(2.9-3.0), GW12(2.9-3.0), GW31(3.9-4.0)	**29-Oct-2015**	**----**	----	----	**04-Nov-2015**	12-Nov-2015	✓
ED040N: Sulfate - Calcium Phosphate Soluble (NEPM)							
Soil Glass Jar - Unpreserved (ED040N)							
GW01(2.5-2.6), GW01(4.5-4.6)	**29-Oct-2015**	**05-Nov-2015**	26-Apr-2016	✓	**06-Nov-2015**	26-Apr-2016	✓

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
EG005T: Total Metals by ICP-AES							
Soil Glass Jar - Unpreserved (EG005T)							
GW01(2.5-2.6), GW01(4.5-4.6)	**29-Oct-2015**	**05-Nov-2015**	26-Apr-2016	✓	**05-Nov-2015**	26-Apr-2016	✓
EG035T: Total Recoverable Mercury by FIMS							
Soil Glass Jar - Unpreserved (EG035T)							
GW01(2.5-2.6), GW01(4.5-4.6)	**29-Oct-2015**	**05-Nov-2015**	26-Nov-2015	✓	**06-Nov-2015**	26-Nov-2015	✓
EP003: Total Organic Carbon (TOC) in Soil							
Pulp Bag (EP003)							
GW17(2.2-2.3), GW13(2.9-3.0), GW06(2.9-3.0), GW12(2.9-3.0), GW31(3.9-4.0), GW01(2.5-2.6)	**29-Oct-2015**	**05-Nov-2015**	26-Nov-2015	✓	**05-Nov-2015**	26-Nov-2015	✓
EP080/071: Total Petroleum Hydrocarbons							
Soil Glass Jar - Unpreserved (EP071)							
GW01(2.5-2.6), GW01(4.5-4.6)	**29-Oct-2015**	**04-Nov-2015**	12-Nov-2015	✓	**04-Nov-2015**	14-Dec-2015	✓
EP074A: Monocyclic Aromatic Hydrocarbons							
Soil Glass Jar - Unpreserved (EP074)							
GW01(2.5-2.6), GW01(4.5-4.6)	**29-Oct-2015**	**02-Nov-2015**	05-Nov-2015	✓	**04-Nov-2015**	05-Nov-2015	✓
EP075(SIM)B: Polynuclear Aromatic Hydrocarbons							
Soil Glass Jar - Unpreserved (EP075(SIM))							
GW01(2.5-2.6), GW01(4.5-4.6)	**29-Oct-2015**	**04-Nov-2015**	12-Nov-2015	✓	**04-Nov-2015**	14-Dec-2015	✓
EP080/071: Total Petroleum Hydrocarbons							
Soil Glass Jar - Unpreserved (EP080)							
GW01(2.5-2.6), GW01(4.5-4.6)	**29-Oct-2015**	**02-Nov-2015**	12-Nov-2015	✓	**04-Nov-2015**	12-Nov-2015	✓

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)							
QC24	**29-Oct-2015**	**06-Nov-2015**	26-Apr-2016	✓	**06-Nov-2015**	26-Apr-2016	✓
EG035T: Total Recoverable Mercury by FIMS							
Clear Plastic Bottle - Nitric Acid; Unfiltered (EG035T)							
QC24	**29-Oct-2015**	**----**	----	----	**06-Nov-2015**	26-Nov-2015	✓
EP080/071: Total Petroleum Hydrocarbons							
Amber Glass Bottle - Unpreserved (EP071)							
QC24	**29-Oct-2015**	**02-Nov-2015**	05-Nov-2015	✓	**05-Nov-2015**	12-Dec-2015	✓
EP080/071: Total Petroleum Hydrocarbons							
Amber VOC Vial - Sulfuric Acid (EP080)							
QC23, QC24	**29-Oct-2015**	**05-Nov-2015**	12-Nov-2015	✓	**05-Nov-2015**	12-Nov-2015	✓

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	EA055-103	2	18	**11.11**	**10.00**	✓	NEPM 2013 Schedule B(3) and ALS QCS3 requirement
PAH/Phenols (SIM)	EP075(SIM)	2	12	**16.67**	**10.00**	✓	NEPM 2013 Schedule B(3) and ALS QCS3 requirement
pH in soil using a 0.01M CaCl2 extract	EA001	2	19	**10.53**	**10.00**	✓	NEPM 2013 Schedule B(3) and ALS QCS3 requirement
Sulfate - Calcium Phosphate Soluble	ED040N	1	2	**50.00**	**10.00**	✓	NEPM 2013 Schedule B(3) and ALS QCS3 requirement
Total Mercury by FIMS	EG035T	2	14	**14.29**	**10.00**	✓	NEPM 2013 Schedule B(3) and ALS QCS3 requirement
Total Metals by ICP-AES	EG005T	2	20	**10.00**	**10.00**	✓	NEPM 2013 Schedule B(3) and ALS QCS3 requirement
Total Organic Carbon	EP003	1	8	**12.50**	**10.00**	✓	NEPM 2013 Schedule B(3) and ALS QCS3 requirement
TRH - Semivolatile Fraction	EP071	2	10	**20.00**	**10.00**	✓	NEPM 2013 Schedule B(3) and ALS QCS3 requirement
TRH Volatiles/BTEX	EP080	1	3	**33.33**	**10.00**	✓	NEPM 2013 Schedule B(3) and ALS QCS3 requirement
Volatile Organic Compounds	EP074	1	3	**33.33**	**10.00**	✓	NEPM 2013 Schedule B(3) and ALS QCS3 requirement
Laboratory Control Samples (LCS)							
PAH/Phenols (SIM)	EP075(SIM)	1	12	**8.33**	**5.00**	✓	NEPM 2013 Schedule B(3) and ALS QCS3 requirement
Sulfate - Calcium Phosphate Soluble	ED040N	1	2	**50.00**	**5.00**	✓	NEPM 2013 Schedule B(3) and ALS QCS3 requirement
Total Mercury by FIMS	EG035T	1	14	**7.14**	**5.00**	✓	NEPM 2013 Schedule B(3) and ALS QCS3 requirement
Total Metals by ICP-AES	EG005T	1	20	**5.00**	**5.00**	✓	NEPM 2013 Schedule B(3) and ALS QCS3 requirement
Total Organic Carbon	EP003	1	8	**12.50**	**5.00**	✓	NEPM 2013 Schedule B(3) and ALS QCS3 requirement
TRH - Semivolatile Fraction	EP071	1	10	**10.00**	**5.00**	✓	NEPM 2013 Schedule B(3) and ALS QCS3 requirement
TRH Volatiles/BTEX	EP080	1	3	**33.33**	**5.00**	✓	NEPM 2013 Schedule B(3) and ALS QCS3 requirement
Volatile Organic Compounds	EP074	1	3	**33.33**	**5.00**	✓	NEPM 2013 Schedule B(3) and ALS QCS3 requirement
Method Blanks (MB)							
PAH/Phenols (SIM)	EP075(SIM)	1	12	**8.33**	**5.00**	✓	NEPM 2013 Schedule B(3) and ALS QCS3 requirement
Sulfate - Calcium Phosphate Soluble	ED040N	1	2	**50.00**	**5.00**	✓	NEPM 2013 Schedule B(3) and ALS QCS3 requirement
Total Mercury by FIMS	EG035T	1	14	**7.14**	**5.00**	✓	NEPM 2013 Schedule B(3) and ALS QCS3 requirement
Total Metals by ICP-AES	EG005T	1	20	**5.00**	**5.00**	✓	NEPM 2013 Schedule B(3) and ALS QCS3 requirement
Total Organic Carbon	EP003	1	8	**12.50**	**5.00**	✓	NEPM 2013 Schedule B(3) and ALS QCS3 requirement
TRH - Semivolatile Fraction	EP071	1	10	**10.00**	**5.00**	✓	NEPM 2013 Schedule B(3) and ALS QCS3 requirement
TRH Volatiles/BTEX	EP080	1	3	**33.33**	**5.00**	✓	NEPM 2013 Schedule B(3) and ALS QCS3 requirement
Volatile Organic Compounds	EP074	1	3	**33.33**	**5.00**	✓	NEPM 2013 Schedule B(3) and ALS QCS3 requirement
Matrix Spikes (MS)							
PAH/Phenols (SIM)	EP075(SIM)	1	12	**8.33**	**5.00**	✓	NEPM 2013 Schedule B(3) and ALS QCS3 requirement
Sulfate - Calcium Phosphate Soluble	ED040N	1	2	**50.00**	**5.00**	✓	NEPM 2013 Schedule B(3) and ALS QCS3 requirement
Total Mercury by FIMS	EG035T	1	14	**7.14**	**5.00**	✓	NEPM 2013 Schedule B(3) and ALS QCS3 requirement
Total Metals by ICP-AES	EG005T	1	20	**5.00**	**5.00**	✓	NEPM 2013 Schedule B(3) and ALS QCS3 requirement
TRH - Semivolatile Fraction	EP071	1	10	**10.00**	**5.00**	✓	NEPM 2013 Schedule B(3) and ALS QCS3 requirement
TRH Volatiles/BTEX	EP080	1	3	**33.33**	**5.00**	✓	NEPM 2013 Schedule B(3) and ALS QCS3 requirement
Volatile Organic Compounds	EP074	1	3	**33.33**	**5.00**	✓	NEPM 2013 Schedule B(3) and ALS QCS3 requirement

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)							
Total Mercury by FIMS	EG035T	2	20	**10.00**	**10.00**	✓	NEPM 2013 Schedule B(3) and ALS QCS3 requirement
Total Metals by ICP-MS - Suite A	EG020A-T	2	20	**10.00**	**10.00**	✓	NEPM 2013 Schedule B(3) and ALS QCS3 requirement
TRH - Semivolatile Fraction	EP071	2	14	**14.29**	**10.00**	✓	NEPM 2013 Schedule B(3) and ALS QCS3 requirement
TRH Volatiles/BTEX	EP080	2	20	**10.00**	**10.00**	✓	NEPM 2013 Schedule B(3) and ALS QCS3 requirement
Laboratory Control Samples (LCS)							
Total Mercury by FIMS	EG035T	1	20	**5.00**	**5.00**	✓	NEPM 2013 Schedule B(3) and ALS QCS3 requirement
Total Metals by ICP-MS - Suite A	EG020A-T	1	20	**5.00**	**5.00**	✓	NEPM 2013 Schedule B(3) and ALS QCS3 requirement
TRH - Semivolatile Fraction	EP071	1	14	**7.14**	**5.00**	✓	NEPM 2013 Schedule B(3) and ALS QCS3 requirement
TRH Volatiles/BTEX	EP080	1	20	**5.00**	**5.00**	✓	NEPM 2013 Schedule B(3) and ALS QCS3 requirement
Method Blanks (MB)							
Total Mercury by FIMS	EG035T	1	20	**5.00**	**5.00**	✓	NEPM 2013 Schedule B(3) and ALS QCS3 requirement
Total Metals by ICP-MS - Suite A	EG020A-T	1	20	**5.00**	**5.00**	✓	NEPM 2013 Schedule B(3) and ALS QCS3 requirement
TRH - Semivolatile Fraction	EP071	1	14	**7.14**	**5.00**	✓	NEPM 2013 Schedule B(3) and ALS QCS3 requirement
TRH Volatiles/BTEX	EP080	1	20	**5.00**	**5.00**	✓	NEPM 2013 Schedule B(3) and ALS QCS3 requirement
Matrix Spikes (MS)							
Total Mercury by FIMS	EG035T	1	20	**5.00**	**5.00**	✓	NEPM 2013 Schedule B(3) and ALS QCS3 requirement
Total Metals by ICP-MS - Suite A	EG020A-T	1	20	**5.00**	**5.00**	✓	NEPM 2013 Schedule B(3) and ALS QCS3 requirement
TRH - Semivolatile Fraction	EP071	1	14	**7.14**	**5.00**	✓	NEPM 2013 Schedule B(3) and ALS QCS3 requirement
TRH Volatiles/BTEX	EP080	1	20	**5.00**	**5.00**	✓	NEPM 2013 Schedule B(3) and ALS QCS3 requirement

Brief Method Summaries

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

Analytical Methods	Method	Matrix	Method Descriptions
pH in soil using a 0.01M CaCl2 extract	EA001	SOIL	In house: Referenced to Rayment and Higginson 4B1 (mod.) 10 g of soil is mixed with 50 mL of 0.01M CaCl2 and tumbled end over end for 1 hour. pH is measured from the continuous suspension. This method is compliant with NEPM (2013) Schedule B(3) (Method 103)
Moisture Content	EA055-103	SOIL	In-house. A gravimetric procedure based on weight loss over a 12 hour drying period at 103-105 degrees C. This method is compliant with NEPM (2013) Schedule B(3) Section 7.1 and Table 1 (14 day holding time).
Sulfate - Calcium Phosphate Soluble	ED040N	SOIL	In-house. The sample is extracted with a calcium phosphate solution. The phosphate ion displaces the adsorbed sulfate while calcium ions depress the extraction of interfering S from soil organic matter. SO4 in the extract is determined by ICPAES and reported as dry weight in the original soil. This method is compliant with NEPM (2013) Schedule B(3) (Method 406)
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 (2013) 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 (2013) Schedule B(3)
Total Organic Carbon	EP003	SOIL	In-house C-IR17. Dried and pulverised sample is reacted with acid to remove inorganic Carbonates, then combusted in a LECO furnace in the presence of strong oxidants / catalysts. The evolved (Organic) Carbon (as CO2) is automaticaly measured by infra-red detector.
TRH - Semivolatile Fraction	EP071	SOIL	(USEPA SW 846 - 8015A) Sample extracts are analysed by Capillary GC/FID and quantified against alkane standards over the range C10 - C40.
Volatile Organic Compounds	EP074	SOIL	(USEPA SW 846 - 8260B) Extracts are analysed by Purge and Trap, Capillary GC/MS. Quantification is by comparison against an established 5 point calibration curve. This method is compliant with NEPM (2013) Schedule B(3) (Method 501)
PAH/Phenols (SIM)	EP075(SIM)	SOIL	(USEPA SW 846 - 8270B) 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 (2013) Schedule B(3) (Method 502 and 507)
TRH Volatiles/BTEX	EP080	SOIL	(USEPA SW 846 - 8260B) Extracts are analysed by Purge and Trap, Capillary GC/MS. Quantification is by comparison against an established 5 point calibration curve.
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.

