ENVIRONMENTAL EARTH SCIENCES
THE KNOW AND THE HOW

REPORT NO. **210074_V3**

SUPPLEMENTARY GROUNDWATER INVESTIGATION AT FORMER SOUTH MELBOURNE GASWORKS

ENVIRONMENTAL EARTH SCIENCES VIC
REPORT TO CITY OF PORT PHILLIP
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VERSION 3


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EXECUTIVE SUMMARY

Environmental Earth Sciences VIC was requested by City of Port Phillip (CoPP) to undertake a supplementary groundwater investigation at the property located in Albert Park and is bounded by Graham Street to the south; Pickles Street to the west; Richardson Street to the north; and Foote Street/Bridport Street to the east (the site).

Objectives
The objectives of this supplementary groundwater investigation are to:

- evaluate the inferred changes of contaminants of concern in selected wells with elevated concentrations;
- provide spatial interpretation of data associated with the extent of groundwater contamination offsite;
- confirm that the sewers are still intercepting the majority of the groundwater migrating from the site; and
- establish whether further migration of contamination has occurred since April 2011 groundwater sampling.

The general scope of works undertaken at the site between 24 and 27 June 2013:

- gauging of all groundwater wells located on and off-site with an oil/water interface meter to measure standing water levels (SWL) and to interpret the inferred groundwater flow directions;
- groundwater sampling of selected wells using a low flow micropurge technique to confirm the presence and absence of chemicals of concern and to confirm that the sewers are intercepting the majority of the groundwater migrating from the site; and
- comparison of historical to current results to confirm the trending of chemicals of concern.

Groundwater Contamination
Elevated organic and inorganic results were identified at the time of this groundwater assessment in both onsite and off-site wells which exceeded the adopted criteria for groundwater classified as Segment A2 and these include: MAH's, naphthalene, TPH, selected inorganics such as heavy metals, chloride, ammonia, sulfate, cyanide, total dissolved solids, nitrate and pH

The onsite groundwater conditions precluded Segment A2 groundwater beneficial uses (maintenance of ecosystems, potable water supply, irrigation, stock watering, industrial water use and primary contact recreation). However, these are not considered to be relevant as the site is currently occupied as public open space and no extraction bores were installed for any beneficial uses including recreational purposes.

The off-site groundwater conditions precluded Segment A2 groundwater beneficial uses (maintenance of ecosystem, potable water supply, irrigation, stock watering, industrial water use and primary contact recreation). Although, given the urban setting of the site, the fact that all groundwater discharging from the site is captured via the surrounding sewer network, the availability of reticulated mains water, the low yield and controls over groundwater extraction, it is considered unlikely that groundwater will be extracted for any of the beneficial uses under Segment A2. However, consideration should be given to the north and north-eastern residential properties.

Inferred Groundwater Changes Assessment
The groundwater contamination conditions onsite and off-site are relatively stable (with slight increase or decrease) with some rise of contaminant concentrations (above background concentrations) but the long term trends of chemicals of concern were generally stable over the years and the dissolved contaminant plume is considered to be stable:

On-Site (OS) Wells
The increased chemical concentrations in some locations in the OS Wells can be considered to be a combination of ongoing impacts from the site, off-site sources and background concentrations. The greatest increase in potential gasworks related contaminants of concern [NH_3 and/or TPH(C_{10}-C_{36})] were observed at GW2, GW3 (based on data up to 2011 only), GW4, GW18, GW19, GW24 and GW41 which is consistent with the inferred radial groundwater flow directions. It can be considered that these dissolved chemicals will eventually be captured by the adjacent sewers.

North-West (NW) Wells
Based on the inferred groundwater flow directions, the increase of potential gasworks related contaminants of concern [NH_3 and/or TPH (C_{10}-C_{36})] concentrations at some locations in the NW Wells can be considered to be a combination of onsite and off-site sources (GW34 and GW36).

The increase in potential gasworks related contaminants of concern in GW32, based on the location of the well across the Pickles Street Sewer, is considered to be coming from an off-site source. In addition, higher bicarbonate and lower TDS were noted at GW32 suggesting recent recharge.

It is noted that the majority of the heavy metals results were reported higher than the previous round of sampling (2011). The increase or decrease of heavy metal concentrations cannot be compared accurately due to the difference in filtering methods undertaken (field vs lab filtered).

North-East (NE) Wells
Based on the inferred groundwater flow directions, the increase of chemical concentrations in some locations in the NE Wells can be considered to be a combination of impacts migrating from the site and other off-site sources. The greatest increase (NH_3, NO_3, selected heavy metals, BTEX and TPH fractions) was observed at GW38, which is consistent with the inferred flow directions, however it can be assumed that the plume will eventually be captured by the South Yarra Sewer Main.

South-East (SE) Wells
Based on the inferred groundwater flow directions and the presence of South Yarra Sewer Main, the increase of chemical concentrations (NO_3, selected heavy metals, BTEX and TPH fractions) in some locations in the SE Wells is not considered to be as a result of impacts from the former gasworks, but could be considered background concentrations or coming from an off-site source.

Trade Waste Agreement
Assessment of groundwater samples collected during the June 2013 groundwater investigation compared against South East Water '*Standards for trade waste discharge to the sewerage system'* indicated a number of dissolved chemicals exceeding maximum allowable concentrations and/or values for discharge to the sewerage system.

Revalidation of Groundwater Flux to Sewers
The updated estimated groundwater flux of 7 ML/year (19,200 L/day) to sewers was higher than the previous estimate of 4 ML/year (Environmental Earth Sciences 2013b). The calculated flux is orders of magnitude lower than the typical daily flow rate in the sewer (estimated to be 230ML/day by Golders report 2006) and therefore the daily discharge to sewers can be considered negligible.

Risk Associated with Groundwater Contamination
As all the groundwater flowing from the site is captured by the sewerage system, it is ultimately pumped to the Werribee Treatment Plant. The flux of groundwater from the site is several orders of magnitude less than the total flow rate of sewage through the sewers to the Werribee Treatment Plant. Therefore, although several dissolved chemicals exceed the criteria for discharge to a sewerage system, contaminant concentrations are diluted by several orders of magnitude. Therefore, associated risks to workers at the treatment plant would be very low. Furthermore, the personal protective equipment routinely used by workers working on the sewers themselves would protect them from any additional contaminants introduced into the sewers from the site.

As Gasworks Park and Southport are owned by the CoPP and the State of Victoria, the extraction of groundwater onsite can be effectively controlled through management to prevent the use of groundwater on the site to reduce the risks associated with this pathway to an acceptable level.

As stated above, the capture of the groundwater by the sewers also means that there is negligible risk to ecosystems. Even if all the sewers in South Melbourne were sealed such that the natural groundwater flow system to Port Phillip Bay were restored, the hydraulic gradient towards the Bay would be so low that the groundwater would move towards the Bay at a rate that is at least an order of magnitude less than the current rate of groundwater flow towards the sewers and the travel time would likely be thousands of years. The volumetric rate of discharge to the Bay would, therefore, be very low when the contaminants ultimately reached the Bay.

In the impacted area to the north east of the site, the risks associated with it are considered to be negligible *in-situ*. Any potential risks related to the contamination would be associated with the extraction of the groundwater. Although it is considered unlikely that the local residents would extract groundwater in this area, there is potential for groundwater extraction to take place.

The nearest significant ecological receptors are the waters and sediments of Port Philip Bay, 350 m south-west of the site. Due to the fact that all of groundwater from Gasworks Park Precinct discharges to the Melbourne Water Sewer System (refer to Environmental Earth Sciences, 2013b), therefore, all contaminants being transported in groundwater from the site are captured by the sewer system. As such, there is negligible risk of impacted groundwater from Gasworks Park discharging to receiving waters (i.e. ecosystems) in the vicinity of the site.

It is noted that, based on the inferred groundwater flow directions, most (or all) groundwater discharging from the site is expected to be captured by the sewers to the west, south and east.

Environmental Earth Sciences recommends that the most effective and practical way of managing the groundwater impacts is to implement a regular groundwater monitoring (monitored natural attenuation) program via a Groundwater Quality Management Plan (refer to Remediation Action Plan Report, Environmental Earth Sciences 2013c).

It should be noted that there is also a possibility that a Groundwater Quality Restricted Use Zone (GQRUZ) will be identified by EPA.

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1 INTRODUCTION

This site is currently undergoing a 53V environmental audit commissioned by the City of Port Phillip (CoPP) to assess the risk of harm posed by the site. Environmental Earth Sciences has previously undertaken a groundwater investigation in 2011 and prepared a report titled *April 2011 Groundwater Investigations at Former South Melbourne Gasworks version 3* (Environmental Earth Sciences, 2013b), which is the main report to which this assessment supplements.

Based on the findings of the 2011 investigation, Environmental Earth Sciences recommended additional groundwater monitoring, focusing on the bores located onsite (OS) and to the north east (NE) of the site. In addition, selected groundwater wells were sampled within the north west (NW) and south east (SE) to confirm that the sewers are intercepting the majority of the groundwater migrating from the site.

2 OBJECTIVES AND SCOPE OF WORKS

The objectives of this supplementary groundwater investigation are to:

- evaluate the inferred changes of contaminants of concern in selected wells with elevated concentrations;
- provide spatial interpretation of data associated with the extent of groundwater contamination offsite;
- confirm that the sewers are still intercepting the majority of the groundwater migrating from the site; and
- establish whether further migration of contamination has occurred since April 2011 groundwater sampling.

The scope of works required to meet the objective included the following:

- undertake a groundwater monitoring event on selected groundwater wells;
- laboratory analysis of samples collected for chemicals of concern;
- interpretation of current and historical groundwater data; and
- preparation of a supplementary groundwater investigation report.

3 SITE IDENTIFICATION

3.1 Site location and description

The site is located in Albert Park and is bounded by Graham Street to the south; Pickles Street to the west; Richardson Street to the north; and Foote Street/Bridport Street to the east (refer to Figure 1 and Figure 2) and currently owned by CoPP and the State of Victoria.

The site covers an area of 3.21 hectares (ha) and includes 'Gasworks Arts Park' and 'Southport Community Nursing Home':

- Gasworks Arts Park incorporates 2.67 ha of the site, consisting of grassed and landscaped areas, playground, BBQ and rotunda facilities, and small wetlands, all of which are linked by gravel access tracks. Residual gasworks buildings have been retained near the entrance of the park and used as a café, bookshop, art galleries, administration area and theatre, foyer and dressing room area. Other residual gasworks buildings are scattered around the perimeter of the park and used as various art studios; and
- the Southport site covers an area of 0.54 ha and is situated in the northeast corner of the SMG site (refer to Figure 2). The Southport Community Nursing Home occupies the majority of the Southport Site (fronting Richardson Street) and incorporates a brick building (i.e. nursing home), and open grass, paving and landscaped gardens.

South Melbourne Gasworks is surrounded by low density residential houses to the north and east across Richardson Street and Foote Street. High density residential units are present across Pickles Street to the east, and to the south across Graham Street.

The nearest surface water body to the site is Port Phillip Bay approximately 350 m south of the site (Figure 1).

3.2 Summary of geology and hydrogeology

The geology onsite according to the Geological Survey of Victoria (GSV 1974) *Melbourne 1:63,360 map sheet* consists of the Port Melbourne Sands (PMS) which is described as raised beach ridges of well sorted sand, shelly sand, minor silty or clayey sand. Geology encountered onsite is generally in accordance with the expected regional geology which includes the Brighton Group sediments and Older Volcanic Basalt (in the north eastern portion of the site).

Regional groundwater flow in the basement Dargile Formation is towards Port Phillip Bay, therefore under natural hydraulic gradients, the groundwater flow direction would be expected to be towards the south to south west beneath the site.

Further discussion regarding geology and hydrogeology is presented in Environmental Earth Sciences, 2013b report.

3.3 Trade waste agreement

A "*Deed of Agreement Groundwater and Gasworks Arts Park, Albert Park*" exists between CoPP, Melbourne Water and South East Water. This '*Deed of Agreement'* states that Melbourne Water (responsible for the South Yarra Sewer Main and Hobsons Bay Sewer Main) and South East Water (responsible for the Pickles Street Branch sewer) acknowledge that these sewers act as a control for groundwater surrounding Gasworks Arts Park and agree to accept groundwater discharging from Gasworks Arts Park. Further discussion regarding the Deed of Agreement is provided in Environmental Earth Sciences 2013b report, however, essentially CoPP has agreed to monitor groundwater contamination within vicinity of the sewers, supply data related to the groundwater conditions and notify Melbourne Water and South East Water of any changes in the groundwater conditions. As such, the groundwater results have been compared against the trade waste agreement guidelines.

3.4 Current site conditions

Currently, 42 bores exist onsite predominantly installed into the upper Brighton Group sediments. Deeper wells targeting the base of the Brighton Group were installed by Environmental Earth Sciences in 2011 (GW42D - GW44D). Well locations are shown in Figure 3.

TABLE 1 SUMMARY OF EXISTING GROUNDWATER WELLS

Location	Groundwater Wells (GW)
OS Wells	1, 2, 3, 4, 5, 18, 19, 20, 21, 22, 23, 24, 31, 35, 39, 40, 41, 42D, 43D and 44D
NW Wells	6, 32, 33, 34 and 36
NE Wells	7, 8, 26, 27, 28, 29, 30, 37 and 38
SE Wells	9, 10, 11, 12, 13, 14, 15, 16 and 25

Note: D indicates wells are "deep" and installed at the base of the aquifer hydrogeological unit (Brighton Group Sediments).

The contamination existing onsite is related to the gasworks activities which occurred previously onsite and the chemicals of concern are considered to be:

- polycyclic aromatic hydrocarbons (PAHs) including naphthalene;
- heavy metals (arsenic [As], cobalt [Co], copper [Cu], lead [Pb] and zinc [Zn]);
- cyanide (CN);
- inorganics (ammonia [NH_4^+] and sulfate [SO_4^{2-}]); and
- total recoverable hydrocarbons (TRH).

4 ASSESSMENT CRITERIA

The main report (Environmental Earth Sciences, 2013b) discusses in detail the assessment criteria adopted for the site and justification for selecting those criteria. Please refer to that document, if additional information is required.

Based on the total dissolved solids (TDS) concentrations determined to be representative of background conditions and in accordance with the State Environment Protection Policy, 1997, *Groundwaters of Victoria* (SEPP GoV), the groundwater beneath the site is classified as Segment A2. The beneficial uses to be protected under Segment A2 are:

- maintenance of ecosystems;
- potable water supply (acceptable);
- agriculture, parks and gardens;
- stock watering;
- industrial water use;
- primary contact recreation; and

- buildings and structures.

The selected criteria to assess the beneficial uses are listed in Table 2.

TABLE 2 GROUNDWATER BENEFICIAL USES

Beneficial Use	Adopted Guideline Source
Maintenance of Ecosystems	ANZECC 2000 "Aquatic systems" guidelines for marine and freshwater species, Trigger values for 95% marine water. Also Hickey (2002) for nitrate criteria.
Acceptable Potable Water Supply	National Health and Medical Research Council (NHMRC) *Guidelines for Managing Risks in Recreational Water*, 2008. NHMRC *National Water Quality Management Strategy, Australian Drinking Water Guidelines 6*, 2011.
Agriculture, parks and gardens	ANZECC, 2000 "Primary Industries" guidelines for irrigation water quality.
Stock watering	ANZECC, 2000 "Primary Industries" guidelines for livestock drinking water quality.
Industrial Water Use	No specific guidelines as stated in ANZECC 2000.
Primary Contact Recreation	NHMRC *Guidelines for Managing Risks In Recreational Waters*, 2008.
Buildings and Structures	Australian Standard AS3600 – 2009 *Concrete Structures*.

In reference to Melbourne Water and South East Water specific obligations, groundwater concentrations at the site have been compared against South East Water '*Standards for trade waste discharge to the sewerage system*', presented in Environmental Earth Sciences 2013b report. Please note Melbourne Water standards for discharge could not be identified.

5 SITE INVESTIGATION

5.1 Summary of field activities

Thirty six wells were proposed to be sampled as part of this groundwater investigation, however during the groundwater investigation, GW27 could not be located and therefore was not sampled. The well was subsequently found by surveyors after the conclusion of the groundwater investigation. The supplementary groundwater investigation was undertaken between 24 and 27 June 2013.

At the start of the groundwater investigation, all groundwater wells were gauged, using an interface meter, to measure the standing water level (SWL) and are presented in **Table T1**. No light non-aqueous phase liquid (LNAPL) was identified during the gauging event.

The selected groundwater wells to be sampled were gauged and purged prior to sampling using a low flow (Micro-purge) sampling technique. Field parameters (dissolved oxygen, pH, conductivity, temperature and oxidation reduction potential) and SWL were recorded and

stabilised prior to sampling. Six groundwater wells that had shown to have poor recovery from past investigations, or had less than one metre of water column were bailed dry (with the use of a dedicated plastic bailer). Those bores were left to recover and sampled on the same day or within 24 hours. Two bores were found to be dry (GW3 and GW20). Groundwater sampling records are presented in **Appendix A**.

Samples were collected in the appropriate laboratory prepared bottles and labelled with the well number and date sampled before being placed in a darked cooler with ice. Groundwater collected for heavy metal analysis was field filtered while samples collected for cyanide analysis was pre-treated using laboratory supplied pre-treatment bottles.

The wastewater intermediate bulk container (IBC) was picked up from the site on 2 July 2013 and the waste transport certificates are presented in **Appendix B**.

All sampling procedures were undertaken in accordance with Environmental Earth Sciences, 2011, *Soil, gas & groundwater sampling manual* and EPA Publication 669, 2000, *Groundwater sampling guidelines*. Practices to eliminate cross contamination included the following:

- use of individual dedicated pump bladders, tubing and bailer (if necessary) at each groundwater well; and
- thorough washing of all re-used sampling equipment (including the pump, steel cable and interface meter) with detergent (Decon 90) water, then double rinsing with clean water and drying before each location.

5.2 Laboratory analysis

Groundwater samples were collected from 33 groundwater wells. All primary, rinsate and trip blank samples were analysed by Australian Laboratory Services (ALS) and all inter-laboratory triplicate samples were analysed by Eurofins-MGT Laboratories, both of which are NATA accredited laboratories. Each sample was analysed for the following:

- ionic balance including pH, TDS, Ca^{2+}, Mg^{2+}, Na^{+}, K^{+}, NH_4^{+}, Cl^{-}, HCO_3^{-}, SO_4^{2-}, NO_3^{-}, NO_2^{-}, PO_4^{3-} and F^{-};
- dissolved heavy metals including Al, As, B, Cd, Co, Cr (VI), Cu, Fe, Hg, Pb, Mn, Ni, Se and Zn;
- total cyanide;
- TPHs and total recoverable hydrocarbons (TRH);
- monocyclic aromatic hydrocarbons (MAHs) including trimethylbenzene, benzene, toluene, ethylbenzene and xylene (BTEX), and
- naphthalene.

Those groundwater samples with elevated concentrations of TPH were re-analysed for the silica-gel clean up to remove any organics which are not associated with petroleum hydrocarbons.

Two duplicate and triplicate samples were collected during the groundwater investigation and analysed for all the above analysis except the ionic balance suite. Rinsate samples were collected each day (four samples in total) and were analysed for TPH, MAH and naphthalene. Trip blank samples (eight in total) were placed into each esky sent off to the laboratory and analysed for MAH and naphthalene only.

5.3 Field hydrogeological information

The hydrostratigraphy on site and in the vicinity of the site consists of Brighton Group sediments overlying the Older Volcanics. Groundwater flow through the full saturated thickness of the Brighton Group sediments is mostly controlled by deep sewers which border the site on three sides, i.e. Foote Street/Bridport Street to the south east, Graham Street to the south west and Pickles Street to the north west. The water table on site is drawn down several metres below its natural level by the sewers such that it is several metres below sea level throughout the area of the site and the surrounding vicinity, and the upper 7-8 m of the Brighton Group and overlying fill are generally unsaturated. The majority of the groundwater on site ultimately flows to the sewers beneath Foote Street/Bridport Street and Graham Street as they are deeper than the sewer beneath Pickles Street.

The horizontal hydraulic gradient over much of the site is in the range 0.007 to 0.02 (refer to Figure 4).

5.4 Groundwater Flow and aquifer yield estimates

Based on gauging data collected on 24 June 2013 groundwater elevation contours are shown in **Figure 4**.

The aquifer is considered to be heterogeneous in both the vertical and lateral directions due to lithological variations within the Brighton Group. Groundwater is likely to move preferentially through the most permeable layers.

The maximum linear velocity of the groundwater is estimated to be approximately 62 m/yr, based on the maximum hydraulic conductivity (K) of 1.7 m/day evaluated from slug tests (refer to Environmental Earth Sciences, 2013b), an effective porosity of 0.2 (Environmental Earth Sciences, 2013b) and a hydraulic gradient of 0.02 (maximum gradient). For the median hydraulic conductivity of 0.3 m/day calculated from the slug test results, the average linear velocity of the groundwater is estimated to be approximately 11 m/yr.

The groundwater flow system through the Brighton Group on site is interpreted to have the following additional characteristics:

- nearly all of the groundwater flow in the Brighton Group beneath the site has been recharged by infiltration from the ground surface on site;
- there is an upward gradient from the underlying Older Volcanics to the Brighton Group such that contaminated groundwater cannot migrate below the Brighton Group. Due to this gradient, there may also be some minor upward leakage into the Brighton Group flow system from the underlying Older Volcanics; however, this flux is considered to be small in comparison to the flux derived from on-site recharge;
- most of the groundwater discharging from the site is captured by the sewers with exception to the northern portion of the site (via Richardson Street Sewer), but eventually is expected to be captured by the adjacent sewers;
- lateral groundwater flow towards the sewers takes place through the full saturated thickness of the Brighton Group. However, the greatest lateral flux takes place through the layers of greatest K. Over most of the site, the saturated thickness of the Brighton Group is approximately 10 m;
- the oldest groundwater within the Brighton Group on site is likely to be closest to the sewers towards the down gradient end of the longest flow paths, within the relatively low K zones of the Brighton Group, and/or in areas of relatively low hydraulic gradient;

- the median K of the Brighton Group at the site was evaluated from slug tests to be approximately 0.3 m/day. K was observed to decrease with depth in the Brighton Group; and
- the average linear velocity of the groundwater flowing laterally through the Brighton Group over most of the site is estimated to be approximately 11 m/yr.

5.5 Revalidation of Groundwater Flux to Sewers

The estimated groundwater flux to sewers based on the interpreted hydrogeological information for this round of groundwater sampling is as follows:

South Yarra main sewer
Assuming a saturated thickness of 9 metres, a sewer length over which discharge is taking place of 170 m, a hydraulic gradient of 0.02 and a hydraulic conductivity of 0.3 m/day, the groundwater discharge rate from the site to the South Yarra main sewer (along Bridport Street) was estimated to be 9.20 m^3/day.

Hobsons Bay main sewer
Assuming a saturated thickness of 9 metres, a sewer length over which discharge is taking place of 140 m, a hydraulic gradient of 0.02 and a hydraulic conductivity of 0.3 m/day, the groundwater discharge rate from the site to the Hobson Bay main sewer (along Graham Street) was estimated to be 7.56 m^3/day.

Pickles Street sewer
Assuming a saturated thickness of 9 metres, a sewer length over which discharge is taking place of 112 m, a hydraulic gradient of 0.007 and a hydraulic conductivity of 0.3 m/day, the groundwater discharge rate from the site to the Pickles Street sewer was estimated to be 2.12 m^3/day.

Thus, the total discharge to the surrounding sewers from Gasworks Park and Southport Community Nursing Home is estimated to be 19 m^3/day 7 ML/yr).

The flux estimates herein were calculated from observations of hydraulic properties and gradients within the Brighton Group sediments on site. Previous estimates by Golder were based on assumed sewer pipe hydraulic properties rather than on-site field measurements of Brighton Group properties. The updated estimate was higher than the previous estimated flux by Environmental Earth Sciences (Environmental Earth Sciences, 2013b). However, the calculated flux is orders of magnitude lower than the typical daily flow rate in the sewer (estimated to be 230ML/day by Golders report 2006) and therefore the daily discharge to sewers can be considered negligible.

5.6 Analytical data validation

Analytical data validation is the process of assessing whether data is in compliance with method requirements and project specifications. The primary objectives of this process are to ensure that data of known quality is reported, and to identify if the data can be used to fulfill the overall project objectives. The process involves the checking of analytical procedure compliance and assessment of the accuracy and precision of the analytical data from a range of quality control measurements, generated from both the sampling and analytical programs.

Specific parameters that were checked and assessed for this project included:

- collection of field duplicate and field split samples. The field duplicate samples were analysed by ALS (primary laboratory) and the triplicate samples were analysed by Eurofins-MGT (secondary laboratory);
- preservation and storage of samples upon collection and during transport to the laboratory;
- calibration of field equipment;
- correlation of field collected groundwater data (pH, EC, ORP, temperature) with laboratory analysis results (pH, TDS, NO_3/NH_3 concentrations);
- adherence to sample holding times;
- use of appropriate analytical procedures;
- review of limit of reporting;
- laboratory duplicates and calculation of relative percent differences (RPDs);
- laboratory blank results;
- matrix spike recovery results; and
- the occurrence of apparently unusual or anomalous results, e.g. laboratory results that appear to be inconsistent with field observations or measurements.

The QA/QC report is presented in **Appendix C**.

6 DISCUSSION OF RESULTS

The groundwater wells were sampled between 24 and 27 June 2013 and were analysed for CoPC as per section 5.2. Four equipment blanks, eight trip blanks and two duplicate and split samples were also collected for QAQC purposes. All samples were subjected to laboratory analysis, a summary of the groundwater laboratory results are presented in Tables **T2 toT5**. Laboratory transcripts and chain of custody forms are included in **Appendix D**.

6.1 Organic groundwater analysis

All organic laboratory groundwater results are presented in Tables **T2 to T4**. The majority of the reported organic compounds concentrations were below the adopted site criteria with the exception of:

6.1.1 Polycyclic Aromatic Hydrocarbons

- naphthalene concentrations of 134 µg/L for NE well (GW38) and ranging between 572 and 6,470 µg/L for OS wells (GW44D and GW24).

6.1.2 Monocyclic Aromatic Hydrocarbons

- benzene concentrations ranging between:
  - 1 and 3,380 µg/L for OS wells (GW02, GW05, GW23, GW24, GW35, GW39, GW42D and GW44D);
  - 15 and 269 µg/L for NE wells (GW08, GW37 and GW38); and
  - 69 µg/L for NW well (GW32);
- ethylbenzene concentrations ranging between:
  - 36 and 52 µg/L for OS wells (GW44D and GW23); and
  - 15 µg/L for NE well (GW38);
- xylenes concentrations for OS wells ranging from 27 µg/L (GW42D) to 1,635 µg/L (GW24).

6.1.3 Total Petroleum Hydrocarbons

- $TPHC_6$-C_9 concentrations ranging between:
  - 200 and 5,110 µg/L for OS wells (GW23, GW24, GW42D and GW44D); and
  - 530 µg/L for NE well (GW38);
- $TPHC_{10}$-C_{36} concentrations ranging between:
  - 810 and 116,000 µg/L for OS wells (GW02, GW05, GW19, GW23, GW24, GW39, GW42D and GW44D); and
  - 1,160 and 11,900 µg/L for NE wells (GW08, GW37 and GW38).

Silica gel clean up and re-analysis was undertaken on a number of samples for TPH fraction C_{10}-C_{36}. The results of this analysis indicated that approximately 16.5% to 100% of previously identified TPH compounds across the analysed samples were confirmed to be from primarily natural organic influences such as humic and fulvic acids rather than attributed to true petroleum hydrocarbons.

Therefore after silica gel clean-up only the following wells exceeded adopted ecological and health criteria (600 µg/L):

- OS wells GW23 (650 µg/L), GW24 (12,600 µg/L) and GW44D (58,100 µg/L); and
- NE well GW38 (9,100 µg/L).

As discussed in the main groundwater report (Environmental Earth Sciences 2013b), these detections were considered to be aromatic hydrocarbons only, which is consistent with the PAH and BTEX concentrations reported for these samples. This indicates that TPH detected onsite consists predominantly of BTEX and PAHs compounds. Therefore TPHs as a CoPC are of lesser concern on this site as they are assessed separately under their more toxic constituents.

These elevated TPH concentrations are comparable with the groundwater results reported in the main groundwater report (Environmental Earth Sciences 2013b).

6.2 Inorganic groundwater analysis

All inorganic laboratory groundwater results are presented in Tables T2 to T4. The majority of the reported inorganic compounds concentrations were below the adopted site criteria with the exception of:

6.2.1 Heavy metals

- Aluminium concentration of 0.45 mg/L for OS well GW42D;
- Arsenic concentrations ranging between:
  - 0.003 and 2.06 mg/L for all OS wells;
  - 0.017 and 1.45 mg/L for most NW wells except for GW06;
  - 0.011 and 0.034 mg/L for most SE wells except for GW15; and
  - 0.065 and 0.365 mg/L for most NE wells except for GW29.
- Boron concentrations ranging between:
  - 0.60 and 3.03 mg/L for most OS wells except for GW42D;
  - 0.99 and 8.25 mg/L for all NW wells;
  - 0.62 and 1.51 mg/L for most SE wells except for GW10; and
  - 0.53 and 0.95 mg/L for most NE wells except for GW26.
- Cobalt concentrations ranging between:
  - 0.002 and 7.79 mg/L for all OS wells;
  - 0.002 and 0.015 mg/L for most NW wells except for GW06 and GW32;
  - 0.002 and 0.01 mg/L for most SE wells except for GW09; and
  - 0.004 and 0.034 mg/L for most NE wells except for GW28.
- Copper concentrations ranging between:
  - 0.002 and 0.065 mg/L for most OS wells except for GW05, GW23 and GW31;
  - 0.002 and 0.006 mg/L for all NW wells;
  - 0.002 and 0.003 mg/L for all SE wells; and
  - 0.002 and 0.004 mg/L for most NE wells except for GW28 and GW38.
- Iron concentrations ranging between:
  - 0.24 and 49.40 mg/L for most OS wells except for GW18, GW22, GW24 and GW41;
  - 0.49 and 2.33 mg/L for three NW wells (GW32, GW34 and GW36);
  - 0.33 and 0.96 mg/L for two SE wells (GW10 and GW25); and
  - 0.71 and 36.30 mg/L for most NE wells except for GW29.
- Magnesium concentrations in OS deep wells GW18 (727 mg/L), GW42D (1,060 mg/L) and GW43D (638 mg/L).
- Manganese concentrations ranging between:
  - 1.32 to 3.64 mg/L for three NE wells (GW08, GW26 and GW38); and
  - 0.741 and 24.6 mg/L for 10 OS wells (GW02, GW05, GW18, GW19, GW35, GW39, GW40, GW42D, GW43 and GW44).

- Nickel concentrations ranging between:
  - 0.04 and 2.20 mg/L for 10 OS wells (GW01, GW05, GW19, GW22, GW31, GW39, GW40, GW42D, GW43 and GW44);
  - 0.025 and .074 mg/L for all NW wells;
  - 0.036 and 0.066 mg/L for all SE wells; and
  - 0.028 and 0.1 mg/L for five NE wells (GW07, GW08, GW26 GW29 and GW30).
- Selenium concentrations ranging between:
  - 0.004 mg/L for NE well GW28;
  - 0.01 mg/L for two OS wells (GW42D and GW44); and
  - It should be noted that the laboratory LOR are higher than the adopted criteria ANZECC 2000.
- Zinc concentrations ranging between:
  - 0.021 and 0.143 mg/L for most OS wells except for GW18, GW23, GW24 and GW35;
  - 0.018 and 0.035 mg/L for most NW wells except for GW34;
  - 0.031 and0 .067 mg/L for all SE wells; and
  - 0.02 and 0.137 mg/L for six NE wells (GW07, GW08, GW26, GW29, GW30 and GW37).
- Lead concentration of 0.011 mg/L for NW well GW32.

6.2.2 Other Inorganics

- Ammonia concentrations ranging between:
  - 0.350 and 2,410 mg/L for most OS wells except for GW40;
  - 0.67 mg/L for SE well GW15;
  - 0.42 and 16.30 mg/L for most NW wells except for GW36; and
  - 1.29 and 1,150 mg/L for most NE wells except for GW29 and GW30.
- Chloride concentrations ranging between:
  - 816 and 9,670 mg/L for 11 OS wells (GW01, GW02, GW18, GW19, GW31, GW35, GW40, GW41, GW42D, GW43 and GW44); and
  - 302 and 1,000 mg/L for most NE wells except for GW08 and GW38.
- Total Cyanide concentrations ranging between:
  - 0.015 and 0.212 mg/L for most OS wells except for GW40 and GW43;
  - 0.005 and 0.255 mg/L for all NW wells; and
  - 0.016 and 0.16 mg/L for most NE wells except for GW26, GW29 and GW30.
- Fluoride concentrations ranging between:
  - 1.4 and 4.5 mg/L for six OS wells (GW01, GW05, GW31, GW35, GW39 and GW41);
  - 1.4 and 2.5 mg/L for all NW wells; and
  - 1.3 and 2 mg/L for four NE wells (GW07, GW28, GW30 and GW37).

- Total dissolved solids concentrations ranging between:
  - 596 and 27,000 mg/L for all OS wells;
  - 936 and 6,390 mg/L for all NW wells;
  - 520 and 680 mg/L for all SE wells; and
  - 1,180 and 3,440 mg/L for all NE wells.
- Nitrate concentrations of:
  - 128.47 mg/L for OS well GW24;
  - 115.62 mg/L for SE well GW09; and
  - 71.32 mg/L for NE well GW29.
- Sulfate concentrations ranging between:
  - 178 mg/L to 6,950 mg/L for all OS wells;
  - 184 mg/L to 2,070 mg/L for all NE wells;
  - 158 mg/L to 314 mg/L for most SE wells except for monitoring well GW09; and
  - 206 mg/L to 2,430 mg/L for most NW wells except for monitoring well GW06.
- pH measurements ranging between:
  - 5.57 and 6.48 pH units for six OS wells (GW05, GW19, GW40, GW42D, GW43 and GW44);
  - 3.66 and 6.49 pH units for all SE wells, and
  - 5.82 and 5.96 pH units for two NE wells (GW08 and GW30).

7 HYDROGEOCHEMISTRY

The geochemistry of the groundwater samples collected in June 2013 is generally the same as compared with the groundwater samples collected in 2011 by Environmental Earth Sciences (Environmental Earth Sciences 2013b).

Chart 1 and Chart 2 present Schoeller Plots of the shallow Brighton Group groundwater chemistry and the deep Brighton Group groundwater chemistry respectively. Based on the results presented in Tables **T2-T5** and Charts 1 and 2, the groundwater across the site can be characterised in terms of chemistry and geo-chemical evolution.

It should also be noted that based on the reported TDS results which were higher within those wells located adjacent to sewers, suggesting that the seawater from the Bay was potentially migrating along the sewers and causing very high TDS values.

7.1 Shallow groundwater wells

Groundwater pH within shallow wells across the site and surrounds is relatively neutral, with an average field pH of 6.6 (June 2013 GME) and comparatively the same as the previous 2011 GME with an average of 6.8.

Mean TDS concentrations were approximately 4,450 mg/L in shallow OS wells, 2,200 mg/L in NE wells, 3,253 mg/L in NW wells, and 581 mg/L in SE wells.

South-East (SE) wells (i.e. GW9, GW10, GW15 and GW25) are characterised by low concentrations of TDS ranging from 520 to 620 mg/L and generally dominated by Na-SO_4 (HCO_3) with Mg–Cl (HCO_3) sub-dominant. Localised proportionally elevated concentrations of nitrate (NO_3) are also consistent with influences from urban activities. These conditions are considered to be background conditions of the local region and correspond with the expected groundwater segment and associated beneficial uses.

North-West (NW) wells (i.e. GW6, GW32, GW33, GW34 and GW36) have TDS concentrations ranging from 936 to 6,390 mg/L where the higher TDS concentrations were noted within vicinity of the corner of Pickles Street and Richardson Streets sewers. The NW groundwater was generally dominated with Na-Cl to Ca- SO_4 with the exception of GW32 where a higher bicarbonate and lower TDS were noted suggesting a recent recharge.

Note that it may be possible for relatively high salinity and alkalinity water to migrate laterally to some extent via preferential pathways along sewer lines that are below sea level especially to those well located within the vicinity of these sewers.

Based on the inferred groundwater flow directions, the impacts in the NW wells are likely to be from site, off-site or a combination of both. The groundwater impact to monitoring wells GW33 and GW32 could be either background concentrations or be coming from an off-site source due to the presence of the Pickles Street Sewer preventing flow across Pickles Street. On the other hand, in monitoring wells GW06, GW34 and GW36, there is a potential that the groundwater impacts within these wells could be from an onsite source or could be an off-site source (Richardson Street Sewer).

North-East (NE) wells (GW7, GW8, GW26, GW27, GW28, GW29, GW30, GW37 and GW38) have TDS concentrations ranging from 1,180 to 2,560 mg/L and a considerable range in the dominant ions. Based on the inferred groundwater flow direction as interpreted in Figure 4, it is possible that these wells have been impacted by contaminated groundwater migrating from the site.

On-Site (OS) wells (i.e. GW1, GW2, GW5, GW18, GW19, GW22, GW23, GW24, GW31, GW35, GW39, GW40 and GW41) have a broad range of TDS concentrations from 596 to 15,600 mg/L. There is a broad range of water types among the OS wells from Na-Cl dominated to Ca- SO_4 dominated. This is likely to reflect a range of temporal and spatial impacts at the site, as well as different rates of recharge at different locations since the decommissioning of the gasworks.

Overall, there is a broad range of water types among the OS wells from Na-Cl dominated to Ca- SO_4 dominated. This is likely to reflect a range of temporal and spatial impacts at the site, as well as different rates of recharge at different locations since the decommissioning of the gasworks. The wells with the lowest TDS (e.g. GW22 and GW40) also have a relatively high proportion of HCO_3, which is likely to reflect recent recharge. In addition, it should also be noted that based on the reported TDS results higher within those wells located adjacent to sewers, this suggests that the seawater from the Bay was potentially migrating along the sewers and causing very high TDS values.

7.2 Deeper OS groundwater wells

Groundwater within deeper OS Brighton Group wells is slightly acidic, with an average field pH of 6.0. The TDS concentration within the three deeper groundwater wells ranged from 9,310 to 27,000 mg/L, with an average TDS of 14,728 mg/L. The TDS concentrations in the deeper OS wells are all greater than the TDS concentration in any shallow well.

Chart 2 presents the geochemical signatures found within deeper groundwater wells and also includes the geochemical signatures of seawater and rainwater for comparison. The geochemistry signature at most of the deeper wells GW43D (Na-Cl>Mg-SO_4) is generally similar to that of seawater, apart from elevated NH_4^+.

Note that it may be possible for relatively high salinity and alkalinity water to migrate laterally to some extent via preferential pathways along sewer lines that are below sea level especially to those well located within the vicinity of these sewers.

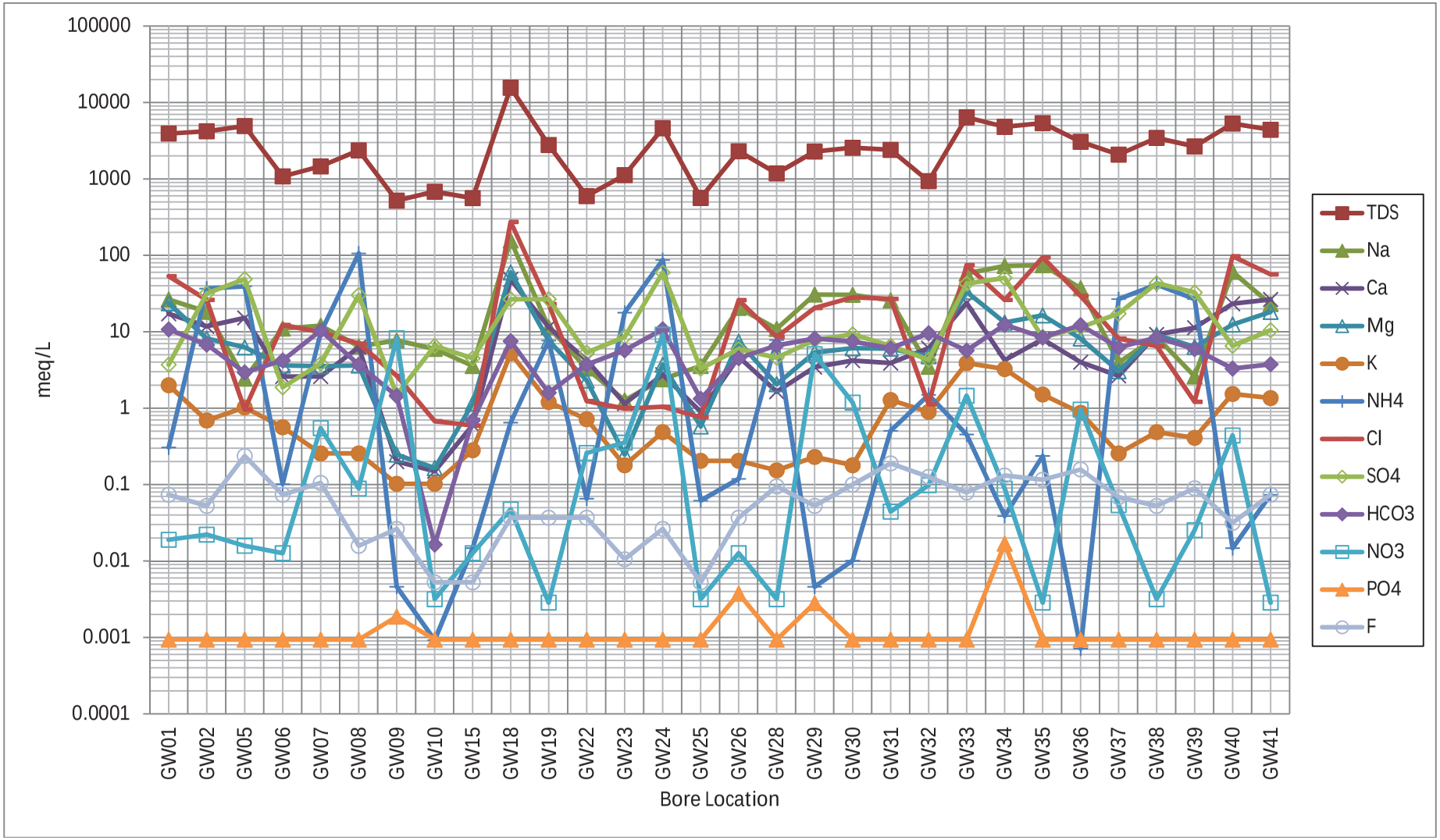

Chart 1: Schoeller Plot. Groundwater Chemistry 'Shallow groundwater wells' – June 2013GME

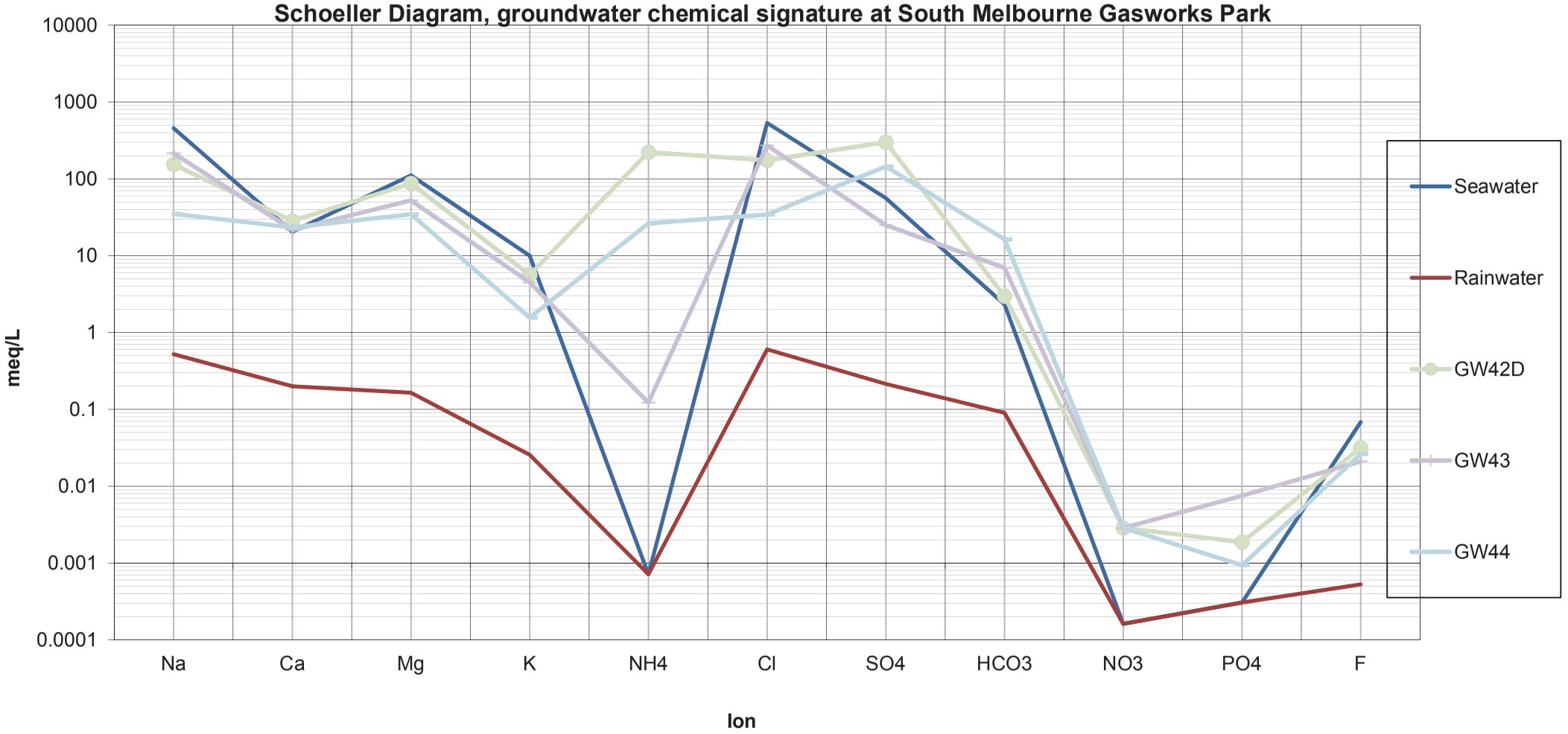

Chart 2: Schoeller Plot. Groundwater Chemistry 'Deeper groundwater wells – June 2013 GME'.

8 INFERRED GROUNDWATER CHANGES ASSESSMENT

The inferred changes from groundwater analysis of previous monitoring events and current groundwater results have been presented within **Table T6**.

In general, the groundwater contamination conditions onsite and off-site are relatively stable (with slight increase or decrease) with some rise of contaminant concentrations (above background concentrations) within the NW and NE Wells but the long term trend of chemicals of concern were generally stable over the years and the dissolved contaminant plume is considered to be stable. In addition, as there are no known extraction wells used for groundwater Segment A2 beneficial uses located within the vicinity of NW and NE wells, the increase of contaminants of concern in some locations within the adjacent residential properties can be considered unlikely to pose un-acceptable risks to adjacent users.

The comparison of historical and current concentrations has been presented in **Table T6**.

8.1 OS Wells

The reported concentrations within the OS Wells are relatively stable (with slight increase/ decrease in concentrations). Concentrations of all chemicals in groundwater have deceased since 2011 with the exception of (more than two times higher than the baseline results for most of the chemicals except for heavy metals and one order of magnitude higher than the baseline results for heavy metals):

- increased NH_3 concentrations were found in GW2, GW3, GW4, GW24 and GW41;
- increased NO_2^- concentration was found in GW24;
- increased NO_3 concentration was found in GW4 and GW40;
- increased TDS concentrations were found in GW40 and GW41;
- increased Cl concentrations were found in GW3, GW18, GW19, GW31, GW40, GW41and GW44;
- increased Na concentrations were found in GW4, GW18, GW19, GW40 and GW41;
- increased Ca concentrations were found in GW40;
- increased As concentrations were found in GW1, GW19, GW21, GW23, GW24, GW31, GW35 and GW39;
- increased Cu concentration was found in GW40;
- increased Fe concentrations were found in GW1, GW31 and GW35;
- increased Mn concentrations were found in GW18;
- increased Zn concentrations were found in GW40;
- increased benzene concentrations were found in GW5 and GW39;
- increased naphthalene concentration was found in GW24;
- increased TPH C_{10}-C_{14} concentration was found in GW2;
- increased TPH C_{10}-C_{16} were found in GW19 and GW41;

- increased TPH C_{15}-C_{28} concentrations were found in GW2, GW3, GW4 GW19 and GW35;
- increased TPH C_{29}-C_{36} concentrations were found in GW4; and
- increased TPH C_{10}-C_{36} concentrations were found in GW2, GW3, GW4 and GW19.

The increase of chemical concentrations in some locations in the OS Wells can be considered to be a combination of ongoing impacts migrating from the site, off-site source/s and background concentrations. The greatest increase of potential gasworks related contaminants of concern [NH_3 and/or TPH(C_{10}-C_{36})] were observed at GW2, GW3 (based on data up to 2011 only), GW4, GW18, GW19, GW24 and GW41 which is consistent with the inferred radial groundwater flow directions. It can be considered that these dissolved chemicals will be captured by the adjacent sewers.

The majority of the heavy metal concentrations in deeper OS Well GW42D remained significantly higher as compared with the other OS shallow and deep wells. However, it should be noted that the heavy metal results were either stable or had decreased (particularly OS well GW42D with Al from 3.91 mg/L to 0.45 mg/L, Zn from 2.2mg/L to 0.143 mg/L and Mn from 120mg/L to 24.6mg/L) as compared with the previous round of sampling. As these elevated heavy metals were not observed in the majority of the shallow and deep OS wells, it can be considered likely that this was not a result of the historical use of the site.

8.2 NW Wells

The reported concentrations within the NW Wells are relatively stable (with slight increase/ decrease in concentrations). Concentrations of all chemicals in groundwater have deceased since 2011 with the exception of (more than two times higher than the baseline results for most of the chemicals except for heavy metals and one order of magnitude higher than the baseline results for heavy metals):

- increased NH_3 concentration was found at GW34;
- increased NO_3 concentration was found in GW34;
- increased Cl concentrations were found in GW33;
- increased As concentrations were found in GW32, GW34 and GW36;
- increased Fe concentrations were found in GW32 and GW34;
- increased benzene and ethylbenzene concentrations were found in GW32;
- increased fluoride concentrations were found in GW34;
- increased TPH C_6-C_9 concentration was found in GW32;
- increased TRH C_{16}-C_{34} concentration was found in GW32;
- increased TPH C_{15}-C_{28} concentrations was found in GW32, and
- increased TPH C_{10}-C_{36} concentrations were found in GW32.

Based on the inferred groundwater flow directions, the increase in potential gasworks related contaminants of concern [NH_3 and/or TPH (C_{10}-C_{36})] concentrations in some locations in the NW Wells can be considered to be a combination of onsite and off-site sources (GW34 and GW36).

The increase of potential gasworks related contaminants of concern in GW32 can be considered to be coming from an off-site source as this well is located across the Pickles Street Sewer. In addition, higher bicarbonate and lower TDS were noted at GW32 suggesting recent recharge.

It is noted that the majority of the heavy metals results were reported higher than the previous round of sampling (2011). The increase or decrease of heavy metals cannot be compared accurately due to the difference in filtering methods undertaken (field vs lab filtered).

8.3 NE Wells

The reported concentrations within the NE wells are relatively stable (with slight increase/ decrease in concentrations). Concentrations of all chemicals in groundwater have deceased since 2011 with the exception of (more than two times higher than the baseline results for most of the chemicals except for heavy metals and one order of magnitude higher than the baseline results for heavy metals):

- increased NH_3 concentrations were found in GW8, GW26, GW28;
- increased NO_3 concentration was found in GW27;
- increased As concentrations were found in GW26, GW28;
- increased Fe concentrations were found in GW08, GW26, GW28, GW30 and GW38;
- increased BTEX concentration was found in GW38;
- increased trimethylbenzene concentration was found in GW38;
- increased naphthalene and TPH C_6-C_9, TPH C_{10}-C_{16} concentrations were found in GW38;
- increased TPH C_{10}-C_{14} concentrations were found in GW38;
- increased TPH C_{16}-C_{34} concentrations were found in GW07;
- increased TPH C_{29}-C_{36} concentrations were found in GW27; and
- increased TPH C_{15}-C_{28} and TPH C_{10}-C_{36} concentrations were found in GW27 and GW28.

Based on the inferred groundwater flow directions, the increase in chemical concentrations at some locations in the NE Wells can be considered to be a combination of impacts migrating from the site and other off-site sources. The greatest increase was observed at GW38, which is consistent with the inferred flow direction, however it can be assumed that the plume will eventually be captured by South Yarra Sewer Main.

8.4 SE Wells

The reported concentrations within the SE wells are relatively stable (with slight increase/ decrease in concentrations). Concentrations of all chemicals in groundwater have deceased since 2011 with the exception of (more than two times higher than the baseline results for most of the chemicals except for heavy metals and one order of magnitude higher than the baseline results for heavy metals):

- increased NO_3 concentrations were found in GW12;
- increased Cl concentrations were found in GW13 and GW14;

- increased Ca concentration were found in GW25;
- increased As concentrations were found in GW25;
- increased Fe concentrations were found in GW10; and
- increased TPH C_{15}-C_{28}, TPH C_{29}-C_{36}, TPH C_{10}-C_{36} concentrations were found in GW11 (based on 2011 data only).

Based on the inferred groundwater flow directions and the presence of South Yarra Sewer Main, the increase of chemical concentrations in some locations in the SE Wells is not considered to be as a result of the impacts coming from the former gasworks. The concentrations detected could be considered as background concentrations, or as a result of an off-site source.

9 GROUNDWATER BENEFICIAL USES

The watertable beneath the site is within the Brighton Group sediments. Groundwater onsite within the Brighton Group aquifer has been classified according to the State Environment Protection Policy (SEPP) 1997, *Groundwaters of Victoria (GoV)* publication (SEPP *GoV*), using the laboratory TDS levels reported for the June 2013 groundwater investigations. Groundwater encountered beneath the site ranges between Segment A and Segment D. As displayed in Table 2, most TDS results classified groundwater as Segment B. However in reference to the SEPP, groundwater should be assessed in comparison with the most sensitive beneficial uses (i.e. Segment A2), i.e.:

- maintenance of ecosystems;
- potable water supply (acceptable);
- potable mineral water;
- agriculture, parks and gardens (irrigation);
- stock watering;
- industrial water use;
- primary contact recreation; and
- buildings and structures.

As Gasworks Park and Southport are owned by the CoPP and the State of Victoria, extraction of groundwater onsite can be effectively controlled through management, should any of these beneficial uses be precluded. By preventing the use of groundwater on the site, the risks associated with this exposure pathway will be reduced to an acceptable level.

9.1 Maintenance of ecosystems

The following water quality indicators exceeded ecological based criteria:

- CN;
- NH_3;
- heavy metals: As, Co, Cu, Pb, Ni, Se and Zn;
- naphthalene;

- benzene, toluene and ethyl benzene; and
- TPH (C_6-C_9 and C_{10}-C_{36}).

The protection and maintenance of ecosystems was a potential beneficial use of all groundwater in the Brighton Group sediments beneath the site. The nearest significant ecological receptors are the waters and sediments of Port Philip Bay, 350 m south-west of the site. Although this beneficial use is considered to be precluded, this can be considered unlikely to be realised given the distance to the nearest body of water and as most (or all) groundwater discharging from the site is captured by the sewers (based on the inferred groundwater flow directions).

If the sewers were to be removed in the future then there is potential for this pathway to be realised. However, even if all the sewers in South Melbourne were sealed such that the natural groundwater flow system to Port Phillip Bay were restored, the hydraulic gradient towards the Bay would be so low that the groundwater would move towards the Bay at a rate that is at least an order of magnitude less than the current rate of groundwater flow towards the sewers and the travel time would likely be thousands of years.

9.2 Potable water supply (acceptable)

The following water quality indicators exceeded potable water supply criteria (ADWG2011):

- pH (aesthetics only);
- TDS (aesthetics only);
- SO_4^{2-};
- Cl (aesthetics only);
- CN;
- fluoride;
- nitrate;
- heavy metals: Al, As, Bo, Mn, Ni, Pb and Se; and
- benzene, xylenes and TPH (C_6-C_9 and C_{10}-C_{36}).

The search of the groundwater database (refer to Environmental Earth Sciences 2013b) indicated that nine wells located within 1 km; 13 wells located with 1-2 km; and 8 wells located with 2-3 km radius of the site are registered for stock and/or domestic usage. Groundwater wells installed for this purpose were between 3 – 32 metres in depth within sand, Older Volcanics basalt (>17 m BGL), and sand/marl geological units.

Although this beneficial use is considered to be precluded, given the urban setting of the site, the fact that all groundwater discharging from the site is captured via the surrounding sewer network, the availability of reticulated mains water and the low yield of groundwater, it is considered unlikely that groundwater will be extracted for this use. However, despite the low likelihood of the use of the groundwater for potable water supply, this potential beneficial use cannot be completely discounted.

9.3 Potable mineral water supply

As the Albert Park area and the Brighton Group aquifer are not sources of mineral water supply. Therefore, this beneficial use is not relevant and does not require protection in the future.

9.4 Agriculture, parks and gardens

Irrigation is a potential beneficial use based on the TDS and major ions concentrations in the SE (background) wells. However, to the north and west of the site, in areas considered to be outside of the potential impact area of the site, the TDS is above 2,500 mg/L in most of the groundwater wells and is above 3,500 mg/L in several of the wells.

Although this protected beneficial use is considered to be precluded, the likelihood of extraction of groundwater from the Brighton Group for irrigation purposes is considered to be extremely low due to:

- the residential urban setting surrounding the site;
- the low yield of the Brighton Group aquifer; and
- the availability of reticulated water in the area (for domestic irrigation use).

However, despite the low likelihood of use of the groundwater for irrigation purposes, this protected beneficial use cannot be completely discounted.

9.5 Stock watering

The search of the groundwater database (refer to Environmental Earth Sciences, 2013b) indicated that 9 wells located within 1 km; 13 wells located with 1-2 km; and 8 wells located with 2-3 km radius of the site are registered for stock and/or domestic usage. Groundwater wells installed for this purpose were between 3 – 32 metres in depth within sand, Older Volcanics basalt (>17 m BGL), and sand/marl geological units.

Naturally occurring TDS concentrations exceeded the livestock watering guideline (3,000 mg/L) in 11 onsite, and four off site wells. Concentrations of certain metals and major ions exceeded stock water criteria at some locations.

Given the urban setting of the site, the fact that all groundwater discharging from the site is captured via the surrounding sewer network, the availability of reticulated mains water and the low groundwater yield, it can be considered that the likelihood of use of the groundwater is low. However, despite the low likelihood of use of the groundwater for stock/ domestic purposes, this potential beneficial use cannot be discounted in this area.

9.6 Industrial water use

All groundwater beneath the site needs to consider industrial application as a potential beneficial use. As water quality indicators for industrial use are very specific, complete assessment of all potential uses is beyond the scope of this study. However, it can be generally stated that natural TDS (as specified in the SEPP GoV (1997)) and CoPC concentrations exceed acceptable thresholds for industrial applications of this water.

Although the protected industrial water use is considered to be precluded, the likelihood of extraction of groundwater for industrial use is considered to be extremely low due to:

- the site setting and adjacent properties are not used for industrial;
- the yield of the aquifer is unlikely to be sufficient for such purposes as industrial processes usually require reasonably large volumes of water; and
- no groundwater wells exist for this use or are registered within 3 km of the surrounding area and given the low yield and elevated salinity in areas of local groundwater it is unlikely that such use exists.

However, despite the low likelihood of use of the groundwater for industrial purposes, this protected beneficial use cannot be completely discounted.

9.7 Primary contact recreation

Primary contact recreation is a potential beneficial use for all groundwater beneath the site. However, as the site is located within a highly urbanised area serviced by reticulated water, the yield of the Brighton Group is low, and discharge of most groundwater from Gasworks Park Precinct is to the Melbourne Water Sewer System, the likelihood of the use of groundwater migrating from Gasworks Park for recreational use is considered to be low.

Notwithstanding the low likelihood, Environmental Earth Sciences VIC investigated the number of residential swimming pools within 600 metres of the site from aerial photographs. A total of 27 outdoor swimming pools were identified (refer to Environmental Earth Sciences, 2013b). All pools are considered to be outside the area of groundwater contamination associated with the Gasworks Park precinct (i.e. beyond sewers), with the exception of the following two locations:

- 7 Richardson Street, Port Melbourne – 50 m north; and
- 266 Bridport Street, Port Melbourne – 80 m north-east.

The property located at 7 Richardson Street is up-gradient from the site, however, 266 Bridport Street is down-gradient from the site and in an area of elevated NH_4^+ and SO_4^{2-} concentrations in the groundwater. Review of the DSE '*Groundwater Database'* indicated no groundwater wells within a 3 km radius of the site are registered for extraction and no wells are registered for any uses at the above location. Therefore, it can be concluded that the swimming pools at the above addresses are filled from sources other than local groundwater.

Considering the availability of reticulated mains water and the low yield of the Brighton Group, it is unlikely that an extraction well would be drilled for the purpose of filling a swimming pool. However, this potential beneficial use cannot be discounted in this area.

9.8 Buildings and structures

Buildings and structures is a potential beneficial use for all groundwater beneath the site. The depth to groundwater across the site is between 6 and 10 mbgl and groundwater levels are predominantly drawn down by the sewers. Therefore, footings and foundations are unlikely to come into contact with the groundwater unless they extend to more than 6 mbgl.

In addition, based on the relatively neutral pH (average 6.5 for both shallow and deep wells), and average sulfate concentration of 1,446 mg/L, groundwater beneath the site is considered to be non aggressive based on Australian Standard *Concrete Structures* AS 3600-2009 and *Piling – Design and Installation* AS 2159-2009.

Buildings and structures is not considered to be a precluded beneficial use.

9.9 Trade waste agreement

As part of the specific obligations, Melbourne Water noted that it accept would groundwater provided that it "*maintain the right acting reasonably, not to accept the groundwater if it is found to interfere with the operation or maintenance of its assets or does not comply with trade waste requirements or safety requirements imposed by the Victorian Government from time to time*".

In reference to Melbourne Water specific obligations, groundwater concentrations at the site have been compared with South East Water '*Standards for trade waste discharge to the sewerage system*'.

Concentrations that exceeded the maximum allowable value for discharge to the sewerage system include:

- pH in three OS wells (GW40, GW42D and GW43), two NE wells (GW08 and GW30), and one SE well (GW10);
- SO_4^{2-} in all OS wells, most NW wells except GW6, all NE wells and most SE wells except GW9;
- NH_3 in six OS wells (GW02, GW05, GW24, GW39, GW42D and GW44) and three NE wells (GW8, GW37 and GW38);
- As in two OS wells (GW19 and GW35) and two NW wells (GW32 and GW34);
- Mn in three OS wells (GW19, GW42D and GW44D);
- Fe in one OS well (GW19); and
- benzene and TPH fraction C_6-C_9 in two OS wells (GW24 and GW44D).

Please note these standards are discharge of waste from land to the sewer and were not intended to address groundwater discharging directly to sewers.

10 CONCLUSION

Environmental Earth Sciences VIC was requested by CoPP to undertake a groundwater investigation at the property located in Albert Park and is bounded by Graham Street to the south; Pickles Street to the west; Richardson Street to the north; and Foote Street/Bridport Street to the east.

10.1 Groundwater contamination

10.1.1 Onsite Groundwater Impacts

Elevated organic and inorganic results were identified at the time of this groundwater assessment which exceeded the adopted criteria for groundwater classified as Segment A2 and these include: MAH's, naphthalene, TPH, selected inorganics such as heavy metals, chloride, ammonia, sulfate, cyanide, total dissolved solids, nitrate and pH. However, there is no evidence of either DNAPL or LNAPL existing onsite.

The relatively low contaminant concentrations towards the centre of the site in comparison to the site perimeter could be due to less contamination originating from the central part of the site but may also reflect some flushing of the on-site flow system with less contaminated recharge since the site ceased to operate as a gasworks in 1971.

Although all the groundwater beneficial uses are precluded on-site, these are not considered to be relevant as the site is currently occupied as public open space and no extraction bores were installed for any beneficial uses including recreational purposes. 'Recreational' includes filling up of pools/spas or outdoor water features including ponds. In addition, the site does not have on-site ecological groundwater receptors such as an aquatic ecosystem.

In addition, groundwater from the site does not support any ecosystem as most (or all) groundwater discharging from the site is captured by the sewers (based on the inferred groundwater flow directions – see Figure 4).

10.1.2 Off-site Groundwater Impacts

Elevated organic and inorganic results were identified at the time of this assessment which exceeded the adopted criteria for groundwater classified as Segment A2 (maintenance of ecosystem, potable water supply, irrigation, stock watering, industrial water use and primary contact recreation). These include: MAH's, naphthalene, TPH, and selected inorganics such as heavy metals, chloride, ammonia, sulfate, cyanide, total dissolved solids, nitrate and pH. However, there is no evidence of either DNAPL or LNAPL existing onsite.

The gasworks site is considered likely to be the main source in this area of groundwater contamination. This is especially the case in the NE wells and some of the NW wells (GW34, GW36 and GW06 off-site groundwater impacts). However, it should be noted that some impacts could also be coming from other off-site sources.

The nearest significant ecological receptors are the waters and sediments of Port Phillip Bay, 350 m south-west of the site. Due to the fact that all groundwater from the Gasworks Park Precinct discharges to the Melbourne Water Sewer System (refer to Environmental Earth Sciences, 2013b), all contaminants being transported in groundwater from the site are captured by the sewer system, and ultimately discharge to the Werribee Treatment Plant. As such, there is negligible risk of impacted groundwater from Gasworks Park discharging to receiving waters (i.e. ecosystems) in the vicinity of the site. However, off-site ecosystems

may require protection in the future should hydrogeological conditions change or should the adjacent sewers be removed. These potential eventualities can be considered possible but unlikely.

Although all groundwater beneficial uses for extraction purposes are precluded off-site, these are not considered to be relevant as there is no extraction bore installed for any beneficial uses including recreational purposes adjacent of the site 'Recreational' includes filling up of pools/spas or outdoor water features including ponds. However, consideration should be given to the north and north-eastern residential properties.

Given the urban setting of the site, the fact that all groundwater discharging from the site is captured via the surrounding sewer network, the availability of reticulated mains water and low groundwater yield it is considered highly unlikely that groundwater will be extracted for any of the beneficial uses under Segment A2. However, despite the low likelihood of use of the groundwater for any protected beneficial uses under Segment A2, these potential beneficial uses cannot be discounted in this area.

10.2 Groundwater Inferred Changes Assessment

In general, the groundwater contamination conditions onsite and off-site are relatively stable (with slight increase or decrease) with some rise of potential gasworks related contaminants of concern [NH_3 and/or TPH (C_{10}-C_{36})] above background and historical concentrations within the NW and NE Wells. Despite this, the long term trend of chemicals of concern is generally stable and hence the dissolved contaminant plumes identified are considered to be stable. In addition, as there are no known extraction wells used for groundwater Segment A2 beneficial uses located within the vicinity of NW and NE wells, the increase of contaminants of concern in some locations within the adjacent residential properties can be considered unlikely to pose un-acceptable risks to adjacent users. Refer to Section 8 for further discussion.

10.3 Trade waste agreement

A '*Deed of Agreement Groundwater and Gasworks Arts Park, Albert Park'* exists between CoPP, Melbourne Water and South East Water. This '*Deed of Agreement'* states that Melbourne Water and South East Water acknowledge that groundwater from the Gasworks Site enters the South Yarra Main and Hobsons Bay Main and the Pickles Street Branch Sewer respectively, and that these mains and sewer act as a control for groundwater. Both have agreed to accept groundwater that enters the Gasworks Site into the mains and sewer, provided that they maintain the right, acting reasonably, not to accept the groundwater if it is found to interfere with the operation or maintenance of its assets.

Assessment of groundwater samples collected during the June 2013 investigation compared against South East Water '*Standards for trade waste discharge to the sewerage system* indicated a number of dissolved chemicals exceed maximum allowable concentrations and/or values for discharge to the sewerage system.

10.4 Risks associated with the groundwater contamination

As all the groundwater flowing from the site is captured by the sewer system, it is ultimately pumped to the Werribee Treatment Plant. The flux of groundwater from the site is several orders of magnitude less the total flow rate of sewage through the sewers to the Werribee Treatment Plant. Therefore, although several dissolved chemicals exceed the criteria for discharge to a sewerage system, contaminant concentrations are diluted by several orders of magnitude. Therefore, associated risks to workers at the treatment plant would be very low. Furthermore, the personal protective equipment routinely used by workers working on the sewers themselves would protect them from any additional contaminants introduced into the sewers from the site.

As stated above, the capture of the groundwater by the sewers also means that there is negligible risk to ecosystems. Even if all the sewers in South Melbourne were sealed such that the natural groundwater flow system to Port Phillip Bay were restored, the hydraulic gradient towards the Bay would be so low that the groundwater would move towards the Bay at a rate that is at least an order of magnitude less than the current rate of groundwater flow towards the sewers and the travel time would likely be thousands of years. The volumetric rate of discharge to the Bay would, therefore, be very low when the contaminants ultimately reached the Bay.

In the impacted area to the north and north east of the site, the risks associated with it are considered to be negligible *in-situ*. Any potential risks related to the contamination would be associated with the extraction of the groundwater. Although it is considered unlikely that the local residents would extract groundwater in this area, there is potential for groundwater extraction to take place.

As Gasworks Park and Southport are owned by the CoPP and the State of Victoria, the extraction of groundwater onsite can be effectively controlled through management to prevent the use of groundwater on the site to reduce the risks associated with this pathway to an acceptable level.

11 RECOMMENDATIONS

Based on the above discussion, Environmental Earth Sciences is of the opinion that the most effective and practical way of managing groundwater impacts at the site is to implement a regular groundwater monitoring (monitored natural attenuation) program via a Groundwater Quality Management Plan (refer to Remediation Action Plan Report, Environmental Earth Sciences 2013c).

It should be noted that there is also a possibility that a Groundwater Quality Restricted Use Zone (GQRUZ) will be identified by EPA.

12 LIMITATIONS

This report has been prepared by Environmental Earth Sciences VIC ABN 13 109 404 024 in response to and subject to the following limitations:

1. The specific instructions received from City of Port Phillip;
2. The specific scope of works set out in PO213030 issued by Environmental Earth Sciences for and on behalf of City of Port Philip, is included in Section 2 (Objectives) of this report;
3. May not be relied upon by any third party not named in this report for any purpose except with the prior written consent of Environmental Earth Sciences VIC (which consent may or may not be given at the discretion of Environmental Earth Sciences VIC);
4. This report comprises the formal report, documentation sections, tables, figures and appendices as referred to in the index to this report and must not be released to any third party or copied in part without all the material included in this report for any reason;
5. The report only relates to the site referred to in the scope of works being located at the Former South Melbourne Gasworks ("the site");
6. The report relates to the site as at the date of the report as conditions may change thereafter due to natural processes and/or site activities;
7. No warranty or guarantee is made in regard to any other use than as specified in the scope of works and only applies to the depth tested and reported in this report,
8. Fill, soil, groundwater and rock to the depth tested on the site may be fit for the use specified in this report. Unless it is expressly stated in this report, the fill, soil and/or rock may not be suitable for classification as clean fill if deposited off site; and
9. Our General Limitations set out at the back of the body of this report.

13 REFERENCES

Australian and New Zealand Environment and Conservation Council (ANZECC) and ARMCANZ, 2000. *Australian and New Zealand guidelines for fresh and marine water quality;*

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ENVIRONMENTAL EARTH SCIENCES GENERAL LIMITATIONS

Scope of services

The work presented in this report is Environmental Earth Sciences response to the specific scope of works requested by, planned with and approved by the client. It cannot be relied on by any other third party for any purpose except with our prior written consent. Client may distribute this report to other parties and in doing so warrants that the report is suitable for the purpose it was intended for. However, any party wishing to rely on this report should contact us to determine the suitability of this report for their specific purpose.

Data should not be separated from the report

A report is provided inclusive of all documentation sections, limitations, tables, figures and appendices and should not be provided or copied in part without all supporting documentation for any reason, because misinterpretation may occur.

Subsurface conditions change

Understanding an environmental study will reduce exposure to the risk of the presence of contaminated soil and or groundwater. However, contaminants may be present in areas that were not investigated, or may migrate to other areas. Analysis cannot cover every type of contaminant that could possibly be present. When combined with field observations, field measurements and professional judgement, this approach increases the probability of identifying contaminated soil and or groundwater. Under no circumstances can it be considered that these findings represent the actual condition of the site at all points.

Environmental studies identify actual sub-surface conditions only at those points where samples are taken, when they are taken. Actual conditions between sampling locations differ from those inferred because no professional, no matter how qualified, and no sub-surface exploration program, no matter how comprehensive, can reveal what is hidden below the ground surface. The actual interface between materials may be far more gradual or abrupt than an assessment indicates. Actual conditions in areas not sampled may differ from that predicted. Nothing can be done to prevent the unanticipated. However, steps can be taken to help minimize the impact. For this reason, site owners should retain our services.

Problems with interpretation by others

Advice and interpretation is provided on the basis that subsequent work will be undertaken by Environmental Earth Sciences VIC. This will identify variances, maintain consistency in how data is interpreted, conduct additional tests that may be necessary and recommend solutions to problems encountered on site. Other parties may misinterpret our work and we cannot be responsible for how the information in this report is used. If further data is collected or comes to light we reserve the right to alter their conclusions.

Obtain regulatory approval

The investigation and remediation of contaminated sites is a field in which legislation and interpretation of legislation is changing rapidly. Our interpretation of the investigation findings should not be taken to be that of any other party. When approval from a statutory authority is required for a project, that approval should be directly sought by the client.

Limit of liability

This study has been carried out to a particular scope of works at a specified site and should not be used for any other purpose. This report is provided on the condition that Environmental Earth Sciences VIC disclaims all liability to any person or entity other than the client in respect of anything done or omitted to be done and of the consequence of anything done or omitted to be done by any such person in reliance, whether in whole or in part, on the contents of this report. Furthermore, Environmental Earth Sciences VIC disclaims all liability in respect of anything done or omitted to be done and of the consequence of anything done or omitted to be done by the client, or any such person in reliance, whether in whole or any part of the contents of this report of all matters not stated in the brief outlined in Environmental Earth Sciences VIC's proposal number and according to Environmental Earth Sciences general terms and conditions and special terms and conditions for contaminated sites.

To the maximum extent permitted by law, we exclude all liability of whatever nature, whether in contract, tort or otherwise, for the acts, omissions or default, whether negligent or otherwise for any loss or damage whatsoever that may arise in any way in connection with the supply of services. Under circumstances where liability cannot be excluded, such liability is limited to the value of the purchased service.