Analytical Methods	Method	Matrix	Method Descriptions
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 (2013) Schedule B(3)
TRH - Semivolatile Fraction	EP071	WATER	USEPA SW 846 - 8015A 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 (2013) Schedule B(3)
TRH Volatiles/BTEX	EP080	WATER	USEPA SW 846 - 8260B 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 (2013) Schedule B(3)

Preparation Methods	Method	Matrix	Method Descriptions
Dry and Pulverise (up to 100g)	GEO30	SOIL	#
Methanolic Extraction of Soils for Purge and Trap	ORG16	SOIL	(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	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 (2013) Schedule B(3)

SAMPLE RECEIPT NOTIFICATION (SRN)

Work Order : **EM1516495**

Client	: **AECOM Australia Pty Ltd**	Laboratory	: Environmental Division Melbourne
Contact	: MS AVERYLL COYNE	Contact	: Carol Walsh
Address	: LEVEL 9 8 EXHIBITION ST MELBOURNE VIC 3000	Address	: 4 Westall Rd Springvale VIC Australia 3171
E-mail	: averyll.coyne@aecom.com	E-mail	: carol.walsh@alsglobal.com
Telephone	: +61 03 9653 1234	Telephone	: +61-3-8549 9608
Facsimile	: +61 03 9654 7117	Facsimile	: +61-3-8549 9601
Project	: 60431087	Page	: 1 of 3
Order number	: ----	Quote number	: EB2015AECOMAU0580 (EN/004/15)
C-O-C number	: ----	QC Level	: NEPM 2013 Schedule B(3) and ALS QCS3 requirement
Site	: Fishermans Bend		
Sampler	: MATTHEW SHEPPARD, OLIVER TAYLOR		

Dates

Date Samples Received	: 30-Oct-2015 10:40 AM	Issue Date	: 02-Nov-2015
Client Requested Due Date	: 09-Nov-2015	Scheduled Reporting Date	: **09-Nov-2015**

Delivery Details

Mode of Delivery	: Carrier	Security Seal	: Intact.
No. of coolers/boxes	: 1	Temperature	: 3.8°C - Ice present
Receipt Detail	:	No. of samples received / analysed	: 27 / 9

General Comments

- This report contains the following information:
  - Sample Container(s)/Preservation Non-Compliances
  - Summary of Sample(s) and Requested Analysis
  - Proactive Holding Time Report
  - Requested Deliverables
- **Please direct any queries related to sample condition / numbering / breakages to Client Services.**
- Sample Disposal - Aqueous (14 days), Solid (60 days) from date of completion of work order.
- **Analytical work for this work order will be conducted at ALS Springvale and ALS Brisbane.**
- **Please refer to the Proactive Holding Time Report table below which summarises breaches of recommended holding times that have occurred prior to samples/instructions being received at the laboratory. The absence of this summary table indicates that all samples have been received within the recommended holding times for the analysis requested.**

Sample Container(s)/Preservation Non-Compliances

All comparisons are made against pretreatment/preservation AS, APHA, USEPA standards.

- **No sample container / preservation non-compliance exist.**

Summary of Sample(s) and Requested Analysis

Some items described below may be part of a laboratory process necessary for the execution of client requested tasks. Packages may contain additional analyses, such as the determination of moisture content and preparation tasks, that are included in the package.

Matrix: **SOIL**

Laboratory sample ID	Client sampling date / time	Client sample ID	(On Hold) SOIL No analysis requested	SOIL - EA001 pH (CaCl)	SOIL - EA055-103 Moisture Content	SOIL - ED040N Calcium Phosphate Extractable Sulfate	SOIL - EP003 Total Organic Carbon (TOC) in Soil	SOIL - S-02 8 Metals (incl. Digestion)	SOIL - S-10 TRH/VOC/PAH
EM1516495-001	[29-Oct-2015]	GW17(1.5-1.6)	✓						
EM1516495-002	[29-Oct-2015]	GW17(1.9-2.0)	✓						
EM1516495-003	[29-Oct-2015]	GW17(2.2-2.3)			✓		✓		
EM1516495-004	[29-Oct-2015]	GW17(2.9-3.0)	✓						
EM1516495-005	[29-Oct-2015]	GW13(1.6-1.7)	✓						
EM1516495-006	[29-Oct-2015]	GW13(1.9-2.0)	✓						
EM1516495-007	[29-Oct-2015]	GW13(2.9-3.0)			✓		✓		
EM1516495-008	[29-Oct-2015]	GW13(3.9-4.0)	✓						
EM1516495-009	[29-Oct-2015]	GW06(1.6-1.7)	✓						
EM1516495-010	[29-Oct-2015]	GW06(1.9-2.0)	✓						
EM1516495-011	[29-Oct-2015]	GW06(2.9-3.0)			✓		✓		
EM1516495-012	[29-Oct-2015]	GW06(3.9-4.0)	✓						
EM1516495-013	[29-Oct-2015]	GW12(1.6-1.7)	✓						
EM1516495-014	[29-Oct-2015]	GW12(1.9-2.0)	✓						
EM1516495-015	[29-Oct-2015]	GW12(2.9-3.0)			✓		✓		
EM1516495-016	[29-Oct-2015]	GW12(3.9-4.0)	✓						
EM1516495-017	[29-Oct-2015]	GW31(1.9-2.0)	✓						
EM1516495-018	[29-Oct-2015]	GW31(2.9-3.0)	✓						
EM1516495-019	[29-Oct-2015]	GW31(3.6-3.7)	✓						
EM1516495-020	[29-Oct-2015]	GW31(3.9-4.0)			✓		✓		
EM1516495-021	[29-Oct-2015]	GW01(2.0-2.1)	✓						
EM1516495-022	[29-Oct-2015]	GW01(2.5-2.6)		✓	✓	✓	✓	✓	✓
EM1516495-023	[29-Oct-2015]	GW01(3.5-3.6)	✓						
EM1516495-024	[29-Oct-2015]	GW01(4.5-4.6)		✓	✓	✓		✓	✓

Matrix: **SOIL**

Laboratory sample ID	Client sampling date / time	Client sample ID	SOIL - EG005T (solids) Total Metals by ICP-AES
EM1516495-022	[29-Oct-2015]	GW01(2.5-2.6)	✓
EM1516495-024	[29-Oct-2015]	GW01(4.5-4.6)	✓

Matrix: **WATER**

Laboratory sample ID	Client sampling date / time	Client sample ID	(On Hold) WATER No analysis requested	WATER - EG020T Total Recoverable Metals by ICPMS (including	WATER - W-05T TRH/BTEXN/8 Metals (Total)	WATER - W-18 TRH(C6 - C9)/BTEXN
EM1516495-025	[29-Oct-2015]	QC23				✓
EM1516495-026	[29-Oct-2015]	QC24		✓	✓	
EM1516495-027	[28-Oct-2015]	QC22	✓			

Proactive Holding Time Report

Sample(s) have been received within the recommended holding times for the requested analysis.

Requested Deliverables

AP_CUSTOMER SERVICE ANZ

- A4 - AU Tax Invoice (INV)	Email	ap_customerservice.anz@aecom.com

AVERYLL COYNE

- *AU Certificate of Analysis - NATA (COA)	Email	averyll.coyne@aecom.com
- *AU Interpretive QC Report - DEFAULT (Anon QCI Rep) (QCI)	Email	averyll.coyne@aecom.com
- *AU QC Report - DEFAULT (Anon QC Rep) - NATA (QC)	Email	averyll.coyne@aecom.com
- A4 - AU Sample Receipt Notification - Environmental HT (SRN)	Email	averyll.coyne@aecom.com
- A4 - AU Tax Invoice (INV)	Email	averyll.coyne@aecom.com
- Chain of Custody (CoC) (COC)	Email	averyll.coyne@aecom.com
- EDI Format - ENMRG (ENMRG)	Email	averyll.coyne@aecom.com
- EDI Format - EQUIS V5 AECOM (EQUIS_V5_AECOM)	Email	averyll.coyne@aecom.com
- EDI Format - ESDAT (ESDAT)	Email	averyll.coyne@aecom.com
- EDI Format - HLAPro (HLAPro)	Email	averyll.coyne@aecom.com
- EDI Format - XTab (XTAB)	Email	averyll.coyne@aecom.com

Samples received without CoC

CLIENT / SENDER: AECOM
PROJECT: 60431087
CONTACT NAME: AV Coyne
CONTACT NUMBER: 0499 052 502
CARRIER: Courier
CONNOTE REFERENCE: —
SAMPLER:
NUMBER OF SAMPLES/MATRIX: Soils + Water
Client services notified by: Tom

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

SAMPLES RECEIVED BY: Tom
DATE/TIME: 10:40, 30/10

ANALYSIS RECEIVED BY:
DATE/TIME:

Comments

Environmental Division
Melbourne
Work Order Reference
EM1516495

Telephone : +61-3-8549 9600

LAB ID	SAMPLE DETAILS: SAMPLE ID	DATE	MATRIX	NUMBER OF CONTAINERS	Additional Information
			TOTAL		

Approved Date: 15/01/2014

COC Rec'd 30/10 @ 13:08

Form:

AECOM

Chain of Custody & Analysis Request Form

AECOM - Melbourne
Level 9, 8 Exhibition Street
Melbourne VIC 3000
Tel: 03 9653 8072
Fax: 61 3 9653 1234
Email: averyll.coyne@aecom.com

Laboratory Details
Lab. Name: ALS
Lab. Address: 4 Westall Rd, Springvale
Contact Name:
Lab. Ref:
Tel: 8549 9600
Fax:
Preliminary Report by:
Final Report by:
Lab Quote No:

Project Name: Fishermans Bend
Project Number: 60431087
Purchase Order Number: NA

Sample collected by: Matthew Sheppard and Oliver Taylor
Sample Results to be returned to: Averyll Coyne

Specifications:	(Tick)		
1. Urgent TAT required? (please circle: 24hr 48hr ___3___days)	☐ Yes	☑ No	☐ N/A
2. Fast TAT Guarantee Required?	☐ Yes	☑ No	☐ N/A
3. Is any sediment layer present in waters to be excluded from extractions?	☐ Yes	☑ No	☐ N/A
4. Special storage requirements?	☐ Yes	☑ No	☐ N/A
5. Preservation requirements ☐ Fax ☐ Hard copy ☑ Email	☐ Yes	☑ No	☐ N/A
6. Other requirements?	☑ Yes	☐ No	☐ N/A

7. Report Format: Email with QC reports
8. Project Manager: Averyll Coyne tel: 9653 8072

Lab. ID	Sample ID	Sampling Date & time (on)	Sampling Date & Time (off)	Matrix: soil	Matrix: water	Matrix: other	Preservation: filtered	Preservation: acid	Preservation: ice	Preservation: other	Container (No. & type)	TOC	Moisture Content	TRH(C6-C40)	Full VOC Scan (70 Analytes) - Code EP074(A-H)	PAH	Metals	TRH, BTEX and metals	pH and sulfate	Remarks & comments
1	GW17(1.5-1.6)	29/10/2015		x					x		Jar									Please hold
2	GW17(1.9-2.0)	29/10/2015		x					x		Jar									Please hold
3	GW17(2.2-2.3)	29/10/2015		x					x		Jar	x	x							
4	GW17(2.9-3.0)	29/10/2015		x					x		Jar									Please hold
5	GW13(1.6-1.7)	29/10/2015		x					x		Jar									Please hold
6	GW13(1.9-2.0)	29/10/2015		x					x		Jar									Please hold
7	GW13(2.9-3.0)	29/10/2015		x					x		Jar	x	x							
8	GW13(3.9-4.0)	29/10/2015		x					x		Jar									Please hold
9	GW06(1.6-1.7)	29/10/2015		x					x		Jar									Please hold
10	GW06(1.9-2.0)	29/10/2015		x					x		Jar									Please hold
11	GW06(2.9-3.0)	29/10/2015		x					x		Jar	x	x							
12	GW06(3.9-4.0)	29/10/2015		x					x		Jar									Please hold
13	GW12(1.6-1.7)	29/10/2015		x					x		Jar									Please hold
14	GW12(1.9-2.0)	29/10/2015		x					x		Jar									Please hold
15	GW12(2.9-3.0)	29/10/2015		x					x		Jar	x	x							
16	GW12(3.9-4.0)	29/10/2015		x					x		Jar									Please hold
17	GW31(1.9-2.0)	29/10/2015		x					x		Jar									Please hold
18	GW31(2.9-3.0)	29/10/2015		x					x		Jar									Please hold
19	GW31(3.6-3.7)	29/10/2015		x					x		Jar									Please hold

Metals (As, Cd, Cr, Cu, Pb, Ni, Zn, Al, Fe, Se, Hg)

Relinquished By:	Received by:		
Name: Oliver Taylor	Date: 30/10/2015 Time:9:00	Name:	Date:
of: AECOM		of: ALS	Time:
Relinquished By:		Received by:	
Name:	Date:	Name:	Date:
of:	Time:	of:	Time:

Received in good condition?	Yes/No/NA	Method of Shipment	
Samples received chilled?	Yes/No/NA	Consignment Note No.	
	Yes/No/NA	Transport Co:	
Received in good condition?	Yes/No/NA	Method of Shipment	
Samples received chilled?	Yes/No/NA	Consignment Note No.	
	Yes/No/NA	Transport Co:	

Form:

AECOM

Chain of Custody & Analysis Request Form

AECOM - Melbourne
Level 9, 8 Exhibition Street
Melbourne VIC 3000
Tel: 03 9653 8072
Fax: 61 3 9653 1234
Email: averyll.coyne@aecom.com

Laboratory Details
Lab. Name: ALS
Lab. Address: 4 Westall Rd, Springvale
Contact Name:
Lab. Ref:
Tel: 8549 9600
Fax:
Preliminary Report by:
Final Report by:
Lab Quote No:

Project Name: Fishermans Bend
Project Number: 60431087
Purchase Order Number: NA

Sample collected by: Matthew Sheppard and Oliver Taylor
Sample Results to be returned to: Averyll Coyne

Specifications:	(Tick)		
1. Urgent TAT required? (please circle: 24hr 48hr ___3___days)	☐ Yes	☑ No	☐ N/A
2. Fast TAT Guarantee Required?	☐ Yes	☑ No	☐ N/A
3. Is any sediment layer present in waters to be excluded from extractions?	☐ Yes	☑ No	☐ N/A
4. Special storage requirements?	☐ Yes	☑ No	☐ N/A
5. Preservation requirements ☐ Fax ☐ Hard copy ☑ Email	☐ Yes	☑ No	☐ N/A
6. Other requirements?	☑ Yes	☐ No	☐ N/A

7. Report Format: Email with QC reports
8. Project Manager: Averyll Coyne tel: 9653 8072

Lab. ID	Sample ID	Sampling Date & time (on)	Sampling Date & Time (off)	Matrix: soil	Matrix: water	Matrix: other	Preservation: filtered	Preservation: acid	Preservation: ice	Preservation: other	Container (No. & type)	TOC	Moisture Content	TRH(C6-C40)	Full VOC Scan (70 Analytes) - Code EP074(A-H)	PAH	Metals	TRH, BTEX and metals	pH and sulfate	Remarks & comments
20	GW31(3.9-4.0)	29/10/2015		x					x		Jar	x	x							Metals (As, Cd, Cr, Cu, Pb, Ni, Zn, Al, Fe, Se, Hg)
21	GW01(2.0-2.1)	29/10/2015	30	x					x		Jar									Please hold
22	GW01(2.5-2.6)	29/10/2015	↓	x					x		Jar	x	x	x	x	x	x		x	
23	GW01(3.5-3.6)	29/10/2015		x					x		Jar									Please hold
24	GW01(4.5-4.6)	29/10/2015		x					x		Jar			x	x	x	x		x	
25	QC23	29/10/2015			x				x		Bottles			x						
26	QC24	29/10/2015			x				x		Bottles							x		
Extra 27	Sample QC25	28/10/15			x															
		SH 2/11																		

Relinquished By:	Received by:	Received in good condition?	Yes/No/NA	Method of Shipment	
Name: Oliver Taylor Date: 30/10/2015	Name: Date:	Samples received chilled?	Yes/No/NA	Consignment Note No.	
of: AECOM Time:9:00	of: ALS Time:		Yes/No/NA	Transport Co:	
Relinquished By:	**Received by:**	**Received in good condition?**	Yes/No/NA	**Method of Shipment**	
Name: Date:	Name: Date:	**Samples received chilled?**	Yes/No/NA	**Consignment Note No.**	
of: Time:	of: Time:		Yes/No/NA	**Transport Co:**	

Appendix K

Data Validation

Data Validation

The Quality Assurance and Quality Control (QA/QC) processes implemented by AECOM during baseline groundwater assessment were conducted in general accordance with EPA Publication 669 (Groundwater Sampling Guidelines) (EPA, 2000), Industrial Waste Guidelines, Publication IWRG701 (Sampling and Analysis of Waters, Wastewaters, Soils and Wastes) (EPA, 2009), NEPM (as amended 2013) and Australian Standards (AS4482.1).

As per the NEPM 1999 (as amended 2013), Quality Assurance is the '*planned and systematic activities implemented within a quality system*' necessary to provide the confidence that a dataset will meet the quality objectives. Quality Control is the '*operational techniques and activities'* necessary to ensure a dataset will meet the quality objectives. The NEPM provides guidance on both field QA/QC procedures and laboratory QA/QC procedures. Data Quality Indicators (DQIs), including completeness, comparability, representativeness, precision and accuracy, assess the reliability and effectiveness of field and laboratory QA/QC procedures implemented during an investigation.

Field QA/QC

The AECOM Sampling and Analysis Quality Plan (2015) outlined the scope of works to be completed for this assessment. The SAQP (2015) also outlined the procedures for groundwater monitoring well gauging and sampling, and field quality control sampling and analysis. The groundwater sampling event in this assessment was performed in accordance with the SAQP.

Appendix K summarises the field considerations used to assess the field QA/QC procedures implemented as part of this assessment.

Laboratory QA/QC

Routine quality assurance practices are used by the laboratories during analysis to ensure the accuracy and reliability of analytical results. The adequacy of the laboratory quality assurance practices is measured by field and laboratory quality control procedures.

Appendix K summarises the controls used to measure and assess the laboratory QA/QC procedures implemented during this baseline groundwater assessment.

Data Validation Summary

The QA/QC assessment process is used to assess and document the usability of the data and whether the data are suitable as a basis for interpretation. Data sets are assessed for completeness, comparability, representativeness, precision and accuracy against field specific and laboratory-specific QA/QC requirements.

The review of field and laboratory QA/QC results, as provided in **Appendix K,** indicated that the reported analytical data are representative of shallow groundwater quality at the sample locations and the data are adequately reliable for the intended purposes.

Table K1 - Summary of Rinsate and Trip Blank Results - Soil

	Sample ID	QC01	QC03	QC04	QC05	QC08	QC09	QC10	QC11	QC12	QC13	QC14	QC15	QC16	QC17	QC18	QC19	QC20	QC21	QC22
	Sample Type	Rinsate	Trip_B	Rinsate	Trip_B	Rinsate	Trip_B	Trip_B	Rinsate	Trip_B	Trip_B	Rinsate	Trip_B	Trip_B	Trip_B	Rinsate	Trip_B	Rinsate	Trip_B	Rinsate
	Date Sampled	12/10/2015	12/10/2015	13/10/2015	13/10/2015	14/10/2015	14/10/2015	14/10/2015	15/10/2015	15/10/2015	15/10/2015	16/10/2015	16/10/2015	16/10/2015	27/10/2015	27/10/2015	27/10/2015	27/10/2015	28/10/2015	28/10/2015
Chemical Group	**Chemical Name**	**Units**	**EQL**																		
BTEX	Benzene	µg/L	1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1
	Ethylbenzene	µg/L	2	<2	<2	<2	<2	<2	<2	<2	<2	<2	<2	<2	<2	<2	<2	<2	<2	<2	<2
	Toluene	µg/L	2	<2	<2	<2	<2	<2	<2	<2	<2	<2	<2	<2	<2	<2	<2	<2	<2	<2	<2
	Total BTEX	mg/L	0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001
	Xylene (m & p)	µg/L	2	<2	<2	<2	<2	<2	<2	<2	<2	<2	<2	<2	<2	<2	<2	<2	<2	<2	<2
	Xylene (o)	µg/L	2	<2	<2	<2	<2	<2	<2	<2	<2	<2	<2	<2	<2	<2	<2	<2	<2	<2	<2
	Xylene Total	µg/L	2	<2	<2	<2	<2	<2	<2	<2	<2	<2	<2	<2	<2	<2	<2	<2	<2	<2	<2
	C6-C10 less BTEX (F1)	mg/L	0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02
Metals	Aluminium	mg/L	0.01	<0.01	-	<0.01	-	<0.01	-	-	0.09	-	-	<0.01	-	-	-	<0.01	-	<0.01	-	<0.01
	Arsenic	mg/L	0.001	<0.001	-	<0.001	-	<0.001	-	-	<0.001	-	-	<0.001	-	-	-	<0.001	-	<0.001	-	<0.001
	Cadmium	mg/L	0.0001	<0.0001	-	<0.0001	-	<0.0001	-	-	0.0002	-	-	<0.0001	-	-	-	<0.0001	-	<0.0001	-	<0.0001
	Chromium (III+VI)	mg/L	0.001	<0.001	-	<0.001	-	<0.001	-	-	<0.001	-	-	<0.001	-	-	-	<0.001	-	<0.001	-	<0.001
	Copper	mg/L	0.001	<0.001	-	<0.001	-	<0.001	-	-	0.002	-	-	<0.001	-	-	-	<0.001	-	<0.001	-	<0.001
	Iron	mg/L	0.05	<0.05	-	<0.05	-	<0.05	-	-	0.09	-	-	<0.05	-	-	-	<0.05	-	<0.05	-	<0.05
	Lead	mg/L	0.001	<0.001	-	<0.001	-	<0.001	-	-	0.002	-	-	<0.001	-	-	-	<0.001	-	<0.001	-	<0.001
	Mercury	mg/L	0.0001	<0.0001	-	<0.0001	-	<0.0001	-	-	<0.0001	-	-	<0.0001	-	-	-	<0.0001	-	<0.0001	-	<0.0001
	Nickel	mg/L	0.001	<0.001	-	<0.001	-	<0.001	-	-	<0.001	-	-	<0.001	-	-	-	<0.001	-	<0.001	-	<0.001
	Selenium	mg/L	0.01	<0.01	-	<0.01	-	<0.01	-	-	<0.01	-	-	<0.01	-	-	-	<0.01	-	<0.01	-	<0.01
	Zinc	mg/L	0.005	<0.005	-	<0.005	-	<0.005	-	-	<0.005	-	-	<0.005	-	-	-	<0.005	-	<0.005	-	<0.005
PAH/Phenols	Naphthalene	µg/L	5	<5	<5	<5	<5	<5	<5	<5	<5	<5	<5	<5	<5	<5	<5	<5	<5	<5	<5	<5
TPH	F2-NAPHTHALENE	mg/L	0.1	<0.1	-	<0.1	-	<0.1	-	-	<0.1	-	-	<0.1	-	-	-	-	-	-	-	-
	C6 - C9	µg/L	20	<20	<20	<20	<20	<20	<20	<20	<20	<20	<20	<20	<20	<20	<20	<20	<20	<20	<20	<20
	C10 - C14	µg/L	50	<50	-	<50	-	<50	-	-	<50	-	-	<50	-	-	-	-	-	-	-	-
	C15 - C28	µg/L	100	<100	-	<100	-	<100	-	-	<100	-	-	<100	-	-	-	-	-	-	-	-
	C29-C36	µg/L	50	<50	-	<50	-	<50	-	-	<50	-	-	<50	-	-	-	-	-	-	-	-
	+C10 - C36 (Sum of total)	µg/L	50	<50	-	<50	-	<50	-	-	<50	-	-	<50	-	-	-	-	-	-	-	-
	C10 - C40 (Sum of total)	µg/L	100	<100	-	<100	-	<100	-	-	<100	-	-	<100	-	-	-	-	-	-	-	-
	C10-C16	mg/L	0.1	<0.1	-	<0.1	-	<0.1	-	-	<0.1	-	-	<0.1	-	-	-	-	-	-	-	-
	C16-C34	mg/L	0.1	<0.1	-	<0.1	-	<0.1	-	-	<0.1	-	-	<0.1	-	-	-	-	-	-	-	-
	C34-C40	mg/L	0.1	<0.1	-	<0.1	-	<0.1	-	-	<0.1	-	-	<0.1	-	-	-	-	-	-	-	-
	C6-C10	mg/L	0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02

Env Stds Comments

Table K2
Data Validation - Quality Control Sample Register - Soil

QA/QC Sample ID	Date Sampled	QA/QC Sample Type	Matrix	Laboratory	Analysis Requested
QC01	12/10/2015	Rinsate	WATER	ALS	BTEX; Metals: Al, As, Cd, Cr, Cu, Fe, Pb, Hg, Ni, Se, Zn; PAH/Phenols (Naphthalene); TPH
QC03	12/10/2015	Trip Blank	WATER	ALS	BTEX; PAH/Phenols (Naphthalene); TPH (C6-C10), (C6-C9)
QC04	13/10/2015	Rinsate	WATER	ALS	BTEX; Metals: Al, As, Cd, Cr, Cu, Fe, Pb, Hg, Ni, Se, Zn; PAH/Phenols (Naphthalene); TPH
QC05	13/10/2015	Trip Blank	WATER	ALS	BTEX; PAH/Phenols (Naphthalene); TPH (C6-C10), (C6-C9)
QC06	14/10/2015	Primary Duplicate - GW04	WATER	ALS	BTEX; Chlorinated Hydrocarbons; Halogenated Benzenes; Halogenated Hydrocarbons; pH, Moisture; Sulfate as SO4; Metals: Al, As, Cd, Cr, Cu, Fe, Pb, Hg, Ni, Se, Zn; PAH; TRH/TPH; Sovelnts; VOC Scan
QC07	14/10/2015	Secondary Duplicate - GW04	WATER	Eurofins-MGT	BTEX; Chlorinated Hydrocarbons; Halogenated Benzenes; Halogenated Hydrocarbons; Moisture; Metals: Al, As, Cd, Cr, Cu, Fe, Pb, Hg, Ni, Se, Zn; PAH; TRH/TPH; Solvents
QC08	14/10/2015	Rinsate	WATER	ALS	BTEX; Metals: Al, As, Cd, Cr, Cu, Fe, Pb, Hg, Ni, Se, Zn; PAH/Phenols (Naphthalene); TPH
QC09	14/10/2015	Trip Blank	WATER	ALS	BTEX; PAH/Phenols (Naphthalene); TPH (C6-C10), (C6-C9)
QC10	14/10/2015	Trip Blank	WATER	ALS	BTEX; PAH/Phenols (Naphthalene); TPH (C6-C10), (C6-C9)
QC11	15/10/2015	Rinsate	WATER	ALS	BTEX; Metals: Al, As, Cd, Cr, Cu, Fe, Pb, Hg, Ni, Se, Zn; PAH/Phenols (Naphthalene); TPH
QC12	15/10/2015	Trip Blank	WATER	ALS	BTEX; PAH/Phenols (Naphthalene); TPH (C6-C10), (C6-C9)
QC13	15/10/2015	Trip Blank	WATER	ALS	BTEX; PAH/Phenols (Naphthalene); TPH (C6-C10), (C6-C9)
QC14	16/10/2015	Rinsate	WATER	ALS	BTEX; Metals: Al, As, Cd, Cr, Cu, Fe, Pb, Hg, Ni, Se, Zn; PAH/Phenols (Naphthalene); TPH
QC15	16/10/2015	Trip Blank	WATER	ALS	BTEX; PAH/Phenols (Naphthalene); TPH (C6-C10), (C6-C9)
QC16	16/10/2015	Trip Blank	WATER	ALS	BTEX; PAH/Phenols (Naphthalene); TPH (C6-C10), (C6-C9)
QC17	27/10/2015	Trip Blank	WATER	ALS	BTEX; PAH/Phenols (Naphthalene); TPH (C6-C10), (C6-C9)
QC18	27/10/2015	Rinsate	WATER	ALS	BTEX; Metals: Al, As, Cd, Cr, Cu, Fe, Pb, Hg, Ni, Se, Zn; PAH/Phenols (Naphthalene); TPH (C6-C10), (C6-C9)
QC19	27/10/2015	Trip Blank	WATER	ALS	BTEX; PAH/Phenols (Naphthalene); TPH (C6-C10), (C6-C9)
QC20	27/10/2015	Rinsate	WATER	ALS	BTEX; Metals: Al, As, Cd, Cr, Cu, Fe, Pb, Hg, Ni, Se, Zn; PAH/Phenols (Naphthalene); TPH (C6-C10), (C6-C9)
QC21	28/10/2015	Trip Blank	WATER	ALS	BTEX; PAH/Phenols (Naphthalene); TPH (C6-C10), (C6-C9)
QC22	28/10/2015	Rinsate	WATER	ALS	BTEX; Metals: Al, As, Cd, Cr, Cu, Fe, Pb, Hg, Ni, Se, Zn; PAH/Phenols (Naphthalene); TPH (C6-C10), (C6-C9)

Table K3
Data Quality Summary Table - Soil

QA/QC Item	Data Quality Indicators	Acceptability Limits	Source Guidance Document	Pass?	Applicable DQO	Comments
Field Calibration	All equipment/ instrumentation has been calibrated prior to use in the field.	Field instrumentation should be calibrated prior to use and on a daily basis (or as required). Calibration certificates and records to be included.	Australian Standard AS4482.1-2005; NEPM (1999) Schedule B(2)	**Y**	-	Refer to Appendix C for Calibration Certificates.
Sample Preservation and Storage	Samples preserved and transported in a manner such that sample integrity is maintained.	Samples stored in pre-spiked bottles supplied by the laboratory. Transported at a temperature between 0°C - 4°C (or as specified for analytical methods)	Australian Standard AS4482.1-2005	**N**	-	Samples received by ALS with ice present. Sample temperatures measured by ALS ranged between 4.3-5.4°C. Temperatures measured for all of the samples exceeded acceptible limits.
Sample Holding Times	Samples transported to the laboratory for extraction and analysis within recommended holding times.	Analyte Specific	NATA accredited method specific holding times (refer to laboratory QC documentation)	**Y**	-	All batches were analysed within holding time.
Sample Analysis	Samples were analysed for requested analytes using appropriate analytical techniques.	Samples analysed by a laboratory that is NATA accredited for the required analytical methods.	NATA Technical Note No. 23 (2008)	**Y**	-	ALS is NATA accredited
Limits of Reporting	Analytical limits of reporting should be below relevant screening criteria.	PQL < lowest applicable screening/assessment criteria	Australian Standard AS4482.1-2005	**N**	-	Matrix spike exceedances were noted for 3 ALS batches. EM1515593 had 2 analyte breaches, EM1515737 had 1 analyte breach, and EM1516473 had 2 analyte breaches. These are not considered to affect the validity of the dataset.
Primary Duplicates	Relative percent difference (RPD) between duplicate sample and parent sample within acceptable range.	RPD generated should be ±50%		**N**	Precision	RPD exceedances are displayed in Table K4. Exceedances were observed between GW04 and QC06. These are not considered to affect the validity of the dataset for the purposes of this report and are representative of the comparison of low concentrations.
Secondary Duplicates				**Y**	Precision	No secondary duplicate RPD exceedances occurred.
Rinsate Blanks	Provide a baseline for water used to prepare Rinsate Blanks	Collected for each batch of deionised water used for decontamination of sampling equipment		**Y**	Completeness	Results for rinsate blanks were reported below LOR.
Field Method Blanks	Analytes reported at concentrations below the laboratory limit of reporting.	<LOR		**Y**	Completeness	Results for field method blanks were reported below LOR.
Trip Blanks				**Y**	Completeness	Results for trip blanks were reported below LOR.
Laboratory Method Blank				**Y**	Completeness	No method blank outliers occurred.
Laboratory Duplicates	Relative percent deviation (RPD) between laboratory duplicate samples within acceptable range.	RPD generated should be ±30%		**N**	Precision	RPD exceedances are displayed in Table K4. Exceedances were observed between GW04 and QC07. These are not considered to affect the validity of the dataset for the purposes of this report, and are a result of the comparison of low concentrations.