FIGURES

Source: UBD Australian City Streets (version 2.1)
(page 283, B8)
E 319317 N 5809245

0 500
Scale in Metres

ENVIRONMENTAL EARTH SCIENCES
THE KNOW AND THE HOW

Title:	**Site Location Map**		
Location:	**21 Graham Street Albert Park, Vic.**		
Client:	**City of Port Phillip**	Job No:	**210074**
Project Man:	**RO**	Scale:	**As shown**
Drawn By:	**LB**	Date:	**January 2014**
		Figure	**1**

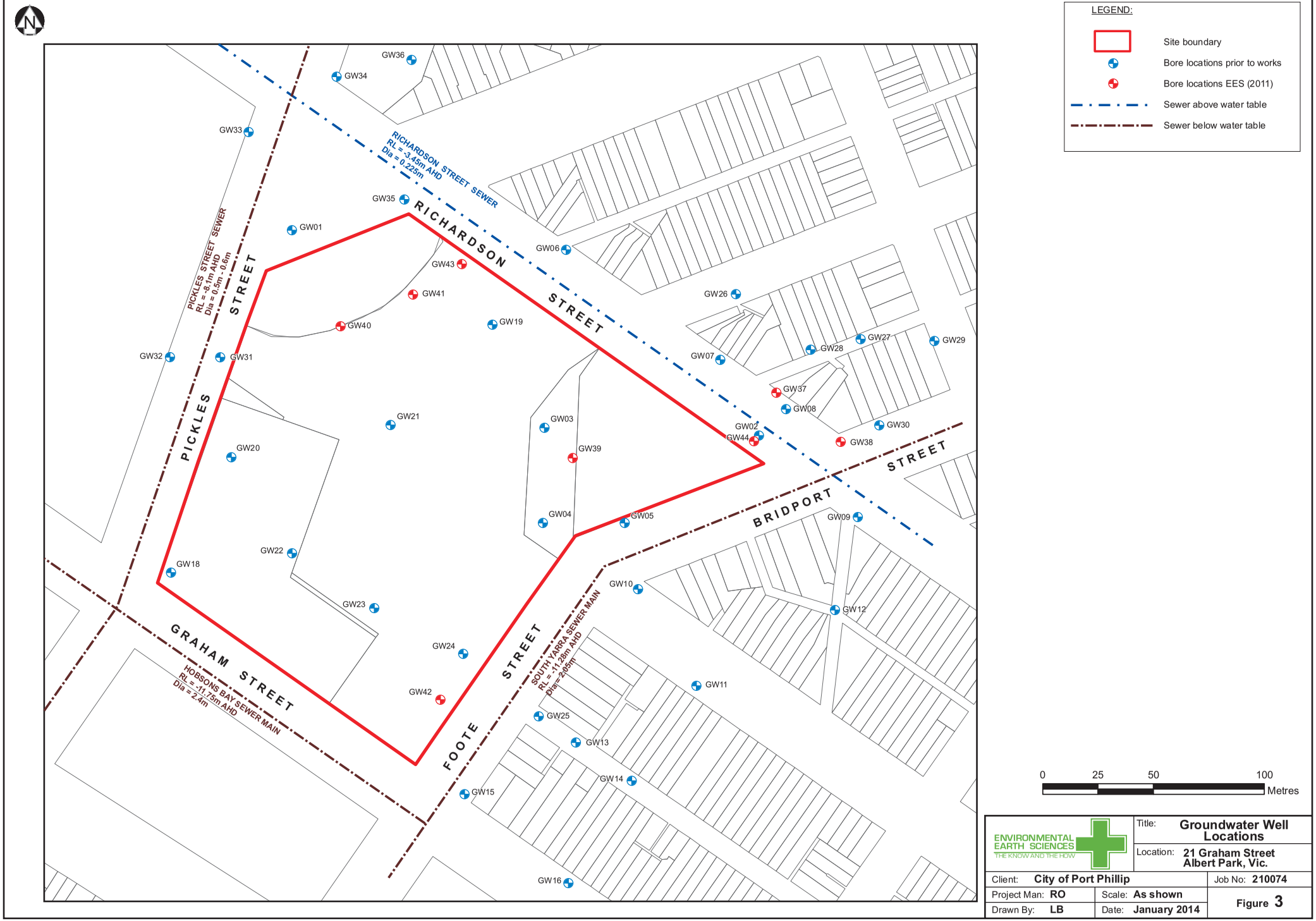
0 20 40 60 80 100
Scale in Metres

ENVIRONMENTAL EARTH SCIENCES
THE KNOW AND THE HOW

Title: **South Melbourne Gasworks - Current Site Layout**

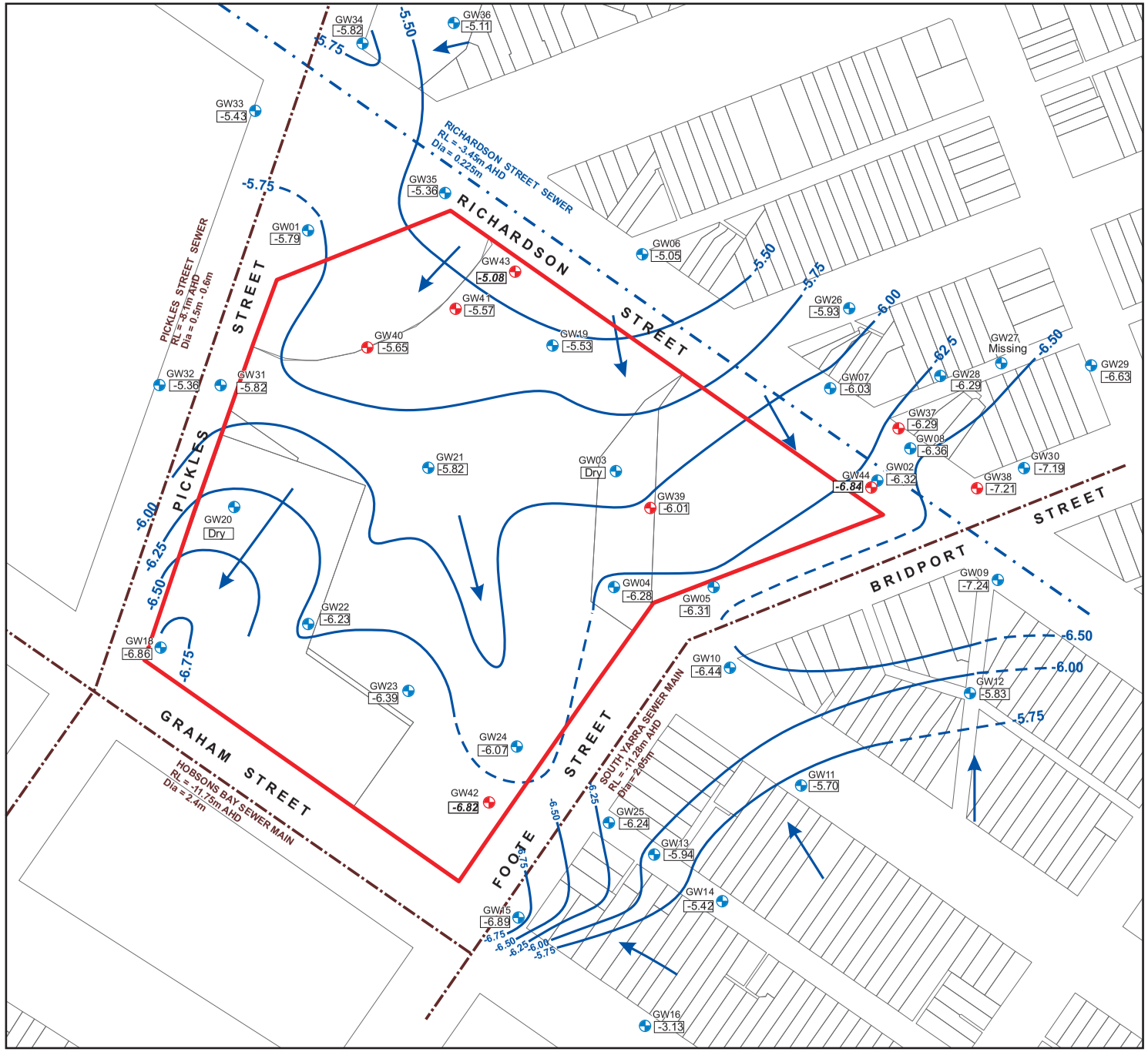
Location: **21 Graham Street Albert Park, Vic.**

Client: **City of Port Phillip**		Job No: **210074**
Project Man: **RO**	Scale: **As shown**	Figure **2**
Drawn By: **LB**	Date: **January 2014**	



ENVIRONMENTAL EARTH SCIENCES
THE KNOW AND THE HOW

Title:	**Groundwater Well Locations**	
Location:	**21 Graham Street Albert Park, Vic.**	
Client: **City of Port Phillip**		Job No: **210074**
Project Man: **RO**	Scale: **As shown**	**Figure 3**
Drawn By: **LB**	Date: **January 2014**	



LEGEND:

- Site boundary
- Bore locations prior to works
- Bore locations EES (2011)
- -6.26 SWL Shallow wells
- -6.70 SWL Deeper wells
- Inferred water table contour m (AHD)
- Groundwater flow direction
- Sewer above water table
- Sewer below water table

NOTE:
Deeper well groundwater levels have been corrected for salinity effects. They are freshwater heads that have been calculated for the measured head, the measured salinity and measured temperature.

SWL's for deeper bores have not been used to generate contours.

ENVIRONMENTAL EARTH SCIENCES
THE KNOW AND THE HOW

Title:	**Inferred Water Table Surface - July 2013**
Location:	**21 Graham Street Albert Park, Vic.**
Client:	**City of Port Phillip**
Job No:	**210074**
Project Man:	**RO**
Scale:	**As shown**
Drawn By:	**LB**
Date:	**January 2014**

Figure 4

TABLES

TABLE T1: STANDING WATER LEVELS

Date **24-27 June 2013**

Bore ID	Depth to Water		Stick-up (m)	m AHD		Standing water level	
	SWL_{TOC} (m)	SWL_{GS} (m)		TOC m AHD	GS m AHD	SWL_{GS} (m AHD)	
GW01	7.754	7.764	-0.01	1.96	1.97	-5.79	
GW02	8.291	8.401	-0.11	1.97	2.08	-6.32	
GW03	Dry	Dry	-0.06	2.375	2.435	-	
GW04	8.62	8.78	-0.16	2.34	2.5	-6.28	
GW05	8.252	8.422	-0.17	1.94	2.11	-6.31	
GW06	6.6	6.67	-0.07	1.555	1.625	-5.05	
GW07	7.8	7.86	-0.06	1.775	1.835	-6.03	
GW08	8.07	8.19	-0.12	1.71	1.83	-6.36	
GW09	8.907	9.097	-0.19	1.67	1.86	-7.24	
GW10	8.316	8.436	-0.12	1.875	1.995	-6.44	
GW11	7.45	7.55	-0.1	1.75	1.85	-5.70	
GW12	7.445	7.545	-0.1	1.62	1.72	-5.83	
GW13	7.76	7.85	-0.09	1.82	1.91	-5.94	
GW14	7.359	7.469	-0.11	1.94	2.05	-5.42	
GW15	9.08	9.2	-0.12	2.195	2.315	-6.89	
GW16	5.632	5.702	-0.07	2.505	2.575	-3.13	
GW18	9.289	9.389	-0.1	2.43	2.53	-6.86	
GW19	7.837	7.937	-0.1	2.31	2.41	-5.53	
GW20	Dry	Dry	-0.1	2.105	2.205	-	
GW21	8.354	8.454	-0.1	2.535	2.635	-5.82	
GW22	8.563	8.773	-0.21	2.335	2.545	-6.23	
GW23	9.06	9.165	-0.105	2.67	2.775	-6.39	
GW24	9.06	8.79	-0.1	2.62	2.72	-6.07	
GW25	7.965	8.095	-0.13	1.73	1.86	-6.24	
GW26	7.664	7.774	-0.11	1.73	1.84	-5.93	
GW27	-	-	-0.07	1.87	1.94	-	
GW28	8.001	8.101	-0.1	1.71	1.81	-6.29	
GW29	8.57	8.7	-0.13	1.945	2.075	-6.63	
GW30	8.978	9.088	-0.11	1.79	1.9	-7.19	
GW31	7.498	7.638	-0.14	1.68	1.82	-5.82	
GW32	7.616	7.26	-0.1	1.8	1.9	-5.36	
GW33	7.469	7.32	-0.1	1.79	1.89	-5.43	
GW34	7.69	7.84	-0.15	1.87	2.02	-5.82	
GW35	6.949	7.024	-0.075	1.59	1.665	-5.36	
GW36	7.027	7.097	-0.07	1.92	1.99	-5.11	
GW37	8.177	8.242	-0.065	1.892	1.957	-6.29	
GW38	9.08	9.174	-0.094	1.874	1.968	-7.21	
GW39	8.34	8.423	-0.083	2.331	2.414	-6.01	
GW40	7.803	7.971	-0.168	2.149	2.317	-5.65	
GW41	8.05	8.148	-0.098	2.485	2.583	-5.57	Freshwater heads
GW42(D)	9.34	9.431	-0.091	2.518	2.609	-6.82	-6.73
GW43(D)	7.341	7.399	-0.058	2.262	2.32	-5.08	-4.997
GW44(D)	8.908	8.987	-0.079	2.07	2.149	-6.84	-6.8070

TABLE T2: SUMMARY OF ONSITE WELLS RESULTS

								Field_ID	GW01	GW02	GW05	GW18	GW19	GW22	GW23	GW24	GW31	GW35	GW39	GW40	GW41	GW42D	GW43	SPLIT	DUP1	GW44
								Lab_Report_Number	EM1306738	EM1306798	EM1306906	EM1306738	EM1306677	EM1306738	EM1306677	EM1306820	EM1306871	EM1306738	EM1306677	EM1306738	EM1306677	EM1306677	EM1306677	383844	EM1306677	EM1306766
ChemName	**Units**	**EQL**	**ANZECC 2000 MW 95%**	**ADWG 2011 Health**	***Recreation***	**Livestock**	**Irrigation**	**Trade Waste**																		
BTEX																										
Benzene	µg/L	1	700	1	*1*			1000	<1	*1*	*7*	<1	<1	<1	*61*	*3380*	<1	<1	*72*	<1	<1	*425*	<1	<1	<1	*1120*
Ethylbenzene	µg/L	1	5	300				2000	<2	<2	<2	<2	<2	<2	52	<100	<2	<2	4	<2	<2	4	<2	<1	<2	36
Toluene	µg/L	1	180	800				2000	<2	<2	4	<2	<2	<2	3	<100	<2	<2	7	<2	<2	38	<2	<1	<2	455
Xylene (m & p)	µg/L	2							<2	<2	<2	<2	<2	<2	3	1100	<2	<2	7	<2	<2	16	<2	<2	<2	185
Xylene (o)	µg/L	1							<2	<2	<2	<2	<2	<2	12	535	<2	<2	6	<2	<2	11	<2	<1	<2	112
Xylene Total	µg/L	3		600	*20*			2000	<4	<4	<4	<4	<4	<4	15	*1635*	<4	<4	13	<4	<4	27	<4	<3	<4	297
Inorganics																										
Alkalinity (total) as CaCO3	mg/L	1							654	414	179	460	97	227	348	657	370	515	362	201	229	181	425	-	-	996
Ammonia as N	µg/L	10	910	500	*1500*			200,000	*3320*	*399,000*	*427,000*	*7020*	*83,200*	*710*	*193,000*	*947,000*	*5580*	*2870*	*290,000*	160	*800*	*2,410,000*	*1330*	350	*1390*	*286,000*
Anions Total	meq/L	0.01							70.1	66	53.5	310	51.6	11.1	16.5	73.7	40.8	113	41.1	108	71.5	478	306	-	-	199
Cations Total	meq/L	0.01							69.2	68.3	48.3	270	52	10.6	16.5	76.6	36.9	100	45	98.1	69	446	294	-	-	118
Chloride	mg/L	1		250			700		1890	926	34	9710	816	44	35	37	954	3330	43	3450	2000	6190	9670	-	-	1220
Cyanide Total	mg/L	0.004	0.004	0.08	*1.6*			10	0.017	0.018	0.101	0.028	0.06	0.14	0.054	0.209	0.212	0.015	0.116	<0.004	0.035	0.025	<0.004	<0.005	<0.004	0.75
Fluoride	mg/L	0.1		1.5	*30*	**2**	1	30	1.4	1	*4.6*	0.7	0.7	0.7	0.2	0.5	*3.6*	*2.2*	1.7	0.6	1.4	0.6	0.4	-	-	0.5
Ionic Balance	%	0.01							0.6	1.68	5.1	6.94	0.37	2.48	0.1	1.88	5.04	5.82	4.43	4.73	1.7	3.48	2.07	-	-	25.7
Nitrate (as N)	mg/L	0.01				**30**			0.06	0.07	0.05	0.15	<0.01	0.82	1.12	29	0.14	<0.01	0.08	1.39	<0.01	<0.01	<0.01	-	-	<0.01
Nitrate	mg/L	0.01		50	*1000*	**400**			0.27	0.31	0.22	0.66	<0.01	3.63	4.96	*128.47*	0.62	<0.01	0.35	6.16	<0.01	<0.01	<0.01	-	-	<0.01
Nitrite (as N)	mg/L	0.01							<0.01	<0.01	<0.01	0.01	<0.01	<0.01	0.04	0.12	<0.01	<0.01	0.04	<0.01	<0.01	<0.01	<0.01	-	-	<0.01
pH (Lab)	pH_Units	0.01		6.5-8.5			4.0-9.0	6.0-10.0	6.73	6.68	*6.37*	6.83	*6.12*	6.99	6.83	7.27	7.44	6.87	6.67	*5.57*	6.9	*5.76*	*5.82*	-	-	*6.48*
Reactive Phosphorus as P	mg/L	0.01							<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	0.02	0.08	-	-	<0.01
Sodium (Filtered)	mg/L	1					120		607	420	56	3590	264	76	29	55	592	1710	60	1400	530	3530	4950	-	-	806
Sulphate as S	mg/L	5		500	*10,000*	**1000**		100	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	400	-	-
Sulfate as SO4 - Turbidimetric (Filtered)	mg/L	1		500	*10,000*	**1000**		100	178	*1520*	*2350*	*1280*	*1280*	256	411	*2860*	314	403	*1570*	314	*503*	*14,400*	*1200*	-	*1210*	*6990*
TDS	mg/L	10		1000		**3000**	500		*3920*	*4200*	*4920*	*15,600*	2780	596	1120	*4600*	2400	*5370*	2660	*5300*	*4400*	*27,000*	*18,200*	-	-	*9310*
Monoaromatic Hydrocarbons																										
1,2,4-trimethylbenzene	µg/L	5							<5	<5	<5	<5	<5	<5	19	160	<5	<5	<5	<5	<5	<5	<5	-	<5	30
1,3,5-trimethylbenzene	µg/L	5							<5	<5	<5	<5	<5	<5	<5	<100	<5	<5	<5	<5	<5	<5	<5	-	<5	11
Isopropylbenzene	µg/L	1							<5	<5	<5	<5	<5	<5	10	<100	<5	<5	<5	<5	<5	<5	<5	<1	<5	<5
n-butylbenzene	µg/L	5							<5	<5	<5	<5	<5	<5	<5	<100	<5	<5	<5	<5	<5	<5	<5	-	<5	<5
n-propylbenzene	µg/L	5							<5	<5	<5	<5	<5	<5	<5	<100	<5	<5	<5	<5	<5	<5	<5	-	<5	<5
p-isopropyltoluene	µg/L	5							<5	<5	<5	<5	<5	<5	<5	<100	<5	<5	<5	<5	<5	<5	<5	-	<5	<5
sec-butylbenzene	µg/L	5							<5	<5	<5	<5	<5	<5	<5	<100	<5	<5	<5	<5	<5	<5	<5	-	<5	<5
Styrene	µg/L	1		30				2000	<5	<5	<5	<5	<5	<5	<5	<100	<5	<5	<5	<5	<5	<5	<5	<1	<5	<5
tert-butylbenzene	µg/L	5							<5	<5	<5	<5	<5	<5	<5	<100	<5	<5	<5	<5	<5	<5	<5	-	<5	<5
Heavy Metals																										
Aluminium (Filtered)	mg/L	0.01		0.2		**5**	5		<0.01	<0.01	0.02	0.01	0.04	<0.01	0.02	0.02	<0.01	<0.01	<0.01	0.04	<0.01	*0.45*	<0.01	<0.05	<0.01	<0.01
Arsenic (Filtered)	mg/L	0.001	0.0023	0.007	*0.14*	**0.5**	0.1	1	*0.478*	*0.126*	*0.288*	0.004	*2.06*	*0.01*	*0.864*	*0.017*	*0.455*	*1.11*	*0.482*	*0.01*	*0.03*	*0.016*	0.003	0.003	<0.001	*0.103*
Boron (Filtered)	mg/L	0.05		4	*80*	**5**	0.5	25	1.37	0.7	1.11	1.01	1.51	0.88	1.57	0.6	3.03	1.08	1.57	0.67	0.84	0.28	0.99	1.2	1.08	0.78
Cadmium (Filtered)	mg/L	0.0001	0.0055	0.002	*0.04*	**0.01**	0.01	2	0.0001	<0.0001	0.0008	<0.0001	0.0003	0.0004	<0.0001	<0.0001	0.0001	0.0003	0.0004	0.0002	0.0006	0.0002	0.0007	0.0007	0.0009	0.0004
Calcium (Filtered)	mg/L	1					1000		345	236	304	968	231	85	23	55	78	160	226	466	530	567	433	-	-	468
Cobalt (Filtered)	mg/L	0.001	0.001			**1**	0.05	10	0.003	0.002	0.026	0.002	0.094	0.003	0.002	0.002	0.002	0.003	0.044	0.006	0.002	**7.79**	0.06	0.051	0.064	0.028
Copper (Filtered)	mg/L	0.001	0.0013	2	*40*	**0.5**	0.2	10	0.002	0.003	0.001	0.004	0.003	0.002	0.001	0.002	0.001	0.002	0.004	0.065	0.004	0.018	0.006	0.014	0.022	0.01
Iron (Filtered)	mg/L	0.05					0.2	100	2.76	20.4	13.6	<0.05	255	0.07	3.72	0.13	0.6	7.56	67.8	0.39	0.18	13.3	0.26	0.35	0.24	49.4
Magnesium (Filtered)	mg/L	1				**600**			287	99	76	**727**	93	28	3	45	73	199	77	151	221	**1060**	**638**	-	-	420
Manganese (Filtered)	mg/L	0.001		0.5	*10*			10	0.266	2.17	3.41	1.1	*10.3*	0.047	0.041	0.035	0.19	0.741	3.82	0.862	0.409	*24.6*	6.69	9.3	*7*	*19.8*
Nickel (Filtered)	mg/L	0.001	0.07	0.02	*0.4*	**1**	0.2	10	0.056	0.002	0.058	<0.001	0.04	0.053	0.002	0.004	0.094	0.02	0.059	0.041	0.013	*2.22*	0.062	0.058	0.072	0.064
Potassium (Filtered)	mg/L	1							78	27	40	204	47	28	7	19	50	59	16	60	53	220	175	-	-	61
Selenium (Filtered)	mg/L	0.001	0.003	0.01	*0.2*	**0.02**	0.02	10	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	0.01	<0.01	0.002	<0.01	0.01
Zinc (Filtered)	mg/L	0.001	0.015	3		**20**	2	10	0.039	0.021	0.047	0.01	0.025	0.035	0.012	0.011	0.025	0.014	0.032	0.331	0.024	0.143	0.048	0.086	0.11	0.035
Lead (Filtered)	mg/L	0.001	0.0044	0.01	*0.2*	**0.1**	0.2	10	<0.001	<0.001	<0.001	<0.001	<0.001	0.002	<0.001	0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	0.001	0.001	0.002	0.002
Polycyclic Aromatic Hydrocarbons (PAH)																										
Naphthalene	µg/L	1	70						<7	<7	<7	<7	<7	<7	<7	6470	<7	<7	19	<7	<7	31	<7	<1	<7	572
Total Petroleum Hydrocarbons (TPH)																										
C10 - C14	µg/L	50							<50	110	50	<50	140	<50	730	11,700	<50	<50	500	<50	<50	760	<50	<50	<50	98,300
C6 - C9	µg/L	20	150	150				1000	<20	<20	<20	<20	<20	<20	*200*	*5110*	<20	<20	100	<20	<20	*480*	<20	<20	<20	*1930*
C15 - C28	µg/L	100							200	700	880	<100	1530	< 100	1020	3290	110	300	1570	<100	330	340	<100	<100	<100	16,600
C29-C36	µg/L	50							<50	<50	100	<80	<50	<50	<50	80	<50	<50	<50	<50	<50	<50	<50	<100	<50	980
>C10 - C36 (Sum of total)	µg/L	50	600	600					200 - 250	*810 - 835*	*1030*	<50	*1670 - 1695*	<50	*1750 - 1775*	*15,070 - 15,100*	110 - 160	300 - 350	*2070 - 2095*	<50	330 - 380	*1100 - 1125*	<50	<100	<50	*115,000 - 116,000*
Total Recoverable Hydrocarbons (TRH)																										
C6-C10 less BTEX (F1)	µg/L	20							-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
C6-C10	µg/L	20							<20	<20	20	20	<20	<20	260	5110	<20	<20	110	<20	<20	440	<20	<20	<20	1890
C10-C16	µg/L	50							<100	270	380	<100	650	< 100	780	10200	<100	180	940	<100	250	670	<100	<20	<100	81900
C16-C34	µg/L	100							200	600	690	<140	1130	< 100	820	2350	120	160	1220	<100	100	180	<100	<50	<100	12400
C34-C40	µg/L	100							<100	<100	<100	<100	<100	<100	<100	<100	<100	<100	<100	<100	<100	<100	<100	<100	<100	<100
C10 - C40 (Sum of total)	µg/L	100							200	870	1070	<100	1780	< 100	1600	12,600	120	340	2160	<100	350	850	<100	<100	<100	94,300
TPH - Silica Gel Cleanup																										
TPH C10-C14 Fraction after Silica Cleanup	µg/L	50							-	-	-	-	90	-	170	11700	-	-	190	-	-	<50	-	-	-	56000
TPH C15-C28 Fraction after Silica Cleanup	µg/L	100							-	-	-	-	320	-	480	920	-	-	130	-	-	<100	-	-	-	2080
TPH C29-C36 Fraction after Silica Cleanup	µg/L	50							-	-	-	-	<60	-	<50	<50	-	-	<50	-	-	<50	-	-	-	<50
C10 - C36 Fraction (sum) (SG)	µg/L	50	600	600					-	-	-	-	410	-	650	12600	-	-	320	-	-	<50	-	-	-	58100
TRH - Silica Gel Cleanup																										
>C10 - C16 Fraction (SG)	µg/L	100							-	-	-	-	270	-	290	10200	-	-	310	-	-	<100	-	-	-	48000
>C16 - C34 Fraction (SG)	µg/L	100							-	-	-	-	220	-	380	390	-	-	<100	-	-	<100	-	-	-	780
>C34 - C40 Fraction (SG)	µg/L	100							-	-	-	-	<100	-	<100	<100	-	-	<100	-	-	<100	-	-	-	<100
>C10 - C40 Fraction (sum) (SG)	µg/L	100							-	-	-	-	490	-	670	10600	-	-	310	-	-	<100	-	-	-	48800

TABLE T3: SUMMARY OF NORTH-WEST WELLS RESULTS

									Field_ID	GW06	GW32	GW33	GW34	GW36
									Lab_Report_Number	EM1306820	EM1306871	EM1306820	EM1306820	EM1306871
ChemName	**Units**	**EQL**	**ANZECC 2000 MW 95%**	**ADWG 2011 Health**	***Recreation***	**Livestock**	**Irrigation**	**Trade Waste**						
BTEX														
Benzene	µg/L	1	700	1	*1*			1000		<1	*69*	<1	<1	<1
Ethylbenzene	µg/L	1	5	300				2000		<2	3	<2	<2	<2
Toluene	µg/L	1	180	800				2000		<2	<2	<2	<2	<2
Xylene (m & p)	µg/L	2								<2	<2	<2	<2	<2
Xylene (o)	µg/L	1								<2	<2	<2	<2	<2
Xylene Total	µg/L	3		600	*20*			2000		<4	<4	<4	<4	<4
Inorganics														
Alkalinity (total) as CaCO3	mg/L	1								257	584	346	753	743
Ammonia as N	µg/L	10	910	500	*1500*			200,000		1100	*16,300*	*4910*	420	<10
Anions Total	meq/L	0.01								19.3	17.1	124	91.7	55.6
Cations Total	meq/L	0.01								17.8	15.2	119	93.3	50.2
Chloride	mg/L	1		250			700			435	40	2640	925	1040
Cyanide Total	mg/L	0.004	0.004	0.08	*1.6*			10		0.005	0.141	0.069	0.255	0.053
Fluoride	mg/L	0.1		1.5	*30*	**2**	1	30		1.4	**2.4**	1.5	**2.5**	3
Ionic Balance	%	0.01								4.05	5.72	2.14	0.81	5.18
Nitrate (as N)	mg/L	0.01				**30**				0.04	0.31	4.59	0.28	3.03
Nitrate	mg/L	0.01		50	*1000*	**400**				0.18	1.37	20.33	1.24	13.42
Nitrite (as N)	mg/L	0.01								<0.01	<0.01	0.01	<0.01	0.1
pH (Lab)	pH_Units	0.01		6.5-8.5			4.0-9.0	6.0-10.0		7.02	7.29	6.88	6.95	7.13
Reactive Phosphorus as P	mg/L	0.01								<0.01	<0.01	<0.01	0.18	<0.01
Sodium (Filtered)	mg/L	1					120			253	80	1330	1670	854
Sulphate as S	mg/L	5		500	*10,000*	**1000**		100		-	-	-	-	-
Sulfate as SO4 - Turbidimetric (Filtered)	mg/L	1		500	*10,000*	**1000**		100		90	206	**2050**	**2430**	549
TDS	mg/L	10		1000		**3000**	500			1080	936	**6390**	**4800**	**3060**
Monoaromatic Hydrocarbons														
1,2,4-trimethylbenzene	µg/L	5								<5	<5	<5	<5	<5
1,3,5-trimethylbenzene	µg/L	5								<5	<5	<5	<5	<5
Isopropylbenzene	µg/L	1								<5	<5	<5	<5	<5
n-butylbenzene	µg/L	5								<5	<5	<5	<5	<5
n-propylbenzene	µg/L	5								<5	<5	<5	<5	<5
p-isopropyltoluene	µg/L	5								<5	<5	<5	<5	<5
sec-butylbenzene	µg/L	5								<5	<5	<5	<5	<5
Styrene	µg/L	1		30				2000		<5	<5	<5	<5	<5
tert-butylbenzene	µg/L	5								<5	<5	<5	<5	<5
Heavy Metals														
Aluminium (Filtered)	mg/L	0.01		0.2		**5**	5			<0.01	<0.01	<0.01	0.02	0.1
Arsenic (Filtered)	mg/L	0.001	0.0023	0.007	*0.14*	**0.5**	0.1	1		0.002	*1.39*	0.017	*1.45*	0.067
Boron (Filtered)	mg/L	0.05		4	*80*	**5**	0.5	25		1.61	0.99	4	8.25	1.62
Cadmium (Filtered)	mg/L	0.0001	0.0055	0.002	*0.04*	**0.01**	0.01	2		<0.0001	0.0004	0.0004	<0.0001	0.0004
Calcium (Filtered)	mg/L	1					1000			52	122	477	85	80
Cobalt (Filtered)	mg/L	0.001	0.001			**1**	0.05	10		<0.001	<0.001	0.015	0.003	0.002
Copper (Filtered)	mg/L	0.001	0.0013	2	*40*	**0.5**	0.2	10		0.002	0.002	0.006	0.004	0.004
Iron (Filtered)	mg/L	0.05					0.2	100		<0.05	1.26	0.14	2.33	0.49
Magnesium (Filtered)	mg/L	1				**600**				44	58	405	160	99
Manganese (Filtered)	mg/L	0.001		0.5	*10*			10		0.07	0.162	0.421	0.124	0.242
Nickel (Filtered)	mg/L	0.001	0.07	0.02	*0.4*	**1**	0.2	10		0.025	0.027	0.048	0.074	0.054
Potassium (Filtered)	mg/L	1								22	35	152	127	34
Selenium (Filtered)	mg/L	0.001	0.003	0.01	*0.2*	**0.02**	0.02	10		<0.01	<0.01	<0.01	<0.01	<0.01
Zinc (Filtered)	mg/L	0.001	0.015	3		**20**	2	10		0.021	0.018	0.035	0.01	0.018
Lead (Filtered)	mg/L	0.001	0.0044	0.01	*0.2*	**0.1**	0.2	10		<0.001	0.011	<0.001	<0.001	0.002
Polycyclic Aromatic Hydrocarbons (PAH)														
Naphthalene	µg/L	1	70							<7	<7	<7	<7	<7
Total Petroleum Hydrocarbons (TPH)														
C6 - C9	µg/L	20	150	150				1000		<20	70	<20	<20	<20
C10 - C14	µg/L	50								<50	<50	<50	<50	<50
C15 - C28	µg/L	100								<100	120	<100	<100	<100
C29-C36	µg/L	50								<50	<50	<50	<50	<50
+C10 - C36 (Sum of total)	µg/L	50	600	600						<50	120 - 170	<50	<50	<50
Total Recoverable Hydrocarbons (TRH)														
C6-C10 less BTEX (F1)	µg/L	20								-	-	-	-	-
C6-C10	µg/L	20								<20	70	<20	<20	<20
C10-C16	µg/L	50								<100	<100	<100	<100	<100
C16-C34	µg/L	100								<100	180	<100	120	<100
C34-C40	µg/L	100								<100	<100	<100	<100	<100
C10 - C40 (Sum of total)	µg/L	100								<100	180	<100	120	<100

TABLE T4: SUMMARY OF NORTH-EAST WELLS RESULTS

									Field_ID	GW07	GW08	GW26	GW28	Dup 2	SPLIT 2	GW29	GW30	GW37	GW38
									Lab_Report_Number	EM1306798	EM1306766	EM1306820	EM1306738	EM1306738	383984	EM1306798	EM1306798	EM1306766	EM1306798
ChemName	Units	EQL	ANZECC 2000 MW 95%	ADWG 2011 Health	*Recreation*	Livestock	Irrigation	Trade Waste											
BTEX																			
Benzene	µg/L	1	700	1	*1*			1000		<1	*15*	<1	<1	<1	<1	<1	<1	*38*	*269*
Ethylbenzene	µg/L	1	5	300				2000		<2	<2	<2	<2	<2	<1	<2	<2	<2	15
Toluene	µg/L	1	180	800				2000		<2	2	<2	<2	<2	<1	<2	<2	11	131
Xylene (m & p)	µg/L	2								<2	<2	<2	<2	<2	<2	<2	<2	3	76
Xylene (o)	µg/L	1								<2	<2	<2	<2	<2	<1	<2	<2	2	43
Xylene Total	µg/L	3		600	*20*			2000		<4	<4	<4	<4	<4	<3	<4	<4	5	*119*
Inorganics																			
Alkalinity (total) as CaCO3	mg/L	1								633	226	275	404	-	-	497	456	379	514
Ammonia as N	µg/L	10	910	500	*1500*			200,000		*105,000*	*1,150,000*	1290	*84,600*	-	-	50	110	*290,000*	*449,000*
Anions Total	meq/L	0.01								26.4	41.7	37.4	21.2	-	-	38.1	46.6	33	59.9
Cations Total	meq/L	0.01								25.8	100	32.8	19.2	-	-	39.7	40.9	30.9	61.2
Chloride	mg/L	1		250			700			350	248	919	302	-	-	725	1000	289	230
Cyanide Total	mg/L	0.004	0.004	0.08	*1.6*			10		0.027	0.029	<0.004	0.016	0.018	0.038	<0.004	<0.004	0.103	0.16
Fluoride	mg/L	0.1		1.5	*30*	**2**	1	30		2	0.3	0.7	1.8	-	-	1	1.9	1.3	1
Ionic Balance	%	0.01								0.98	41.2	6.45	4.86	-	-	1.98	6.51	3.32	1.07
Nitrate (as N)	mg/L	0.01				**30**				1.73	0.28	0.04	0.01	-	-	16.1	3.74	0.17	0.01
Nitrate	mg/L	0.01		50	*1000*	**400**				7.66	1.24	0.18	0.04	-	-	71.32	16.57	0.75	0.04
Nitrite (as N)	mg/L	0.01								0.1	<0.01	<0.01	<0.01	-	-	0.06	0.08	0.07	0.04
pH (Lab)	pH_Units	0.01		6.5-8.5			4.0-9.0	6.0-10.0		6.97	5.96	6.72	7.18	-	-	6.94	5.82	6.98	6.53
Reactive Phosphorus as P	mg/L	0.01								<0.01	<0.01	0.04	<0.01	-	-	0.03	<0.01	<0.01	<0.01
Sodium (Filtered)	mg/L	1					120			276	148	472	251	-	-	705	700	91	196
Sulphate as S	mg/L	5		500	*10,000*	**1000**		100		-	-	-	-	-	-	-	-	-	-
Sulfate as SO4 - Turbidimetric (Filtered)	mg/L	1		500	*10,000*	**1000**		100		184	1450	285	220	-	-	372	445	830	**2070**
TDS	mg/L	10		1000		**3000**	500			1460	2360	2300	1180	-	-	2280	2560	2080	**3440**
Monoaromatic Hydrocarbons																			
1,2,4-trimethylbenzene	µg/L	5								<5	<5	<5	<5	<5	-	<5	<5	<5	16
1,3,5-trimethylbenzene	µg/L	5								<5	<5	<5	<5	<5	-	<5	<5	<5	6
Isopropylbenzene	µg/L	1								<5	<5	<5	<5	<5	<1	<5	<5	<5	<5
n-butylbenzene	µg/L	5								<5	<5	<5	<5	<5	-	<5	<5	<5	<5
n-propylbenzene	µg/L	5								<5	<5	<5	<5	<5	-	<5	<5	<5	<5
p-isopropyltoluene	µg/L	5								<5	<5	<5	<5	<5	-	<5	<5	<5	<5
sec-butylbenzene	µg/L	5								<5	<5	<5	<5	<5	-	<5	<5	<5	<5
Styrene	µg/L	1		30				2000		<5	<5	<5	<5	<5	<1	<5	<5	<5	<5
tert-butylbenzene	µg/L	5								<5	<5	<5	<5	<5	-	<5	<5	<5	<5
Heavy Metals																			
Aluminium (Filtered)	mg/L	0.01		0.2		**5**	5			<0.01	<0.01	<0.01	<0.01	<0.01	<0.05	<0.01	<0.01	<0.01	<0.01
Arsenic (Filtered)	mg/L	0.001	0.0023	0.007	*0.14*	**0.5**	0.1	1		0.092	*0.179*	0.072	*0.314*	*0.308*	*0.24*	<0.001	0.065	*0.211*	*0.365*
Boron (Filtered)	mg/L	0.05		4	*80*	**5**	0.5	25		0.95	0.8	0.47	0.81	0.86	0.8	0.53	0.55	0.93	0.91
Cadmium (Filtered)	mg/L	0.0001	0.0055	0.002	*0.04*	**0.01**	0.01	2		0.0004	0.0002	0.0005	<0.0001	<0.0001	0.0002	0.0005	0.0005	0.0002	<0.0001
Calcium (Filtered)	mg/L	1					1000			52	126	94	33	-	-	69	84	53	185
Cobalt (Filtered)	mg/L	0.001	0.001			**1**	0.05	10		0.001	0.009	0.034	<0.001	<0.001	<0.001	0.008	0.007	0.004	0.004
Copper (Filtered)	mg/L	0.001	0.0013	2	*40*	**0.5**	0.2	10		0.002	0.002	0.003	<0.001	<0.001	<0.001	0.004	0.003	0.001	0.002
Iron (Filtered)	mg/L	0.05					0.2	100		0.87	36.3	1.69	2.2	2.12	2.3	<0.05	0.71	7.1	35.7
Magnesium (Filtered)	mg/L	1				**600**				43	44	90	25	-	-	65	74	37	111
Manganese (Filtered)	mg/L	0.001		0.5	*10*			10		0.178	1.32	3.46	0.175	0.173	0.17	0.449	0.429	0.236	3.64
Nickel (Filtered)	mg/L	0.001	0.07	0.02	*0.4*	**1**	0.2	10		0.05	0.1	0.044	0.018	0.017	0.016	0.028	0.038	0.017	0.003
Potassium (Filtered)	mg/L	1								10	10	8	6	-	-	9	7	10	19
Selenium (Filtered)	mg/L	0.001	0.003	0.01	*0.2*	**0.02**	0.02	10		<0.01	<0.01	<0.01	<0.01	<0.01	0.004	<0.01	<0.01	<0.01	<0.01
Zinc (Filtered)	mg/L	0.001	0.015	3		20	2	10		0.022	0.137	0.05	0.005	<0.005	0.01	0.02	0.088	0.021	0.013
Lead (Filtered)	mg/L	0.001	0.0044	0.01	*0.2*	**0.1**	0.2	10		<0.001	0.002	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001
Polycyclic Aromatic Hydrocarbons (PAH)																			
Naphthalene	µg/L	1	70							<7	<7	<7	<7	<7	<1	<7	<7	27	134
Total Petroleum Hydrocarbons (TPH)																			
C6 - C9	µg/L	20	150	150				1000		<20	<20	<20	<20	<20	<20	<20	<20	50	530
C10 - C14	µg/L	50								<50	230	<50	<50	<50	<50	<50	<50	390	8460
C15 - C28	µg/L	100								450	930	<100	160	160	<100	<100	<100	940	3370
C29 - C36	µg/L	50								110	<50	<50	<50	<80	<100	<50	<50	<50	70
+C10 - C36 (Sum of total)	µg/L	50	600	600						560 - 585	1160 - 1185	<50	160 - 210	160 - 225	<100	<50	<50	1330 - 1355	11,900
Total Recoverable Hydrocarbons (TRH)																			
C6-C10 less BTEX (F1)	µg/L	20								-	-	-	-	-	<0.02	-	-	-	-
C6-C10	µg/L	20								<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	0.05	0.53
C10-C16	µg/L	50								<0.1	0.46	<0.1	<0.1	<0.1	<0.05	<0.1	<0.1	0.61	8.78
C16-C34	µg/L	100								0.49	0.74	<0.1	0.17	0.24	<0.1	<0.1	<0.1	0.72	2.62
C34-C40	µg/L	100								<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1
C10 - C40 (Sum of total)	µg/L	100								490	1200	<100	170	240	-	<100	<100	1330	11,400
TPH - Silica Gel Cleanup																			
TPH C10-C14 Fraction after Silica Cleanup	µg/L	50								-	<50	-	-	-	-	-	-	<50	8460
TPH C15-C28 Fraction after Silica Cleanup	µg/L	100								-	<100	-	-	-	-	-	-	<100	640
TPH C29-C36 Fraction after Silica Cleanup	µg/L	50								-	<50	-	-	-	-	-	-	<50	<50
C10 - C36 Fraction (sum) (SG)	µg/L	50	600	600						-	<50	-	-	-	-	-	-	<50	9100
TRH - Silica Gel Cleanup																			
>C10 - C16 Fraction (SG)	µg/L	100								-	<100	-	-	-	-	-	-	<100	8780
>C16 - C34 Fraction (SG)	µg/L	100								-	<100	-	-	-	-	-	-	<100	220
>C34 - C40 Fraction (SG)	µg/L	100								-	<100	-	-	-	-	-	-	<100	<100
>C10 - C40 Fraction (sum) (SG)	µg/L	100								-	<100	-	-	-	-	-	-	<100	9000

TABLE T5: SUMMARY OFSOUTH-EAST WELLS RESULTS

								Field_ID	GW09	GW10	GW15	GW25
								Lab_Report_Number	EM1306798	EM1306871	EM1306906	EM1306906
ChemName	**Units**	**EQL**	**ANZECC 2000 MW 95%**	**ADWG 2011 Health**	***Recreation***	**Livestock**	**Irrigation**	**Trade Waste**				
BTEX												
Benzene	µg/L	1	700	1	*1*			1000	<1	<1	<1	<1
Ethylbenzene	µg/L	1	5	300				2000	<2	<2	<2	<2
Toluene	µg/L	1	180	800				2000	<2	<2	<2	<2
Xylene (m & p)	µg/L	2							<2	<2	<2	<2
Xylene (o)	µg/L	1							<2	<2	<2	<2
Xylene Total	µg/L	3		600	*20*			2000	<4	<4	<4	<4
Inorganics												
Alkalinity (total) as CaCO3	mg/L	1							88	<1	42	81
Ammonia as N	µg/L	10	910	500	*1500*			200,000	50	<10	160	670
Anions Total	meq/L	0.01							7.77	7.21	5.93	5.67
Cations Total	meq/L	0.01							8.25	6.38	5.6	5.25
Chloride	mg/L	1		250			700		94	24	21	27
Cyanide Total	mg/L	0.004	0.004	0.08	*1.6*			10	<0.004	<0.004	0.004	0.004
Fluoride	mg/L	0.1		1.5	*30*	**2**	1	30	0.5	<0.1	<0.1	0.1
Ionic Balance	%	0.01							2.97	6.22	2.89	3.91
Nitrate (as N)	mg/L	0.01				**30**			26.1	0.01	0.04	0.01
Nitrate	mg/L	0.01		50	*1000*	**400**			115.62	0.04	0.18	0.04
Nitrite (as N)	mg/L	0.01							0.03	<0.01	<0.01	<0.01
pH (Lab)	pH_Units	0.01		6.5-8.5			4.0-9.0	6.0-10.0	6.16	3.66	6.11	6.49
Reactive Phosphorus as P	mg/L	0.01							0.02	<0.01	<0.01	<0.01
Sodium (Filtered)	mg/L	1					120		177	137	82	82
Sulphate as S	mg/L	5		500	*10,000*	**1000**		100	-	-	-	-
Sulfate as SO4 - Turbidimetric (Filtered)	mg/L	1		500	*10,000*	**1000**		100	72	314	216	158
TDS	mg/L	10		1000		**3000**	500		520	680	560	564
Monoaromatic Hydrocarbons												
1,2,4-trimethylbenzene	µg/L	5							<5	<5	<5	<5
1,3,5-trimethylbenzene	µg/L	5							<5	<5	<5	<5
Isopropylbenzene	µg/L	1							<5	<5	<5	<5
n-butylbenzene	µg/L	5							<5	<5	<5	<5
n-propylbenzene	µg/L	5							<5	<5	<5	<5
p-isopropyltoluene	µg/L	5							<5	<5	<5	<5
sec-butylbenzene	µg/L	5							<5	<5	<5	<5
Styrene	µg/L	1		30				2000	<5	<5	<5	<5
tert-butylbenzene	µg/L	5							<5	<5	<5	<5
Heavy Metals												
Aluminium (Filtered)	mg/L	0.01		0.2		**5**	5		<0.01	0.03	<0.01	<0.01
Arsenic (Filtered)	mg/L	0.001	0.0023	0.007	*0.14*	**0.5**	0.1	1	0.011	0.018	<0.001	0.034
Boron (Filtered)	mg/L	0.05		4	*80*	**5**	0.5	25	0.62	0.34	1.51	1.38
Cadmium (Filtered)	mg/L	0.0001	0.0055	0.002	*0.04*	**0.01**	0.01	2	0.0005	0.0003	0.0004	0.0004
Calcium (Filtered)	mg/L	1					1000		4	3	12	18
Cobalt (Filtered)	mg/L	0.001	0.001			**1**	0.05	10	<0.001	0.002	0.01	0.002
Copper (Filtered)	mg/L	0.001	0.0013	2	*40*	**0.5**	0.2	10	0.003	0.002	0.003	0.003
Iron (Filtered)	mg/L	0.05					0.2	100	<0.05	0.96	<0.05	0.33
Magnesium (Filtered)	mg/L	1				**600**			3	2	14	7
Manganese (Filtered)	mg/L	0.001		0.5	*10*			10	0.034	0.017	0.102	0.063
Nickel (Filtered)	mg/L	0.001	0.07	0.02	*0.4*	**1**	0.2	10	0.054	0.067	0.036	0.066
Potassium (Filtered)	mg/L	1							4	4	11	8
Selenium (Filtered)	mg/L	0.001	0.003	0.01	*0.2*	**0.02**	0.02	10	<0.01	<0.01	<0.01	<0.01
Zinc (Filtered)	mg/L	0.001	0.015	3		**20**	2	10	0.036	0.067	0.031	0.04
Lead (Filtered)	mg/L	0.001	0.0044	0.01	*0.2*	**0.1**	0.2	10	<0.001	<0.001	<0.001	<0.001
Polycyclic Aromatic Hydrocarbons (PAH)												
Naphthalene	µg/L	1	70						<7	<7	<7	<7
Total Petroleum Hydrocarbons (TPH)												
C6 - C9	µg/L	20	150	150				1000	<20	<20	<20	<20
C10 - C14	µg/L	50							<50	<50	<50	<50
C15 - C28	µg/L	100							<100	<100	<100	<100
C29 - C36	µg/L	50							<50	50	<50	<100
+C10 - C36 (Sum of total)	µg/L	50	600	600					<50	50 - 125	<50	<50
Total Recoverable Hydrocarbons (TRH)												
C6-C10 less BTEX (F1)	mg/L	0.02							-	-	-	-
C6-C10	mg/L	0.02							<0.02	<0.02	<0.02	<0.02
C10-C16	mg/L	0.05							<0.1	<0.1	<0.1	<0.1
C16-C34	mg/L	0.1							<0.1	0.13	<0.1	<0.19
C34-C40	mg/L	0.1							<0.1	<0.1	<0.1	<0.1
C10 - C40 (Sum of total)	µg/L	100							<100	130	<100	<100

TABLE T6: SUMMARY OF GROUNDWATER TREND ASSESSMENT

			OS Wells															
			Field_ID	GW1	GW1	GW01	Trend	GW2	GW2	GW02	Trend	GW3	GW3	GW3	Trend	GW4	GW4	GW4	Trend
			Sampled_Date-Time	7-Feb-06	18/04/2011	25/06/2013		6-Feb-06	15-Jun-06	26/06/2013		8-Feb-06	14-Jun-06	20/04/2011		8-Feb-06	13-Jun-06	20/04/2011	
Chem_Group	ChemName	Units	EQL																
MAH	Benzene	µg/L	0.5	<1	<1	<1	S	<1	<1	1	S	<1	1	2	S	<1	<1	<1	S
	Ethylbenzene	µg/L	0.5	<1	<2	<2	S	<1	<1	<2	S	<1	3	<2	S	<1	<1	<2	S
	Toluene	µg/L	0.5	1	<2	<2	S	1	<1	<2	S	<1	4	<2	S	<1	<1	<2	S
	Total BTEX	mg/L	0.001	<.004	<.001	-	S	<.004	<.004	-	S	<.004	0.012	0.005	S	<0.004	<0.004	<0.001	S
	Xylene (m & p)	µg/L	1		<2	<2	S			<2	-			3	-			<2	-
	Xylene (o)	µg/L	0.5		<2	<2	S			<2	-			<2	-			<2	-
	Xylene Total	µg/L	2	<0.001	<2	<4	S	<1	<1	<4	S	<1	4	3 - 4	S	<0.001	<0.001	<2	S
	1,2,4-trimethylbenzene	µg/L	0.5	<1	<5	<5	S	<1	<1	<5	S	<1	2	<5	S	<1	<1	<5	S
	Naphthalene	µg/L	0.2	<1	<1	<7	S	<1	<1	<7	S	<1	15	<5 - 1.2	S	<1	0.15	<1	S
Ionic Balance	Ammonia as N	mg/L	0.01	3.6	1.43	3.32	S	77	89	399	I	170	340	660	I	0.15	0.16	0.29	I
	Chloride	mg/L	1	1600	1040	1890	S	2300	2100	926	D	33	59	64	I	56	59	57	S
	Cyanide (Free)	mg/L	0.004		0.012	-	-			-	-			0.005	-			0.1	-
	Cyanide Total	mg/L	0.004	0.017	0.016	0.017	S	0.08	0.097	0.018	D	0.022	0.041	0.07	S	0.24	0.22	0.32	S
	Fluoride	mg/L	0.1		1.3	1.4	S			1	-			1.3	-			0.6	-
	Nitrate (as N)	mg/L	0.01	0.14	0.39	0.06	D	<0.01	0.47	0.07	S	<0.01	0.02	<0.01	S	0.79	11	15.7	I
	Nitrite (as N)	mg/L	0.003	0.05	0.1	<0.01	D	<0.01	0.25	<0.01	S	<0.01	0.03	<0.01	S	0.17	0.19	0.09	D
	pH (Lab)	pH_Units	0.01	7	7.17	6.73	S	7.2	7.9	6.68	S	7.6	6.5	6.6	S	8.1	7.6	7.11	S
	Reactive Phosphorus as P	mg/L	0.01		<0.01	<0.01	S			<0.01	-			<0.01	-			0.06	-
	Sodium (Filtered)	mg/L	1	590	400	607	S	1100	960	420	D	40	72	62	S	26	20	180	I
	Sulphate	mg/L	1	75	120	-	S	960	1100	-	-	1000	2700	2070	S	220	180	222	S
	Calcium (Filtered)	mg/L	1	290	196	345	S	380	380	236	S	130	340	232	S	34	22	50	S
	TDS	mg/L	5	3400	2780	3920	S	4900	4900	4200	S	1400	3500	3410	S	590	510	1010	S
Heavy Metals	Aluminum (Filtered)	mg/L	0.01	-	<0.01	<0.01	S	-	-	<0.01	-	-	-	<0.01	-	-	-	<0.01	-
	Arsenic (Filtered)	mg/L	0.001	0.029	0.051	0.478	I	0.12	0.18	0.126	S	0.071	0.67	0.01	S	0.14	0.37	0.12	S
	Boron (Filtered)	mg/L	0.05	1.3	1.3	1.37	S	0.63	0.75	0.7	S	0.61	1.2	1.3	S	0.07	<0.01	0.05	S
	Cadmium (Filtered)	mg/L	0.0001	<0.0002	0.0001	0.0001	S	<0.0002	<0.0002	<0.0001	S	<0.0002	<0.0002	<0.0001	S	<0.0002	<0.0002	<0.0001	S
	Chromium (hexavalent) (Filtered)	mg/L	0.01		<0.01	-	-			-	-			<0.01	-			<0.01	-
	Cobalt (Filtered)	mg/L	0.001	<0.01	0.002	0.003	S	<0.01	<0.01	0.002	S	<0.01	0.019	0.021	S	<0.01	<0.01	0.001	S
	Copper (Filtered)	mg/L	0.001	0.019	0.005	0.002	D	0.004	0.001	0.003	S	0.002	<0.001	0.001	S	0.008	0.006	0.006	S
	Iron (Filtered)	mg/L	0.05		<0.05	2.76	I			20.4	-			27	-			0.23	-
	Lead (Filtered)	mg/L	0.001	<.005	<0.001	<0.001	S	<0.005	<0.005	<0.001	S	<0.005	<0.005	<0.001	S	<0.005	<0.005	0.001	S
	Magnesium (Filtered)	mg/L	1	190	210	287	S	210	210	99	S	17	51	43	S	5	3.8	20	I
	Manganese (Filtered)	mg/L	0.001	0.3	0.197	0.266	S	3	3.2	2.17	S	1.3	5.1	4.18	S	0.01	0.05	0.01	S
	Mercury (Filtered)	mg/L	0.0001	<0.0001	<0.0001	-	-	<0.0001	<0.0001	-	-	<0.0001	<0.0001	<0.0001	S	<0.0001	<0.0001	0.0002	S
	Nickel (Filtered)	mg/L	0.001	<0.005	0.002	0.056	S	<0.005	0.034	0.002	S	0.018	0.009	0.014	S	<0.005	0.008	0.002	S
	Potassium (Filtered)	mg/L	1	48	53	78	S	26	23	27	S	14	15	16	S	27	24	26	S
	Selenium (Filtered)	mg/L	0.001	0.0084	<0.01	<0.01	S	0.01	0.0069	<0.01	S	0.0017	<0.001	<0.01	S	0.0035	<0.001	<0.01	S
	Zinc (Filtered)	mg/L	0.001	0.069	0.024	0.039	S	0.028	0.013	0.021	S	0.044	0.02	0.017	S	0.006	0.014	<0.005	D
TRH	C10-C16	µg/L	50		<100	<100	S			270	-			610	-			<100	-
	C16-C34	µg/L	100		290	200	S			600	-			1300	-			910	-
	C34-C40	µg/L	100		<100	<100	S			<100	-			<100	-			290	-
TPH	C6 - C9	µg/L	20	<0.04	<20	<20	S	<40	<40	<20	S	<40	<40	<20	S	<40	<30	<20	S
	C10 - C14	µg/L	50	<0.04	<50	<50	S	<40	<40	110	I	<40	410	420	S	<40	<30	<50	S
	C15 - C28	µg/L	100	0.2	270	200	S	300	300	700	I	300	500	1440	I	100	<300	570	I
	C29-C36	µg/L	50	<0.1	60	<50	S	<100	<100	<50	S	<100	<100	150	S	<100	<300	510	I
	+C10 - C36 (Sum of total)	µg/L	50	200	330 - 355	200 - 250	S	300	300	810 - 835	I	300	910	2010	I	100	<900	1080 - 1105	I

Notes:

1. S - Stable (with slight increase or decrease in concentration)
2. I - Increase (based on one magniture of order higher from the baseline concentrations for heavy metals and more than doubled than the baseline concentrations for the rest of the contaminants)
3. D - Decrease (based on one magniture of order lower from the baseline concentrations for heavy metals and less than half of the baseline concentrations for

TABLE T6: SUMMARY OF GROUNDWATER TREND ASSESSMENT

				OS Wells													
			Field_ID	GW5	GW5	GW05	Trend	GW18	GW18	Trend	GW19	GW19	GW19	Trend	GW21	GW21	Trend
			Sampled_Date-Time	6-Feb-06	20-Jun-06	27/06/2013		23-Jun-06	25/06/2013		21-Jun-06	20/04/2011	24/06/2013		22-Jun-06	20/04/2011	
Chem_Group	ChemName	Units	EQL														
MAH	Benzene	µg/L	0.5	2	<	7	I	<1	<1	S	<1	<1	<1	S	<1	<1	S
	Ethylbenzene	µg/L	0.5	<1	<1	<2	S	<1	<2	S	<1	<2	<2	S	<1	<2	S
	Toluene	µg/L	0.5	2	<1	4	S	<1	<2	S	<1	<2	<2	S	<1	<2	S
	Total BTEX	mg/L	0.001	<0.006	<0.004	-	S	<0.004	-	-	<0.004	<0.001	-	S	<0.004	<0.001	S
	Xylene (m & p)	µg/L	1			<2	-		<2	-		<2	<2	S		<2	-
	Xylene (o)	µg/L	0.5			<2	-		<2	-		<2	<2	S		<2	-
	Xylene Total	µg/L	2	<1	<1	<4	S	<0.001	<4	-	<0.001	<2	<4	S	<0.001	<2	S
	1,2,4-trimethylbenzene	µg/L	0.5	<1	<1	<5	S	<1	<5	S	<1	<5	<5	S	<1	<5	S
	Naphthalene	µg/L	0.2	<1	<1	<7	S	<1	<7	S	1.3	<1	<7	S	<1	<1	S
Ionic Balance	Ammonia as N	mg/L	0.01	800	190	427	S	1.5	7.02	I	120	184	83.2	S	25	27	S
	Chloride	mg/L	1	48	27	34	S	660	9710	I	63	56	816	I	74	74	D
	Cyanide (Free)	mg/L	0.004			-	-		-	-		<0.004	-	-		<0.004	-
	Cyanide Total	mg/L	0.004	0.072	0.022	0.101	S	0.24	0.028	D	0.071	0.08	0.06	S	0.015	0.02	S
	Fluoride	mg/L	0.1			4.5	-		0.7	-		0.6	0.7	S		0.4	-
	Nitrate (as N)	mg/L	0.01	<0.01	1	0.05	S	0.24	0.15	S	<0.01	0.15	<0.01	S	0.02	0.1	D
	Nitrite (as N)	mg/L	0.003	<0.01	0.18	<0.01	S	0.68	0.01	D	<0.01	0.01	<0.01	S	<0.01	<0.01	S
	pH (Lab)	pH_Units	0.01	6.2	6	6.37	S	7.7	6.83	S	6.2	5.43	6.12	S	4.5	5.44	S
	Reactive Phosphorus as P	mg/L	0.01			<0.01	-		<0.01	-		<0.01	<0.01	S		<0.01	-
	Sodium (Filtered)	mg/L	1	47	36	56	S	150	3590	I	53	51	264	I	24	24	D
	Sulphate	mg/L	1	2400	2000	-	S	240	-	-	1600	700	-	S	1300	981	S
	Calcium (Filtered)	mg/L	1	360	320	304	S	170	968	S	250	198	231	S	330	277	S
	TDS	mg/L	5	3200	2800	4920	S	1700	15,600	I	2300	2320	2780	S	1900	1590	S
Heavy Metals	Aluminum (Filtered)	mg/L	0.01	-	-	0.02	-	-	0.01	-	-	0.17	0.04	S	-	0.14	-
	Arsenic (Filtered)	mg/L	0.001	0.034	0.003	0.281	I	0.005	0.004	S	<0.001	0.799	2.06	I	0.031	0.156	I
	Boron (Filtered)	mg/L	0.05	0.61	0.67	1.11	S	1.5	1.01	S	1.6	1.86	1.51	S	2.2	1.64	S
	Cadmium (Filtered)	mg/L	0.0001	0.0003	0.0011	0.0008	S	<0.0002	<0.0001	S	<0.0002	<0.0001	0.0003	S	<0.0002	<0.0001	S
	Chromium (hexavalent) (Filtered)	mg/L	0.01			-	-		-	-		<0.01	-	-		<0.01	-
	Cobalt (Filtered)	mg/L	0.001	0.073	0.022	0.026	S	<0.01	0.002	S	0.037	0.079	0.094	S	0.085	0.079	S
	Copper (Filtered)	mg/L	0.001	0.004	0.006	0.001	S	0.001	0.004	S	<0.001	0.001	0.003	S	<0.001	0.004	S
	Iron (Filtered)	mg/L	0.05			13.6	-		<0.05	-		309	255	S		53.8	-
	Lead (Filtered)	mg/L	0.001	<0.005	<0.005	<0.001	S	<0.005	<0.001	S	<0.005	<0.001	<0.001	S	0.014	0.01	S
	Magnesium (Filtered)	mg/L	1	75	64	76	S	130	727	S	91	69	93	S	100	82	S
	Manganese (Filtered)	mg/L	0.001	3.1	1.9	3.41	S	0.1	1.1	I	14	14.2	10.3	S	4.1	2.19	S
	Mercury (Filtered)	mg/L	0.0001	<0.0001	<0.0001	-	S	<0.0001	-	-	<0.0001	<0.0001	-	S	<0.0001	<0.0001	S
	Nickel (Filtered)	mg/L	0.001	0.16	0.1	0.058	S	<0.005	<0.001	S	0.052	0.021	0.04	S	0.19	0.017	S
	Potassium (Filtered)	mg/L	1	34	20	40	S	62	204	S	42	43	47	S	37	38	S
	Selenium (Filtered)	mg/L	0.001	0.0032	<0.001	<0.01	S	0.006	<0.01	D	<0.001	<0.01	<0.01	S	<0.001	<0.01	S
	Zinc (Filtered)	mg/L	0.001	0.21	0.1	0.047	S	<0.005	0.01	S	0.15	0.129	0.025	S	0.61	0.082	S
TRH	C10-C16	µg/L	50			380	-		<100	-		120	650	I		<100	-
	C16-C34	µg/L	100			690	-		<140	-		1100	1130	S		<100	-
	C34-C40	µg/L	100			<100	-		<100	-		<100	<100	S		<100	-
TPH	C6 - C9	µg/L	20	<40	<40	<20	S	<40	<20	S	<40	<20	<20	S	<40	<20	S
	C10 - C14	µg/L	50	160	<40	50	S	<40	<50	S	230	<50	140	S	<40	<50	S
	C15 - C28	µg/L	100	700	300	880	S	100	<100	S	600	1110	1530	I	<100	<100	S
	C29-C36	µg/L	50	<100	<100	100	S	<100	<60	S	<100	140	<50	S	<100	<50	S
	+C10 - C36 (Sum of total)	µg/L	50	860	300	1030	S	100	<50	D	830	1250 - 1275	1670 - 1695	I	<240	<50	S

Notes:

1. S - Stable (with slight increase or decrease in concentration)
2. I - Increase (based on one magniture of order higher from the baseline concentrations for heavy met
3. D - Decrease (based on one magniture of order lower from the baseline concentrations for heavy m

TABLE T6: SUMMARY OF GROUNDWATER TREND ASSESSMENT

			OS Wells																
			Field_ID	GW22	GW22	GW22	Trend	GW23A	GW23	GW23	Trend	GW24	GW24	GW24	Trend	GW31	GW31	GW31	Trend
			Sampled_Date-Time	22-Jun-06	20/04/2011	25/06/2013		23-Jun-06	20/04/2011	24/06/2013		23-Jun-06	20/04/2011	27/06/2013		9-May-07	18/04/2011	27/06/2013	
Chem_Group	ChemName	Units	EQL													GW31/50090507			
MAH	Benzene	µg/L	0.5	<1	<1	<1	S	56	16	61	S	6900	6350	3380	D	<1	<1	<1	S
	Ethylbenzene	µg/L	0.5	<1	<2	<2	S	41	13	52	S	150	111	<100	D	<1	<2	<2	S
	Toluene	µg/L	0.5	<1	<2	<2	S	4	<2	3	S	1000	318	<100	D	<1	<2	<2	S
	Total BTEX	mg/L	0.001	<0.004	<0.001	-	S	0.163	0.032	-	D	10.35	9.07	-	S	<0.004	<0.001	-	S
	Xylene (m & p)	µg/L	1		<2	<2	S		<2	3	S		1550	1100	D		<2	<2	S
	Xylene (o)	µg/L	0.5		<2	<2	S		3	12	I		739	535	D		<2	<2	S
	Xylene Total	µg/L	2	<1	<2	<4	S	62	3 - 4	15	S	2,300	2289 - 2290	1635	D	<0.003	<2	<4	S
	1,2,4-trimethylbenzene	µg/L	0.5	<1	<5	<5	S	23	<5	19	S	260	185	160	D	<1	<5	<5	S
	Naphthalene	µg/L	0.2	<0.001	<1	<7	S	0.0312	<5 - 1.2	<7	S	2,600	1820 - 4530	6470	I	<1	<1	<7	S
Ionic Balance	Ammonia as N	mg/L	0.01	0.4	0.99	0.71	S	200	201	193	S	110	854	947	I	6	10	5.58	S
	Chloride	mg/L	1	26	90	44	S	36	38	35	S	58	42	37	D	440	550	954	I
	Cyanide (Free)	mg/L	0.004		<0.004	-	-		<0.004	-	-		0.01	-	-		<0.004	-	-
	Cyanide Total	mg/L	0.004	0.17	0.165	0.14	S	0.26	0.086	0.054	D	0.068	0.219	0.209	S	0.3	0.118	0.212	S
	Fluoride	mg/L	0.1		0.6	0.7	S		0.1	0.2	S		0.3	0.5	S		3.1	3.6	S
	Nitrate (as N)	mg/L	0.01	1.4	0.79	0.82	S	0.06	0.48	1.12	I	0.02	5.35	29	I	0.09	1.37	0.14	S
	Nitrite (as N)	mg/L	0.003	0.34	0.14	<0.01	D	0.01	0.05	0.04	S	<0.01	0.02	0.12	I	0.12	0.03	<0.01	D
	pH (Lab)	pH_Units	0.01	7	6.17	6.99	S	7	6.52	6.83	S	7.6	7.25	7.27	S	7.9	7.06	7.44	S
	Reactive Phosphorus as P	mg/L	0.01		<0.01	<0.01	S		<0.01	<0.01	S		<0.01	<0.01	S		0.01	<0.01	S
	Sodium (Filtered)	mg/L	1	77	111	76	S	31	39	29	S	65	67	55	D	360	454	592	S
	Sulphate	mg/L	1	220	209	-	-	480	388	-	-	1500	2340	-	S	360	227	-	D
	Calcium (Filtered)	mg/L	1	73	94	85	S	24	22	23	S	52	55	55	S	50	42	78	S
	TDS	mg/L	5	610	662	596	S	610	1280	1120	S	3200	4430	4600	S	1,700	1440	2400	S
Heavy Metals	Aluminum (Filtered)	mg/L	0.01	-	<0.01	<0.01	S	-	<0.01	0.02	S	-	<0.01	0.02	S	-	0.04	<0.01	D
	Arsenic (Filtered)	mg/L	0.001	0.005	0.008	0.01	S	0.18	0.077	0.554	I	0.013	0.039	0.017	S	0.045	0.272	0.425	I
	Boron (Filtered)	mg/L	0.05	0.8	0.77	0.88	S	1.6	1.14	1.57	S	0.35	0.32	0.6	S	3.4	2.65	3.03	S
	Cadmium (Filtered)	mg/L	0.0001	<0.0002	<0.0001	0.0004	S	<0.0002	<0.0001	<0.0001	S	<0.0002	<0.0001	<0.0001	S	<0.001	<0.0001	0.0001	S
	Chromium (hexavalent) (Filtered)	mg/L	0.01		<0.01	-	-		<0.01	-	-		<0.01	-	-		<0.01	-	-
	Cobalt (Filtered)	mg/L	0.001	<0.01	0.003	0.003	S	<0.01	0.002	0.002	S	<0.01	0.001	0.002	S	<0.01	<0.001	0.002	S
	Copper (Filtered)	mg/L	0.001	<0.001	0.003	0.002	S	<0.001	<0.001	0.001	S	0.005	0.004	0.002	D	<0.01	0.002	0.001	S
	Iron (Filtered)	mg/L	0.05		0.06	0.07	S		3.69	3.72	S		0.13	0.13	S		0.06	0.6	I
	Lead (Filtered)	mg/L	0.001	<0.005	0.006	0.002	S	<0.005	<0.001	<0.001	S	<0.005	0.002	0.001	S	<0.01	<0.001	<0.001	S
	Magnesium (Filtered)	mg/L	1	24	28	28	S	3.4	2	3	S	34	38	45	S	42	51	73	S
	Manganese (Filtered)	mg/L	0.001	0.08	0.045	0.047	S	0.07	0.037	0.041	S	0.14	0.019	0.035	S	0.06	0.083	0.19	S
	Mercury (Filtered)	mg/L	0.0001	<0.0001	<0.0001	-	S	<0.0001	<0.0001	-	-	<0.0001	<0.0001	-	S	<0.001	<0.0001	-	S
	Nickel (Filtered)	mg/L	0.001	0.043	0.053	0.053	S	0.009	0.041	0.002	S	0.016	0.012	0.004	D	<0.01	0.002	0.094	I
	Potassium (Filtered)	mg/L	1	27	35	28	S	4.7	8	7	S	15	21	19	S	40	49	50	S
	Selenium (Filtered)	mg/L	0.001	0.0025	<0.01	<0.01	S	0.0016	<0.01	<0.01	S	0.007	<0.01	<0.01	S	0.004	<0.01	<0.01	S
	Zinc (Filtered)	mg/L	0.001	<0.005	0.041	0.035	S	0.017	0.033	0.012	S	<0.005	0.013	0.011	S	0.02	0.016	0.025	S
TRH	C10-C16	µg/L	50		<100	<100	S		550	780	S		14600	10200	D		<100	<100	S
	C16-C34	µg/L	100		<100	<100	S		1160	820	S		4670	2350	D		<100	120	S
	C34-C40	µg/L	100		<100	<100	S		<100	<100	S		<100	<100	S		<100	<100	S
TPH	C6 - C9	µg/L	20	<40	<20	<20	S	250	70	200	S	11000	9780	5110	D	<0.04	<20	<20	S
	C10 - C14	µg/L	50	<40	<50	<50	S	770	380	730	S	15000	14,200	11,700	D	<0.04	<50	<50	S
	C15 - C28	µg/L	100	<100	<100	<100	S	800	1250	1020	S	2800	6120	3290	S	<100	<100	110	S
	C29-C36	µg/L	50	<100	<50	<50	S	<100	170	<50	S	<100	220	80	S	<100	<50	<50	S
	+C10 - C36 (Sum of total)	µg/L	50	<240	<50	<50	S	1570	1800	1750 - 1775	S	17,800	20,500 - 20,540	15,070 - 15,100	S	<240	<50	110 - 160	S

Notes:

1. S - Stable (with slight increase or decrease in concentration)
2. I - Increase (based on one magniture of order higher from the baseline concentrations for heavy met
3. D - Decrease (based on one magniture of order lower from the baseline concentrations for heavy m

TABLE T6: SUMMARY OF GROUNDWATER TREND ASSESSMENT

			OS Wells															
			Field_ID	GW35	GW35	GW35	Trend	GW39	GW39	Trend	GW40	GW40	Trend	GW41	GW41	Trend	GW42D	GW42D	Trend
			Sampled_Date-Time	9-May-07	18/04/2011	25/06/2013		20/04/2011	24/06/2013		20/04/2011	25/06/2013		20/04/2011	24/06/2013		21/04/2011	24/06/2013	
Chem_Group	ChemName	Units	EQL																
MAH	Benzene	µg/L	0.5	8	<1	4	S	28	72	I	<1	<1	S	<1	<1	S	355	425	S
	Ethylbenzene	µg/L	0.5	<1	<2	<2	S	2	4	S	<2	<2	S	<2	<2	S	3	4	S
	Toluene	µg/L	0.5	<1	<2	<2	S	4	7	S	<2	<2	S	<2	<2	S	61	38	S
	Total BTEX	mg/L	0.001	<0.004	<0.001	-	S	0.042	-	-	<0.001	-	-	<0.001	-	-	0.439	-	-
	Xylene (m & p)	µg/L	1		<2	<2	S	4	7	S	<2	<2	S	<2	<2	S	11	16	S
	Xylene (o)	µg/L	0.5		<2	<2	S	4	6	S	<2	<2	S	<2	<2	S	9	11	S
	Xylene Total	µg/L	2	8	<2	<4	D	8	13	S	<2	<4	S	<2	<4	S	20	27	S
	1,2,4-trimethylbenzene	µg/L	0.5	<1	<5	<5	S	<5	<5	S	<5	<5	S	<5	<5	S	<5	<5	S
	Naphthalene	µg/L	0.2	<0.001	<1	<7	S	18 - 22.3	19	S	<1	<7	S	<1	<7	S	21.3 - 33	31	S
Ionic Balance	Ammonia as N	mg/L	0.01	16	4.25	2.57	D	430	290	S	8.9	0.16	D	0.31	0.8	I	2,170	2,410	S
	Chloride	mg/L	1	4700	3400	3330	S	57	43	S	385	3450	I	298	2000	I	3380	6190	S
	Cyanide (Free)	mg/L	0.004		<0.004	-	-	0.006	-	-	<0.004	-	-	<0.004	-	-	0.013	-	-
	Cyanide Total	mg/L	0.004	0.037	0.039	0.015	S	0.093	0.116	S	0.01	<0.004	D	0.027	0.035	S	0.434	0.025	D
	Fluoride	mg/L	0.1		1.8	2.2	S	1	1.7	S	1	0.6	S	1.4	1.4	S	1	0.6	S
	Nitrate (as N)	mg/L	0.01	0.13	0.01	<0.01	D	0.66	0.08	D	0.28	1.39	I	0.09	<0.01	S	<0.01	<0.01	S
	Nitrite (as N)	mg/L	0.003	<0.01	0.01	<0.01	S	0.55	0.04	D	0.01	<0.01	S	<0.01	<0.01	S	0.02	<0.01	D
	pH (Lab)	pH_Units	0.01	7	7.18	6.87	S	6.52	6.67	S	7.1	5.57	S	7.15	6.9	S	6.3	5.76	S
	Reactive Phosphorus as P	mg/L	0.01		<0.01	<0.01	S	<0.01	<0.01	S	<0.01	<0.01	S	<0.01	<0.01	S	<0.01	0.02	S
	Sodium (Filtered)	mg/L	1	2100	2490	1710	S	68	60	S	55	1400	I	48	530	I	2450	3530	S
	Sulphate	mg/L	1	640	503	-	S	2250	-	-	28	-	-	226	-	-	14,800	-	-
	Calcium (Filtered)	mg/L	1	330	98	160	S	280	226	S	128	466	I	147	530	I	375	567	S
	TDS	mg/L	5	8,700	6450	5370	S	3110	2660	S	1040	5300	I	1260	4400	I	23,400	27,000	S
Heavy Metals	Aluminum (Filtered)	mg/L	0.01	-	<0.01	<0.01	S	<0.01	<0.01	S	<0.01	0.04	S	<0.01	<0.01	S	3.91	0.45	D
	Arsenic (Filtered)	mg/L	0.001	0.263	0.286	1.11	I	0.011	0.682	I	0.007	0.01	S	0.014	0.03	S	0.031	0.016	S
	Boron (Filtered)	mg/L	0.05	1.1	1.39	1.08	S	1.57	1.57	S	0.34	0.67	S	0.67	0.84	S	0.66	0.28	S
	Cadmium (Filtered)	mg/L	0.0001	<0.001	<0.0001	0.0003	S	<0.0001	0.0004	S	<0.0001	0.0002	S	<0.0001	0.0006	S	0.0012	0.0002	S
	Chromium (hexavalent) (Filtered)	mg/L	0.01		<0.01	-	-	<0.01	-	-	<0.01	-	-	<0.01	-	-	<0.01	-	-
	Cobalt (Filtered)	mg/L	0.001	<0.01	0.002	0.003	S	0.04	0.044	S	<0.001	0.006	S	0.001	0.002	S	9.66	7.79	S
	Copper (Filtered)	mg/L	0.001	<0.01	0.002	0.002	S	0.001	0.004	S	0.001	0.065	I	0.001	0.004	S	0.051	0.018	S
	Iron (Filtered)	mg/L	0.05		0.09	7.56	I	29.5	67.8	I	<0.05	0.39	S	<0.05	0.18	S	12.9	13.3	S
	Lead (Filtered)	mg/L	0.001	<0.01	<0.001	<0.001	S	<0.001	<0.001	S	<0.001	<0.001	S	0.001	<0.001	S	0.002	<0.001	S
	Magnesium (Filtered)	mg/L	1	340	205	199	S	81	77	S	42	151	S	66	221	S	787	1060	S
	Manganese (Filtered)	mg/L	0.001	1.8	0.792	0.741	D	5.5	3.82	S	0.124	0.862	S	0.132	0.409	S	120	24.6	D
	Mercury (Filtered)	mg/L	0.0001	<0.001	<0.0001	-	S	<0.0001	-	-	0.0002	-	-	0.0002	-	-	0.0002	-	-
	Nickel (Filtered)	mg/L	0.001	0.01	0.007	0.02	S	0.029	0.059	S	0.005	0.041	S	<0.001	0.013	S	2.82	2.22	S
	Potassium (Filtered)	mg/L	1	80	43	59	S	17	16	S	27	60	S	24	53	S	217	220	S
	Selenium (Filtered)	mg/L	0.001	0.022	<0.01	<0.01	S	<0.01	<0.01	S	<0.01	<0.01	S	<0.01	<0.01	S	0.03	0.01	S
	Zinc (Filtered)	mg/L	0.001	0.02	0.014	0.014	S	0.012	0.032	S	<0.005	0.331	I	<0.005	0.024	S	2.2	0.143	D
TRH	C10-C16	µg/L	50		<100	180	I	690	940	S	<100	<100	S	<100	250	I	1750	670	D
	C16-C34	µg/L	100		240	160	S	1390	1220	S	120	<100	S	220	100	D	1410	180	D
	C34-C40	µg/L	100		<100	<100	S	<100	<100	S	<100	<100	S	<100	<100	S	110	<100	D
TPH	C6 - C9	µg/L	20	0.15	<20	<20	S	60	100	S	<20	<20	S	<20	<20	S	470	480	S
	C10 - C14	µg/L	50	0.26	<50	<50	S	440	500	S	<50	<50	S	<50	<50	S	2960	760	D
	C15 - C28	µg/L	100	100	280	300	I	1590	1570	S	<100	<100	S	150	330	I	1560	340	D
	C29-C36	µg/L	50	<100	<50	<50	S	140	<50	D	70	<50	D	110	<50	D	200	<50	D
	+C10 - C36 (Sum of total)	µg/L	50	1260	280 - 330	300 - 350	D	2170	2070 - 2095	S	70 - 145	<50	D	260 - 285	330 - 380	S	4720	1100 - 1125	D