Table K3
Data Quality Summary Table - Soil

QA/QC Item	Data Quality Indicators	Acceptability Limits	Source Guidance Document	Pass?	Applicable DQO	Comments
Matrix Spike Recoveries	Recoveries within adopted acceptability range.	Recoveries should be within 75% - 125%.		**N**	Accuracy	Matrix spike exceedances were noted for 3 ALS batches. EM1515593 had 2 analyte breaches, EM1515737 had 1 analyte breach, and EM1516473 had 2 analyte breaches. These are not considered to affect the validity of the dataset.
Laboratory Control Spike (LCS) Recoveries	Recoveries within adopted acceptability range.	Recoveries should be within 70% - 130%.		**Y**	Accuracy	No LCS recovery exceedences occurred.
Surrogate Spike Recoveries	Recoveries within adopted acceptability range.	As specified in laboratory QC report, if applicable. If laboratory does not specify, acceptance criteria of 70%-130% has been adopted.		**Y**	Accuracy	No surrogacy spike outliers occurred.
Frequency of Quality Control Measurements	Number of quality control samples is consistent with site specific requirements	Primary Duplicates collected at a frequency of 5% of total samples. Secondary Duplicates collected at a frequency of 5% of total samples. One rinsate blank per matrix per piece of equipment requiring decontamination should be collected per day. One trip blank per day. Laboratory control measures including duplicates, method blanks, matrix spike recovery and laboratory control spike to be measured at a frequency of 10% of the total samples analysed.		**Y**	-	Primary and Secondary Duplicates were collected at a frequency of 6.6% (i.e. 1 per 15 primary samples). One trip blank was collected per esky. One rinsate and field blank was collected per piece of equipment per day. Laboratory control measures were collected at the expected frequencies.

Table K4
RPD Results - Soil

Lab Report Number	EM1515593	EM1515593		EM1515593	476023	
Field ID	GW04	QC06	RPD	GW04	QC07	RPD
Sampled Date/Time	13/10/2015 15:00	13/10/2015 15:00		13/10/2015 15:00	13/10/2015 15:00	
Chem_Group	**ChemName**	**Units**	**EQL**			
BTEX	Benzene	mg/kg	0.1	<0.2	<0.2	-	<0.2	<1.0	-
	Ethylbenzene	mg/kg	0.1	<0.5	<0.5	-	<0.5	<1.0	-
	Toluene	mg/kg	0.1	<0.5	<0.5	-	<0.5	<1.0	-
	BTEX Total	mg/kg	0.2	<0.2	<0.2	-	<0.2	-	-
	Xylene (m & p)	mg/kg	0.2	<0.5	<0.5	-	<0.5	<0.2	-
	Xylene (o)	mg/kg	0.1	<0.5	<0.5	-	<0.5	<0.1	-
	Xylene Total	mg/kg	0.3	<0.5	<0.5	-	<0.5	<0.3	-
	C6-C10 less BTEX (F1)	mg/kg	10	<10	<10	-	<10	<20	-
Chlorinated Hydrocarbons	1,1,1,2-tetrachloroethane	mg/kg	0.05	<0.5	<0.5	-	<0.5	<0.05	-
	1,1,1-trichloroethane	mg/kg	0.05	<0.5	<0.5	-	<0.5	<0.05	-
	1,1,2,2-tetrachloroethane	mg/kg	0.05	<0.5	<0.5	-	<0.5	<0.05	-
	1,1,2-trichloroethane	mg/kg	0.05	<0.5	<0.5	-	<0.5	<0.05	-
	1,1-dichloroethane	mg/kg	0.05	<0.5	<0.5	-	<0.5	<0.05	-
	1,1-dichloroethene	mg/kg	0.5	<0.5	<0.5	-	<0.5	<0.05	-
	1,1-dichloropropene	mg/kg	0.05	<0.5	<0.5	-	<0.5	-	-
	1,2,3-trichloropropane	mg/kg	0.5	<0.5	<0.5	-	<0.5	<0.05	-
	1,2-dibromo-3-chloropropane	mg/kg	0.05	<0.5	<0.5	-	<0.5	-	-
	1,2-dichloroethane	mg/kg	0.05	<0.5	<0.5	-	<0.5	<0.05	-
	1,2-dichloropropane	mg/kg	0.05	<0.5	<0.5	-	<0.5	<0.05	-
	1,3-dichloropropane	mg/kg	0.5	<0.5	<0.5	-	<0.5	<0.05	-
	2,2-dichloropropane	mg/kg		<0.5	<0.5	-	<0.5	-	-
	Bromodichloromethane	mg/kg	0.05	-	-	-	-	<0.05	-
	Bromoform	mg/kg	0.05	<0.5	<0.5	-	<0.5	<0.05	-
	Carbon tetrachloride	mg/kg	0.05	<0.5	<0.5	-	<0.5	<0.05	-
	Chlorodibromomethane	mg/kg	0.05	<0.5	<0.5	-	<0.5	<0.05	-
	Chloroethane	mg/kg	0.05	<5	<5	-	<5	<0.05	-
	Chloroform	mg/kg	0.05	<0.5	<0.5	-	<0.5	<0.05	-
	cis-1,2-dichloroethene	mg/kg	0.05	<0.5	<0.5	-	<0.5	<0.05	-
	cis-1,3-dichloropropene	mg/kg	0.05	<0.5	<0.5	-	<0.5	<0.05	-
	Dibromomethane	mg/kg	0.05	-	-	-	-	<0.05	-
	Dichloromethane	mg/kg		<0.5	<0.5	-	<0.5	<0.05	-
	Hexachlorobutadiene	mg/kg	0.5	<0.5	<0.5	-	<0.5	-	-
	Trichloroethene	mg/kg	0.05	<0.5	<0.5	-	<0.5	<0.05	-
	Tetrachloroethene	mg/kg	0.05	<0.5	<0.5	-	<0.5	<0.05	-
	trans-1,2-dichloroethene	mg/kg	0.05	<0.5	<0.5	-	<0.5	<0.05	-
	trans-1,3-dichloropropene	mg/kg	0.05	<0.5	<0.5	-	<0.5	<0.05	-
	Vinyl chloride	mg/kg	0.05	<5	<5	-	<5	<0.05	-
Halogenated Benzenes	1,2,3-trichlorobenzene	mg/kg	0.5	<0.5	<0.5	-	<0.5	-	-
	1,2,4-trichlorobenzene	mg/kg	0.5	<0.5	<0.5	-	<0.5	-	-
	1,2-dichlorobenzene	mg/kg	0.05	<0.5	<0.5	-	<0.5	<0.05	-
	1,3-dichlorobenzene	mg/kg	0.05	<0.5	<0.5	-	<0.5	<0.05	-
	1,4-dichlorobenzene	mg/kg	0.05	<0.5	<0.5	-	<0.5	<0.05	-
	2-chlorotoluene	mg/kg	0.5	<0.5	<0.5	-	<0.5	-	-
	4-chlorotoluene	mg/kg	0.05	<0.5	<0.5	-	<0.5	<0.05	-
	Bromobenzene	mg/kg	0.05	<0.5	<0.5	-	<0.5	<0.05	-
	Chlorobenzene	mg/kg	0.05	<0.5	<0.5	-	<0.5	<0.05	-
Halogenated Hydrocarbons	1,2-dibromoethane	mg/kg	0.05	<0.5	<0.5	-	<0.5	<0.05	-
	Bromomethane	mg/kg	0.05	<5	<5	-	<5	<0.05	-
	Chloromethane	mg/kg	0.05	<5	<5	-	<5	<0.05	-
	Dichlorodifluoromethane	mg/kg	0.05	<5	<5	-	<5	<0.05	-
	Iodomethane	mg/kg	0.05	<0.5	<0.5	-	<0.5	<0.05	-
	Trichlorofluoromethane	mg/kg	0.05	<5	<5	-	<5	<0.05	-
Inorganics	pH (Lab)	pH_Units	0.1	8	7.9	1%	8	-	-
	Moisture	%	1	7.7	8	4%	7.7	5.8	28%
	Sulfate as SO4	mg/kg	50	50	60	18%	50	-	-
	TOC	%	0.02	-	-	-	-	-	-
MAH	1,2,4-trimethylbenzene	mg/kg	0.05	<0.5	<0.5	-	<0.5	<0.05	-
	1,3,5-trimethylbenzene	mg/kg	005	<0.5	<0.5	-	<0.5	<0.05	-
	Isopropylbenzene	mg/kg	0.05	<0.5	<0.5	-	<0.5	<0.05	-
	n-butylbenzene	mg/kg	0.5	<0.5	<0.5	-	<0.5	-	-
	n-propylbenzene	mg/kg	0.5	<0.5	<0.5	-	<0.5	-	-
	p-isopropyltoluene	mg/kg	0.5	<0.5	<0.5	-	<0.5	-	-
	sec-butylbenzene	mg/kg	0.5	<0.5	<0.5	-	<0.5	-	-
	Styrene	mg/kg	0.05	<0.5	<0.5	-	<0.5	<0.05	-
	tert-butylbenzene	mg/kg	0.5	<0.5	<0.5	-	<0.5	-	-
Metals	Aluminium (Filtered)	mg/kg	10	7470	7010	6%	7470	9200	21%
	Arsenic (Filtered)	mg/kg	2	17	23	30%	17	12	34%
	Cadmium (Filtered)	mg/kg	0.4	<1	<1	-	<1	0.5	-
	Chromium (III+VI) (Filtered)	mg/kg	2	22	21	5%	22	21	5%
	Copper (Filtered)	mg/kg	5	60	52	14%	60	57	5%
	Iron (Filtered)	mg/kg	5	25,700	28,400	10%	25,700	29,000	12%
	Lead (Filtered)	mg/kg	5	217	271	22%	217	180	19%
	Mercury (Filtered)	mg/kg	0.1	<0.1	<0.1	-	<0.1	0.3	-
	Nickel (Filtered)	mg/kg	2	40	38	5%	40	44	10%
	Selenium (Filtered)	mg/kg	2	<5	<5	-	<5	<2	-
	Zinc (Filtered)	mg/kg	5	**318**	**233**	**31%**	318	310	3%
PAH	Benzo[b+j]fluoranthene	mg/kg	0.5	1.5	1.6	6%	1.5	1.3	14%
PAH/Phenols	Acenaphthene	mg/kg	0.5	<0.5	<0.5	-	<0.5	<0.5	-
	Acenaphthylene	mg/kg	0.5	<0.5	<0.5	-	<0.5	<0.5	-
	Anthracene	mg/kg	0.5	<0.5	<0.5	-	<0.5	<0.5	-
	Benz(a)anthracene	mg/kg	0.5	1.1	1.2	9%	1.1	1.3	17%
	Benzo(a) pyrene	mg/kg	0.5	1.3	1.4	7%	1.3	1.7	27%
	Benzo(g,h,i)perylene	mg/kg	0.5	0.8	0.8	0%	**0.8**	**1.7**	**72%**
	Benzo(k)fluoranthene	mg/kg	0.5	0.6	0.6	0%	**0.6**	**1.1**	**59%**
	Chrysene	mg/kg	0.5	1	1.1	10%	1	1.3	26%
	Dibenz(a,h)anthracene	mg/kg	0.5	<0.5	<0.5	-	<0.5	0.5	-
	Fluoranthene	mg/kg	0.5	2.2	2.4	9%	2.2	2.1	5%
	Fluorene	mg/kg	0.5	<0.5	<0.5	-	<0.5	<0.5	-
	Indeno(1,2,3-c,d)pyrene	mg/kg	0.5	0.7	0.7	0%	0.7	1.1	**44%**
	Naphthalene	mg/kg	0.5	<0.5	<0.5	-	<0.5	<0.5	-
	PAHs (Sum of total)	mg/kg	0.5	12.6	13.2	5%	12.6	15	17%
	Phenanthrene	mg/kg	0.5	1	1	0%	1	1.2	18%
	Pyrene	mg/kg	0.5	2.4	2.4	0%	2.4	2	18%
	Benzo(a)pyrene TEQ (half LOR)	mg/kg	0.5	2	2.1	5%	2	2.7	30%
	Benzo(a)pyrene TEQ (LOR)	mg/kg	0.5	2.2	2.3	4%	2.2	2.7	20%
	Benzo(a)pyrene TEQ (zero)	mg/kg	0.5	1.7	1.8	6%	1.7	2.7	**45%**
Solvents	2-hexanone (MBK)	mg/kg	5	<5	<5	-	<5	<0.05	-
	Methyl Ethyl Ketone	mg/kg	0.05	<5	<5	-	<5	<0.05	-
	4-Methyl-2-pentanone	mg/kg	0.05	<5	<5	-	<5	<0.05	-
	Acetone	mg/kg		-	-	-	-	<0.05	-
	Allyl chloride	mg/kg		-	-	-	-	<0.05	-
	Carbon disulfide	mg/kg	0.05	<0.5	<0.5	-	<0.5	<0.05	-
	Vinyl acetate	mg/kg	5	<5	<5	-	<5	-	-

Table K4
RPD Results - Soil

Lab Report Number	EM1515593	EM1515593		EM1515593	476023	
Field ID	GW04	QC06	RPD	GW04	QC07	RPD
Sampled Date/Time	13/10/2015 15:00	13/10/2015 15:00		13/10/2015 15:00	13/10/2015 15:00	

Chem_Group	ChemName	Units	EQL						
TPH	F2-NAPHTHALENE	mg/l	50	<50	<50	-	<50	<50	-
	+C10 - C36 (Sum of total)	µg/L	50	<50	<50	-	<50	220	-
	C6 - C9	mg/kg	10	<10	<10	-	<10	<20	-
	C10 - C14	mg/kg	20	<50	<50	-	<50	<20	-
	C15 - C28	mg/kg	50	<100	<100	-	<100	88	-
	C29-C36	mg/kg	50	<100	<100	-	<100	130	-
	C10 - C40 (Sum of total)	mg/kg	50	<50	<50	-	<50	-	-
	C10-C16	mg/kg	50	<50	<50	-	<50	<50	-
	C16-C34	mg/kg	100	<100	<100	-	<100	140	-
	C34-C40	mg/kg	100	<100	<100	-	<100	130	-
	C6-C10	mg/kg	10	<10	<10	-	<10	<20	-
VOCs	cis-1,4-Dichloro-2-butene	mg/kg	0.5	<0.5	<0.5	-	<0.5	-	-
	Pentachloroethane	mg/kg	0.5	<0.5	<0.5	-	<0.5	-	-
	trans-1,4-Dichloro-2-butene	mg/kg	0.5	<0.5	<0.5	-	<0.5	-	-

*RPDs have only been considered where a concentration is greater than 0 times the EQL.
**High RPDs are in bold (Acceptable RPDs for each EQL multiplier range are: 50 (0-10 x EQL); 30 (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 K5
Data Validation - Quality Control Sample Register

QA/QC Sample ID	Date Sampled	QA/QC Sample Type	Matrix	Laboratory	Analysis Requested
QC01	18/11/2015	Primary Duplicate - GW21	WATER	ALS	pH, TDS, TOC; Dissolved Metals; Ammonia as N, Ca, Mg, Na, K, Cl, SO4, Alkalinity; Minor Anions; 8 Metals; TRH(C6-C40)/PAH/BTEXN
QC02	18/11/2015	Secondary Duplicate - GW21	WATER	Envirolab	pH, TDS, TOC; Ca, Mg, Na, K, Cl, SO4, Alkalinity, Ammonia as N, Reactive P, Nitrite as N, Nitrate as N plus Nox, F; Metals: As, Cd, Cr, Cu, Ni, Pb, Zn, Hg, Al, Fe, Se, Mn; TOS as SO4; TRH(C6-C40)/PAH; VOC Scan including BTEXN
QC03	18/11/2015	Primary Duplicate - GW27	WATER	ALS	pH, TDS, TOC; Dissolved Metals; Ammonia as N, Ca, Mg, Na, K, Cl, SO4, Alkalinity; Minor Anions; 8 Metals; TRH(C6-C40)/PAH/BTEXN
QC04	18/11/2015	Secondary Duplicate - GW27	WATER	Envirolab	pH, TDS, TOC; Ca, Mg, Na, K, Cl, SO4, Alkalinity, Ammonia as N, Reactive P, Nitrite as N, Nitrate as N plus Nox, F; Metals: As, Cd, Cr, Cu, Ni, Pb, Zn, Hg, Al, Fe, Se, Mn; TOS as SO4; TRH(C6-C40)/PAH; VOC Scan including BTEXN
QC05	20/11/2015	Primary Duplicate - GW35	WATER	ALS	pH, TDS, TOC; Dissolved Metals; Ammonia as N, Ca, Mg, Na, K, Cl, SO4, Alkalinity; Minor Anions; 8 Metals; TRH(C6-C40)/PAH/BTEXN
QC06	20/11/2015	Secondary Duplicate - GW35	WATER	Envirolab	pH, TDS, TOC; Ca, Mg, Na, K, Cl, SO4, Alkalinity, Ammonia as N, Reactive P, Nitrite as N, Nitrate as N plus Nox, F; Metals: As, Cd, Cr, Cu, Ni, Pb, Zn, Hg, Al, Fe, Se, Mn; TOS as SO4;
QCA	16/11/2015	Rinsate	WATER	ALS	Metals, TRH (C6-C40), BTEXN
QCB	16/11/2015	Rinsate	WATER	ALS	Metals, TRH (C6-C40), BTEXN
QCC	16/11/2015	Trip Blank	WATER	ALS	TPH (C6-C9), BTEXN
QCD	16/11/2015	Field Method Blank	WATER	ALS	Metals, TRH (C6-C40), BTEXN
QCE	17/11/2015	Field Method Blank	WATER	ALS	Metals, TRH (C6-C40), BTEXN
QCF	17/11/2015	Rinsate	WATER	ALS	Metals, TRH (C6-C40), BTEXN
QCG	17/11/2015	Rinsate	WATER	ALS	Metals, TRH (C6-C40), BTEXN
QCH	17/11/2015	Trip Blank	WATER	ALS	TPH (C6-C9), BTEXN
QCI	18/11/2015	Field Method Blank	WATER	ALS	Metals, TRH (C6-C40), BTEXN
QCJ	18/11/2015	Rinsate	WATER	ALS	Metals, TRH (C6-C40), BTEXN
QCK	23/11/2015	Rinsate	WATER	ALS	Metals, TRH (C6-C40), BTEXN
QCL	23/11/2015	Field Method Blank	WATER	ALS	Metals, TRH (C6-C40), BTEXN
QCM	19/11/2015	Trip Blank	WATER	ALS	TPH (C6-C9), BTEXN
QCN	20/11/2015	Rinsate	WATER	ALS	Metals, TRH (C6-C40), BTEXN
QCO	20/11/2015	Field Method Blank	WATER	ALS	Metals, TRH (C6-C40), BTEXN
QCP	20/11/2015	Trip Blank	WATER	ALS	TPH (C6-C9), BTEXN
QCQ	19/11/2015	Rinsate	WATER	ALS	Metals, TRH (C6-C40), BTEXN
QCR	19/11/2015	Field Method Blank	WATER	ALS	Metals, TRH (C6-C40), BTEXN

Table K6
Data Quality Summary Table

QA/QC Item	Data Quality Indicators	Acceptability Limits	Source Guidance Document	Pass?	Applicable DQO	Comments
Field Calibration	All equipment/ instrumentation has been calibrated prior to use in the field.	Field instrumentation should be calibrated prior to use and on a daily basis (or as required). Calibration certificates and records to be included.	Australian Standard AS4482.1-2005; NEPM (1999) Schedule B(2)	**Y**	-	Refer to Appendix C for Calibration Certificates.
Sample Preservation and Storage	Samples preserved and transported in a manner such that sample integrity is maintained.	Samples stored in pre-spiked bottles supplied by the laboratory. Transported at a temperature between 0°C - 4^{o}C (or as specified for analytical methods)	Australian Standard AS4482.1-2005	**N**	-	Samples received by ALS and Envirolab with ice present. Sample temperatures measured by ALS ranged between 3.1-9.9°C. Temperatures measured by Envirolab ranged between 3.0-6.2°C. Temperatures measured for 7504, EM1517153, EM1517312, EM1517384 and EM1517387 exceeded acceptible limits.
Sample Holding Times	Samples transported to the laboratory for extraction and analysis within recommended holding times.	Analyte Specific	NATA accredited method specific holding times (refer to laboratory QC documentation)	**N**	-	All batches except for EM1517153, EM1517312 and EM1517384, were analysed within method specific holding times. EM1517153 - 1 analyte breached EM1517312 - 1 analyte breached EM1517384 - 2 analytes breached
Sample Analysis	Samples were analysed for requested analytes using appropriate analytical techniques.	Samples analysed by a laboratory that is NATA accredited for the required analytical methods.	NATA Technical Note No. 23 (2008)	**Y**	-	ALS and Envirolab laboratories are NATA accredited
Limits of Reporting	Analytical limits of reporting should be below relevant screening criteria.	PQL < lowest applicable screening/assessment criteria	Australian Standard AS4482.1-2005	**N**	-	Limits of reporting exceeded screening criteria for 12 analytes: - **Maintenance of Ecosystems** exceeded LORs for 4 analytes (Hexachlorobutadiene, Anthracene, Benzo(a) pyrene and Phenanthrene) - **Potable Water Supply** exceeded LORs for 10 analytes (1,1,1,2-tetrachloroethane, 1,1,2,2-tetrachloroethane, 1,1,2-trichloroethane, 1,2,3-trichloropropane, Benz(a)anthracene, Benzo(a) pyrene, Benzo(k)fluoranthene, Dibenz(a,h)anthracene, Indeno(1,2,3-c,d)pyrene, Naphthalene) - **Primary Contact Recreation** exceeded LORs for 6 analytes (1,1,2,2-tetrachloroethane, 1,2,3-trichloropropane, Benz(a)anthracene, Benzo(a) pyrene, Dibenz(a,h)anthracene, Indeno(1,2,3-c,d)pyrene)
Primary Duplicates	Relative percent difference (RPD) between duplicate sample and parent sample within acceptable range.	RPD generated should be ±50%	FBURA Sampling and Analysis Quality Plan 2015	**N**	Precision	RPD exceedances are displayed in Table K7. Exceedances were observed between GW21 and QC01, and GW35 and QC05. These are not considered to affect the validity of the dataset for the purposes of this report.
Secondary Duplicates				**N**	Precision	RPD exceedances are displayed in Table K7. Exceedances were observed between GW21 and QC02, and GW35 and QC06. These are not considered to affect the validity of the dataset for the purposes of this report.
Rinsate Blanks	Provide a baseline for water used to prepare Rinsate Blanks	Collected for each batch of deionised water used for decontamination of sampling equipment		**Y**	Completeness	Results for rinsate blanks were reported below LOR.
Field Method Blanks	Analytes reported at concentrations below the laboratory limit of reporting.	<LOR		**Y**	Completeness	Results for field method blanks were reported below LOR.
Trip Blanks				**Y**	Completeness	Results for trip blanks were reported below LOR.
Laboratory Method Blank				**Y**	Completeness	No method blank outliers occurred.
Laboratory Duplicates	Relative percent deviation (RPD) between laboratory duplicate samples within acceptable range.	RPD generated should be ±30%		**Y**	Precision	No laboratory duplicates RPD exceedances occurred.
Matrix Spike Recoveries	Recoveries within adopted acceptability range.	Recoveries should be within 75% - 125%.		**N**	Accuracy	Matrix spike exceedances were noted for 4 ALS batches. EM1517153 had 4 analyte breaches, EM1517312 had 1 analyte breach, EM1517384 had 2 analyte breaches and EM1517387 had 2 analyte breaches. These are not considered to affect the validity of the dataset for the purposes of this report.

Table K6
Data Quality Summary Table

QA/QC Item	Data Quality Indicators	Acceptability Limits	Source Guidance Document	Pass?	Applicable DQO	Comments
Laboratory Control Spike (LCS) Recoveries	Recoveries within adopted acceptability range.	Recoveries should be within 70% - 130%.	FBURA Sampling and Analysis Quality Plan 2015	**Y**	Accuracy	No LCS recovery exceedences occurred.
Surrogate Spike Recoveries	Recoveries within adopted acceptability range.	As specified in laboratory QC report, if applicable. If laboratory does not specify, acceptance criteria of 70%-130% has been adopted.		**N**	Accuracy	Surrogate spike recovery exceedances were noted for 2 ALS batches.EM1517153 had 2 analyte breaches and EM1517387 had 1 analyte breach.
Frequency of Quality Control Measurements	Number of quality control samples is consistent with site specific requirements	Primary Duplicates collected at a frequency of 5% of total samples. Secondary Duplicates collected at a frequency of 5% of total samples. One rinsate blank per matrix per piece of equipment requiring decontamination should be collected per day. One trip blank per day. Laboratory control measures including duplicates, method blanks, matrix spike recovery and laboratory control spike to be measured at a frequency of 10% of the total samples analysed.		**Y**	-	Primary Duplicates and Secondary Duplicates were collected at frequencies of 8%. One trip blank was collected per esky. One rinsate and field blank was collected per piece of equipment per day. Laboratory control measures were collected at the expected frequencies.