Notes:

1. S - Stable (with slight increase or decrease in concentration)
2. I - Increase (based on one magniture of order higher from the baseline concentrations for heavy met
3. D - Decrease (based on one magniture of order lower from the baseline concentrations for heavy m

TABLE T6: SUMMARY OF GROUNDWATER TREND ASSESSMENT

			OS Wells						
			Field_ID	GW43D	GW43	Trend	GW44D	GW44	Trend
			Sampled_Date-Time	20/04/2011	24/06/2013		20/04/2011	25/06/2013	
Chem_Group	ChemName	Units	EQL						
MAH	Benzene	µg/L	0.5	<1	<1	S	1350	1120	S
	Ethylbenzene	µg/L	0.5	<2	<2	S	46	36	S
	Toluene	µg/L	0.5	12	<2	D	712	455	S
	Total BTEX	mg/L	0.001	0.012	-	-	2.54	-	-
	Xylene (m & p)	µg/L	1	<2	<2	S	285	185	S
	Xylene (o)	µg/L	0.5	<2	<2	S	150	112	S
	Xylene Total	µg/L	2	<2	<4	S	435	297	S
	1,2,4-trimethylbenzene	µg/L	0.5	<5	<5	S	49	30	S
	Naphthalene	µg/L	0.2	<1	<7	S	142 - 776	572	S
Ionic Balance	Ammonia as N	mg/L	0.01	4.11	1.33	D	1,190	286	D
	Chloride	mg/L	1	9860	9670	S	450	1220	I
	Cyanide (Free)	mg/L	0.004	<0.004	-	-	0.186	-	-
	Cyanide Total	mg/L	0.004	<0.004	<0.004	S	3.98	0.75	D
	Fluoride	mg/L	0.1	0.3	0.4	S	0.6	0.5	S
	Nitrate (as N)	mg/L	0.01	0.01	<0.01	S	0.03	<0.01	D
	Nitrite (as N)	mg/L	0.003	<0.01	<0.01	S	0.03	<0.01	D
	pH (Lab)	pH_Units	0.01	6.75	5.82	S	6.72	6.48	S
	Reactive Phosphorus as P	mg/L	0.01	0.03	0.08	S	<0.01	<0.01	S
	Sodium (Filtered)	mg/L	1	5140	4950	S	594	806	S
	Sulphate	mg/L	1	1090	-	-	5020	-	-
	Calcium (Filtered)	mg/L	1	427	433	S	399	468	S
	TDS	mg/L	5	19,400	18,200	S	8860	9310	S
Heavy Metals	Aluminum (Filtered)	mg/L	0.01	<0.01	<0.01	S	<0.01	<0.01	S
	Arsenic (Filtered)	mg/L	0.001	0.002	0.003	S	0.038	0.103	S
	Boron (Filtered)	mg/L	0.05	1.14	0.99	S	1.02	0.78	S
	Cadmium (Filtered)	mg/L	0.0001	0.0025	0.0007	D	<0.0001	0.0004	S
	Chromium (hexavalent) (Filtered)	mg/L	0.01	<0.01	-	-	<0.01	-	-
	Cobalt (Filtered)	mg/L	0.001	0.075	0.06	S	0.051	0.028	S
	Copper (Filtered)	mg/L	0.001	0.007	0.006	S	0.009	0.01	S
	Iron (Filtered)	mg/L	0.05	0.4	0.26	S	11.1	49.4	S
	Lead (Filtered)	mg/L	0.001	<0.001	0.001	S	<0.001	0.002	S
	Magnesium (Filtered)	mg/L	1	694	638	S	169	420	S
	Manganese (Filtered)	mg/L	0.001	7.63	6.69	S	10.5	19.8	S
	Mercury (Filtered)	mg/L	0.0001	<0.0001	-	-	<0.0001	-	-
	Nickel (Filtered)	mg/L	0.001	0.067	0.062	S	0.072	0.064	S
	Potassium (Filtered)	mg/L	1	212	175	S	48	61	S
	Selenium (Filtered)	mg/L	0.001	<0.01	<0.01	S	0.01	0.01	S
	Zinc (Filtered)	mg/L	0.001	0.016	0.048	S	0.032	0.035	S
TRH	C10-C16	µg/L	50	<100	<100	S	230000	81900	D
	C16-C34	µg/L	100	330	<100	D	25000	12400	D
	C34-C40	µg/L	100	150	<100	D	710	<100	D
TPH	C6 - C9	µg/L	20	<20	<20	S	3380	1930	S
	C10 - C14	µg/L	50	<50	<50	S	251,000	98,300	D
	C15 - C28	µg/L	100	180	<100	D	32,200	16,600	D
	C29-C36	µg/L	50	210	<50	D	1770	680	D
	+C10 - C36 (Sum of total)	µg/L	50	390 - 415	<50	D	285,000	115,600 - 116,000	D

Notes:

1. S - Stable (with slight increase or decrease in concentration)
2. I - Increase (based on one magniture of order higher from the baseline concentrations for heavy met
3. D - Decrease (based on one magniture of order lower from the baseline concentrations for heavy m

TABLE T6: SUMMARY OF GROUNDWATER TREND ASSESSMENT

				NW Wells															
			Field_ID	GW6	GW6	GW06	Trend	GW32	GW32	GW32	Trend	GW33	GW33	GW33	Trend	GW34	GW34	GW34	Trend
			Sampled_Date-Time	14-Jun-06	18/04/2011	26/06/2013		11-May-07	19/04/2011	27/06/2013		11-May-07	18/04/2011	27/06/2013		10-May-07	18/04/2011	27/06/2013	
Chem_Group	ChemName	Units	EQL																
MAH	Benzene	µg/L	0.5	<1	<1	<1	S	<1	5	69	I	<1	<1	<1	S	<1	<1	<1	S
	Ethylbenzene	µg/L	0.5	<1	<2	<2	S	<1	<2	3	I	<1	<2	<2	S	<1	<2	<2	S
	Toluene	µg/L	0.5	<1	<2	<2	S	<1	<2	<2	S	<1	<2	<2	S	<1	<2	<2	S
	Total BTEX	mg/L	0.001	0.001	<0.001	-	S	<0.004	0.005	-	S	<0.004	<0.001	-	S	<0.004	<0.001	-	S
	Xylene (m & p)	µg/L	1		<2	<2	S		<2	<2	S		<2	<2	S		<2	<2	S
	Xylene (o)	µg/L	0.5		<2	<2	S		<2	<2	S		<2	<2	S		<2	<2	S
	Xylene Total	µg/L	2	<1	<2	<4	S	<0.003	<2	<4	S	<0.003	<2	<4	S	<3	<2	<4	S
	1,2,4-trimethylbenzene	µg/L	0.5	<1	<5	<5	S	<1	<5	<5	S	<1	<5	<5	S	<1	<5	<5	S
	Naphthalene	µg/L	0.2	<0.001	<1	<7	S	<0.001	<1	<7	S	<1	<1	<7	S	<1	<1	<7	S
Ionic Balance	Ammonia as N	mg/L	0.01	1.4	0.43	1.1	S	24	12.5	16.3	S	9	8.43	4.91	D	0.1	0.41	0.42	I
	Chloride	mg/L	1	690	466	435	S	60	41	40	S	61	1050	2640	I	610	243	925	S
	Cyanide (Free)	mg/L	0.004		0.006	-	-		0.006	-	-		<0.004	-	-		0.005	-	-
	Cyanide Total	mg/L	0.004	0.007	0.006	0.005	S	0.39	0.226	0.141	D	0.059	0.058	0.069	S	0.18	0.24	0.255	S
	Fluoride	mg/L	0.1		1.3	1.4	S		2.3	2.4	S		1.2	1.5	S		0.2	2.5	I
	Nitrate (as N)	mg/L	0.01	0.16	0.89	0.04	D	0.07	1.67	0.31	S	2.5	4.11	4.59	S	<0.01	0.07	0.28	I
	Nitrite (as N)	mg/L	0.003	0.34	0.01	<0.01	D	<0.01	0.02	<0.01	S	0.07	0.02	0.01	S	<0.01	0.04	<0.01	S
	pH (Lab)	pH_Units	0.01	6.9	6.97	7.02	S	7.8	7.69	7.29	S	7.3	7.39	6.88	S	7.8	7.52	6.95	S
	Reactive Phosphorus as P	mg/L	0.01		<0.01	<0.01	S		<0.01	<0.01	S		<0.01	<0.01	S		0.11	0.18	S
	Sodium (Filtered)	mg/L	1	270	247	253	S	100	73	80	S	1400	672	1330	S	900	776	1670	S
	Sulphate	mg/L	1	100	72	-	-	210	216	-	-	330	1930	-	-	1100	1440	-	S
	Calcium (Filtered)	mg/L	1	120	44	52	S	120	131	122	S	450	379	477	S	69	30	85	S
	TDS	mg/L	5	1500	1190	1080	S	1,000	1310	936	S	7,300	3480	6390	S	3,300	3010	4800	S
Heavy Metals	Aluminum (Filtered)	mg/L	0.01	-	<0.01	<0.01	S	-	<0.01	<0.01	S	-	<0.01	<0.01	S	-	<0.01	0.02	S
	Arsenic (Filtered)	mg/L	0.001	0.004	0.002	0.002	S	0.032	0.318	1.39	I	0.008	0.01	0.017	S	0.052	0.396	1.45	I
	Boron (Filtered)	mg/L	0.05	1.3	1.54	1.61	S	0.75	0.83	0.99	S	3.7	3.38	4	S	4.4	6.88	8.25	S
	Cadmium (Filtered)	mg/L	0.0001	<0.0002	<0.0001	<0.0001	S	<0.001	<0.0001	0.0004	S	<0.001	<0.0001	0.0004	S	<0.001	<0.0001	<0.0001	S
	Chromium (hexavalent) (Filtered)	mg/L	0.01		<0.01	-	-		<0.01	-	-		<0.01	-	-		<0.01	-	-
	Cobalt (Filtered)	mg/L	0.001	<0.01	<0.001	<0.001	S	<0.01	<0.001	<0.001	S	<0.01	0.005	0.015	S	<0.01	0.002	0.003	S
	Copper (Filtered)	mg/L	0.001	<0.001	0.003	0.002	S	<0.01	0.003	0.002	S	<0.01	0.006	0.006	S	<0.01	0.003	0.004	S
	Iron (Filtered)	mg/L	0.05		<0.05	<0.05	S		0.06	1.26	I		<0.05	0.14	S		0.1	2.33	I
	Lead (Filtered)	mg/L	0.001	<0.005	<0.001	<0.001	S	<0.01	<0.001	0.011	S	<0.01	<0.001	<0.001	S	<0.01	<0.001	<0.001	S
	Magnesium (Filtered)	mg/L	1	90	51	44	D	66	63	58	S	390	383	405	S	75	54	160	S
	Manganese (Filtered)	mg/L	0.001	0.11	0.018	0.07	D	0.1	0.176	0.162	S	0.24	0.32	0.421	S	0.07	0.021	0.124	S
	Mercury (Filtered)	mg/L	0.0001	<0.0001	<0.0001	-	-	<0.001	<0.0001	-	S	<0.001	<0.0001	-	-	<0.001	<0.0001	-	S
	Nickel (Filtered)	mg/L	0.001	0.088	0.004	0.025	S	0.02	0.002	0.027	S	0.02	0.006	0.048	S	<0.01	0.003	0.074	S
	Potassium (Filtered)	mg/L	1	36	17	22	S	38	30	35	S	180	168	152	S	46	42	127	S
	Selenium (Filtered)	mg/L	0.001	<0.001	<0.01	<0.01	S	0.004	<0.01	<0.01	S	0.017	<0.01	<0.01	S	0.009	<0.01	<0.01	S
	Zinc (Filtered)	mg/L	0.001	0.006	0.01	0.021	S	0.03	0.006	0.018	S	0.02	0.012	0.035	S	0.02	<0.005	0.01	S
TRH	C10-C16	µg/L	50		<100	<100	S		<100	<100	S		<100	<100	S		<100	<100	S
	C16-C34	µg/L	100		<100	<100	S		<100	180	I		<100	<100	S		<100	120	S
	C34-C40	µg/L	100		<100	<100	S		<100	<100	S		<100	<100	S		<100	<100	S
TPH	C6 - C9	µg/L	20	<40	<20	<20	S	<40	<20	70	I	<40	<20	<20	S	<40	<20	<20	S
	C10 - C14	µg/L	50	<40	<50	<50	S	<40	<50	<50	S	<40	<50	<50	S	<40	<50	<50	S
	C15 - C28	µg/L	100	<100	<100	<100	S	<100	<100	120	I	<100	<100	<100	S	<100	<100	<100	S
	C29-C36	µg/L	50	<100	<50	<50	S	<100	<50	<50	S	<100	<50	<50	S	<100	<50	<50	S
	+C10 - C36 (Sum of total)	µg/L	50	<240	<50	<50	S	<240	<50	120 - 170	I	<240	<50	<50	S	<240	<50	<50	S

Notes:

1. S - Stable (with slight increase or decrease in concentration)
2. I - Increase (based on one magnitude of order higher from the baseline concentrations for heavy met
3. D - Decrease (based on one magnitude of order lower from the baseline concentrations for heavy m

TABLE T6: SUMMARY OF GROUNDWATER TREND ASSESSMENT

				NW Wells			
			Field_ID	GW36	GW36	GW36	Trend
			Sampled_Date-Time	10-May-07	20/04/2011	27/06/2013	
Chem_Group	ChemName	Units	EQL				
MAH	Benzene	µg/L	0.5	<1	<1	<1	S
	Ethylbenzene	µg/L	0.5	<1	<2	<2	S
	Toluene	µg/L	0.5	<1	<2	<2	S
	Total BTEX	mg/L	0.001	<0.004	<0.001	-	S
	Xylene (m & p)	µg/L	1		<2	<2	S
	Xylene (o)	µg/L	0.5		<2	<2	S
	Xylene Total	µg/L	2	<3	<2	<4	S
	1,2,4-trimethylbenzene	µg/L	0.5	<1	<5	<5	S
	Naphthalene	µg/L	0.2	<1	<1	<7	S
Ionic Balance	Ammonia as N	mg/L	0.01	<0.1	3.76	<.01	S
	Chloride	mg/L	1	1400	1320	1040	S
	Cyanide (Free)	mg/L	0.004		<0.004	-	-
	Cyanide Total	mg/L	0.004	0.039	0.053	0.053	S
	Fluoride	mg/L	0.1		1.9	3	S
	Nitrate (as N)	mg/L	0.01	1.9	2.77	3.03	S
	Nitrite (as N)	mg/L	0.003	0.06	0.08	0.1	S
	pH (Lab)	pH_Units	0.01	7.8	7.08	7.13	S
	Reactive Phosphorus as P	mg/L	0.01		<0.01	<0.01	S
	Sodium (Filtered)	mg/L	1	880	931	854	S
	Sulphate	mg/L	1	560	440	-	S
	Calcium (Filtered)	mg/L	1	140	93	80	D
	TDS	mg/L	5	3,700	3400	3060	S
Heavy Metals	Aluminum (Filtered)	mg/L	0.01	-	<0.01	0.1	S
	Arsenic (Filtered)	mg/L	0.001	0.004	0.025	0.067	I
	Boron (Filtered)	mg/L	0.05	1.5	1.3	1.62	S
	Cadmium (Filtered)	mg/L	0.0001	<0.001	<0.0001	0.0004	S
	Chromium (hexavalent) (Filtered)	mg/L	0.01		<0.01	-	-
	Cobalt (Filtered)	mg/L	0.001	<0.01	0.002	0.002	S
	Copper (Filtered)	mg/L	0.001	<0.01	0.004	0.004	S
	Iron (Filtered)	mg/L	0.05		<0.05	0.49	S
	Lead (Filtered)	mg/L	0.001	<0.01	<0.001	0.002	S
	Magnesium (Filtered)	mg/L	1	130	113	99	S
	Manganese (Filtered)	mg/L	0.001	0.11	0.241	0.242	S
	Mercury (Filtered)	mg/L	0.0001	<0.001	0.0002	-	S
	Nickel (Filtered)	mg/L	0.001	<0.01	0.005	0.054	S
	Potassium (Filtered)	mg/L	1	35	35	34	S
	Selenium (Filtered)	mg/L	0.001	0.011	<0.01	<0.01	S
	Zinc (Filtered)	mg/L	0.001	0.01	0.009	0.018	S
TRH	C10-C16	µg/L	50		<100	<100	S
	C16-C34	µg/L	100		<100	<100	S
	C34-C40	µg/L	100		<100	<100	S
TPH	C6 - C9	µg/L	20	<40	<20	<20	S
	C10 - C14	µg/L	50	<40	<50	<50	S
	C15 - C28	µg/L	100	<100	<100	<100	S
	C29-C36	µg/L	50	<100	<50	<50	S
	+C10 - C36 (Sum of total)	µg/L	50	<240	<50	<50	S

Notes:

1. S - Stable (with slight increase or decrease in concentration)
2. I - Increase (based on one magniture of order higher from the baseline concentrations for heavy met
3. D - Decrease (based on one magniture of order lower from the baseline concentrations for heavy m

TABLE T6: SUMMARY OF GROUNDWATER TREND ASSESSMENT

				NE Wells														
			Field_ID	GW7	GW7	GW07	Trend	GW8	GW8	GW08	Trend	GW26	GW26	GW26	Trend	GW27	GW27	Trend
			Sampled_Date-Time	14-Jun-06	2/05/2011	26/06/2013		15-Jun-06	19/04/2011	25/06/2013		26-Sep-06	2/05/2011	26/06/2013		27-Sep-06	20/04/2011	
Chem_Group	ChemName	Units	EQL															
MAH	Benzene	µg/L	0.5	<1	<1	<1	S	31	13	15	S	<1	<1	<1	S	<1	<1	S
	Ethylbenzene	µg/L	0.5	<1	<2	<2	S	2	<2	<2	D	<1	<2	<2	S	<1	<2	S
	Toluene	µg/L	0.5	2	<2	<2	S	5	4	2	D	<1	<2	<2	S	<1	<2	S
	Total BTEX	mg/L	0.001	0.002	<0.001	-	S	0.046	0.021	-	D	<0.004	<0.001	-	S	<0.004	<0.001	S
	Xylene (m & p)	µg/L	1		<2	<2	S		2	<2	D		<2	<2	S		<2	S
	Xylene (o)	µg/L	0.5		<2	<2	S		2	<2	D		<2	<2	S		<2	S
	Xylene Total	µg/L	2	<0.001	<2	<4	S	8	4	<4	D	<1	<2	<4	S	<0.001	<2	S
	1,2,4-trimethylbenzene	µg/L	0.5	<1	<5	<5	S	2	<5	<5	S	<1	<5	<5	S	<1	<5	S
	Naphthalene	µg/L	0.2	<1	<5 - 9.1	<7	S	213	14,2 - 18	<7	D	<1	<1	<7	S	<0.001	<1	S
Ionic Balance	Ammonia as N	mg/L	0.01	1,600	112	105	D	320	318	1,150	I	0.6	0.96	1.29	I	<0.1	0.6	S
	Chloride	mg/L	1	250	212	350	S	600	290	248	D	500	564	919	S	1500	1100	S
	Cyanide (Free)	mg/L	0.004		<0.004	-	-		<0.004	-	-		<0.004	-	-		<0.004	-
	Cyanide Total	mg/L	0.004	0.083	0.047	0.027	D	0.029	0.014	0.029	S	0.009	0.005	<0.004	S	<0.005	0.004	S
	Fluoride	mg/L	0.1		1.5	2	S		0.2	0.3	S		0.6	0.7	S		1	-
	Nitrate (as N)	mg/L	0.01	0.76	<0.01	1.73	S	0.23	0.24	0.28	S	0.03	0.3	0.04	S	0.31	10.2	I
	Nitrite (as N)	mg/L	0.003	0.18	0.01	0.1	S	0.2	0.05	<0.01	D	0.02	0.01	<0.01	S	0.01	0.03	S
	pH (Lab)	pH_Units	0.01	7.3	6.52	6.97	S	7.4	6.27	5.96	S	7.3	6.9	6.72	S	7.7	7.3	S
	Reactive Phosphorus as P	mg/L	0.01		<0.01	<0.01	S		<0.01	<0.01	S		<0.01	0.04	S		0.04	-
	Sodium (Filtered)	mg/L	1	96	277	276	S	210	173	148	S	380	469	472	S	1100	941	S
	Sulphate	mg/L	1	690	225	-	D	1800	1510	-	S	220	306	-	S	490	711	S
	Calcium (Filtered)	mg/L	1	100	47	52	S	160	130	126	S	88	86	94	S	110	73	S
	TDS	mg/L	5	1100	1640	1460	S	2500	2740	2360	S	1,400	1740	2300	S	3,600	3610	S
Heavy Metals	Aluminum (Filtered)	mg/L	0.01	-	<0.01	<0.01	S	-	<0.01	<0.01	S	-	<0.01	<0.01	S	-	<0.01	-
	Arsenic (Filtered)	mg/L	0.001	0.074	0.084	0.092	S	0.035	0.012	0.179	S	0.008	0.038	0.072	S	0.002	0.003	S
	Boron (Filtered)	mg/L	0.05	1.1	0.84	0.95	S	1.4	0.91	0.8	S	0.27	0.3	0.47	S	0.66	0.65	S
	Cadmium (Filtered)	mg/L	0.0001	<0.0002	<0.0001	0.0004	S	<0.0002	<0.0001	0.0002	S	<0.0002	<0.0001	0.0005	S	<0.0002	<0.0001	S
	Chromium (hexavalent) (Filtered)	mg/L	0.01		<0.01	-	-		<0.01	-	-		<0.01	-	-		<0.01	-
	Cobalt (Filtered)	mg/L	0.001	<0.01	<0.001	0.001	S	0.013	0.006	0.009	S	0.029	0.016	0.034	S	<0.01	0.003	S
	Copper (Filtered)	mg/L	0.001	<0.001	<0.001	0.002	S	0.001	0.003	0.002	S	0.001	<0.001	0.003	S	0.001	0.004	S
	Iron (Filtered)	mg/L	0.05		0.12	0.87	S		3.5	36.3	I		<0.05	1.69	I		<0.05	-
	Lead (Filtered)	mg/L	0.001	<0.005	<0.001	<0.001	S	<0.005	0.001	0.002	S	<0.005	<0.001	<0.001	S	<0.005	<0.001	S
	Magnesium (Filtered)	mg/L	1	78	35	43	S	55	50	44	S	62	69	90	S	88	75	S
	Manganese (Filtered)	mg/L	0.001	0.35	0.138	0.178	S	2	1.35	1.32	S	3.2	1.97	3.46	S	0.26	0.231	S
	Mercury (Filtered)	mg/L	0.0001	<0.0001	<0.0001	-	S	<0.0001	<0.0001	-	-	<0.0001	<0.0001	-	-	0.0002	0.0004	S
	Nickel (Filtered)	mg/L	0.001	0.13	0.007	0.05	S	0.12	0.066	0.1	S	0.023	0.009	0.044	S	0.057	0.023	S
	Potassium (Filtered)	mg/L	1	14	8	10	S	13	8	10	S	8.6	8	8	S	13	10	S
	Selenium (Filtered)	mg/L	0.001	<0.001	<0.01	<0.01	S	0.0042	<0.01	<0.01	S	0.007	<0.01	<0.01	S	0.008	<0.01	S
	Zinc (Filtered)	mg/L	0.001	<0.005	0.026	0.022	S	0.19	0.052	0.137	S	0.041	<0.005	0.05	S	0.018	0.019	S
TRH	C10-C16	µg/L	50		<100	<100	S		680	460	S		<100	<100	S		<100	-
	C16-C34	µg/L	100		230	490	I		980	740	S		210	<100	D		380	-
	C34-C40	µg/L	100		<100	<100	S		<100	<100	S		<100	<100	S		100	-
TPH	C6 - C9	µg/L	20	<40	<20	<20	S	<20	20	<20	S	<40	<20	<20	S	<40	<20	S
	C10 - C14	µg/L	50	<40	<50	<50	S	480	510	230	S	<40	<50	<50	S	<40	<50	S
	C15 - C28	µg/L	100	300	220	450	S	300	1110	930	S	<100	170	<100	S	<100	280	I
	C29-C36	µg/L	50	<100	60	110	S	<200	90	<50	S	<100	80	<50	S	<100	190	I
	+C10 - C36 (Sum of total)	µg/L	50	300	280 - 305	560 - 585	S	880	1710	1160 - 1185	S	<240	250 - 275	<50	S	<240	470 - 495	I

Notes:

1. S - Stable (with slight increase or decrease in concentration)
2. I - Increase (based on one magniture of order higher from the baseline concentrations for heavy met
3. D - Decrease (based on one magniture of order lower from the baseline concentrations for heavy m

TABLE T6: SUMMARY OF GROUNDWATER TREND ASSESSMENT

				NE Wells														
			Field_ID	GW28	GW28	GW28	Trend	GW29	GW29	GW29	Trend	GW30	GW30	GW30	Trend	GW37	GW37	Trend
			Sampled_Date-Time	27-Sep-06	19/04/2011	25/06/2013		27-Sep-06	18/04/2011	26/06/2013		26-Sep-06	19/04/2011	26/06/2013		19/04/2011	25/06/2013	
Chem_Group	ChemName	Units	EQL															
MAH	Benzene	µg/L	0.5	<1	<1	<1	S	<1	<1	<1	S	<0.001	<1	<1	S	42	38	S
	Ethylbenzene	µg/L	0.5	<1	<2	<2	S	<1	<2	<2	S	<0.001	<2	<2	S	<2	<2	S
	Toluene	µg/L	0.5	<1	<2	<2	S	<1	<2	<2	S	<0.001	<2	<2	S	12	11	S
	Total BTEX	mg/L	0.001	<0.004	<0.001	-	S	<0.004	<0.001	-	S	<0.004	<0.001	-	-	0.062	-	-
	Xylene (m & p)	µg/L	1		<2	<2	S		<2	<2	S		<2	<2	S	5	3	S
	Xylene (o)	µg/L	0.5		<2	<2	S		<2	<2	S		<2	<2	S	3	2	S
	Xylene Total	µg/L	2	<1	<2	<4	S	<0.001	<2	<4	S	<0.001	<2	<4	S	8	5	S
	1,2,4-trimethylbenzene	µg/L	0.5	<1	<5	<5	S	<0.001	<5	<5	S	<0.001	<5	<5	S	<5	<5	S
	Naphthalene	µg/L	0.2	<1	<1	<7	S	<0.001	<1	<7	S	<0.001	<1	<7	S	27.8 - 40	27	S
Ionic Balance	Ammonia as N	mg/L	0.01	40	76	85	I	<0.1	0.1	0.05	S	<0.1	0.44	0.11	S	0.358	0.290	S
	Chloride	mg/L	1	220	332	302	S	810	735	725	S	1100	1020	1000	S	154	289	S
	Cyanide (Free)	mg/L	0.004		<0.004	-	-		<0.004	-	-		<0.004	-	-	<0.004	-	-
	Cyanide Total	mg/L	0.004	0.044	0.033	0.016	D	<0.005	<0.004	<0.004	S	0.008	<0.004	<0.004	S	0.39	0.103	D
	Fluoride	mg/L	0.1		1.4	1.8	S		0.8	1	S		1.6	1.9	S	1.1	1.3	S
	Nitrate (as N)	mg/L	0.01	2.9	<0.01	0.01	D	0.38	14.2	16.1	S	3.1	4.49	3.74	S	0.47	0.17	D
	Nitrite (as N)	mg/L	0.003	<0.01	0.01	<0.01	S	<0.01	0.09	0.06	S	0.13	0.15	0.08	S	0.44	0.07	D
	pH (Lab)	pH_Units	0.01	7.7	7.65	7.18	S	7.5	7.22	6.94	S	7.4	7.37	5.82	S	7.06	6.98	S
	Reactive Phosphorus as P	mg/L	0.01		<0.01	<0.01	S		<0.01	0.03	S		<0.01	<0.01	S	<0.01	<0.01	S
	Sodium (Filtered)	mg/L	1	150	351	251	S	820	602	705	S	890	733	700	S	120	91	S
	Sulphate	mg/L	1	48	167	-	I	440	353	-	-	280	573	-	-	1060	-	-
	Calcium (Filtered)	mg/L	1	45	30	33	S	75	57	69	S	100	88	84	S	67	53	S
	TDS	mg/L	5	710	1540	1180	S	2,200	2450	2280	S	2,300	3050	2560	S	2260	2080	S
Heavy Metals	Aluminum (Filtered)	mg/L	0.01	-	<0.01	<0.01	S	-	<0.01	<0.01	S	-	0.01	<0.01	S	<0.01	<0.01	S
	Arsenic (Filtered)	mg/L	0.001	0.12	0.189	0.314	S	0.001	0.002	<0.001	S	0.001	0.064	0.065	S	0.041	0.211	S
	Boron (Filtered)	mg/L	0.05	0.74	0.74	0.81	S	0.42	0.46	0.53	S	0.45	0.44	0.55	S	0.71	0.93	S
	Cadmium (Filtered)	mg/L	0.0001	<0.0002	<0.0001	<0.0001	S	<0.0002	<0.0001	0.0005	S	<0.0002	<0.0001	0.0005	S	<0.0001	0.0002	S
	Chromium (hexavalent) (Filtered)	mg/L	0.01		<0.01	-	-		<0.01	-	-		<0.01	-	-	<0.01	-	-
	Cobalt (Filtered)	mg/L	0.001	<0.01	<0.001	<0.001	S	<0.01	0.005	0.008	S	<0.01	0.007	0.007	S	0.003	0.004	S
	Copper (Filtered)	mg/L	0.001	<0.001	0.002	<0.001	S	0.003	0.005	0.004	S	0.006	0.003	0.003	S	0.002	0.001	S
	Iron (Filtered)	mg/L	0.05		<0.05	2.2	I		<0.05	<0.05	S		<0.05	0.71	I	0.23	7.1	S
	Lead (Filtered)	mg/L	0.001	<0.005	0.003	<0.001	S	<0.005	0.002	<0.001	S	0.008	0.01	<0.001	D	<0.001	<0.001	S
	Magnesium (Filtered)	mg/L	1	26	26	25	S	63	56	65	S	79	83	74	S	37	37	S
	Manganese (Filtered)	mg/L	0.001	0.19	0.17	0.175	S	0.53	0.403	0.449	S	0.47	0.434	0.429	S	0.298	0.236	S
	Mercury (Filtered)	mg/L	0.0001	<0.0001	<0.0001	-	-	<0.0001	<0.0001	-	-	0.075	<0.0001	-	-	<0.0001	-	-
	Nickel (Filtered)	mg/L	0.001	0.061	0.014	0.018	S	0.17	0.008	0.028	D	0.046	0.005	0.038	S	0.008	0.017	S
	Potassium (Filtered)	mg/L	1	10	6	6	S	7.9	7	9	S	10	7	7	S	9	10	S
	Selenium (Filtered)	mg/L	0.001	0.002	<0.01	<0.01	S	0.004	<0.01	<0.01	S	<0.01	<0.01	<0.01	S	<0.01	<0.01	S
	Zinc (Filtered)	mg/L	0.001	0.051	<0.005	0.005	S	0.023	0.021	0.02	S	<0.01	0.017	0.088	S	0.01	0.021	S
TRH	C10-C16	µg/L	50		<100	<100	S		<100	<100	S		<100	<100	S	880	610	S
	C16-C34	µg/L	100		<100	170	S		<100	<100	S		<100	<100	S	1110	720	S
	C34-C40	µg/L	100		<100	<100	S		<100	<100	S		<100	<100	S	<100	<100	S
TPH	C6 - C9	µg/L	20	<40	<20	<20	S	<0.04	<20	<20	S	<0.04	<20	<20	S	60	50	S
	C10 - C14	µg/L	50	<40	<50	<50	S	<0.04	<50	<50	S	0.07	<50	<50	S	610	390	S
	C15 - C28	µg/L	100	300	<100	160	S	<0.1	<100	<100	S	0.3	<100	<100	S	1330	940	S
	C29-C36	µg/L	50	<100	<50	<50	S	<0.1	<50	<50	S	<0.1	<50	<50	S	60	<50	S
	+C10 - C36 (Sum of total)	µg/L	50	300	<50	160 - 210	S	<0.24	<50	<50	S	0.37	<50	<50	S	2000	1330 - 1355	S

Notes:

1. S - Stable (with slight increase or decrease in concentration)
2. I - Increase (based on one magniture of order higher from the baseline concentrations for heavy met
3. D - Decrease (based on one magniture of order lower from the baseline concentrations for heavy m

TABLE T6: SUMMARY OF GROUNDWATER TREND ASSESSMENT

				NE Wells		
			Field_ID	GW38	GW38	Trend
			Sampled_Date-Time	19/04/2011	26/06/2013	
Chem_Group	ChemName	Units	EQL			
MAH	Benzene	µg/L	0.5	27	269	I
	Ethylbenzene	µg/L	0.5	<2	15	I
	Toluene	µg/L	0.5	10	131	I
	Total BTEX	mg/L	0.001	0.044	-	-
	Xylene (m & p)	µg/L	1	4	76	I
	Xylene (o)	µg/L	0.5	3	43	I
	Xylene Total	µg/L	2	7	119	I
	1,2,4-trimethylbenzene	µg/L	0.5	<5	16	I
	Naphthalene	µg/L	0.2	20.6 - 28	134	I
Ionic Balance	Ammonia as N	mg/L	0.01	511	449	S
	Chloride	mg/L	1	200	230	S
	Cyanide (Free)	mg/L	0.004	0.01	-	-
	Cyanide Total	mg/L	0.004	0.055	0.16	S
	Fluoride	mg/L	0.1	0.7	1	S
	Nitrate (as N)	mg/L	0.01	0.06	0.01	D
	Nitrite (as N)	mg/L	0.003	0.13	0.04	D
	pH (Lab)	pH_Units	0.01	6.88	6.53	S
	Reactive Phosphorus as P	mg/L	0.01	<0.01	<0.01	S
	Sodium (Filtered)	mg/L	1	301	196	S
	Sulphate	mg/L	1	585	-	-
	Calcium (Filtered)	mg/L	1	102	185	S
	TDS	mg/L	5	3770	3440	S
Heavy Metals	Aluminum (Filtered)	mg/L	0.01	<0.01	<0.01	S
	Arsenic (Filtered)	mg/L	0.001	0.034	0.365	I
	Boron (Filtered)	mg/L	0.05	0.96	0.91	S
	Cadmium (Filtered)	mg/L	0.0001	<0.0001	<0.0001	S
	Chromium (hexavalent) (Filtered)	mg/L	0.01	<0.01	-	-
	Cobalt (Filtered)	mg/L	0.001	0.002	0.004	S
	Copper (Filtered)	mg/L	0.001	0.003	0.002	S
	Iron (Filtered)	mg/L	0.05	<0.05	35.7	I
	Lead (Filtered)	mg/L	0.001	0.004	<0.001	D
	Magnesium (Filtered)	mg/L	1	46	111	S
	Manganese (Filtered)	mg/L	0.001	1.08	3.64	S
	Mercury (Filtered)	mg/L	0.0001	<0.0001	-	-
	Nickel (Filtered)	mg/L	0.001	0.283	0.003	D
	Potassium (Filtered)	mg/L	1	13	19	S
	Selenium (Filtered)	mg/L	0.001	<0.01	<0.01	S
	Zinc (Filtered)	mg/L	0.001	0.014	0.013	S
TRH	C10-C16	µg/L	50	3590	8780	I
	C16-C34	µg/L	100	1580	2620	S
	C34-C40	µg/L	100	<100	<100	S
TPH	C6 - C9	µg/L	20	40	530	I
	C10 - C14	µg/L	50	3370	8460	I
	C15 - C28	µg/L	100	1850	3370	I
	C29-C36	µg/L	50	130	70	S
	+C10 - C36 (Sum of total)	µg/L	50	5350	11,900	I

Notes:

1. S - Stable (with slight increase or decrease in concentration)
2. I - Increase (based on one magniture of order higher from the baseline concentrations for heavy met
3. D - Decrease (based on one magniture of order lower from the baseline concentrations for heavy m

TABLE T6: SUMMARY OF GROUNDWATER TREND ASSESSMENT

				SE Wells													
			Field_ID	GW9	GW9	GW09	Trend	GW10	GW10	GW10	Trend	GW11	GW11	Trend	GW12	GW12	Trend
			Sampled_Date-Time	15-Jun-06	19/04/2011	26/06/2013		16-Jun-06	20/04/2011	27/06/2013		16-Jun-06	20/04/2011		16-Jun-06	19/04/2011	
Chem_Group	ChemName	Units	EQL														
MAH	Benzene	µg/L	0.5	<1	<1	<1	S	<1	<1	<1	S	<1	<1	S	<1	<1	S
	Ethylbenzene	µg/L	0.5	<1	<2	<2	S	<1	<2	<2	S	<1	<2	S	<1	<2	S
	Toluene	µg/L	0.5	<1	<2	<2	S	<1	<2	<2	S	<1	<2	S	1	<2	S
	Total BTEX	mg/L	0.001	<0.004	<0.001	-	S	<0.004	<0.001	S	-	<0.004	<0.001	S	0.001	<0.001	S
	Xylene (m & p)	µg/L	1		<2	<2	S		<2	<2	S		<2	-		<2	-
	Xylene (o)	µg/L	0.5		<2	<2	S		<2	<2	S		<2	-		<2	-
	Xylene Total	µg/L	2	<0.001	<2	<4	S	<1	<2	<4	S	<1	<2	S	<1	<2	S
	1,2,4-trimethylbenzene	µg/L	0.5	<1	<5	<5	S	<1	<5	<5	S	<1	<5	S	<0.001	<5	S
	Naphthalene	µg/L	0.2	<1	<1	<7	S	<1	<1	<7	S	<1	<1	S	<1	<1	-
Ionic Balance	Ammonia as N	mg/L	0.01	<.100	0.52	0.05	S	0.1	0.43	<.01	S	<0.1	0.04	S	<0.1	<0.01	S
	Chloride	mg/L	1	56	150	94	S	54	65	24	D	48	54	S	69	80	S
	Cyanide (Free)	mg/L	0.004		<0.004	-	-		<0.004	-	-		<0.004	-		<0.004	-
	Cyanide Total	mg/L	0.004	<0.005	<0.004	<0.004	S	<0.005	<0.004	<0.004	S	0.01	0.009	S	<0.005	<0.004	S
	Fluoride	mg/L	0.1		0.4	0.5	S		<0.1	<0.1	S		<0.1	-		0.6	-
	Nitrate (as N)	mg/L	0.01	29	21	26.1	S	0.15	<0.01	0.01	S	0.12	0.02	S	0.13	1.55	I
	Nitrite (as N)	mg/L	0.003	0.09	0.01	0.03	S	0.05	<0.01	<0.01	D	<0.01	0.01	S	0.07	<0.01	D
	pH (Lab)	pH_Units	0.01	8	6.65	6.16	S	6.9	5.23	3.66	D	6.2	5.55	S	7.9	6.91	S
	Reactive Phosphorus as P	mg/L	0.01		<0.01	0.02	S		<0.01	<0.01	S		<0.01	-		<0.01	-
	Sodium (Filtered)	mg/L	1	120	168	177	S	180	192	137	S	64	89	S	190	202	S
	Sulphate	mg/L	1	48	54	-	S	360	303	-	-	110	93	S	210	142	S
	Calcium (Filtered)	mg/L	1	4.9	4	4	S	8.5	4	3	D	1.8	<1	D	3.3	2	S
	TDS	mg/L	5	530	548	520	S	890	590	680	S	620	288	D	680	546	S
Heavy Metals	Aluminum (Filtered)	mg/L	0.01	-	<0.01	<0.01	S	-	0.01	0.03	S	-	0.03	-	-	<0.01	-
	Arsenic (Filtered)	mg/L	0.001	0.005	0.004	0.011	S	0.006	0.006	0.018	S	0.003	0.002	S	0.006	0.008	S
	Boron (Filtered)	mg/L	0.05	0.68	0.45	0.62	S	0.16	0.18	0.34	S	0.37	0.26	S	0.51	0.36	S
	Cadmium (Filtered)	mg/L	0.0001	0.0003	<0.0001	0.0005	S	<0.0002	<0.0001	0.0003	S	<0.0002	<0.0001	S	<0.0002	<0.0001	S
	Chromium (hexavalent) (Filtered)	mg/L	0.01		<0.01	-	-		<0.01	-	-		<0.01	-		<0.01	-
	Cobalt (Filtered)	mg/L	0.001	<0.01	<0.001	<0.001	S	<0.01	0.001	0.002	S	<0.01	<0.001	S	<0.01	<0.001	S
	Copper (Filtered)	mg/L	0.001	0.002	0.001	0.003	S	0.005	0.007	0.002	S	0.004	0.002	S	0.006	0.005	S
	Iron (Filtered)	mg/L	0.05		<0.05	<0.05	S		<0.05	0.96	I		<0.05	-		<0.05	-
	Lead (Filtered)	mg/L	0.001	<0.005	<0.001	<0.001	S	<0.005	<0.001	<0.001	S	<0.005	<0.001	S	<0.005	<0.001	S
	Magnesium (Filtered)	mg/L	1	2.4	3	3	S	4.6	3	2	D	0.72	<1	D	2.2	1	D
	Manganese (Filtered)	mg/L	0.001	0.04	0.007	0.034	S	0.07	0.022	0.017	D	0.01	0.002	S	0.12	<0.001	D
	Mercury (Filtered)	mg/L	0.0001	<0.0001	0.0001	-	S	<0.001	0.0002	-	S	<0.001	0.0002	S	<0.001	<0.0001	S
	Nickel (Filtered)	mg/L	0.001	0.017	0.004	0.054	S	0.098	0.037	0.067	S	0.011	<0.001	D	0.063	0.007	D
	Potassium (Filtered)	mg/L	1	3.2	4	4	S	3.1	3	4	S	1.6	1	S	3.6	4	S
	Selenium (Filtered)	mg/L	0.001	0.0018	<0.01	<0.01	S	0.0014	<0.01	<0.01	S	<0.001	<0.01	S	<0.001	<0.01	S
	Zinc (Filtered)	mg/L	0.001	0.023	0.014	0.036	S	0.33	0.032	0.067	S	0.027	<0.005	D	<0.005	<0.005	S
TRH	C10-C16	µg/L	50		<100	<100	S		<100	<100	S		<100	-		<100	-
	C16-C34	µg/L	100		<100	<100	S		130	130	S		670	-		<100	-
	C34-C40	µg/L	100		<100	<100	S		<100	<100	S		120	-		<100	-
TPH	C6 - C9	µg/L	20	<40	<20	<20	S	<100	<20	<20	S	<100	<20	S	<100	<20	S
	C10 - C14	µg/L	50	<40	<50	<50	S	<40	<50	<50	S	<40	<50	S	<40	<50	S
	C15 - C28	µg/L	100	<100	<100	<100	S	<100	<100	<100	S	<100	510	I	<100	<100	S
	C29-C36	µg/L	50	<100	<50	<50	S	<100	60	50	S	<100	260	I	<100	50	S
	+C10 - C36 (Sum of total)	µg/L	50	<240	<50	<50	S	<240	60 - 135	50 - 125	S	<240	770 - 795	I	<240	50 - 125	S

Notes:

1. S - Stable (with slight increase or decrease in concentration)
2. I - Increase (based on one magniture of order higher from the baseline concentrations for heavy met
3. D - Decrease (based on one magniture of order lower from the baseline concentrations for heavy m

TABLE T6: SUMMARY OF GROUNDWATER TREND ASSESSMENT

				SE Wells												
			Field_ID	GW13	GW13	Trend	GW14	GW14	Trend	GW15	GW15	GW15	Trend	GW16	GW16	Trend
			Sampled_Date-Time	19-Jun-06	20/04/2011		19-Jun-06	20/04/2011		20-Jun-06	20/04/2011	27/06/2013		21-Jun-06	20/04/2011	
Chem_Group	ChemName	Units	EQL													
MAH	Benzene	µg/L	0.5	<1	<1	S	<1	<1	S	<1	<1	<1	S	<1	<1	S
	Ethylbenzene	µg/L	0.5	<1	<2	S	<1	<2	S	<1	<2	<2	S	<1	<2	S
	Toluene	µg/L	0.5	<1	<2	S	<1	<2	S	1	<2	<2	S	<1	<2	S
	Total BTEX	mg/L	0.001	<0.004	<0.001	S	<0.004	<0.001	-	0.001	<0.001	-	S	<0.004	<0.001	S
	Xylene (m & p)	µg/L	1		<2	-		<2	S		<2	<2	S		<2	-
	Xylene (o)	µg/L	0.5		<2	-		<2	S		<2	<2	S		<2	-
	Xylene Total	µg/L	2	<0.001	<2	S	<1	<2	S	<1	<2	<4	S	<1	<2	S
	1,2,4-trimethylbenzene	µg/L	0.5	<1	<5	S	<0.001	<5	S	<1	<5	<5	S	<1	<5	S
	Naphthalene	µg/L	0.2	<1	<1	S	<1	<1	S	<1	<1	<7	S	<1	<1	S
Ionic Balance	Ammonia as N	mg/L	0.01	0.2	0.07	D	0.5	0.85	S	0.3	0.19	0.16	S	<0.1	0.01	S
	Chloride	mg/L	1	37	75	I	21	55	I	35	<1	21	S	15	13	S
	Cyanide (Free)	mg/L	0.004		<0.004	-		<0.004	-		<0.004	-	-		<0.004	-
	Cyanide Total	mg/L	0.004	0.01	0.008	D	0.013	0.014	S	0.01	0.006	0.004	S	<0.005	<0.004	S
	Fluoride	mg/L	0.1		<0.1	-		<0.1	S		<0.1	<0.1	S		<0.1	-
	Nitrate (as N)	mg/L	0.01	0.04	0.05	S	0.37	0.12	S	0.01	0.06	0.04	S	0.15	0.33	S
	Nitrite (as N)	mg/L	0.003	<0.01	<0.01	S	0.95	<0.01	S	<0.01	<0.01	<0.01	S	<0.01	<0.01	S
	pH (Lab)	pH_Units	0.01	6.5	6.25	S	6.8	6.67	S	6.2	6.11	6.11	S	7	7.2	S
	Reactive Phosphorus as P	mg/L	0.01		<0.01	-		<0.01	-		<0.01	<0.01	S		<0.01	-
	Sodium (Filtered)	mg/L	1	95	111	S	31	43	S	89	101	82	S	36	41	S
	Sulphate	mg/L	1	170	126	-	130	111	S	240	191	-	S	45	46	S
	Calcium (Filtered)	mg/L	1	6.7	4	S	24	23	S	17	12	12	S	10	6	S
	TDS	mg/L	5	360	406	S	370	368	S	470	364	560	S	310	156	D
Heavy Metals	Aluminum (Filtered)	mg/L	0.01	-	<0.01	-	-	<0.01	-	-	<0.01	<0.01	S	-	0.03	-
	Arsenic (Filtered)	mg/L	0.001	0.002	0.003	S	0.004	0.005	S	<0.001	<0.001	<0.001	S	<0.001	0.001	S
	Boron (Filtered)	mg/L	0.05	1.6	0.87	S	1.4	0.94	S	1.3	1.02	1.51	S	0.63	0.51	S
	Cadmium (Filtered)	mg/L	0.0001	<0.0002	<0.0001	S	<0.0002	<0.0001	S	0.0005	<0.0001	0.0004	S	<0.0002	<0.0001	S
	Chromium (hexavalent) (Filtered)	mg/L	0.01		<0.01	-		<0.01	-		<0.01	-	-		<0.01	-
	Cobalt (Filtered)	mg/L	0.001	<0.01	<0.001	S	<0.01	0.004	S	<0.01	0.008	0.01	S	<0.01	<0.001	S
	Copper (Filtered)	mg/L	0.001	<0.001	0.002	S	<0.001	0.001	S	<0.001	0.002	0.003	S	<0.001	<0.001	S
	Iron (Filtered)	mg/L	0.05		<0.05	-		<0.05	-		<0.05	<0.05	S		0.08	-
	Lead (Filtered)	mg/L	0.001	<0.005	0.008	S	<0.005	<0.001	S	<0.005	0.001	<0.001	S	<0.005	<0.001	S
	Magnesium (Filtered)	mg/L	1	5.3	4	S	27	27	S	17	12	14	S	8.1	6	S
	Manganese (Filtered)	mg/L	0.001	0.03	0.014	S	0.08	0.061	S	0.04	0.058	0.102	S	0.03	0.002	D
	Mercury (Filtered)	mg/L	0.0001	<0.0001	<0.0001	S	<0.0001	<0.0001	S	<0.0001	<0.0001	-	S	<0.0001	<0.0001	-
	Nickel (Filtered)	mg/L	0.001	0.034	0.003	D	0.008	0.005	S	0.031	0.01	0.036	S	<0.005	<0.001	S
	Potassium (Filtered)	mg/L	1	8	10	S	18	22	S	13	13	11	S	6.5	7	S
	Selenium (Filtered)	mg/L	0.001	<0.001	<0.01	S	<0.001	<0.01	S	<0.001	<0.01	<0.01	S	<0.001	<0.01	S
	Zinc (Filtered)	mg/L	0.001	0.013	0.018	S	0.025	0.007	S	0.007	0.016	0.031	S	0.73	0.045	D
TRH	C10-C16	µg/L	50		<100	-		<100	-	-	<100	<100	S		<100	-
	C16-C34	µg/L	100		<100	-		<100	-	-	140	<100	D		<100	-
	C34-C40	µg/L	100		<100	-		<100	-	-	<100	<100	S		<100	-
TPH	C6 - C9	µg/L	20	<40	<20	S	<40	<20	S	<40	<20	<20	S	<40	<20	S
	C10 - C14	µg/L	50	<40	<50	S	<40	<50	S	<40	<50	<50	S	<40	<50	S
	C15 - C28	µg/L	100	<100	<100	S	<100	<100	S	<100	230	<100	S	<100	<100	S
	C29-C36	µg/L	50	<100	<50	S	<100	<50	S	<100	<50	<50	S	<100	<50	S
	+C10 - C36 (Sum of total)	µg/L	50	<240	<50	S	<240	<50	S	<240	230 - 280	<50	S	<240	<50	S

Notes:

1. S - Stable (with slight increase or decrease in concentration)
2. I - Increase (based on one magniture of order higher from the baseline concentrations for heavy met
3. D - Decrease (based on one magniture of order lower from the baseline concentrations for heavy m

TABLE T6: SUMMARY OF GROUNDWATER TREND ASSESSMENT

				SE Wells			
			Field_ID	GW25	GW25	GW25	Trend
			Sampled_Date-Time	19-Jun-06	20/04/2011	27/06/2013	
Chem_Group	ChemName	Units	EQL				
MAH	Benzene	µg/L	0.5	<1	<1	<1	S
	Ethylbenzene	µg/L	0.5	<1	<2	<2	S
	Toluene	µg/L	0.5	<1	<2	<2	S
	Total BTEX	mg/L	0.001	<0.004	<0.001	-	S
	Xylene (m & p)	µg/L	1		<2	<2	S
	Xylene (o)	µg/L	0.5		<2	<2	S
	Xylene Total	µg/L	2	<1	<2	<4	S
	1,2,4-trimethylbenzene	µg/L	0.5	<1	<5	<5	S
	Naphthalene	µg/L	0.2	<1	<1 - 6	<7	S
Ionic Balance	Ammonia as N	mg/L	0.01	7.9	2.11	0.67	D
	Chloride	mg/L	1	81	100	27	D
	Cyanide (Free)	mg/L	0.004		<0.004	-	-
	Cyanide Total	mg/L	0.004	0.01	0.008	0.004	D
	Fluoride	mg/L	0.1		<0.1	0.1	S
	Nitrate (as N)	mg/L	0.01	0.08	0.24	0.01	S
	Nitrite (as N)	mg/L	0.003	<0.01	<0.01	<0.01	S
	pH (Lab)	pH_Units	0.01	7.1	6.45	6.49	S
	Reactive Phosphorus as P	mg/L	0.01		<0.01	<0.01	S
	Sodium (Filtered)	mg/L	1	140	132	82	S
	Sulphate	mg/L	1	230	128	-	S
	Calcium (Filtered)	mg/L	1	7.9	12	18	I
	TDS	mg/L	5	550	360	564	S
Heavy Metals	Aluminum (Filtered)	mg/L	0.01	-	<0.01	<0.01	S
	Arsenic (Filtered)	mg/L	0.001	<0.001	0.002	0.034	I
	Boron (Filtered)	mg/L	0.05	1.7	1	1.38	S
	Cadmium (Filtered)	mg/L	0.0001	<0.0002	<0.0001	0.0004	S
	Chromium (hexavalent) (Filtered)	mg/L	0.01		<0.01	-	-
	Cobalt (Filtered)	mg/L	0.001	0.018	<0.001	0.002	S
	Copper (Filtered)	mg/L	0.001	<0.001	0.003	0.003	S
	Iron (Filtered)	mg/L	0.05		<0.05	0.33	S
	Lead (Filtered)	mg/L	0.001	<0.005	<0.001	<0.001	S
	Magnesium (Filtered)	mg/L	1	6.4	8	7	S
	Manganese (Filtered)	mg/L	0.001	0.16	0.014	0.063	S
	Mercury (Filtered)	mg/L	0.0001	<0.0001	<0.0001	-	S
	Nickel (Filtered)	mg/L	0.001	0.013	0.003	0.066	S
	Potassium (Filtered)	mg/L	1	13	11	8	S
	Selenium (Filtered)	mg/L	0.001	<0.001	<0.01	<0.01	S
	Zinc (Filtered)	mg/L	0.001	0.018	<0.005	0.04	S
TRH	C10-C16	µg/L	50		<100	<100	S
	C16-C34	µg/L	100		160	<190	S
	C34-C40	µg/L	100		<100	<100	S
TPH	C6 - C9	µg/L	20	<40	<20	<20	S
	C10 - C14	µg/L	50	<40	<50	<50	S
	C15 - C28	µg/L	100	<100	120	<100	S
	C29-C36	µg/L	50	<100	70	<100	S
	+C10 - C36 (Sum of total)	µg/L	50	<240	190 - 215	<50	S

Notes:

1. S - Stable (with slight increase or decrease in concentration)
2. I - Increase (based on one magniture of order higher from the baseline concentrations for heavy met
3. D - Decrease (based on one magniture of order lower from the baseline concentrations for heavy m

APPENDIX A GROUNDWATER SAMPLING RECORDS

GL20.

ENVIRONMENTAL EARTH SCIENCES
THE KNOW AND THE HOW

Field Chemical Characteristics for Water Samples

Job No: 210074	Date: 24/6/13.	Sampled By: SFL	Client: CAP	Site: St. Melbourne

Sample No	Type + Depth	Container + Additive	Time	Water Level (m)	Stickup (m)	Volume Purged (L)	Temp C	pH	pe mV	Dissolved Oxygen (ppm)	EC uScm^{-1}	Odour	Colour	Comments
GW03														DRY 8.16mTOC.
GW43			12.31	7.39		1L	17.6	6.45	110.1	1.59	23233	NO	clear.	
			12.34	7.36		2L	17.4	6.48	80.5	0.77	23819			SWL: 7.34TOC TD: 17.07TOC
			12.38	7.38		3L	17.3	6.48	62.3	0.72	23937			3Lpm.
			12.42	7.39		4L	17.7	6.48	61.2	0.52	24232			
			12.50	7.38		8L	18.4	5.44	124.7	4.11	24133			
			12.54	7.38		10L	18.4	5.44	125.5	4.15	24146			
			12.58	7.38		11L	18.4	5.44	120.5	4.17	24148			
			13:02	7.38		12L	18.4	5.46	119.8	4.19	24185			Stabilised, Sampled GWP

Key

Additives
W = no additives
X = conc. HNO_3
Y = NaOH
Z = $Na_2S_2O_3$

Type
SW = Surface water
SWC = Creek
SWP = Pond
SWD = Dam
SWL = Puddle
GW = Groundwater
GWA = Artesian
GWS = Sub-artesian

Sampling device
B = Bailer
P = Piston
S = Spring
SP = Submersible pump
GD = Gas drive
GL = Gas lift
SL = Suction lift
PD = Positive displacement
G = Grab

Sampling Container
PI = Polyethylene
G = Amber glass

Field Parameters
Field parameters will be measured ex-situ in in-line flow cells with the following stabilisation criteria
±10% DO when >1ppm (no criteria for<1ppm)
±10% Turbidity
±5% EC
±0.1 pH
±10mV ORP

The meter will be calibrated as needed (at least daily) and in accordance with the manufacturers specifications (i.e. at least 2 point calibration for pH, EC and DO)

GW41 SWL: 7.97 TOC
TD: 10.00 TOC

ENVIRONMENTAL EARTH SCIENCES
THE KNOW AND THE HOW

Field Chemical Characteristics for Water Samples

Job No: 210079	Date: 23/6	Sampled By: SEL	Client: CPP	Site: Sth Melb.

Sample No	Type + Depth	Container + Additive	Time	Water Level (m)	Stickup (m)	Volume Purged (L)	Temp C	pH	pe mV	Dissolved Oxygen (ppm)	EC uScm^{-1}	Odour	Colour	Comments
GW41			3.31	8.08		1	17.4	6.69	20.2	1.81	6710	Nil	Turbid yellow	3cpm
			3.35	8.20		2	17.9	6.63	16.9	0.67	5580			2cpm.
			3.39	8.22		3	17.8	6.60	32.7	1.11	5158			
			3.44	8.24		4	17.6	6.57	42.1	1.65	5162			
			3.49	8.25		5	17.7	6.57	42.9	1.65	5145			
			3.54	8.28		6	17.8	6.55	49.5	1.64	5252			
			3.59	8.30		7	17.8	6.57	49.5	1.66	5214			Sampled Stabalised (mp)

Key	Additives	Type	Sampling device	Sampling Container	Field Parameters
	W = no additives X = conc. HNO_3 Y = NaOH Z = $Na_2S_2O_3$	SW = Surface water SWC = Creek SWP = Pond SWD = Dam SWL = Puddle GW = Groundwater GWA = Artesian GWS = Sub-artesian	B = Bailer P = Piston S = Spring SP = Submersible pump GD = Gas drive GL = Gas lift SL = Suction lift PD = Positive displacement G = Grab	Pl = Polyethylene G = Amber glass	Field parameters will be measured ex-situ in in-line flow cells with the following stabilisation criteria ±10% DO when >1ppm (no criteria for<1ppm) ±10% Turbidity ±5% EC ±0.1 pH ±10mV ORP The meter will be calibrated as needed (at least daily) and in accordance with the manufacturers specifications (i.e. at least 2 point calibration for pH, EC and DO)

GW39

WL 8.34 depth 10.42m TOC

ENVIRONMENTAL EARTH SCIENCES
THE KNOW AND THE HOW

Field Chemical Characteristics for Water Samples

Job No: 210074 Date: 26.6.13 Sampled By: KK Client: Port Phillip Council Site: Gasworks Park / Retirement Home

Sample No	Type + Depth	Container + Additive	Time	Water Level (m)	Stickup (m)	Volume Purged (L)	Temp C	pH	pe mV	Dissolved Oxygen (ppm)	EC uScm^{-1}	Odour	Colour	Comments
			12:11	8.29	with pump in									Start 2lpm
						1	16.1	6.71	-98.9	4.01	3637	PAH	dark grey very turbid	
			12:17	8.49		1.5	17.0	6.78	-133.0	2.64	3680	PAH	"	Reduced to 1lpm
			12.24	8.45		2	16.6	6.76	-135.8	2.53	3424	"	"	
			12:31	8.44		3	16.6	6.72	-132.3	2.71	3374	"	"	
			12.37	8.45		4	16.6	6.70	-125.4	2.95	3328	"	turbid grey	WL stable
			12.42	8.45		4.5	16.7	6.70	-125.9	2.98	3304	"	"	
			12:5[illegible]	8.45		5.0	16.8	6.69	-123.4	2.55	3273			
			12:56			5.5	16.7	6.67	-121.9	2.44	3254	"	"	
							Stab 6 parameters - sampled @ 12:57							

Key	Additives	Type	Sampling device	Sampling Container	Field Parameters
	W = no additives X = conc. HNO_3 Y = NaOH Z = $Na_2S_2O_3$	SW = Surface water SWC = Creek SWP = Pond SWD = Dam SWL = Puddle GW = Groundwater GWA = Artesian GWS = Sub-artesian	B = Bailer P = Piston S = Spring SP = Submersible pump GD = Gas drive GL = Gas lift SL = Suction lift PD = Positive displacement G = Grab	PI = Polyethylene G = Amber glass	Field parameters will be measured ex-situ in in-line flow cells with the following stabilisation criteria ±10% DO when >1ppm (no criteria for<1ppm) ±10% Turbidity. ±5% EC ±0.1 pH ±10mV ORP The meter will be calibrated as needed (at least daily) and in accordance with the manufacturers specifications (i.e. at least 2 point calibration for pH, EC and DO)

GW42

Initial WL: 9.34m

ENVIRONMENTAL EARTH SCIENCES
THE KNOW AND THE HOW

Field Chemical Characteristics for Water Samples

Job No: 210074	Date: 24/6/13	Sampled By: KK	Client: Port Phillip Council	Site: Gasworks Park

Sample No	Type + Depth	Container + Additive	Time	Water Level (m)	Stickup (m)	Volume Purged (L)	Temp C	pH	pe mV	Dissolved Oxygen ~~(ppm)~~	EC uScm^{-1}	Odour	Colour	Comments
				9.34		0				mg/L				
GW42	(D)		9:30	8.96		0	with pump in around 14m below TOC.							
			9:35	9.32		1	13.9	5.97	-136.2	3.82	23384	strong sulfuric	grey to black flecks	Start 1cpm
			9:46	9.88		3	16.2	5.59	-21.6	2.60	27,770	slight sulfuric		WL dropping rapidly @ 1cpm
		9:53	10:20	10.20		3.5	16.3	5.57	-30.7	2.91	27,861	mod sulfuric	turbid grey	WL continues to ↓
			10:00	10.53		4.0	16.2	5.56	-66.5	2.93	27,842	"	"	paused to check for recovery @ 10:01am @ 10.63m
	10:01→10:63		10:12	10.53										
			10:23	10.42	WL	slowly recovers when not pumped (slower than 1cpm)								
			10:24	resume		pumping @ 1cpm.								
			10.27	10.50		4.5	15.0	5.54	-67.4	3.15	27,043	slight sulfuric	turbid grey	
			10.31	10.74		5	16.2	5.54	-85.8	3.26	27,683	"	"	
			10.37	11.01		6	16.5	5.56	-109.7	3.24	27,679	"	"	
			10.41	11.17		6.5	16.5	5.55	-115.6	3.30	27,533			
			10:45	11.30		7	16.4	5.54	-120.6	3.32	27,504			
		after sampling	10:49	11.56		7.5	16.4	5.55	-130.6	3.36	27,858			
		← parameters stabilised	11:12	12.41		parameters stabilised - sampled @								11:52am

Key

Additives
W = no additives
X = conc. HNO_3
Y = NaOH
Z = $Na_2S_2O_3$

Type
SW = Surface water
SWC = Creek
SWP = Pond
SWD = Dam
SWL = Puddle
GW = Groundwater
GWA = Artesian
GWS = Sub-artesian

Sampling device
B = Bailer
P = Piston
S = Spring
SP = Submersible pump
GD = Gas drive
GL = Gas lift
SL = Suction lift
PD = Positive displacement
G = Grab

Sampling Container
PI = Polyethylene
G = Amber glass

Field Parameters
Field parameters will be measured ex-situ in in-line flow cells with the following stabilisation criteria
±10% DO when >1ppm (no criteria for<1ppm)
±10% Turbidity
±5% EC
±0.1 pH
±10mV ORP

The meter will be calibrated as needed (at least daily) and in accordance with the manufacturers specifications (i.e. at least 2 point calibration for pH, EC and DO)

Initial WL - 8.57
Depth - 10.06

GW22

ENVIRONMENTAL EARTH SCIENCES
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Field Chemical Characteristics for Water Samples

Job No: 210074	Date: 25.6.13	Sampled By: KK	Client: Port Phillip Council	Site: Gasworks Park

Sample No	Type + Depth	Container + Additive	Time	Water Level (m)	Stickup (m)	Volume Purged (L)	Temp C	pH	pe mV	Dissolved Oxygen (ppm)	EC uScm^{-1}	Odour	Colour	Comments
GW22			8:02	8.58										start 1 cpm
			8.04	8.61		0.5	14.6	6.48	83.3	1.71	2869	slight H/C	slightly grey turbid	
			8.15	8.64		1.5	15.9	6.42	84.2	2.14	1072	"	"	
			8:21	8.65		2.5	15.9	6.40	90.7	3.14	1109	"	"	conductivity bouncy around a lot
			8.29	8.69		3.2	16.4	6.35	98.4	3.63	864	"	"	parameters bouncing around a lot
			8:38	8.77		3.8	16.4	6.34	99.0	3.49	1157			
			paused			4.2	16.5	6.31	98.2	3.46	870			
				8.79	paused	@ 8:43 to monitor recovery								
			8:53	8.70	slow	recovery	indicated		start again @			8:56am		1cpm still
			8:57	8.73		4.5	15.8	6.30	92.2	3.53	863		cleaning	
			9.02	8.78		5	16.7	6.37	78.6	3.20	965		clear	
			9.05	8.82		5.3	16.4	6.34	78.0	3.36	896			
			9.09			5.6	16.5	6.30	79.7	3.36	982	sampled.		

Key

Additives
W = no additives
X = conc. HNO_3
Y = NaOH
Z = $Na_2S_2O_3$

Type
SW = Surface water
SWC = Creek
SWP = Pond
SWD = Dam
SWL = Puddle
GW = Groundwater
GWA = Artesian
GWS = Sub-artesian

Sampling device
B = Bailer
P = Piston
S = Spring
SP = Submersible pump
GD = Gas drive
GL = Gas lift
SL = Suction lift
PD = Positive displacement
G = Grab

Sampling Container
PI = Polyethylene
G = Amber glass

Field Parameters
Field parameters will be measured ex-situ in in-line flow cells with the following stabilisation criteria
±10% DO when >1ppm (no criteria for<1ppm)
±10% Turbidity
±5% EC
±0.1 pH
±10mV ORP

The meter will be calibrated as needed (at least daily) and in accordance with the manufacturers specifications (i.e. at least 2 point calibration for pH, EC and DO)

GW35 WL 6.967oc
depth 10.14m

ENVIRONMENTAL EARTH SCIENCES
THE KNOW AND THE HOW

Field Chemical Characteristics for Water Samples

Job No: 210774 | Date: 25/6/13 | Sampled By: KK | Client: City of Port Phillip | Site: Gasworks park

Sample No	Type + Depth	Container + Additive	Time	Water Level (m)	Stickup (m)	Volume Purged (L)	Temp C	pH	pe mV	Dissolved Oxygen (ppm)	EC uScm^{-1}	Odour	Colour	Comments
			10:26	6.95	= pump		start				-			1 cpm
			10:33			1	16.6	6.52	-76.5	1.70	18,808	turb	turbid yellow	
			10:39	7.03		1.5	17.1	6.56	-92.8	0.92	19013	slight/low	turbid, yellow	
			10:44	7.04		2	17.2	6.69	-99.6	1.64	13,310	"	"	
			10:50	7.03		2.5	17.1	6.75	-109.3	2.00	9,462	PAH	cleaning	2 cpm - wl stable
			10:56			3.0	17.6	6.92	-120.5	2.08	8,002	~~PAH~~	almost clear	
			11:00	7.05		4	17.6	7.01	-127.5	2.07	7,531	~~PAH~~	"	
			11:11	7.05		5.0	17.8	6.95	-123.5	2.07	7,778	PAH	clear	
			11:16	7.05		6.5	17.8	6.92	-122.2	2.12	7,754	"	"	
							parameters stabilised - sampled.							

Key	Additives	Type	Sampling device	Sampling Container	Field Parameters
	W = no additives X = conc. HNO_3 Y = NaOH Z = $Na_2S_2O_3$	SW = Surface water SWC = Creek SWP = Pond SWD = Dam SWL = Puddle GW = Groundwater GWA = Artesian GWS = Sub-artesian	B = Bailer P = Piston S = Spring SP = Submersible pump GD = Gas drive GL = Gas lift SL = Suction lift PD = Positive displacement G = Grab	PT = Polyethylene G = Amber glass	Field parameters will be measured ex-situ in in-line flow cells with the following stabilisation criteria ±10% DO when >1ppm (no criteria for<1ppm) ±10% Turbidity. ±5% EC ±0.1 pH ±10mV ORP The meter will be calibrated as needed (at least daily) and in accordance with the manufacturers specifications (i.e. at least 2 point calibration for pH, EC and DO)

DUP 2
SPLIT 2

GW28
WL 8.09
depth = 10.26m

Field Chemical Characteristics for Water Samples

ENVIRONMENTAL EARTH SCIENCES
THE KNOW AND THE HOW

Job No: 21007	Date: 25/6	Sampled By: KK	Client:	Site:

Sample No	Type + Depth	Container + Additive	Time	Water Level (m)	Stickup (m)	Volume Purged (L)	Temp C	pH	pe mV	Dissolved Oxygen (ppm)	EC uScm^{-1}	Odour	Colour	Comments
GW28			12:27	8.00		0	—							Start 3cpm
						0.5	18.4	7.01	-111.1	0.48	3250	slight/ none	clear	
			12.31	8.09		1	18.5	6.87	-110.7	0.23	1907			reduced to 2 cpm
			12:35	8.07		1.5	18.6	6.79	-110.7	0.23	2777	"	"	WL recovered slightly
			12:40	8.07		2	18.7	6.17	-86.4	0.92	1942			
			12:44			2.5	18.7	6.19	-88.8	1.46	2470			2 cpm
			12.50			3	18.7	6.00	-91.1	2.03	2186			
			12.56	8.09		3.5	18.8	5.97	-91.0	2.08	2266			
			1:03			4.2	18.9	5.88	-93.1	2.18	2041			
			1:08	8.09		4.5	18.9	5.83	-93.7	2.25	2468			
			1:15	8.09		5	18.9	5.65	-98.7	2.27	2158			
			1:20			5.5	18.8	5.67	-98.8	2.32	2182	— parameters stable — SAMPLED		
							DUP 2 & SPLIT 2							

Key	Additives	Type	Sampling device	Sampling Container	Field Parameters
	W = no additives X = conc. HNO_3 Y = NaOH Z = $Na_2S_2O_3$	SW = Surface water SWC = Creek SWP = Pond SWD = Dam SWL = Puddle GW = Groundwater GWA = Artesian GWS = Sub-artesian	B = Bailer P = Piston S = Spring SP = Submersible pump GD = Gas drive GL = Gas lift SL = Suction lift PD = Positive displacement G = Grab	PI = Polyethylene G = Amber glass	Field parameters will be measured ex-situ in in-line flow cells with the following stabilisation criteria ±10% DO when >1ppm (no criteria for<1ppm) ±10% Turbidity. ±5% EC ±0.1 pH ±10mV ORP The meter will be calibrated as needed (at least daily) and in accordance with the manufacturers specifications (i.e. at least 2 point calibration for pH, EC and DO)

GW44
Initial WL: 8.74
Depth 17.64 top casing

ENVIRONMENTAL EARTH SCIENCES
THE KNOW AND THE HOW

Field Chemical Characteristics for Water Samples

Job No: 210074	Date: 25/6/13	Sampled By: KK	Client: City of Port Phillip	Site: Gasworks Park

Sample No	Type + Depth	Container + Additive	Time	Water Level (m)	Stickup (m)	Volume Purged (L)	Temp C	pH	pe mV	Dissolved Oxygen (ppm)	EC uScm^{-1}	Odour	Colour	Comments
			2:58	8.48								strong PAH	strikes!	1 cpm - dropping
			3:04	8.70		1	17.6	6.23	-78.7	0.90	8983		dark black/ purple	
			3:10	8.83		1.5	17.6	5.95	-79.8	4.90	11649	very strong PAH	~~clear~~ ~~slightly~~ dark w black streaks	WL ↓
			3:20	8.92		2.5	17.8	5.39	-87.2	5.42	11,410			WL ↓
			2:27	8.93		3	17.9	5.37	-92.1	5.37	11,559	"	"	
			3:39	8.94		4	17.5	5.95	-95.3	5.29	12,401	"		
			3:47	8.96		4.5	17.5	5.98	-96.4	5.27	12,291	"	"	
			3:55	8.97			17.8	6.01	-97.0	5.26	12,426			
			3:59				17.7	6.01	-96.5	5.22	12,476	"	"	
					parameters stable.									

Key	Additives	Type	Sampling device	Sampling Container	Field Parameters
	W = no additives X = conc. HNO_3 Y = NaOH Z = $Na_2S_2O_3$	SW = Surface water SWC = Creek SWP = Pond SWD = Dam SWL = Puddle GW = Groundwater GWA = Artesian GWS = Sub-artesian	B = Bailer P = Piston S = Spring SP = Submersible pump GD = Gas drive GL = Gas lift SL = Suction lift PD = Positive displacement G = Grab	PI = Polyethylene G = Amber glass	Field parameters will be measured ex-situ in in-line flow cells with the following stabilisation criteria ±10% DO when >1ppm (no criteria for<1ppm) ±10% Turbidity ±5% EC ±0.1 pH ±10mV ORP The meter will be calibrated as needed (at least daily) and in accordance with the manufacturers specifications (i.e. at least 2 point calibration for pH, EC and DO)

GW08 = SWL: 8.06 TOC
TD: 9.325

ENVIRONMENTAL EARTH SCIENCES
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Field Chemical Characteristics for Water Samples

Job No: 210074	Date: 25/6/13	Sampled By: SFL	Client: CPP.	Site: 5th Melb Gasworks

Sample No	Type + Depth	Container + Additive	Time	Water Level (m)	Stickup (m)	Volume Purged (L)	Temp C	pH	pe mV	Dissolved Oxygen (ppm)	EC uScm^{-1}	Odour	Colour	Comments
GW08			3.22	8.08		0.5	17.9	6.49	-72.9	2.54	3555	slight PAH	slty grey	1cpm.
			3.27	8.10		1	19.0	5.90	-62.7	1.77	3553	"	"	
			3.32	8.11		1.5	19.0	5.78	-57.9	2.82	3548			
			3.37	8.105		2	19.0	5.72	-56.9	3.06	3530			
		3.42	3.42	8.10		2.5	18.7	5.74	-58.2	3.03	3524			
			3.46	8.10		3	18.8	5.75	-54.9	3.08	3561			
		3.50	4.00	8.10		3.5	18.9	5.71	-54.0	3.18	3523			
		354	4.04	8.10		4	18.7	5.71	-54.2	3.12	3532			Sampled, Stabilised (mp)

Key

Additives
W = no additives
X = conc. HNO_3
Y = NaOH
Z = $Na_2S_2O_3$

Type
SW = Surface water
SWC = Creek
SWP = Pond
SWD = Dam
SWL = Puddle
GW = Groundwater
GWA = Artesian
GWS = Sub-artesian

Sampling device
B = Bailer
P = Piston
S = Spring
SP = Submersible pump
GD = Gas drive
GL = Gas lift
SL = Suction lift
PD = Positive displacement
G = Grab

Sampling Container
PI = Polyethylene
G = Amber glass

Field Parameters
Field parameters will be measured ex-situ in in-line flow cells with the following stabilisation criteria
±10% DO when >1ppm (no criteria for<1ppm)
±10% Turbidity
±5% EC
±0.1 pH
±10mV ORP

The meter will be calibrated as needed (at least daily) and in accordance with the manufacturers specifications (i.e. at least 2 point calibration for pH, EC and DO)

GW1 = SWL 7.75
TD: 9.015

ENVIRONMENTAL EARTH SCIENCES
THE KNOW AND THE HOW

Field Chemical Characteristics for Water Samples

Job No: 210074 | Date: 25/3 | Sampled By: SRL | Client: CPP | Site: Sth Mellaire.

Sample No	Type + Depth	Container + Additive	Time	Water Level (m)	Stickup (m)	Volume Purged (L)	Temp C	pH	pe mV	Dissolved Oxygen (ppm)	EC uScm^{-1}	Odour	Colour	Comments
GW01			11.05	7.77		0.5	15.6	6.78	-139.8	1.80	6238	~~Nil~~	clear	2cpm.
			11.90	7.87		1	17.3	6.72	-150.6	0.37	6386	Slight PHH		1cpm
			11.15	7.95		1.5	17.1	6.60	-135.7	0.82	6395			
			11.20	7.97		2	17.1	6.57	-129.8	0.93	6415			
			11.25	7.98		2.5	17.1	6.55	-126.2	0.93	6345			
			11.30	7.98		3	17.3	6.55	-126.2	0.93	6325			
			11.34	8.00		3.5	17.5	6.58	-126.7	0.89	6231			
			11.38	8.00		4	17.2	6.58	-126.9	0.91	6167			
			11.42	8.01		4.5	17.4	6.60	-126.2	0.93	6124			Stabilised Sampled (MP)

Key

Additives
W = no additives
X = conc. HNO_3
Y = NaOH
Z = $Na_2S_2O_3$

Type
SW = Surface water
SWC = Creek
SWP = Pond
SWD = Dam
SWL = Puddle
GW = Groundwater
GWA = Artesian
GWS = Sub-artesian

Sampling device
B = Bailer
P = Piston
S = Spring
SP = Submersible pump
GD = Gas drive
GL = Gas lift
SL = Suction lift
PD = Positive displacement
G = Grab

Sampling Container
PI = Polyethylene
G = Amber glass

Field Parameters
Field parameters will be measured ex-situ in in-line flow cells with the following stabilisation criteria
±10% DO when >1ppm (no criteria for<1ppm)
±10% Turbidity
±5% EC
±0.1 pH
±10mV ORP

The meter will be calibrated as needed (at least daily) and in accordance with the manufacturers specifications (i.e. at least 2 point calibration for pH, EC and DO)

GW20 - dry 8.16 GW04 - 8.62

ENVIRONMENTAL EARTH SCIENCES
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Field Chemical Characteristics for Water Samples

Job No: 210074	Date: 25/6	Sampled By: SFL	Client: CAP	Site:

Sample No	Type + Depth	Container + Additive	Time	Water Level (m)	Stickup (m)	Volume Purged (L)	Temp C	pH	pe mV	Dissolved Oxygen (ppm)	EC uScm^{-1}	Odour	Colour	Comments
GW20														DRY.
GW40			9.20	7.85		0.5	16.4	7.15	147.6	2.54	6866	NO		SWL: 7.80 TD: 10.225
			9.23	7.91		1	17.6	6.69	177.2	0.83	7039	NO	turbid yellow	2cpm. WL dropping (7.98)
			9.28	7.93		1.5	17.6	6.61	180.2	0.49	6993	"	"	1cpm
			9.33	7.87		2	17.6	6.64	181.3	0.79	6865			
			9.38	7.88		2.5	17.6	6.52	183.3	0.67	7021			
			9.43	7.90		3	17.5	6.21	239.4	3.75	7332			
			9.49	7.90		3.5	17.9	5.25	240.1	3.89	7284			
			9.53	7.90		4	18.0	5.24	239.2	3.82	7335			Sampled (MP)

Key

Additives
W = no additives
X = conc. HNO_3
Y = NaOH
Z = $Na_2S_2O_3$

Type
SW = Surface water
SWC = Creek
SWP = Pond
SWD = Dam
SWL = Puddle
GW = Groundwater
GWA = Artesian
GWS = Sub-artesian

Sampling device
B = Bailer
P = Piston
S = Spring
SP = Submersible pump
GD = Gas drive
GL = Gas lift
SL = Suction lift
PD = Positive displacement
G = Grab

Sampling Container
PI = Polyethylene
G = Amber glass

Field Parameters
Field parameters will be measured ex-situ in in-line flow cells with the following stabilisation criteria
±10% DO when >1ppm (no criteria for<1ppm)
±10% Turbidity
±5% EC
±0.1 pH
±10mV ORP

The meter will be calibrated as needed (at least daily) and in accordance with the manufacturers specifications (i.e. at least 2 point calibration for pH, EC and DO)

GW37 SWL: 8.18 mTOC TD: 10.275 mTOC

GW24 - near bin.
GW36 - behind gate.
GW34 - behind shed in property boundary.

ENVIRONMENTAL EARTH SCIENCES
THE KNOW AND THE HOW

Field Chemical Characteristics for Water Samples

Job No: 210574	Date: 26/8	Sampled By: SFL	Client: CAP	Site:

Sample No	Type + Depth	Container + Additive	Time	Water Level (m)	Stickup (m)	Volume Purged (L)	Temp C	pH	pe mV	Dissolved Oxygen (ppm)	EC uScm^{-1}	Odour	Colour	Comments
GW37			8.08	8.245		4	14.7	6.73	-102.2	2.81	2786	PAH	slt grey	2 cpm
			8.12	8.265	1.5	2	17.0	6.67	-119.7	0.32	3277			
			8.16	8.26		2	17.8	6.68	-135.8	0.57	3114			
			8.22	8.26		3	18	6.68	-136.8	0.76	3114			
			8.27	8.27		4	18.1	6.69	-139.2	0.92	3143			
			8.31	8.27		4.5	18.3	6.69	-140.9	0.90	3140			
			8.35	8.27		5	18.3	6.69	~~-138.1~~ -141.1	0.90	3058			
			8.39	8.27		5.5	18.2	6.69	-142.3	0.93	3087			stabilised, sampled (mp)
														Samples sent 26/8 (AM)
								✓	✓	✓	✓			

Key

Additives
W = no additives
X = conc. HNO_3
Y = NaOH
Z = $Na_2S_2O_3$

Type
SW = Surface water
SWC = Creek
SWP = Pond
SWD = Dam
SWL = Puddle
GW = Groundwater
GWA = Artesian
GWS = Sub-artesian

Sampling device
B = Bailer
P = Piston
S = Spring
SP = Submersible pump
GD = Gas drive
GL = Gas lift
SL = Suction lift
PD = Positive displacement
G = Grab

Sampling Container
PI = Polyethylene
G = Amber glass

Field Parameters
Field parameters will be measured ex-situ in in-line flow cells with the following stabilisation criteria
±10% DO when >1ppm (no criteria for<1ppm)
±10% Turbidity
±5% EC
±0.1 pH
±10mV ORP

The meter will be calibrated as needed (at least daily) and in accordance with the manufacturers specifications (i.e. at least 2 point calibration for pH, EC and DO)

GW30: SWL: 8.98 TOC
TD: 10.565 TOC

ENVIRONMENTAL EARTH SCIENCES
THE KNOW AND THE HOW

Field Chemical Characteristics for Water Samples

Job No: 210074 | Date: 26/6/13 | Sampled By: SFL | Client: CPP | Site: SMG.

Sample No	Type + Depth	Container + Additive	Time	Water Level (m)	Stickup (m)	Volume Purged (L)	Temp C	pH	pe mV	Dissolved Oxygen (ppm)	EC uScm^{-1}	Odour	Colour	Comments
GW30			10.42	9.04		0.5	15.1	6.94	-30.2	2.22	4919	Cloudy grey	PAH/sewer	2 cpm
			10.47	9.09		1.5	16.9	6.73	-29.3	0.68	4990	"	"	
			10.54	9.09		3	17.1	6.75	-54.3	0.83	4863	"	"	
			10.59	9.09		3.5	17.2	6.74	-58.3	0.82	4798	"	"	
			11.04	9.09		4	17.2	6.74	-64.7	0.91	4746	"	"	
			11.08	9.09		4.5	17.1	6.74	-69.2	0.98	4698	"	"	
			11.12	9.09		5	17.2	6.74	-67.1	0.97	4702	"	"	Stabilised, sampled (mp)

Key

Additives
W = no additives
X = conc. HNO_3
Y = NaOH
Z = $Na_2S_2O_3$

Type
SW = Surface water
SWC = Creek
SWP = Pond
SWD = Dam
SWL = Puddle
GW = Groundwater
GWA = Artesian
GWS = Sub-artesian

Sampling device
B = Bailer
P = Piston
S = Spring
SP = Submersible pump
GD = Gas drive
GL = Gas lift
SL = Suction lift
PD = Positive displacement
G = Grab

Sampling Container
PI = Polyethylene
G = Amber glass

Field Parameters
Field parameters will be measured ex-situ in in-line flow cells with the following stabilisation criteria
±10% DO when >1ppm (no criteria for<1ppm)
±10% Turbidity
±5% EC
±0.1 pH
±10mV ORP

The meter will be calibrated as needed (at least daily) and in accordance with the manufacturers specifications (i.e. at least 2 point calibration for pH, EC and DO)

8.60

GW29: SWL: 8.575 TOC
TD: 11.63

ENVIRONMENTAL EARTH SCIENCES
THE KNOW AND THE HOW

Field Chemical Characteristics for Water Samples

Job No: 20074	Date: 26/6/13	Sampled By: SFL	Client: CPP	Site: SMG.

Sample No	Type + Depth	Container + Additive	Time	Water Level (m)	Stickup (m)	Volume Purged (L)	Temp C	pH	pe mV	Dissolved Oxygen (ppm)	EC uScm^{-1}	Odour	Colour	Comments
GW29			1210	8.60		0.5	17.7	7.10	46.6	1.27	2886	nil	clear.	3cpm
			12.15	8.60		2	18.7	6.86	22.1	0.32	3231	"	"	
			1220	8.60		3	18.7	6.85	25.5	0.51	3285			
			1225	8.61		4	18.8	6.85	24.4	0.48	3307			
			1230	8.61		5	18.8	6.84	21.8	0.59	3325			
			1235	8.61		6	18.6	6.84	20.8	0.79	3327			stabilised, Sampled (MP)

Key

Additives
W = no additives
X = conc. HNO_3
Y = NaOH
Z = $Na_2S_2O_3$

Type
SW = Surface water
SWC = Creek
SWP = Pond
SWD = Dam
SWL = Puddle
GW = Groundwater
GWA = Artesian
GWS = Sub-artesian

Sampling device
B = Bailer
P = Piston
S = Spring
SP = Submersible pump
GD = Gas drive
GL = Gas lift
SL = Suction lift
PD = Positive displacement
G = Grab

Sampling Container
PI = Polyethylene
G = Amber glass

Field Parameters
Field parameters will be measured ex-situ in in-line flow cells with the following stabilisation criteria
±10% DO when >1ppm (no criteria for<1ppm)
±10% Turbidity
±5% EC
±0.1 pH
±10mV ORP

The meter will be calibrated as needed (at least daily) and in accordance with the manufacturers specifications (i.e. at least 2 point calibration for pH, EC and DO)

GW26 SWL: 7.656 TOC TD: 11.675 TOC

ENVIRONMENTAL EARTH SCIENCES
THE KNOW AND THE HOW

Field Chemical Characteristics for Water Samples

Job No: 210674	Date: 26/6/13	Sampled By: SEL	Client: CPP	Site: SMG

Sample No	Type + Depth	Container + Additive	Time	Water Level (m)	Stickup (m)	Volume Purged (L)	Temp C	pH	pe mV	Dissolved Oxygen (ppm)	EC uScm^{-1}	Odour	Colour	Comments
GW26			2.54	7.745		1	18.2	6.68	-37.7	0.48	4130	PAH/sewer	silty grey	3 cpm
			2.59	7.82		2	18.4	6.65	-37.3	0.29	3907			2 cpm
			3.04	7.87		3	18.2	6.65	-38.1	0.65	3752			
			3.09	7.88		4	18.2	6.65	-38.8	0.63	3714			
			3.14	7.88		5	18.4	6.64	-40.1	0.74	3608			
			3.19	7.92		6	18.4	6.66	-40.9	0.86	3563			
			3.23	7.92		7	18.3	6.66	-40.6	0.88	3476			
			3.27	7.92		8	18.3	6.66	-40.8	0.91	3499			Stabilised Stopped
			3.30	7.92		9	18.4	6.66	-40.8	0.89	3487			

Key

Additives
W = no additives
X = conc. HNO_3
Y = NaOH
Z = $Na_2S_2O_3$

Type
SW = Surface water
SWC = Creek
SWP = Pond
SWD = Dam
SWL = Puddle
GW = Groundwater
GWA = Artesian
GWS = Sub-artesian

Sampling device
B = Bailer
P = Piston
S = Spring
SP = Submersible pump
GD = Gas drive
GL = Gas lift
SL = Suction lift
PD = Positive displacement
G = Grab

Sampling Container
PI = Polyethylene
G = Amber glass

Field Parameters
Field parameters will be measured ex-situ in in-line flow cells with the following stabilisation criteria
±10% DO when >1ppm (no criteria for<1ppm)
±10% Turbidity
±5% EC
±0.1 pH
±10mV ORP

The meter will be calibrated as needed (at least daily) and in accordance with the manufacturers specifications (i.e. at least 2 point calibration for pH, EC and DO)

GW34 SWL - 7.68 TOC
TO - 1030 TOC

ENVIRONMENTAL EARTH SCIENCES
THE KNOW AND THE HOW

Field Chemical Characteristics for Water Samples

Job No: 21004	Date: 27/6	Sampled By: SFL	Client: CPP	Site: SHG

Sample No	Type + Depth	Container + Additive	Time	Water Level (m)	Stickup (m)	Volume Purged (L)	Temp C	pH	pe mV	Dissolved Oxygen (ppm)	EC uScm^{-1}	Odour	Colour	Comments
GW34			8.27	7.83		0.5	16.8	6.94	-163.0	0.65	6181	Sewerage	dark purple/black	2 Lpm.
			8.32	7.93		1	17.8	6.91	-176.5	0.28	6298	"	"	
			8.37	7.91		2	18.1	6.89	-183.5	0.10	6354	"	Clearing	
			8.42	7.96		2.5	17.3	6.89	-186.1	0.99	6259			1 Lpm.
			8.47	7.96		3	16.9	6.80	-179.3	0.95	6272			
			8.52	7.96		3.5	16.9	6.85	-172.1	0.96	6435			
			8.57	7.96		4	16.9	6.85	-177.5	0.94	6481			
			9.00	7.96		4.5	17.0	6.85	-178.2	0.94	6456			stabilised, Sampled. (mp)

Key

Additives
W = no additives
X = conc. HNO_3
Y = NaOH
Z = $Na_2S_2O_3$

Type
SW = Surface water
SWC = Creek
SWP = Pond
SWD = Dam
SWL = Puddle
GW = Groundwater
GWA = Artesian
GWS = Sub-artesian

Sampling device
B = Bailer
P = Piston
S = Spring
SP = Submersible pump
GD = Gas drive
GL = Gas lift
SL = Suction lift
PD = Positive displacement
G = Grab

Sampling Container
PI = Polyethylene
G = Amber glass

Field Parameters
Field parameters will be measured ex-situ in in-line flow cells with the following stabilisation criteria
±10% DO when >1ppm (no criteria for<1ppm)
±10% Turbidity
±5% EC
±0.1 pH
±10mV ORP

The meter will be calibrated as needed (at least daily) and in accordance with the manufacturers specifications (i.e. at least 2 point calibration for pH, EC and DO)

SWL: 7.49 TOC

GW31 TD: 10.505 TOC

ENVIRONMENTAL EARTH SCIENCES
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Field Chemical Characteristics for Water Samples

Job No: 210014	Date: 27/6	Sampled By: SFL	Client: CPP	Site: South melb Gasworks.

Sample No	Type + Depth	Container + Additive	Time	Water Level (m)	Stickup (m)	Volume Purged (L)	Temp C	pH	pe mV	Dissolved Oxygen (ppm)	EC uScm^{-1}	Odour	Colour	Comments
GW3			10.26	7.50		0.5	17.0	7.62	-105.5	2.40	3401	burnt/sewer	silty grey/br	Iron
			10.31	7.52		1.	17.6	7.25	-127.0	1.30	4021			
			10.36	7.57		1.5	18.3	7.20	-133.8	0.63	3935			
			10.41	7.57		2	18.3	7.20	-135.5	0.47	3842			
			10.46	7.57		2.5	18.1	7.20	-118.6	0.51	3682			
			10.51	7.57		3	18.0	7.20	-113.9	0.63	3667			
			10.56	7.57		3.5	17.8	7.20	-113.7	0.59	3670			
			11.00	7.57		4	17.9	7.20	-112.9	0.53	3633			Stabilised, Sampled. MP

Key

Additives
W = no additives
X = conc. HNO_3
Y = NaOH
Z = $Na_2S_2O_3$

Type
SW = Surface water
SWC = Creek
SWP = Pond
SWD = Dam
SWL = Puddle
GW = Groundwater
GWA = Artesian
GWS = Sub-artesian

Sampling device
B = Bailer
P = Piston
S = Spring
SP = Submersible pump
GD = Gas drive
GL = Gas lift
SL = Suction lift
PD = Positive displacement
G = Grab

Sampling Container
PI = Polyethylene
G = Amber glass

Field Parameters
Field parameters will be measured ex-situ in in-line flow cells with the following stabilisation criteria
±10% DO when >1ppm (no criteria for<1ppm)
±10% Turbidity
±5% EC
±0.1 pH
±10mV ORP

The meter will be calibrated as needed (at least daily) and in accordance with the manufacturers specifications (i.e. at least 2 point calibration for pH, EC and DO)

GW10 SWL: 8.30 toc
TD: 9.785

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Field Chemical Characteristics for Water Samples

Job No: 240514	Date: 27/6	Sampled By: SEL	Client: CRP	Site: SMG

Sample No	Type + Depth	Container + Additive	Time	Water Level (m)	Stickup (m)	Volume Purged (L)	Temp C	pH	pe mV	Dissolved Oxygen (ppm)	EC uScm^{-1}	Odour	Colour	Comments
GW10			12.25	8.315		0.5	18.5	7.49	20.2	3.88	797	PAH	Silty yellow	2cpm Fresh water? Maybe leaking water pipe?
			12.30	8.38		1.5	18.9	5.19	177.1	0.42	754	〃	〃	
			12.35	8.40		2	19.0	5.15	179.9	0.54	752	〃	〃	Change to 1cpm
			12.40	8.40		2.5	18.9	5.07	181.7	0.77	751			
			12.45	8.40		3.5	19.0	5.09	181.3	0.94	751			
			12.49	8.40		4	19.7	5.09	182.4	0.63	752			
			12.53	8.40		4.5	19.2	5.07	181.2	0.96	749			
			12.57	8.40		5	19.1	5.07	181.3	0.98	749			Stabilised, Sampled (mp)
							✓	✓	✓	✓	✓			

Key

Additives
W = no additives
X = conc. HNO_3
Y = NaOH
Z = $Na_2S_2O_3$

Type
SW = Surface water
SWC = Creek
SWP = Pond
SWD = Dam
SWL = Puddle
GW = Groundwater
GWA = Artesian
GWS = Sub-artesian

Sampling device
B = Bailer
P = Piston
S = Spring
SP = Submersible pump
GD = Gas drive
GL = Gas lift
SL = Suction lift
PD = Positive displacement
G = Grab

Sampling Container
Pl = Polyethylene
G = Amber glass

Field Parameters
Field parameters will be measured ex-situ in in-line flow cells with the following stabilisation criteria
±10% DO when >1ppm (no criteria for<1ppm)
±10% Turbidity
±5% EC
±0.1 pH
±10mV ORP

The meter will be calibrated as needed (at least daily) and in accordance with the manufacturers specifications (i.e. at least 2 point calibration for pH, EC and DO)

GW25 SWL: 7.965TOC
TD: 10.17 TOC

ENVIRONMENTAL EARTH SCIENCES
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Field Chemical Characteristics for Water Samples

Job No: 210074	Date: 27/6/13	Sampled By: SFL	Client: CPP	Site: GW25

Sample No	Type + Depth	Container + Additive	Time	Water Level (m)	Stickup (m)	Volume Purged (L)	Temp C	pH	pe mV	Dissolved Oxygen (ppm)	EC uScm^{-1}	Odour	Colour	Comments
GW25			2.52	~~2.588~~ 8.08		0.5	18.2	6.63	-0.3	1.63	536	slight sewer	Clear slight yellow	2cpm.
			2.58	~~8.11~~		1.5	18.6	6.46	20.1	0.35	541	"	"	→ fresh H_2O again ∴ low EC.
			3.02	8.19		~~2.5~~	18.7	6.44	20.9	0.31	541	"	"	Change to 1 cpm
			3.07	8.16		~~3.53~~	18.2	6.45	23.5	0.53	534	"	"	
			3.12	8.10		3.5	18.1	6.48	20.7	0.75	530	"	"	
			3.17	8.10		4	18.1	6.49	22.4	0.88	528	"	"	
			~~3.~~ 22	8.10		45	17.9	6.49	28.1	0.60	531	"	"	
			3.27	8.10		5	17.8	6.49	25.5	0.78	524	"	"	Stabilised Sampled (WP)

Key

Additives
W = no additives
X = conc. HNO_3
Y = NaOH
Z = $Na_2S_2O_3$

Type
SW = Surface water
SWC = Creek
SWP = Pond
SWD = Dam
SWL = Puddle
GW = Groundwater
GWA = Artesian
GWS = Sub-artesian

Sampling device
B = Bailer
P = Piston
S = Spring
SP = Submersible pump
GD = Gas drive
GL = Gas lift
SL = Suction lift
PD = Positive displacement
G = Grab

Sampling Container
PI = Polyethylene
G = Amber glass

Field Parameters
Field parameters will be measured ex-situ in in-line flow cells with the following stabilisation criteria
±10% DO when >1ppm (no criteria for<1ppm)
±10% Turbidity
±5% EC
±0.1 pH
±10mV ORP

The meter will be calibrated as needed (at least daily) and in accordance with the manufacturers specifications (i.e. at least 2 point calibration for pH, EC and DO)

NO NAPL
(bailed 0.5m of water after WL)

GW06
Initial WL: 6.87
depth: 9.65

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Field Chemical Characteristics for Water Samples

Job No: 2w074	Date: 26/6/13	Sampled By: KC	Client: Port Phillip Council	Site: Gasworks Park

Sample No	Type + Depth	Container + Additive	Time	Water Level (m)	Stickup (m)	Volume Purged (L)	Temp C	pH	pe mV	Dissolved Oxygen (ppm)	EC uScm^{-1}	Odour	Colour	Comments
			2:54	6.88		0.5	17.3	6.50	-12.0	2.07	1568		yellow turbid	start on 1cpm
			3:05	6.90		1.0	18.2	6.35	46.2	0.66	1667	slight		inc to 2cpm to check if it can hold.
			3:10	6.94		1.5	18.7	6.44	53.1	0.14	1667		"	
			3:15	6.95		2.0	18.7	6.52	50.4	1.44	1639	none		
			3:20	6.95		2.5	18.7	6.54	48.7	1.68	1607			
			3:23			3	18.7	6.57	49.0	1.74	1593		yl.	
			3:28	6.97		3.5	18.8	6.48	51.0	1.82	1598			
			3:33	6.97		4	18.8	6.48	52.1	1.90	1599			
			3:35	parameters stabilised - sampled.										

Key	Additives	Type	Sampling device	Sampling Container	Field Parameters
	W = no additives X = conc. HNO_3 Y = NaOH Z = $Na_2S_2O_3$	SW = Surface water SWC = Creek SWP = Pond SWD = Dam SWL = Puddle GW = Groundwater GWA = Artesian GWS = Sub-artesian	B = Bailer P = Piston S = Spring SP = Submersible pump GD = Gas drive GL = Gas lift SL = Suction lift PD = Positive displacement G = Grab	PI = Polyethylene G = Amber glass	Field parameters will be measured ex-situ in in-line flow cells with the following stabilisation criteria ±10% DO when >1ppm (no criteria for<1ppm) ±10% Turbidity ±5% EC ±0.1 pH ±10mV ORP The meter will be calibrated as needed (at least daily) and in accordance with the manufacturers specifications (i.e. at least 2 point calibration for pH, EC and DO)

GW 33
initial WL - 7.45
depth - 10.13

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Field Chemical Characteristics for Water Samples

Job No: 210074	Date: 27.6.13	Sampled By: KK	Client: Port Phillip Council	Site: Gasworks Park

Sample No	Type + Depth	Container + Additive	Time	Water Level (m)	Stickup (m)	Volume Purged (L)	Temp C	pH	pe mV	Dissolved Oxygen (ppm)	EC uScm^{-1}	Odour	Colour	Comments
			8:33	7.45	—	—	—							2cpm start.
			8:36	7.49		0.5	16.4	6.57	2.3	0.91	19401	slight	slightly cloudy	
			8:41	7.53		1	17.4	6.87	-30.0	0.31	19,730	"	"	WL slowly ↓ but ok.
			8:49	7.56		2.5	17.7	6.64	5.3	0.72	9311	"	cloudy	
			8:54	7.57		3.5	18.0	6.56	20.1	1.24	6912	"	"	
			9:02	7:58		4	18.0	6.57	22.3	1.54	6504	"	"	
			9.09	7.61		4.5	18.1	6.49	21.0	1.64	6889	"	"	
			9:12			4.1	18.1	6.50	18.7	1.68	6289			
						params stable - SAMPLED								

Key

Additives
W = no additives
X = conc. HNO_3
Y = NaOH
Z = $Na_2S_2O_3$

Type
SW = Surface water
SWC = Creek
SWP = Pond
SWD = Dam
SWL = Puddle
GW = Groundwater
GWA = Artesian
GWS = Sub-artesian

Sampling device
B = Bailer
P = Piston
S = Spring
SP = Submersible pump
GD = Gas drive
GL = Gas lift
SL = Suction lift
PD = Positive displacement
G = Grab

Sampling Container
PI = Polyethylene
G = Amber glass

Field Parameters
Field parameters will be measured ex-situ in in-line flow cells with the following stabilisation criteria
±10% DO when >1ppm (no criteria for<1ppm)
±10% Turbidity.
±5% EC
±0.1 pH
±10mV ORP

The meter will be calibrated as needed (at least daily) and in accordance with the manufacturers specifications (i.e. at least 2 point calibration for pH, EC and DO)

GW32
initial depth WL - 7.675
Depth - 10.44

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Field Chemical Characteristics for Water Samples

Job No: 210074	Date: 27.6.13	Sampled By: KK	Client: PPCC	Site: Gasworks Park

Sample No	Type + Depth	Container + Additive	Time	Water Level (m)	Stickup (m)	Volume Purged (L)	Temp C	pH	pe mV	Dissolved Oxygen (ppm)	EC uScm^{-1}	Odour	Colour	Comments
			10:30	7.59		0	—							start 1 lpm
			10:33			0.5	15.5	7.32	-43.0	1.91	1557	strong	cloudy yl red	
			10:35	7.67		0.7	16.8	7.39	-113.2	0.36	1540	strong PAH/HC	turbid yl-red.	
			10:47	7.77		1.5	17.3	7.43	-147.2	0.26	2026	"	"	WL ↓ ≈ 1 lpm
			10:55	7.83		2.1	17.6	7.31	-133.0	0.57	1548	"	clearing	"
			11:08	7.90		3	17.6	7.25	-122.9	1.03	1489	"	"	
			11:13			3.5	17.7	7.20	-115.7	1.23	1381			
			11:22	8.0		3.8	17.7	7.14	-106.7	1.26	1481	strong.	clear	WL ↓
			11:31	8.06		4.3	17.7	7.06	-93.0	1.33	1499			
			11:40			5	17.7	7.02	-89.6	1.39	1448			
					parameters	stabilised	-	sampled.						

Key

Additives
W = no additives
X = conc. HNO_3
Y = NaOH
Z = $Na_2S_2O_3$

Type
SW = Surface water
SWC = Creek
SWP = Pond
SWD = Dam
SWL = Puddle
GW = Groundwater
GWA = Artesian
GWS = Sub-artesian

Sampling device
B = Bailer
P = Piston
S = Spring
SP = Submersible pump
GD = Gas drive
GL = Gas lift
SL = Suction lift
PD = Positive displacement
G = Grab

Sampling Container
PI = Polyethylene
G = Amber glass

Field Parameters
Field parameters will be measured ex-situ in in-line flow cells with the following stabilisation criteria
±10% DO when >1ppm (no criteria for<1ppm)
±10% Turbidity
±5% EC
±0.1 pH
±10mV ORP

The meter will be calibrated as needed (at least daily) and in accordance with the manufacturers specifications (i.e. at least 2 point calibration for pH, EC and DO)

GW36
Initial WL 7.02
depth: 10.38

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Field Chemical Characteristics for Water Samples

Job No: 210074	Date: 27.6.13	Sampled By: KK	Client: PPCC	Site: Gasworks Park

Sample No	Type + Depth	Container + Additive	Time	Water Level (m)	Stickup (m)	Volume Purged (L)	Temp C	pH	pe mV	Dissolved Oxygen (ppm)	EC uScm^{-1}	Odour	Colour	Comments
			12:39	7.0	12:	47	-	7.02						Start 2 cpm
			12.48	7.05		0.5	16.2	6.91	-72.3	1.66	5634	moderate	clear, slight sheen	
			12:56	7.10		1.0	17.5	6.83	-59.7	0.36	3716	"	cloudy	
			1:02	7.17		1.5	17.5	6.81	-57.5	0.74	4154	"		↓ to 1 cpm
			1:08	7.10		2	17.1	6.81	-55.2	1.40	4507	"	"	WL ↑ once reduced cpm.
			1:15	7.10		2.5	17.1	6.80	-47.5	1.65	4519	~~slight~~	cloudy, no sheen	
			1:25	7.10		3	17.2	6.79	-47.5	1.69	4566			WL stable
			1:36	7.10		3.5	17.2	6.82	-47.6	1.71	4662			
						parameters stable - sampled								

Key

Additives
W = no additives
X = conc. HNO_3
Y = NaOH
Z = $Na_2S_2O_3$

Type
SW = Surface water
SWC = Creek
SWP = Pond
SWD = Dam
SWL = Puddle
GW = Groundwater
GWA = Artesian
GWS = Sub-artesian

Sampling device
B = Bailer
P = Piston
S = Spring
SP = Submersible pump
GD = Gas drive
GL = Gas lift
SL = Suction lift
PD = Positive displacement
G = Grab

Sampling Container
PI = Polyethylene
G = Amber glass

Field Parameters
Field parameters will be measured ex-situ in in-line flow cells with the following stabilisation criteria
±10% DO when >1ppm (no criteria for<1ppm)
±10% Turbidity
±5% EC
±0.1 pH
±10mV ORP

The meter will be calibrated as needed (at least daily) and in accordance with the manufacturers specifications (i.e. at least 2 point calibration for pH, EC and DO)

GW15
WL 9.085m
Depth 12.50

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Field Chemical Characteristics for Water Samples

Job No: 210074 | Date: 27.6.13 | Sampled By: RK | Client: APPCC | Site: Gasworks Park

Sample No	Type + Depth	Container + Additive	Time	Water Level (m)	Stickup (m)	Volume Purged (L)	Temp C	pH	pe mV	Dissolved Oxygen (ppm)	EC uScm^{-1}	Odour	Colour	Comments
			3:01	9.07		0	—							start 1 cpm
			3:15										red floc highly sedimented	
			3:25	9.18		1.5	18.0	5.46	142.3	1.60	634	slight	turbid red	
			3:37	9.23		2.5	18.0	5.55	145.7	1.96	697	"	clearing up	
			3:43	9.25		2.8	18.0	5.57	143.6	2.17	632	slight - none	slightly turbid generally clear	
			3:57	9.27		3.5	18.0	5.65	135.8	1.98	673		clearing	
			4:01	9.29		4.0	18.0	5.66	136.4	1.91	698			
			4:13	9:31		4.5	18.0	5.64	133.0	1.81	627		clear	
						parameters stabilised - sampled.								

Key	Additives	Type	Sampling device	Sampling Container	Field Parameters
	W = no additives X = conc. HNO_3 Y = NaOH Z = $Na_2S_2O_3$	SW = Surface water SWC = Creek SWP = Pond SWD = Dam SWL = Puddle GW = Groundwater GWA = Artesian GWS = Sub-artesian	B = Bailer P = Piston S = Spring SP = Submersible pump GD = Gas drive GL = Gas lift SL = Suction lift PD = Positive displacement G = Grab	PJ = Polyethylene G = Amber glass	Field parameters will be measured ex-situ in in-line flow cells with the following stabilisation criteria ±10% DO when >1ppm (no criteria for<1ppm) ±10% Turbidity ±5% EC ±0.1 pH ±10mV ORP The meter will be calibrated as needed (at least daily) and in accordance with the manufacturers specifications (i.e. at least 2 point calibration for pH, EC and DO)

GW07

Initial WL 7.825 (no NAPL on IP)

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Field Chemical Characteristics for Water Samples

Job No: 200874 | Date: 26/6/13 | Sampled By: KLC | Client: Port Phillip Council | Site: Gasworks Park

Sample No	Type + Depth	Container + Additive	Time	Water Level (m)	Stickup (m)	Volume Purged (L)	Temp C	pH	pe mV	Dissolved Oxygen (ppm)	EC uScm^{-1}	Odour	Colour	Comments
GW07			dredi	in		bailer		for	NAPL	64	sampling	setup		
			8:07	7.81		0			start	8:11 am				start @ 1 lpm
			8:17	7.85		0.5	15.6	6.99	-14.6	0.54	2328	HC plastic	grey, turbid	
			8:26	7.87		1.0	16.5	7.01	-51.9	1.05	2118	" strong	"	
			8:34	7.88		1.8	16.7	7.01	-42.1	1.84	2403	"	"	
			8:39			2	16.7	7.00	-39.4	1.97	2166	"	slightly grey turb.+	ok on 1 lpm
			8:52			3.2	17.1	7.02	-50.3	1.96	2319			
			8:57	7.88		3.5	17.0	7.01	-54.8	1.99	2148			
			9:05	7.90		4	17.2	6.99	-59.6	1.96	2257	parameters stabilised - SAMPLED		

Key

Additives
W = no additives
X = conc. HNO_3
Y = NaOH
Z = $Na_2S_2O_3$

Type
SW = Surface water
SWC = Creek
SWP = Pond
SWD = Dam
SWL = Puddle
GW = Groundwater
GWA = Artesian
GWS = Sub-artesian

Sampling device
B = Bailer
P = Piston
S = Spring
SP = Submersible pump
GD = Gas drive
GL = Gas lift
SL = Suction lift
PD = Positive displacement
G = Grab

Sampling Container
PI = Polyethylene
G = Amber glass

Field Parameters
Field parameters will be measured ex-situ in in-line flow cells with the following stabilisation criteria
±10% DO when >1ppm (no criteria for<1ppm)
±10% Turbidity
±5% EC
±0.1 pH
±10mV ORP

The meter will be calibrated as needed (at least daily) and in accordance with the manufacturers specifications (i.e. at least 2 point calibration for pH, EC and DO)

GW09

WL 8.93m.
Depth 10.06m

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Field Chemical Characteristics for Water Samples

Job No: 210074	Date: 26.6.13	Sampled By: KK	Client: Port Phillip Council	Site: Gasworks Park

Sample No	Type + Depth	Container + Additive	Time	Water Level (m)	Stickup (m)	Volume Purged (L)	Temp C	pH	pe mV	Dissolved Oxygen (ppm)	EC uScm^{-1}	Odour	Colour	Comments
GW09			11:58	8.90	—	—								
			12:01	8.90		0.8	17.7	5.92	65.7	1.53	841	Slight / none	slightly turbid - grey/cloudy. 1 cpm.	
			12:13	8.93		2	18.3	5.78	100.2	1.34	812			
			12:24			2.5	18.6	5.86	111.0	1.84	808	"	cloudy yl-gy.	
			12:36	9.05		3.5	18.5	5.85	114.5	2.10	791	"	"	
			12:47	9.07		4.2	18.6	5.84	114.7	2.35	787		clear	
			12:58	9.09		4.7	18.5	5.83	114.0	2.46	786	parameters stabilised - SAMPLED.		

Key	Additives	Type	Sampling device	Sampling Container	Field Parameters
	W = no additives X = conc. HNO_3 Y = NaOH Z = $Na_2S_2O_3$	SW = Surface water SWC = Creek SWP = Pond SWD = Dam SWL = Puddle GW = Groundwater GWA = Artesian GWS = Sub-artesian	B = Bailer P = Piston S = Spring SP = Submersible pump GD = Gas drive GL = Gas lift SL = Suction lift PD = Positive displacement G = Grab	PI = Polyethylene G = Amber glass	Field parameters will be measured ex-situ in in-line flow cells with the following stabilisation criteria ±10% DO when >1ppm (no criteria for<1ppm) ±10% Turbidity. ±5% EC ±0.1 pH ±10mV ORP The meter will be calibrated as needed (at least daily) and in accordance with the manufacturers specifications (i.e. at least 2 point calibration for pH, EC and DO)

SWL: 9.02 TOC in pump.

SWL: 9.06
TD: 10.05

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THE KNOW AND THE HOW

Field Chemical Characteristics for Water Samples

Job No: 210074 | Date: 24/6 | Sampled By: SFL. | Client: City of Port Phillip | Site: South Melbourne Gasworks.

Sample No	Type + Depth	Container + Additive	Time	Water Level (m)	Stickup (m)	Volume Purged (L)	Temp C	pH	pe mV	Dissolved Oxygen (ppm)	EC uScm^{-1}	Odour	Colour	Comments
GW23				9.12		1	15.1	7.28	-41.5	9.85	12.5	Peppery	cloudy/orange	started on 1cpm - not enough
						5	15.8	6.84	-85.1	3.08	1628			Late 1dam. Purged ≈1.5L
				10.34		10	16.0	6.86	-98.0	3.74	1604			Bailed dry ≈ 10L
				2.45									SWL: 9.07 TOC	
	Came back to bail sample					1L	16.8	6.88	-42.9	2.88	3670			sampled (B)

Key	Additives	Type	Sampling device	Sampling Container	Field Parameters
	W = no additives X = conc. HNO_3 Y = NaOH Z = $Na_2S_2O_3$	SW = Surface water SWC = Creek SWP = Pond SWD = Dam SWL = Puddle GW = Groundwater GWA = Artesian GWS = Sub-artesian	B = Bailer P = Piston S = Spring SP = Submersible pump GD = Gas drive GL = Gas lift SL = Suction lift PD = Positive displacement G = Grab	PI = Polyethylene G = Amber glass	Field parameters will be measured ex-situ in in-line flow cells with the following stabilisation criteria ±10% DO when >1ppm (no criteria for<1ppm) ±10% Turbidity ±5% EC ±0.1 pH ±10mV ORP The meter will be calibrated as needed (at least daily) and in accordance with the manufacturers specifications (i.e. at least 2 point calibration for pH, EC and DO)

GW18 = SWL = 9.285 TOC
TD = 10.14 TOC

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Field Chemical Characteristics for Water Samples

Job No:	Date:	Sampled By:	Client:	Site:

Sample No	Type + Depth	Container + Additive	Time	Water Level (m)	Stickup (m)	Volume Purged (L)	Temp C	pH	pe mV	Dissolved Oxygen (ppm)	EC uScm^{-1}	Odour	Colour	Comments
GW18				9.285		1L	15.8	6.70	194.5	2.90	21645	Nil	slight yellow	less than 1m water column, historically dry. Bailed dry.
			8:45	~~9.285~~		5L	12.2	6.80	158.8	3.27	22343	"	Turbid orange	
				9.285			Left	10	Recover					
			12.39	~~9.289~~		1L	18.0	~~6.89~~	-13.1	3.56	23231			Sampled (B)

Key

Additives
W = no additives
X = conc. HNO_3
Y = NaOH
Z = $Na_2S_2O_3$

Type
SW = Surface water
SWC = Creek
SWP = Pond
SWD = Dam
SWL = Puddle
GW = Groundwater
GWA = Artesian
GWS = Sub-artesian

Sampling device
B = Bailer
P = Piston
S = Spring
SP = Submersible pump
GD = Gas drive
GL = Gas lift
SL = Suction lift
PD = Positive displacement
G = Grab

Sampling Container
PI = Polyethylene
G = Amber glass

Field Parameters
Field parameters will be measured ex-situ in in-line flow cells with the following stabilisation criteria
±10% DO when >1ppm (no criteria for<1ppm)
±10% Turbidity
±5% EC
±0.1 pH
±10mV ORP

The meter will be calibrated as needed (at least daily) and in accordance with the manufacturers specifications (i.e. at least 2 point calibration for pH, EC and DO)

GW02 SWL: 8.275
TD 8.72

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Field Chemical Characteristics for Water Samples

Job No: 21074	Date: 25/6	Sampled By: SFL	Client:	Site:

Sample No	Type + Depth	Container + Additive	Time	Water Level (m)	Stickup (m)	Volume Purged (L)	Temp C	pH	pe mV	Dissolved Oxygen (ppm)	EC uScm^{-1}	Odour	Colour	Comments
GW02			2.56			1L	17.8	6.73	-70.6	2.55	6996	PAH	silty grey.	Baired Dry. 2L
	26/6/13			8.285		0.5	16.4	6.61	-58.1	3.67	5558			Sampled 26/6/13 (B).
26/6/13				GW24		SFL/KK.								SWL: 9.06 toc
GW24				9.16		1L	16.9	7.18	42.1	2.51	6565	PAH(Stony)	brown.	TD: 10.05 toc
				~~4.55~~		4L	17.8	7.10	38.2	3.13	6712	"		Baired 26/6
				4.5		6	17.5	~~7~~ 7.08	40.6	3.45	6664	"		
			4.30			10	15.9	7.~~19~~	40.7	~~4~~ 3.91	6544	"		WL: 9.89 toc
		27/6/13	7.30	9.14		1L	15.6	7.24	37.8	3.97	6430	phenol odour		Sampled (B)

Key

Additives
W = no additives
X = conc. HNO_3
Y = NaOH
Z = $Na_2S_2O_3$

Type
SW = Surface water
SWC = Creek
SWP = Pond
SWD = Dam
SWL = Puddle
GW = Groundwater
GWA = Artesian
GWS = Sub-artesian

Sampling device
B = Bailer
P = Piston
S = Spring
SP = Submersible pump
GD = Gas drive
GL = Gas lift
SL = Suction lift
PD = Positive displacement
G = Grab

Sampling Container
PI = Polyethylene
G = Amber glass

Field Parameters
Field parameters will be measured ex-situ in in-line flow cells with the following stabilisation criteria
±10% DO when >1ppm (no criteria for<1ppm)
±10% Turbidity
±5% EC
±0.1 pH
±10mV ORP

The meter will be calibrated as needed (at least daily) and in accordance with the manufacturers specifications (i.e. at least 2 point calibration for pH, EC and DO)

GW05 : SWL: 8.24 toc.
TD: 8.865 toc

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Field Chemical Characteristics for Water Samples

Job No: 210074	Date:	Sampled By:	Client:	Site:

Sample No	Type + Depth	Container + Additive	Time	Water Level (m)	Stickup (m)	Volume Purged (L)	Temp C	pH	pe mV	Dissolved Oxygen (ppm)	EC uScm^{-1}	Odour	Colour	Comments
GW05			11.59			0.5	19.3	6.74	-61.6	2.57	4998	PAH	Slty brown	Baled dry.
			12.03			1.5L								Dry
			4.25pm 8.24											Not enough water to collect water chemistry parameters.
														Sampled, (BS)

Key	Additives	Type	Sampling device	Sampling Container
	W = no additives X = conc. HNO_3 Y = NaOH Z = $Na_2S_2O_3$	SW = Surface water SWC = Creek SWP = Pond SWD = Dam SWL = Puddle GW = Groundwater GWA = Artesian GWS = Sub-artesian	B = Bailer P = Piston S = Spring SP = Submersible pump GD = Gas drive GL = Gas lift SL = Suction lift PD = Positive displacement G = Grab	PI = Polyethylene G = Amber glass

Field Parameters
Field parameters will be measured ex-situ in in-line flow cells with the following stabilisation criteria
±10% DO when >1ppm (no criteria for<1ppm)
±10% Turbidity
±5% EC
±0.1 pH
±10mV ORP

The meter will be calibrated as needed (at least daily) and in accordance with the manufacturers specifications (i.e. at least 2 point calibration for pH, EC and DO)

BAILED

GW38
initial WL → 9.10
Depth → 10.05.

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Field Chemical Characteristics for Water Samples

Job No: 210074 | Date: 26/6/13 | Sampled By: KL | Client: Port Phillip Council | Site: Gasworks Parks

Sample No	Type + Depth	Container + Additive	Time	Water Level (m)	Stickup (m)	Volume Purged (L)	Temp C	pH	pe mV	Dissolved Oxygen (ppm)	EC uScm^{-1}	Odour	Colour	Comments
			Based on previous data, this bore dried recover well ∴ will bail											
			10:47			1	16.5	6.44	-76.1	1.66	4391	strong HC/PAH	dark grey turbid	strong odour
			10.50	9.33		1.8	16.7	6.54	-66.2	1.16	4445	"	"	
			10:55	9.27		~~2~~	~~16.7~~	~~6.52~~	~~-62.7~~	~~2.58~~	~~3904~~	~~strong~~		very slow recovery.
			11:00			3	16.7	6.52	-62.7	2.58	3904			
			11:02	9.57		4	17.4	6.42	-56.7	2.57	4337			
			11:07			5	16.7	6.39	-54.7	2.48	4554			
						6	17.0	6.37	-54.5	3.15	3797			
				9.72		6.8	17.2	6.94	-56.0	5.85	4394			- rested, recharging a bit
			11.23	9.90		9.5	17.4	6.18	-46.5	6.07	4357			
				left to recover										
			12:30	9.12	-	sampled @				12:35pm.				

Key

Additives
W = no additives
X = conc. HNO_3
Y = NaOH
Z = $Na_2S_2O_3$

Type
SW = Surface water
SWC = Creek
SWP = Pond
SWD = Dam
SWL = Puddle
GW = Groundwater
GWA = Artesian
GWS = Sub-artesian

Sampling device
B = Bailer
P = Piston
S = Spring
SP = Submersible pump
GD = Gas drive
GL = Gas lift
SL = Suction lift
PD = Positive displacement
G = Grab

Sampling Container
PI = Polyethylene
G = Amber glass

Field Parameters
Field parameters will be measured ex-situ in in-line flow cells with the following stabilisation criteria
±10% DO when >1ppm (no criteria for<1ppm)
±10% Turbidity
±5% EC
±0.1 pH
±10mV ORP

The meter will be calibrated as needed (at least daily) and in accordance with the manufacturers specifications (i.e. at least 2 point calibration for pH, EC and DO)

GW19 initial WL 7.845m TOC
depth 9.93

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Field Chemical Characteristics for Water Samples

Job No: 21004	Date: 24/6/13	Sampled By: KIC	Client: COPP	Site: S. Melbourne

Sample No	Type + Depth	Container + Additive	Time	Water Level (m)	Stickup (m)	Volume Purged (L)	Temp C	pH	pe mV	Dissolved Oxygen (ppm)	EC uScm^{-1}	Odour	Colour	Comments
			3:11	7.84		0	~~15.1~~	~~6.12~~	~~-61.3~~	~~3.95~~	~~2648~~		yellow turbid HC/PAH	1 cpm start.
			3:15	7.89		1	15.1	6.12	-61.3	3.95	2648		↓HC/PAH	up to 2cpm
			3:20	7.92		2	16.3	6.08	-47.3	1.20	2702	HC/PAH	yellow turbid	
			3:24	7.94		3.5	16.4	6.05	-44.6	1.73	2709	"	"	
			3:32	7.97		3.2	16.4	6.02	-43.6	2.55	2849	"	"	
			3:43	7.98		4.2	16.4	6.04	-46.3	2.90	3309			
			3:48	7.98		4.7	16.4	6.04	-48.8	2.98	3394		clearing slightly - yellow	
			3:53	7.98		5.2	16.4	6.05	-49.0	3.06	3543			
					parameters stabilised - sampled @ 3:55pm									

Key	Additives	Type	Sampling device	Sampling Container	Field Parameters
	W = no additives X = conc. HNO_3 Y = NaOH Z = $Na_2S_2O_3$	SW = Surface water SWC = Creek SWP = Pond SWD = Dam SWL = Puddle GW = Groundwater GWA = Artesian GWS = Sub-artesian	B = Bailer P = Piston S = Spring SP = Submersible pump GD = Gas drive GL = Gas lift SL = Suction lift PD = Positive displacement G = Grab	PI = Polyethylene G = Amber glass	Field parameters will be measured ex-situ in in-line flow cells with the following stabilisation criteria ±10% DO when >1ppm (no criteria for<1ppm) ±10% Turbidity ±5% EC ±0.1 pH ±10mV ORP The meter will be calibrated as needed (at least daily) and in accordance with the manufacturers specifications (i.e. at least 2 point calibration for pH, EC and DO)

APPENDIX B WASTE TRANSPORT CERTIFICATE

ENVIRONMENT PROTECTION AUTHORITY
WASTE TRANSPORT CERTIFICATE

1050060

EPA VICTORIA
Regulatory Programs Unit
GPO BOX 4395
MELBOURNE 3001

PART A
To be completed by the Producer of the Waste.

1. Name of Waste Producer: ENVIRONMENTAL + EARTH SCIENCES
Address of Site of Waste Source: 21 GRAHAM ST
ALBERT PARK Postcode: 3206
Name of Emergency Contact: REGIN ORQUIZA Phone: 0348885933

2. Proposed Disposal/Treatment/Storage Site: CHEMSAL State: V.I.C

3. Intended Disposal Route – Recycling ☐ Storage ☑ Landfill ☐ Incineration ☐ Energy Recovery ☐ Immobilisation ☐ Chem/Phys Treatment ☐ Biodegradation ☐ Other ☐

4. Description of Waste: CONTAMINATED WATER

5. Waste Code No. (List 1): 4 J120 Hazard Category (List 2): ☐ Contaminants (List 3): Waste Origin (List 4): 2922

U.N. Number: 3077 Class: N.O.S. Packing Group: III Bulk/No. of Packages: 1

Amount of Waste: kilograms or cubic metres or 500 litres

I declare that to the best of my knowledge and belief the above information is true and correct.

Name and Position: REGIN ORQUIZA ENGINEER

Signature ..... Date: 02/07/13

PLEASE USE BLOCK LETTERS

PART B
To be completed by the Waste Transporter.

6. Name of Transporter: CHEMSAL
Address: 83 DOHERTYS RD LAVERTON NORTH
Vehicle No. 1 Registration: ZJ9407 Transport Permit No.: 71481 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: 02/07/13

PART C
To be completed by the Depot Receiving Waste.

7. Name of Disposal/Treatment/Storage Facility: CHEMSAL Licence No.: 9738
Address: A DIVISION OF DOLOMATRIX AUST. LTD 83 DOHERTYS RD LAVERTON NTH 3025 Type of Treatment (List 5): D15

8. Amount of Waste: kilograms or cubic metres or 500 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: DAVID DILBER
Signature ..... Date: 02/07/13

EPA-F012

COPY 2 — TO BE RETAINED BY THE PERSON/COMPANY WHO COMPLETED PART A

COPY 2

APPENDIX C QUALITY ASSURANCE AND QUALITY CONTROL PROCEDURES

ANALYTICAL DATA VALIDATION

Specific elements relating to the data validation of the groundwater sampling data that have been checked and assessed for this project were:

- preservation and storage of samples upon collection and during transport to the laboratory in order to maintain sample integrity in accordance with AS4482.1-2005 (Standards Australia, 2005) and Victorian EPA Industrial Waste Resource Guidelines 2009 - "S*ampling and analysis of waters, wastewaters, soils and wastes*";
- calibration of field equipment(refer to Attachment C1);
- sample holding times to maintain sample integrity in accordance with AS4482.1-2005 (Standards Australia, 2005);
- use of appropriate analytical procedures in accordance with National Association of Testing Authorities (NATA);
- required limits of reporting to be below applied guideline concentrations;
- frequency of conducting quality control measurements as defined in AS4482.1-2005 (Standards Australia, 2005), National Environment Protection Measure (NEPM 1999) – "*Guideline on data collection, sample design and reporting*" and Victorian EPA Industrial Waste Resource Guidelines 2009 - "S*ampling and analysis of waters, wastewaters, soils and wastes*";
- laboratory blank results which enable the measurement of incidental or accidental contamination within the laboratory;
- matrix spike recovery results in order to assess the effects of the sample matrix on the precision and accuracy of the analyses. The desired matrix spike recovery range is between 60% - 140%;
- surrogate spike results in order to assess the accuracy of organic analyses that involve chromatographic techniques. The desired surrogate recovery range is between 60% - 140%;
- intra laboratory duplicate results to assess the combined precision of sampling, sample preparation and analysis AS4482.1-2005 (Standards Australia, 2005);
- inter laboratory duplicate results to assess the accuracy of the data generated by the primary laboratory in accordance with AS4482.1-2005 (Standards Australia, 2005);
- field equipment blanks and trip blank to be collected where applicable, to ensure that no cross contamination occurs during sampling and transit; and
- the occurrence of apparently unusual or anomalous results, e.g. laboratory results that appear to be inconsistent with field observations or measurements.

The following sections summarise the specific analytical data quality elements that were checked and assessed for this project.

1.1 Development of Data Quality Objectives

Development of data quality objectives (DQOs) for each project is a requirement of the National environment protection (assessment of site contamination) measure (NEPC 1999). This is based on a DQO process formulated by the USEPA for contaminated land assessment and remediation. This has not been formally adopted by the EPA Victoria or the contaminated land industry, however, it provides sound guidance for a consistent approach in understanding site assessment and remediation and based on the DQO's the following measurement data quality indicators (MDQIS) is provided in Table 1 below.

TABLE 1 MEASUREMENT DATA QUALITY INDICATORS (MDQIS)

Parameter	Procedure	Minimum Frequency	Criteria	
			(5 to 10x LOR)	>10x LOR
Precision	Field Duplicates	1 in 20 - metals	<80 RPD	<50 RPD
		1 in 20 - semi-volatiles	<100 RPD	<80 RPD
		1 in 20 - volatiles	<150 RPD	<130 RPD
	Lab Replicate*	1 in 20	<50 RPD	<30 RPD
Accuracy	Reference Material	1 in 10	60% to 140%R	80% to 120%R
	Matrix spikes			
	Surrogate spikes			
Representativeness	Reagent Blanks	1 per batch	No detection	
	Holding Times*	Every sample	-	
Blanks	Trip Blank	1 per batch	No detection	
	Rinsate Blanks			
Sensitivity	Limit of Reporting	Every sample	LOR < ½ site criteria	

Notes:
1. RPD – relative percentage difference
2. %R – percent recovery

It should be noted that Standards Australia (AS4482.1) specify that typical MDQIs for precision should be ≤50% RPD, however also acknowledge that low concentrations and organic compounds in particular can be acceptably outside this range. As the standard suggests, an RPD of >50% has been used as a 'trigger' and values above this level of repeatability have also been noted and explained.

1.2 Collection, preservation, transportation and storage of samples

Samples were collected, preserved and transported by Environmental Earth Sciences field staff and are considered to be representative of the groundwater conditions encountered during the investigation. This sampling program was performed in accordance with AS4482.1-2005 (Standards Australia, 2005) and under chain of custody protocols. Copies of the chain of custody documentation can be found within Appendix D of the report.

1.3 Calibration of field equipment

The calibration of the water quality kit was undertaken on a daily basis throughout the groundwater sampling. The calibration records can be found within Attachment C1.

1.4 Holding Times

Analysed samples were extracted and analysed within acceptable holding times as defined in Australian Standard (AS 4482.1), 2005, *Guide to the Sampling and Investigation of Potentially Contaminated Soil, Part 1: Non-volatile and Semi-volatile Compounds* and Victorian EPA Industrial Waste Resource Guidelines 2009 - "*Sampling and analysis of waters, wastewaters, soils and wastes*" with the exception of pH and dissolved oxygen in selected groundwater samples which are not considered to be a chemical of concern and the measured field parameters can be used to validate the lab results and vice versa.

Refer to Attachment C2 for the sample receipt notification.

1.5 Laboratories and Analytical Procedures

The laboratories used NATA accredited methods for the analyses undertaken and the methods utilised are described in the laboratory reports (Appendix D).

Primary samples collected were sent to ALS Environmental Laboratory and secondary samples were sent to Eurofins/MGT Laboratory.

1.6 Required Limits of Reporting

Acceptable limits of reporting (LOR) were mostly provided by the analytical laboratory to allow the results to be compared against the groundwater investigation levels with the exception of selenium that was considered not a chemical of concern.

1.7 Laboratory Method Blanks

Reported results for laboratory method blank samples were lower than laboratory LORs.

1.8 Laboratory Duplicates

Laboratory duplicate results can be found in the analytical laboratory reports. The Relative Percent Difference (RPD) between analytical results for primary samples and their corresponding laboratory soil and groundwater duplicates were generally within acceptable limits of 0-30%. As such, the results obtained are considered to be reliable and acceptable.

1.9 Matrix Spike Recoveries

The matrix spike recovery results can be found in the analytical laboratory reports. Matrix spike recoveries were generally within the laboratory DQO ranges with the exception of at least one as not determined (where the background level greater than or equal to 4x spike level) or low recovery (where the recovery is less than the lower data quality objective) for each batch of report for one or more of the following analytes (total cyanide, sulphate, ammonia, chloride, manganese). However, as the majority of the matrix spike recoveries (over 90%) were within the laboratory DQO ranges with only few of the analytes were reported with either not determined or low limit, therefore matrix spike recoveries can still be considered acceptable.

1.10 Laboratory Spike Recoveries

The surrogate spike recovery results can be found in the analytical laboratory reports and generally ranged within the DQO with the exception of few total cyanide results, which could be due to sample interference.

1.11 Groundwater Duplicate and Triplicate Samples

Two duplicate and three triplicate samples were collected during the groundwater sampling program. Duplicate and triplicate samples were collected at the required frequency of 1 groundwater duplicate sample per 20 primary samples for groundwater (5%). RPD calculations for the duplicate and triplicate samples and their corresponding primary samples are presented within the attached **Table C1**.

It is noted that duplicate 2 and split 2 were not analysed for ammonia and sulphate as it was overlooked during the preparation of CoC but the remainder of the analytes can be considered sufficient for the purpose of quality assurance/quality control.

The RPDs between the primary samples and their corresponding duplicate samples were assessed against Environmental Earth Sciences' Measurement Data quality Indicators (Table 1), although RPDs greater than 50% were also examined as suggested by AS4482.1.

Calculated RPDs between the primary sample and their corresponding duplicate and triplicate samples were generally within the acceptable limits specified in our MQDI with the exception of copper concentrations between GW43 and DUP1 which could be due to laboratory sample preparation and ammonia between GW43 and Split 1(refer to **Table C3**, bold and highlights RPD's) which could be due to difference in analytical methods (primary sample by discrete analyzer and split sample by flow injection analysis) and

Those other anlytes (refer to **Table C3**, bold RPD's) reported above 50% could be generally due to low levels detected (<10 x LOR). Hence, based on the general data set, the results can be considered reliable.

1.12 Equipment Rinsate and Trip Blanks

1.12.1 Groundwater Sampling Program

Four equipment rinsate blanks were collected as part of the groundwater sampling program to ensure cross contamination between samples was not occurring due to insufficient decontamination of equipment used. The results of the equipment rinsate blanks are presented in **Table C4**.

The equipment rinsate blank results reported chemical concentrations below the LOR with the exception of RIN3. The silica gel clean up and re-analysis was undertaken on RIN 3 and the results indicated that 100% of previously identified TPH compounds were confirmed to be from primarily natural organic influences such as humic and fluvic acids rather than attributed to true petroleum hydrocarbons.

The RIN3 was collected out of the interface meter upon completion of monitoring well GW38 where elevated TRH fractions were reported and then followed by the sampling of monitoring well GW09. Although TRH fractions were reported at RIN3, based on the results of monitoring well GW09, it was confirmed that it was not contaminated due to potential insufficient decontamination process.

Overall, it can be considered that the decontamination procedures applied for this groundwater sampling event were sufficient and appropriate even with the minor detection of TRH fractions at RIN3.

Eight trip blanks were collected as part of the groundwater sampling program to confirm that cross contamination did not occur during transit of samples. The results of the trip blanks are presented in **Table C4**.

The trip blank results reported chemical concentrations below the LOR, which indicates that no potential cross contamination occurred during the transit.

1.13 Occurrence of Anomalous Results

Upon review of the QAQC data, minor exceedences of the groundwater samples were noted and some analytes were reported outside the holding times (pH), which was not considered to be a concern. Few total cyanide results exceeded the surrogate spike recovery limits which could be due to sample interference.

TPH concentrations were reported from rinsate water RIN3. However, silica gel clean up and re-analysis was undertaken on RIN 3 and the results indicated that 100% of previously identified TPH compounds were confirmed to be from primarily natural organic influences such as humic and fluvic acids. Although TRH fractions were reported at RIN3, based on the results of monitoring well GW09, it was confirmed that it was not contaminated due to potential insufficient decontamination process.

1.14 Overall Assessment of Data Quality

The general “rule of thumb” is that, one duplicate and split sample should be taken for every 20 samples taken (5%). An assessment of the groundwater data indicated that two duplicate and two triplicate samples were collected with only 33 water samples being analysed. This indicates that the QAQC samples were collected at an appropriate rate.

Most of the RPD calculations are considered to be within acceptable limits and the data set is also considered to be reliable with few exceedences. On the basis of the analytical data validation procedures employed and interpretation provided above, the overall quality of the analytical data produced is considered to be of an acceptable standard for interpretative use.

ATTACHMENT C1 CALIBRATION RECORDS

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Equipment Calibration Record – Hanna Multi

This equipment calibration record is to be stored in your job folder

Equipment Type: Hanna Multimeter HI 9828

Equipment Number: Hired from arimet. x2

Date Calibrated: 25/6/13

Calibrated By: SFL/KK. (name)

Job Number: 210074.

Details of Calibration:

Temperature:	4	°C
pH at 4.01 Reading:	4.0	
pH at 7.01 Reading (or 6.88):	7.09	
ORP in Redox solution (240 mV):	240~	(mV) (irregular readings)
Conductivity in 2.76 mS/cm:	1900	mS/cm
Conductivity in 12.88 mS/cm:	900	mS/cm
Dissolved Oxygen in 0.00 ppm in Sodium sulfate:	0	%
Dissolved Oxygen 100% Air Saturation:	—	%

ENVIRONMENTAL EARTH SCIENCES
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Equipment Calibration Record – Hanna Multi

This equipment calibration record is to be stored in your job folder

Equipment Type: Hanna Multimeter HI 9828

Equipment Number: Hired from aimer x2

Date Calibrated: 26/6/13

Calibrated By: SFL/KK. (name)

Job Number: 210074

Details of Calibration:

Temperature:	4	°C
pH at 4.01 Reading:	4	
pH at 7.01 Reading (or 6.88):	7.09	
ORP in Redox solution (240 mV):	240~ (irregular readings)	mV)
Conductivity in 2.76 mS/cm:	1900	mS/cm
Conductivity in 12.88 mS/cm:	9.00	mS/cm
Dissolved Oxygen in 0.00 ppm in Sodium sulfate:	0	%
Dissolved Oxygen 100% Air Saturation:	/	%

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Equipment Calibration Record – Hanna Multi

This equipment calibration record is to be stored in your job folder

Equipment Type: Hanna Multimeter HI 9828

Equipment Number: Hired from airnet.

Date Calibrated: 27/6/13.

Calibrated By: SEL/HC (name)

Job Number: 40074.

Details of Calibration:

Temperature: 4 °C

pH at 4.01 Reading: 4

pH at 7.01 Reading (or 6.88): 7.09

ORP in Redox solution (240 mV): ~~20~~ — (mV)

Conductivity in 2.76 mS/cm: 1900 mS/cm

Conductivity in 12.88 mS/cm: 9.00 mS/cm

Dissolved Oxygen in 0.00 ppm in Sodium sulfate: 0 %

Dissolved Oxygen 100% Air Saturation: — %

Multi Parameter Water Meter

Instrument **YSI Quatro Pro Plus**
Serial No. **11K101256**

airmet
Air-Met Scientific Pty Ltd
1300 137 067

Item	Test	Pass	Comments
Battery	Charge Condition	✓	
	Fuses	✓	
	Capacity	✓	
Switch/keypad	Operation	✓	
Display	Intensity	✓	
	Operation (segments)	✓	
Grill Filter	Condition	✓	
	Seal	✓	
PCB	Condition	✓	
Connectors	Condition	✓	
Sensor	1. pH	✓	
	2. mV	✓	
	3. EC	✓	
	4. D.O	✓	
	5. Temp	✓	
Alarms	Beeper		
	Settings		
Software	Version		
Data logger	Operation		
Download	Operation		
Other tests:			

Certificate of Calibration

This is to certify that the above instrument has been calibrated to the following specifications:

Sensor	Serial no	Standard Solutions	Certified	Solution Bottle Number	Instrument Reading
1. pH 7.00		pH 7.00		JH1866	pH 7.00
2. pH 4.00		pH 4.00		KD1211	pH 4.00
3. mV		231.14 mV		KD2047/2022	231.14 mV
4. EC		2.76 mS		JL2250	2.76 mS
6. D.O		0 ppm		CSI0715	0 ppm
7. Temp		20.3 oC		MultiTherm	20.3 oC

Calibrated by: **Peter McColl**

Calibration date: **17-Jun-13**

Next calibration due: **14-Dec-13**

Multi Parameter Water Meter

Instrument YSI Quatro Pro Plus
Serial No. 11K101257

airmet
Air-Met Scientific Pty Ltd
1300 137 067

Item	Test	Pass	Comments
Battery	Charge Condition	✓	
	Fuses	✓	
	Capacity	✓	
Switch/keypad	Operation	✓	
Display	Intensity	✓	
	Operation (segments)	✓	
Grill Filter	Condition	✓	
	Seal	✓	
PCB	Condition	✓	
Connectors	Condition	✓	
Sensor	1. pH	✓	
	2. mV	✓	
	3. EC	✓	
	4. D.O	✓	
	5. Temp	✓	
Alarms	Beeper		
	Settings		
Software	Version		
Data logger	Operation		
Download	Operation		
Other tests:			

Certificate of Calibration

This is to certify that the above instrument has been calibrated to the following specifications:

Sensor	Serial no	Standard Solutions	Certified	Solution Bottle Number	Instrument Reading
1. pH 7.00		pH 7.00		JH1866	pH 7.00
2. pH 4.00		pH 4.00		KD1211	pH 4.00
3. mV		235.98mV		KD1151/1152	235.98mV
4. EC		2.76 mS		JL2250	2.76 mS
6. D.O		0 ppm		CS10715	0 ppm
7. Temp		19.1 oC		MultiTherm	19.1 oC

Calibrated by: **Yu Che**

Calibration date: **17-Jun-13**

Next calibration due: **14-Dec-13**

Oil / Water Interface Meter

airmet

Air-Met Scientific Pty Ltd
1300 137 067

Instrument **Interface Meter (30M)**
Serial No. **211087**

Item	Test	Pass	Comments
Battery	Compartment	✓	
	Capacity	✓	
	above 7.9V		
Probe	Cleaned/Decon.	✓	
	Operation	✓	
Connectors	Condition	✓	
		✓	
Tape Check	Cleaned	✓	
Connectors	Checked for cuts	✓	
Instrument Test	At surface level	✓	

Certificate of Calibration

This is to certify that the above instrument has been cleaned and tested.

Tested by: **Louis Chen**

Test date: **17/06/2013**

Next Test due: **16/08/2013**

Oil / Water Interface Meter

Instrument **Interface Meter (50M)**
Serial No. **122 007854-1**

airmet
Air-Met Scientific Pty Ltd
1300 137 067

Item	Test	Pass	Comments
Battery	Compartment	✓	
	Capacity	✓	
	above 7.9V		
Probe	Cleaned/Decon.	✓	
	Operation	✓	
Connectors	Condition	✓	
		✓	
Tape Check	Cleaned	✓	
Connectors	Checked for cuts	✓	
Instrument Test	At surface level	✓	

Certificate of Calibration

This is to certify that the above instrument has been cleaned and tested.

Tested by: **Peter McColl**

Test date: **19/06/2013**

Next Test due: **18/08/2013**

ATTACHMENT C2 SAMPLE RECEIPT NOTIFICATION

Environmental Division

SAMPLE RECEIPT NOTIFICATION (SRN)

Comprehensive Report

Work Order	: **EM1306677**		
Client	: **ENVIRONMENTAL EARTH SCIENCES**	Laboratory	: Environmental Division Melbourne
Contact	: MR REGIN ORQUIZA	Contact	: Carol Walsh
Address	: P.O.BOX 2253 FOOTSCRAY VIC, AUSTRALIA 3011	Address	: 4 Westall Rd Springvale VIC Australia 3171
E-mail	: rorquiza@environmentalearthsciences.com	E-mail	: carol.walsh@alsglobal.com
Telephone	: +61 03 96871666	Telephone	: +61-3-8549 9608
Facsimile	: +61 03 96871844	Facsimile	: +61-3-8549 9601
Project	: 210074 Sth Melbourne Gasworks	Page	: 1 of 3
Order number	: ----		
C-O-C number	: ----	Quote number	: EM2013ENVEAR0231 (ME/330/13)
Site	: ----		
Sampler	: SFL/KK	QC Level	: NEPM 1999 Schedule B(3) and ALS QCS3 requirement

Dates

Date Samples Received	: 24-JUN-2013	Issue Date	: 25-JUN-2013 18:15
Client Requested Due Date	: 02-JUL-2013	Scheduled Reporting Date	: **02-JUL-2013**

Delivery Details

Mode of Delivery	: Carrier	Temperature	: 4.5-7.0 - Ice present
No. of coolers/boxes	: 2	No. of samples received	: 9
Security Seal	: N/A	No. of samples analysed	: 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
- **Samples received in appropriately pretreated and preserved containers.**
- **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.**
- **Please direct any queries related to sample condition / numbering / breakages to Peter Ravlic.**
- **Analytical work for this work order will be conducted at ALS Springvale.**
- Sample Disposal - Aqueous (14 days), Solid (60 days) from date of completion of work order.

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 neccessary 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.
If no sampling time is provided, the sampling time will default to 15:00 on the date of sampling. If no sampling date is provided, the sampling date will be assumed by the laboratory for processing purposes and will be shown bracketed without a time component.

Matrix: **WATER**

Laboratory sample ID	Client sampling date / time	Client sample ID	WATER - ED041G Sulfate (Turbidimetric) as SO4 2 by Discrete	WATER - EES Ionic Balance EES Ionic Balance	WATER - EG020F Dissolved Metals by ICPMS	WATER - EK026SF Total Cyanide by Segmented Flow Analyser	WATER - EK055G Ammonia as N By Discrete Analyser	WATER - EK055G-NH4 Ammonium as N	WATER - EP071SG TPH Silica Gel Clean Up	WATER - EP074 (water) Volatile Organic Compounds
EM1306677-001	24-JUN-2013 15:00	GW43		✓	✓	✓		✓		✓
EM1306677-002	24-JUN-2013 15:00	DUP1	✓		✓	✓	✓			✓
EM1306677-003	24-JUN-2013 15:00	GW39		✓	✓	✓		✓	✓	✓
EM1306677-004	24-JUN-2013 15:00	GW42D		✓	✓	✓		✓	✓	✓
EM1306677-005	24-JUN-2013 15:00	GW41		✓	✓	✓		✓		✓
EM1306677-006	24-JUN-2013 15:00	GW23		✓	✓	✓		✓	✓	✓
EM1306677-007	24-JUN-2013 15:00	GW19		✓	✓	✓		✓	✓	✓
EM1306677-008	24-JUN-2013 15:00	Rinsate 1								✓
EM1306677-009	24-JUN-2013 15:00	Trip 1								✓

Matrix: **WATER**

Laboratory sample ID	Client sampling date / time	Client sample ID	WATER - EP074A VOC - MAH's	WATER - TPH TPH (fractions)
EM1306677-001	24-JUN-2013 15:00	GW43	✓	✓
EM1306677-002	24-JUN-2013 15:00	DUP1	✓	✓
EM1306677-003	24-JUN-2013 15:00	GW39	✓	✓
EM1306677-004	24-JUN-2013 15:00	GW42D	✓	✓
EM1306677-005	24-JUN-2013 15:00	GW41	✓	✓
EM1306677-006	24-JUN-2013 15:00	GW23	✓	✓
EM1306677-007	24-JUN-2013 15:00	GW19	✓	✓
EM1306677-008	24-JUN-2013 15:00	Rinsate 1	✓	✓
EM1306677-009	24-JUN-2013 15:00	Trip 1	✓	

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		Due for extraction	Due for analysis	Samples Received		Instructions Received	
Client Sample ID(s)	Container			Date	Evaluation	Date	Evaluation
EA005: pH							
GW19	Clear Plastic Bottle - Natural	----	24-JUN-2013	24-JUN-2013	✓	25-JUN-2013	×
GW23	Clear Plastic Bottle - Natural	----	24-JUN-2013	24-JUN-2013	✓	25-JUN-2013	×
GW39	Clear Plastic Bottle - Natural	----	24-JUN-2013	24-JUN-2013	✓	25-JUN-2013	×
GW41	Clear Plastic Bottle - Natural	----	24-JUN-2013	24-JUN-2013	✓	25-JUN-2013	×
GW42D	Clear Plastic Bottle - Natural	----	24-JUN-2013	24-JUN-2013	✓	25-JUN-2013	×
GW43	Clear Plastic Bottle - Natural	----	24-JUN-2013	24-JUN-2013	✓	25-JUN-2013	×

Requested Deliverables

ALL INVOICES MELB ADDRESS

- A4 - AU Tax Invoice (INV)	Email	eesvic@eesi.biz

MS SOOKFEI LEONG

- *AU Certificate of Analysis - NATA (COA)	Email	sleong@eesi.biz
- *AU Interpretive QC Report - DEFAULT (Anon QCI Rep) (QCI)	Email	sleong@eesi.biz
- *AU QC Report - DEFAULT (Anon QC Rep) - NATA (QC)	Email	sleong@eesi.biz
- A4 - AU Sample Receipt Notification - Environmental HT (SRN)	Email	sleong@eesi.biz
- Chain of Custody (CoC) (COC)	Email	sleong@eesi.biz
- EDI Format - ENMRG (ENMRG)	Email	sleong@eesi.biz
- EDI Format - ESDAT (ESDAT)	Email	sleong@eesi.biz

REGIN ORQUIZA

- *AU Certificate of Analysis - NATA (COA)	Email	rorquiza@eesi.biz
- *AU Interpretive QC Report - DEFAULT (Anon QCI Rep) (QCI)	Email	rorquiza@eesi.biz
- *AU QC Report - DEFAULT (Anon QC Rep) - NATA (QC)	Email	rorquiza@eesi.biz
- A4 - AU Sample Receipt Notification - Environmental HT (SRN)	Email	rorquiza@eesi.biz
- A4 - AU Tax Invoice (INV)	Email	rorquiza@eesi.biz
- Chain of Custody (CoC) (COC)	Email	rorquiza@eesi.biz
- EDI Format - ENMRG (ENMRG)	Email	rorquiza@eesi.biz
- EDI Format - ESDAT (ESDAT)	Email	rorquiza@eesi.biz

Environmental Division

SAMPLE RECEIPT NOTIFICATION (SRN)

Comprehensive Report

Work Order	: **EM130673V**		
Client	: **ENHIRONMENTAL EART2 SCIENCES**	Laboratory	: Environmental Division Melbourne
Contact	: REGIN ORQUIZA	Contact	: Carol Walsh
Address	: P.O.BOX 2253 FOOTSCRAY VIC, AUSTRALIA 3011	Address	: 4 Westall Rd Springvale VIC Australia 3171
E-mail	: rorquiza@eesi.biz	E-mail	: carol.walsh@alsglobal.com
Telephone	: +61 03 96871666	Telephone	: +61-3-8549 9608
Facsimile	: +61 03 96871844	Facsimile	: +61-3-8549 9601
Project	: 200174 Sth Melbourne Gasworks	Page	: 1 of 3
Order number	: ----		
C-O-C number	: ----	Quote number	: EM2013ENVEAR0231 (ME/330/13)
Site	: ----		
Sampler	: ----	QC Level	: NEPM 1999 Schedule B(3) and ALS QCS3 requirement

Dates

Date Samples Received	: 25-JUN-2013	Issue Date	: 26-JUN-2013 11:04
Client Requested Due Date	: 03-JUL-2013	Scheduled Reporting Date	: **03-JUL-a013**

Delivery Details

Mode of Delivery	: Carrier	Temperature	: 2.8-3.6 - Ice present
No. of coolers/boxes	: 2	No. of samples received	: 10
Security Seal	: N/A	No. of samples analysed	: 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
- **Smp l sec rei evned vt mi l rol rvmyes l reyremyed mt d l recerned i ot ymt ercf**
- **Psemce reher yo yge Promi yne 2 osdvt b Tvp e Rel ory ymwse wesou u gvi g c/ p p mrvcec wremi gec oh rei op p et ded gosdvt b yp ec ygmygmme oi i / rred l rvor yo cmp l secqt cyr/ i yot c wevt b rei evned my yge smwormyor. f Tge mwcet i e ohygvc c/ p p mr. ymwse vt dvi myec ygmymsscmp l sec gmne weet rei evned u vgvt yge rei op p et ded gosdvt b yp ec hor yge mt ms cvc re| / ecyedf**
- **Psemce dvrei ymt . | / ervec resmyed yo cmp l se i ot dwyot qt / p wervt b qwremkmbec yo Peyer Rmmsi f**
- **At ms yi msu ork hor ygvc u ork order u vsswe i ot d/ i yed my ALS Sl rvt bnmsef**
- Sample Disposal - Aqueous (14 days), Solid (60 days) from date of completion of work order.