Table K7
Data Validation - Duplicate and Triplicate RPDs

Lab Report Number		EM1517312	EM1517312		EM1517312	EM1517312		EM1517387	EM1517387		EM1517312	Interlab_D		EM1517312	Interlab_D		EM1517387	Interlab_D	
Field ID		GW21	QC01	**RPD**	GW27	QC03	**RPD**	GW35	QC05	**RPD**	GW21	QC02	**RPD**	GW27	QC04	**RPD**	GW35	QC06	**RPD**
Sampled Date/Time		18/11/2015 15:00	18/11/2015 15:00		18/11/2015 15:00	18/11/2015 15:00		20/11/2015 15:00	20/11/2015 15:00		18/11/2015 15:00	18/11/2015 15:00		18/11/2015 15:00	18/11/2015 15:00		20/11/2015 15:00	20/11/2015 15:00	
Chem_Group	**ChemName**	**Units**	**EQL**																
Sulfate (Turbidimetric) as SO4	Sulfate as SO4 - Turbidimetric (Filtered)	mg/l	1	230.0	227.0	1%	-	-	-	2110	1950	8%	230.0	-	-	-	-	-	2110	-	-
Total Oxidised Sulfur as SO4 2	Total Oxidised Sulfur as SO4 2-	mg/l	1	266.0	242.0	9%	-	-	-	2200	1790	21%	266.0	-	-	-	-	-	2200	-	-
BTEX	Benzene	µg/L	1	<1.0	<1.0	-	<1.0	<1.0	-	<1	-	-	<1.0	<1.0	-	<1.0	<1.0	-	<1	-	-
	Ethylbenzene	µg/L	1	<1.0	<1.0	-	<1.0	<1.0	-	<2	-	-	<1.0	<1.0	-	<1.0	<1.0	-	<2	-	-
	Toluene	µg/L	1	<1.0	<1.0	-	<1.0	<1.0	-	<2	-	-	<1.0	<1.0	-	<1.0	<1.0	-	<2	-	-
	Xylene (m & p)	µg/L	1 (Primary): 2 (Interlab)	<1.0	<1.0	-	<1.0	<1.0	-	<2	-	-	<1.0	<2.0	-	<1.0	<2.0	-	<2	-	-
	Xylene (o)	µg/L	1	<1.0	<1.0	-	<1.0	<1.0	-	<2	-	-	<1.0	<1.0	-	<1.0	<1.0	-	<2	-	-
	C6-C10 less BTEX (F1)	mg/l	0.02 (Primary): 0.01 (Interlab)	<0.02	<0.02	-	<0.02	<0.02	-	<0.02	-	-	<0.02	<0.01	-	<0.02	<0.01	-	<0.02	-	-
Chlorinated Hydrocarbons	1,1,1,2-tetrachloroethane	µg/L	1	<1.0	<1.0	-	<1.0	<1.0	-	-	-	-	<1.0	<1.0	-	<1.0	<1.0	-	-	-	-
	1,1,1-trichloroethane	µg/L	1	<1.0	<1.0	-	<1.0	<1.0	-	-	-	-	<1.0	<1.0	-	<1.0	<1.0	-	-	-	-
	1,1,2,2-tetrachloroethane	µg/L	1	<1.0	<1.0	-	<1.0	<1.0	-	-	-	-	<1.0	<1.0	-	<1.0	<1.0	-	-	-	-
	1,1,2-trichloroethane	µg/L	1	<1.0	<1.0	-	<1.0	<1.0	-	-	-	-	<1.0	<1.0	-	<1.0	<1.0	-	-	-	-
	1,1-dichloroethane	µg/L	1	<1.0	<1.0	-	<1.0	<1.0	-	-	-	-	<1.0	<1.0	-	<1.0	<1.0	-	-	-	-
	1,1-dichloroethene	µg/L	1	<1.0	<1.0	-	<1.0	<1.0	-	-	-	-	<1.0	<1.0	-	<1.0	<1.0	-	-	-	-
	1,1-dichloropropene	µg/L	1	<1.0	<1.0	-	<1.0	<1.0	-	-	-	-	<1.0	<1.0	-	<1.0	<1.0	-	-	-	-
	1,2,3-trichloropropane	µg/L	1	<1.0	<1.0	-	<1.0	<1.0	-	-	-	-	<1.0	<1.0	-	<1.0	<1.0	-	-	-	-
	1,2-dibromo-3-chloropropane	µg/L	1	<1.0	<1.0	-	<1.0	<1.0	-	-	-	-	<1.0	<1.0	-	<1.0	<1.0	-	-	-	-
	1,2-dichloroethane	µg/L	1	<1.0	<1.0	-	<1.0	<1.0	-	-	-	-	<1.0	<1.0	-	<1.0	<1.0	-	-	-	-
	1,2-dichloropropane	µg/L	1	<1.0	<1.0	-	<1.0	<1.0	-	-	-	-	<1.0	<1.0	-	<1.0	<1.0	-	-	-	-
	1,3-dichloropropane	µg/L	1	<1.0	<1.0	-	<1.0	<1.0	-	-	-	-	<1.0	<1.0	-	<1.0	<1.0	-	-	-	-
	2,2-dichloropropane	µg/L	1	<1.0	<1.0	-	<1.0	<1.0	-	-	-	-	<1.0	<1.0	-	<1.0	<1.0	-	-	-	-
	Bromodichloromethane	µg/L	1	<1.0	<1.0	-	<1.0	<1.0	-	-	-	-	<1.0	<1.0	-	<1.0	<1.0	-	-	-	-
	Bromoform	µg/L	1	<1.0	<1.0	-	<1.0	<1.0	-	-	-	-	<1.0	<1.0	-	<1.0	<1.0	-	-	-	-
	Carbon tetrachloride	µg/L	1	<1.0	<1.0	-	<1.0	<1.0	-	-	-	-	<1.0	<1.0	-	<1.0	<1.0	-	-	-	-
	Chlorodibromomethane	µg/L	1	<1.0	<1.0	-	<1.0	<1.0	-	-	-	-	<1.0	<1.0	-	<1.0	<1.0	-	-	-	-
	Chloroethane	µg/L	10	<10.0	<10.0	-	<10.0	<10.0	-	-	-	-	<10.0	<10.0	-	<10.0	<10.0	-	-	-	-
	Chloroform	µg/L	1	<1.0	<1.0	-	<1.0	<1.0	-	-	-	-	<1.0	<1.0	-	<1.0	<1.0	-	-	-	-
	cis-1,2-dichloroethene	µg/L	1	<1.0	<1.0	-	<1.0	<1.0	-	-	-	-	<1.0	<1.0	-	<1.0	<1.0	-	-	-	-
	cis-1,3-dichloropropene	µg/L	2 (Primary): 1 (Interlab)	<2.0	<2.0	-	<2.0	<2.0	-	-	-	-	<2.0	<1.0	-	<2.0	<1.0	-	-	-	-
	Dibromomethane	µg/L	1	<1.0	<1.0	-	<1.0	<1.0	-	-	-	-	<1.0	<1.0	-	<1.0	<1.0	-	-	-	-
	Dichloromethane	µg/L	2	<5.0	<5.0	-	<5.0	<5.0	-	-	-	-	<5.0	-	-	<5.0	-	-	-	-	-
	Hexachlorobutadiene	µg/L	0.5 (Primary): 1 (Interlab)	<1.0	<1.0	-	<1.0	<1.0	-	-	-	-	<1.0	<1.0	-	<1.0	<1.0	-	-	-	-
	Trichloroethene	µg/L	1	<1.0	<1.0	-	<1.0	<1.0	-	-	-	-	<1.0	<1.0	-	<1.0	<1.0	-	-	-	-
	Tetrachloroethene	µg/L	1	<1.0	<1.0	-	<1.0	<1.0	-	-	-	-	<1.0	<1.0	-	<1.0	<1.0	-	-	-	-
	trans-1,2-dichloroethene	µg/L	1	<1.0	<1.0	-	<1.0	<1.0	-	-	-	-	<1.0	<1.0	-	<1.0	<1.0	-	-	-	-
	trans-1,3-dichloropropene	µg/L	2 (Primary): 1 (Interlab)	<2.0	<2.0	-	<2.0	<2.0	-	-	-	-	<2.0	<1.0	-	<2.0	<1.0	-	-	-	-
	Vinyl chloride	µg/L	0.2 (Primary): 10 (Interlab)	<10.0	<10.0	-	<10.0	<10.0	-	-	-	-	<10.0	<10.0	-	<10.0	<10.0	-	-	-	-
Halogenated Benzenes	1,2,3-trichlorobenzene	µg/L	1	<1.0	<1.0	-	<1.0	<1.0	-	-	-	-	<1.0	<1.0	-	<1.0	<1.0	-	-	-	-
	1,2,4-trichlorobenzene	µg/L	1	<1.0	<1.0	-	<1.0	<1.0	-	-	-	-	<1.0	<1.0	-	<1.0	<1.0	-	-	-	-
	1,2-dichlorobenzene	µg/L	1	<1.0	<1.0	-	<1.0	<1.0	-	-	-	-	<1.0	<1.0	-	<1.0	<1.0	-	-	-	-
	1,3-dichlorobenzene	µg/L	1	<1.0	<1.0	-	<1.0	<1.0	-	-	-	-	<1.0	<1.0	-	<1.0	<1.0	-	-	-	-
	1,4-dichlorobenzene	µg/L	0.1 (Primary): 1 (Interlab)	<1.0	<1.0	-	<1.0	<1.0	-	-	-	-	<1.0	<1.0	-	<1.0	<1.0	-	-	-	-
	2-chlorotoluene	µg/L	1	<1.0	<1.0	-	<1.0	<1.0	-	-	-	-	<1.0	<1.0	-	<1.0	<1.0	-	-	-	-
	4-chlorotoluene	µg/L	1	<1.0	<1.0	-	<1.0	<1.0	-	-	-	-	<1.0	<1.0	-	<1.0	<1.0	-	-	-	-
	Bromobenzene	µg/L	1	<1.0	<1.0	-	<1.0	<1.0	-	-	-	-	<1.0	<1.0	-	<1.0	<1.0	-	-	-	-
	Chlorobenzene	µg/L	1	<1.0	<1.0	-	<1.0	<1.0	-	-	-	-	<1.0	<1.0	-	<1.0	<1.0	-	-	-	-
Halogenated Hydrocarbons	1,2-dibromoethane	µg/L	1	<1.0	<1.0	-	<1.0	<1.0	-	-	-	-	<1.0	<1.0	-	<1.0	<1.0	-	-	-	-
	Bromomethane	µg/L	10	<10.0	<10.0	-	<10.0	<10.0	-	-	-	-	<10.0	<10.0	-	<10.0	<10.0	-	-	-	-
	Chloromethane	µg/L	10	<10.0	<10.0	-	<10.0	<10.0	-	-	-	-	<10.0	<10.0	-	<10.0	<10.0	-	-	-	-
	Dichlorodifluoromethane	µg/L	10	<10.0	<10.0	-	<10.0	<10.0	-	-	-	-	<10.0	<10.0	-	<10.0	<10.0	-	-	-	-
	Iodomethane	µg/L	1	<1.0	<1.0	-	<1.0	<1.0	-	-	-	-	<1.0	-	-	<1.0	-	-	-	-	-
	Trichlorofluoromethane	µg/L	10	<10.0	<10.0	-	<10.0	<10.0	-	-	-	-	<10.0	<10.0	-	<10.0	<10.0	-	-	-	-
Inorganics	Alkalinity (Hydroxide) as CaCO3	µg/l	1000	<1000.0	<1000.0	-	-	-	-	<1000	<1000	-	<1000.0	-	-	-	-	-	<1000	-	-
	Alkalinity (total) as CaCO3	mg/l	1	222.0	224.0	1%	-	-	-	487	473	3%	222.0	-	-	-	-	-	487	-	-
	Ammonia as N	µg/l	10	640.0	580.0	10%	540.0	550.0	2%	7220	7270	1%	640.0	-	-	540.0	-	-	7220	-	-
	Anions Total	meq/L	0.01	10.2	10.2	0%	-	-	-	58.2	54.5	7%	10.2	-	-	-	-	-	58.2	-	-
	Alkalinity (Bicarbonate as CaCO3)	mg/l	1	222.0	224.0	1%	-	-	-	487	473	3%	222.0	-	-	-	-	-	487	-	-
	Alkalinity (Carbonate as CaCO3)	mg/l	1	<1.0	<1.0	-	-	-	-	<1	<1	-	<1.0	-	-	-	-	-	<1	-	-
	Cations Total	meq/L	0.01	10.6	10.6	0%	-	-	-	59.7	57.2	4%	10.6	-	-	-	-	-	59.7	-	-
	Chloride	mg/l	1	36.0	36.0	0%	-	-	-	161	158	2%	36.0	30.0	18%	-	-	-	**161**	**280**	**54%**
	Fluoride	mg/l	0.1	0.5	0.5	0%	-	-	-	0.2	0.2	0%	0.5	0.3	50%	-	-	-	**0.2**	**2.8**	**173%**
	Ionic Balance	%	0.01	1.6	1.92	18%	-	-	-	**1.31**	**2.43**	**60%**	**1.6**	**0.03**	**193%**	-	-	-	**1.31**	**48**	**189%**
	Nitrate (as N)	mg/l	0.01 (Primary): 0.005 (Interlab)	0.02	0.02	0%	-	-	-	0.07	<0.01	-	0.02	<0.005	**-**	-	-	-	0.07	<0.005	-
	Nitrite (as N)	mg/l	0.01 (Primary): 0.005 (Interlab)	<0.01	<0.01	-	-	-	-	<0.01	<0.01	-	<0.01	<0.005	-	-	-	-	<0.01	<0.005	-
	Nitrogen (Total Oxidised)	mg/l	0.01	0.02	0.02	0%	-	-	-	0.07	<0.01	-	0.02	-	-	-	-	-	0.07	-	-
	pH (Lab)	pH_Units	0.01	7.09	7.09	0%	-	-	-	7.08	6.5	9%	7.09	9.5	29%	-	-	-	7.08	7.2	2%
	Reactive Phosphorus as P	mg/l	0.01	<0.01	<0.01	-	-	-	-	<0.01	<0.01	-	<0.01	-	-	-	-	-	<0.01	-	-
	Sodium (Filtered)	mg/l	1	79.0	80.0	1%	-	-	-	401	393	2%	79.0	-	-	-	-	-	401	-	-
	TDS	mg/l	10 (Primary): 5 (Interlab)	787.0	733.0	7%	-	-	-	3760	3410	10%	787.0	650.0	19%	-	-	-	3760	4000	6%
	TOC	mg/l	1	9.0	10.0	11%	5.0	5.0	0%	26	-	-	9.0	10.0	11%	5.0	5.0	0%	26	-	-
MAH	1,2,4-trimethylbenzene	µg/L	1	<1.0	<1.0	-	<1.0	<1.0	-	-	-	-	<1.0	<1.0	-	<1.0	<1.0	-	-	-	-
	1,3,5-trimethylbenzene	µg/L	1	<1.0	<1.0	-	<1.0	<1.0	-	-	-	-	<1.0	<1.0	-	<1.0	<1.0	-	-	-	-
	Isopropylbenzene	µg/L	1	<1.0	<1.0	-	<1.0	<1.0	-	-	-	-	<1.0	<1.0	-	<1.0	<1.0	-	-	-	-
	n-butylbenzene	µg/L	1	<1.0	<1.0	-	<1.0	<1.0	-	-	-	-	<1.0	<1.0	-	<1.0	<1.0	-	-	-	-
	n-propylbenzene	µg/L	1	<1.0	<1.0	-	<1.0	<1.0	-	-	-	-	<1.0	<1.0	-	<1.0	<1.0	-	-	-	-
	p-isopropyltoluene	µg/L	1	<1.0	<1.0	-	<1.0	<1.0	-	-	-	-	<1.0	<1.0	-	<1.0	<1.0	-	-	-	-
	sec-butylbenzene	µg/L	1	<1.0	<1.0	-	<1.0	<1.0	-	-	-	-	<1.0	<1.0	-	<1.0	<1.0	-	-	-	-
	Styrene	µg/L	1	<1.0	<1.0	-	<1.0	<1.0	-	-	-	-	<1.0	<1.0	-	<1.0	<1.0	-	-	-	-
	tert-butylbenzene	µg/L	1	<1.0	<1.0	-	<1.0	<1.0	-	-	-	-	<1.0	<1.0	-	<1.0	<1.0	-	-	-	-
Metals	Aluminium (Filtered)	mg/l	0.01	0.01	<0.01	-	0.11	0.11	0%	<0.01	<0.01	-	0.01	0.045	127%	0.11	0.11	0%	<0.01	0.011	-
	Arsenic (Filtered)	mg/l	0.001	0.006	0.006	0%	<0.001	<0.001	-	0.002	<0.001	-	0.006	0.007	15%	<0.001	0.001	-	0.002	0.003	40%
	Cadmium (Filtered)	mg/l	0.0001	<0.0001	<0.0001	-	<0.0001	<0.0001	-	<0.0001	<0.0001	-	<0.0001	<0.0001	-	<0.0001	<0.0001	-	<0.0001	<0.0001	-
	Calcium (Filtered)	mg/l	1	102.0	102.0	0%	-	-	-	510	485	5%	102.0	-	-	-	-	-	510	-	-
	Chromium (III+VI) (Filtered)	mg/l	0.001	**0.002**	**0.001**	**67%**	0.001	<0.001	-	<0.001	<0.001	-	0.002	0.002	0%	0.001	<0.001	-	<0.001	<0.001	-
	Copper (Filtered)	mg/l	0.001	<0.001	<0.001	-	<0.001	<0.001	-	<0.001	<0.001	-	<0.001	<0.001	-	<0.001	<0.001	-	<0.001	<0.001	-
	Iron (Filtered)	mg/l	0.05 (Primary): 0.01 (Interlab)	11.8	11.5	3%	20.1	24.1	18%	**16.6**	**0.89**	**180%**	11.8	13.0	10%	20.1	22.0	9%	16.6	19	13%
	Lead (Filtered)	mg/l	0.001	<0.001	<0.001	-	<0.001	<0.001	-	<0.001	<0.001	-	<0.001	<0.001	-	<0.001	<0.001	-	<0.001	<0.001	-
	Magnesium (Filtered)	mg/l	1	23.0	23.0	0%	-	-	-	192	181	6%	23.0	-	-	-	-	-	192	-	-
	Manganese (Filtered)	mg/l	0.001 (Primary): 0.005 (Interlab)	0.202	0.199	1%	0.542	0.558	3%	1.3	1.28	2%	0.202	0.25	21%	0.542	0.64	17%	1.3	1.6	21%
	Mercury (Filtered)	mg/l	0.0001 (Primary): 0.00005 (Interlab)	<0.0001	<0.0001	-	<0.0001	<0.0001	-	<0.0001	<0.0001	-	<0.0001	<0.0001	-	<0.0001	<0.0001	-	<0.0001	<0.00005	-
	Nickel (Filtered)	mg/l	0.001	0.015	0.015	0%	0.016	0.019	17%	**0.087**	**0.022**	**119%**	0.015	0.018	18%	0.016	0.02	22%	**0.087**	**0.023**	**116%**
	Potassium (Filtered)	mg/l	1	6.0	6.0	0%	-	-	-	41	40	2%	6.0	-	-	-	-	-	41	-	-