Sample Container(s)/Preservation Non-Compliances

All comparisons are made against pretreatment/preservation AS, APHA, USEPA standards.

- **No cmp l se i ot ymt er ql recernmyot t ot -i op l smt i e exvcyf**

Summary of Sample(s) and Requested Analysis

Some items described below may be part of a laboratory process neccessary 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.
If no sampling time is provided, the sampling time will default to 15:00 on the date of sampling. If no sampling date is provided, the sampling date will be assumed by the laboratory for processing purposes and will be shown bracketed without a time component.

Matrix: **WATER**

Laboratory sample ID	*Client sampling date / time*	*Client sample ID*	WATER - EES Ionic Balance EES Ionic Balance	WATER - EG020F Dissolved Metals by ICPMS	WATER - EK026SF Total Cyanide by Segmented Flow Analyser	WATER - EK055G-NH4 Ammonium as N	WATER - EP074 (water) Volatile Organic Compounds	WATER - TPH TPH (fractions)
EM1306738-001	25-JUN-2013 15:00	GW18	✓	✓	✓	✓	✓	✓
EM1306738-002	25-JUN-2013 15:00	GW01	✓	✓	✓	✓	✓	✓
EM1306738-003	25-JUN-2013 15:00	GW40	✓	✓	✓	✓	✓	✓
EM1306738-004	25-JUN-2013 15:00	GW28	✓	✓	✓	✓	✓	✓
EM1306738-005	25-JUN-2013 15:00	GW35	✓	✓	✓	✓	✓	✓
EM1306738-006	25-JUN-2013 15:00	GW22	✓	✓	✓	✓	✓	✓
EM1306738-007	25-JUN-2013 15:00	Rinsate 2					✓	✓
EM1306738-008	25-JUN-2013 15:00	Trip 2					✓	
EM1306738-009	25-JUN-2013 15:00	Trip 3					✓	
EM1306738-010	25-JUN-2013 15:00	Dup 2		✓	✓		✓	✓

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		D/ e hor exyrmi yot	D/ e hor mt ms cvc	Smp l sec Rei evned		It cyr/ i yot c Rei evned	
Cset y Smp l se ID(c)	Cot ymt er			Dmye	Enms/ myot	Dmye	Enms/ myot
EA005: l 2							
GW01	Clear Plastic Bottle - Natural	----	25-JUN-2013	25-JUN-2013	✓	26-JUN-2013	×
GW18	Clear Plastic Bottle - Natural	----	25-JUN-2013	25-JUN-2013	✓	26-JUN-2013	×
GW22	Clear Plastic Bottle - Natural	----	25-JUN-2013	25-JUN-2013	✓	26-JUN-2013	×
GW28	Clear Plastic Bottle - Natural	----	25-JUN-2013	25-JUN-2013	✓	26-JUN-2013	×
GW35	Clear Plastic Bottle - Natural	----	25-JUN-2013	25-JUN-2013	✓	26-JUN-2013	×
GW40	Clear Plastic Bottle - Natural	----	25-JUN-2013	25-JUN-2013	✓	26-JUN-2013	×

Requested Deliverables

ALL INHOICES MELB ADDRESS

- A4 - AU Tax Invoice (INV)	Email	eesvic@eesi.biz

MS SOOKFEI LEONG

- *AU Certificate of Analysis - NATA (COA)	Email	sleong@eesi.biz
- *AU Interpretive QC Report - DEFAULT (Anon QCI Rep) (QCI)	Email	sleong@eesi.biz
- *AU QC Report - DEFAULT (Anon QC Rep) - NATA (QC)	Email	sleong@eesi.biz
- A4 - AU Sample Receipt Notification - Environmental HT (SRN)	Email	sleong@eesi.biz
- Chain of Custody (CoC) (COC)	Email	sleong@eesi.biz
- EDI Format - ENMRG (ENMRG)	Email	sleong@eesi.biz
- EDI Format - ESDAT (ESDAT)	Email	sleong@eesi.biz

REGIN ORQUIZA

- *AU Certificate of Analysis - NATA (COA)	Email	rorquiza@eesi.biz
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- EDI Format - ESDAT (ESDAT)	Email	rorquiza@eesi.biz

Environmental Division

SAMPLE RECEIPT NOTIFICATION (SRN)

Comprehensive Report

Work Order	: **EM1306766**		
Client	: **ENVIRONMENTAL EARTH SCIENCES**	Laboratory	: Environmental Division Melbourne
Contact	: REGIN ORQUIZA	Contact	: Carol Walsh
Address	: P.O.BOX 2253 FOOTSCRAY VIC, AUSTRALIA 3011	Address	: 4 Westall Rd Springvale VIC Australia 3171
E-mail	: rorquiza@eesi.biz	E-mail	: carol.walsh@alsglobal.com
Telephone	: +61 03 96871666	Telephone	: +61-3-8549 9608
Facsimile	: +61 03 96871844	Facsimile	: +61-3-8549 9601
Project	: 210074 Sth Melbourne Gasworks	Page	: 1 of 2
Order number	: ----		
C-O-C number	: ----	Quote number	: EM2013ENVEAR0231 (ME/330/13)
Site	: ----		
Sampler	: SFL/KK	QC Level	: NEPM 1999 Schedule B(3) and ALS QCS3 requirement

Dates

Date Samples Received	: 26-JUN-2013	Issue Date	: 26-JUN-2013 13:47
Client Requested Due Date	: 03-JUL-2013	Scheduled Reporting Date	: 02-JUL-2013

Delivery Details

Mode of Delivery	: Carrier	Temperature	: 3.1-5.5 - Ice present
No. of coolers/boxes	: 1	No. of samples received	: 4
Security Seal	: N/A	No. of samples analysed	: 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
- **Samples received in appropriately pretreated and preserved containers.**
- **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.**
- **Please direct any queries related to sample condition / numbering / breakages to Peter Ravlic.**
- **Analytical work for this work order will be conducted at ALS Springvale.**
- Sample Disposal - Aqueous (14 days), Solid (60 days) from date of completion of work order.

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 neccessary 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.
If no sampling time is provided, the sampling time will default to 15:00 on the date of sampling. If no sampling date is provided, the sampling date will be assumed by the laboratory for processing purposes and will be shown bracketed without a time component.

Matrix: **WATER**

Laboratory sample ID	Client sampling date / time	Client sample ID	WATER - EES Ionic Balance EES Ionic Balance	WATER - EG020F Dissolved Metals by ICPMS	WATER - EK026SF Total Cyanide by Segmented Flow Analyser	WATER - EK055G-NH4 Ammonium as N	WATER - EP071SG TPH Silica Gel Clean Up	WATER - EP074 (water) Volatile Organic Compounds	WATER - TPH TPH (fractions)
EM1306766-001	25-JUN-2013 15:00	GW08	✓	✓	✓	✓	✓	✓	✓
EM1306766-002	25-JUN-2013 15:00	GW37	✓	✓	✓	✓	✓	✓	✓
EM1306766-003	25-JUN-2013 15:00	GW44	✓	✓	✓	✓	✓	✓	✓
EM1306766-004	25-JUN-2013 15:00	Trip 4						✓	

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		Due for extraction	Due for analysis	Samples Received		Instructions Received	
Client Sample ID(s)	Container			Date	Evaluation	Date	Evaluation
EA005: pH							
GW08	Clear Plastic Bottle - Natural	----	25-JUN-2013	26-JUN-2013	×	26-JUN-2013	×
GW37	Clear Plastic Bottle - Natural	----	25-JUN-2013	26-JUN-2013	×	26-JUN-2013	×
GW44	Clear Plastic Bottle - Natural	----	25-JUN-2013	26-JUN-2013	×	26-JUN-2013	×

Requested Deliverables

ALL INVOICES MELB ADDRESS

- A4 - AU Tax Invoice (INV)	Email	eesvic@eesi.biz

MS SOOKFEI LEONG

- *AU Certificate of Analysis - NATA (COA)	Email	sleong@eesi.biz
- *AU Interpretive QC Report - DEFAULT (Anon QCI Rep) (QCI)	Email	sleong@eesi.biz
- *AU QC Report - DEFAULT (Anon QC Rep) - NATA (QC)	Email	sleong@eesi.biz
- A4 - AU Sample Receipt Notification - Environmental HT (SRN)	Email	sleong@eesi.biz
- Chain of Custody (CoC) (COC)	Email	sleong@eesi.biz
- EDI Format - ENMRG (ENMRG)	Email	sleong@eesi.biz
- EDI Format - ESDAT (ESDAT)	Email	sleong@eesi.biz

REGIN ORQJ IZA

- *AU Certificate of Analysis - NATA (COA)	Email	rorquiza@eesi.biz
- *AU Interpretive QC Report - DEFAULT (Anon QCI Rep) (QCI)	Email	rorquiza@eesi.biz
- *AU QC Report - DEFAULT (Anon QC Rep) - NATA (QC)	Email	rorquiza@eesi.biz
- A4 - AU Sample Receipt Notification - Environmental HT (SRN)	Email	rorquiza@eesi.biz
- A4 - AU Tax Invoice (INV)	Email	rorquiza@eesi.biz
- Chain of Custody (CoC) (COC)	Email	rorquiza@eesi.biz
- EDI Format - ENMRG (ENMRG)	Email	rorquiza@eesi.biz
- EDI Format - ESDAT (ESDAT)	Email	rorquiza@eesi.biz

ALS Group

Environmental Division

SAMPLE RECEIPT NOTIFICATION (SRN)

Comprehensive Report

Work Order : **EM13067VH**

Client	: **EN2IRONMENTAL EART-SCIENCES**	Laboratory	: Environmental Division Melbourne
Contact	: MR REGIN ORQUIZA	Contact	: Carol Walsh
Address	: P.O.BOX 2253 FOOTSCRAY VIC, AUSTRALIA 3011	Address	: 4 Westall Rd Springvale VIC Australia 3171
E-mail	: rorquiza@environmentalearthsciences.com	E-mail	: carol.walsh@alsglobal.com
Telephone	: +61 03 96871666	Telephone	: +61-3-8549 9608
Facsimile	: +61 03 96871844	Facsimile	: +61-3-8549 9601
Project	: 210074 Sth Melbourne Gasworks	Page	: 1 of 3
Order number	: ----		
C-O-C number	: ----	Quote number	: EM2013ENVEAR0231 (ME/330/13)
Site	: ----		
Sampler	: SFL / KK	QC Level	: NEPM 1999 Schedule B(3) and ALS QCS3 requirement

Dates

Date Samples Received	: 26-JUN-2013	Issue Date	: 28-JUN-2013 12:11
Client Requested Due Date	: 04-JUL-2013	Scheduled Reporting Date	: **03JUa LJn013**

Delivery Details

Mode of Delivery	: Carrier	Temperature	: 4.5-5.0 - Ice present
No. of coolers/boxes	: 1	No. of samples received	: 9
Security Seal	: N/A	No. of samples analysed	: 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
- **Spl sœi revert ed ry pssrosrrp.edʼ sre.rep.ed pyd srei ert ed voy.pryeri h**
- **Pœpi e reger .o .be Propv.rt e - ocdrywTrl e Resor. .puœ ueœ/ / brvb i ql l prri ei urepvbei og revol l eyded bocdryw.rl ei .bp. bpt e ovvqrred srror .o i pl sœi |ryi .rqv.royi uerywrevert ed p. .be œuorp.orf h Tbe pui eyve og.bri i ql l prf .puœ rydrvp.ei .bp. pœi pl sœi bpt e ueey revert ed / nbry .be revol l eyded bocdryw.rl ei gor .be pypdʼ i ri re+qei .edh**
- **Pœpi e drrev. pyf +qerrei reœ.ed .o i pl sœ voydnroy | yql uerryw| urepkpwei .o Pe.er Rpt œvh**
- **Aypdʼ .rvpc/ ork gor .bri / ork order / rrœue voydqv.ed p. ALS Ssrrywt pœh**
- Sample Disposal - Aqueous (14 days), Solid (60 days) from date of completion of work order.

Sample Container(s)/Preservation Non-Compliances

All comparisons are made against pretreatment/preservation AS, APHA, USEPA standards.

- **No incorrect preservative recorded for sample.**

Summary of Sample(s) and Requested Analysis

Some items described below may be part of a laboratory process neccessary 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.
If no sampling time is provided, the sampling time will default to 15:00 on the date of sampling. If no sampling date is provided, the sampling date will be assumed by the laboratory for processing purposes and will be shown bracketed without a time component.

Matrix: **WATER**

Laboratory sample ID	Client sampling date / time	Client sample ID	WATER - EES Ionic Balance EES Ionic Balance	WATER - EG020F Dissolved Metals by ICPMS	WATER - EK026SF Total Cyanide by Segmented Flow Analyser	WATER - EK055G Ammonia as N By Discrete Analyser	WATER - EK055G-NH4 Ammonium as N	WATER - EP071SG TPH Silica Gel Clean Up	WATER - EP074 (water) Volatile Organic Compounds	WATER - TPH TPH (fractions)
EM1306798-001	26-JUN-2013 15:00	GW02	✓	✓	✓		✓		✓	✓
EM1306798-002	26-JUN-2013 15:00	GW07	✓	✓	✓		✓		✓	✓
EM1306798-003	26-JUN-2013 15:00	GW09	✓	✓	✓		✓		✓	✓
EM1306798-004	26-JUN-2013 15:00	GW29	✓	✓	✓		✓		✓	✓
EM1306798-005	26-JUN-2013 15:00	GW30	✓	✓	✓		✓		✓	✓
EM1306798-006	26-JUN-2013 15:00	GW38	✓	✓	✓		✓	✓	✓	✓
EM1306798-007	26-JUN-2013 15:00	RIN 3				✓				
EM1306798-008	26-JUN-2013 15:00	RIN 4							✓	✓
EM1306798-009	26-JUN-2013 15:00	TRIP 5							✓	

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		Date sampled	Date received	Holding time		Holding time	
Container / Sample ID(s)	Container			Date	Evaluation	Date	Evaluation
EA004: s-							
GW02	Clear Plastic Bottle - Natural	----	26-JUN-2013	26-JUN-2013	✓	27-JUN-2013	×
GW07	Clear Plastic Bottle - Natural	----	26-JUN-2013	26-JUN-2013	✓	27-JUN-2013	×
GW09	Clear Plastic Bottle - Natural	----	26-JUN-2013	26-JUN-2013	✓	27-JUN-2013	×
GW29	Clear Plastic Bottle - Natural	----	26-JUN-2013	26-JUN-2013	✓	27-JUN-2013	×
GW30	Clear Plastic Bottle - Natural	----	26-JUN-2013	26-JUN-2013	✓	27-JUN-2013	×
GW38	Clear Plastic Bottle - Natural	----	26-JUN-2013	26-JUN-2013	✓	27-JUN-2013	×

Requested Deliverables

ALL IN2OICES MELB ADDRESS

- A4 - AU Tax Invoice (INV)	Email	eesvic@eesi.biz

MS SOOKFEI LEONG

- *AU Certificate of Analysis - NATA (COA)	Email	sleong@eesi.biz
- *AU Interpretive QC Report - DEFAULT (Anon QCI Rep) (QCI)	Email	sleong@eesi.biz
- *AU QC Report - DEFAULT (Anon QC Rep) - NATA (QC)	Email	sleong@eesi.biz
- A4 - AU Sample Receipt Notification - Environmental HT (SRN)	Email	sleong@eesi.biz
- Chain of Custody (CoC) (COC)	Email	sleong@eesi.biz
- EDI Format - ENMRG (ENMRG)	Email	sleong@eesi.biz
- EDI Format - ESDAT (ESDAT)	Email	sleong@eesi.biz

REGIN ORQa IZA

- *AU Certificate of Analysis - NATA (COA)	Email	rorquiza@eesi.biz
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- *AU QC Report - DEFAULT (Anon QC Rep) - NATA (QC)	Email	rorquiza@eesi.biz
- A4 - AU Sample Receipt Notification - Environmental HT (SRN)	Email	rorquiza@eesi.biz
- Chain of Custody (CoC) (COC)	Email	rorquiza@eesi.biz
- EDI Format - ENMRG (ENMRG)	Email	rorquiza@eesi.biz
- EDI Format - ESDAT (ESDAT)	Email	rorquiza@eesi.biz

Environmental Division

SAMPLE RECEIPT NOTIFICATION (SRN)

Comprehensive Report

Work Order	: **EM1306820**		
Client	: **ENVIRONMENTAL EARTH SCIENCES**	Laboratory	: Environmental Division Melbourne
Contact	: REGIN ORQUIZA	Contact	: Carol Walsh
Address	: P.O.BOX 2253 FOOTSCRAY VIC, AUSTRALIA 3011	Address	: 4 Westall Rd Springvale VIC Australia 3171
E-mail	: rorquiza@eesi.biz	E-mail	: carol.walsh@alsglobal.com
Telephone	: +61 03 96871666	Telephone	: +61-3-8549 9608
Facsimile	: +61 03 96871844	Facsimile	: +61-3-8549 9601
Project	: 210074 Sth Melbourne Gasworks	Page	: 1 of 2
Order number	: ----		
C-O-C number	: ----	Quote number	: EM2013ENVEAR0231 (ME/330/13)
Site	: ----		
Sampler	: SFL / KK	QC Level	: NEPM 1999 Schedule B(3) and ALS QCS3 requirement

Dates

Date Samples Received	: 27-JUN-2013	Issue Date	: 28-JUN-2013 14:14
Client Requested Due Date	: 04-JUL-2013	Scheduled Reporting Date	: **04-JUL-2013**

Delivery Details

Mode of Delivery	: Carrier	Temperature	: 4.0-6.0 - Ice present
No. of coolers/boxes	: 1	No. of samples received	: 6
Security Seal	: N/A	No. of samples analysed	: 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
- **Samples received in appropriately pretreated and preserved containers.**
- **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.**
- **Please direct any queries related to sample condition / numbering / breakages to Peter Ravlic.**
- **Analytical work for this work order will be conducted at ALS Springvale.**
- Sample Disposal - Aqueous (14 days), Solid (60 days) from date of completion of work order.

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 neccessary 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.
If no sampling time is provided, the sampling time will default to 15:00 on the date of sampling. If no sampling date is provided, the sampling date will be assumed by the laboratory for processing purposes and will be shown bracketed without a time component.

Matrix: **WATER**

Laboratory sample ID	Client sampling date / time	Client sample ID	WATER - EES Ionic Balance EES Ionic Balance	WATER - EG020F Dissolved Metals by ICPMS	WATER - EK026SF Total Cyanide by Segmented Flow Analyser	WATER - EK055G-NH4 Ammonium as N	WATER - EP071SG TPH Silica Gel Clean Up	WATER - EP074 (water) Volatile Organic Compounds	WATER - TPH TPH (fractions)
EM1306820-001	27-JUN-2013 15:00	GW34	✓	✓	✓	✓		✓	✓
EM1306820-002	27-JUN-2013 15:00	GW33	✓	✓	✓	✓		✓	✓
EM1306820-003	27-JUN-2013 15:00	GW24	✓	✓	✓	✓	✓	✓	✓
EM1306820-004	26-JUN-2013 15:00	GW06	✓	✓	✓	✓		✓	✓
EM1306820-005	26-JUN-2013 15:00	Trip 6						✓	
EM1306820-006	26-JUN-2013 15:00	GW26	✓	✓	✓	✓		✓	✓

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		Due for extraction	Due for analysis	Samples Received		Instructions Received	
Client Sample ID(s)	Container			Date	Evaluation	Date	Evaluation
EA005: pH							
GW06	Clear Plastic Bottle - Natural	----	26-JUN-2013	27-JUN-2013	✘	27-JUN-2013	✘
GW26	Clear Plastic Bottle - Natural	----	26-JUN-2013	27-JUN-2013	✘	27-JUN-2013	✘

Requested Deliverables

ALL INVOICES MELB ADDRESS

- A4 - AU Tax Invoice (INV)	Email	eesvic@eesi.biz

MS SOOKFEI LEONG

- *AU Certificate of Analysis - NATA (COA)	Email	sleong@eesi.biz
- *AU Interpretive QC Report - DEFAULT (Anon QCI Rep) (QCI)	Email	sleong@eesi.biz
- *AU QC Report - DEFAULT (Anon QC Rep) - NATA (QC)	Email	sleong@eesi.biz
- A4 - AU Sample Receipt Notification - Environmental HT (SRN)	Email	sleong@eesi.biz
- Chain of Custody (CoC) (COC)	Email	sleong@eesi.biz
- EDI Format - ENMRG (ENMRG)	Email	sleong@eesi.biz
- EDI Format - ESDAT (ESDAT)	Email	sleong@eesi.biz

REGIN ORQUIZA

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- *AU Interpretive QC Report - DEFAULT (Anon QCI Rep) (QCI)	Email	rorquiza@eesi.biz
- *AU QC Report - DEFAULT (Anon QC Rep) - NATA (QC)	Email	rorquiza@eesi.biz
- A4 - AU Sample Receipt Notification - Environmental HT (SRN)	Email	rorquiza@eesi.biz
- Chain of Custody (CoC) (COC)	Email	rorquiza@eesi.biz
- EDI Format - ENMRG (ENMRG)	Email	rorquiza@eesi.biz
- EDI Format - ESDAT (ESDAT)	Email	rorquiza@eesi.biz

ALS Group

Environmental Division

SAMPLE RECEIPT NOTIFICATION (SRN)

Comprehensive Report

Work Order : **EM13067V1**

Client	: **ENHIRONMENTAL EART2 SCIENCES**	Laboratory	: Environmental Division Melbourne
Contact	: MR REGIN ORQUIZA	Contact	: Carol Walsh
Address	: P.O.BOX 2253 FOOTSCRAY VIC, AUSTRALIA 3011	Address	: 4 Westall Rd Springvale VIC Australia 3171
E-mail	: rorquiza@environmentalearthsciences.com	E-mail	: carol.walsh@alsglobal.com
Telephone	: +61 03 96871666	Telephone	: +61-3-8549 9608
Facsimile	: +61 03 96871844	Facsimile	: +61-3-8549 9601
Project	: 200174 Sth Melbourne Gasworks	Page	: 1 of 2
Order number	: ----		
C-O-C number	: ----	Quote number	: EM2013ENVEAR0231 (ME/330/13)
Site	: ----		
Sampler	: SFL, KK	QC Level	: NEPM 1999 Schedule B(3) and ALS QCS3 requirement

Dates

Date Samples Received	: 27-JUN-2013	Issue Date	: 28-JUN-2013 12:17
Client Requested Due Date	: 05-JUL-2013	Scheduled Reporting Date	: **0- JUa LJn013**

Delivery Details

Mode of Delivery	: Carrier	Temperature	: 4.5-5.0 - Ice present
No. of coolers/boxes	: 1	No. of samples received	: 6
Security Seal	: N/A	No. of samples analysed	: 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
- **Spl sœi revert ed ry pssrosrrp.ed sre.rep.ed pyd srei ert ed voy.pryeri h**
- **Pœpi e reger .o .be Propv.rt e 2 ocdryw Trl e Resor. .puœ ueœ/ / brvb i ql l prri ei urepvbei og revol l eyded bocdryw.rl ei .bp. bpt e ovvqrred srror .o i pl sœi |ryi .rqv.royi ueryw revert ed p. .be quorp.orf h Tbe pui eyve og.bri i ql l prf .puœ rydrvp.ei .bp. pœi pl sœi bpt e ueey revert ed / nbry .be revol l eyded bocdryw.rl ei gpr .be pypdf i ri re+qei .edh**
- **Pœpi e drrev. pyf +qerrei reqp.ed .o i pl sœ voydnroy | yql uerryw| urepkpwei .o Pe.er Rpt œvh**
- **Aypdf .rvpc/ ork gpr .bri / ork order / rccue voydqv.ed p. ALS Ssrryw t pœh**
- Sample Disposal - Aqueous (14 days), Solid (60 days) from date of completion of work order.

Sample Container(s)/Preservation Non-Compliances

All comparisons are made against pretreatment/preservation AS, APHA, USEPA standards.

- **No information found**

Summary of Sample(s) and Requested Analysis

Some items described below may be part of a laboratory process neccessary 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.
If no sampling time is provided, the sampling time will default to 15:00 on the date of sampling. If no sampling date is provided, the sampling date will be assumed by the laboratory for processing purposes and will be shown bracketed without a time component.

Matrix: **WATER**

Laboratory sample ID	Client sampling date / time	Client sample ID	WATER - EES Ionic Balance EES Ionic Balance	WATER - EG020F Dissolved Metals by ICPMS	WATER - EK026SF Total Cyanide by Segmented Flow Analyser	WATER - EK055G-NH4 Ammonium as N	WATER - EP074 (water) Volatile Organic Compounds	WATER - TPH TPH (fractions)
EM1306871-001	27-JUN-2013 15:00	GW10	✓	✓	✓	✓	✓	✓
EM1306871-002	27-JUN-2013 15:00	GW31	✓	✓	✓	✓	✓	✓
EM1306871-003	27-JUN-2013 15:00	GW32	✓	✓	✓	✓	✓	✓
EM1306871-004	27-JUN-2013 15:00	GW36	✓	✓	✓	✓	✓	✓
EM1306871-005	27-JUN-2013 15:00	RIN4					✓	✓
EM1306871-006	27-JUN-2013 15:00	Trip 7					✓	

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		Date sampled	Date received		Holding time	
Container / Sample ID(s)	Container		Date	Evaluation	Date	Evaluation
EA00-: s2						
GW10	Clear Plastic Bottle - Natural	----	27-JUN-2013	27-JUN-2013	✓	28-JUN-2013	×
GW31	Clear Plastic Bottle - Natural	----	27-JUN-2013	27-JUN-2013	✓	28-JUN-2013	×
GW32	Clear Plastic Bottle - Natural	----	27-JUN-2013	27-JUN-2013	✓	28-JUN-2013	×
GW36	Clear Plastic Bottle - Natural	----	27-JUN-2013	27-JUN-2013	✓	28-JUN-2013	×

Requested Deliverables

ALL INHOICES MELB ADDRESS

- A4 - AU Tax Invoice (INV)	Email	eesvic@eesi.biz

MS SOOKFEI LEONG

- *AU Certificate of Analysis - NATA (COA)	Email	sleong@eesi.biz
- *AU Interpretive QC Report - DEFAULT (Anon QCI Rep) (QCI)	Email	sleong@eesi.biz
- *AU QC Report - DEFAULT (Anon QC Rep) - NATA (QC)	Email	sleong@eesi.biz
- A4 - AU Sample Receipt Notification - Environmental HT (SRN)	Email	sleong@eesi.biz
- Chain of Custody (CoC) (COC)	Email	sleong@eesi.biz
- EDI Format - ENMRG (ENMRG)	Email	sleong@eesi.biz
- EDI Format - ESDAT (ESDAT)	Email	sleong@eesi.biz

REGIN ORQa IZA

- *AU Certificate of Analysis - NATA (COA)	Email	rorquiza@eesi.biz
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- EDI Format - ESDAT (ESDAT)	Email	rorquiza@eesi.biz

Environmental Division

SAMPLE RECEIPT NOTIFICATION (SRN)

Comprehensive Report

Work Order	: **EM1306806**		
Client	: **EN2IRONMENTAL EARTV SCIENCES**	Laboratory	: Environmental Division Melbourne
Contact	: REGIN ORQUIZA	Contact	: Carol Walsh
Address	: P.O.BOX 2253 FOOTSCRAY VIC, AUSTRALIA 3011	Address	: 4 Westall Rd Springvale VIC Australia 3171
E-mail	: rorquiza@eesi.biz	E-mail	: carol.walsh@alsglobal.com
Telephone	: +61 03 96871666	Telephone	: +61-3-8549 9608
Facsimile	: +61 03 96871844	Facsimile	: +61-3-8549 9601
Project	: 200174 Sth Melbourne Gasworks	Page	: 1 of 2
Order number	: ----		
C-O-C number	: ----	Quote number	: EM2013ENVEAR0231 (ME/330/13)
Site	: ----		
Sampler	: SFL/KK	QC Level	: NEPM 1999 Schedule B(3) and ALS QCS3 requirement

Dates

Date Samples Received	: 28-JUN-2013	Issue Date	: 28-JUN-2013 17:13
Client Requested Due Date	: 05-JUL-2013	Scheduled Reporting Date	: 0H4-JL4U013

Delivery Details

Mode of Delivery	: Carrier	Temperature	: 0.6-1.4 - Ice present
No. of coolers/boxes	: 1	No. of samples received	: 4
Security Seal	: Intact.	No. of samples analysed	: 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
- **Samples received in appropriately pretreated and preserved containers.**
- **Please refer to the Proactive Volding 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.**
- **Please direct any queries related to sample condition / numbering / breakages to Peter Ravlic.**
- **Analytical work for this work order will be conducted at ALS Springvale.**
- Sample Disposal - Aqueous (14 days), Solid (60 days) from date of completion of work order.

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 neccessary 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.
If no sampling time is provided, the sampling time will default to 15:00 on the date of sampling. If no sampling date is provided, the sampling date will be assumed by the laboratory for processing purposes and will be shown bracketed without a time component.

Matrix: **WATER**

Laboratory sample ID	Client sampling date / time	Client sample ID	WATER - EES Ionic Balance EES Ionic Balance	WATER - EG020F Dissolved Metals by ICPMS	WATER - EK026SF Total Cyanide by Segmented Flow Analyser	WATER - EK055G-NH4 Ammonium as N	WATER - EP074 (water) Volatile Organic Compounds	WATER - TPH TPH (fractions)
EM1306906-001	27-JUN-2013 15:00	GW15	✓	✓	✓	✓	✓	✓
EM1306906-002	27-JUN-2013 15:00	GW25	✓	✓	✓	✓	✓	✓
EM1306906-003	27-JUN-2013 15:00	GW05	✓	✓	✓	✓	✓	✓
EM1306906-004	27-JUN-2013 15:00	Trip 8					✓	

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		Due for extraction	Due for analysis	Samples Received		Instructions Received	
Client Sample ID(s)	Container			Date	Evaluation	Date	Evaluation
EA00H: pV							
GW05	Clear Plastic Bottle - Natural	----	27-JUN-2013	28-JUN-2013	×	28-JUN-2013	×
GW15	Clear Plastic Bottle - Natural	----	27-JUN-2013	28-JUN-2013	×	28-JUN-2013	×
GW25	Clear Plastic Bottle - Natural	----	27-JUN-2013	28-JUN-2013	×	28-JUN-2013	×

Requested Deliverables

ALL IN2OICES MELB ADDRESS

- A4 - AU Tax Invoice (INV)	Email	eesvic@eesi.biz

MS SOOKFEI LEONG

- *AU Certificate of Analysis - NATA (COA)	Email	sleong@eesi.biz
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- *AU QC Report - DEFAULT (Anon QC Rep) - NATA (QC)	Email	sleong@eesi.biz
- A4 - AU Sample Receipt Notification - Environmental HT (SRN	Email	sleong@eesi.biz
- Chain of Custody (CoC) (COC)	Email	sleong@eesi.biz
- EDI Format - ENMRG (ENMRG)	Email	sleong@eesi.biz
- EDI Format - ESDAT (ESDAT)	Email	sleong@eesi.biz

REGIN ORQJ IZA

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- *AU QC Report - DEFAULT (Anon QC Rep) - NATA (QC)	Email	rorquiza@eesi.biz
- A4 - AU Sample Receipt Notification - Environmental HT (SRN	Email	rorquiza@eesi.biz
- A4 - AU Tax Invoice (INV)	Email	rorquiza@eesi.biz
- Chain of Custody (CoC) (COC)	Email	rorquiza@eesi.biz
- EDI Format - ENMRG (ENMRG)	Email	rorquiza@eesi.biz
- EDI Format - ESDAT (ESDAT)	Email	rorquiza@eesi.biz

eurofins | mgt

ABN – 50 005 085 521 e.mail : enviro@mgtlabmark.com.au web : www.mgtlabmark.com.au

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Oakleigh Vic 3166
Phone : +61 3 8564 5000
NATA # 1261
Site # 1254 & 14271

Sydney
Unit F6, Building F
16 Mars Road
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: **Environmental Earth Sciences VIC**

Contact name: Regin Orquiza
Client job number: 210074 5TH MELBOURNE GASWORDS
COC number: Not provided
Turn around time: 5 Day
Date/Time received: Jun 26, 2013 1:30 PM
Eurofins | mgt reference: **383984**

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.

☑ Organic samples had Teflon liners.

☑ Sample containers for volatile analysis received with zero headspace.

☒ 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:

Adrian Tabacchiera on Phone : (+61) (3) 8564 5000 or by e.mail:
AdrianTabacchiera@eurofins.com.au

Results will be delivered electronically via e.mail to Regin Orquiza - rorquiza@eesi.biz.

Eurofins | mgt Sample Receipt

CoC received 25/06/13 15:36 JT

Ref 1

COURIER

CHAIN OF CUSTODY

ALS Laboratory: please tick →

ALS Sydney: 277 Woodpark Rd Smithfield NSW 2164 Ph: 02 8784 8555 E: samples.sydney@alsenviro.com
ALS Newcastle: 5 Rosegum Rd Warabrook NSW 2304 Ph: 02 4958 5955 E: samples.newcastle@alsenviro.com
ALS Brisbane: 32 Shand St Stafford QLD 4053 Ph: 07 3243 7222 E: samples.brisbane@alsenviro.com
ALS Townsville: 14-15 Desma Ct Bohle QLD 4818 Ph: 07 4796 0600 E: [illegible]
ALS Melbourne: 24 Westall Rd Springvale VIC 3171 Ph: 03 8549 9600 E: samples.melbourne@alsenviro.com
ALS Adelaide: 21 Burma Rd Pooraka SA 5095 Ph: 08 8359 0890 E: adelaide@alsenviro.com
ALS Perth: 10 Hod Way Malaga WA 6090 Ph: 08 9209 7655 E: samples.perth@alsenviro.com
ALS Launceston: 27 Wellington St Launceston TAS 7250 Ph: 03 6331 2088 E: launceston@alsenviro.com

CLIENT: ENVIRONMENTAL EARTH SCIENCES	TURNAROUND REQUIREMENTS: (Standard TAT may be longer for some tests e.g. Ultra Trace Organics)		FOR LABORATORY USE ONLY (Circle): Custody Seal Intact? Yes No N/A; Free ice / frozen ice bricks present upon receipt? Yes No N/A; Random Sample Temperature on Receipt: 0.8 – 2.6; Other comments:
OFFICE: 88 MARIBYRNONG RD, FOOTSCRAY, VIC, 3011			
PROJECT: 210074 Sth Melbourne Gasworks	ALS QUOTE NO.: ME/330/13	COC SEQUENCE NUMBER (Circle): CI 1 2 3 4 5 7; CO 1 2 3 4 5 7	
ORDER NUMBER:			
PROJECT MANAGER: REGIN ORQUIZA	CONTACT PH: 9398 4403		
SAMPLER:	SAMPLER MOBILE:	RELINQUISHED BY: S.Leong	RECEIVED BY: ALS Courier
COC emailed to ALS? (YES / NO)	EDD FORMAT (or default):	DATE/TIME: 25/6/13 3 pm	DATE/TIME: 25/6/13 3pm
Email Reports to : rorquiza@eesicontracting.com and sleong@eesi.biz		RELINQUISHED BY:	RECEIVED BY: [illegible]
Email Invoice to : rorquiza@eesicontracting.com		DATE/TIME:	DATE/TIME: 25/6, 1635

COMMENTS/SPECIAL HANDLING/STORAGE OR DISPOSAL:

Environmental Divi
Melbourne
Work Order
EM13067.

Telephone : +61-3-8549

ALS USE ONLY	SAMPLE DETAILS MATRIX: Solid(S) Water(W)			CONTAINER INFORMATION		ANALYSIS REQUIRED including SUITES (NB. Suite Codes must be listed to attract suite price) Where Metals are required, specify Total (unpreserved bottle required) or Dissolved (field filtered bottle required)												Additional Information		
LAB ID	SAMPLE ID	DATE / TIME	MATRIX	TYPE & PRESERVATIVE (refer to codes below)	TOTAL BOTTLES	EES IONIC BALANCE SUITE - includes pH, TDS, Ca, Mg, Na, K, Cl, SO4, Alk, F, NO3, Reactive P, Ammonia	Ammonium (field pH and field temp. must be recorded on the COC)	Dissolved metals - Al, As, Cd, Cu, Fe, Pb, Ni, Zn, Co, Se, B & Mn	Total Cyanide	EP074A - MAH	EP074H - Naphthalene only	TPH (C6-C36) plus TRH (C6-C40)	Silica gel clean up - on SV TPH - TPH (C10-C36) and TRH(C10-C40)					Field pH	Field temp	
(1)	GW18	25/06/2013	W		8	X	X	X	X	X	X	X						6.89	18	
(2)	GW01	25/06/2013	W		8	X	X	X	X	X	X	X						6.6	17.4	
(3)	GW09	25/06/2013	W		8	X	X	X	X	X	X	X						5.74	18	
(4)	GW28	25/06/2013	W		8	X	X	X	X	X	X	X						5.67	18.8	
(5)	GW35	25/06/2013	W		8	X	X	X	X	X	X	X						6.92	17.8	
(6)	GW22	25/06/2013	W		8	X	X	X	X	X	X	X						6.3	18.5	
(7)	Rinsate 2	25/06/2013	W		2					X	X	X								
(8)	Trip 2	25/06/2013	W		1					X	X									
(9)	Trip 3	25/06/2013	W		1					X	X									
	Extra pairs:																			
(10)	Dup 2	25/6/13	W	Ice (ALS)				X	X	X	X	X								
(11)	Split 2	25/6/13	W	25/6/13				X	X	X	X	X					Please	Send	to MGT	
				TOTAL																

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

Received (ALS) 26/6, 12:00

Steven EF/MGT 383984
26/6 1:30pm

Ref 1

Raymond Thai

From: Carol Walsh
Sent: Wednesday, 26 June 2013 9:16 AM
To: Samples Melbourne
Subject: REVISED COC - EM1306738-ENVIROMENTAL EARTH SCIENCES
Attachments: img-626090130.pdf

Importance: High

COURIER

SEE ATTACHED REVISED COC.

Please send the SPLIT 2 sample to MGT as per COC.

-----Original Message-----
From: Regin Orquiza [mailto:rorquiza@eesicontracting.com]
Sent: Wednesday, 26 June 2013 9:14 AM
To: Carol Walsh
Subject: RE: ISSUES - EM1306738-ENVIROMENTAL EARTH SCIENCES

Hi Carol,

Please find the attached updated CoC showing the dup/split 2 required analytes. Please send the Split 2 sample to MGT.

Regards

Regin

Regin Orquiza - Senior Environmental Engineer PO Box 2253, Footscray, Victoria 3011
p: 03 9687 1666
d: 03 8398 4403
m: 0448 888 593
f: 03 9687 1844
rorquiza@environmentalearthsciences.com
www.environmentalearthsciences.com

-----Original Message-----
From: Carol Walsh [mailto:Carol.Walsh@alsglobal.com]
Sent: Wednesday, 26 June 2013 8:50 AM
To: Regin Orquiza
Subject: ISSUES - EM1306738-ENVIROMENTAL EARTH SCIENCES

Ref 11

Regin

COURIER

For this attached work order, EM1306738, we have received two extra sample - DUP 2 & SPLIT 2 .

Please advise if any analysis is required on these samples, or should SPLIT 2 be sent off to another lab.

Kind Regards

Carol Walsh
Senior Client Services Officer
ALS | Environmental Division
4 Westall Rd
Springvale, VIC. 3171 Australia

How was your customer experience? Please send us your feedback Please see our latest Enviromail 67 - Aqueous Film Forming Foams (AFFFs) March 2013

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F +61 3 8549 9626

www.alsglobal.com
Winner of the inaugural CARE Award 2011 - Sustainable Technology & Innovation: Reduction in Sample Volumes - Improving quality, safety, efficiency and sustainability in environmental practices

eurofins | mgt

ABN – 50 005 085 521 e.mail : enviro@mgtlabmark.com.au web : www.mgtlabmark.com.au

Melbourne
3-5 Kingston Town Close
Oakleigh Vic 3166
Phone : +61 3 8564 5000
NATA # 1261
Site # 1254 & 14271

Sydney
Unit F6, Building F
16 Mars Road
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: **Environmental Earth Sciences VIC**

Contact name: Regin Orquiza
Client job number: 210074 STH MELBOURNE GASWORKS
COC number: Not provided
Turn around time: 5 Day
Date/Time received: Jun 25, 2013 3:39 PM
Eurofins | mgt reference: **383844**

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.

☑ Organic samples had Teflon liners.

☑ Sample containers for volatile analysis received with zero headspace.

☒ 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:

Adrian Tabacchiera on Phone : (+61) (3) 8564 5000 or by e.mail:
AdrianTabacchiera@eurofins.com.au

Results will be delivered electronically via e.mail to Regin Orquiza - rorquiza@eesi.biz.

Eurofins | mgt Sample Receipt

COC received on 25/6 @ 8:34 AWTH

(7)

CHAIN OF CUSTODY

ALS Laboratory: please tick →

ALS

Sydney | Brisbane | Melbourne | Perth
Newcastle | Townsville | Adelaide | Launceston

CLIENT: ENVIRONMENTAL EARTH SCIENCES	TURNAROUND REQUIREMENTS: (Standard TAT may be longer for some tests e.g. Ultra Trace Organics)	Standard
OFFICE: 98 MARIBYRNONG RD, FOOTSCRAY, VIC. 3011		
PROJECT: 210074 Sth Melbourne Gasworks	ALS QUOTE NO.: ME/330/13	COC SEQUENCE NUMBER (Circle): COC 1 2 3 4 5 7 / OOO 1 2 3 4 5 7
ORDER NUMBER:		
PROJECT MANAGER: REGIN ORQUIZA	CONTACT PH: 8398 4403	
SAMPLER: SFL / ICK	SAMPLER MOBILE:	
COC emailed to ALS? (YES / NO)	EDD FORMAT (or default):	
Email Reports to : rorquiza@environmentalearthsciences.com and sloong@environmentalearthsciences.com		
Email Invoice to : rorquiza@environmentalearthsciences.com		

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

RELINQUISHED BY:	RECEIVED BY:	RELINQUISHED BY:	RECEIVED BY:
SFL	Courier	Bharathi	Tom W - ERLog
DATE/TIME: 23/6	DATE/TIME: 23/6/13	DATE/TIME: 25/6/13 12:30pm	DATE/TIME: 25/6/13 3:39pm

COURIER

COMMENTS/SPECIAL HANDLING/STORAGE OR DISPOSAL:

Report: 383844

ALS USE ONLY	SAMPLE DETAILS Matrix: Solid(S) Water(W)			CONTAINER INFORMATION		ANALYSIS REQUIRED including SUITES (NB. Suite Codes must be listed to attract suite price) Where Metals are required, specify Total (unfiltered bottle required) or Dissolved (field filtered bottle required)											Additional Information		
LAB ID	SAMPLE ID	DATE / TIME	MATRIX	TYPE & PRESERVATIVE (refer to codes below)	TOTAL BOTTLES	EES IONIC BALANCE SUITE - includes pH, TDS, Ca, Mg, Na, K, Cl, SO4, Alk, F, NO3, Reactive P, Ammonia	Ammonium (field pH and field temp must be recorded on the COC)	Dissolved metals - Al, As, Cd, Cu, Fe, Pb, Ni, Zn, Co, Se, B & Mn	Total Cyanide	EP074A - MAH	EP074H - Naphthalene only	TPH (C6-C36) plus TRH (C6-C40)	Silica gel clean up - on SV TPH - TPH (C10-C36) and TPH (C6-C36)	TPH (C6-C36)	Ammonium Sulphate	BTEX	Trimethylbenzene	field pH	Field temp	
1	GW43	24/6	W		8	✓		✓	✓		✓	✓		✓		✓	✓	5.46	18	4
2	Dup1	24/6			8			✓	✓		✓	✓		✓	✓	✓	✓			
→	Split → please forward to ALS Chromatec.	24/6			8			✓	✓		✓	✓		✓	✓	✓	✓			
3	GW39	24/6			8	✓		✓	✓		✓	✓	✓	✓		✓	✓	6.67	16.7	
NAC: High EC 4	GW42D				8	✓		✓	✓		✓	✓	✓	✓		✓	✓	5.55	16.4	
27,000																				
5	GW41	24/6			8	✓		✓	✓		✓	✓						6.57	17.8	
6	GW23	24/6			8	✓		✓	✓		✓	✓	✓					6.85	16.8	
7	GW19	24/6			8	✓		✓	✓		✓	✓	✓					6.09	16.4	
8	Rinsate 1	24/6			2						✓	✓				✓	✓			
9	Trip 1	24/6			1						✓					✓	✓			
				TOTAL	67															

Water Container Codes: P = Unpreserved Plastic; N = Nitric Preserved Plastic; ORC = Nitric Preserved ORC; SH = Sodium Hydroxide/Cd Preserved; S = Sodium Hydroxide Preserved Plastic; AG = Amber Glass Unpreserved; AP = Airfreight Unpreserved Plastic
V = VOA Vial HCl Preserved; VB = VOA Vial Sodium Bisulphate Preserved; VS = VOA Vial Sulfuric Preserved; AV = Airfreight Unpreserved Vial SG = Sulfuric Preserved Amber Glass; H = HCl preserved Plastic; HS = HCl preserved Speciation bottle; SP = Sulfuric Preserved Plastic; F = Formaldehyde Preserved

Enquiries

From: Regin Orquiza [rorquiza@eesicontracting.com]
Sent: Wednesday, 26 June 2013 4:33 PM
To: Enquiries; Adrian Tabacchiera
Subject: RE: Eurofins | mgt Sample Receipt Advice - Report 383844 : Site 210074 STH MELBOURNE GASWORKS

Hi James and Adrian,

Could you please change the BTEX and Trimethylebenzenes to MAH's.

Please confirm if you have received my request.

Regards

Regin

-----Original Message-----
From: enquiries.melb@mgtlabmark.com.au [mailto:enquiries.melb@mgtlabmark.com.au]
Sent: Tuesday, 25 June 2013 7:12 PM
To: Regin Orquiza
Subject: Eurofins | mgt Sample Receipt Advice - Report 383844 : Site 210074 STH MELBOURNE GASWORKS

Dear Client,

Please find attached sample receipt advice, summary sheet and your chain of custody (COC). It is important that you check these documents to ensure that the details are correct.

If there are any irregularities then please contact your Eurofins | mgt client manager as soon as possible to make certain they get amended.

Your client manager will be your point of contact for queries and test results.

Your client manager's contact details can be found on your SRA.

Kind Regards

James Gould
Eurofins | mgt

Ph:03 8564 5025
Email:enquiries@mgtlabmark.com.au

ATTACHMENT C3 SUMMARY OF RPD RESULTS

Table C3 - Summary of Relative Percentage Differences (RPD)

			SDG	EM1306677	EM1306677		EM1306677	Interlab_D		EM1306738	EM1306738		EM1306738	Interlab_D	
			Field_ID	GW43	DUP1	RPD	GW43	SPLIT	RPD	GW28	Dup 2	RPD	GW28	SPLIT 2	RPD
			Sampled_Date-Time	24/06/2013 15:00	24/06/2013 15:00		24/06/2013 15:00	24/06/2013 15:00		25/06/2013 15:00	25/06/2013 15:00		25/06/2013 15:00	25/06/2013 15:00	
Method_Name	**ChemName**	**Units**	**EQL**												
EK055G: Ammonia as N by Discrete Analyser	Ammonia as N	µg/l	10	1330.0	1390.0	4	**1330.0**	**350.0**	**117**						
EG020F: Dissolved Metals by ICP-MS	Aluminium (Filtered)	mg/l	0.01 (Primary): 0.05 (Interlab)	<0.01	<0.01	0	<0.01	<0.05	0	<0.01	<0.01	0	<0.01	<0.05	0
	Arsenic (Filtered)	mg/l	0.001	0.003	<0.001	**100**	0.003	0.003	0	0.314	0.308	2	0.314	0.24	27
	Boron (Filtered)	mg/l	0.05	0.99	1.08	9	0.99	1.2	19	0.81	0.86	6	0.81	0.8	1
	Cadmium (Filtered)	mg/l	0.0001 (Primary): 0.0002 (Interlab)	0.0007	0.0009	25	0.0007	0.0007	0	<0.0001	<0.0001	0	<0.0001	0.0002	**67**
	Cobalt (Filtered)	mg/l	0.001	0.06	0.064	6	0.06	0.051	16	<0.001	<0.001	0	<0.001	<0.001	0
	Copper (Filtered)	mg/l	0.001	**0.006**	**0.022**	**114**	**0.006**	**0.014**	**80**	<0.001	<0.001	0	<0.001	<0.001	0
	Iron (Filtered)	mg/l	0.05	0.26	0.24	8	0.26	0.35	30	2.2	2.12	4	2.2	2.3	4
	Lead (Filtered)	mg/l	0.001	0.001	0.002	**67**	0.001	0.001	0	<0.001	<0.001	0	<0.001	<0.001	0
	Manganese (Filtered)	mg/l	0.001 (Primary): 0.005 (Interlab)	6.69	7.0	5	6.69	9.3	33	0.175	0.173	1	0.175	0.17	3
	Nickel (Filtered)	mg/l	0.001	0.062	0.072	15	0.062	0.058	7	0.018	0.017	6	0.018	0.016	12
	Selenium (Filtered)	mg/l	0.01 (Primary): 0.001 (Interlab)	<0.01	<0.01	0	<0.01	0.002	0	<0.01	<0.01	0	<0.01	0.004	0
	Zinc (Filtered)	mg/l	0.005 (Primary): 0.001 (Interlab)	**0.048**	**0.11**	**78**	**0.048**	**0.086**	**57**	0.005	<0.005	0	0.005	0.01	**67**
ED041G: Sulfate (Turbidimetric) as SO4 2- by DA	Sulfate as SO4 - Turbidimetric (Filtered)	mg/l	1	1200.0	1210.0	1	1200.0	400 (as S) X 3 = 1200.0	0						
EK026SF: Total CN by Segmented Flow Analyser	Cyanide Total	mg/l	0.004 (Primary): 0.005 (Interlab)	<0.004	<0.004	0	<0.004	<0.005	0	0.016	0.018	12	0.016	0.038	**81**
EP080/071: Total Petroleum Hydrocarbons	C10 - C14	µg/L	50	<50.0	<50.0	0	<50.0	<50.0	0	<50.0	<50.0	0	<50.0	<50.0	0
	C15 - C28	µg/L	100	<100.0	<100.0	0	<100.0	<100.0	0	160.0	160.0	0	160.0	<100.0	46
	C29-C36	µg/L	50 (Primary): 100 (Interlab)	<50.0	<50.0	0	<50.0	<100.0	0	<50.0	<80.0	0	<50.0	<100.0	0
	+C10 - C36 (Sum of total)	µg/L	50 (Primary): 100 (Interlab)	<50.0	<50.0	0	<50.0	<100.0	0	160.0	160.0	0	160.0	<100.0	46
EP080/071: Total Recoverable Hydrocarbons - NEPM 2010 Draft	C10-C16	mg/l	0.1 (Primary): 0.05 (Interlab)	<0.1	<0.1	0	<0.1	<0.05	0	<0.1	<0.1	0	<0.1	<0.05	0
	C16-C34	mg/l	0.1	<0.1	<0.1	0	<0.1	<0.1	0	0.17	0.24	34	0.17	<0.1	**52**
	C34-C40	mg/l	0.1	<0.1	<0.1	0	<0.1	<0.1	0	<0.1	<0.1	0	<0.1	<0.1	0
	C10 - C40 (Sum of total)	µg/L	100	<100.0	<100.0	0	<100.0			170.0	240.0	34	170.0		
EP080/071: Total Petroleum Hydrocarbons	C6 - C9	µg/L	20	<20.0	<20.0	0	<20.0	<20.0	0	<20.0	<20.0	0	<20.0	<20.0	0
EP080/071: Total Recoverable Hydrocarbons - NEPM 2010 Draft	C6-C10	mg/l	0.02	<0.02	<0.02	0	<0.02	<0.02	0	<0.02	<0.02	0	<0.02	<0.02	0
EP074A: Monocyclic Aromatic Hydrocarbons	1,2,4-trimethylbenzene	µg/L	5	<5.0	<5.0	0	<5.0			<5.0	<5.0	0	<5.0		
	1,3,5-trimethylbenzene	µg/L	5	<5.0	<5.0	0	<5.0			<5.0	<5.0	0	<5.0		
	Benzene	µg/L	1	<1.0	<1.0	0	<1.0	<1.0	0	<1.0	<1.0	0	<1.0	<1.0	0
	Ethylbenzene	µg/L	2 (Primary): 1 (Interlab)	<2.0	<2.0	0	<2.0	<1.0	0	<2.0	<2.0	0	<2.0	<1.0	0
	Isopropylbenzene	µg/L	5 (Primary): 1 (Interlab)	<5.0	<5.0	0	<5.0	<1.0	0	<5.0	<5.0	0	<5.0	<1.0	0
	n-butylbenzene	µg/L	5	<5.0	<5.0	0	<5.0			<5.0	<5.0	0	<5.0		
	n-propylbenzene	µg/L	5	<5.0	<5.0	0	<5.0			<5.0	<5.0	0	<5.0		
	p-isopropyltoluene	µg/L	5	<5.0	<5.0	0	<5.0			<5.0	<5.0	0	<5.0		
	sec-butylbenzene	µg/L	5	<5.0	<5.0	0	<5.0			<5.0	<5.0	0	<5.0		
	Styrene	µg/L	5 (Primary): 1 (Interlab)	<5.0	<5.0	0	<5.0	<1.0	0	<5.0	<5.0	0	<5.0	<1.0	0
	tert-butylbenzene	µg/L	5	<5.0	<5.0	0	<5.0			<5.0	<5.0	0	<5.0		
	Toluene	µg/L	2 (Primary): 1 (Interlab)	<2.0	<2.0	0	<2.0	<1.0	0	<2.0	<2.0	0	<2.0	<1.0	0
	Xylene (m & p)	µg/L	2	<2.0	<2.0	0	<2.0	<2.0	0	<2.0	<2.0	0	<2.0	<2.0	0
	Xylene (o)	µg/L	2 (Primary): 1 (Interlab)	<2.0	<2.0	0	<2.0	<1.0	0	<2.0	<2.0	0	<2.0	<1.0	0
EP074H: Naphthalene	Naphthalene	µg/L	7 (Primary): 20 (Interlab)	<7.0	<7.0	0	<7.0	<1.0	0	<7.0	<7.0	0	<7.0	<1.0	0

*RPDs have only been considered where a concentration is greater than 5 times the EQL.

**High RPDs are in bold (Acceptable RPDs for each EQL multiplier range are: 100 (5-10 x EQL); 50 (10-20 x EQL); 20 (> 20 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

ATTACHMENT C4 SUMMARY OF RINSATE AND EQUIPMENT BLANKS

Table C2 - Summary of Rinsate and Trip Blanks Results

	Field_ID			Rinsate 1	Rinsate 2	RIN 3	RIN4	Trip 1	Trip 2	Trip 3	Trip 4	TRIP 5	Trip 6	Trip 7	Trip 8
	Lab_Report_Number			EM1306677	EM1306738	EM1306798	EM1306871	EM1306677	EM1306738	EM1306738	EM1306766	EM1306798	EM1306820	EM1306871	EM1306906
Chem_Group	**ChemName**	**Units**	**EQL**												
	Ammonium as N	mg/L	0.01	-	-	-	-	-	-	-	-	-	-	-	-
	>C10 - C16 Fraction (SG)	mg/L	0.1	-	-	-	-	-	-	-	-	-	-	-	-
	>C10 - C40 Fraction (sum) (SG)	mg/L	0.1	-	-	-	-	-	-	-	-	-	-	-	-
	>C16 - C34 Fraction (SG)	mg/L	0.1	-	-	-	-	-	-	-	-	-	-	-	-
	>C34 - C40 Fraction (SG)	mg/L	0.1	-	-	-	-	-	-	-	-	-	-	-	-
	Sulfate as SO4 - Turbidimetric (Filtered)	mg/L	1	-	-	-	-	-	-	-	-	-	-	-	-
	C10 - C36 Fraction (sum) (SG)	mg/L	0.05	-	-	-	-	-	-	-	-	-	-	-	-
BTEX	Benzene	µg/L	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
	Toluene	µg/L	1	<2	<2	<2	<2	<2	<2	<2	<2	<2	<2	<2	<2
	Xylene (m & p)	µg/L	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
	Xylene Total	µg/L	3	<4	<4	<4	<4	<4	<4	<4	<4	<4	<4	<4	<4
	C6-C10 less BTEX (F1)	mg/L	0.02	-	-	-	-	-	-	-	-	-	-	-	-
Inorganics	Ammonium Ion	mg/L	0.01	-	-	-	-	-	-	-	-	-	-	-	-
	Alkalinity (total) as CaCO3	mg/L	1	-	-	-	-	-	-	-	-	-	-	-	-
	Ammonia as N	µg/L	10	-	-	<10	-	-	-	-	-	-	-	-	-
	Anions Total	meq/L	0.01	-	-	-	-	-	-	-	-	-	-	-	-
	Cations Total	meq/L	0.01	-	-	-	-	-	-	-	-	-	-	-	-
	Chloride	mg/L	1	-	-	-	-	-	-	-	-	-	-	-	-
	Cyanide Total	mg/L	0.004	-	-	-	-	-	-	-	-	-	-	-	-
	Fluoride	mg/L	0.1	-	-	-	-	-	-	-	-	-	-	-	-
	Ionic Balance	%	0.01	-	-	-	-	-	-	-	-	-	-	-	-
	Nitrate (as N)	mg/L	0.01	-	-	-	-	-	-	-	-	-	-	-	-
	Nitrate	mg/L	0.01	-	-	-	-	-	-	-	-	-	-	-	-
	Nitrite (as N)	mg/L	0.01	-	-	-	-	-	-	-	-	-	-	-	-
	pH (Lab)	pH Units	0.01	-	-	-	-	-	-	-	-	-	-	-	-
	Reactive Phosphorus as P	mg/L	0.01	-	-	-	-	-	-	-	-	-	-	-	-
	Sodium (Filtered)	mg/L	1	-	-	-	-	-	-	-	-	-	-	-	-
	Sulphate as S	mg/L	5	-	-	-	-	-	-	-	-	-	-	-	-
	TDS	mg/L	10	-	-	-	-	-	-	-	-	-	-	-	-
Lead	Lead (Filtered)	mg/L	0.001	-	-	-	-	-	-	-	-	-	-	-	-
MAH	1,2,4-trimethylbenzene	µg/L	5	<5	<5	<5	<5	<5	<5	<5	<5	<5	<5	<5	<5
	1,3,5-trimethylbenzene	µg/L	5	<5	<5	<5	<5	<5	<5	<5	<5	<5	<5	<5	<5
	Isopropylbenzene	µg/L	1	<5	<5	<5	<5	<5	<5	<5	<5	<5	<5	<5	<5
	n-butylbenzene	µg/L	5	<5	<5	<5	<5	<5	<5	<5	<5	<5	<5	<5	<5
	n-propylbenzene	µg/L	5	<5	<5	<5	<5	<5	<5	<5	<5	<5	<5	<5	<5
	p-isopropyltoluene	µg/L	5	<5	<5	<5	<5	<5	<5	<5	<5	<5	<5	<5	<5
	sec-butylbenzene	µg/L	5	<5	<5	<5	<5	<5	<5	<5	<5	<5	<5	<5	<5
	Styrene	µg/L	1	<5	<5	<5	<5	<5	<5	<5	<5	<5	<5	<5	<5
	tert-butylbenzene	µg/L	5	<5	<5	<5	<5	<5	<5	<5	<5	<5	<5	<5	<5
Metals	Aluminium (Filtered)	mg/L	0.01	-	-	-	-	-	-	-	-	-	-	-	-
	Arsenic (Filtered)	mg/L	0.001	-	-	-	-	-	-	-	-	-	-	-	-
	Boron (Filtered)	mg/L	0.05	-	-	-	-	-	-	-	-	-	-	-	-
	Cadmium (Filtered)	mg/L	0.0001	-	-	-	-	-	-	-	-	-	-	-	-
	Calcium (Filtered)	mg/L	1	-	-	-	-	-	-	-	-	-	-	-	-
	Cobalt (Filtered)	mg/L	0.001	-	-	-	-	-	-	-	-	-	-	-	-
	Copper (Filtered)	mg/L	0.001	-	-	-	-	-	-	-	-	-	-	-	-
	Iron (Filtered)	mg/L	0.05	-	-	-	-	-	-	-	-	-	-	-	-
	Magnesium (Filtered)	mg/L	1	-	-	-	-	-	-	-	-	-	-	-	-
	Manganese (Filtered)	mg/L	0.001	-	-	-	-	-	-	-	-	-	-	-	-
	Nickel (Filtered)	mg/L	0.001	-	-	-	-	-	-	-	-	-	-	-	-
	Potassium (Filtered)	mg/L	1	-	-	-	-	-	-	-	-	-	-	-	-
	Selenium (Filtered)	mg/L	0.001	-	-	-	-	-	-	-	-	-	-	-	-
	Zinc (Filtered)	mg/L	0.001	-	-	-	-	-	-	-	-	-	-	-	-

PAH/Phenols	Naphthalene	µg/L	1	<7	<7	<7	<7	<7	<7	<7	<7	<7	<7	<7	<7
TPH	C10-C16	mg/L	0.05	<0.1	<0.1	<0.1	<0.1	-	-	-	-	-	-	-	-
	C16-C34	mg/L	0.1	<0.1	<0.1	0.22	<0.1	-	-	-	-	-	-	-	-
	C34-C40	mg/L	0.1	<0.1	<0.1	<0.1	<0.1	-	-	-	-	-	-	-	-
	F2-NAPHTHALENE	mg/L	0.05	-	-		-	-	-	-	-	-	-	-	-
	TPH C10-C14 Fraction after Silica Cleanup	mg/L	0.05	-	-	<50	-	-	-	-	-	-	-	-	-
	TPH C15-C28 Fraction after Silica Cleanup	mg/L	0.1	-	-	<100	-	-	-	-	-	-	-	-	-
	TPH C29-C36 Fraction after Silica Cleanup	mg/L	0.05	-	-	<50	-	-	-	-	-	-	-	-	-
	C10 - C14	µg/L	50	<50	<50	<50	<50	-	-	-	-	-	-	-	-
	C6 - C9	µg/L	20	<20	<20	<20	<20	-	-	-	-	-	-	-	-
	C15 - C28	µg/L	100	<100	<100	140	<100	-	-	-	-	-	-	-	-
	TPH C15-C28 Fraction after Silica Cleanup	mg/L	0.1	-	-	<100	-	-	-	-	-	-	-	-	-
	C29-C36	µg/L	50	<50	<50	100	<50	-	-	-	-	-	-	-	-
	TPH C29-C36 Fraction after Silica Cleanup	mg/L	0.05	-	-	<50	-	-	-	-	-	-	-	-	-
	+C10 - C36 (Sum of total)	µg/L	50	<50	<50	240 - 265	<50	-	-	-	-	-	-	-	-
	C10 - C36 (Sum of total) SGC	µg/L	50	-	-	<50	-	-	-	-	-	-	-	-	-
	C10 - C40 (Sum of total)	µg/L	100	<100	<100	220	<100	-	-	-	-	-	-	-	-
	C10 - C40 (Sum of total) SGC	µg/L	100	-	-	<100	-	-	-	-	-	-	-	-	-
	C6-C10	mg/L	0.02	<0.02	<0.02	<0.02	<0.02	-	-	-	-	-	-	-	-

APPENDIX D LABORATORY TRANSCRIPTS AND CHAIN OF CUSTODY FORMS

COC received on 25/6 @ 8:34 AWTH

(7)

CHAIN OF CUSTODY

ALS Laboratory: please tick →

ALS

Sydney 277 Woodpark Rd Smithfield NSW 2164 Ph 02 8784 8555 E samples.sydney@alsenviro.com

Brisbane 32 Shand St Stafford QLD 4053 Ph 07 3243 7222 E samples.brisbane@alsenviro.com

Melbourne 24 Ph E

Perth Ph E

Newcastle 5 Rosegum Rd Warabrook NSW 2304 Ph 02 4968 9433 E samples.newcastle@alsenviro.com

Townsville 14-15 Desma Cl Bohle QLD 4818 Ph 07 4796 0600 E

Adelaide Ph E

Launceston Ph E

CLIENT: ENVIRONMENTAL EARTH SCIENCES	TURNAROUND REQUIREMENTS: (Standard TAT may be longer for some tests e.g. Ultra Trace Organics) Standard	FOR LABORATORY USE ONLY (Circle) Custody Seal Intact? Yes No N/A
OFFICE: 98 MARIBYRNONG RD, FOOTSCRAY, VIC. 3011		Free ice / frozen ice bricks present upon receipt? Yes No N/A
PROJECT: 210074 5th Melbourne Gasworks	ALS QUOTE NO.: ME/330/13	Random Sample Temperature on Receipt: °C
ORDER NUMBER:	COC SEQUENCE NUMBER (Circle) COC 1 2 3 4 5 7 OF 1 2 3 4 5 7	Other comments:
PROJECT MANAGER: REGIN ORQUIZA	CONTACT PH: 8398 4403	
SAMPLER: SFL / ICK	SAMPLER MOBILE:	RELINQUISHED BY: SFL DATE/TIME: 23/6
COC emailed to ALS? (YES / NO)	EDD FORMAT (or default):	RECEIVED BY: Courier DATE/TIME: 23/6/13
Email Reports to : rorquiza@environmentalearthsciences.com and sloong@environmentalearthsciences.com		RELINQUISHED BY: Bhavathi DATE/TIME: 25/6/13 12:30pm
Email Invoice to : rorquiza@environmentalearthsciences.com		RECEIVED BY: Tom W - Courier DATE/TIME: 25/6/13 3:39pm

COMMENTS/SPECIAL HANDLING/STORAGE OR DISPOSAL:

COURIER

Report: 383844

ALS USE ONLY	SAMPLE DETAILS MATRIX: Solid(S) Water(W)			CONTAINER INFORMATION		ANALYSIS REQUIRED including SUITES (NB. Suite Codes must be listed to attract suite price) Where Metals are required, specify Total (unfiltered bottle required) or Dissolved (field filtered bottle required)											Additional Information		
LAB ID	SAMPLE ID	DATE / TIME	MATRIX	TYPE & PRESERVATIVE (refer to codes below)	TOTAL BOTTLES	EES IONIC BALANCE SUITE - includes pH, TDS, Ca, Mg, Na, K, Cl, SO4, Alk, F, NO3, Reactive P, Ammonia	Ammonium (field pH and field temp must be recorded on the COC)	Dissolved metals - Al, As, Cd, Cu, Fe, Pb, Ni, Zn, Co, Se, B & Mn	Total Cyanide	EP074A - MAH	EP074H - Naphthalene only	TPH (C6-C36) plus TRH (C6-C40)	Silica gel clean up - on SV TPH - TPH (C10-C36) and TPH (C6-C36)	TPH (C6-C36)	Ammonium Sulphate	BTEX	Trimethylbenzene	field pH	Field temp	
1	GW43	24/6	W		8	✓		✓	✓		✓	✓		✓		✓	✓	5.46	18	4
2	Dup1	24/6			8			✓	✓		✓	✓		✓	✓	✓	✓			
→	Split → please forward to ALS Chemmac.	24/6			8			✓	✓		✓	✓		✓	✓	✓	✓			
3	GW39	24/6			8	✓		✓	✓		✓	✓	✓	✓		✓	✓	6.67	16.7	
NAC: High EC 27,000	4 GW42D				8	✓		✓	✓		✓	✓	✓	✓		✓	✓	5.55	16.4	
5	GW41	24/6			8	✓		✓	✓		✓	✓						6.57	17.8	
6	GW23	24/6			8	✓		✓	✓		✓	✓	✓					6.85	68	
7	GW19	24/6			8	✓		✓	✓		✓	✓	✓					6.09	16.4	
8	Rinsate 1	24/6			2						✓	✓				✓	✓			
9	Trip 1	24/6			1						✓					✓	✓			
				TOTAL	67															

Water Container Codes: P = Unpreserved Plastic; N = Nitric Preserved Plastic; ORC = Nitric Preserved ORC; SH = Sodium Hydroxide/Cd Preserved; S = Sodium Hydroxide Preserved Plastic; AG = Amber Glass Unpreserved; AP = Airfreight Unpreserved Plastic; V = VOA Vial HCl Preserved; VB = VOA Vial Sodium Bisulphate Preserved; VS = VOA Vial Sulfuric Preserved; AV = Airfreight Unpreserved Vial SG = Sulfuric Preserved Amber Glass; H = HCl preserved Plastic; HS = HCl preserved Speciation bottle; SP = Sulfuric Preserved Plastic; F = Formaldehyde Preserved

Enquiries

From: Regin Orquiza [rorquiza@eesicontracting.com]
Sent: Wednesday, 26 June 2013 4:33 PM
To: Enquiries; Adrian Tabacchiera
Subject: RE: Eurofins | mgt Sample Receipt Advice - Report 383844 : Site 210074 STH MELBOURNE GASWORKS

Hi James and Adrian,

Could you please change the BTEX and Trimethylebenzenes to MAH's.

Please confirm if you have received my request.

Regards

Regin

-----Original Message-----
From: enquiries.melb@mgtlabmark.com.au [mailto:enquiries.melb@mgtlabmark.com.au]
Sent: Tuesday, 25 June 2013 7:12 PM
To: Regin Orquiza
Subject: Eurofins | mgt Sample Receipt Advice - Report 383844 : Site 210074 STH MELBOURNE GASWORKS

Dear Client,

Please find attached sample receipt advice, summary sheet and your chain of custody (COC). It is important that you check these documents to ensure that the details are correct.

If there are any irregularities then please contact your Eurofins | mgt client manager as soon as possible to make certain they get amended.

Your client manager will be your point of contact for queries and test results.

Your client manager's contact details can be found on your SRA.

Kind Regards

James Gould
Eurofins | mgt

Ph:03 8564 5025
Email:enquiries@mgtlabmark.com.au

En□ironment□□E□rt□Sciences□□□
□e□e□□□□□□□ □rib□rnon□Street
Footscr□□
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□ttention: **□e□in□□rqui□□**

□e□ort	□□□□□□□□
□lient Reference	210074 STH MELBOURNE GASWORKS
Received □ate	Jun 2□, 2013

□ertificate of Analysis

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.

□ient□S□m□e□□ **S□m□e□□ □tri□** **Euro□ins□□m□t□S□m□e□□o□** **□□te□S□m□e□** Test□Reference	LOR	Unit	**S□□T** **□ □ter** **□ □□□n□□□□□** **□un□□□□□□□□**
Tot□□□eco□er□b□e□□□roc□rbons□□□□□□□□E□□ Fr□ctions			
TRH □6-□□	0.02	mg□L	□0.02
TRH □10-□14	0.0□	mg□L	□0.0□
TRH □1□-□28	0.1	mg□L	□0.1
TRH □2□-□36	0.1	mg□L	□0.1
TRH □10-36 □Total□	0.1	mg□L	□0.1
□onoc□c□ic□□rom□tic□□□roc□rbons			
Benzene	0.001	mg□L	□0.001
Ethylbenzene	0.001	mg□L	□0.001
□sopropyl benzene □□umene□	0.001	mg□L	□0.001
m□p-□ylenes	0.002	mg□L	□0.002
o-□ylene	0.001	mg□L	□0.001
Styrene	0.001	mg□L	□0.001
Toluene	0.001	mg□L	□0.001
□ylenes - Total	0.003	mg□L	□0.003
□luorobenzene □surr.□	1	□	64
Tot□□□eco□er□b□e□□□roc□rbons□□□□□□□□E□□ Fr□ctions			
Naphthalene N02	0.02	mg□L	□0.02
TRH □6-□10	0.02	mg□L	□0.02
TRH □6-□10 less BTE□ □□1□ N04	0.02	mg□L	□0.02
TRH □□10-□16	0.0□	mg□L	□0.0□
TRH □□10-□16 less Naphthalene □□2□ N01	0.0□	mg□L	□0.0□
TRH □□16-□34	0.1	mg□L	□0.1
TRH □□34-□40	0.1	mg□L	□0.1
□o□□c□c□ic□□rom□tic□□□roc□rbons			
Naphthalene	0.001	mg□L	□0.001
Ammonia □as N□	0.01	mg□L	0.3□
□yanide □total□	0.00□	mg□L	□0.00□
Sulphate □as S□	□	mg□L	400
□e□□□□□et□s			
Aluminium □filtered□	0.0□	mg□L	□0.0□
Arsenic □filtered□	0.001	mg□L	0.003
Boron □filtered□	0.0□	mg□L	1.2
□admium □filtered□	0.0002	mg□L	0.0007
□obalt □filtered□	0.001	mg□L	0.0□1
□opper □filtered□	0.001	mg□L	0.014

□ient Sam□e □ Sam□e □atri□ □uro□in□ □m□t Sam□e No□ □ate Sam□ed Test/□eference	□O□	□nit	S□□T □ ater □1□□□n1□1□6 □un 24□2□1□
□ea□□ □eta□□			
Iron □filtered□	0.05	m□/□	0.□5
□ead □filtered□	0.001	m□/□	0.001
□an□anese □filtered□	0.005	m□/□	□.□
□ic□el □filtered□	0.001	m□/□	0.05□
Selenium □filtered□	0.001	m□/□	0.002
□inc □filtered□	0.001	m□/□	0.0□□

Sam□e □i□tor□

□ here samples are submitted/anal□sed o□er se□eral da□s, the last date of e□traction and anal□sis is reported.
A recent re□iew of our □I□S has resulted in the correction or clarification of some method identifications. □ue to this, some of the method reference information on reports has chan□ed. □owe□er, no substanti□e chan□e has been made to our laborator□methods, and as such there is no chan□e in the □alidit□of current or pre□ious results □re□ardin□ both □ualit□and □ATA accreditation□

□e□cri□tion	Te□tin□ Site	□□tracted	□o□din□ Time
Total □eco□erable □□drocarbons □1□□□ □E□□ □ractions	□elbourne	□un 2□, 201□	7 □a□
□□ethod□T□□ C□C□□ □□ □T 100A			
Total □eco□erable □□drocarbons □201□ □E□□ □ractions	□elbourne	□un 2□, 201□	7 □a□
□□ethod□□□ □□T□ □O□□2010			
□onoc□clic Aromatic □□drocarbons	□elbourne	□un 2□, 201□	7 □a□
□□ethod□□SE□A □2□0 □□ □T □50A □onoc□clic Aromatic □□drocarbons			
□ol□c□clic Aromatic □□drocarbons	□elbourne	□un 2□, 201□	7 □a□
□□ethod□□SE□A □270 □ol□c□clic Aromatic □□drocarbons			
Ammonia □as □□	□elbourne	□un 25, 201□	2□ □a□
□□ethod□A□□A □500□□□□Ammonia □itro□en b□□IA			
C□anide □total□	□elbourne	□un 2□, 201□	1□ □a□
□□ethod□□SE□A □010 C□anide			
Sulphate □as S□	□elbourne	□un 2□, 201□	2□ □a□
□□ethod□A□□A □500□SO□ □SO□b□ □iscrete Anal□ser□			
□ea□□ □etals □filtered□	□elbourne	□un 25, 201□	1□0 □a□
□□ethod□□SE□A □020 □ea□□ □etals			

□uro□in□ □m□t □nterna□□ua□it□ □ontro□□e□ie□ and □ □o□□ar□

□enera□

1. □aborator□ □C results for □ethod □lan□s, □uplicates, □atri□Spi□es, and □aborator□Control Samples are included in this □C report where applicable. Additional □C data ma□be a□ailable on re□uest.
2. All soil results are reported on a dr□basis, unless otherwise stated.
□. Actual □□□s are matri□dependant. □uoted □□□s ma□be raised where sample e□tracts are diluted due to interferences.
□. □esults are uncorrected for matri□spi□es or surro□ate reco□eries.
5. S□OC anal□sis on waters are performed on homo□enised, unfiltered samples, unless noted otherwise.
□. Samples were anal□sed on an □as recei□ed□basis. 7. This report replaces an□interim results pre□ousl□issued.

□o□din□ Time□

□lease refer to □Sample □reser□ation and Container □uide□for holdin□ times □□S□001□

□or samples recei□ed on the last da□of holdin□ time, notification of testin□re□uirements should ha□e been recei□ed at least □ hours prior to sample receipt deadlines as stated on the Sample □eceipt Ac□nowled□ment.

If the □aborator□did not recei□e the information in the re□uired timeframe, and re□ardless of an□other inte□rit□issues, suitabl□□ualified results ma□still be reported.

□oldin□ times appl□from the date of samplin□, therefore compliance to these ma□be outside the laboratori□s control.

□**N□T**□□p□ duplicates are reported as a ran□e □OT as □□□

□N□TS

m□□□□milli□rams per □ilo□ram	**m**□□□milli□rams per litre
u□□□micro□rams per litre	□□**m**□□arts per million
□□**b**□□arts per billion	□ □□ercenta□e
or□**1**□□**m**□□Or□anisms per 100 millilitres	**NT**□□□nits
□□**N□1**□□**m**□□□ost □robable □umber of or□anisms per 100 millilitres	

T□□□S

□**r**□	□ here a moisture has been determined on a solid sample the result is e□pressed on a dr□basis.
□□□	□imit of □eportin□.
S□□□	Addition of the anal□te to the sample and reported as percenta□e reco□er□.
□□□	□elati□e □ercent □ifference between two □uplicate pieces of anal□sis.
□□**S**	□aborator□Control Sample □reported as percent reco□er□
□□□	Certified □eference □aterial □reported as percent reco□er□
□**et□od** □**an**□	In the case of solid samples these are performed on laborator□certified clean sands. In the case of water samples these are performed on de□ionised water.
Surr □Surro□ate	The addition of a li□e compound to the anal□te tar□et and reported as percenta□e reco□er□.
□**u□licate**	A second piece of anal□sis from the same sample and reported in the same units as the result to show comparison.
□**atc□ □u□licate**	A second piece of anal□sis from a sample outside of the clients batch of samples but run within the laborator□batch of anal□sis.
□**atc□ S**□□□	Spi□e reco□er□reported on a sample from outside of the clients batch of samples but run within the laborator□batch of anal□sis.
□**S**□□**A**	□nited States En□ironment □rotection Authorit□
A□□**A**	American □ublic □ealth Association
AS□□	Australian Standard □eachin□ □rocedure □AS□□□□.□□
T□□□	To□icit□Characteristic □eachin□ □rocedure
□□□	Chain of Custod□
S□**A**	Sample □eceipt Ad□ice
□□	Client □arent □□C was performed on samples pertainin□to this report
N□□	□on□Client □arent □□C performed on samples not pertainin□to this report, □C is representati□e of the se□uence or batch that client samples were anal□sed within

□□ □A□□□□TAN□□ □□T□□A

□□□ □uplicates□□lobal □□□ □uplicates Acceptance Criteria is □0□ howe□er the followin□acceptance □uidelines are e□uall□applicable□

□esults □10 times the □O□ □□o □imit

□esults between 10□20 times the □O□ □□□□ must lie between 0□50□

□esults □20 times the □O□ □□□□ must lie between 0□□0□

Surro□ate □eco□eries □□eco□eries must lie between 50□150□ □□henols 20□1□0□.

□□ □ATA □□N□□A□ □□□□□NTS

1. □ here a result is reported as a less than □□□, hi□her than the nominated □O□, this is due to either matri□interference, e□tract dilution re□uired due to interferences or contaminant le□els within the sample, hi□h moisture content or insufficient sample pro□ided.
2. □uplicate data shown within this report that states the word □□ATC□□is a □atch □uplicate from outside of □our sample batch, but within the laborator□sample batch at a 1□10 ratio. The □arent and □uplicate data shown is not data from □our samples.
□. Or□anochlorine □esticide anal□sis □where reportin□ □CS data, To□ophene □ Chlordane are not added to the □CS.
□. Or□anochlorine □esticide anal□sis □where reportin□Spi□e data, To□ophene is not added to the Spi□e.
5. Total □eco□erable □□drocarbons □where reportin□Spi□e □ □CS data, a sin□le spi□e of commercial □□drocarbon products in the ran□e of C12□C□0 is added and it□s Total □eco□er□is reported in the C10□C1□cell of the □eport.
□. p□ and □ree Chlorine anal□sed in the laborator□ □Anal□sis on this test must be□in within □0 minutes of samplin□.Therefore laborator□anal□sis is unli□el□to be completed within holdin□ time. Anal□sis will be□in as soon as possible after sample receipt.
7. □eco□er□□ata □Spi□es □ Surro□ates□□where chromato□raphic interference does not allow the determination of □eco□er□the term □□T□appears a□ainst that anal□te.
□. □ol□chlorinated □iphen□ls are spi□ed onl□usin□Arochlor 12□0 in □atri□Spi□es and □CS□s.
□. □or □atri□Spi□es and □CS results a dash □□□in the report means that the specific anal□te was not added to the □C sample.
10. □uplicate □□□□s are calculated from raw anal□tical data thus it is possible to ha□e two sets of data.

Test	Unit	Result 1			Acceptance Limits	Qualifying Code
Method Blank						
Total Recoverable Hydrocarbons - NEPM 2013 Fractions TRH C6-C40						
TRH C6-C9	mg/kg	< 0.02			0.02	Pass
TRH C10-C14	mg/kg	< 0.05			0.05	Pass
TRH C15-C28	mg/kg	< 0.1			0.1	Pass
TRH C29-C36	mg/kg	< 0.1			0.1	Pass
Method Blank						
Monocyclic Aromatic Hydrocarbons - US EPA 8260 Monocyclic Aromatic Hydrocarbons						
Benzene	mg/kg	< 0.001			0.001	Pass
Ethylbenzene	mg/kg	< 0.001			0.001	Pass
Isopropyl benzene (Cumene)	mg/kg	< 0.001			0.001	Pass
m&p-Xylenes	mg/kg	< 0.002			0.002	Pass
o-Xylene	mg/kg	< 0.001			0.001	Pass
Styrene	mg/kg	< 0.001			0.001	Pass
Toluene	mg/kg	< 0.001			0.001	Pass
Xylenes - Total	mg/kg	< 0.00			0.00	Pass
Method Blank						
Total Recoverable Hydrocarbons - NEPM 2013 Fractions TRH C6-C40 minus BTEX						
Naphthalene	mg/kg	< 0.02			0.02	Pass
TRH C6-C10	mg/kg	< 0.02			0.02	Pass
TRH C6-C10 less BTEX (F1)	mg/kg	< 0.05			0.05	Pass
TRH C10-C16	mg/kg	< 0.1			0.1	Pass
TRH C16-C34	mg/kg	< 0.1			0.1	Pass
Method Blank						
Polycyclic Aromatic Hydrocarbons - US EPA 8270 Polycyclic Aromatic Hydrocarbons						
Naphthalene	mg/kg	< 0.001			0.001	Pass
Method Blank						
Ammonia as N	mg/kg	< 0.01			0.01	Pass
Cyanide (total)	mg/kg	< 0.005			0.005	Pass
Sulphate as S	mg/kg	< 5			5	Pass
Method Blank						
Heavy Metals (Filtered) - US EPA 6020 Heavy Metals						
Aluminium (filtered)	mg/kg	< 0.05			0.05	Pass
Arsenic (filtered)	mg/kg	< 0.001			0.001	Pass
Boron (filtered)	mg/kg	< 0.05			0.05	Pass
Cadmium (filtered)	mg/kg	< 0.0002			0.0002	Pass
Cobalt (filtered)	mg/kg	< 0.001			0.001	Pass
Copper (filtered)	mg/kg	< 0.001			0.001	Pass
Iron (filtered)	mg/kg	< 0.05			0.05	Pass
Lead (filtered)	mg/kg	< 0.001			0.001	Pass
Nickel (filtered)	mg/kg	< 0.001			0.001	Pass
Selenium (filtered)	mg/kg	< 0.001			0.001	Pass
Zinc (filtered)	mg/kg	< 0.001			0.001	Pass
LCS - Recovery						
Total Recoverable Hydrocarbons - NEPM 2013 Fractions TRH C6-C40						
TRH C6-C9	%	88			70-130	Pass
TRH C10-C14	%	100			70-130	Pass
LCS - Recovery						
Monocyclic Aromatic Hydrocarbons - US EPA 8260 Monocyclic Aromatic Hydrocarbons						

Te□t	□nit□	□e□u□t 1			Acce□tance □imit□	□a□□ □imit□	□ua□i□□in□ □ode
□en□ene	□	□□			70□1□0	□ass	
Eth□lben□ene	□	□□			70□1□0	□ass	
m□p□□ehes	□	101			70□1□0	□ass	
Toluene	□	□5			70□1□0	□ass	
□□enes □Total	□	101			70□1□0	□ass	
□□S □□ □eco□er□							
Tota□□eco□erab□e □□drocarbon□ □2□1□N□□□ □raction□ □□ □T□ □ □□□2□1□							
T□□ C□C10	□	□□			70□1□0	□ass	
T□□ □C10□C1□	□	101			70□1□0	□ass	
□□S □□ □eco□er□							
□o□c□c□ic Aromatic □□drocarbon□ □S□□A □2□□ □o□□c□c□ic Aromatic □□drocarbon□							
□aphthalene	□	72			70□1□0	□ass	
□□S □□ □eco□er□							
Ammonia □as □□	□	□0			70□1□0	□ass	
C□anide □total□	□	□7			70□1□0	□ass	
Sulphate □as S□	□	10□			70□1□0	□ass	
□□S □□ □eco□er□							
□ea□□ □eta□□ □i□tered□□S□□A 6□2□ □ea□□ □eta□□							
Aluminium □filtered□	□	□□			□0□120	□ass	
Arsenic □filtered□	□	10□			□0□120	□ass	
□oron □filtered□	□	□5			□0□120	□ass	
Cadmium □filtered□	□	100			□0□120	□ass	
Cobalt □filtered□	□	□7			□0□120	□ass	
Copper □filtered□	□	10□			□0□120	□ass	
Iron □filtered□	□	□5			□0□120	□ass	
□ead □filtered□	□	□5			□0□120	□ass	
□an□anese □filtered□	□	11□			□0□120	□ass	
□ic□el □filtered□	□	□□			□0□120	□ass	
Selenium □filtered□	□	□□			□0□120	□ass	
□inc □filtered□	□	100			□0□120	□ass	

Te□t	□ab Sam□□e □□	□A Source	□nit□	□e□u□t 1			Acce□tance □imit□	□a□□ □imit□	□ua□i□□in□ □ode
S□i□e □□ □eco□er□									
Tota□□eco□erab□e □□drocarbon□ □1□□□N□□□ □raction□				□esult 1					
T□□ C□C□	□1□□n1□151	□C□	□	11□			70□1□0	□ass	
S□i□e □□ □eco□er□									
□onoc□c□ic Aromatic □□drocarbon□				□esult 1					
□en□ene	□1□□n1□151	□C□	□	107			70□1□0	□ass	
Eth□lben□ene	□1□□n1□151	□C□	□	11□			70□1□0	□ass	
m□p□□ehes	□1□□n1□151	□C□	□	11□			70□1□0	□ass	
o□□□lene	□1□□n1□151	□C□	□	117			70□1□0	□ass	
Toluene	□1□□n1□151	□C□	□	122			70□1□0	□ass	
□□enes □Total	□1□□n1□151	□C□	□	11□			70□1□0	□ass	
S□i□e □□ □eco□er□									
Tota□□eco□erab□e □□drocarbon□ □2□1□N□□□ □raction□				□esult 1					
T□□ C□C10	□1□□n1□151	□C□	□	11□			70□1□0	□ass	
S□i□e □□ □eco□er□									
				□esult 1					
Ammonia □as □□	A1□□n1□5□□	□C□	□	□2			70□1□0	□ass	
C□anide □total□	□1□□n17□□□	□C□	□	□1			70□1□0	□ass	
Sulphate □as S□	□1□□n1□51□	□C□	□	□□			70□1□0	□ass	
S□i□e □□ □eco□er□									
□ea□□ □eta□□ □i□tered□				□esult 1					

Test	Lab Sample ID	QA Source	Units	Result 1			Acceptance Limits	Pass Limits	Qualifying Code
Arsenic Filtered	[illegible]1[illegible]n1[illegible]1[illegible]	[illegible]C[illegible]	[illegible]	[illegible]			75[illegible]125	[illegible]ass	
[illegible]oron Filtered	[illegible]1[illegible]n1[illegible]1[illegible]	[illegible]C[illegible]	[illegible]	77			75[illegible]125	[illegible]ass	
Cadmium Filtered	[illegible]1[illegible]n1[illegible]1[illegible]	[illegible]C[illegible]	[illegible]	[illegible]			75[illegible]125	[illegible]ass	
Cobalt Filtered	[illegible]1[illegible]n1[illegible]1[illegible]	[illegible]C[illegible]	[illegible]	[illegible]0			75[illegible]125	[illegible]ass	
Copper Filtered	[illegible]1[illegible]n1[illegible]1[illegible]	[illegible]C[illegible]	[illegible]	[illegible]			75[illegible]125	[illegible]ass	
Iron Filtered	[illegible]1[illegible]n172[illegible]1	[illegible]C[illegible]	[illegible]	[illegible]7			75[illegible]125	[illegible]ass	
[illegible]ead Filtered	[illegible]1[illegible]n1[illegible]1[illegible]	[illegible]C[illegible]	[illegible]	[illegible]			75[illegible]125	[illegible]ass	
[illegible]ic[illegible]el Filtered	[illegible]1[illegible]n1[illegible]1[illegible]	[illegible]C[illegible]	[illegible]	[illegible]			75[illegible]125	[illegible]ass	
Selenium Filtered	[illegible]1[illegible]n1[illegible]1[illegible]	[illegible]C[illegible]	[illegible]	[illegible]0			75[illegible]125	[illegible]ass	
[illegible]inc Filtered	[illegible]1[illegible]n1[illegible]1[illegible]	[illegible]C[illegible]	[illegible]	[illegible]7			75[illegible]125	[illegible]ass	
Test	**Lab Sample ID**	**QA Source**	**Units**	**Result 1**			**Acceptance Limits**	**Pass Limits**	**Qualifying Code**
[illegible]u[illegible]icate									
Tota[illegible]eco[illegible]erab[illegible] [illegible]drocarbon[illegible] [illegible]1[illegible][illegible]N[illegible][illegible] [illegible]raction[illegible]				Result 1	Result 2	[illegible][illegible]			
T[illegible][illegible] C[illegible]C[illegible]	[illegible]1[illegible]n1[illegible]150	[illegible]C[illegible]	m[illegible]/[illegible]	[illegible]0.02	[illegible]0.02	[illegible]1	[illegible]0[illegible]	[illegible]ass	
[illegible]u[illegible]icate									
[illegible]onoc[illegible]c[illegible]ic Aromatic [illegible][illegible]drocarbon[illegible]				Result 1	Result 2	[illegible][illegible]			
[illegible]en[illegible]ene	[illegible]1[illegible]n1[illegible]150	[illegible]C[illegible]	m[illegible]/[illegible]	[illegible]0.001	[illegible]0.001	[illegible]1	[illegible]0[illegible]	[illegible]ass	
Eth[illegible]lben[illegible]ene	[illegible]1[illegible]n1[illegible]150	[illegible]C[illegible]	m[illegible]/[illegible]	[illegible]0.001	[illegible]0.001	[illegible]1	[illegible]0[illegible]	[illegible]ass	
Isoprop[illegible]l ben[illegible]ene [illegible]Cumene[illegible]	[illegible]1[illegible]n1[illegible]150	[illegible]C[illegible]	m[illegible]/[illegible]	[illegible]0.001	[illegible]0.001	[illegible]1	[illegible]0[illegible]	[illegible]ass	
m[illegible]p[illegible][illegible]ehes	[illegible]1[illegible]n1[illegible]150	[illegible]C[illegible]	m[illegible]/[illegible]	[illegible]0.002	[illegible]0.002	[illegible]1	[illegible]0[illegible]	[illegible]ass	
o[illegible][illegible]lene	[illegible]1[illegible]n1[illegible]150	[illegible]C[illegible]	m[illegible]/[illegible]	[illegible]0.001	[illegible]0.001	[illegible]1	[illegible]0[illegible]	[illegible]ass	
St[illegible]rene	[illegible]1[illegible]n1[illegible]150	[illegible]C[illegible]	m[illegible]/[illegible]	[illegible]0.001	[illegible]0.001	[illegible]1	[illegible]0[illegible]	[illegible]ass	
Toluene	[illegible]1[illegible]n1[illegible]150	[illegible]C[illegible]	m[illegible]/[illegible]	[illegible]0.001	[illegible]0.001	[illegible]1	[illegible]0[illegible]	[illegible]ass	
[illegible][illegible]enes [illegible]Total	[illegible]1[illegible]n1[illegible]150	[illegible]C[illegible]	m[illegible]/[illegible]	[illegible]0.00[illegible]	[illegible]0.00[illegible]	[illegible]1	[illegible]0[illegible]	[illegible]ass	
[illegible]u[illegible]icate									
Tota[illegible][illegible]eco[illegible]erab[illegible] [illegible]drocarbon[illegible] [illegible]2[illegible]1[illegible]N[illegible][illegible] [illegible]raction[illegible]				Result 1	Result 2	[illegible][illegible]			
[illegible]aphthalene	[illegible]1[illegible]n1[illegible]150	[illegible]C[illegible]	m[illegible]/[illegible]	[illegible]0.02	[illegible]0.02	[illegible]1	[illegible]0[illegible]	[illegible]ass	
T[illegible][illegible] C[illegible]C10	[illegible]1[illegible]n1[illegible]150	[illegible]C[illegible]	m[illegible]/[illegible]	[illegible]0.02	[illegible]0.02	[illegible]1	[illegible]0[illegible]	[illegible]ass	
[illegible]u[illegible]icate									
				Result 1	Result 2	[illegible][illegible]			
Ammonia [illegible]as [illegible][illegible]	A1[illegible][illegible]n1[illegible]5[illegible]	[illegible]C[illegible]	m[illegible]/[illegible]	[illegible]0.01	[illegible]0.01	[illegible]1	[illegible]0[illegible]	[illegible]ass	
C[illegible]anide [illegible]total[illegible]	[illegible]1[illegible]n17[illegible][illegible]	[illegible]C[illegible]	m[illegible]/[illegible]	[illegible]0.005	[illegible]0.005	[illegible]1	[illegible]0[illegible]	[illegible]ass	
Sulphate [illegible]as S[illegible]	[illegible]1[illegible]n1[illegible][illegible][illegible]	[illegible]C[illegible]	m[illegible]/[illegible]	[illegible]5	[illegible]5	[illegible]1	[illegible]0[illegible]	[illegible]ass	
[illegible]u[illegible]icate									
[illegible]ea[illegible] [illegible]eta[illegible] [illegible]i[illegible]tered[illegible]				Result 1	Result 2	[illegible][illegible]			
Aluminium Filtered	[illegible]1[illegible]n1[illegible]1[illegible]	[illegible]C[illegible]	m[illegible]/[illegible]	0.1[illegible]	0.1[illegible]	20	[illegible]0[illegible]	[illegible]ass	
Arsenic Filtered	[illegible]1[illegible]n1[illegible]1[illegible]	[illegible]C[illegible]	m[illegible]/[illegible]	0.001[illegible]	0.0012	[illegible].7	[illegible]0[illegible]	[illegible]ass	
[illegible]oron Filtered	[illegible]1[illegible]n1[illegible]1[illegible]	[illegible]C[illegible]	m[illegible]/[illegible]	0.05[illegible]	0.052	2.[illegible]	[illegible]0[illegible]	[illegible]ass	
Cadmium Filtered	[illegible]1[illegible]n1[illegible]1[illegible]	[illegible]C[illegible]	m[illegible]/[illegible]	[illegible]0.0002	[illegible]0.0002	[illegible]1	[illegible]0[illegible]	[illegible]ass	
Cobalt Filtered	[illegible]1[illegible]n1[illegible]1[illegible]	[illegible]C[illegible]	m[illegible]/[illegible]	[illegible]0.001	[illegible]0.001	[illegible]1	[illegible]0[illegible]	[illegible]ass	
Copper Filtered	[illegible]1[illegible]n1[illegible]1[illegible]	[illegible]C[illegible]	m[illegible]/[illegible]	[illegible]0.001	[illegible]0.001	[illegible]1	[illegible]0[illegible]	[illegible]ass	
Iron Filtered	[illegible]1[illegible]n172[illegible]1	[illegible]C[illegible]	m[illegible]/[illegible]	[illegible]0.05	[illegible]0.05	[illegible]1	[illegible]0[illegible]	[illegible]ass	
[illegible]ead Filtered	[illegible]1[illegible]n1[illegible]1[illegible]	[illegible]C[illegible]	m[illegible]/[illegible]	[illegible]0.001	[illegible]0.001	[illegible]1	[illegible]0[illegible]	[illegible]ass	
[illegible]ic[illegible]el Filtered	[illegible]1[illegible]n1[illegible]1[illegible]	[illegible]C[illegible]	m[illegible]/[illegible]	[illegible]0.001	[illegible]0.001	[illegible]1	[illegible]0[illegible]	[illegible]ass	
Selenium Filtered	[illegible]1[illegible]n1[illegible]1[illegible]	[illegible]C[illegible]	m[illegible]/[illegible]	[illegible]0.001	[illegible]0.001	[illegible]1	[illegible]0[illegible]	[illegible]ass	
[illegible]inc Filtered	[illegible]1[illegible]n1[illegible]1[illegible]	[illegible]C[illegible]	m[illegible]/[illegible]	0.00[illegible]	0.007[illegible]	1[illegible]	[illegible]0[illegible]	[illegible]ass	

□omment□

Sam□□e □nte□rit□

Custod□ Seals Intact □if used□	□/A
Attempt to Chill was e□ident	□es
Sample correctl□ preser□ed	□es
Or□anic samples had Teflon liners	□es
Sample containers for □olatile anal□sis rece□ed with minimal headspace	□es
Samples rece□ed within □oldin□Time	□es
Some samples ha□e been subcontracted	□o

□ua□i□ier □ode□□□omment□

□ode	□e□cri□tion
□01	□2 is determined b□ arithmeticall□ subtractin□ the □naphthalene□□alue from the □□C10□C1□□□alue. The naphthalene □alue used in this calculation is obtained from □olatiles □□□e □ Trap anal□sis□
□02	□ here we ha□e reported both □olatile □□□T □C□S□and semi□olatile □□C□S□naphthalene data, results ma□ not be identical. □ro□ided correct sample handlin□ protocols ha□e been followed, an□obser□ed differences in results are li□el□to be due to procedural differences within each methodolo□□. □esults determined b□both techni□ues ha□e passed all □A□C acceptance criteria, and are entirel□ technicall□ □alid.
□0□	□1 is determined b□ arithmeticall□ subtractin□ the □Total □TE□□□alue from the □C□□C10□□alue. The □Total □TE□□□alue is obtained b□ summin□ the concentrations of □TE□ anal□tes. The □C□□C10□□alue is obtained b□ □uantitatin□ a□ainst a standard of mi□ed aromatic/aliphatic anal□tes.

Aut□ori□ed □□

Adrian Tabacchiera	Client Ser□ices
Carroll □ee	Senior Anal□st□□olatile □□IC□
Emil□ □osenber□	Senior Anal□st□□etal □□IC□
□uon□ □e	Senior Anal□st□Inor□anic □□IC□
Stace□ □en□ins	Senior Anal□st□Or□anic □□IC□

□ □enn □ac□□on

□aborator□ □ ana□er

Final report - this Report replaces any previously issued Report

□Indicates □ot □e□uested

□Indicates □ATA accreditation does not co□er the performance of this ser□ice

□ncertaint□ data is a□ailable on re□uest

Ref 11

CoC received 25/06/13 15:36 RT

COURIER

CHAIN OF CUSTODY

ALS Laboratory: please tick →

☐ Sydney: 277 Woodpark Rd Smithfield NSW 2176 ☐ Newcastle: 5 Rosegum Rd Warabrook NSW 2304 ☐ Brisbane: 32 Shand St Stafford QLD 4053 ☐ Townsville: 14-15 Desma Ct Bohle QLD 4818 ☐ Melbourne: 2-4 Westall Rd Springvale VIC 3171 ☐ Adelaide: 2-1 Burma Rd Pooraka SA 5095 ☐ Perth: 10 Hod Way Malaga WA 6090 ☐ Launceston: 27 Wellington St Launceston TAS 7250

CLIENT: ENVIRONMENTAL EARTH SCIENCES	TURNAROUND REQUIREMENTS:		FOR LABORATORY USE ONLY (Circle)
OFFICE: 88 MARIBYRNONG RD, FOOTSCRAY, VIC, 3011	(Standard TAT may be longer for some tests e.g. Ultra Trace Organics)		Custody Seal Intact? Yes No N/A
PROJECT: 210074 Sth Melbourne Gasworks	ALS QUOTE NO.: ME/330/13	COC SEQUENCE NUMBER (Circle)	Free ice / frozen ice bricks present upon receipt? Yes No N/A
ORDER NUMBER:		C: 1 2 3 4 5 7	Random Sample Temperature on Receipt:
PROJECT MANAGER: REGIN ORQUIZA	CONTACT PH: 8388 4403	O: 1 2 3 4 5 7	Other comment: 2.8 - 3.6
SAMPLER:	SAMPLER MOBILE:	RELINQUISHED BY: S.Leong	RECEIVED BY: ALS Courier
COC emailed to ALS? (YES / NO)	EDD FORMAT (or default):	DATE/TIME: 25/06/13 / 3 pm	DATE/TIME: 25/6/13 3pm
Email Reports to: rorquiza@eesicontracting.com and sleong@eesi.biz		RELINQUISHED BY:	RECEIVED BY: [signature]
Email Invoice to: rorquiza@eesicontracting.com		DATE/TIME:	DATE/TIME: 25/6, 1635

COMMENTS/SPECIAL HANDLING/STORAGE OR DISPOSAL:

Environmental Division
Melbourne
Work Order
EM13067
Telephone: +61-3-8549

R.5

ALS USE ONLY: LAB ID	SAMPLE ID	DATE / TIME	MATRIX	TYPE & PRESERVATIVE (refer to codes below)	TOTAL BOTTLES	EES IONIC BALANCE SUITE - includes pH, TDS, Ca, Mg, Na, K, Cl, SO4, Alk, F, NO3, Reactive P, Ammonia	Ammonium (field pH and field temp. must be recorded on the COC)	Dissolved metals - Al, As, Cd, Cu, Fe, Pb, Ni, Zn, Co, Se, B & Mn	Total Cyanide	EP074A - MAH	EP074H - Naphthalene only	TPH (C6-C36) plus TRH (C6-C40)	Silica gel clean up - on SV TPH - TPH (C10-C36) and TRH(C10-C40)	Field pH	Field temp
1	GW18	25/06/2013	W		8	x	x	x	x	x	x	x		6.69	18
2	GW01	25/06/2013	W		8	x	x	x	x	x	x	x		6.6	17.4
3	GW48	25/06/2013	W		8	x	x	x	x	x	x	x		5.74	18
4	GW28	25/06/2013	W		8	x	x	x	x	x	x	x		5.87	18.8
5	GW35	25/06/2013	W		8	x	x	x	x	x	x	x		6.92	17.8
6	GW22	25/06/2013	W		8	x	x	x	x	x	x	x		6.3	15.5
7	Rinsate 2	25/06/2013	W		2					x	x	x			
8	Trip 2	25/06/2013	W		1					x	x				
9	Trip 3	25/06/2013	W		1					x	x				
	Extra jars:														
10	Dup2	25/6/13	W	Rn (Acn) 25/6/13				X	X	X	X	X			
11	Split 2	25/6/13	W					X	X	X	X	X			
				TOTAL											

Please send to MGT

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

Manu (Acn) 26/6, 12:00

Steven EF/MGT 383984
26/6 1:30pm

Ref 1

Raymond Thai

From: Carol Walsh
Sent: Wednesday, 26 June 2013 9:16 AM
To: Samples Melbourne
Subject: REVISED COC - EM1306738-ENVIROMENTAL EARTH SCIENCES
Attachments: img-626090130.pdf

Importance: High

COURIER

SEE ATTACHED REVISED COC.

Please send the SPLIT 2 sample to MGT as per COC.

-----Original Message-----
From: Regin Orquiza [mailto:rorquiza@eesicontracting.com]
Sent: Wednesday, 26 June 2013 9:14 AM
To: Carol Walsh
Subject: RE: ISSUES - EM1306738-ENVIROMENTAL EARTH SCIENCES

Hi Carol,

Please find the attached updated CoC showing the dup/split 2 required analytes. Please send the Split 2 sample to MGT.

Regards

Regin

Regin Orquiza - Senior Environmental Engineer PO Box 2253, Footscray, Victoria 3011
p: 03 9687 1666
d: 03 8398 4403
m: 0448 888 593
f: 03 9687 1844
rorquiza@environmentalearthsciences.com
www.environmentalearthsciences.com

-----Original Message-----
From: Carol Walsh [mailto:Carol.Walsh@alsglobal.com]
Sent: Wednesday, 26 June 2013 8:50 AM
To: Regin Orquiza
Subject: ISSUES - EM1306738-ENVIROMENTAL EARTH SCIENCES

Ref 11

Regin

COURIER

For this attached work order, EM1306738, we have received two extra sample - DUP 2 & SPLIT 2 .

Please advise if any analysis is required on these samples, or should SPLIT 2 be sent off to another lab.

Kind Regards

Carol Walsh
Senior Client Services Officer
ALS | Environmental Division
4 Westall Rd
Springvale, VIC. 3171 Australia

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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.

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Tota□□eco□erab□e □□drocarbon□ □□1□□□N□□□ □raction□			
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Isoprop□l ben□ene □Cumene□	0.001	m□/□	□0.001
m□p□□□ehes	0.002	m□/□	□0.002
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St□rene	0.001	m□/□	□0.001
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□aphthalene	0.001	m□/□	□0.001
C□anide □total□	0.005	m□/□	0.0□□
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Aluminium □filtered□	0.05	m□/□	□0.05
Arsenic □filtered□	0.001	m□/□	0.2□
□oron □filtered□	0.05	m□/□	0.□0
Cadmium □filtered□	0.0002	m□/□	0.0002
Cobalt □filtered□	0.001	m□/□	□0.001
Copper □filtered□	0.001	m□/□	□0.001
Iron □filtered□	0.05	m□/□	2.□
□ead □filtered□	0.001	m□/□	□0.001

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Sam□□e □i□tor□

□ here samples are submitted/anal□sed o□er se□eral da□s, the last date of e□traction and anal□sis is reported.
A recent re□iew of our □I□S has resulted in the correction or clarification of some method identifications. □ue to this, some of the method reference information on reports has chan□ed. □owe□er, no substanti□e chan□e has been made to our laborator□methods, and as such there is no chan□e in the □alidit□of current or pre□ious results □re□ardin□ both □ualit□and □ATA accreditation□

□e□cri□tion	Te□tin□ Site	□□tracted	□o□din□ Time
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1. □aborator□ □C results for □ethod □lan□s, □uplicates, □atri□Spi□es, and □aborator□Control Samples are included in this □C report where applicable. Additional □C data ma□be a□ailable on re□uest.
2. All soil results are reported on a dr□basis, unless otherwise stated.
□. Actual □□□s are matri□dependant. □uoted □□□s ma□be raised where sample e□tracts are diluted due to interferences.
□. □esults are uncorrected for matri□spi□es or surro□ate reco□eries.
5. S□OC anal□sis on waters are performed on homo□enised, unfiltered samples, unless noted otherwise.
□. Samples were anal□sed on an □as recei□ed□basis. 7. This report replaces an□interim results pre□ousl□issued.

□o□din□ Time□

□lease refer to □Sample □reser□ation and Container □uide□for holdin□ times □□S□001□

□or samples recei□ed on the last da□of holdin□ time, notification of testin□re□uirements should ha□e been recei□ed at least □ hours prior to sample receipt deadlines as stated on the Sample □eceipt Ac□nowled□ment.

If the □aborator□did not recei□e the information in the re□uired timeframe, and re□ardless of an□other inte□rit□issues, suitabl□□ualified results ma□still be reported.

□oldin□ times appl□from the date of samplin□, therefore compliance to these ma□be outside the laborator□s control.

□**N**□**T**□□p□ duplicates are reported as a ran□e □OT as □□□

□N□TS

m□□□□milli□rams per □ilo□ram	**m**□□□milli□rams per litre
u□□□micro□rams per litre	□□**m**□□arts per million
□□**b**□□arts per billion	□ □□ercenta□e
or□**1**□□**m**□□Or□anisms per 100 millilitres	**NT**□□□nits
□□**N**□**1**□□**m**□□□ost □robable □umber of or□anisms per 100 millilitres	

T□□□S

□**r**□	□ here a moisture has been determined on a solid sample the result is e□pressed on a dr□basis.
□□□	□imit of □eportin□.
S□□□	Addition of the anal□te to the sample and reported as percenta□e reco□er□.
□□□	□elati□e □ercent □ifference between two □uplicate pieces of anal□sis.
□□**S**	□aborator□Control Sample □reported as percent reco□er□
□□□	Certified □eference □aterial □reported as percent reco□er□
□**et□od □an**□	In the case of solid samples these are performed on laborator□certified clean sands. In the case of water samples these are performed on de□ionised water.
Surr □Surro□ate	The addition of a li□e compound to the anal□te tar□et and reported as percenta□e reco□er□.
□**u□licate**	A second piece of anal□sis from the same sample and reported in the same units as the result to show comparison.
□**atc□ □u□licate**	A second piece of anal□sis from a sample outside of the clients batch of samples but run within the laborator□batch of anal□sis.
□**atc□ S**□□□	Spi□e reco□er□reported on a sample from outside of the clients batch of samples but run within the laborator□batch of anal□sis.
□**S**□□**A**	□nited States En□ironment □rotection Authorit□
A□□**A**	American □ublic □ealth Association
AS□□	Australian Standard □eachin□ □rocedure □AS□□□□.□□
T□□□	To□icit□Characteristic □eachin□ □rocedure
□□□	Chain of Custod□
S□**A**	Sample □eceipt Ad□ice
□□	Client □arent □□C was performed on samples pertainin□to this report
N□□	□on□Client □arent □□C performed on samples not pertainin□to this report, □C is representati□e of the se□uence or batch that client samples were anal□sed within

□□ □A□□□□TAN□□ □□T□□A

□□□ □uplicates□□lobal □□□ □uplicates Acceptance Criteria is □0□ howe□er the followin□acceptance □uidelines are e□uall□applicable□

□esults □10 times the □O□ □□o □imit

□esults between 10□20 times the □O□ □□□□ must lie between 0□50□

□esults □20 times the □O□ □□□□ must lie between 0□□0□

Surro□ate □eco□eries □□eco□eries must lie between 50□150□ □□henols 20□1□0□.

□□ □ATA □□N□□A□ □□□□ □NTS

1. □ here a result is reported as a less than □□□, hi□her than the nominated □O□, this is due to either matri□interference, e□tract dilution re□uired due to interferences or contaminant le□els within the sample, hi□h moisture content or insufficient sample pro□ided.
2. □uplicate data shown within this report that states the word □□ATC□□is a □atch □uplicate from outside of □our sample batch, but within the laborator□sample batch at a 1□10 ratio. The □arent and □uplicate data shown is not data from □our samples.
□. Or□anochlorine □esticide anal□sis □where reportin□ □CS data, To□ophene □ Chlordane are not added to the □CS.
□. Or□anochlorine □esticide anal□sis □where reportin□Spi□e data, To□ophene is not added to the Spi□e.
5. Total □eco□erable □□drocarbons □where reportin□Spi□e □ □CS data, a sin□le spi□e of commercial □□drocarbon products in the ran□e of C12□C□0 is added and it□s Total □eco□er□is reported in the C10□C1□cell of the □eport.
□. p□ and □ree Chlorine anal□sed in the laborator□ □Anal□sis on this test must be□in within □0 minutes of samplin□.Therefore laborator□anal□sis is unli□el□to be completed within holdin□ time. Anal□sis will be□in as soon as possible after sample receipt.
7. □eco□er□□ata □Spi□es □ Surro□ates□□where chromato□raphic interference does not allow the determination of □eco□er□the term □□T□appears a□ainst that anal□te.
□. □ol□chlorinated □iphen□ls are spi□ed onl□usin□Arochlor 12□0 in □atri□Spi□es and □CS□s.
□. □or □atri□Spi□es and □CS results a dash □□□in the report means that the specific anal□te was not added to the □C sample.
10. □uplicate □□□s are calculated from raw anal□tical data thus it is possible to ha□e two sets of data.

Test	Units	Result 1			Acceptance Limits	Pass Limits	Qualifying Code
Method Blank							
Total Recoverable Hydrocarbons □1□□□N□□□ Fractions T□□ □6□□6 □ □□T 1□□A							
TRH C10-C14	mg/L	< 0.05			0.05	Pass	
TRH C15-C28	mg/L	< 0.1			0.1	Pass	
TRH C29-C36	mg/L	< 0.1			0.1	Pass	
Method Blank							
Monocyclic Aromatic Hydrocarbons □S□□A □26□ □□ □T □5□A Monocyclic Aromatic Hydrocarbons							
Benzene	mg/L	< 0.001			0.001	Pass	
Ethylbenzene	mg/L	< 0.001			0.001	Pass	
Isopropyl benzene (Cumene)	mg/L	< 0.001			0.001	Pass	
m&p-Xylenes	mg/L	< 0.002			0.002	Pass	
o-Xylene	mg/L	< 0.001			0.001	Pass	
Styrene	mg/L	< 0.001			0.001	Pass	
Toluene	mg/L	< 0.001			0.001	Pass	
Xylenes - Total	mg/L	< 0.00□			0.00□	Pass	
Method Blank							
Total Recoverable Hydrocarbons □2□1□N□□□ Fractions □□ □T□□ □□□2□1□							
Naphthalene	mg/L	< 0.02			0.02	Pass	
TRH >C10-C16	mg/L	< 0.05			0.05	Pass	
TRH >C16-C34	mg/L	< 0.1			0.1	Pass	
TRH >C34-C40	mg/L	< 0.1			0.1	Pass	
Method Blank							
Polycyclic Aromatic Hydrocarbons □S□□A □2□□ Polycyclic Aromatic Hydrocarbons							
Naphthalene	mg/L	< 0.001			0.001	Pass	
Method Blank							
Cyanide (total)	mg/L	< 0.005			0.005	Pass	
Method Blank							
Heavy Metals (filtered) □S□□A 6□2□ Heavy Metals							
Aluminium (filtered)	mg/L	< 0.05			0.05	Pass	
Arsenic (filtered)	mg/L	< 0.001			0.001	Pass	
Boron (filtered)	mg/L	< 0.05			0.05	Pass	
Cadmium (filtered)	mg/L	< 0.0002			0.0002	Pass	
Cobalt (filtered)	mg/L	< 0.001			0.001	Pass	
Copper (filtered)	mg/L	< 0.001			0.001	Pass	
Iron (filtered)	mg/L	< 0.05			0.05	Pass	
Lead (filtered)	mg/L	< 0.001			0.001	Pass	
Manganese (filtered)	mg/L	< 0.005			0.005	Pass	
Nickel (filtered)	mg/L	< 0.001			0.001	Pass	
Selenium (filtered)	mg/L	< 0.001			0.001	Pass	
Zinc (filtered)	mg/L	< 0.001			0.001	Pass	
LCS - % Recovery							
Total Recoverable Hydrocarbons □1□□□N□□□ Fractions T□□ □6□□6 □ □□T 1□□A							
TRH C6-C9	%	102			70-130	Pass	
TRH C10-C14	%	□1			70-130	Pass	
LCS - % Recovery							
Monocyclic Aromatic Hydrocarbons □S□□A □26□ □□ □T □5□A Monocyclic Aromatic Hydrocarbons							
Benzene	%	□□			70-130	Pass	
Ethylbenzene	%	10□			70-130	Pass	
m&p-Xylenes	%	111			70-130	Pass	

eurofins | mgt

Te□t			□nit□	□e□u□t 1			Acce□tance □imit□	□a□□ □imit□	□ua□i□□in□ □ode
Toluene			□	102			70□1□0	□ass	
□□enes □Total			□	10□			70□1□0	□ass	
□□S □□ □eco□er□									
Tota□□eco□erab□e □□drocarbon□ □2□1□N□□□ □raction□ □□ □□T□□ □□□2□1□									
T□□ C□C10			□	102			70□1□0	□ass	
T□□ □C10□C1□			□	□2			70□1□0	□ass	
□□S □□ □eco□er□									
□o□c□c□ic Aromatic □□drocarbon□ □S□□A □2□□ □o□c□c□ic Aromatic □□drocarbon□									
□aphthalene			□	72			70□1□0	□ass	
□□S □□ □eco□er□									
C□anide □total□			□	□□			70□1□0	□ass	
□□S □□ □eco□er□									
□ea□□ □eta□□ □i□tered□□S□□A 6□2□ □ea□□ □eta□□									
Aluminium □filtered□			□	117			□0□120	□ass	
Arsenic □filtered□			□	10□			□0□120	□ass	
□oron □filtered□			□	105			□0□120	□ass	
Cadmium □filtered□			□	111			□0□120	□ass	
Cobalt □filtered□			□	115			□0□120	□ass	
Copper □filtered□			□	107			□0□120	□ass	
□ead □filtered□			□	112			□0□120	□ass	
□an□anese □filtered□			□	11□			□0□120	□ass	
□ic□el □filtered□			□	110			□0□120	□ass	
Selenium □filtered□			□	112			□0□120	□ass	
□inc □filtered□			□	10□			□0□120	□ass	
Te□t	**□ab Sam□□e □□**	**□A Source**	**□nit□**	**□e□u□t 1**			**Acce□tance □imit□**	**□a□□ □imit□**	**□ua□i□□in□ □ode**
S□i□e □□ □eco□er□									
Tota□□eco□erab□e □□drocarbon□ □1□□□N□□□ □raction□				□esult 1					
T□□ C□C□	□1□□n1□□00	□C□	□	111			70□1□0	□ass	
T□□ C10□C1□	□1□□n1□□27	□C□	□	7□			70□1□0	□ass	
S□i□e □□ □eco□er□									
□onoc□c□ic Aromatic □□drocarbon□				□esult 1					
□en□ene	□1□□n1□□00	□C□	□	100			70□1□0	□ass	
Eth□lben□ene	□1□□n1□□00	□C□	□	110			70□1□0	□ass	
m□p□□□□enes	□1□□n1□□00	□C□	□	117			70□1□0	□ass	
o□□□lene	□1□□n1□□00	□C□	□	10□			70□1□0	□ass	
Toluene	□1□□n1□□00	□C□	□	115			70□1□0	□ass	
□□□enes □Total	□1□□n1□□00	□C□	□	11□			70□1□0	□ass	
S□i□e □□ □eco□er□									
Tota□□eco□erab□e □□drocarbon□ □2□1□N□□□ □raction□				□esult 1					
T□□ C□C10	□1□□n1□□00	□C□	□	111			70□1□0	□ass	
T□□ □C10□C1□	□1□□n1□□27	□C□	□	□0			70□1□0	□ass	
S□i□e □□ □eco□er□									
				□esult 1					
C□anide □total□	□1□□n1□□2□	□C□	□	77			70□1□0	□ass	
S□i□e □□ □eco□er□									
□ea□□ □eta□□ □i□tered□				□esult 1					
Aluminium □filtered□	□1□□n1□□00	□C□	□	□□			75□125	□ass	
Arsenic □filtered□	□1□□n1□□00	□C□	□	□5			75□125	□ass	
□oron □filtered□	□1□□n1□□00	□C□	□	□1			75□125	□ass	
Cadmium □filtered□	□1□□n1□□00	□C□	□	□0			75□125	□ass	
Cobalt □filtered□	□1□□n1□□00	□C□	□	□□			75□125	□ass	
Copper □filtered□	□1□□n1□□00	□C□	□	□0			75□125	□ass	

Test	Lab Sample ID	QA Source	Units	Result 1			Acceptance Limits	Pass Limits	Qualifying Code
Lead (filtered)	1[illegible]n1[illegible]00	QC		7			75-125	Pass	
Manganese (filtered)	1[illegible]n1[illegible]212	QC		5			75-125	Pass	
Nickel (filtered)	1[illegible]n1[illegible]00	QC		2			75-125	Pass	
Selenium (filtered)	1[illegible]n1[illegible]00	QC		10			75-125	Pass	
Zinc (filtered)	1[illegible]n1[illegible]00	QC		2			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	A1[illegible]n1[illegible]5	QC	mg/kg	0.02	0.02	1	0-0	Pass	
TRH C10-C14	1[illegible]n1[illegible]1	QC	mg/kg	0.05	0.05	1	0-0	Pass	
TRH C15-C28	1[illegible]n1[illegible]1	QC	mg/kg	0.1	0.1	1	0-0	Pass	
TRH C29-C36	1[illegible]n1[illegible]1	QC	mg/kg	0.1	0.1	1	0-0	Pass	
Duplicate									
Monocyclic Aromatic Hydrocarbons				Result 1	Result 2	RPD			
Benzene	A1[illegible]n1[illegible]5	QC	mg/kg	0.001	0.001	1	0-0	Pass	
Ethylbenzene	A1[illegible]n1[illegible]5	QC	mg/kg	0.001	0.001	1	0-0	Pass	
Isopropylbenzene (Cumene)	A1[illegible]n1[illegible]5	QC	mg/kg	0.001	0.001	1	0-0	Pass	
m+p-xylenes	A1[illegible]n1[illegible]5	QC	mg/kg	0.002	0.002	1	0-0	Pass	
o-xylene	A1[illegible]n1[illegible]5	QC	mg/kg	0.001	0.001	1	0-0	Pass	
Styrene	A1[illegible]n1[illegible]5	QC	mg/kg	0.001	0.001	1	0-0	Pass	
Toluene	A1[illegible]n1[illegible]5	QC	mg/kg	0.001	0.001	1	0-0	Pass	
[illegible]lenes -Total	A1[illegible]n1[illegible]5	QC	mg/kg	0.00	0.00	1	0-0	Pass	
Duplicate									
Total Recoverable Hydrocarbons - 2013 NEPM Fractions				Result 1	Result 2	RPD			
Naphthalene	A1[illegible]n1[illegible]5	QC	mg/kg	0.02	0.02	1	0-0	Pass	
TRH C6-C10	A1[illegible]n1[illegible]5	QC	mg/kg	0.02	0.02	1	0-0	Pass	
TRH >C10-C16	1[illegible]n1[illegible]1	QC	mg/kg	0.05	0.05	1	0-0	Pass	
TRH >C16-C34	1[illegible]n1[illegible]1	QC	mg/kg	0.1	0.1	1	0-0	Pass	
TRH >C34-C40	1[illegible]n1[illegible]1	QC	mg/kg	0.1	0.1	1	0-0	Pass	
Duplicate									
				Result 1	Result 2	RPD			
Cyanide (total)	1[illegible]n1[illegible]2	QC	mg/kg	0.005	0.005	1	0-0	Pass	
Duplicate									
Heavy Metals (filtered)				Result 1	Result 2	RPD			
Aluminium (filtered)	1[illegible]n1[illegible]00	QC	mg/kg	0.05	0.05	1	0-0	Pass	
Arsenic (filtered)	1[illegible]n1[illegible]00	QC	mg/kg	0.01	0.017	7.0	0-0	Pass	
Boron (filtered)	1[illegible]n1[illegible]00	QC	mg/kg	0.0	0.0	0	0-0	Pass	
Cadmium (filtered)	1[illegible]n1[illegible]00	QC	mg/kg	0.0002	0.0002	1	0-0	Pass	
Cobalt (filtered)	1[illegible]n1[illegible]00	QC	mg/kg	0.0012	0.0011	0	0-0	Pass	
Copper (filtered)	1[illegible]n1[illegible]00	QC	mg/kg	0.001	0.001	1	0-0	Pass	
Iron (filtered)	1[illegible]n200[illegible]7	QC	mg/kg	17	1	5.0	0-0	Pass	
Lead (filtered)	1[illegible]n1[illegible]00	QC	mg/kg	0.001	0.001	1	0-0	Pass	
Manganese (filtered)	1[illegible]n1[illegible]00	QC	mg/kg	0.1	0.1	0	0-0	Pass	
Nickel (filtered)	1[illegible]n1[illegible]00	QC	mg/kg	0.002	0.001	1	0-0	Pass	
Selenium (filtered)	1[illegible]n1[illegible]00	QC	mg/kg	0.001	0.001	17	0-0	Pass	
Zinc (filtered)	1[illegible]n1[illegible]00	QC	mg/kg	0.00	0.00	0	0-0	Pass	

□omment□

Sam□□e □nte□rit□

Custod□ Seals Intact □if used□	□/A
Attempt to Chill was e□ident	□es
Sample correctl□ preser□ed	□es
Or□anic samples had Teflon liners	□es
Sample containers for □olatile anal□sis rece□ed with minimal headspace	□es
Samples rece□ed within □oldin□Time	□es
Some samples ha□e been subcontracted	□o

□ua□i□ier □ode□□□omment□

□ode	□e□cri□tion
□01	□2 is determined b□ arithmeticall□ subtractin□ the □naphthalene□□alue from the □□C10□C1□□□alue. The naphthalene □alue used in this calculation is obtained from □olatiles □□□□e □ Trap anal□sis□
□02	□ here we ha□e reported both □olatile □□□T □C□S□and semi□olatile □□C□S□naphthalene data, results ma□ not be identical. □ro□ided correct sample handlin□ protocols ha□e been followed, an□obser□ed differences in results are li□el□to be due to procedural differences within each methodolo□□. □esults determined b□both techni□ues ha□e passed all □A□C acceptance criteria, and are entirel□ technicall□ □alid.
□0□	□1 is determined b□ arithmeticall□ subtractin□ the □Total □TE□□□alue from the □C□□C10□□alue. The □Total □TE□□□alue is obtained b□ summin□ the concentrations of □TE□ anal□tes. The □C□□C10□□alue is obtained b□ □uantitatin□ a□ainst a standard of mi□ed aromatic/aliphatic anal□tes.

Aut□ori□ed □□

Adrian Tabacchiera	Client Ser□ices
Carroll □ee	Senior Anal□st□□olatile □□IC□
Emil□ □osenber□	Senior Anal□st□□etal □□IC□
□uon□ □e	Senior Anal□st□Inor□anic □□IC□
Stace□ □en□ins	Senior Anal□st□Or□anic □□IC□

□ □enn □ac□□on

□aborator□ □ ana□er

Final report - this Report replaces any previously issued Report

□Indicates □ot □e□uested

□Indicates □ATA accreditation does not co□er the performance of this ser□ice

□ncertaint□ data is a□ailable on re□uest

COC received on 25/6 @ 8:34 AWTH

(7)

CHAIN OF CUSTODY

ALS Laboratory: please tick →

ALS

Sydney 277 Woodpark Rd Smithfield NSW 2164 Ph 02 8784 8555 E samples.sydney@alsenviro.com

Brisbane 32 Shand St Stafford QLD 4053 Ph 07 3243 7222 E samples.brisbane@alsenviro.com

Melbourne 24 Ph E

Perth Ph E

Newcastle 5 Rosegum Rd Warabrook NSW 2304 Ph 02 4968 9433 E samples.newcastle@alsenviro.com

Townsville 14-15 Desma Cl Bohle QLD 4818 Ph 07 4796 0600 E

Adelaide Ph E

Launceston Ph E

CLIENT: ENVIRONMENTAL EARTH SCIENCES	TURNAROUND REQUIREMENTS: (Standard TAT may be longer for some tests e.g. Ultra Trace Organics) Standard	FOR LABORATORY USE ONLY (Circle) Custody Seal Intact? Yes No N/A
OFFICE: 98 MARIBYRNONG RD, FOOTSCRAY, VIC. 3011		Free ice / frozen ice bricks present upon receipt? Yes No N/A
PROJECT: 210074 5th Melbourne Gasworks	ALS QUOTE NO.: ME/330/13	Random Sample Temperature on Receipt: °C
ORDER NUMBER:	COC SEQUENCE NUMBER (Circle) COC 1 2 3 4 5 7 OF 1 2 3 4 5 7	Other comments:
PROJECT MANAGER: REGIN ORQUIZA	CONTACT PH: 8398 4403	
SAMPLER: SFL / ICK	SAMPLER MOBILE:	RELINQUISHED BY: SFL DATE/TIME: 23/6
COC emailed to ALS? (YES / NO)	EDD FORMAT (or default):	RECEIVED BY: Courier DATE/TIME: 23/6/13
Email Reports to : rorquiza@environmentalearthsciences.com and sloong@environmentalearthsciences.com		RELINQUISHED BY: Bhavathi DATE/TIME: 25/6/13 12:30pm
Email Invoice to : rorquiza@environmentalearthsciences.com		RECEIVED BY: Tom W - Courier DATE/TIME: 25/6/13 3:39pm

COMMENTS/SPECIAL HANDLING/STORAGE OR DISPOSAL:

COURIER

Report: 383844

ALS USE ONLY	SAMPLE DETAILS MATRIX: Solid(S) Water(W)			CONTAINER INFORMATION		ANALYSIS REQUIRED including SUITES (NB. Suite Codes must be listed to attract suite price) Where Metals are required, specify Total (unfiltered bottle required) or Dissolved (field filtered bottle required)											Additional Information		
LAB ID	SAMPLE ID	DATE / TIME	MATRIX	TYPE & PRESERVATIVE (refer to codes below)	TOTAL BOTTLES	EES IONIC BALANCE SUITE - includes pH, TDS, Ca, Mg, Na, K, Cl, SO4, Alk, F, NO3, Reactive P, Ammonia	Ammonium (field pH and field temp must be recorded on the COC)	Dissolved metals - Al, As, Cd, Cu, Fe, Pb, Ni, Zn, Co, Se, B & Mn	Total Cyanide	EP074A - MAH	EP074H - Naphthalene only	TPH (C6-C36) plus TRH (C6-C40)	Silica gel clean up - on SV TPH - TPH (C10-C36) and TPH (C6-C36)	TPH (C6-C36)	Ammonium Sulphate	BTEX	Trimethylbenzene	field pH	Field temp	
1	GW43	24/6	W		8	✓		✓	✓		✓	✓		✓		✓	✓	5.46	18	4
2	Dup1	24/6			8			✓	✓		✓	✓		✓	✓	✓	✓			
→	Split → please forward to ALS Chemmac.	24/6			8			✓	✓		✓	✓		✓	✓	✓	✓			
3	GW39	24/6			8	✓		✓	✓		✓	✓	✓	✓		✓	✓	6.67	16.7	
NAC: High EC 27,000	4 GW42D				8	✓		✓	✓		✓	✓	✓	✓		✓	✓	5.55	16.4	
5	GW41	24/6			8	✓		✓	✓		✓	✓						6.57	17.8	
6	GW23	24/6			8	✓		✓	✓		✓	✓	✓					6.85	68	
7	GW19	24/6			8	✓		✓	✓		✓	✓	✓					6.09	16.4	
8	Rinsate 1	24/6			2						✓	✓				✓	✓			
9	Trip 1	24/6			1						✓					✓	✓			
				TOTAL	67															

Water Container Codes: P = Unpreserved Plastic; N = Nitric Preserved Plastic; ORC = Nitric Preserved ORC; SH = Sodium Hydroxide/Cd Preserved; S = Sodium Hydroxide Preserved Plastic; AG = Amber Glass Unpreserved; AP = Airfreight Unpreserved Plastic; V = VOA Vial HCl Preserved; VB = VOA Vial Sodium Bisulphate Preserved; VS = VOA Vial Sulfuric Preserved; AV = Airfreight Unpreserved Vial SG = Sulfuric Preserved Amber Glass; H = HCl preserved Plastic; HS = HCl preserved Speciation bottle; SP = Sulfuric Preserved Plastic; F = Formaldehyde Preserved

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Sub□ect□ □E□Eurofins □m□t Sample □eceipt Ad□ice □□eport □□□□□□ □Site 21007□ ST□ □E□□O□□□E □AS□ O□□S

Hi James and Adrian,

Could you please change the BTEX and Trimethylebenzenes to MAH's.

Please confirm if you have received my request.

Regards

Regin

-----Original Message-----
From: enquiries.melb@mgtlabmark.com.au [mailto:enquiries.melb@mgtlabmark.com.au]
Sent: Tuesday, 25 June 2013 7:12 PM
To: Regin Orquiza
Subject: Eurofins | mgt Sample Receipt Advice - Report 383844 : Site 210074 STH MELBOURNE GASWORKS

Dear Client,

Please find attached sample receipt advice, summary sheet and your chain of custody (COC). It is important that you check these documents to ensure that the details are correct.

If there are any irregularities then please contact your Eurofins | mgt client manager as soon as possible to make certain they get amended.

Your client manager will be your point of contact for queries and test results.

Your client manager's contact details can be found on your SRA.

Kind Regards

James Gould
Eurofins | mgt

Ph:03 8564 5025
Email:enquiries@mgtlabmark.com.au

Certificate of Anal□sis

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.

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Client □eference 21007□ST□ □E□□O□□□E □AS□ O□□S
□ecei□ed □ate □un 25, 201□

□ient Sam□e □□ **Sam□e □atri□** **□uro□in□ □m□t Sam□e No□** **□ate Sam□ed** Test/□eference	□O□	□nit	**S□□T** **□ ater** **□1□□□n1□1□6** **□un 24□2□1□**
Tota□□eco□erab□e □□drocarbon□ □1□□□N□□□ □raction□			
T□□ C□□C□	0.02	m□/□	□0.02
T□□ C10□C1□	0.05	m□/□	□0.05
T□□ C15□C2□	0.1	m□/□	□0.1
T□□ C2□□C□□	0.1	m□/□	□0.1
T□□ C10□□□ □Total□	0.1	m□/□	□0.1
□onoc□c□ic Aromatic □□drocarbon□			
□en□ene	0.001	m□/□	□0.001
Eth□lben□ene	0.001	m□/□	□0.001
Isoprop□l ben□ene □Cumene□	0.001	m□/□	□0.001
m□p□□□ehes	0.002	m□/□	□0.002
o□□□lene	0.001	m□/□	□0.001
St□rene	0.001	m□/□	□0.001
Toluene	0.001	m□/□	□0.001
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□luoroben□ene □surr.□	1	□	□□
Tota□□eco□erab□e □□drocarbon□ □2□1□N□□□ □raction□			
□aphthalene□02	0.02	m□/□	□0.02
T□□ C□□C10	0.02	m□/□	□0.02
T□□ C□□C10 less □TE□ □□1□0□	0.02	m□/□	□0.02
T□□ □C10□C1□	0.05	m□/□	□0.05
T□□ □C10□C1□ less □aphthalene □□2□01	0.05	m□/□	□0.05
T□□ □C1□□C□□	0.1	m□/□	□0.1
T□□ □C□□□C□0	0.1	m□/□	□0.1
□o□□c□c□ic Aromatic □□drocarbon□			
□aphthalene	0.001	m□/□	□0.001
Ammonia □as □□	0.01	m□/□	0.□5
C□anide □total□	0.005	m□/□	□0.005
Sulphate □as S□	5	m□/□	□00
□ea□□ □eta□□			
Aluminium □filtered□	0.05	m□/□	□0.05
Arsenic □filtered□	0.001	m□/□	0.00□
□oron □filtered□	0.05	m□/□	1.2
Cadmium □filtered□	0.0002	m□/□	0.0007
Cobalt □filtered□	0.001	m□/□	0.051
Copper □filtered□	0.001	m□/□	0.01□

□ient Sam□e □ Sam□e □atri□ □uro□in□ □m□t Sam□e No□ □ate Sam□ed Test/□eference	□O□	□nit	S□□T □ ater □1□□□n1□1□6 □un 24□2□1□
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Iron □filtered□	0.05	m□/□	0.□5
□ead □filtered□	0.001	m□/□	0.001
□an□anese □filtered□	0.005	m□/□	□.□
□ic□el □filtered□	0.001	m□/□	0.05□
Selenium □filtered□	0.001	m□/□	0.002
□inc □filtered□	0.001	m□/□	0.0□□

Sam□e □i□tor□

□ here samples are submitted/anal□sed o□er se□eral da□s, the last date of e□traction and anal□sis is reported.
A recent re□iew of our □I□S has resulted in the correction or clarification of some method identifications. □ue to this, some of the method reference information on reports has chan□ed. □owe□er, no substanti□e chan□e has been made to our laborator□methods, and as such there is no chan□e in the □alidit□of current or pre□ious results □re□ardin□ both □ualit□and □ATA accreditation□

□e□cri□tion	Te□tin□ Site	□□tracted	□o□din□ Time
Total □eco□erable □□drocarbons □1□□□ □E□□ □ractions	□elbourne	□un 2□, 201□	7 □a□
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Total □eco□erable □□drocarbons □201□ □E□□ □ractions	□elbourne	□un 2□, 201□	7 □a□
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Ammonia □as □□	□elbourne	□un 25, 201□	2□ □a□
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Sulphate □as S□	□elbourne	□un 2□, 201□	2□ □a□
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1. □aborator□ □C results for □ethod □lan□s, □uplicates, □atri□Spi□es, and □aborator□Control Samples are included in this □C report where applicable. Additional □C data ma□be a□ailable on re□uest.
2. All soil results are reported on a dr□basis, unless otherwise stated.
□. Actual □□□s are matri□dependant. □uoted □□□s ma□be raised where sample e□tracts are diluted due to interferences.
□. □esults are uncorrected for matri□spi□es or surro□ate reco□eries.
5. S□OC anal□sis on waters are performed on homo□enised, unfiltered samples, unless noted otherwise.
□. Samples were anal□sed on an □as recei□ed□basis. 7. This report replaces an□interim results pre□ousl□issued.

□o□din□ Time□

□lease refer to □Sample □reser□ation and Container □uide□for holdin□ times □□S□001□

□or samples recei□ed on the last da□of holdin□ time, notification of testin□re□uirements should ha□e been recei□ed at least □ hours prior to sample receipt deadlines as stated on the Sample □eceipt Ac□nowled□ment.

If the □aborator□did not recei□e the information in the re□uired timeframe, and re□ardless of an□other inte□rit□issues, suitabl□□ualified results ma□still be reported.

□oldin□ times appl□from the date of samplin□, therefore compliance to these ma□be outside the laboratori□s control.

□**N□T**□□p□ duplicates are reported as a ran□e □OT as □□□

□N□TS

m□□□□milli□rams per □ilo□ram	**m**□□□milli□rams per litre
u□□□micro□rams per litre	□□**m**□□arts per million
□□**b**□□arts per billion	□ □□ercenta□e
or□**1**□□**m**□□Or□anisms per 100 millilitres	**NT**□□□nits
□□**N□1**□□**m**□□□ost □robable □umber of or□anisms per 100 millilitres	

T□□□S

□**r**□	□ here a moisture has been determined on a solid sample the result is e□pressed on a dr□basis.
□□□	□imit of □eportin□.
S□□□	Addition of the anal□te to the sample and reported as percenta□e reco□er□.
□□□	□elati□e □ercent □ifference between two □uplicate pieces of anal□sis.
□□**S**	□aborator□Control Sample □reported as percent reco□er□
□□□	Certified □eference □aterial □reported as percent reco□er□
□**et□od** □**an**□	In the case of solid samples these are performed on laborator□certified clean sands. In the case of water samples these are performed on de□ionised water.
Surr □Surro□ate	The addition of a li□e compound to the anal□te tar□et and reported as percenta□e reco□er□.
□**u□licate**	A second piece of anal□sis from the same sample and reported in the same units as the result to show comparison.
□**atc□ □u□licate**	A second piece of anal□sis from a sample outside of the clients batch of samples but run within the laborator□batch of anal□sis.
□**atc□ S**□□□	Spi□e reco□er□reported on a sample from outside of the clients batch of samples but run within the laborator□batch of anal□sis.
□**S**□□**A**	□nited States En□ironment □rotection Authorit□
A□□**A**	American □ublic □ealth Association
AS□□	Australian Standard □eachin□ □rocedure □AS□□□□.□□
T□□□	To□icit□Characteristic □eachin□ □rocedure
□□□	Chain of Custod□
S□**A**	Sample □eceipt Ad□ice
□□	Client □arent □□C was performed on samples pertainin□to this report
N□□	□on□Client □arent □□C performed on samples not pertainin□to this report, □C is representati□e of the se□uence or batch that client samples were anal□sed within

□□ □A□□□□TAN□□ □□T□□A

□□□ □uplicates□□lobal □□□ □uplicates Acceptance Criteria is □0□ howe□er the followin□acceptance □uidelines are e□uall□applicable□

□esults □10 times the □O□ □□o □imit

□esults between 10□20 times the □O□ □□□□ must lie between 0□50□

□esults □20 times the □O□ □□□□ must lie between 0□□0□

Surro□ate □eco□eries □□eco□eries must lie between 50□150□ □□henols 20□1□0□.

□□ □ATA □□N□□A□ □□□□□NTS

1. □ here a result is reported as a less than □□□, hi□her than the nominated □O□, this is due to either matri□interference, e□tract dilution re□uired due to interferences or contaminant le□els within the sample, hi□h moisture content or insufficient sample pro□ided.
2. □uplicate data shown within this report that states the word □□ATC□□is a □atch □uplicate from outside of □our sample batch, but within the laborator□sample batch at a 1□10 ratio. The □arent and □uplicate data shown is not data from □our samples.
□. Or□anochlorine □esticide anal□sis □where reportin□ □CS data, To□ophene □ Chlordane are not added to the □CS.
□. Or□anochlorine □esticide anal□sis □where reportin□Spi□e data, To□ophene is not added to the Spi□e.
5. Total □eco□erable □□drocarbons □where reportin□Spi□e □ □CS data, a sin□le spi□e of commercial □□drocarbon products in the ran□e of C12□C□0 is added and it□s Total □eco□er□is reported in the C10□C1□cell of the □eport.
□. p□ and □ree Chlorine anal□sed in the laborator□ □Anal□sis on this test must be□in within □0 minutes of samplin□.Therefore laborator□anal□sis is unli□el□to be completed within holdin□ time. Anal□sis will be□in as soon as possible after sample receipt.
7. □eco□er□□ata □Spi□es □ Surro□ates□□where chromato□raphic interference does not allow the determination of □eco□er□the term □□T□appears a□ainst that anal□te.
□. □ol□chlorinated □iphen□ls are spi□ed onl□usin□Arochlor 12□0 in □atri□Spi□es and □CS□s.
□. □or □atri□Spi□es and □CS results a dash □□□in the report means that the specific anal□te was not added to the □C sample.
10. □uplicate □□□□s are calculated from raw anal□tical data thus it is possible to ha□e two sets of data.

Test	Unit	Result 1			Acceptance Limits	Qualifying Code
Method Blank						
Total Recoverable Hydrocarbons - NEPM 2013 Fractions TRH C6-C40						
TRH C6-C9	mg/kg	< 0.02			0.02	Pass
TRH C10-C14	mg/kg	< 0.05			0.05	Pass
TRH C15-C28	mg/kg	< 0.1			0.1	Pass
TRH C29-C36	mg/kg	< 0.1			0.1	Pass
Method Blank						
Monocyclic Aromatic Hydrocarbons - US EPA 8260 Monocyclic Aromatic Hydrocarbons						
Benzene	mg/kg	< 0.001			0.001	Pass
Ethylbenzene	mg/kg	< 0.001			0.001	Pass
Isopropyl benzene (Cumene)	mg/kg	< 0.001			0.001	Pass
m&p-Xylenes	mg/kg	< 0.002			0.002	Pass
o-Xylene	mg/kg	< 0.001			0.001	Pass
Styrene	mg/kg	< 0.001			0.001	Pass
Toluene	mg/kg	< 0.001			0.001	Pass
Xylenes - Total	mg/kg	< 0.00			0.00	Pass
Method Blank						
Total Recoverable Hydrocarbons - NEPM 2013 Fractions TRH C6-C40 minus BTEX						
Naphthalene	mg/kg	< 0.02			0.02	Pass
TRH C6-C10	mg/kg	< 0.02			0.02	Pass
TRH C6-C10 less BTEX (F1)	mg/kg	< 0.05			0.05	Pass
TRH C10-C16	mg/kg	< 0.1			0.1	Pass
TRH C16-C34	mg/kg	< 0.1			0.1	Pass
Method Blank						
Polycyclic Aromatic Hydrocarbons - US EPA 8270 Polycyclic Aromatic Hydrocarbons						
Naphthalene	mg/kg	< 0.001			0.001	Pass
Method Blank						
Ammonia as N	mg/kg	< 0.01			0.01	Pass
Cyanide (total)	mg/kg	< 0.005			0.005	Pass
Sulphate as S	mg/kg	< 5			5	Pass
Method Blank						
Heavy Metals (Filtered) - US EPA 6020 Heavy Metals						
Aluminium (filtered)	mg/kg	< 0.05			0.05	Pass
Arsenic (filtered)	mg/kg	< 0.001			0.001	Pass
Boron (filtered)	mg/kg	< 0.05			0.05	Pass
Cadmium (filtered)	mg/kg	< 0.0002			0.0002	Pass
Cobalt (filtered)	mg/kg	< 0.001			0.001	Pass
Copper (filtered)	mg/kg	< 0.001			0.001	Pass
Iron (filtered)	mg/kg	< 0.05			0.05	Pass
Lead (filtered)	mg/kg	< 0.001			0.001	Pass
Nickel (filtered)	mg/kg	< 0.001			0.001	Pass
Selenium (filtered)	mg/kg	< 0.001			0.001	Pass
Zinc (filtered)	mg/kg	< 0.001			0.001	Pass
LCS - Recovery						
Total Recoverable Hydrocarbons - NEPM 2013 Fractions TRH C6-C40						
TRH C6-C9	%	88			70-130	Pass
TRH C10-C14	%	100			70-130	Pass
LCS - Recovery						
Monocyclic Aromatic Hydrocarbons - US EPA 8260 Monocyclic Aromatic Hydrocarbons						

Te□t			□nit□	□e□u□t 1			Acce□tance □imit□	□a□□ □imit□	□ua□i□□in□ □ode
□en□ene			□	□□			70□1□0	□ass	
Eth□lben□ene			□	□□			70□1□0	□ass	
m□p□□□ehes			□	101			70□1□0	□ass	
Toluene			□	□5			70□1□0	□ass	
□□□enes □Total			□	101			70□1□0	□ass	
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Tota□□eco□erab□e □□drocarbon□ □2□1□N□□□ □raction□ □□ □T□□ □□□2□1□									
T□□ C□C10			□	□□			70□1□0	□ass	
T□□ □C10□C1□			□	101			70□1□0	□ass	
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□o□□c□c□ic Aromatic □□drocarbon□ □S□□A □2□□ □o□□c□c□ic Aromatic □□drocarbon□									
□aphthalene			□	72			70□1□0	□ass	
□□S □□ □eco□er□									
Ammonia □as □□			□	□0			70□1□0	□ass	
C□anide □total□			□	□7			70□1□0	□ass	
Sulphate □as S□			□	10□			70□1□0	□ass	
□□S □□ □eco□er□									
□ea□□ □eta□□ □i□tered□□S□□A 6□2□ □ea□□ □eta□□									
Aluminium □filtered□			□	□□			□0□120	□ass	
Arsenic □filtered□			□	10□			□0□120	□ass	
□oron □filtered□			□	□5			□0□120	□ass	
Cadmium □filtered□			□	100			□0□120	□ass	
Cobalt □filtered□			□	□7			□0□120	□ass	
Copper □filtered□			□	10□			□0□120	□ass	
Iron □filtered□			□	□5			□0□120	□ass	
□ead □filtered□			□	□5			□0□120	□ass	
□an□anese □filtered□			□	11□			□0□120	□ass	
□ic□el □filtered□			□	□□			□0□120	□ass	
Selenium □filtered□			□	□□			□0□120	□ass	
□inc □filtered□			□	100			□0□120	□ass	
Te□t	**□ab Sam□□e □□**	**□A Source**	**□nit□**	**□e□u□t 1**			**Acce□tance □imit□**	**□a□□ □imit□**	**□ua□i□□in□ □ode**
S□i□e □□ □eco□er□									
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S□i□e □□ □eco□er□									
□onoc□c□ic Aromatic □□drocarbon□				□esult 1					
□en□ene	□1□□n1□151	□C□	□	107			70□1□0	□ass	
Eth□lben□ene	□1□□n1□151	□C□	□	11□			70□1□0	□ass	
m□p□□□ehes	□1□□n1□151	□C□	□	11□			70□1□0	□ass	
o□□□lene	□1□□n1□151	□C□	□	117			70□1□0	□ass	
Toluene	□1□□n1□151	□C□	□	122			70□1□0	□ass	
□□□enes □Total	□1□□n1□151	□C□	□	11□			70□1□0	□ass	
S□i□e □□ □eco□er□									
Tota□□eco□erab□e □□drocarbon□ □2□1□N□□□ □raction□				□esult 1					
T□□ C□C10	□1□□n1□151	□C□	□	11□			70□1□0	□ass	
S□i□e □□ □eco□er□									
				□esult 1					
Ammonia □as □□	A1□□n1□5□□	□C□	□	□2			70□1□0	□ass	
C□anide □total□	□1□□n17□□□	□C□	□	□1			70□1□0	□ass	
Sulphate □as S□	□1□□n1□51□	□C□	□	□□			70□1□0	□ass	
S□i□e □□ □eco□er□									
□ea□□ □eta□□ □i□tered□				□esult 1					

Test	Lab Sample ID	QA Source	Units	Result 1			Acceptance Limits	Pass Limits	Qualifying Code
Arsenic Filtered	[illegible]1[illegible]n1[illegible]1[illegible]	[illegible]C[illegible]	[illegible]	[illegible]			75[illegible]125	[illegible]ass	
[illegible]oron Filtered	[illegible]1[illegible]n1[illegible]1[illegible]	[illegible]C[illegible]	[illegible]	77			75[illegible]125	[illegible]ass	
Cadmium Filtered	[illegible]1[illegible]n1[illegible]1[illegible]	[illegible]C[illegible]	[illegible]	[illegible]			75[illegible]125	[illegible]ass	
Cobalt Filtered	[illegible]1[illegible]n1[illegible]1[illegible]	[illegible]C[illegible]	[illegible]	[illegible]0			75[illegible]125	[illegible]ass	
Copper Filtered	[illegible]1[illegible]n1[illegible]1[illegible]	[illegible]C[illegible]	[illegible]	[illegible]			75[illegible]125	[illegible]ass	
Iron Filtered	[illegible]1[illegible]n172[illegible]1	[illegible]C[illegible]	[illegible]	[illegible]7			75[illegible]125	[illegible]ass	
[illegible]ead Filtered	[illegible]1[illegible]n1[illegible]1[illegible]	[illegible]C[illegible]	[illegible]	[illegible]			75[illegible]125	[illegible]ass	
[illegible]ic[illegible]el Filtered	[illegible]1[illegible]n1[illegible]1[illegible]	[illegible]C[illegible]	[illegible]	[illegible]			75[illegible]125	[illegible]ass	
Selenium Filtered	[illegible]1[illegible]n1[illegible]1[illegible]	[illegible]C[illegible]	[illegible]	[illegible]0			75[illegible]125	[illegible]ass	
[illegible]inc Filtered	[illegible]1[illegible]n1[illegible]1[illegible]	[illegible]C[illegible]	[illegible]	[illegible]7			75[illegible]125	[illegible]ass	
Test	**Lab Sample ID**	**QA Source**	**Units**	**Result 1**			**Acceptance Limits**	**Pass Limits**	**Qualifying Code**
[illegible]u[illegible]icate									
Tota[illegible]eco[illegible]erab[illegible] [illegible]drocarbon[illegible] [illegible]1[illegible][illegible]N[illegible][illegible] [illegible]raction[illegible]				Result 1	Result 2	[illegible][illegible]			
T[illegible][illegible] C[illegible]C[illegible]	[illegible]1[illegible]n1[illegible]150	[illegible]C[illegible]	m[illegible]/[illegible]	[illegible]0.02	[illegible]0.02	[illegible]1	[illegible]0[illegible]	[illegible]ass	
[illegible]u[illegible]icate									
[illegible]onoc[illegible]c[illegible]ic Aromatic [illegible][illegible]drocarbon[illegible]				Result 1	Result 2	[illegible][illegible]			
[illegible]en[illegible]ene	[illegible]1[illegible]n1[illegible]150	[illegible]C[illegible]	m[illegible]/[illegible]	[illegible]0.001	[illegible]0.001	[illegible]1	[illegible]0[illegible]	[illegible]ass	
Eth[illegible]lben[illegible]ene	[illegible]1[illegible]n1[illegible]150	[illegible]C[illegible]	m[illegible]/[illegible]	[illegible]0.001	[illegible]0.001	[illegible]1	[illegible]0[illegible]	[illegible]ass	
Isoprop[illegible]l ben[illegible]ene [illegible]Cumene[illegible]	[illegible]1[illegible]n1[illegible]150	[illegible]C[illegible]	m[illegible]/[illegible]	[illegible]0.001	[illegible]0.001	[illegible]1	[illegible]0[illegible]	[illegible]ass	
m[illegible]p[illegible][illegible]ehes	[illegible]1[illegible]n1[illegible]150	[illegible]C[illegible]	m[illegible]/[illegible]	[illegible]0.002	[illegible]0.002	[illegible]1	[illegible]0[illegible]	[illegible]ass	
o[illegible][illegible]lene	[illegible]1[illegible]n1[illegible]150	[illegible]C[illegible]	m[illegible]/[illegible]	[illegible]0.001	[illegible]0.001	[illegible]1	[illegible]0[illegible]	[illegible]ass	
St[illegible]rene	[illegible]1[illegible]n1[illegible]150	[illegible]C[illegible]	m[illegible]/[illegible]	[illegible]0.001	[illegible]0.001	[illegible]1	[illegible]0[illegible]	[illegible]ass	
Toluene	[illegible]1[illegible]n1[illegible]150	[illegible]C[illegible]	m[illegible]/[illegible]	[illegible]0.001	[illegible]0.001	[illegible]1	[illegible]0[illegible]	[illegible]ass	
[illegible][illegible]enes [illegible]Total	[illegible]1[illegible]n1[illegible]150	[illegible]C[illegible]	m[illegible]/[illegible]	[illegible]0.00[illegible]	[illegible]0.00[illegible]	[illegible]1	[illegible]0[illegible]	[illegible]ass	
[illegible]u[illegible]icate									
Tota[illegible][illegible]eco[illegible]erab[illegible] [illegible]drocarbon[illegible] [illegible]2[illegible]1[illegible]N[illegible][illegible] [illegible]raction[illegible]				Result 1	Result 2	[illegible][illegible]			
[illegible]aphthalene	[illegible]1[illegible]n1[illegible]150	[illegible]C[illegible]	m[illegible]/[illegible]	[illegible]0.02	[illegible]0.02	[illegible]1	[illegible]0[illegible]	[illegible]ass	
T[illegible][illegible] C[illegible]C10	[illegible]1[illegible]n1[illegible]150	[illegible]C[illegible]	m[illegible]/[illegible]	[illegible]0.02	[illegible]0.02	[illegible]1	[illegible]0[illegible]	[illegible]ass	
[illegible]u[illegible]icate									
				Result 1	Result 2	[illegible][illegible]			
Ammonia [illegible]as [illegible][illegible]	A1[illegible][illegible]n1[illegible]5[illegible]	[illegible]C[illegible]	m[illegible]/[illegible]	[illegible]0.01	[illegible]0.01	[illegible]1	[illegible]0[illegible]	[illegible]ass	
C[illegible]anide [illegible]total[illegible]	[illegible]1[illegible]n17[illegible][illegible]	[illegible]C[illegible]	m[illegible]/[illegible]	[illegible]0.005	[illegible]0.005	[illegible]1	[illegible]0[illegible]	[illegible]ass	
Sulphate [illegible]as S[illegible]	[illegible]1[illegible]n1[illegible][illegible][illegible]	[illegible]C[illegible]	m[illegible]/[illegible]	[illegible]5	[illegible]5	[illegible]1	[illegible]0[illegible]	[illegible]ass	
[illegible]u[illegible]icate									
[illegible]ea[illegible] [illegible]eta[illegible] [illegible]i[illegible]tered[illegible]				Result 1	Result 2	[illegible][illegible]			
Aluminium Filtered	[illegible]1[illegible]n1[illegible]1[illegible]	[illegible]C[illegible]	m[illegible]/[illegible]	0.1[illegible]	0.1[illegible]	20	[illegible]0[illegible]	[illegible]ass	
Arsenic Filtered	[illegible]1[illegible]n1[illegible]1[illegible]	[illegible]C[illegible]	m[illegible]/[illegible]	0.001[illegible]	0.0012	[illegible].7	[illegible]0[illegible]	[illegible]ass	
[illegible]oron Filtered	[illegible]1[illegible]n1[illegible]1[illegible]	[illegible]C[illegible]	m[illegible]/[illegible]	0.05[illegible]	0.052	2.[illegible]	[illegible]0[illegible]	[illegible]ass	
Cadmium Filtered	[illegible]1[illegible]n1[illegible]1[illegible]	[illegible]C[illegible]	m[illegible]/[illegible]	[illegible]0.0002	[illegible]0.0002	[illegible]1	[illegible]0[illegible]	[illegible]ass	
Cobalt Filtered	[illegible]1[illegible]n1[illegible]1[illegible]	[illegible]C[illegible]	m[illegible]/[illegible]	[illegible]0.001	[illegible]0.001	[illegible]1	[illegible]0[illegible]	[illegible]ass	
Copper Filtered	[illegible]1[illegible]n1[illegible]1[illegible]	[illegible]C[illegible]	m[illegible]/[illegible]	[illegible]0.001	[illegible]0.001	[illegible]1	[illegible]0[illegible]	[illegible]ass	
Iron Filtered	[illegible]1[illegible]n172[illegible]1	[illegible]C[illegible]	m[illegible]/[illegible]	[illegible]0.05	[illegible]0.05	[illegible]1	[illegible]0[illegible]	[illegible]ass	
[illegible]ead Filtered	[illegible]1[illegible]n1[illegible]1[illegible]	[illegible]C[illegible]	m[illegible]/[illegible]	[illegible]0.001	[illegible]0.001	[illegible]1	[illegible]0[illegible]	[illegible]ass	
[illegible]ic[illegible]el Filtered	[illegible]1[illegible]n1[illegible]1[illegible]	[illegible]C[illegible]	m[illegible]/[illegible]	[illegible]0.001	[illegible]0.001	[illegible]1	[illegible]0[illegible]	[illegible]ass	
Selenium Filtered	[illegible]1[illegible]n1[illegible]1[illegible]	[illegible]C[illegible]	m[illegible]/[illegible]	[illegible]0.001	[illegible]0.001	[illegible]1	[illegible]0[illegible]	[illegible]ass	
[illegible]inc Filtered	[illegible]1[illegible]n1[illegible]1[illegible]	[illegible]C[illegible]	m[illegible]/[illegible]	0.00[illegible]	0.007[illegible]	1[illegible]	[illegible]0[illegible]	[illegible]ass	

□omment□

Sam□□e □nte□rit□

Custod□ Seals Intact □if used□	□/A
Attempt to Chill was e□ident	□es
Sample correctl□ preser□ed	□es
Or□anic samples had Teflon liners	□es
Sample containers for □olatile anal□sis rece□ed with minimal headspace	□es
Samples rece□ed within □oldin□Time	□es
Some samples ha□e been subcontracted	□o

□ua□i□ier □ode□□□omment□

□ode	□e□cri□tion
□01	□2 is determined b□ arithmeticall□ subtractin□ the □naphthalene□□alue from the □□C10□C1□□□alue. The naphthalene □alue used in this calculation is obtained from □olatiles □□□e □ Trap anal□sis□
□02	□ here we ha□e reported both □olatile □□□T □C□S□and semi□olatile □□C□S□naphthalene data, results ma□ not be identical. □ro□ided correct sample handlin□ protocols ha□e been followed, an□obser□ed differences in results are li□el□to be due to procedural differences within each methodolo□□. □esults determined b□both techni□ues ha□e passed all □A□C acceptance criteria, and are entirel□ technicall□ □alid.
□0□	□1 is determined b□ arithmeticall□ subtractin□ the □Total □TE□□□alue from the □C□□C10□□alue. The □Total □TE□□□alue is obtained b□ summin□ the concentrations of □TE□ anal□tes. The □C□□C10□□alue is obtained b□ □uantitatin□ a□ainst a standard of mi□ed aromatic/aliphatic anal□tes.