Table K7
Data Validation - Duplicate and Triplicate RPDs

	Lab Report Number	EM1517312	EM1517312		EM1517312	EM1517312		EM1517387	EM1517387		EM1517312	Interlab_D		EM1517312	Interlab_D		EM1517387	Interlab_D	
	Field ID	GW21	QC01	RPD	GW27	QC03	RPD	GW35	QC05	RPD	GW21	QC02	RPD	GW27	QC04	RPD	GW35	QC06	RPD
	Sampled Date/Time	18/11/2015 15:00	18/11/2015 15:00		18/11/2015 15:00	18/11/2015 15:00		20/11/2015 15:00	20/11/2015 15:00		18/11/2015 15:00	18/11/2015 15:00		18/11/2015 15:00	18/11/2015 15:00		20/11/2015 15:00	20/11/2015 15:00	
Chem_Group	**ChemName**	**Units**	**EQL**																
	Selenium (Filtered)	mg/l	0.01 (Primary): 0.001 (Interlab)	<0.01	<0.01	-	<0.01	<0.01	-	<0.01	<0.01	-	<0.01	<0.001	-	<0.01	<0.001	-	<0.01	<0.001	-
	Zinc (Filtered)	mg/l	0.005 (Primary): 0.001 (Interlab)	<0.005	<0.005	-	0.017	0.019	11%	0.007	<0.005	-	<0.005	0.007	-	0.017	0.016	6%	0.007	0.005	33%
PAH	Benzo[b+j]fluoranthene	mg/l	0.001	<0.001	<0.001	-	<0.001	<0.001	-	<0.001	-	-	<0.001	-	-	<0.001	-	-	<0.001	-	-
PAH/Phenols	Acenaphthene	µg/L	1	<1.0	<1.0	-	<1.0	<1.0	-	<1	-	-	<1.0	<1.0	-	<1.0	<1.0	-	<1	-	-
	Acenaphthylene	µg/L	1	<1.0	<1.0	-	<1.0	<1.0	-	<1	-	-	<1.0	<1.0	-	<1.0	<1.0	-	<1	-	-
	Anthracene	µg/L	1	<1.0	<1.0	-	<1.0	<1.0	-	<1	-	-	<1.0	<1.0	-	<1.0	<1.0	-	<1	-	-
	Benz(a)anthracene	µg/L	1	<1.0	<1.0	-	<1.0	<1.0	-	<1	-	-	<1.0	<1.0	-	<1.0	<1.0	-	<1	-	-
	Benzo(a) pyrene	µg/L	0.5 (Primary): 1 (Interlab)	<0.5	<0.5	-	<0.5	<0.5	-	<0.5	-	-	<0.5	<1.0	-	<0.5	<1.0	-	<0.5	-	-
	Benzo(g,h,i)perylene	µg/L	1	<1.0	<1.0	-	<1.0	<1.0	-	<1	-	-	<1.0	<1.0	-	<1.0	<1.0	-	<1	-	-
	Benzo(k)fluoranthene	µg/L	1	<1.0	<1.0	-	<1.0	<1.0	-	<1	-	-	<1.0	-	-	<1.0	-	-	<1	-	-
	Chrysene	µg/L	1	<1.0	<1.0	-	<1.0	<1.0	-	<1	-	-	<1.0	<1.0	-	<1.0	<1.0	-	<1	-	-
	Dibenz(a,h)anthracene	µg/L	1	<1.0	<1.0	-	<1.0	<1.0	-	<1	-	-	<1.0	<1.0	-	<1.0	<1.0	-	<1	-	-
	Fluoranthene	µg/L	1	<1.0	<1.0	-	<1.0	<1.0	-	<1	-	-	<1.0	<1.0	-	<1.0	<1.0	-	<1	-	-
	Fluorene	µg/L	1	<1.0	<1.0	-	<1.0	<1.0	-	<1	-	-	<1.0	<1.0	-	<1.0	<1.0	-	<1	-	-
	Indeno(1,2,3-c,d)pyrene	µg/L	1	<1.0	<1.0	-	<1.0	<1.0	-	<1	-	-	<1.0	<1.0	-	<1.0	<1.0	-	<1	-	-
	Naphthalene	µg/L	5 (Primary): 1 (Interlab)	<5.0	<5.0	-	<5.0	<5.0	-	<1	-	-	<5.0	<1.0	-	<5.0	<1.0	-	<1	-	-
	Naphthalene	µg/L	1	<1.0	<1.0	-	<1.0	<1.0	-	<1	-	-	<1.0	<1.0	-	<1.0	<1.0	-	<1	-	-
	PAHs (Sum of total)	µg/L	0.5 (Primary): 1 (Interlab)	<0.5	<0.5	-	<0.5	<0.5	-	<0.5	-	-	<0.5	<1.0	-	<0.5	<1.0	-	<0.5	-	-
	Phenanthrene	µg/L	1	<1.0	<1.0	-	<1.0	<1.0	-	<1	-	-	<1.0	<1.0	-	<1.0	<1.0	-	<1	-	-
	Pyrene	µg/L	1	<1.0	<1.0	-	<1.0	<1.0	-	<1	-	-	<1.0	<1.0	-	<1.0	<1.0	-	<1	-	-
Solvents	2-hexanone (MBK)	µg/L	10	<10.0	<10.0	-	<10.0	<10.0	-	-	-	-	<10.0	-	-	<10.0	-	-	-	-	-
	Methyl Ethyl Ketone	µg/L	10	<10.0	<10.0	-	<10.0	<10.0	-	-	-	-	<10.0	-	-	<10.0	-	-	-	-	-
	4-Methyl-2-pentanone	µg/L	10	<10.0	<10.0	-	<10.0	<10.0	-	-	-	-	<10.0	-	-	<10.0	-	-	-	-	-
	Acetone	mg/l	0.01	<0.01	<0.01	-	<0.01	<0.01	-	-	-	-	<0.01	-	-	<0.01	-	-	-	-	-
	Carbon disulfide	µg/L	1	<1.0	<1.0	-	<1.0	<1.0	-	-	-	-	<1.0	-	-	<1.0	-	-	-	-	-
	Vinyl acetate	µg/L	10	<10.0	<10.0	-	<10.0	<10.0	-	-	-	-	<10.0	-	-	<10.0	-	-	-	-	-
TPH	F2-NAPHTHALENE	mg/l	0.1 (Primary): 0.05 (Interlab)	<0.1	<0.1	-	<0.1	<0.1	-	-	-	-	<0.1	<0.05	-	<0.1	<0.05	-	-	-	-
	+C10 - C36 (Sum of total)	µg/L	50	240.0	<50.0	**-**	<50.0	<50.0	-	110	-	-	240.0	-	-	<50.0	-	-	110	-	-
	C6 - C9	µg/L	20 (Primary): 10 (Interlab)	<20.0	<20.0	-	<20.0	<20.0	-	<20	-	-	<20.0	<10.0	-	<20.0	<10.0	-	<20	-	-
	C10 - C14	µg/L	50	70.0	<50.0	-	<50.0	<50.0	-	<50	-	-	70.0	<50.0	-	<50.0	<50.0	-	<50	-	-
	C15 - C28	µg/L	100	170.0	<100.0	**-**	<100.0	<100.0	-	110	-	-	170.0	<100.0	**-**	<100.0	<100.0	-	110	-	-
	C29-C36	µg/L	50 (Primary): 100 (Interlab)	<50.0	<50.0	-	<50.0	<50.0	-	<50	-	-	<50.0	<100.0	-	<50.0	<100.0	-	<50	-	-
	C10 - C40 (Sum of total)	µg/L	100	160.0	<100.0	-	<100.0	<100.0	-	100	-	-	160.0	-	-	<100.0	-	-	100	-	-
	C10-C16	mg/l	0.1 (Primary): 0.05 (Interlab)	<0.1	<0.1	-	<0.1	<0.1	-	<0.1	-	-	<0.1	<0.05	-	<0.1	<0.05	-	<0.1	-	-
	C16-C34	mg/l	0.1	0.16	<0.1	-	<0.1	<0.1	-	0.1	-	-	0.16	<0.1	-	<0.1	<0.1	-	0.1	-	-
	C34-C40	mg/l	0.1	<0.1	<0.1	-	<0.1	<0.1	-	<0.1	-	-	<0.1	<0.1	-	<0.1	<0.1	-	<0.1	-	-
	C6-C10	mg/l	0.02 (Primary): 0.01 (Interlab)	<0.02	<0.02	-	<0.02	<0.02	-	<0.02	-	-	<0.02	<0.01	-	<0.02	<0.01	-	<0.02	-	-
VOCs	cis-1,4-Dichloro-2-butene	µg/L	1	<1.0	<1.0	-	<1.0	<1.0	-	-	-	-	<1.0	-	-	<1.0	-	-	-	-	-
	Pentachloroethane	µg/L	1	<1.0	<1.0	-	<1.0	<1.0	-	-	-	-	<1.0	-	-	<1.0	-	-	-	-	-
	trans-1,4-Dichloro-2-butene	µg/L	1	<1.0	<1.0	-	<1.0	<1.0	-	-	-	-	<1.0	-	-	<1.0	-	-	-	-	-

*RPDs have only been considered where a concentration is greater than 0 times the EQL.

**High RPDs are in bold (Acceptable RPDs for each EQL multiplier range are: 50 (0-10 x EQL); 30 (10-30 x EQL); 30 (> 30 x EQL))

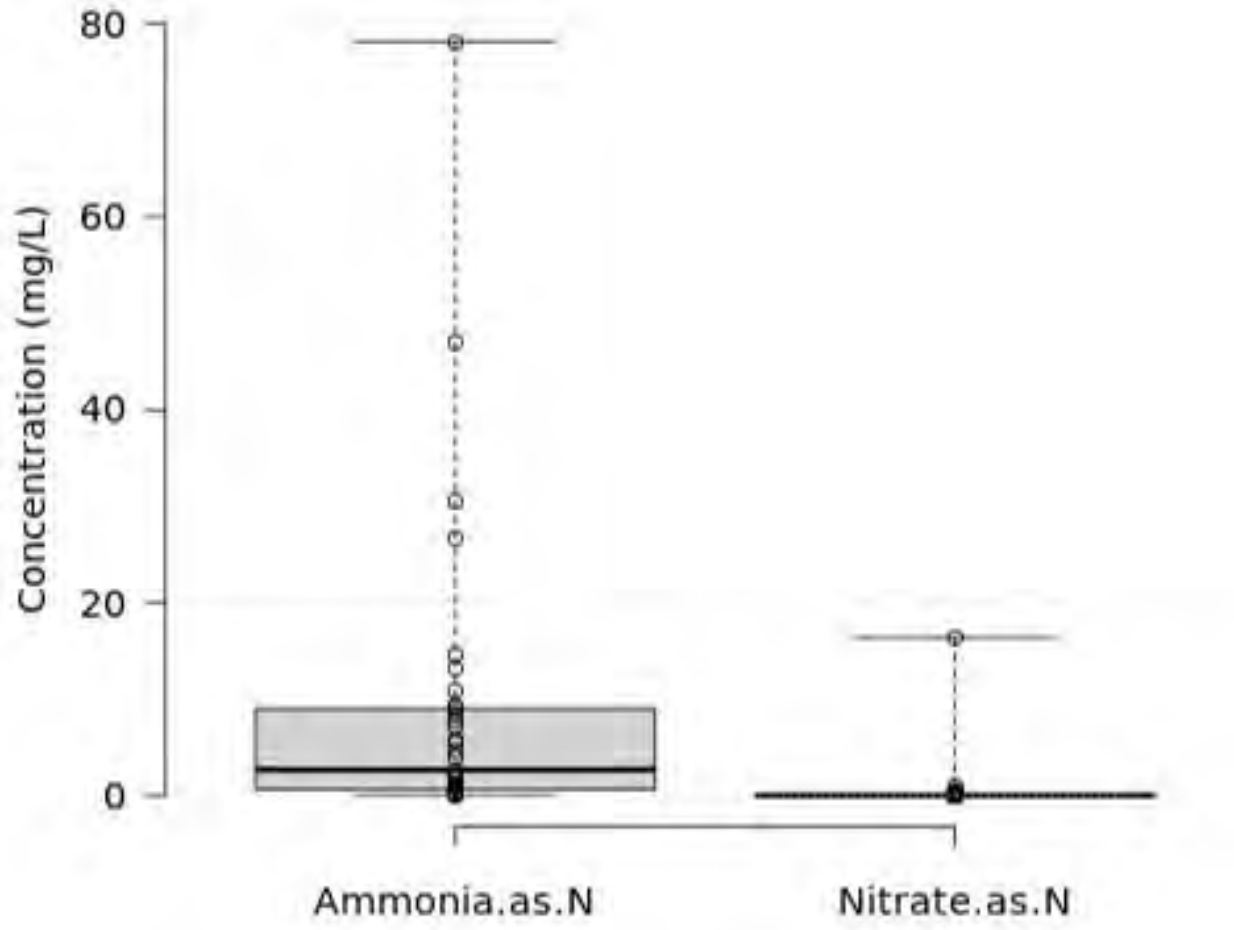
***Interlab Duplicates are matched on a per compound basis as methods vary between laboratories. Any methods in the row header relate to those used in the primary laboratory

Table K8
Summary of Rinsates and Trip Blank Results - Groundwater

		Lab Report Number	EM1517153	EM1517153	EM1517384	EM1517502	EM1517153	EM1517153	EM1517153	EM1517153	EM1517384	EM1517387	EM1517502	EM1517153	EM1517384	EM1517387
		Field ID	QCD	QCE	QCR	QCL	QCA	QCB	QCF	QCG	QCQ	QCN	QCK	QCH	QCM	QCP
		Sampled_Date/Time	16/11/2015 15:00	17/11/2015 15:00	19/11/2015 15:00	23/11/2015 15:00	16/11/2015 15:00	16/11/2015 15:00	17/11/2015 15:00	17/11/2015 15:00	19/11/2015 15:00	20/11/2015 15:00	23/11/2015 15:00	17/11/2015 15:00	19/11/2015 15:00	20/11/2015 15:00
		Sample Type	Field_B	Field_B	Field_B	Field_B	Rinsate	Rinsate	Rinsate	Rinsate	Rinsate	Rinsate	Rinsate	Trip_B	Trip_B	Trip_B
Chem_Group	**ChemName**	**Units**	**EQL**													
BTEX	Benzene	µg/L	1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1
	Ethylbenzene	µg/L	1	<2	<2	<2	<2	<2	<2	<2	<2	<2	<2	<2	<2	<2
	Toluene	µg/L	1	<2	<2	<2	<2	<2	<2	<2	<2	<2	<2	<2	<2	<2
	Total BTEX	mg/l	0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001
	Xylene (m & p)	µg/L	1	<2	<2	<2	<2	<2	<2	<2	<2	<2	<2	<2	<2	<2
	Xylene (o)	µg/L	1	<2	<2	<2	<2	<2	<2	<2	<2	<2	<2	<2	<2	<2
	Xylene Total	µg/L	2	<2	<2	<2	<2	<2	<2	<2	<2	<2	<2	<2	<2	<2
	C6-C10 less BTEX (F1)	mg/l	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	<0.02
Metals	Aluminium	mg/l	0.01	<0.01	<0.01		<0.01	<0.01	<0.01	<0.01		<0.01				
	Arsenic	mg/l	0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001				
	Cadmium	mg/l	0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001				
	Chromium (III+VI)	mg/l	0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001				
	Copper	mg/l	0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001				
	Iron	mg/l	0.05	<0.05	<0.05		<0.05	<0.05	<0.05	<0.05		<0.05				
	Lead	mg/l	0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001				
	Manganese	mg/l	0.001	<0.001	<0.001		<0.001	<0.001	<0.001	<0.001		<0.001				
	Mercury	mg/l	0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001				
	Nickel	mg/l	0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001				
	Selenium	mg/l	0.01	<0.01	<0.01		<0.01	<0.01	<0.01	<0.01		<0.01				
	Zinc	mg/l	0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005				
PAH/Phenols	Naphthalene	µg/L	1	<5	<5	<5	<5	<5	<5	<5	<5	<5	<5	<5	<5	<5
TPH	F2-NAPHTHALENE	mg/l	0.05	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1				
	+C10 - C36 (Sum of total)	µg/L	50	<50	<50	<50	<50	<50	<50	<50	<50	<50				
	C6 - C9	µg/L	10	<20	<20	<20	<20	<20	<20	<20	<20	<20	<20	<20	<20	<20
	C10 - C14	µg/L	50	<50	<50	<50	<50	<50	<50	<50	<50	<50				
	C15 - C28	µg/L	100	<100	<100	<100	<100	<100	<100	<100	<100	<100				
	C29-C36	µg/L	50	<50	<50	<50	<50	<50	<50	<50	<50	<50				
	C10 - C40 (Sum of total)	µg/L	100	<100	<100	<100	<100	<100	<100	<100	<100	<100				
	C10-C16	mg/l	0.05	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1				
	C16-C34	mg/l	0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1				
	C34-C40	mg/l	0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1				
	C6-C10	mg/l	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	<0.02