Aut□ori□ed □□

Adrian Tabacchiera	Client Ser□ices
Carroll □ee	Senior Anal□st□□olatile □□IC□
Emil□ □osenber□	Senior Anal□st□□etal □□IC□
□uon□ □e	Senior Anal□st□Inor□anic □□IC□
Stace□ □en□ins	Senior Anal□st□Or□anic □□IC□

□ □enn □ac□□on

□aborator□ □ ana□er

Final report - this Report replaces any previously issued Report

□Indicates □ot □e□uested

□Indicates □ATA accreditation does not co□er the performance of this ser□ice

□ncertaint□ data is a□ailable on re□uest

Ref 11

CoC received 25/06/13 15:36 RT

COURIER

CHAIN OF CUSTODY

ALS Laboratory: please tick →

☐ Sydney: 277 Woodpark Rd Smithfield NSW 2176 ☐ Newcastle: 5 Rosegum Rd Warabrook NSW 2304 ☐ Brisbane: 32 Shand St Stafford QLD 4053 ☐ Townsville: 14-15 Desma Ct Bohle QLD 4818 ☐ Melbourne: 2-4 Westall Rd Springvale VIC 3171 ☐ Adelaide: 2-1 Burma Rd Pooraka SA 5095 ☐ Perth: 10 Hod Way Malaga WA 6090 ☐ Launceston: 27 Wellington St Launceston TAS 7250

CLIENT: ENVIRONMENTAL EARTH SCIENCES	TURNAROUND REQUIREMENTS: (Standard TAT may be longer for some tests e.g. Ultra Trace Organics)		FOR LABORATORY USE ONLY (Circle) Custody Seal Intact? Yes No N/A; Free ice / frozen ice bricks present upon receipt? Yes No N/A; Random Sample Temperature on Receipt: ; Other comment: 2.8 – 3.6
OFFICE: 58 MARIBYRNONG RD, FOOTSCRAY, VIC, 3011	ALS QUOTE NO.: ME/330/13	COC SEQUENCE NUMBER (Circle)	
PROJECT: 210074 Sth Melbourne Gasworks		COC: 1 2 3 4 5 7	
ORDER NUMBER:		OF: 1 2 3 4 5 7	
PROJECT MANAGER: REGIN ORQUIZA	CONTACT PH: 8338 4403		
SAMPLER:	SAMPLER MOBILE:	RELINQUISHED BY: S.Leong	RECEIVED BY: ALS Courier
COC emailed to ALS? (YES / NO)	EDD FORMAT (or default):	DATE/TIME: 25/06/13 3pm	DATE/TIME: 25/6/13 3pm
Email Reports to : rorquiza@eesicontracting.com and sleong@eesi.biz		RELINQUISHED BY:	RECEIVED BY: [signature]
Email Invoice to : rorquiza@eesicontracting.com		DATE/TIME:	DATE/TIME: 25/6, 1635
COMMENTS/SPECIAL HANDLING/STORAGE OR DISPOSAL:			

ALS USE ONLY	SAMPLE DETAILS MATRIX: Solid(S) Water(W)			CONTAINER INFORMATION		ANALYSIS REQUIRED including SUITES (NB. Suite Codes must be listed to attract suite price) Where Metals are required, specify Total (unfiltered bottle required) or Dissolved (field filtered bottle required)														Additional
LAB ID	SAMPLE ID	DATE / TIME	MATRIX	TYPE & PRESERVATIVE (refer to codes below)	TOTAL BOTTLES	EES IONIC BALANCE SUITE - includes pH, TDS, Ca, Mg, Na, K, Cl, SO4, Alk, F, NO3, Reactive P, Ammonia	Ammonium (field pH and field temp. must be recorded on the COC)	Dissolved metals - Al, As, Cd, Cu, Fe, Pb, Ni, Zn, Co, Se, B & Mn	Total Cyanide	EP074A - MAH	EP074H - Naphthalene only	TPH (C6-C36) plus TRH (C6-C40)	Silica gel clean up - on SV TPH - TPH (C10-C36) and TRH(C10-C40)					Field pH	Field temp	
(1)	GW18	25/06/2013	W		8	X	X	X	X	X	X	X						6.69	18	
(2)	GW01	25/06/2013	W		8	X	X	X	X	X	X	X						6.6	17.4	
(3)	GW48	25/06/2013	W		8	X	X	X	X	X	X	X						5.74	18	
(4)	GW28	25/06/2013	W		8	X	X	X	X	X	X	X						5.87	18.8	
(5)	GW35	25/06/2013	W		8	X	X	X	X	X	X	X						6.92	17.8	
(6)	GW22	25/06/2013	W		8	X	X	X	X	X	X	X						6.3	15.5	
(7)	Rinsate 2	25/06/2013	W		2					X	X	X								
(8)	Trip 2	25/06/2013	W		1					X	X									
(9)	Trip 3	25/06/2013	W		1					X	X									
	Extra samples:																			
(10)	Dup 2	25/6/13	W	} Re CAKS 25/6/13				X	X	X	X	X								
(11)	Split 2	25/6/13	W					X	X	X	X	X					Please		Send	to MGT
				TOTAL																

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

Environmental Division
Melbourne
Work Order
EM13067

Telephone : + 61-3-8549

R.S

Manu Call 26/6, 12:00

Steven EF/MGT 383984
26/6 1:30pm

Ref 1

Raymond Thai

From: Carol Walsh
Sent: Wednesday, 26 June 2013 9:16 AM
To: Samples Melbourne
Subject: REVISED COC - EM1306738-ENVIROMENTAL EARTH SCIENCES
Attachments: img-626090130.pdf

Importance: High

COURIER

SEE ATTACHED REVISED COC.

Please send the SPLIT 2 sample to MGT as per COC.

-----Original Message-----
From: Regin Orquiza [mailto:rorquiza@eesicontracting.com]
Sent: Wednesday, 26 June 2013 9:14 AM
To: Carol Walsh
Subject: RE: ISSUES - EM1306738-ENVIROMENTAL EARTH SCIENCES

Hi Carol,

Please find the attached updated CoC showing the dup/split 2 required analytes. Please send the Split 2 sample to MGT.

Regards

Regin

Regin Orquiza - Senior Environmental Engineer PO Box 2253, Footscray, Victoria 3011
p: 03 9687 1666
d: 03 8398 4403
m: 0448 888 593
f: 03 9687 1844
rorquiza@environmentalearthsciences.com
www.environmentalearthsciences.com

-----Original Message-----
From: Carol Walsh [mailto:Carol.Walsh@alsglobal.com]
Sent: Wednesday, 26 June 2013 8:50 AM
To: Regin Orquiza
Subject: ISSUES - EM1306738-ENVIROMENTAL EARTH SCIENCES

Ref 11

Regin

COURIER

For this attached work order, EM1306738, we have received two extra sample - DUP 2 & SPLIT 2 .

Please advise if any analysis is required on these samples, or should SPLIT 2 be sent off to another lab.

Kind Regards

Carol Walsh
Senior Client Services Officer
ALS | Environmental Division
4 Westall Rd
Springvale, VIC. 3171 Australia

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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.

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Attention□ **□e□in □r□ui□a**

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Client □eference 21007□5T□ □E□□O□□□E □AS□ O□□S
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□ient Sam□e □□ **Sam□e □atri□** **□uro□in□ □m□t Sam□e No□** **□ate Sam□ed** Test/□eference	□O□	□nit	**S□□T 2** **□ ater** **□1□□□n1□□□2** **□un 25□2□1□**
Tota□□eco□erab□e □□drocarbon□ □□1□□□N□□□ □raction□			
T□□ C□□C□	0.02	m□/□	□0.02
T□□ C10□C1□	0.05	m□/□	□0.05
T□□ C15□C2□	0.1	m□/□	□0.1
T□□ C2□□C□□	0.1	m□/□	□0.1
T□□ C10□□□ □Total□	0.1	m□/□	□0.1
□onoc□c□ic Aromatic □□drocarbon□			
□en□ene	0.001	m□/□	□0.001
Eth□lben□ene	0.001	m□/□	□0.001
Isoprop□l ben□ene □Cumene□	0.001	m□/□	□0.001
m□p□□□ehes	0.002	m□/□	□0.002
o□□□lene	0.001	m□/□	□0.001
St□rene	0.001	m□/□	□0.001
Toluene	0.001	m□/□	□0.001
□□□enes □Total	0.00□	m□/□	□0.00□
□luoroben□ene □surr.□	1	□	□5
Tota□□eco□erab□e □□drocarbon□ □2□1□N□□□ □raction□			
□aphthalene□02	0.02	m□/□	□0.02
T□□ C□□C10	0.02	m□/□	□0.02
T□□ C□□C10 less □TE□ □□1□0□	0.02	m□/□	□0.02
T□□ □C10□C1□	0.05	m□/□	□0.05
T□□ □C10□C1□ less □aphthalene □□2□01	0.05	m□/□	□0.05
T□□ □C1□□C□□	0.1	m□/□	□0.1
T□□ □C□□□C□0	0.1	m□/□	□0.1
□o□□c□c□ic Aromatic □□drocarbon□			
□aphthalene	0.001	m□/□	□0.001
C□anide □total□	0.005	m□/□	0.0□□
□ea□□ □eta□□			
Aluminium □filtered□	0.05	m□/□	□0.05
Arsenic □filtered□	0.001	m□/□	0.2□
□oron □filtered□	0.05	m□/□	0.□0
Cadmium □filtered□	0.0002	m□/□	0.0002
Cobalt □filtered□	0.001	m□/□	□0.001
Copper □filtered□	0.001	m□/□	□0.001
Iron □filtered□	0.05	m□/□	2.□
□ead □filtered□	0.001	m□/□	□0.001

□ient Sam□e □ Sam□e □atri□ □uro□in□ □m□t Sam□e No□ □ate Sam□ed Test/□eference	□O□	□nit	S□□T 2 □ ater □1□□□n1□□□2 □un 25□2□1□
□ea□□ □eta□□			
□an□anese □filtered□	0.005	m□/□	0.17
□ic□el □filtered□	0.001	m□/□	0.01□
Selenium □filtered□	0.001	m□/□	0.00□
□inc □filtered□	0.001	m□/□	0.010

Sam□□e □i□tor□

□ here samples are submitted/anal□sed o□er se□eral da□s, the last date of e□traction and anal□sis is reported.
A recent re□iew of our □I□S has resulted in the correction or clarification of some method identifications. □ue to this, some of the method reference information on reports has chan□ed. □owe□er, no substanti□e chan□e has been made to our laborator□methods, and as such there is no chan□e in the □alidit□of current or pre□ious results □re□ardin□ both □ualit□and □ATA accreditation□

□e□cri□tion	Te□tin□ Site	□□tracted	□o□din□ Time
Total □eco□erable □□drocarbons □1□□□ □E□□ □ractions	□elbourne	□un 2□, 201□	7 □a□
□□ethod□T□□ C□□C□□ □□ □T 100A			
Total □eco□erable □□drocarbons □201□ □E□□ □ractions	□elbourne	□un 2□, 201□	7 □a□
□□ethod□□□ □□T□ □O□□2010			
□onoc□clic Aromatic □□drocarbons	□elbourne	□un 2□, 201□	7 □a□
□□ethod□□SE□A □2□0 □□ □T □50A □onoc□clic Aromatic □□drocarbons			
□ol□c□clic Aromatic □□drocarbons	□elbourne	□un 2□, 201□	7 □a□
□□ethod□□SE□A □270 □ol□c□clic Aromatic □□drocarbons			
C□anide □total□	□elbourne	□un 27, 201□	1□ □a□
□□ethod□□SE□A □010 C□anide			
□ea□□ □etals □filtered□	□elbourne	□un 2□, 201□	1□0 □a□
□□ethod□□SE□A □020 □ea□□ □etals			

□uro□in□ □m□t □nterna□□ua□it□ □ontro□□e□ie□ and □ □o□□ar□

□enera□

1. □aborator□ □C results for □ethod □lan□s, □uplicates, □atri□Spi□es, and □aborator□Control Samples are included in this □C report where applicable. Additional □C data ma□be a□ailable on re□uest.
2. All soil results are reported on a dr□basis, unless otherwise stated.
□. Actual □□□s are matri□dependant. □uoted □□□s ma□be raised where sample e□tracts are diluted due to interferences.
□. □esults are uncorrected for matri□spi□es or surro□ate reco□eries.
5. S□OC anal□sis on waters are performed on homo□enised, unfiltered samples, unless noted otherwise.
□. Samples were anal□sed on an □as recei□ed□basis. 7. This report replaces an□interim results pre□ousl□issued.

□o□din□ Time□

□lease refer to □Sample □reser□ation and Container □uide□for holdin□ times □□S□001□

□or samples recei□ed on the last da□of holdin□ time, notification of testin□re□uirements should ha□e been recei□ed at least □ hours prior to sample receipt deadlines as stated on the Sample □eceipt Ac□nowled□ment.

If the □aborator□did not recei□e the information in the re□uired timeframe, and re□ardless of an□other inte□rit□issues, suitabl□□ualified results ma□still be reported.

□oldin□ times appl□from the date of samplin□, therefore compliance to these ma□be outside the laborator□s control.

□**N**□**T**□□p□ duplicates are reported as a ran□e □OT as □□□

□N□TS

m□□□□milli□rams per □ilo□ram	**m**□□□milli□rams per litre
u□□□micro□rams per litre	□□**m**□□arts per million
□□**b**□□arts per billion	□ □□ercenta□e
or□**1**□□**m**□□Or□anisms per 100 millilitres	**NT**□□□nits
□□**N**□**1**□□**m**□□□ost □robable □umber of or□anisms per 100 millilitres	

T□□□S

□**r**□	□ here a moisture has been determined on a solid sample the result is e□pressed on a dr□basis.
□□□	□imit of □eportin□.
S□□□	Addition of the anal□te to the sample and reported as percenta□e reco□er□.
□□□	□elati□e □ercent □ifference between two □uplicate pieces of anal□sis.
□□**S**	□aborator□Control Sample □reported as percent reco□er□
□□□	Certified □eference □aterial □reported as percent reco□er□
□**et□od □an**□	In the case of solid samples these are performed on laborator□certified clean sands. In the case of water samples these are performed on de□ionised water.
Surr □Surro□ate	The addition of a li□e compound to the anal□te tar□et and reported as percenta□e reco□er□.
□**u□licate**	A second piece of anal□sis from the same sample and reported in the same units as the result to show comparison.
□**atc□ □u□licate**	A second piece of anal□sis from a sample outside of the clients batch of samples but run within the laborator□batch of anal□sis.
□**atc□ S**□□□	Spi□e reco□er□reported on a sample from outside of the clients batch of samples but run within the laborator□batch of anal□sis.
□**S**□□**A**	□nited States En□ironment □rotection Authorit□
A□□**A**	American □ublic □ealth Association
AS□□	Australian Standard □eachin□ □rocedure □AS□□□□.□□
T□□□	To□icit□Characteristic □eachin□ □rocedure
□□□	Chain of Custod□
S□**A**	Sample □eceipt Ad□ice
□□	Client □arent □□C was performed on samples pertainin□to this report
N□□	□on□Client □arent □□C performed on samples not pertainin□to this report, □C is representati□e of the se□uence or batch that client samples were anal□sed within

□□ □A□□□□TAN□□ □□T□□A

□□□ □uplicates□□lobal □□□ □uplicates Acceptance Criteria is □0□ howe□er the followin□acceptance □uidelines are e□uall□applicable□

□esults □10 times the □O□ □□o □imit

□esults between 10□20 times the □O□ □□□□ must lie between 0□50□

□esults □20 times the □O□ □□□□ must lie between 0□□0□

Surro□ate □eco□eries □□eco□eries must lie between 50□150□ □□henols 20□1□0□.

□□ □ATA □□N□□A□ □□□□ □NTS

1. □ here a result is reported as a less than □□□, hi□her than the nominated □O□, this is due to either matri□interference, e□tract dilution re□uired due to interferences or contaminant le□els within the sample, hi□h moisture content or insufficient sample pro□ided.
2. □uplicate data shown within this report that states the word □□ATC□□is a □atch □uplicate from outside of □our sample batch, but within the laborator□sample batch at a 1□10 ratio. The □arent and □uplicate data shown is not data from □our samples.
□. Or□anochlorine □esticide anal□sis □where reportin□ □CS data, To□ophene □ Chlordane are not added to the □CS.
□. Or□anochlorine □esticide anal□sis □where reportin□Spi□e data, To□ophene is not added to the Spi□e.
5. Total □eco□erable □□drocarbons □where reportin□Spi□e □ □CS data, a sin□le spi□e of commercial □□drocarbon products in the ran□e of C12□C□0 is added and it□s Total □eco□er□is reported in the C10□C1□cell of the □eport.
□. p□ and □ree Chlorine anal□sed in the laborator□ □Anal□sis on this test must be□in within □0 minutes of samplin□.Therefore laborator□anal□sis is unli□el□to be completed within holdin□ time. Anal□sis will be□in as soon as possible after sample receipt.
7. □eco□er□□ata □Spi□es □ Surro□ates□□where chromato□raphic interference does not allow the determination of □eco□er□the term □□T□appears a□ainst that anal□te.
□. □ol□chlorinated □iphen□ls are spi□ed onl□usin□Arochlor 12□0 in □atri□Spi□es and □CS□s.
□. □or □atri□Spi□es and □CS results a dash □□□in the report means that the specific anal□te was not added to the □C sample.
10. □uplicate □□□s are calculated from raw anal□tical data thus it is possible to ha□e two sets of data.

Te□t	□nit□	□e□u□t 1			Acce□tance □imit□	□a□□ □imit□	□ua□i□□in□ □ode
□et□od □□an□							
Tota□□eco□erab□e □□drocarbon□ □1□□□N□□□ □raction□T□□ □6□□6 □□□T 1□□A							
T□□ C10□C1□	m□/□	□0.05			0.05	□ass	
T□□ C15□C2□	m□/□	□0.1			0.1	□ass	
T□□ C2□□C□□	m□/□	□0.1			0.1	□ass	
□et□od □□an□							
□onoc□c□ic Aromatic □□drocarbon□ □S□□A □26□ □□ □T □5□A □onoc□c□ic Aromatic □□drocarbon□							
□en□ene	m□/□	□0.001			0.001	□ass	
Eth□lben□ene	m□/□	□0.001			0.001	□ass	
Isoprop□l ben□ene □Cumene□	m□/□	□0.001			0.001	□ass	
m□p□□□ehes	m□/□	□0.002			0.002	□ass	
o□□□lene	m□/□	□0.001			0.001	□ass	
St□rene	m□/□	□0.001			0.001	□ass	
Toluene	m□/□	□0.001			0.001	□ass	
□□□enes □Total	m□/□	□0.00□			0.00□	□ass	
□et□od □□an□							
Tota□□eco□erab□e □□drocarbon□ □2□1□N□□□ □raction□ □□ □T□□ □□□2□1□							
□aphthalene	m□/□	□0.02			0.02	□ass	
T□□ □C10□C1□	m□/□	□0.05			0.05	□ass	
T□□ □C1□□C□□	m□/□	□0.1			0.1	□ass	
T□□ □C□□□C□0	m□/□	□0.1			0.1	□ass	
□et□od □□an□							
□o□□c□c□ic Aromatic □□drocarbon□ □S□□A □2□□ □o□□c□c□ic Aromatic □□drocarbon□							
□aphthalene	m□/□	□0.001			0.001	□ass	
□et□od □□an□							
C□anide □total□	m□/□	□0.005			0.005	□ass	
□et□od □□an□							
□ea□□ □eta□□ □i□tered□□S□□A 6□2□ □ea□□ □eta□□							
Aluminium □filtered□	m□/□	□0.05			0.05	□ass	
Arsenic □filtered□	m□/□	□0.001			0.001	□ass	
□oron □filtered□	m□/□	□0.05			0.05	□ass	
Cadmium □filtered□	m□/□	□0.0002			0.0002	□ass	
Cobalt □filtered□	m□/□	□0.001			0.001	□ass	
Copper □filtered□	m□/□	□0.001			0.001	□ass	
Iron □filtered□	m□/□	□0.05			0.05	□ass	
□ead □filtered□	m□/□	□0.001			0.001	□ass	
□an□anese □filtered□	m□/□	□0.005			0.005	□ass	
□ic□el □filtered□	m□/□	□0.001			0.001	□ass	
Selenium □filtered□	m□/□	□0.001			0.001	□ass	
□inc □filtered□	m□/□	□0.001			0.001	□ass	
□□S □□ □eco□er□							
Tota□□eco□erab□e □□drocarbon□ □1□□□N□□□ □raction□T□□ □6□□6 □□□T 1□□A							
T□□ C□□C□	□	102			70□1□0	□ass	
T□□ C10□C1□	□	□1			70□1□0	□ass	
□□S □□ □eco□er□							
□onoc□c□ic Aromatic □□drocarbon□ □S□□A □26□ □□ □T □5□A □onoc□c□ic Aromatic □□drocarbon□							
□en□ene	□	□□			70□1□0	□ass	
Eth□lben□ene	□	10□			70□1□0	□ass	
m□p□□□ehes	□	111			70□1□0	□ass	

Test			Units	Result 1			Acceptance Limits	Pass Limits	Qualifying Code
Toluene			%	102			70-130	Pass	
Xylenes - Total			%	10□			70-130	Pass	
LCS - % Recovery									
Total Recoverable Hydrocarbons - 2013 NEPM Fractions (TRH 2013)									
TRH C6-C10			%	102			70-130	Pass	
TRH >C10-C16			%	□2			70-130	Pass	
LCS - % Recovery									
Polycyclic Aromatic Hydrocarbons (USEPA 8270 Polycyclic Aromatic Hydrocarbons)									
Naphthalene			%	72			70-130	Pass	
LCS - % Recovery									
Cyanide (total)			%	[illegible]			70-130	Pass	
LCS - % Recovery									
Heavy Metals (filtered) (USEPA 6020 Heavy Metals)									
Aluminium (filtered)			%	117			□0-120	Pass	
Arsenic (filtered)			%	10□			□0-120	Pass	
Boron (filtered)			%	105			□0-120	Pass	
Cadmium (filtered)			%	111			□0-120	Pass	
Cobalt (filtered)			%	115			□0-120	Pass	
Copper (filtered)			%	107			□0-120	Pass	
Lead (filtered)			%	112			□0-120	Pass	
Manganese (filtered)			%	11□			□0-120	Pass	
Nickel (filtered)			%	110			□0-120	Pass	
Selenium (filtered)			%	112			□0-120	Pass	
Zinc (filtered)			%	10□			□0-120	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	□1□-Jn1□□00	□C□	%	111			70-130	Pass	
TRH C10-C14	□1□-Jn1□□27	□C□	%	7□			70-130	Pass	
Spike - % Recovery									
Monocyclic Aromatic Hydrocarbons				Result 1					
Benzene	□1□-Jn1□□00	□C□	%	100			70-130	Pass	
Ethylbenzene	□1□-Jn1□□00	□C□	%	110			70-130	Pass	
m&p-Xylenes	□1□-Jn1□□00	□C□	%	117			70-130	Pass	
o-Xylene	□1□-Jn1□□00	□C□	%	10□			70-130	Pass	
Toluene	□1□-Jn1□□00	□C□	%	115			70-130	Pass	
Xylenes - Total	□1□-Jn1□□00	□C□	%	11□			70-130	Pass	
Spike - % Recovery									
Total Recoverable Hydrocarbons - 2013 NEPM Fractions				Result 1					
TRH C6-C10	□1□-Jn1□□00	□C□	%	111			70-130	Pass	
TRH >C10-C16	□1□-Jn1□□27	□C□	%	□0			70-130	Pass	
Spike - % Recovery									
				Result 1					
Cyanide (total)	□1□-Jn1□□2□	□C□	%	77			70-130	Pass	
Spike - % Recovery									
Heavy Metals (filtered)				Result 1					
Aluminium (filtered)	□1□-Jn1□□00	□C□	%	[illegible]			75-125	Pass	
Arsenic (filtered)	□1□-Jn1□□00	□C□	%	□5			75-125	Pass	
Boron (filtered)	□1□-Jn1□□00	□C□	%	□1			75-125	Pass	
Cadmium (filtered)	□1□-Jn1□□00	□C□	%	□0			75-125	Pass	
Cobalt (filtered)	□1□-Jn1□□00	□C□	%	[illegible]			75-125	Pass	
Copper (filtered)	□1□-Jn1□□00	□C□	%	□0			75-125	Pass	

Test	Lab Sample ID	QA Source	Units	Result 1			Acceptance Limits	Pass Limits	Qualifying Code
Lead (filtered)	1[illegible]n1[illegible]00	QC		7			75-125	Pass	
Manganese (filtered)	1[illegible]n1[illegible]212	QC		5			75-125	Pass	
Nickel (filtered)	1[illegible]n1[illegible]00	QC		2			75-125	Pass	
Selenium (filtered)	1[illegible]n1[illegible]00	QC		10			75-125	Pass	
Zinc (filtered)	1[illegible]n1[illegible]00	QC		2			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	A1[illegible]n1[illegible]5	QC	mg/kg	0.02	0.02	1	0-0	Pass	
TRH C10-C14	1[illegible]n1[illegible]1	QC	mg/kg	0.05	0.05	1	0-0	Pass	
TRH C15-C28	1[illegible]n1[illegible]1	QC	mg/kg	0.1	0.1	1	0-0	Pass	
TRH C29-C36	1[illegible]n1[illegible]1	QC	mg/kg	0.1	0.1	1	0-0	Pass	
Duplicate									
Monocyclic Aromatic Hydrocarbons				Result 1	Result 2	RPD			
Benzene	A1[illegible]n1[illegible]5	QC	mg/kg	0.001	0.001	1	0-0	Pass	
Ethylbenzene	A1[illegible]n1[illegible]5	QC	mg/kg	0.001	0.001	1	0-0	Pass	
Isopropylbenzene (Cumene)	A1[illegible]n1[illegible]5	QC	mg/kg	0.001	0.001	1	0-0	Pass	
m+p-xylenes	A1[illegible]n1[illegible]5	QC	mg/kg	0.002	0.002	1	0-0	Pass	
o-xylene	A1[illegible]n1[illegible]5	QC	mg/kg	0.001	0.001	1	0-0	Pass	
Styrene	A1[illegible]n1[illegible]5	QC	mg/kg	0.001	0.001	1	0-0	Pass	
Toluene	A1[illegible]n1[illegible]5	QC	mg/kg	0.001	0.001	1	0-0	Pass	
[illegible]lenes -Total	A1[illegible]n1[illegible]5	QC	mg/kg	0.00	0.00	1	0-0	Pass	
Duplicate									
Total Recoverable Hydrocarbons - 2013 NEPM Fractions				Result 1	Result 2	RPD			
Naphthalene	A1[illegible]n1[illegible]5	QC	mg/kg	0.02	0.02	1	0-0	Pass	
TRH C6-C10	A1[illegible]n1[illegible]5	QC	mg/kg	0.02	0.02	1	0-0	Pass	
TRH >C10-C16	1[illegible]n1[illegible]1	QC	mg/kg	0.05	0.05	1	0-0	Pass	
TRH >C16-C34	1[illegible]n1[illegible]1	QC	mg/kg	0.1	0.1	1	0-0	Pass	
TRH >C34-C40	1[illegible]n1[illegible]1	QC	mg/kg	0.1	0.1	1	0-0	Pass	
Duplicate									
				Result 1	Result 2	RPD			
Cyanide (total)	1[illegible]n1[illegible]2	QC	mg/kg	0.005	0.005	1	0-0	Pass	
Duplicate									
Heavy Metals (filtered)				Result 1	Result 2	RPD			
Aluminium (filtered)	1[illegible]n1[illegible]00	QC	mg/kg	0.05	0.05	1	0-0	Pass	
Arsenic (filtered)	1[illegible]n1[illegible]00	QC	mg/kg	0.01	0.017	7.0	0-0	Pass	
Boron (filtered)	1[illegible]n1[illegible]00	QC	mg/kg	0.0	0.0	0	0-0	Pass	
Cadmium (filtered)	1[illegible]n1[illegible]00	QC	mg/kg	0.0002	0.0002	1	0-0	Pass	
Cobalt (filtered)	1[illegible]n1[illegible]00	QC	mg/kg	0.0012	0.0011	0	0-0	Pass	
Copper (filtered)	1[illegible]n1[illegible]00	QC	mg/kg	0.001	0.001	1	0-0	Pass	
Iron (filtered)	1[illegible]n200[illegible]7	QC	mg/kg	17	1	5.0	0-0	Pass	
Lead (filtered)	1[illegible]n1[illegible]00	QC	mg/kg	0.001	0.001	1	0-0	Pass	
Manganese (filtered)	1[illegible]n1[illegible]00	QC	mg/kg	0.1	0.1	0	0-0	Pass	
Nickel (filtered)	1[illegible]n1[illegible]00	QC	mg/kg	0.002	0.001	1	0-0	Pass	
Selenium (filtered)	1[illegible]n1[illegible]00	QC	mg/kg	0.001	0.001	17	0-0	Pass	
Zinc (filtered)	1[illegible]n1[illegible]00	QC	mg/kg	0.00	0.00	0	0-0	Pass	

□omment□

Sam□□e □nte□rit□

Custod□ Seals Intact □if used□	□/A
Attempt to Chill was e□ident	□es
Sample correctl□ preser□ed	□es
Or□anic samples had Teflon liners	□es
Sample containers for □olatile anal□sis rece□ed with minimal headspace	□es
Samples rece□ed within □oldin□Time	□es
Some samples ha□e been subcontracted	□o

□ua□i□ier □ode□□□omment□

□ode	□e□cri□tion
□01	□2 is determined b□ arithmeticall□ subtractin□ the □naphthalene□□alue from the □□C10□C1□□□alue. The naphthalene □alue used in this calculation is obtained from □olatiles □□□□e □ Trap anal□sis□
□02	□ here we ha□e reported both □olatile □□□T □C□S□and semi□olatile □□C□S□naphthalene data, results ma□ not be identical. □ro□ided correct sample handlin□ protocols ha□e been followed, an□obser□ed differences in results are li□el□to be due to procedural differences within each methodolo□□. □esults determined b□both techni□ues ha□e passed all □A□C acceptance criteria, and are entirel□ technicall□ □alid.
□0□	□1 is determined b□ arithmeticall□ subtractin□ the □Total □TE□□□alue from the □C□□C10□□alue. The □Total □TE□□□alue is obtained b□ summin□ the concentrations of □TE□ anal□tes. The □C□□C10□□alue is obtained b□ □uantitatin□ a□ainst a standard of mi□ed aromatic/aliphatic anal□tes.

Aut□ori□ed □□

Adrian Tabacchiera	Client Ser□ices
Carroll □ee	Senior Anal□st□□olatile □□IC□
Emil□ □osenber□	Senior Anal□st□□etal □□IC□
□uon□ □e	Senior Anal□st□Inor□anic □□IC□
Stace□ □en□ins	Senior Anal□st□Or□anic □□IC□

□ □enn □ac□□on

□aborator□ □ ana□er

Final report - this Report replaces any previously issued Report

□Indicates □ot □e□uested

□Indicates □ATA accreditation does not co□er the performance of this ser□ice

□ncertaint□ data is a□ailable on re□uest

Environmental Division

CERTIFICATE OF ANALYSIS

Work Order	: **EM1306677**	Page	: 1 of 9
Client	: **ENVIRONMENTAL EARTH SCIENCES**	Laboratory	: Environmental Division Melbourne
Contact	: MR REGIN ORQUIZA	Contact	: Carol Walsh
Address	: P.O.BOX 2253 FOOTSCRAY VIC, AUSTRALIA 3011	Address	: 4 Westall Rd Springvale VIC Australia 3171
E-mail	: rorquiza@environmentalearthsciences.com	E-mail	: carol.walsh@alsglobal.com
Telephone	: +61 03 96871666	Telephone	: +61-3-8549 9608
Facsimile	: +61 03 96871844	Facsimile	: +61-3-8549 9601
Project	: 210074 Sth Melbourne Gasworks	QC Level	: NEPM 1999 Schedule B(3) and ALS QCS3 requirement
Order number	: ----		
C-O-C number	: ----	Date Samples Received	: 24-JUN-2013
Sampler	: SFL/KK	Issue Date	: 01-JUL-2013
Site	: ----		
		No. of samples received	: 9
Quote number	: ME/330/13	No. of samples analysed	: 9

This report supersedes any previous report(s) with this reference. Results apply to the sample(s) as submitted. All pages of this report have been checked and approved for release.

This Certificate of Analysis contains the following information:

- General Comments
- Analytical Results
- Surrogate Control 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 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

- **EG020F: Results for EM1306677-005 have been confirmed by re-preparation and re-analysis.**
- **EG020F: Zinc and copper results for EM1306677-001 and 002 have been confirmed by re-preparation and re-analysis.**
- **EK026SF : EM1306677-002 matrix spike failed for TCN due to possible sample interference. This has been confirmed by re-analysis.**
- **EK055G: Ammonia was analysed by buchi method for #4 (EK055).**
- **EM1306677-003, 004, 006 and 007: Ammonia as N results were done by buchi method (EK055).**
- **EP071SG: Particular sample EM1306677-007 has LOR raised due to laboratory background.**
- **Ionic balances were calculated using: major anions - chloride, alkalinity and sulfate ; and major cations - calcium, magnesium, potassium, sodium and ammonia for #2 , #4 and #6..**
- **Ionic balances were calculated using: major anions - chloride, alkalinity and sulfate ; and major cations - calcium, magnesium, potassium, sodium, iron and ammonia for #3 and #7..**
- **Ionic balances were calculated using: major anions - chloride, alkalinity and sulfate; and major cations - calcium, magnesium, potassium and sodium.**

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
		Melbourne Inorganics
		Melbourne Inorganics
		Melbourne Inorganics
Nancy Wang	Senior Semivolatile Instrument Chemist	Melbourne Organics
		Melbourne Organics
Varsha Ho Wing	Non-Metals Team Leader	Melbourne Inorganics
Xingbin Lin	Senior Organic Chemist	Melbourne Organics

Analytical Results

Sub-Matrix: **GROUNDWATER** (Matrix: **WATER**)

Compound	CAS Number	LOR	Unit	Client sample ID	GW43	GW42D	GW41	GW23	GW19
				Client sampling date / time	24-JUN-2013 15:00	24-JUN-2013 15:00	24-JUN-2013 15:00	24-JUN-2013 15:00	24-JUN-2013 15:00
					EM1306677-001	EM1306677-004	EM1306677-005	EM1306677-006	EM1306677-007
EA005: pH									
pH Value	----	0.01	pH Unit		5.82	5.76	6.90	6.83	6.12
EA015: Total Dissolved Solids									
Total Dissolved Solids @180°C	----	10	mg/L		18200	27000	4400	1120	2780
ED037P: Alkalinity by PC Titrator									
Total Alkalinity as CaCO3	----	1	mg/L		425	181	229	348	97
ED041G: Sulfate (Turbidimetric) as SO4 2- by DA									
Sulfate as SO4 - Turbidimetric	14808-79-8	1	mg/L		1200	14400	503	411	1280
ED045G: Chloride Discrete analyser									
Chloride	16887-00-6	1	mg/L		9670	6190	2000	35	816
ED093F: Dissolved Major Cations									
Calcium	7440-70-2	1	mg/L		433	567	530	23	231
Magnesium	7439-95-4	1	mg/L		638	1060	221	3	93
Sodium	7440-23-5	1	mg/L		4950	3530	530	29	264
Potassium	7440-09-7	1	mg/L		175	220	53	7	47
EG020F: Dissolved Metals by ICP-MS									
Aluminium	7429-90-5	0.01	mg/L		<0.01	0.45	<0.01	0.02	0.04
Arsenic	7440-38-2	0.001	mg/L		0.003	0.016	0.030	0.554	2.06
Cadmium	7440-43-9	0.0001	mg/L		0.0007	0.0002	0.0006	<0.0001	0.0003
Cobalt	7440-48-4	0.001	mg/L		0.060	7.79	0.002	0.002	0.094
Copper	7440-50-8	0.001	mg/L		0.006	0.018	0.004	0.001	0.003
Lead	7439-92-1	0.001	mg/L		0.001	<0.001	<0.001	<0.001	<0.001
Manganese	7439-96-5	0.001	mg/L		6.69	24.6	0.409	0.041	10.3
Nickel	7440-02-0	0.001	mg/L		0.062	2.22	0.013	0.002	0.040
Selenium	7782-49-2	0.01	mg/L		<0.01	0.01	<0.01	<0.01	<0.01
Zinc	7440-66-6	0.005	mg/L		0.048	0.143	0.024	0.012	0.025
Boron	7440-42-8	0.05	mg/L		0.99	0.28	0.84	1.57	1.51
Iron	7439-89-6	0.05	mg/L		0.26	13.3	0.18	3.72	255
EK026SF: Total CN by Segmented Flow Analyser									
Total Cyanide	57-12-5	0.004	mg/L		<0.004	0.025	0.035	0.054	0.060
EK040P: Fluoride by PC Titrator									
Fluoride	16984-48-8	0.1	mg/L		0.4	0.6	1.4	0.2	0.7
EK055G: Ammonia as N by Discrete Analyser									
Ammonia as N	7664-41-7	0.01	mg/L		1.33	2410	0.80	193	83.2

Analytical Results

Sub-Matrix: **GROUNDWATER** (Matrix: **WATER**)

Compound	CAS Number	LOR	Unit	Client sample ID	GW43	GW42D	GW41	GW23	GW19
				Client sampling date / time	24-JUN-2013 15:00	24-JUN-2013 15:00	24-JUN-2013 15:00	24-JUN-2013 15:00	24-JUN-2013 15:00
					EM1306677-001	EM1306677-004	EM1306677-005	EM1306677-006	EM1306677-007
EK055G-NH4: Ammonium as N by DA									
Ammonium as N	----	0.01	mg/L		1.33	2410	0.80	193	83.2
EK057G: Nitrite as N by Discrete Analyser									
Nitrite as N	----	0.01	mg/L		<0.01	<0.01	<0.01	0.04	<0.01
EK058G: Nitrate as N by Discrete Analyser									
Nitrate as N	14797-55-8	0.01	mg/L		<0.01	<0.01	<0.01	1.12	<0.01
EK071G: Reactive Phosphorus as P by discrete analyser									
Reactive Phosphorus as P	14265-44-2	0.01	mg/L		0.08	0.02	<0.01	<0.01	<0.01
EN055: Ionic Balance									
Total Anions	----	0.01	meq/L		306	478	71.5	16.5	51.6
Total Cations	----	0.01	meq/L		294	----	69.0	----	----
Total Cations	----	0.01	meq/L		----	446	----	16.5	52.0
Ionic Balance	----	0.01	%		2.07	----	1.70	0.10	----
Ionic Balance	----	0.01	%		----	3.48	----	----	0.37
EP071 SG: Total Petroleum Hydrocarbons - Silica gel cleanup									
C10 - C14 Fraction	----	50	µg/L		----	<50	----	170	90
C15 - C28 Fraction	----	100	µg/L		----	<100	----	480	320
C29 - C36 Fraction	----	50	µg/L		----	<50	----	<50	<60
^ C10 - C36 Fraction (sum)	----	50	µg/L		----	<50	----	650	410
EP071 SG: Total Recoverable Hydrocarbons (NEPM 2010 draft) - Silica gel cleanup									
>C10 - C16 Fraction	----	100	µg/L		----	<100	----	290	270
>C16 - C34 Fraction	----	100	µg/L		----	<100	----	380	220
>C34 - C40 Fraction	----	100	µg/L		----	<100	----	<100	<100
^ >C10 - C40 Fraction (sum)	----	100	µg/L		----	<100	----	670	490
EP074A: Monocyclic Aromatic Hydrocarbons									
Benzene	71-43-2	1	µg/L		<1	425	<1	61	<1
Toluene	108-88-3	2	µg/L		<2	38	<2	3	<2
Ethylbenzene	100-41-4	2	µg/L		<2	4	<2	52	<2
meta- & para-Xylene	108-38-3 106-42-3	2	µg/L		<2	16	<2	3	<2
Styrene	100-42-5	5	µg/L		<5	<5	<5	<5	<5
ortho-Xylene	95-47-6	2	µg/L		<2	11	<2	12	<2
Isopropylbenzene	98-82-8	5	µg/L		<5	<5	<5	10	<5
n-Propylbenzene	103-65-1	5	µg/L		<5	<5	<5	<5	<5
1.3.5-Trimethylbenzene	108-67-8	5	µg/L		<5	<5	<5	<5	<5

Analytical Results

Sub-Matrix: **GROUNDWATER** (Matrix: **WATER**)

Compound	CAS Number	LOR	Unit	Client sample ID	GW43	GW42D	GW41	GW23	GW19
				Client sampling date / time	24-JUN-2013 15:00	24-JUN-2013 15:00	24-JUN-2013 15:00	24-JUN-2013 15:00	24-JUN-2013 15:00
					EM1306677-001	EM1306677-004	EM1306677-005	EM1306677-006	EM1306677-007
EP074A: Monocyclic Aromatic Hydrocarbons - Continued									
sec-Butylbenzene	135-98-8	5	µg/L		<5	<5	<5	<5	<5
1.2.4-Trimethylbenzene	95-63-6	5	µg/L		<5	<5	<5	**19**	<5
tert-Butylbenzene	98-06-6	5	µg/L		<5	<5	<5	<5	<5
p-Isopropyltoluene	99-87-6	5	µg/L		<5	<5	<5	<5	<5
n-Butylbenzene	104-51-8	5	µg/L		<5	<5	<5	<5	<5
EP074H: Naphthalene									
Naphthalene	91-20-3	7	µg/L		<7	**31**	<7	<7	<7
EP080/071: Total Petroleum Hydrocarbons									
C6 - C9 Fraction	---	20	µg/L		<20	**480**	<20	**200**	<20
C10 - C14 Fraction	---	50	µg/L		<50	**760**	<50	**730**	**140**
C15 - C28 Fraction	---	100	µg/L		<100	**340**	**330**	**1020**	**1530**
C29 - C36 Fraction	---	50	µg/L		<50	<50	<50	<50	<50
^ C10 - C36 Fraction (sum)	---	50	µg/L		<50	**1100**	**330**	**1750**	**1670**
EP080/071: Total Recoverable Hydrocarbons - NEPM 2010 Draft									
C6 - C10 Fraction	---	20	µg/L		<20	**440**	<20	**260**	<20
>C10 - C16 Fraction	---	100	µg/L		<100	**670**	**250**	**780**	**650**
>C16 - C34 Fraction	---	100	µg/L		<100	**180**	**100**	**820**	**1130**
>C34 - C40 Fraction	---	100	µg/L		<100	<100	<100	<100	<100
^ >C10 - C40 Fraction (sum)	---	100	µg/L		<100	**850**	**350**	**1600**	**1780**
EP074S: VOC Surrogates									
1.2-Dichloroethane-D4	17060-07-0	0.1	%		**116**	**131**	**115**	**119**	**103**
Toluene-D8	2037-26-5	0.1	%		**110**	**107**	**108**	**118**	**111**
4-Bromofluorobenzene	460-00-4	0.1	%		**107**	**112**	**113**	**120**	**104**
EP080S: TPH(V)/BTEX Surrogates									
1.2-Dichloroethane-D4	17060-07-0	0.1	%		**114**	**131**	**112**	**113**	**97.4**
Toluene-D8	2037-26-5	0.1	%		**105**	**104**	**105**	**103**	**97.3**
4-Bromofluorobenzene	460-00-4	0.1	%		**105**	**108**	**108**	**118**	**110**

Analytical Results

Sub-Matrix: **WATER** (Matrix: **WATER**)

Compound	CAS Number	LOR	Unit	Client sample ID: DUP1	GW39	Rinsate 1	Trip 1	----
				Client sampling date / time: 24-JUN-2013 15:00	24-JUN-2013 15:00	24-JUN-2013 15:00	24-JUN-2013 15:00	----
				EM1306677-002	EM1306677-003	EM1306677-008	EM1306677-009	----
EA005: pH								
pH Value	----	0.01	pH Unit	----	**6.67**	----	----	----
EA015: Total Dissolved Solids								
Total Dissolved Solids @180°C	----	10	mg/L	----	**2660**	----	----	----
ED037P: Alkalinity by PC Titrator								
Total Alkalinity as CaCO3	----	1	mg/L	----	**362**	----	----	----
ED041G: Sulfate (Turbidimetric) as SO4 2- by DA								
Sulfate as SO4 - Turbidimetric	14808-79-8	1	mg/L	**1210**	**1570**	----	----	----
ED045G: Chloride Discrete analyser								
Chloride	16887-00-6	1	mg/L	----	**43**	----	----	----
ED093F: Dissolved Major Cations								
Calcium	7440-70-2	1	mg/L	----	**226**	----	----	----
Magnesium	7439-95-4	1	mg/L	----	**77**	----	----	----
Sodium	7440-23-5	1	mg/L	----	**60**	----	----	----
Potassium	7440-09-7	1	mg/L	----	**16**	----	----	----
EG020F: Dissolved Metals by ICP-MS								
Aluminium	7429-90-5	0.01	mg/L	<0.01	<0.01	----	----	----
Arsenic	7440-38-2	0.001	mg/L	<0.001	**0.682**	----	----	----
Cadmium	7440-43-9	0.0001	mg/L	**0.0009**	**0.0004**	----	----	----
Cobalt	7440-48-4	0.001	mg/L	**0.064**	**0.044**	----	----	----
Copper	7440-50-8	0.001	mg/L	**0.022**	**0.004**	----	----	----
Lead	7439-92-1	0.001	mg/L	**0.002**	<0.001	----	----	----
Manganese	7439-96-5	0.001	mg/L	**7.00**	**3.82**	----	----	----
Nickel	7440-02-0	0.001	mg/L	**0.072**	**0.059**	----	----	----
Selenium	7782-49-2	0.01	mg/L	<0.01	<0.01	----	----	----
Zinc	7440-66-6	0.005	mg/L	**0.110**	**0.032**	----	----	----
Boron	7440-42-8	0.05	mg/L	**1.08**	**1.57**	----	----	----
Iron	7439-89-6	0.05	mg/L	**0.24**	**67.8**	----	----	----
EK026SF: Total CN by Segmented Flow Analyser								
Total Cyanide	57-12-5	0.004	mg/L	<0.004	**0.116**	----	----	----
EK040P: Fluoride by PC Titrator								
Fluoride	16984-48-8	0.1	mg/L	----	**1.7**	----	----	----
EK055G: Ammonia as N by Discrete Analyser								
Ammonia as N	7664-41-7	0.01	mg/L	**1.39**	**290**	----	----	----

Analytical Results

Sub-Matrix: **WATER** (Matrix: **WATER**)

Compound	CAS Number	LOR	Unit	Client sample ID	DUP1	GW39	Rinsate 1	Trip 1	----
				Client sampling date / time	24-JUN-2013 15:00	24-JUN-2013 15:00	24-JUN-2013 15:00	24-JUN-2013 15:00	----
					EM1306677-002	EM1306677-003	EM1306677-008	EM1306677-009	----
EK055G-NH4: Ammonium as N by DA									
Ammonium as N	----	0.01	mg/L		----	**290**	----	----	----
EK057G: Nitrite as N by Discrete Analyser									
Nitrite as N	----	0.01	mg/L		----	**0.04**	----	----	----
EK058G: Nitrate as N by Discrete Analyser									
Nitrate as N	14797-55-8	0.01	mg/L		----	**0.08**	----	----	----
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		----	**41.1**	----	----	----
Total Cations	----	0.01	meq/L		----	**45.0**	----	----	----
Ionic Balance	----	0.01	%		----	**4.43**	----	----	----
EP071 SG: Total Petroleum Hydrocarbons - Silica gel cleanup									
C10 - C14 Fraction	----	50	µg/L		----	**190**	----	----	----
C15 - C28 Fraction	----	100	µg/L		----	**130**	----	----	----
C29 - C36 Fraction	----	50	µg/L		----	<50	----	----	----
^ **C10 - C36 Fraction (sum)**	----	50	µg/L		----	**320**	----	----	----
EP071 SG: Total Recoverable Hydrocarbons (NEPM 2010 draft) - Silica gel cleanup									
>C10 - C16 Fraction	----	100	µg/L		----	**310**	----	----	----
>C16 - C34 Fraction	----	100	µg/L		----	<100	----	----	----
>C34 - C40 Fraction	----	100	µg/L		----	<100	----	----	----
^ **>C10 - C40 Fraction (sum)**	----	100	µg/L		----	**310**	----	----	----
EP074A: Monocyclic Aromatic Hydrocarbons									
Benzene	71-43-2	1	µg/L		<1	**72**	<1	<1	----
Toluene	108-88-3	2	µg/L		<2	**7**	<2	<2	----
Ethylbenzene	100-41-4	2	µg/L		<2	**4**	<2	<2	----
meta- & para-Xylene	108-38-3 106-42-3	2	µg/L		<2	**7**	<2	<2	----
Styrene	100-42-5	5	µg/L		<5	<5	<5	<5	----
ortho-Xylene	95-47-6	2	µg/L		<2	**6**	<2	<2	----
Isopropylbenzene	98-82-8	5	µg/L		<5	<5	<5	<5	----
n-Propylbenzene	103-65-1	5	µg/L		<5	<5	<5	<5	----
1.3.5-Trimethylbenzene	108-67-8	5	µg/L		<5	<5	<5	<5	----
sec-Butylbenzene	135-98-8	5	µg/L		<5	<5	<5	<5	----
1.2.4-Trimethylbenzene	95-63-6	5	µg/L		<5	<5	<5	<5	----

Analytical Results

Sub-Matrix: WATER (Matrix: WATER)				Client sample ID	DUP1	GW39	Rinsate 1	Trip 1	----
				Client sampling date / time	24-JUN-2013 15:00	24-JUN-2013 15:00	24-JUN-2013 15:00	24-JUN-2013 15:00	----
Compound	CAS Number	LOR	Unit		EM1306677-002	EM1306677-003	EM1306677-008	EM1306677-009	----
EP074A: Monocyclic Aromatic Hydrocarbons - Continued									
tert-Butylbenzene	98-06-6	5	µg/L		<5	<5	<5	<5	----
p-Isopropyltoluene	99-87-6	5	µg/L		<5	<5	<5	<5	----
n-Butylbenzene	104-51-8	5	µg/L		<5	<5	<5	<5	----
EP074H: Naphthalene									
Naphthalene	91-20-3	7	µg/L		<7	**19**	<7	<7	----
EP080/071: Total Petroleum Hydrocarbons									
C6 - C9 Fraction	----	20	µg/L		<20	**100**	<20	----	----
C10 - C14 Fraction	----	50	µg/L		<50	**500**	<50	----	----
C15 - C28 Fraction	----	100	µg/L		<100	**1570**	<100	----	----
C29 - C36 Fraction	----	50	µg/L		<50	<50	<50	----	----
^ C10 - C36 Fraction (sum)	----	50	µg/L		<50	**2070**	<50	----	----
EP080/071: Total Recoverable Hydrocarbons - NEPM 2010 Draft									
C6 - C10 Fraction	----	20	µg/L		<20	**110**	<20	----	----
>C10 - C16 Fraction	----	100	µg/L		<100	**940**	<100	----	----
>C16 - C34 Fraction	----	100	µg/L		<100	**1220**	<100	----	----
>C34 - C40 Fraction	----	100	µg/L		<100	<100	<100	----	----
^ >C10 - C40 Fraction (sum)	----	100	µg/L		<100	**2160**	<100	----	----
EP074S: VOC Surrogates									
1.2-Dichloroethane-D4	17060-07-0	0.1	%		**110**	**126**	**102**	**103**	----
Toluene-D8	2037-26-5	0.1	%		**103**	**123**	**96.6**	**96.4**	----
4-Bromofluorobenzene	460-00-4	0.1	%		**106**	**126**	**94.0**	**101**	----
EP080S: TPH(V)/BTEX Surrogates									
1.2-Dichloroethane-D4	17060-07-0	0.1	%		**106**	**119**	**99.7**	----	----
Toluene-D8	2037-26-5	0.1	%		**99.3**	**107**	**93.7**	----	----
4-Bromofluorobenzene	460-00-4	0.1	%		**106**	**125**	**92.1**	----	----

Surrogate Control Limits

Sub-Matrix: **GROUNDWATER**		Recovery Limits (%)	
Compound	*CAS Number*	*Low*	*High*
EP074S: VOC Surrogates			
1.2-Dichloroethane-D4	17060-07-0	69	133
Toluene-D8	2037-26-5	72	128
4-Bromofluorobenzene	460-00-4	70	130
EP080S: TPH(V)/BTEX Surrogates			
1.2-Dichloroethane-D4	17060-07-0	70	132
Toluene-D8	2037-26-5	69	125
4-Bromofluorobenzene	460-00-4	61	129

Sub-Matrix: **WATER**		Recovery Limits (%)	
Compound	*CAS Number*	*Low*	*High*
EP074S: VOC Surrogates			
1.2-Dichloroethane-D4	17060-07-0	69	133
Toluene-D8	2037-26-5	72	128
4-Bromofluorobenzene	460-00-4	70	130
EP080S: TPH(V)/BTEX Surrogates			
1.2-Dichloroethane-D4	17060-07-0	70	132
Toluene-D8	2037-26-5	69	125
4-Bromofluorobenzene	460-00-4	61	129

Environmental Division

QUALITY CONTROL REPORT

Work Order	: **EM1306677**	Page	: 1 of 11
Client	: **ENVIRONMENTAL EARTH SCIENCES**	Laboratory	: Environmental Division Melbourne
Contact	: MR REGIN ORQUIZA	Contact	: Carol Walsh
Address	: P.O.BOX 2253 FOOTSCRAY VIC, AUSTRALIA 3011	Address	: 4 Westall Rd Springvale VIC Australia 3171
E-mail	: rorquiza@environmentalearthsciences.com	E-mail	: carol.walsh@alsglobal.com
Telephone	: +61 03 96871666	Telephone	: +61-3-8549 9608
Facsimile	: +61 03 96871844	Facsimile	: +61-3-8549 9601
Project	: 210074 Sth Melbourne Gasworks	QC Level	: NEPM 1999 Schedule B(3) and ALS QCS3 requirement
Site	: ----		
C-O-C number	: ----	Date Samples Received	: 24-JUN-2013
Sampler	: SFL/KK	Issue Date	: 01-JUL-2013
Order number	: ----		
		No. of samples received	: 9
Quote number	: ME/330/13	No. of samples analysed	: 9

This report supersedes any previous report(s) with this reference. Results apply to the sample(s) as submitted. All pages of this report have been checked and approved for release.

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 moisture content, insufficient sample (reduced weight employed) or matrix interference.

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

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
		Melbourne Inorganics
		Melbourne Inorganics
		Melbourne Inorganics
Nancy Wang	Senior Semivolatile Instrument Chemist	Melbourne Organics
		Melbourne Organics
Varsha Ho Wing	Non-Metals Team Leader	Melbourne Inorganics
Xingbin 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: **WATER**

				Laboratory Duplicate (DUP) Report					
Laboratory sample ID	*Client sample ID*	*Method: Compound*	*CAS Number*	*LOR*	*Unit*	*Original Result*	*Duplicate Result*	*RPD (%)*	*Recovery Limits (%)*
EA005: pH (QC Lot: 2936555)									
EM1306663-001	Anonymous	EA005: pH Value	---	0.01	pH Unit	7.96	7.94	0.2	0% - 20%
EM1306685-001	Anonymous	EA005: pH Value	---	0.01	pH Unit	6.72	6.73	0.1	0% - 20%
EA015: Total Dissolved Solids (QC Lot: 2935788)									
EM1306657-001	Anonymous	EA015H: Total Dissolved Solids @180°C	---	10	mg/L	46200	46300	0.1	0% - 20%
EM1306657-010	Anonymous	EA015H: Total Dissolved Solids @180°C	---	10	mg/L	23400	23400	0.0	0% - 20%
ED037P: Alkalinity by PC Titrator (QC Lot: 2936332)									
EM1306539-001	Anonymous	ED037-P: Total Alkalinity as CaCO3	---	1	mg/L	29	30	0.0	0% - 20%
EM1306653-001	Anonymous	ED037-P: Total Alkalinity as CaCO3	---	1	mg/L	912	906	0.6	0% - 20%
ED041G: Sulfate (Turbidimetric) as SO4 2- by DA (QC Lot: 2936017)									
EM1306677-001	GW43	ED041G: Sulfate as SO4 - Turbidimetric	14808-79-8	1	mg/L	1200	1220	0.9	0% - 20%
EM1306704-006	Anonymous	ED041G: Sulfate as SO4 - Turbidimetric	14808-79-8	1	mg/L	158	159	0.0	0% - 20%
ED045G: Chloride Discrete analyser (QC Lot: 2936015)									
EM1306677-001	GW43	ED045G: Chloride	16887-00-6	1	mg/L	9670	9830	1.7	0% - 20%
EM1306718-002	Anonymous	ED045G: Chloride	16887-00-6	1	mg/L	2990	3070	2.6	0% - 20%
ED093F: Dissolved Major Cations (QC Lot: 2936011)									
EM1306677-001	GW43	ED093F: Calcium	7440-70-2	1	mg/L	433	460	6.0	0% - 20%
		ED093F: Magnesium	7439-95-4	1	mg/L	638	674	5.5	0% - 20%
		ED093F: Sodium	7440-23-5	1	mg/L	4950	5170	4.4	0% - 20%
		ED093F: Potassium	7440-09-7	1	mg/L	175	184	5.2	0% - 50%
EM1306718-002	Anonymous	ED093F: Calcium	7440-70-2	1	mg/L	23	23	0.0	0% - 20%
		ED093F: Magnesium	7439-95-4	1	mg/L	306	300	1.7	0% - 20%
		ED093F: Sodium	7440-23-5	1	mg/L	1150	1160	0.5	0% - 20%
		ED093F: Potassium	7440-09-7	1	mg/L	20	19	0.0	0% - 50%
EG020F: Dissolved Metals by ICP-MS (QC Lot: 2936508)									
EM1306623-001	Anonymous	EG020A-F: Cadmium	7440-43-9	0.0001	mg/L	<0.0001	<0.0001	0.0	No Limit
		EG020A-F: Arsenic	7440-38-2	0.001	mg/L	0.009	0.008	14.9	No Limit
		EG020A-F: Cobalt	7440-48-4	0.001	mg/L	0.001	<0.001	0.0	No Limit
		EG020A-F: Copper	7440-50-8	0.001	mg/L	0.024	0.022	5.7	0% - 20%
		EG020A-F: Lead	7439-92-1	0.001	mg/L	<0.001	<0.001	0.0	No Limit
		EG020A-F: Manganese	7439-96-5	0.001	mg/L	0.024	0.027	11.6	0% - 20%
		EG020A-F: Nickel	7440-02-0	0.001	mg/L	0.015	0.014	7.5	0% - 50%
		EG020A-F: Zinc	7440-66-6	0.005	mg/L	0.032	0.031	4.9	No Limit
		EG020A-F: Aluminium	7429-90-5	0.01	mg/L	<0.01	<0.01	0.0	No Limit
		EG020A-F: Selenium	7782-49-2	0.01	mg/L	0.01	<0.01	0.0	No Limit
		EG020A-F: Boron	7440-42-8	0.05	mg/L	1.47	1.69	13.9	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 (%)*
EG020F: Dissolved Metals by ICP-MS (QC Lot: 2936508) - continued									
EM1306623-001	Anonymous	EG020A-F: Iron	7439-89-6	0.05	mg/L	<0.05	<0.05	0.0	No Limit
EM1306677-007	GW19	EG020A-F: Cadmium	7440-43-9	0.0001	mg/L	0.0003	0.0003	0.0	No Limit
		EG020A-F: Arsenic	7440-38-2	0.001	mg/L	2.06	2.07	0.4	0% - 20%
		EG020A-F: Cobalt	7440-48-4	0.001	mg/L	0.094	0.089	5.0	0% - 20%
		EG020A-F: Copper	7440-50-8	0.001	mg/L	0.003	0.003	0.0	No Limit
		EG020A-F: Lead	7439-92-1	0.001	mg/L	<0.001	<0.001	0.0	No Limit
		EG020A-F: Manganese	7439-96-5	0.001	mg/L	10.3	10.8	4.3	0% - 20%
		EG020A-F: Nickel	7440-02-0	0.001	mg/L	0.040	0.037	9.2	0% - 20%
		EG020A-F: Zinc	7440-66-6	0.005	mg/L	0.025	0.025	0.0	No Limit
		EG020A-F: Aluminium	7429-90-5	0.01	mg/L	0.04	0.05	0.0	No Limit
		EG020A-F: Selenium	7782-49-2	0.01	mg/L	<0.01	<0.01	0.0	No Limit
		EG020A-F: Boron	7440-42-8	0.05	mg/L	1.51	1.63	7.2	0% - 20%
		EG020A-F: Iron	7439-89-6	0.05	mg/L	255	308	18.6	0% - 20%
EK026SF: Total CN by Segmented Flow Analyser (QC Lot: 2936566)									
EM1306677-001	GW43	EK026SF: Total Cyanide	57-12-5	0.004	mg/L	<0.004	<0.004	0.0	No Limit
EM1306716-003	Anonymous	EK026SF: Total Cyanide	57-12-5	0.004	mg/L	<0.004	<0.004	0.0	No Limit
EK040P: Fluoride by PC Titrator (QC Lot: 2936333)									
EM1306539-001	Anonymous	EK040P: Fluoride	16984-48-8	0.1	mg/L	<0.1	0.1	0.0	No Limit
EM1306638-008	Anonymous	EK040P: Fluoride	16984-48-8	0.1	mg/L	0.4	0.4	0.0	No Limit
EK055G: Ammonia as N by Discrete Analyser (QC Lot: 2936860)									
EM1306677-001	GW43	EK055G: Ammonia as N	7664-41-7	0.01	mg/L	1.33	1.39	4.4	0% - 20%
EM1306716-003	Anonymous	EK055G: Ammonia as N	7664-41-7	0.01	mg/L	0.08	0.08	0.0	No Limit
EK057G: Nitrite as N by Discrete Analyser (QC Lot: 2936012)									
EM1306677-001	GW43	EK057G: Nitrite as N	----	0.01	mg/L	<0.01	<0.01	0.0	No Limit
EM1306718-002	Anonymous	EK057G: Nitrite as N	----	0.01	mg/L	<0.01	<0.01	0.0	No Limit
EK071G: Reactive Phosphorus as P by discrete analyser (QC Lot: 2936013)									
EM1306677-001	GW43	EK071G: Reactive Phosphorus as P	14265-44-2	0.01	mg/L	0.08	0.08	0.0	No Limit
EP071 SG: Total Petroleum Hydrocarbons - Silica gel cleanup (QC Lot: 2935863)									
EM1306677-003	GW39	EP071SG: C15 - C28 Fraction	----	100	µg/L	130	<100	23.3	No Limit
		EP071SG: C10 - C14 Fraction	----	50	µg/L	190	<50	118	No Limit
		EP071SG: C29 - C36 Fraction	----	50	µg/L	<50	<50	0.0	No Limit
		EP071SG: C10 - C36 Fraction (sum)	----	50	µg/L	320	<50	146	No Limit
EP071 SG: Total Recoverable Hydrocarbons (NEPM 2010 draft) - Silica gel cleanup (QC Lot: 2935863)									
EM1306677-003	GW39	EP071SG: >C10 - C16 Fraction	----	100	µg/L	310	<100	102	No Limit
		EP071SG: >C16 - C34 Fraction	----	100	µg/L	<100	<100	0.0	No Limit
		EP071SG: >C34 - C40 Fraction	----	100	µg/L	<100	<100	0.0	No Limit
EP074A: Monocyclic Aromatic Hydrocarbons (QC Lot: 2935893)									
EM1306677-001	GW43	EP074: Benzene	71-43-2	1	µg/L	<1	<1	0.0	No Limit
		EP074: Toluene	108-88-3	2	µg/L	<2	<2	0.0	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: 2935893) - continued									
EM1306677-001	GW43	EP074: Ethylbenzene	100-41-4	2	µg/L	<2	<2	0.0	No Limit
		EP074: meta- & para-Xylene	108-38-3 106-42-3	2	µg/L	<2	<2	0.0	No Limit
		EP074: ortho-Xylene	95-47-6	2	µg/L	<2	<2	0.0	No Limit
		EP074: Styrene	100-42-5	5	µg/L	<5	<5	0.0	No Limit
		EP074: Isopropylbenzene	98-82-8	5	µg/L	<5	<5	0.0	No Limit
		EP074: n-Propylbenzene	103-65-1	5	µg/L	<5	<5	0.0	No Limit
		EP074: 1.3.5-Trimethylbenzene	108-67-8	5	µg/L	<5	<5	0.0	No Limit
		EP074: sec-Butylbenzene	135-98-8	5	µg/L	<5	<5	0.0	No Limit
		EP074: 1.2.4-Trimethylbenzene	95-63-6	5	µg/L	<5	<5	0.0	No Limit
		EP074: tert-Butylbenzene	98-06-6	5	µg/L	<5	<5	0.0	No Limit
		EP074: p-Isopropyltoluene	99-87-6	5	µg/L	<5	<5	0.0	No Limit
		EP074: n-Butylbenzene	104-51-8	5	µg/L	<5	<5	0.0	No Limit
EM1306685-002	Anonymous	EP074: Benzene	71-43-2	1	µg/L	<1	<1	0.0	No Limit
		EP074: Toluene	108-88-3	2	µg/L	<2	<2	0.0	No Limit
		EP074: Ethylbenzene	100-41-4	2	µg/L	<2	<2	0.0	No Limit
		EP074: meta- & para-Xylene	108-38-3 106-42-3	2	µg/L	<2	<2	0.0	No Limit
		EP074: ortho-Xylene	95-47-6	2	µg/L	<2	<2	0.0	No Limit
		EP074: Styrene	100-42-5	5	µg/L	<5	<5	0.0	No Limit
		EP074: Isopropylbenzene	98-82-8	5	µg/L	<5	<5	0.0	No Limit
		EP074: n-Propylbenzene	103-65-1	5	µg/L	<5	<5	0.0	No Limit
		EP074: 1.3.5-Trimethylbenzene	108-67-8	5	µg/L	<5	<5	0.0	No Limit
		EP074: sec-Butylbenzene	135-98-8	5	µg/L	<5	<5	0.0	No Limit
		EP074: 1.2.4-Trimethylbenzene	95-63-6	5	µg/L	<5	<5	0.0	No Limit
		EP074: tert-Butylbenzene	98-06-6	5	µg/L	<5	<5	0.0	No Limit
		EP074: p-Isopropyltoluene	99-87-6	5	µg/L	<5	<5	0.0	No Limit
		EP074: n-Butylbenzene	104-51-8	5	µg/L	<5	<5	0.0	No Limit
EP074H: Naphthalene (QC Lot: 2935893)									
EM1306677-001	GW43	EP074: Naphthalene	91-20-3	7	µg/L	<7	<7	0.0	No Limit
EM1306685-002	Anonymous	EP074: Naphthalene	91-20-3	7	µg/L	<7	<7	0.0	No Limit
EP080/071: Total Petroleum Hydrocarbons (QC Lot: 2935862)									
EM1306677-001	GW43	EP071: C15 - C28 Fraction	---	100	µg/L	<100	<100	0.0	No Limit
		EP071: C10 - C14 Fraction	---	50	µg/L	<50	<50	0.0	No Limit
		EP071: C29 - C36 Fraction	---	50	µg/L	<50	<50	0.0	No Limit
EM1306677-005	GW41	EP071: C15 - C28 Fraction	---	100	µg/L	330	300	7.5	No Limit
		EP071: C10 - C14 Fraction	---	50	µg/L	<50	<50	0.0	No Limit
		EP071: C29 - C36 Fraction	---	50	µg/L	<50	<50	0.0	No Limit
EP080/071: Total Petroleum Hydrocarbons (QC Lot: 2935894)									
EM1306677-001	GW43	EP080: C6 - C9 Fraction	---	20	µg/L	<20	<20	0.0	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: 2935894) - continued									
EM1306685-002	Anonymous	EP080: C6 - C9 Fraction	----	20	µg/L	<20	<20	0.0	No Limit
EP080/071: Total Recoverable Hydrocarbons - NEPM 2010 Draft (QC Lot: 2935862)									
EM1306677-001	GW43	EP071: >C10 - C16 Fraction	----	100	µg/L	<100	<100	0.0	No Limit
		EP071: >C16 - C34 Fraction	----	100	µg/L	<100	<100	0.0	No Limit
		EP071: >C34 - C40 Fraction	----	100	µg/L	<100	<100	0.0	No Limit
EM1306677-005	GW41	EP071: >C10 - C16 Fraction	----	100	µg/L	250	220	12.1	No Limit
		EP071: >C16 - C34 Fraction	----	100	µg/L	100	100	0.0	No Limit
		EP071: >C34 - C40 Fraction	----	100	µg/L	<100	<100	0.0	No Limit
EP080/071: Total Recoverable Hydrocarbons - NEPM 2010 Draft (QC Lot: 2935894)									
EM1306677-001	GW43	EP080: C6 - C10 Fraction	----	20	µg/L	<20	<20	0.0	No Limit
EM1306685-002	Anonymous	EP080: C6 - C10 Fraction	----	20	µg/L	<20	<20	0.0	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 (QCLot: 2935788)								
EA015H: Total Dissolved Solids @180°C	----	10	mg/L	<10	2000 mg/L	99.6	98	104
ED037P: Alkalinity by PC Titrator (QCLot: 2936332)								
ED037-P: Total Alkalinity as CaCO3	----	1	mg/L	----	200 mg/L	97.4	91	105
ED041G: Sulfate (Turbidimetric) as SO4 2- by DA (QCLot: 2936017)								
ED041G: Sulfate as SO4 - Turbidimetric	14808-79-8	1	mg/L	<1	12.5 mg/L	104	81	125
ED045G: Chloride Discrete analyser (QCLot: 2936015)								
ED045G: Chloride	16887-00-6	1	mg/L	<1	10 mg/L	105	89	117
ED093F: Dissolved Major Cations (QCLot: 2936011)								
ED093F: Calcium	7440-70-2	1	mg/L	<1	5 mg/L	97.0	83	129
ED093F: Magnesium	7439-95-4	1	mg/L	<1	5 mg/L	94.4	80	124
ED093F: Sodium	7440-23-5	1	mg/L	<1	50 mg/L	92.9	77	125
ED093F: Potassium	7440-09-7	1	mg/L	<1	50 mg/L	92.3	77	123
EG020F: Dissolved Metals by ICP-MS (QCLot: 2936508)								
EG020A-F: Aluminium	7429-90-5	0.01	mg/L	<0.01	0.5 mg/L	101	90	110
EG020A-F: Arsenic	7440-38-2	0.001	mg/L	<0.001	0.1 mg/L	101	93	109
EG020A-F: Cadmium	7440-43-9	0.0001	mg/L	<0.0001	0.1 mg/L	99.9	85	111
EG020A-F: Cobalt	7440-48-4	0.001	mg/L	<0.001	0.1 mg/L	97.7	87	111
EG020A-F: Copper	7440-50-8	0.001	mg/L	<0.001	0.1 mg/L	98.0	86	110
EG020A-F: Lead	7439-92-1	0.001	mg/L	<0.001	0.1 mg/L	103	88	112
EG020A-F: Manganese	7439-96-5	0.001	mg/L	<0.001	0.1 mg/L	106	86	110
EG020A-F: Nickel	7440-02-0	0.001	mg/L	<0.001	0.1 mg/L	98.6	86	112
EG020A-F: Selenium	7782-49-2	0.01	mg/L	<0.01	0.1 mg/L	96.0	85	111
EG020A-F: Zinc	7440-66-6	0.005	mg/L	<0.005	0.1 mg/L	99.2	83	113
EG020A-F: Boron	7440-42-8	0.05	mg/L	<0.05	0.1 mg/L	101	72	126
EG020A-F: Iron	7439-89-6	0.05	mg/L	<0.05	0.5 mg/L	101	88	112
EK026SF: Total CN by Segmented Flow Analyser (QCLot: 2936566)								
EK026SF: Total Cyanide	57-12-5	0.004	mg/L	<0.004	0.2 mg/L	105	75	113
EK040P: Fluoride by PC Titrator (QCLot: 2936333)								
EK040P: Fluoride	16984-48-8	0.1	mg/L	<0.1	5 mg/L	105	78	120
EK055G: Ammonia as N by Discrete Analyser (QCLot: 2936860)								
EK055G: Ammonia as N	7664-41-7	0.01	mg/L	<0.01	1.0 mg/L	104	76	122
EK057G: Nitrite as N by Discrete Analyser (QCLot: 2936012)								
EK057G: Nitrite as N	----	0.01	mg/L	<0.01	0.5 mg/L	99.8	84	112