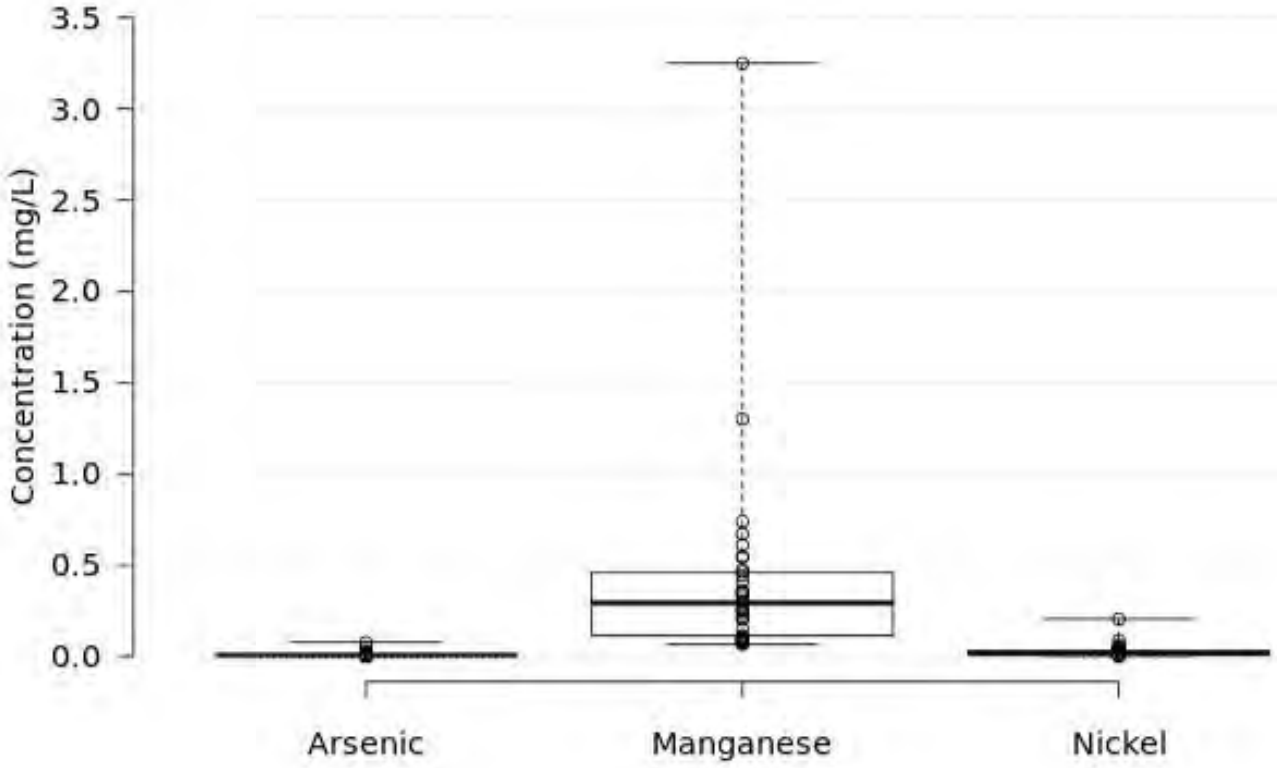
Appendix L

Box Plots



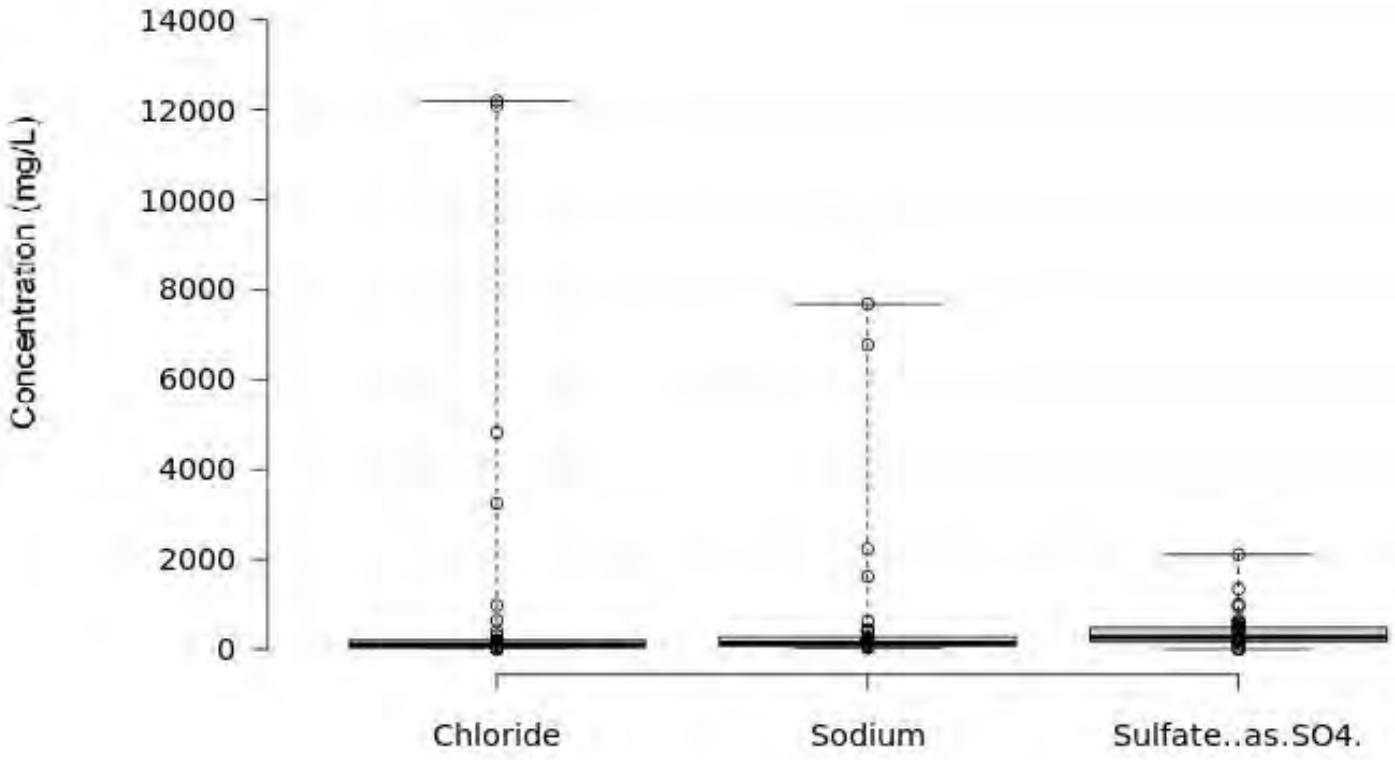
Box plot statistics

	Ammonia.as.N	Nitrate.as.N
Upper whisker	78.10	16.40
3rd quartile	9.00	0.07
Median	2.68	0.04
1st quartile	0.64	0.02
Lower whisker	0.05	0.01
Nr. of data points	33.00	33.00



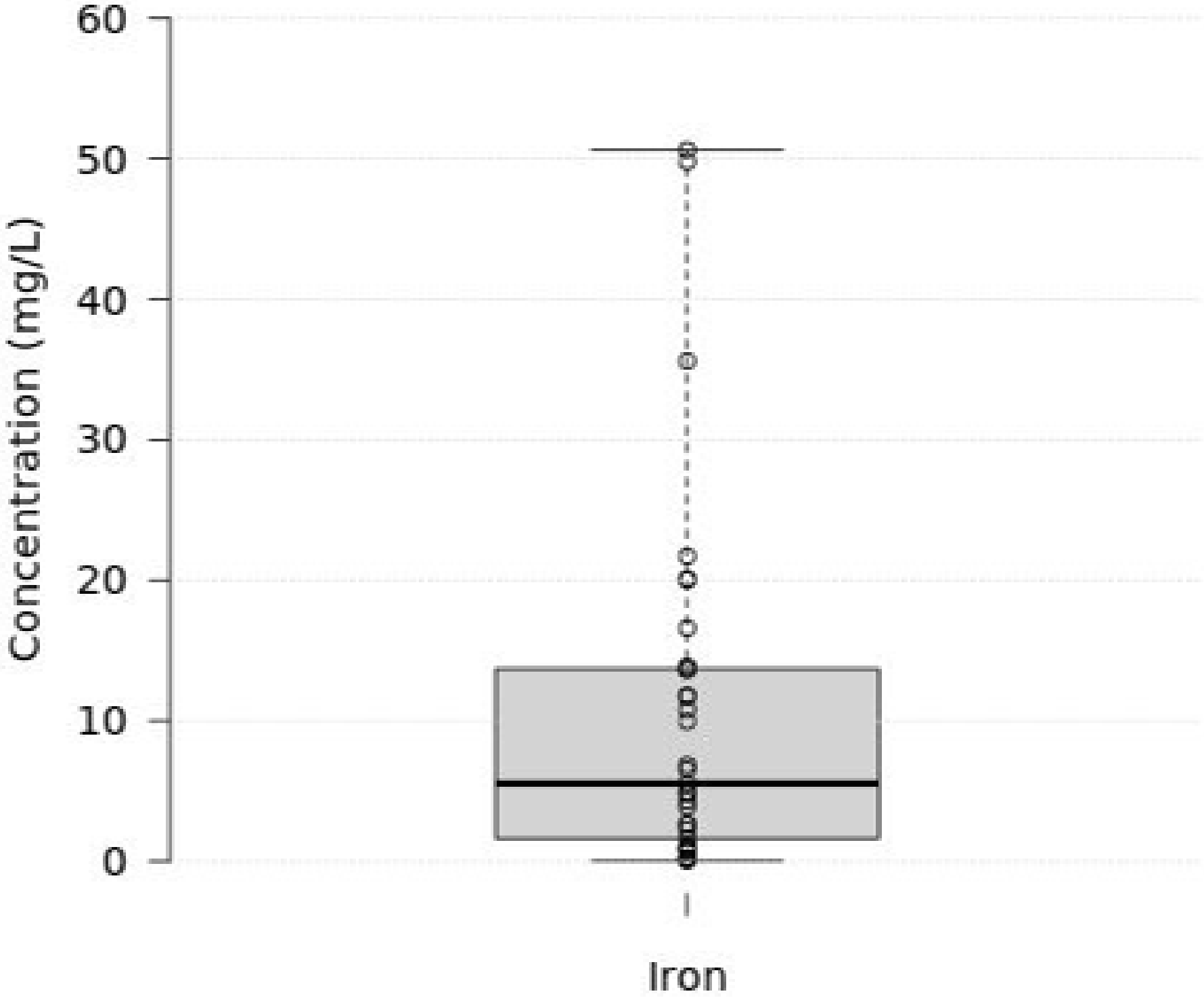
Box plot statistics

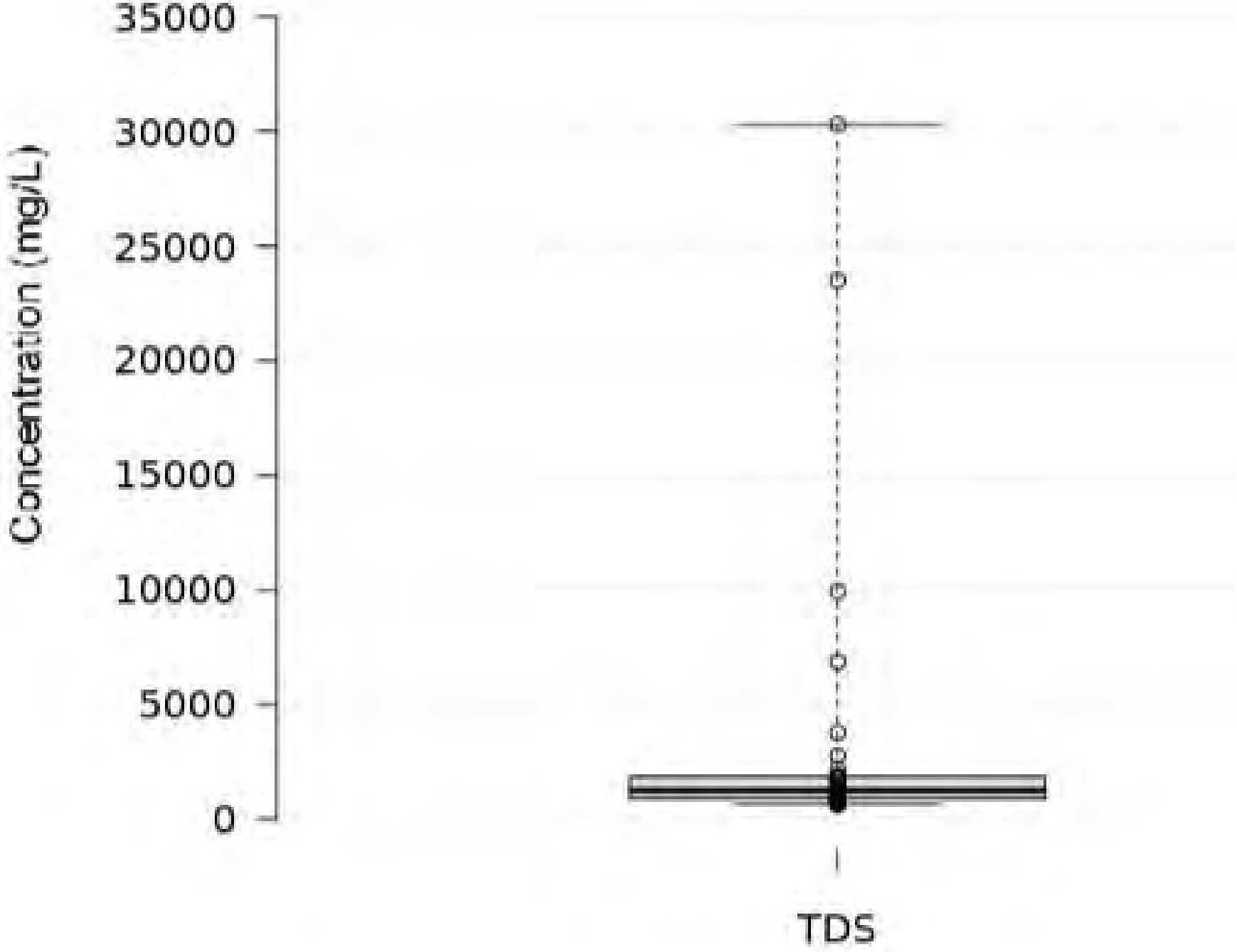
	Arsenic	Manganese	Nickel
Upper whisker	0.08	3.25	0.20
3rd quartile	0.01	0.46	0.03
Median	0.01	0.29	0.02
1st quartile	0.00	0.11	0.01
Lower whisker	0.00	0.07	0.00
Nr. of data points	33.00	33.00	33.00



Box plot statistics

	Chloride	Sodium	Sulfate..as.SO4.
Upper whisker	12200.00	7680.00	2110.00
3rd quartile	203.00	279.00	484.00
Median	101.00	143.00	266.00
1st quartile	35.00	79.00	157.00
Lower whisker	15.00	32.00	2.00
Nr. of data points	33.00	33.00	33.00


60
50
40
30
20
10
0
Concentration (mg/L)
Iron


35000
30000
25000
20000
15000
10000
5000
0
Concentration (mg/L)
TDS