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
EK071G: Reactive Phosphorus as P by discrete analyser (QCLot: 2936013)								
EK071G: Reactive Phosphorus as P	14265-44-2	0.01	mg/L	<0.01	0.5 mg/L	107	84	108
EP071 SG: Total Petroleum Hydrocarbons - Silica gel cleanup (QCLot: 2935863)								
EP071SG: C10 - C14 Fraction	----	50	µg/L	<50	62700 µg/L	102	58	144
EP071SG: C15 - C28 Fraction	----	100	µg/L	<100	101500 µg/L	96.9	55	133
EP071SG: C29 - C36 Fraction	----	50	µg/L	<50	----	----	----	----
EP071SG: C10 - C36 Fraction (sum)	----	50	µg/L	<50	----	----	----	----
EP071 SG: Total Recoverable Hydrocarbons (NEPM 2010 draft) - Silica gel cleanup (QCLot: 2935863)								
EP071SG: >C10 - C16 Fraction	----	100	µg/L	<100	----	----	----	----
EP071SG: >C16 - C34 Fraction	----	100	µg/L	<100	----	----	----	----
EP071SG: >C34 - C40 Fraction	----	100	µg/L	<100	----	----	----	----
EP074A: Monocyclic Aromatic Hydrocarbons (QCLot: 2935893)								
EP074: Benzene	71-43-2	1	µg/L	<1	20 µg/L	91.4	76	122
EP074: Toluene	108-88-3	2	µg/L	<2	20 µg/L	92.1	79	123
EP074: Ethylbenzene	100-41-4	2	µg/L	<2	20 µg/L	91.6	76	118
EP074: meta- & para-Xylene	108-38-3 106-42-3	2	µg/L	<2	40 µg/L	93.4	75	121
EP074: Styrene	100-42-5	5	µg/L	<5	20 µg/L	97.0	72	118
EP074: ortho-Xylene	95-47-6	2	µg/L	<2	20 µg/L	97.4	80	120
EP074: Isopropylbenzene	98-82-8	5	µg/L	<5	20 µg/L	99.1	71	119
EP074: n-Propylbenzene	103-65-1	5	µg/L	<5	20 µg/L	85.0	69	113
EP074: 1.3.5-Trimethylbenzene	108-67-8	5	µg/L	<5	20 µg/L	86.4	70	114
EP074: sec-Butylbenzene	135-98-8	5	µg/L	<5	20 µg/L	84.8	71	115
EP074: 1.2.4-Trimethylbenzene	95-63-6	5	µg/L	<5	20 µg/L	87.3	70	114
EP074: tert-Butylbenzene	98-06-6	5	µg/L	<5	20 µg/L	86.3	72	114
EP074: p-Isopropyltoluene	99-87-6	5	µg/L	<5	20 µg/L	85.1	68	114
EP074: n-Butylbenzene	104-51-8	5	µg/L	<5	20 µg/L	84.7	61	115
EP074H: Naphthalene (QCLot: 2935893)								
EP074: Naphthalene	91-20-3	7	µg/L	<7	20 µg/L	96.6	75	121
EP080/071: Total Petroleum Hydrocarbons (QCLot: 2935862)								
EP071: C10 - C14 Fraction	----	50	µg/L	<50	3610 µg/L	91.4	46	126
EP071: C15 - C28 Fraction	----	100	µg/L	<100	10340 µg/L	96.6	55	125
EP071: C29 - C36 Fraction	----	50	µg/L	<50	3790 µg/L	99.1	55	129
EP080/071: Total Petroleum Hydrocarbons (QCLot: 2935894)								
EP080: C6 - C9 Fraction	----	20	µg/L	<20	360 µg/L	98.1	60	126
EP080/071: Total Recoverable Hydrocarbons - NEPM 2010 Draft (QCLot: 2935862)								
EP071: >C10 - C16 Fraction	----	100	µg/L	<100	5070 µg/L	97.7	53	129
EP071: >C16 - C34 Fraction	----	100	µg/L	<100	11230 µg/L	103	56	132
EP071: >C34 - C40 Fraction	----	100	µg/L	<100	1010 µg/L	97.9	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 2010 Draft (QCLot: 2935894)								
EP080: C6 - C10 Fraction	----	20	µg/L	<20	450 µg/L	94.8	56	130

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: 2936017)							
EM1306677-003	GW39	ED041G: Sulfate as SO4 - Turbidimetric	14808-79-8	10 mg/L	# Not Determined	70	130
ED045G: Chloride Discrete analyser (QCLot: 2936015)							
EM1306677-003	GW39	ED045G: Chloride	16887-00-6	400 mg/L	112	70	130
EG020F: Dissolved Metals by ICP-MS (QCLot: 2936508)							
EM1306623-001	Anonymous	EG020A-F: Arsenic	7440-38-2	0.2 mg/L	110	89	139
		EG020A-F: Cadmium	7440-43-9	0.05 mg/L	102	75	131
		EG020A-F: Cobalt	7440-48-4	0.2 mg/L	110	77	129
		EG020A-F: Copper	7440-50-8	0.2 mg/L	114	71	127
		EG020A-F: Lead	7439-92-1	0.2 mg/L	114	71	123
		EG020A-F: Manganese	7439-96-5	0.2 mg/L	100	66	132
		EG020A-F: Nickel	7440-02-0	0.2 mg/L	103	73	129
		EG020A-F: Zinc	7440-66-6	0.2 mg/L	111	68	136
EK026SF: Total CN by Segmented Flow Analyser (QCLot: 2936566)							
EM1306677-002	DUP1	EK026SF: Total Cyanide	57-12-5	0.2 mg/L	# 56.1	70	130
EK040P: Fluoride by PC Titrator (QCLot: 2936333)							
EM1306539-002	Anonymous	EK040P: Fluoride	16984-48-8	5.0 mg/L	107	70	130
EK055G: Ammonia as N by Discrete Analyser (QCLot: 2936860)							
EM1306677-002	DUP1	EK055G: Ammonia as N	7664-41-7	1.0 mg/L	118	70	130
EK057G: Nitrite as N by Discrete Analyser (QCLot: 2936012)							
EM1306677-003	GW39	EK057G: Nitrite as N	----	0.5 mg/L	96.2	70	130
EK071G: Reactive Phosphorus as P by discrete analyser (QCLot: 2936013)							
EM1306677-003	GW39	EK071G: Reactive Phosphorus as P	14265-44-2	0.5 mg/L	94.7	70	130
EP071 SG: Total Petroleum Hydrocarbons - Silica gel cleanup (QCLot: 2935863)							
EM1306677-004	GW42D	EP071SG: C10 - C14 Fraction	----	62700 µg/L	128	65	149
		EP071SG: C15 - C28 Fraction	----	101500 µg/L	120	56	148

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
EP074A: Monocyclic Aromatic Hydrocarbons (QCLot: 2935893)							
EM1306677-002	DUP1	EP074: Benzene	71-43-2	20 µg/L	94.4	64	121
		EP074: Toluene	108-88-3	20 µg/L	100	63	125
EP080/071: Total Petroleum Hydrocarbons (QCLot: 2935862)							
EM1306677-002	DUP1	EP071: C10 - C14 Fraction	----	3610 µg/L	77.7	40	130
		EP071: C15 - C28 Fraction	----	10340 µg/L	82.7	51	145
		EP071: C29 - C36 Fraction	----	3790 µg/L	85.6	52	144
EP080/071: Total Petroleum Hydrocarbons (QCLot: 2935894)							
EM1306677-002	DUP1	EP080: C6 - C9 Fraction	----	280 µg/L	77.6	46	126
EP080/071: Total Recoverable Hydrocarbons - NEPM 2010 Draft (QCLot: 2935862)							
EM1306677-002	DUP1	EP071: >C10 - C16 Fraction	----	5070 µg/L	82.9	46	142
		EP071: >C16 - C34 Fraction	----	11230 µg/L	88.4	52	146
		EP071: >C34 - C40 Fraction	----	1010 µg/L	87.6	49	143
EP080/071: Total Recoverable Hydrocarbons - NEPM 2010 Draft (QCLot: 2935894)							
EM1306677-002	DUP1	EP080: C6 - C10 Fraction	----	330 µg/L	76.0	45	127

Matrix Spike (MS) and Matrix Spike Duplicate (MSD) Report

The quality control term Matrix Spike (MS) and Matrix Spike Duplicate (MSD) refers to intralaboratory split samples spiked with a representative set of target analytes. The purpose of these QC parameters are 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) and Matrix Spike Duplicate (MSD) Report: Spike Concentration	Spike Recovery (%): MS	Spike Recovery (%): MSD	Recovery Limits (%): Low	Recovery Limits (%): High	RPDs (%): Value	RPDs (%): Control Limit
EP080/071: Total Petroleum Hydrocarbons (QCLot: 2935862)										
EM1306677-002	DUP1	EP071: C10 - C14 Fraction	----	3610 µg/L	77.7	----	40	130	----	----
		EP071: C15 - C28 Fraction	----	10340 µg/L	82.7	----	51	145	----	----
		EP071: C29 - C36 Fraction	----	3790 µg/L	85.6	----	52	144	----	----
EP080/071: Total Recoverable Hydrocarbons - NEPM 2010 Draft (QCLot: 2935862)										
EM1306677-002	DUP1	EP071: >C10 - C16 Fraction	----	5070 µg/L	82.9	----	46	142	----	----
		EP071: >C16 - C34 Fraction	----	11230 µg/L	88.4	----	52	146	----	----
		EP071: >C34 - C40 Fraction	----	1010 µg/L	87.6	----	49	143	----	----
EP071 SG: Total Petroleum Hydrocarbons - Silica gel cleanup (QCLot: 2935863)										
EM1306677-004	GW42D	EP071SG: C10 - C14 Fraction	----	62700 µg/L	128	----	65	149	----	----
		EP071SG: C15 - C28 Fraction	----	101500 µg/L	120	----	56	148	----	----
EP074A: Monocyclic Aromatic Hydrocarbons (QCLot: 2935893)										
EM1306677-002	DUP1	EP074: Benzene	71-43-2	20 µg/L	94.4	----	64	121	----	----
		EP074: Toluene	108-88-3	20 µg/L	100	----	63	125	----	----
EP080/071: Total Petroleum Hydrocarbons (QCLot: 2935894)										

Sub-Matrix: **WATER**

				Matrix Spike (MS) and Matrix Spike Duplicate (MSD) Report						
				Spike	Spike Recovery (%)		Recovery Limits (%)		RPDs (%)	
Laboratory sample ID	Client sample ID	Method: Compound	CAS Number	Concentration	MS	MSD	Low	High	Value	Control Limit
EP080/071: Total Petroleum Hydrocarbons (QCLot: 2935894) - continued										
EM1306677-002	DUP1	EP080: C6 - C9 Fraction	----	280 µg/L	77.6	----	46	126	----	----
EP080/071: Total Recoverable Hydrocarbons - NEPM 2010 Draft (QCLot: 2935894)										
EM1306677-002	DUP1	EP080: C6 - C10 Fraction	----	330 µg/L	76.0	----	45	127	----	----
EK057G: Nitrite as N by Discrete Analyser (QCLot: 2936012)										
EM1306677-003	GW39	EK057G: Nitrite as N	----	0.5 mg/L	96.2	----	70	130	----	----
EK071G: Reactive Phosphorus as P by discrete analyser (QCLot: 2936013)										
EM1306677-003	GW39	EK071G: Reactive Phosphorus as P	14265-44-2	0.5 mg/L	94.7	----	70	130	----	----
ED045G: Chloride Discrete analyser (QCLot: 2936015)										
EM1306677-003	GW39	ED045G: Chloride	16887-00-6	400 mg/L	112	----	70	130	----	----
ED041G: Sulfate (Turbidimetric) as SO4 2- by DA (QCLot: 2936017)										
EM1306677-003	GW39	ED041G: Sulfate as SO4 - Turbidimetric	14808-79-8	10 mg/L	# Not Determined	----	70	130	----	----
EK040P: Fluoride by PC Titrator (QCLot: 2936333)										
EM1306539-002	Anonymous	EK040P: Fluoride	16984-48-8	5.0 mg/L	107	----	70	130	----	----
EG020F: Dissolved Metals by ICP-MS (QCLot: 2936508)										
EM1306623-001	Anonymous	EG020A-F: Arsenic	7440-38-2	0.2 mg/L	110	----	89	139	----	----
		EG020A-F: Cadmium	7440-43-9	0.05 mg/L	102	----	75	131	----	----
		EG020A-F: Cobalt	7440-48-4	0.2 mg/L	110	----	77	129	----	----
		EG020A-F: Copper	7440-50-8	0.2 mg/L	114	----	71	127	----	----
		EG020A-F: Lead	7439-92-1	0.2 mg/L	114	----	71	123	----	----
		EG020A-F: Manganese	7439-96-5	0.2 mg/L	100	----	66	132	----	----
		EG020A-F: Nickel	7440-02-0	0.2 mg/L	103	----	73	129	----	----
		EG020A-F: Zinc	7440-66-6	0.2 mg/L	111	----	68	136	----	----
EK026SF: Total CN by Segmented Flow Analyser (QCLot: 2936566)										
EM1306677-002	DUP1	EK026SF: Total Cyanide	57-12-5	0.2 mg/L	# 56.1	----	70	130	----	----
EK055G: Ammonia as N by Discrete Analyser (QCLot: 2936860)										
EM1306677-002	DUP1	EK055G: Ammonia as N	7664-41-7	1.0 mg/L	118	----	70	130	----	----

Environmental Division

INTERPRETIVE QUALITY CONTROL REPORT

Work Order	: **EM1306677**	Page	: 1 of 10
Client	: ENVIRONMENTAL EARTH SCIENCES	Laboratory	: Environmental Division Melbourne
Contact	: MR REGIN ORQUIZA	Contact	: Carol Walsh
Address	: P.O.BOX 2253 FOOTSCRAY VIC, AUSTRALIA 3011	Address	: 4 Westall Rd Springvale VIC Australia 3171
E-mail	: rorquiza@environmentalearthsciences.com	E-mail	: carol.walsh@alsglobal.com
Telephone	: +61 03 96871666	Telephone	: +61-3-8549 9608
Facsimile	: +61 03 96871844	Facsimile	: +61-3-8549 9601
Project	: 210074 Sth Melbourne Gasworks	QC Level	: NEPM 1999 Schedule B(3) and ALS QCS3 requirement
Site	: ----		
C-O-C number	: ----	Date Samples Received	: 24-JUN-2013
Sampler	: SFL/KK	Issue Date	: 01-JUL-2013
Order number	: ----		
		No. of samples received	: 9
Quote number	: ME/330/13	No. of samples analysed	: 9

This report supersedes any previous report(s) with this reference. Results apply to the sample(s) as submitted. All pages of this report have been checked and approved for release.

This Interpretive Quality Control Report contains the following information:

- Analysis Holding Time Compliance
- Quality Control Parameter Frequency Compliance
- Brief Method Summaries
- Summary of Outliers

Analysis Holding Time Compliance

The following report summarises extraction / preparation and analysis times and compares with recommended holding times. Dates reported represent first date of extraction or analysis and precludes subsequent dilutions and reruns. Information is also provided re the sample container (preservative) from which the analysis aliquot was taken. Elapsed period to analysis represents number of days from sampling where no extraction / digestion is involved or period from extraction / digestion where this is present. For composite samples, sampling date is assumed to be that of the oldest sample contributing to the composite. Sample date for laboratory produced leachates is assumed as the completion date of the leaching process. Outliers for holding time are based on USEPA SW 846, APHA, AS and NEPM (1999). A listing of breaches is provided in the Summary of Outliers.

Holding times for leachate methods (excluding elutriates) vary according to the analytes being determined on the resulting solution. For non-volatile analytes, the holding time compliance assessment compares the leach date with the shortest analyte holding time for the equivalent soil method. These soil holding times are: Organics (14 days); Mercury (28 days) & other metals (180 days). A recorded breach therefore does not guarantee a breach for all non-volatile parameters.

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
EA005: pH							
Clear Plastic Bottle - Natural (EA005)							
GW43, GW39, GW42D, GW41, GW23, GW19	**24-JUN-2013**	**----**	----	----	**26-JUN-2013**	24-JUN-2013	×
EA015: Total Dissolved Solids							
Clear Plastic Bottle - Natural (EA015H)							
GW43, GW39, GW42D, GW41, GW23, GW19	**24-JUN-2013**	**---**	01-JUL-2013	----	**26-JUN-2013**	01-JUL-2013	✓
ED037P: Alkalinity by PC Titrator							
Clear Plastic Bottle - Natural (ED037-P)							
GW43, GW39, GW42D, GW41, GW23, GW19	**24-JUN-2013**	**---**	08-JUL-2013	----	**26-JUN-2013**	08-JUL-2013	✓
ED041G: Sulfate (Turbidimetric) as SO4 2- by DA							
Clear Plastic Bottle - Natural (ED041G)							
GW43, DUP1, GW39, GW42D, GW41, GW23, GW19	**24-JUN-2013**	**---**	22-JUL-2013	----	**26-JUN-2013**	22-JUL-2013	✓
ED045G: Chloride Discrete analyser							
Clear Plastic Bottle - Natural (ED045G)							
GW43, GW39, GW42D, GW41, GW23, GW19	**24-JUN-2013**	**---**	22-JUL-2013	----	**26-JUN-2013**	22-JUL-2013	✓
ED093F: Dissolved Major Cations							
Clear Plastic Bottle - Natural (ED093F)							
GW43, GW39, GW42D, GW41, GW23, GW19	**24-JUN-2013**	**---**	01-JUL-2013	----	**26-JUN-2013**	01-JUL-2013	✓

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)							
GW43, DUP1, GW39, GW42D, GW41, GW23, GW19	**24-JUN-2013**	---	21-DEC-2013	----	**27-JUN-2013**	21-DEC-2013	✓
EK026SF: Total CN by Segmented Flow Analyser							
White Plastic Bottle-NaOH (EK026SF)							
GW23	**24-JUN-2013**	---	08-JUL-2013	----	**26-JUN-2013**	08-JUL-2013	✓
White Plastic Bottle-NaOH - Pb Acetate (EK026SF)							
GW43, DUP1, GW39, GW42D, GW41, GW19	**24-JUN-2013**	---	08-JUL-2013	----	**26-JUN-2013**	08-JUL-2013	✓
EK040P: Fluoride by PC Titrator							
Clear Plastic Bottle - Natural (EK040P)							
GW43, GW39, GW42D, GW41, GW23, GW19	**24-JUN-2013**	---	22-JUL-2013	----	**26-JUN-2013**	22-JUL-2013	✓
EK055G: Ammonia as N by Discrete Analyser							
Clear Plastic Bottle - Sulfuric Acid (EK055G)							
GW43, DUP1, GW39, GW42D, GW41, GW23, GW19	**24-JUN-2013**	---	22-JUL-2013	----	**27-JUN-2013**	22-JUL-2013	✓
EK057G: Nitrite as N by Discrete Analyser							
Clear Plastic Bottle - Natural (EK057G)							
GW43, GW39, GW42D, GW41, GW23, GW19	**24-JUN-2013**	---	26-JUN-2013	----	**25-JUN-2013**	26-JUN-2013	✓
EK071G: Reactive Phosphorus as P by discrete analyser							
Clear Plastic Bottle - Natural (EK071G)							
GW43, GW39, GW42D, GW41, GW23, GW19	**24-JUN-2013**	---	26-JUN-2013	----	**25-JUN-2013**	26-JUN-2013	✓
EP080/071: Total Petroleum Hydrocarbons							
Amber Glass Bottle - Unpreserved (EP071)							
GW43, DUP1, GW39, GW42D, GW41, GW23, GW19, Rinsate 1	**24-JUN-2013**	**26-JUN-2013**	01-JUL-2013	✓	**26-JUN-2013**	05-AUG-2013	✓

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
EP071 SG: Total Petroleum Hydrocarbons - Silica gel cleanup							
Amber Glass Bottle - Unpreserved (EP071SG)							
GW39, GW42D, GW23, GW19	**24-JUN-2013**	**26-JUN-2013**	01-JUL-2013	✓	**26-JUN-2013**	05-AUG-2013	✓
EP071 SG: Total Recoverable Hydrocarbons (NEPM 2010 draft) - Silica gel cleanup							
Amber Glass Bottle - Unpreserved (EP071SG)							
GW39, GW42D, GW23, GW19	**24-JUN-2013**	**26-JUN-2013**	01-JUL-2013	✓	**26-JUN-2013**	05-AUG-2013	✓
EP074A: Monocyclic Aromatic Hydrocarbons							
Amber VOC Vial - Sulfuric Acid (EP074)							
GW43, DUP1, GW39, GW42D, GW41, GW23, GW19, Rinsate 1, Trip 1	**24-JUN-2013**	**26-JUN-2013**	08-JUL-2013	✓	**26-JUN-2013**	08-JUL-2013	✓
EP074H: Naphthalene							
Amber VOC Vial - Sulfuric Acid (EP074)							
GW43, DUP1, GW39, GW42D, GW41, GW23, GW19, Rinsate 1, Trip 1	**24-JUN-2013**	**26-JUN-2013**	08-JUL-2013	✓	**26-JUN-2013**	08-JUL-2013	✓
EP080/071: Total Recoverable Hydrocarbons - NEPM 2010 Draft							
Amber VOC Vial - Sulfuric Acid (EP080)							
GW43, DUP1, GW39, GW42D, GW41, GW23, GW19, Rinsate 1	**24-JUN-2013**	**26-JUN-2013**	08-JUL-2013	✓	**26-JUN-2013**	08-JUL-2013	✓

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(where) 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	**10.0**	**10.0**	✓	NEPM 1999 Schedule B(3) and ALS QCS3 requirement
Ammonia as N by Discrete analyser	EK055G	2	20	**10.0**	**10.0**	✓	NEPM 1999 Schedule B(3) and ALS QCS3 requirement
Chloride by Discrete Analyser	ED045G	2	16	**12.5**	**10.0**	✓	NEPM 1999 Schedule B(3) and ALS QCS3 requirement
Dissolved Metals by ICP-MS - Suite A	EG020A-F	2	20	**10.0**	**10.0**	✓	NEPM 1999 Schedule B(3) and ALS QCS3 requirement
Fluoride by PC Titrator	EK040P	2	20	**10.0**	**10.0**	✓	NEPM 1999 Schedule B(3) and ALS QCS3 requirement
Major Cations - Dissolved	ED093F	2	16	**12.5**	**10.0**	✓	NEPM 1999 Schedule B(3) and ALS QCS3 requirement
Nitrite and Nitrate as N (NOx) by Discrete Analyser	EK059G	2	1	**200.0**	**10.0**	✓	NEPM 1999 Schedule B(3) and ALS QCS3 requirement
Nitrite as N by Discrete Analyser	EK057G	2	11	**18.2**	**10.0**	✓	NEPM 1999 Schedule B(3) and ALS QCS3 requirement
pH	EA005	2	20	**10.0**	**10.0**	✓	NEPM 1999 Schedule B(3) and ALS QCS3 requirement
Reactive Phosphorus as P-By Discrete Analyser	EK071G	1	6	**16.7**	**10.0**	✓	NEPM 1999 Schedule B(3) and ALS QCS3 requirement
Sulfate (Turbidimetric) as SO4 2- by Discrete Analyser	ED041G	2	20	**10.0**	**10.0**	✓	NEPM 1999 Schedule B(3) and ALS QCS3 requirement
Total Cyanide by Segmented Flow Analyser	EK026SF	2	20	**10.0**	**10.0**	✓	NEPM 1999 Schedule B(3) and ALS QCS3 requirement
Total Dissolved Solids (High Level)	EA015H	2	20	**10.0**	**10.0**	✓	NEPM 1999 Schedule B(3) and ALS QCS3 requirement
TPH - Semivolatile Fraction	EP071	2	19	**10.5**	**10.0**	✓	NEPM 1999 Schedule B(3) and ALS QCS3 requirement
TPH - Total Petroleum Hydrocarbons - Silica Gel Clean Up	EP071SG	1	4	**25.0**	**10.0**	✓	NEPM 1999 Schedule B(3) and ALS QCS3 requirement
TPH Volatiles/BTEX	EP080	2	15	**13.3**	**10.0**	✓	NEPM 1999 Schedule B(3) and ALS QCS3 requirement
Volatile Organic Compounds	EP074	2	12	**16.7**	**10.0**	✓	NEPM 1999 Schedule B(3) and ALS QCS3 requirement
Laboratory Control Samples (LCS)							
Alkalinity by PC Titrator	ED037-P	1	20	**5.0**	**5.0**	✓	NEPM 1999 Schedule B(3) and ALS QCS3 requirement
Ammonia as N by Discrete analyser	EK055G	1	20	**5.0**	**5.0**	✓	NEPM 1999 Schedule B(3) and ALS QCS3 requirement
Chloride by Discrete Analyser	ED045G	2	16	**12.5**	**10.0**	✓	NEPM 1999 Schedule B(3) and ALS QCS3 requirement
Dissolved Metals by ICP-MS - Suite A	EG020A-F	1	20	**5.0**	**5.0**	✓	NEPM 1999 Schedule B(3) and ALS QCS3 requirement
Fluoride by PC Titrator	EK040P	1	20	**5.0**	**5.0**	✓	NEPM 1999 Schedule B(3) and ALS QCS3 requirement
Major Cations - Dissolved	ED093F	1	16	**6.3**	**5.0**	✓	NEPM 1999 Schedule B(3) and ALS QCS3 requirement
Nitrite and Nitrate as N (NOx) by Discrete Analyser	EK059G	1	1	**100.0**	**5.0**	✓	NEPM 1999 Schedule B(3) and ALS QCS3 requirement
Nitrite as N by Discrete Analyser	EK057G	1	11	**9.1**	**5.0**	✓	NEPM 1999 Schedule B(3) and ALS QCS3 requirement
Reactive Phosphorus as P-By Discrete Analyser	EK071G	1	6	**16.7**	**5.0**	✓	NEPM 1999 Schedule B(3) and ALS QCS3 requirement
Sulfate (Turbidimetric) as SO4 2- by Discrete Analyser	ED041G	1	20	**5.0**	**5.0**	✓	NEPM 1999 Schedule B(3) and ALS QCS3 requirement
Total Cyanide by Segmented Flow Analyser	EK026SF	1	20	**5.0**	**5.0**	✓	NEPM 1999 Schedule B(3) and ALS QCS3 requirement
Total Dissolved Solids (High Level)	EA015H	1	20	**5.0**	**5.0**	✓	NEPM 1999 Schedule B(3) and ALS QCS3 requirement
TPH - Semivolatile Fraction	EP071	1	19	**5.3**	**5.0**	✓	NEPM 1999 Schedule B(3) and ALS QCS3 requirement
TPH - Total Petroleum Hydrocarbons - Silica Gel Clean Up	EP071SG	1	4	**25.0**	**5.0**	✓	NEPM 1999 Schedule B(3) and ALS QCS3 requirement
TPH Volatiles/BTEX	EP080	1	15	**6.7**	**5.0**	✓	NEPM 1999 Schedule B(3) and ALS QCS3 requirement
Volatile Organic Compounds	EP074	1	12	**8.3**	**5.0**	✓	NEPM 1999 Schedule B(3) and ALS QCS3 requirement
Method Blanks (MB)							
Ammonia as N by Discrete analyser	EK055G	1	20	**5.0**	**5.0**	✓	NEPM 1999 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*	
Method Blanks (MB) - Continued							
Chloride by Discrete Analyser	ED045G	1	16	**6.3**	**5.0**	✓	NEPM 1999 Schedule B(3) and ALS QCS3 requirement
Dissolved Metals by ICP-MS - Suite A	EG020A-F	1	20	**5.0**	**5.0**	✓	NEPM 1999 Schedule B(3) and ALS QCS3 requirement
Fluoride by PC Titrator	EK040P	1	20	**5.0**	**5.0**	✓	NEPM 1999 Schedule B(3) and ALS QCS3 requirement
Major Cations - Dissolved	ED093F	1	16	**6.3**	**5.0**	✓	NEPM 1999 Schedule B(3) and ALS QCS3 requirement
Nitrite and Nitrate as N (NOx) by Discrete Analyser	EK059G	1	1	**100.0**	**5.0**	✓	NEPM 1999 Schedule B(3) and ALS QCS3 requirement
Nitrite as N by Discrete Analyser	EK057G	1	11	**9.1**	**5.0**	✓	NEPM 1999 Schedule B(3) and ALS QCS3 requirement
Reactive Phosphorus as P-By Discrete Analyser	EK071G	1	6	**16.7**	**5.0**	✓	NEPM 1999 Schedule B(3) and ALS QCS3 requirement
Sulfate (Turbidimetric) as SO4 2- by Discrete Analyser	ED041G	1	20	**5.0**	**5.0**	✓	NEPM 1999 Schedule B(3) and ALS QCS3 requirement
Total Cyanide by Segmented Flow Analyser	EK026SF	1	20	**5.0**	**5.0**	✓	NEPM 1999 Schedule B(3) and ALS QCS3 requirement
Total Dissolved Solids (High Level)	EA015H	1	20	**5.0**	**5.0**	✓	NEPM 1999 Schedule B(3) and ALS QCS3 requirement
TPH - Semivolatile Fraction	EP071	1	19	**5.3**	**5.0**	✓	NEPM 1999 Schedule B(3) and ALS QCS3 requirement
TPH - Total Petroleum Hydrocarbons - Silica Gel Clean Up	EP071SG	1	4	**25.0**	**5.0**	✓	NEPM 1999 Schedule B(3) and ALS QCS3 requirement
TPH Volatiles/BTEX	EP080	1	15	**6.7**	**5.0**	✓	NEPM 1999 Schedule B(3) and ALS QCS3 requirement
Volatile Organic Compounds	EP074	1	12	**8.3**	**5.0**	✓	NEPM 1999 Schedule B(3) and ALS QCS3 requirement
Matrix Spikes (MS)							
Ammonia as N by Discrete analyser	EK055G	1	20	**5.0**	**5.0**	✓	ALS QCS3 requirement
Chloride by Discrete Analyser	ED045G	1	16	**6.3**	**5.0**	✓	ALS QCS3 requirement
Dissolved Metals by ICP-MS - Suite A	EG020A-F	1	20	**5.0**	**5.0**	✓	ALS QCS3 requirement
Fluoride by PC Titrator	EK040P	1	20	**5.0**	**5.0**	✓	ALS QCS3 requirement
Nitrite and Nitrate as N (NOx) by Discrete Analyser	EK059G	1	1	**100.0**	**5.0**	✓	ALS QCS3 requirement
Nitrite as N by Discrete Analyser	EK057G	1	11	**9.1**	**5.0**	✓	ALS QCS3 requirement
Reactive Phosphorus as P-By Discrete Analyser	EK071G	1	6	**16.7**	**5.0**	✓	ALS QCS3 requirement
Sulfate (Turbidimetric) as SO4 2- by Discrete Analyser	ED041G	1	20	**5.0**	**5.0**	✓	ALS QCS3 requirement
Total Cyanide by Segmented Flow Analyser	EK026SF	1	20	**5.0**	**5.0**	✓	ALS QCS3 requirement
TPH - Semivolatile Fraction	EP071	1	19	**5.3**	**5.0**	✓	ALS QCS3 requirement
TPH - Total Petroleum Hydrocarbons - Silica Gel Clean Up	EP071SG	1	4	**25.0**	**5.0**	✓	ALS QCS3 requirement
TPH Volatiles/BTEX	EP080	1	15	**6.7**	**5.0**	✓	ALS QCS3 requirement
Volatile Organic Compounds	EP074	1	12	**8.3**	**5.0**	✓	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	EA005	WATER	APHA 21st ed. 4500 H+ B. pH of water samples is determined by ISE either manually or by automated pH meter. This method is compliant with NEPM (1999) Schedule B(3) (Appdx. 2)
Total Dissolved Solids (High Level)	EA015H	WATER	In-House, APHA 21st ed., 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 (1999) Schedule B(3) (Appdx. 2)
Alkalinity by PC Titrator	ED037-P	WATER	APHA 21st ed., 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 (1999) Schedule B(3) (Appdx. 2)
Sulfate (Turbidimetric) as SO4 2- by Discrete Analyser	ED041G	WATER	APHA 21st ed., 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 (1999) Schedule B(3) (Appdx. 2)
Chloride by Discrete Analyser	ED045G	WATER	APHA 21st ed., 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	Major Cations is determined based on APHA 21st ed., 3120; USEPA SW 846 - 6010 The ICPAES technique ionises the 0.45um filtered sample atoms emitting a characteristic spectrum. This spectrum is then compared against matrix matched standards for quantification. This method is compliant with NEPM (1999) Schedule B(3) (Appdx. 2) 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 (1999) Schedule B(3) (Appdx. 2) Hardness parameters are calculated based on APHA 21st ed., 2340 B. This method is compliant with NEPM (1999) Schedule B(3) (Appdx. 2)
Dissolved Metals by ICP-MS - Suite A	EG020A-F	WATER	(APHA 21st ed., 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.

Analytical Methods	Method	Matrix	Method Descriptions
Total Cyanide by Segmented Flow Analyser	EK026SF	WATER	APHA 4500-CN-O. Sodium hydroxide preserved samples are introduced into an automated segmented flow analyser. Complex bound cyanide is decomposed in a continuously flowing stream, at a pH of 3.8, by the effect of UV light. A UV-B lamp (312 nm) and a decomposition spiral of borosilicate glass are used to filter out UV light with a wavelength of less than 290 nm thus preventing the conversion of thiocyanate into cyanide. The hydrogen cyanide present at a pH of 3.8 is separated by gas dialysis. The hydrogen cyanide is then determined photometrically, based on the reaction of cyanide with chloramine-T to form cyanogen chloride. This then reacts with 4-pyridine carboxylic acid and 1,3-dimethylbarbituric acid to give a red colour which is measured at 600 nm. This method is compliant with NEPM (1999) Schedule B(3) (Appdx. 2)
Fluoride by PC Titrator	EK040P	WATER	APHA 21st ed., 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 (1999) Schedule B(3) (Appdx. 2)
Ammonia as N by Discrete analyser	EK055G	WATER	APHA 21st ed., 4500-NH3 G Ammonia is determined by direct colorimetry by Discrete Analyser. This method is compliant with NEPM (1999) Schedule B(3) (Appdx. 2)
Ammonium as N	EK055G-NH4	WATER	Ammonium in the sample is reported as the ionised / unionised fractions by the use of a nomograph and the initial pH and Temperature. Ammonia is determined by direct colorimetry by Discrete Analyser according to APHA 21st ed., 4500-NH3 G. This method is compliant with NEPM (1999) Schedule B(3) (Appdx. 2)
Nitrite as N by Discrete Analyser	EK057G	WATER	APHA 21st ed., 4500-NO2- B. Nitrite is determined by direct colourimetry by Discrete Analyser. This method is compliant with NEPM (1999) Schedule B(3) (Appdx. 2)
Nitrate as N by Discrete Analyser	EK058G	WATER	APHA 21st ed., 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 (1999) Schedule B(3) (Appdx. 2)
Nitrite and Nitrate as N (NOx) by Discrete Analyser	EK059G	WATER	APHA 21st ed., 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 (1999) Schedule B(3) (Appdx. 2)
Reactive Phosphorus as P-By Discrete Analyser	EK071G	WATER	APHA 21st ed., 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 (1999) Schedule B(3) (Appdx. 2)
Ionic Balance by PCT DA and Turbi SO4 DA	EN055 - PG	WATER	APHA 21st Ed. 1030F. The Ionic Balance is calculated based on the major Anions and Cations. The major anions include Alkalinity, Chloride and Sulfate which determined by PCT and DA. The Cations are determined by Turbi SO4 by DA. This method is compliant with NEPM (1999) Schedule B(3) (Appdx. 2)
TPH - 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 NEPM (1999) Schedule B(3) (Appdx. 2)
TPH - Total Petroleum Hydrocarbons - Silica Gel Clean Up	EP071SG	WATER	(USEPA SW 846 - 8015A) Sample extracts are analysed by Capillary GC/FID and quantified against alkane standards over the range C10 - C36. This method is compliant with NEPM (1999) Schedule B(3) (Method 506.1)
Volatile Organic Compounds	EP074	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 (1999) Schedule B(3) (Appdx. 2)

Analytical Methods	Method	Matrix	Method Descriptions
TPH 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 NEPM (1999) Schedule B(3) (Appdx. 2)

Preparation Methods	Method	Matrix	Method Descriptions
Separatory Funnel Extraction of Liquids	ORG14	WATER	USEPA SW 846 - 3510B 100 mL to 1L of sample is transferred to a separatory funnel and serially extracted three times using 60mL DCM for each extract. The resultant extracts are combined, dehydrated and concentrated for analysis. This method is compliant with NEPM (1999) Schedule B(3) (Appdx. 2). ALS default excludes sediment which may be resident in the container.
Volatiles Water Preparation	ORG16-W	WATER	A 5 mL aliquot or 5 mL of a diluted sample is added to a 40 mL VOC vial for sparging.

Summary of Outliers

Outliers : Quality Control Samples

The following report highlights outliers flagged in the Quality Control (QC) Report. Surrogate recovery limits are static and based on USEPA SW 846 or ALS-QWI/EN/38 (in the absence of specific USEPA limits). This report displays QC Outliers (breaches) only.

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	EM1306677-003	GW39	**Sulfate as SO4 - Turbidimetric**	14808-79-8	Not Determined	----	**MS recovery not determined, background level greater than or equal to 4x spike level.**
EK026SF: Total CN by Segmented Flow Analyser	EM1306677-002	DUP1	**Total Cyanide**	57-12-5	56.1 %	70-130%	**Recovery less than lower data quality objective**

- **For all matrices, no Method Blank value outliers occur.**
- **For all matrices, no Duplicate outliers occur.**
- **For all matrices, no Laboratory Control outliers occur.**

Regular Sample Surrogates

- **For all regular sample matrices, no surrogate recovery outliers occur.**

Outliers : Analysis Holding Time Compliance

This report displays Holding Time breaches only. Only the respective Extraction / Preparation and/or Analysis component is/are displayed.

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
EA005: pH						
Clear Plastic Bottle - Natural GW43, GW39, GW42D, GW41, GW23, GW19	----	----	----	26-JUN-2013	24-JUN-2013	**2**

Outliers : Frequency of Quality Control Samples

The following report highlights breaches in the Frequency of Quality Control Samples.

- **No Quality Control Sample Frequency Outliers exist.**

Samples Received without COC

Date/Time Received	24.6.13 16:20.
Date/Time Analysis Received	
Client/Sender:	
Contact Name:	SCANNED
Contact Ph No:	
Number of Eskies:	1
Approx. Number of samples	5
Carrier Company:	
Con-note No:	
Project Details	210074 (Ref).
Sampler/Sampling dates	KK / 24.6.13 & 23.6.13.
Matrix	water

Sample details..

1. GW43 23-6-13
2. SPLT1 "
3. GW39 24.6.13.
4. GW42D "
5. DUP1 "
6. Rin 1 "
7. Trip Blank(Rin1) "

PR 25/6/13

Environmental Division
Melbourne
25/6. Work Order
EM1306677

Telephone : +61-3-8549 9600

Samples sent to lab for
Micro ~~Nitrate~~ BOD pH
Colour Turbidity ~~RB~~
Other.....
Date 25/6 R.T

Notified: _____ Date: _____

Received By: [signature] 24/6/13

Amended COC rec'd 25-6-13. 3:01 [illegible]

CHAIN OF CUSTODY

ALS Laboratory, please tick →

Sydney: 277 Woodpark Rd, Smithfield NSW 2176 / Newcastle: 5 Rosegum Rd, Warabrook NSW 2304 / Brisbane: 32 Shand St, Stafford QLD 4053 / Townsville: 14-15 Desma Ct, Bohle QLD 4818 / Melbourne: 2-4 Westall Rd, Springvale VIC 3171 / Adelaide: 2-1 Burma Rd, Pooraka SA 5095 / Perth: 10 Hod Way, Malaga WA 6090 / Launceston: 27 Wellington St, Launceston TAS 7250

CLIENT: ENVIRONMENTAL EARTH SCIENCES	TURNAROUND REQUIREMENTS: (Standard TAT may be longer for some tests e.g. Ultra Trace Organics) Standard		FOR LABORATORY USE ONLY (Circle) Custody Seal Intact? Free ice / frozen ice bricks present upon receipt? Random Sample Temperature on Receipt: Other comment:
OFFICE: 98 MARIBYRNONG RD, FOOTSCRAY, VIC. 3011			
PROJECT: 210074 Sth Melbourne Gasworks	ALS QUOTE NO.: ME/330/13	COC SEQUENCE NUMBER (Circle) CC 1 2 3 4 5 7	
ORDER NUMBER:		OI 1 2 3 4 5 7	
PROJECT MANAGER: REGIN ORQUIZA	CONTACT PH: 8398 4403		
SAMPLER: SFL / ICK	SAMPLER MOBILE:	RELINQUISHED BY: SFL DATE/TIME: 23/6	RECEIVED BY: courier DATE/TIME: 23/6/13
COC emailed to ALS? (YES / NO)	EDD FORMAT (or default):		RELINQUISHED BY: DATE/TIME:
Email Reports to : rorquiza@environmentalearthsciences.com and sloong@environmentalearthsciences.com			RECEIVED BY: DATE/TIME:
Email Invoice to : rorquiza@environmentalearthsciences.com			

COMMENTS/SPECIAL HANDLING/STORAGE OR DISPOSAL:

ANALYSIS REQUIRED including SUITES (NB. Suite Codes must be listed to attract suite price). Where Metals are required, specify Total (unfiltered bottle required) or Dissolved (field filtered bottle required)

LAB ID (ALS USE ONLY)	SAMPLE ID	DATE / TIME	MATRIX	TYPE & PRESERVATIVE (refer to codes below)	TOTAL BOTTLES	EES IONIC BALANCE SUITE - Includes - pH, TDS, Ca, Mg, Na, K, Cl, SO4, Alk, F, NO3, Reactive P, Ammonia	~~Ammonium (field pH and field temp must be recorded on the COC)~~	Dissolved metals - Al, As, Cd, Cu, Fe, Pb, Ni, Zn, Co, Se, B & Mn	Total Cyanide	EP074A - MAH	EP074H - Naphthalene only	TPH (C6-C36) plus TRH (C6-C40)	Silica gel clean up - on SV TPH - TPH (C10-C36) and TPH (C10-C40)	~~(TPH C10-C40)~~	Ammonia & Sulphate	[illegible]	[illegible]	field pH	Field temp	Additional Information
1	GW43	24/6	W		8	✓	✓	✓	✓	✓	✓	✓		✓		✓	✓	5.46	18.4	
2	Dup1	24/6			8		[illegible]	✓	✓	✓	✓	✓		✓	✓	✓	✓			
→	Split → Please forward to MGT-Labmark.	24/6			8			✓	✓	✓	✓	✓		✓	✓	✓	✓			
3	GW39	24/6			8	✓	✓	✓	✓	✓	✓	✓	✓	✓		✓	✓	6.67	16.7	
Note: High EC 27,000 4	GW42D				8	✓	✓	✓	✓	✓	✓	✓	✓	✓		✓	✓	5.55	16.4	
5	GW41	24/6			8	✓	✓	✓	✓	✓	✓	✓						6.57	17.8	
6	GW23	24/6			8	✓	✓	✓	✓	✓	✓	✓	✓					6.88	16.8	
7	GW19	24/6			8	✓	✓	✓	✓	✓	✓	✓	✓					6.05	16.4	
9	Rinsate 1	24/6			2					✓	✓	✓				✓	✓			
9	Tap 1	24/6			1					✓	✓					✓	✓			
				TOTAL	67															

Water Container Codes: P = Unpreserved Plastic; N = Nitric Preserved Plastic; ORC = Nitric Preserved ORC; SH = Sodium Hydroxide/Cd Preserved; S = Sodium Hydroxide Preserved Plastic; AG = Amber Glass Unpreserved; AP - Airfreight Unpreserved Plastic; V = VOA Vial HCl Preserved; VB = VOA Vial Sodium Bisulphate Preserved; VS = VOA Vial Sulfuric Preserved; AV = Airfreight Unpreserved Vial SG = Sulfuric Preserved Amber Glass; H = HCl preserved Plastic; HS = HCl preserved Speciation bottle; SP = Sulfuric Preserved Plastic; F = Formaldehyde Preserved

COC received on 25/6 @ 8:34 Anita

CHAIN OF COUSTODY

ALS Laboratory: please tick →

☐ Sydney: 277 Woodpark Rd, Smithfield NSW 2176 Ph: 02 8784 8555 E: samples.sydney@alsenviro.com
☐ Newcastle: 5 Rosegum Rd, Warabrook NSW 2304 Ph: 02 4968 9433 E: samples.newcastle@alsenviro.com
☐ Brisbane: 32 Shand St, Stafford QLD 4053 Ph: 07 3243 7222 E: samples.brisbane@alsenviro.com
☐ Townsville: 14-15 Desma Ct, Bohle QLD 4818 Ph: 07 4796 0600 E: townsville.environmental@alsenviro.com
☐ Melbourne: 2-4 Westall Rd, Springvale VIC 3171 Ph: 03 8549 9600 E: samples.melbourne@alsenviro.com
☐ Adelaide: 2-1 Burma Rd, Pooraka SA 5095 Ph: 08 8359 0890 E: adelaide@alsenviro.com
☐ Perth: 10 Hod Way, Malaga WA 6090 Ph: 08 9209 7655 E: samples.perth@alsenviro.com
☐ Launceston: 27 Wellington St, Launceston TAS 7250 Ph: 03 6331 2158 E: launceston@alsenviro.com

CLIENT: ENVIRONMENTAL EARTH SCIENCES
OFFICE: 98 MARIBYRNONG RD, FOOTSCRAY, VIC. 3011
PROJECT: 210074 Sth Melbourne Gasworks
ORDER NUMBER:
PROJECT MANAGER: REGIN ORQUIZA — CONTACT PH: 8398 4403
SAMPLER: SFL / ICK — SAMPLER MOBILE:
COC emailed to ALS? (YES / NO) — EDD FORMAT (or default):
Email Reports to : rorquiza@environmentalearthsciences.com and sleong@environmentalearthsciences.com
Email Invoice to : rorquiza@environmentalearthsciences.com
COMMENTS/SPECIAL HANDLING/STORAGE OR DISPOSAL:

TURNAROUND REQUIREMENTS : Standard
(Standard TAT may be longer for some tests e.g.. Ultra Trace Organics)
ALS QUOTE NO.: ME/330/13

COC SEQUENCE NUMBER (Circle)
CC 1 2 3 4 5 7
O 1 2 3 4 5 7

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

RELINQUISHED BY:	RECEIVED BY:	RELINQUISHED BY:	RECEIVED BY:
SFL	courier		[illegible] ALS
DATE/TIME: 23/6	DATE/TIME: 23/6/13	DATE/TIME:	DATE/TIME: 25/6/13 10:40am

ANALYSIS REQUIRED including SUITES (NB. Suite Codes must be listed to attract suite price)
Where Metals are required, specify Total (unfiltered bottle required) or Dissolved (field filtered bottle required)

LAB ID (ALS USE ONLY)	SAMPLE ID	DATE / TIME	MATRIX	TYPE & PRESERVATIVE (refer to codes below)	TOTAL BOTTLES	EES IONIC BALANCE SUITE - includes - pH, TDS, Ca, Mg, Na, K, Cl, SO4, Alk, F, NO3, Reactive P, Ammonia	~~Ammonium (field pH and field temp must be recorded on the COC)~~	Dissolved metals - Al, As, Cd, Cu, Fe, Pb, Ni, Zn, Co, Se, B & Mn	Total Cyanide	EP074A - MAH	EP074H - Naphthalene only	TPH (C6-C36) plus TRH (C6-C40)	Silica gel clean up - on SV TPH - TPH (C10-C36) and TPH (C?)	~~TPH (C10-C40)~~	Ammonia & sulphate	BTEX	Trimethylbenzene	field pH	Field temp	Additional Information
1	GW43	24/6	W		8	✓		✓	✓		✓	✓		~~✓~~		✓	✓	5.46	18.4	
2	Dup1	24/6			8			✓	✓		✓	✓		~~✓~~	✓	✓	✓			
→	Split	24/6 — Please forward to MGT-Labmark.			8			✓	✓		✓	✓		~~✓~~	✓	✓	✓			
3	GW39	24/6			8	✓		✓	✓		✓	✓	✓	~~✓~~		✓	✓	6.67	16.7	
Note: High EC 27,000 4	GW42D				8	✓		✓	✓		✓	✓	✓	~~✓~~		✓	✓	5.55	16.4	
5	GW41	24/6			8	✓		✓	✓		✓	✓						6.57	17.8	
6	GW23	24/6			8	✓		✓	✓		✓	✓	✓					6.88	16.8	
7	GW19	24/6			8	✓		✓	✓		✓	✓	✓					6.0[illegible]	16.4	
8	Rinsate 1	24/6			2						✓	✓				✓	✓			
9	Trip 1	24/6			1						✓					✓	✓			
				TOTAL	67															

Rec'd 24/6/13 PR (samples 1, 2, Split, 3)
Rec'd 25/6/13 PR (samples 5, 6, 7)
Rec'd 24/6/13 PR (samples 8, 9)

Water Container Codes: P = Unpreserved Plastic; N = Nitric Preserved Plastic; ORC = Nitric Preserved ORC; SH = Sodium Hydroxide/Cd Preserved; S = Sodium Hydroxide Preserved Plastic; AG = Amber Glass Unpreserved; AP - Airfreight Unpreserved Plastic
V = VOA Vial HCl Preserved; VB = VOA Vial Sodium Bisulphate Preserved; VS = VOA Vial Sulfuric Preserved; AV = Airfreight Unpreserved Vial SG = Sulfuric Preserved Amber Glass; H = HCl preserved Plastic; HS = HCl preserved Speciation bottle; SP = Sulfuric Preserved Plastic; F = Formaldehyde Preserved

Environmental Division

CERTIFICATE OF ANALYSIS

Work Order	: **EM1306738**	Pl g	: 1 of 9
Cs nt	: **ENVIRONMENTAL EARTH SCIENCES**	Ll borl tory	: Environm ntl s Divieion M sbourn
Contl ct	: REGIN ORQUIZA	Contl ct	: Cl ros Wl seh
Addr ee	: P.O.BOX 2253 aOOTSCRAY ,VIC, AUSTRALIA 3011	Addr ee	: 4 W etl s Rd Springvl s ,VIC Auetrl sl 3171
E-ml is	: rorquizl @ ei.biz	E-ml is	: cl roswl seh@l segsobl scom
T s phon	: +61 3 96F71666	T s phon	: +61-3-F5499960F
al ceimis	: +61 3 96F71F44	al ceimis	: +61-3-F5499601
Proj ct	: 210074 Sth M sbourn Gl eworke	QC L v s	: NEPM 1999 Sch dus B(3) nd ALS QCS3 quir m nt
Ord r numb r	: ----		
C-O-C numb r	: ----	Dl t Sl mps e R c iv d	: 25-JUN-2013
Sl mps r	: ----	leeu Dl t	: 01-JUL-2013
Sit	: ----		
		No. of l mps e c iv d	: 10
Quot numb r	: ME/330/13	No. of l mps e nl sye d	: 10

Thie r port eup re d e l ny pr vioue r port(e) with thie r f r nc . R euste l ppsy to th el mps (e) l e eubmitt d. Ass pl g e of thie r port hl v b n ch ck d l nd l pprov d for r s l e .

Thie C rtificl t of Anl syeie contl ine th fosowing nforml tion:

- G n rl s Comm nte
- Anl syticl s R euste
- Surrogl t Contros Limite

General Comments

Th l nl sytic l s proc dur e ue d by th Environm ntl s Divieion hl v b n d v sop d from etl bsieh d int rnl tionl sy r cogniz d proc dur e euch l e thoe pubsieh d by th USEPA, APKA, AS l nd NEPM. In houe d v sop d proc dur e r mpsoy d nth be nc of ocum nt d etl ndl rde or by cs nt r qu et.

Wh r moietur d t rminl tion hl e b n p rform d, r eus e r port d on d ry v ight bl eie.

Wh r r port d s ee hl n (H) r eus e high r hl n th LOR, hie ml y b du o priml ry el mps < rl ct/dig etl t dlisution nd/or neuffici nt el mps for nl syeie.

Wh r th LOR of r port d r eus diff re from etl ndl rd LOR, hie ml y b du o high moietur cont nt, neuffici nt el mps (r duc d v ight mpsoy d) or ml tri< nt rf r nc .

Wh n el mpsing im nform l tion e not provid d by th cs nt, el mpsing dl t e r ehown without im compon nt. n th e netl nc e, th im compon nt hl e b n eeum d by th l borl tory for proc eeing purpoe e.

= y CAS Numb r x CAS gietry numb r from dl tl bl e ml intl in d by Ch micl sAbetrl cte S rvic e. Th Ch micl sAbetrl cte S rvic e l divieion of th Am ricl n Ch micl s Soci ty.
LOR x Limit of porting
^ x Thie eus e comput d from individul sl nl syt dl t ctione t or bov th s v s of porting

- **EK026SF : EM1306718-002 matrix spike failed for TCN due to possible sample interference. This has been confirmed by re-analysis.**
- **EM1306738-004: Ammonia as N results were done by buchi method (EK055).**
- **EP071: Particular samples EM1306738-001,001DUP,010 have LOR raised due to laboratory background.**
- **EP071: Sample EM1306738-010 was extracted using volatiles vials instead of unpreserved amber bottle due to laboratory preparation error.**
- **Ionic Balance out of acceptable limits for sample #1 and #5 due to analytes not quantified in this report.**
- **Ionic balances were calculated using: major anions - chloride, alkalinity and sulfate ; and major cations - calcium, magnesium, potassium, sodium and ammonia #4.**
- **Ionic balances were calculated using: major anions - chloride, alkalinity and sulfate; and major cations - calcium, magnesium, potassium and sodium.**

NATA Accr dit d L borl tory F25 8
Accr dit d for compsil nc with ISO/IEC 17025.

Signatories

Thie docum nt hl e b n s ctronicl sy eign d by th l uthoriz d eignl tori e indicl t d b sow. Es ctronic eigning hl e b n cl rri d out in compsil nc with proc dur e ep cifi d n 21 CaR Pl rt 11.

Signatories	Position	Accreditation Category
Dis ni a rnl ndo	S nior norgl nic Ch miet	M sbourn norgl nice
		M sbourn norgl nice
		M sbourn norgl nice
		M sbourn norgl nice
Nl ncy Wl ng	S nior S mivos tis netrum nt Ch miet	M sbourn Orgl nice
		M sbourn Orgl nice
Vl rehl Ko Wing	Non-M tl se T l m L l d r	M sbourn norgl nice
		M sbourn norgl nice

Analytical Results

Sub-Mi tri<: WATER (Mi tri<: WATER)				Client sample ID	GW18	GW01	GW40	GW28	GW35
				Client sampling date / time	25-JUN-2013&15:00	25-JUN-2013&15:00	25-JUN-2013&15:00	25-JUN-2013&15:00	25-JUN-2013&15:00
Compound	CAS Number	LOR	Unit		EM1306738-001	EM1306738-002	EM1306738-003	EM1306738-004	EM1306738-005
EA005: pH									
pH Value	---	0.01	pK&Unit		6.83	6.73	5.57	7.18	6.87
EA015: Total Dissolved Solids									
Total Dissolved Solids @180°C	---	10	mg/L		15600	3920	5300	1180	5370
ED037P: Alkalinity by PC Titrator									
Total Alkalinity as CaCO3	---	1	mg/L		460	654	201	404	515
ED041G: Sulfate (Turbidimetric) as SO4 2- by DA									
Sulfate as SO4 - Turbidimetric	14F0F-79-F	1	mg/L		1280	178	314	220	403
ED045G: Chloride Discrete analyser									
Chloride	16FF7-00-6	1	mg/L		9710	1890	3450	302	3330
ED093F: Dissolved Major Cations									
Calcium	7440-70-2	1	mg/L		968	345	466	33	160
Magnesium	7439-95-4	1	mg/L		727	287	151	25	199
Sodium	7440-23-5	1	mg/L		3590	607	1400	251	1710
Potassium	7440-09-7	1	mg/L		204	78	60	6	59
EG020F: Dissolved Metals by ICP-MS									
Aluminium	7429-90-5	0.01	mg/L		0.01	H0.01	0.04	H0.01	H0.01
Arsenic	7440-3F-2	0.001	mg/L		0.004	0.478	0.010	0.314	1.11
Cadmium	7440-43-9	0.0001	mg/L		H0.0001	0.0001	0.0002	H0.0001	0.0003
Cobalt	7440-4F-4	0.001	mg/L		0.002	0.003	0.006	H0.001	0.003
Copper	7440-50-F	0.001	mg/L		0.004	0.002	0.065	H0.001	0.002
Lead	7439-92-1	0.001	mg/L		H0.001	H0.001	H0.001	H0.001	H0.001
Manganese	7439-96-5	0.001	mg/L		1.10	0.266	0.862	0.175	0.741
Nickel	7440-02-0	0.001	mg/L		H0.001	0.056	0.041	0.018	0.020
Selenium	77F2-49-2	0.01	mg/L		H0.01	H0.01	H0.01	H0.01	H0.01
Zinc	7440-66-6	0.005	mg/L		0.010	0.039	0.331	0.005	0.014
Boron	7440-42-F	0.05	mg/L		1.01	1.37	0.67	0.81	1.08
Iron	7439-F9-6	0.05	mg/L		H0.05	2.76	0.39	2.20	7.56
EK026SF: Total CN by Segmented Flow Analyser									
Total Cyanide	57-12-5	0.004	mg/L		0.028	0.017	H0.004	0.016	0.015
EK040P: Fluoride by PC Titrator									
Fluoride	169F4-4F-F	0.1	mg/L		0.7	1.4	0.6	1.8	2.2
EK055G: Ammonia as N by Discrete Analyser									
Ammonia as N	7664-41-7	0.01	mg/L		7.02	3.32	0.16	84.6	2.57

Analytical Results

Sub-Matrix: WATER (Matrix: WATER)				Client sample ID	GW18	GW01	GW40	GW28	GW35
				Client sampling date / time	25-JUN-2013 15:00	25-JUN-2013 15:00	25-JUN-2013 15:00	25-JUN-2013 15:00	25-JUN-2013 15:00
Compound	CAS Number	LOR	Unit		EM1306738-001	EM1306738-002	EM1306738-003	EM1306738-004	EM1306738-005
EK055G-NH4: Ammonium as N by DA									
Ammonium as N	----	0.01	mg/L		7.02	3.32	0.16	84.6	2.57
EK057G: Nitrite as N by Discrete Analyser									
Nitrite as N	----	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-F	0.01	mg/L		0.15	0.06	1.39	0.01	<0.01
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	m q/L		310	70.1	108	21.2	113
Total Cations	----	0.01	m q/L		270	69.2	98.1	----	100
Total Cations	----	0.01	m q/L		----	----	----	19.2	----
Ionic Balance	----	0.01	%		6.94	0.60	4.73	----	5.82
Ionic Balance	----	0.01	%		----	----	----	4.86	----
EP074A: Monocyclic Aromatic Hydrocarbons									
Benzene	71-43-2	1	µg/L		<1	<1	<1	<1	4
Toluene	10F-FF-3	2	µg/L		<2	<2	<2	<2	<2
Ethylbenzene	100-41-4	2	µg/L		<2	<2	<2	<2	<2
meta- & para-Xylene	10F-3F-38 106-42-3	2	µg/L		<2	<2	<2	<2	<2
Styrene	100-42-5	5	µg/L		<5	<5	<5	<5	<5
ortho-Xylene	95-47-6	2	µg/L		<2	<2	<2	<2	<2
Isopropylbenzene	9F-F2-F	5	µg/L		<5	<5	<5	<5	<5
n-Propylbenzene	103-65-1	5	µg/L		<5	<5	<5	<5	<5
1.3.5-Trimethylbenzene	10F-67-F	5	µg/L		<5	<5	<5	<5	<5
sec-Butylbenzene	135-9F-F	5	µg/L		<5	<5	<5	<5	<5
1.2.4-Trimethylbenzene	95-63-6	5	µg/L		<5	<5	<5	<5	<5
tert-Butylbenzene	9F-06-6	5	µg/L		<5	<5	<5	<5	<5
p-Isopropyltoluene	99-F7-6	5	µg/L		<5	<5	<5	<5	<5
n-Butylbenzene	104-51-F	5	µg/L		<5	<5	<5	<5	<5
EP074H: Naphthalene									
Naphthalene	91-20-3	7	µg/L		<7	<7	<7	<7	<7
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

Analytical Results

Sub-Mi tri<: WATER (Mi tri<: WATER)				Client sample ID	GW18	GW01	GW40	GW28	GW35
				Client sampling date / time	25-JUN-2013&15:00	25-JUN-2013&15:00	25-JUN-2013&15:00	25-JUN-2013&15:00	25-JUN-2013&15:00
Compound	CAS Number	LOR	Unit		EM1306738-001	EM1306738-002	EM1306738-003	EM1306738-004	EM1306738-005
EP080/071: Total Petroleum Hydrocarbons - Continued									
C15 - C28 Fraction	---	100	µg/L		H100	**200**	H100	**160**	**300**
C29 - C36 Fraction	---	50	µg/L		H60	H50	H50	H50	H50
^8C10 - C36 Fraction (sum)	---	50	µg/L		H50	**200**	H50	**160**	**300**
EP080/071: Total Recoverable Hydrocarbons - NEPM 2010 Draft									
C6 - C10 Fraction	---	20	µg/L		H20	H20	H20	H20	H20
>C10 - C16 Fraction	---	100	µg/L		H100	H100	H100	H100	**180**
>C16 - C34 Fraction	---	100	µg/L		H140	**200**	H100	**170**	**160**
>C34 - C40 Fraction	---	100	µg/L		H100	H100	H100	H100	H100
^8>C10 - C40 Fraction (sum)	---	100	µg/L		H100	**200**	H100	**170**	**340**
EP074S: VOC Surrogates									
1.2-Dichloroethane-D4	17060-07-0	0.1	%		**122**	**130**	**119**	**119**	**115**
Toluene-D8	2037-26-5	0.1	%		**111**	**109**	**111**	**100**	**110**
4-Bromofluorobenzene	460-00-4	0.1	%		**102**	**103**	**109**	**99.5**	**109**
EP080S: TPH(V)/BTEX Surrogates									
1.2-Dichloroethane-D4	17060-07-0	0.1	%		**122**	**112**	**119**	**103**	**115**
Toluene-D8	2037-26-5	0.1	%		**97.9**	**99.2**	**98.9**	**90.4**	**98.8**
4-Bromofluorobenzene	460-00-4	0.1	%		**98.9**	**99.1**	**103**	**94.6**	**100**

Analytical Results

Sub-Mi tri<: WATER (Mi tri<: WATER)				Client sample ID	GW22	Rinsate 2	Trip 2	Trip 3	Dup 2
				Client sampling date / time	25-JUN-2013&15:00	25-JUN-2013&15:00	25-JUN-2013&15:00	25-JUN-2013&15:00	25-JUN-2013&15:00
Compound	CAS Number	LOR	Unit		EM1306738-006	EM1306738-007	EM1306738-008	EM1306738-009	EM1306738-010
EA005: pH									
pH Value	----	0.01	pK&Unit		6.99	----	----	----	----
EA015: Total Dissolved Solids									
Total Dissolved Solids @180°C	----	10	mg/L		596	----	----	----	----
ED037P: Alkalinity by PC Titrator									
Total Alkalinity as CaCO3	----	1	mg/L		227	----	----	----	----
ED041G: Sulfate (Turbidimetric) as SO4 2- by DA									
Sulfate as SO4 - Turbidimetric	14F0F-79-F	1	mg/L		256	----	----	----	----
ED045G: Chloride Discrete analyser									
Chloride	16FF7-00-6	1	mg/L		44	----	----	----	----
ED093F: Dissolved Major Cations									
Calcium	7440-70-2	1	mg/L		85	----	----	----	----
Magnesium	7439-95-4	1	mg/L		28	----	----	----	----
Sodium	7440-23-5	1	mg/L		76	----	----	----	----
Potassium	7440-09-7	1	mg/L		28	----	----	----	----
EG020F: Dissolved Metals by ICP-MS									
Aluminium	7429-90-5	0.01	mg/L		H0.01	----	----	----	H0.01
Arsenic	7440-3F-2	0.001	mg/L		0.010	----	----	----	0.308
Cadmium	7440-43-9	0.0001	mg/L		0.0004	----	----	----	H0.0001
Cobalt	7440-4F-4	0.001	mg/L		0.003	----	----	----	H0.001
Copper	7440-50-F	0.001	mg/L		0.002	----	----	----	H0.001
Lead	7439-92-1	0.001	mg/L		0.002	----	----	----	H0.001
Manganese	7439-96-5	0.001	mg/L		0.047	----	----	----	0.173
Nickel	7440-02-0	0.001	mg/L		0.053	----	----	----	0.017
Selenium	77F2-49-2	0.01	mg/L		H0.01	----	----	----	H0.01
Zinc	7440-66-6	0.005	mg/L		0.035	----	----	----	H0.005
Boron	7440-42-F	0.05	mg/L		0.88	----	----	----	0.86
Iron	7439-F9-6	0.05	mg/L		0.07	----	----	----	2.12
EK026SF: Total CN by Segmented Flow Analyser									
Total Cyanide	57-12-5	0.004	mg/L		0.140	----	----	----	0.018
EK040P: Fluoride by PC Titrator									
Fluoride	169F4-4F-F	0.1	mg/L		0.7	----	----	----	----
EK055G: Ammonia as N by Discrete Analyser									
Ammonia as N	7664-41-7	0.01	mg/L		0.71	----	----	----	----

Analytical Results

Sub-Mi tri<: WATER (Mi tri<: WATER)

Compound	CAS Number	LOR	Unit	Client sample ID: GW22	Rinsate 2	Trip 2	Trip 3	Dup 2
				Client sampling date / time: 25-JUN-2013 15:00	25-JUN-2013 15:00	25-JUN-2013 15:00	25-JUN-2013 15:00	25-JUN-2013 15:00
				EM1306738-006	EM1306738-007	EM1306738-008	EM1306738-009	EM1306738-010
EK055G-NH4: Ammonium as N by DA								
Ammonium as N	----	0.01	mg/L	**0.71**	----	----	----	----
EK057G: Nitrite as N by Discrete Analyser								
Nitrite as N	----	0.01	mg/L	H 0.01	----	----	----	----
EK058G: Nitrate as N by Discrete Analyser								
Nitrate as N	14797-55-F	0.01	mg/L	**0.82**	----	----	----	----
EK071G: Reactive Phosphorus as P by discrete analyser								
Reactive Phosphorus as P	14265-44-2	0.01	mg/L	H 0.01	----	----	----	----
EN055: Ionic Balance								
Total Anions	----	0.01	m q/L	**11.1**	----	----	----	----
Total Cations	----	0.01	m q/L	**10.6**	----	----	----	----
Ionic Balance	----	0.01	%	**2.48**	----	----	----	----
EP074A: Monocyclic Aromatic Hydrocarbons								
Benzene	71-43-2	1	µg/L	H 1	H 1	H 1	H 1	H 1
Toluene	10F-FF-3	2	µg/L	H 2	H 2	H 2	H 2	H 2
Ethylbenzene	100-41-4	2	µg/L	H 2	H 2	H 2	H 2	H 2
meta- & para-Xylene	10F-3F-38 106-42-3	2	µg/L	H 2	H 2	H 2	H 2	H 2
Styrene	100-42-5	5	µg/L	H 5	H 5	H 5	H 5	H 5
ortho-Xylene	95-47-6	2	µg/L	H 2	H 2	H 2	H 2	H 2
Isopropylbenzene	9F-F2-F	5	µg/L	H 5	H 5	H 5	H 5	H 5
n-Propylbenzene	103-65-1	5	µg/L	H 5	H 5	H 5	H 5	H 5
1.3.5-Trimethylbenzene	10F-67-F	5	µg/L	H 5	H 5	H 5	H 5	H 5
sec-Butylbenzene	135-9F-F	5	µg/L	H 5	H 5	H 5	H 5	H 5
1.2.4-Trimethylbenzene	95-63-6	5	µg/L	H 5	H 5	H 5	H 5	H 5
tert-Butylbenzene	9F-06-6	5	µg/L	H 5	H 5	H 5	H 5	H 5
p-Isopropyltoluene	99-F7-6	5	µg/L	H 5	H 5	H 5	H 5	H 5
n-Butylbenzene	104-51-F	5	µg/L	H 5	H 5	H 5	H 5	H 5
EP074H: Naphthalene								
Naphthalene	91-20-3	7	µg/L	H 7	H 7	H 7	H 7	H 7
EP080/071: Total Petroleum Hydrocarbons								
C6 - C9 Fraction	----	20	µg/L	H 20	H 20	----	----	H 20
C10 - C14 Fraction	----	50	µg/L	H 50	H 50	----	----	H 50
C15 - C28 Fraction	----	100	µg/L	H 100	H 100	----	----	**160**
C29 - C36 Fraction	----	50	µg/L	H 50	H 50	----	----	H F0

Analytical Results

Sub-Ml tri<: **WATER** (Ml tri<: **WATER**)

				Client sample ID	GW22	Rinsate 2	Trip 2	Trip 3	Dup 2
				Client sampling date / time	25-JUN-20138l5:00	25-JUN-20138l5:00	25-JUN-20138l5:00	25-JUN-20138l5:00	25-JUN-20138l5:00
Compound	*CAS Number*	*LOR*	*Unit*		**EM1306738-006**	**EM1306738-007**	**EM1306738-008**	**EM1306738-009**	**EM1306738-010**
EP080/071: Total Petroleum Hydrocarbons - Continued									
^8**C10 - C36 Fraction (sum)**	----	50	µg/L		H50	H50	----	----	**160**
EP080/071: Total Recoverable Hydrocarbons - NEPM 2010 Draft									
C6 - C10 Fraction	----	20	µg/L		H20	H20	----	----	H20
>C10 - C16 Fraction	----	100	µg/L		H100	H100	----	----	H100
>C16 - C34 Fraction	----	100	µg/L		H100	H100	----	----	**240**
>C34 - C40 Fraction	----	100	µg/L		H100	H100	----	----	H100
^8**>C10 - C40 Fraction (sum)**	----	100	µg/L		H100	H100	----	----	**240**
EP074S: VOC Surrogates									
1.2-Dichloroethane-D4	17060-07-0	0.1	%		**118**	**115**	**109**	**115**	**120**
Toluene-D8	2037-26-5	0.1	%		**98.4**	**97.8**	**96.0**	**112**	**101**
4-Bromofluorobenzene	460-00-4	0.1	%		**93.9**	**94.1**	**99.1**	**111**	**99.2**
EP080S: TPH(V)/BTEX Surrogates									
1.2-Dichloroethane-D4	17060-07-0	0.1	%		**102**	**100**	----	----	**105**
Toluene-D8	2037-26-5	0.1	%		**88.3**	**88.5**	----	----	**90.9**
4-Bromofluorobenzene	460-00-4	0.1	%		**93.0**	**88.6**	----	----	**95.5**

Surrogate Control Limits

Sub-Ml tri<: **WATER**		Recovery Limits (%)	
Compound	*CAS Number*	*Low*	*High*
EP074S: VOC Surrogates			
1.2-Dichloroethane-D4	17060-07-0	69	133
Toluene-D8	2037-26-5	72	12F
4-Bromofluorobenzene	460-00-4	70	130
EP080S: TPH(V)/BTEX Surrogates			
1.2-Dichloroethane-D4	17060-07-0	70	132
Toluene-D8	2037-26-5	69	125
4-Bromofluorobenzene	460-00-4	61	129

Environmental Division

QUALITY CONTROL REPORT

Work Order	: **EM130673V**	Page	: 1 of 1L
i lneEy	: **ENHIRONMENTAL EARTS | CIENCE|**	bar otayotC	: v EmtoED eEyal MmmsroE u elr octEe
i oEyaRy	: Gv l ND QGUZMAW	i oEyaRy	: i atol h alsd
WBBtess	: P.Q.XQ2 LL53 FQQTSi GWY VNl , WZSTGWbNW3011	WBBtess	: 4 h esyall GB SptnEgmale VNl Wcsytalma 3171
v -Darl	: totqcnza@eesnr nz	v -Darl	: Ratol.walsd@alsglor al.RoD
TelepdoEe	: +61 03 96871666	TelepdoEe	: +61-3-8549 9608
FaRsnDrle	: +61 03 96871844	FaRsnDrle	: +61-3-8549 9601
PtojeRy	: L10074 Syd u elr octEe l aswotks	Ui bemel	: Ov Pu 1999 SRdeBcle X(3) aEB WbS Ui S3 teqcrteD eEy
Sne	: ----		
i -Q-i EcDr et	: ----	Maye SaDples GeRemeB	: L5-JZO-L013
SaDplet	: ----	Nssce Maye	: 01-JZb-L013
QtBet EcDr et	: ----		
		Oo. of saDples teRemeB	: 10
Ucoye EcDr et	: u v /330/13	Oo. of saDples aEalCseB	: 10

Tdns tepoty scpetseBes aEC ptemmocs tepoty(s) wnyd ydns tefeteERe. Gesclys applC yo yde saDple(s) as scr DnyeB. Wl pages of ydns tepoty dame r eeE RdeRkeB aEB apptomeB fot telease.

Tdns UcalnyCi oEytol GepotyRoEyanEs yde followrEg nEfotDayroE:

- bar otayotCMcplnRaye (MZP) GepotyKGelaymne PetReEyage MnffeteERe (GPM) aEB WRRepyaERe brDnys
- u eydoB XlaEk (u X) aEB bar otayotCi oEytol Spnke (bi S) GepotyKGeRometCaEB WRRepyaERe brDnys
- u aytn Spnke (u S) GepotyKGeRometCaEB WRRepyaERe brDnys

General Comments

Tde aEalOyRal ptoReBctes cseB r C yde v EmtioEDeEyal MmmsmoE dame reeE BemelopeB ftoD esyarlnsdeB nEyetEayoEallC teRogEnzeB ptoReBctes scRd as ydose pcrlnsdeB r C yde ZSvPW, WPx W, WS aEB OvPu . NE docse BemelopeB ptoReBctes ate eDploCeB nE yde ar seERe of BoRcDeEyeB syaEBatBs ot r CRneEyteqcesy.

h dete Dorsycte BeyetDnEayoE das r eeE petfotDeB, tesclys ate tepotyeB oE a BtCwergdyr asns.

h dete a tepotyeB less ydaE (H) tesclyns drgdet ydaE yde bQG, ydns DaCr e Bce yo ptnDatCsaDple e; ytaRyBrgesyaye BrncyoE aEB/ot nEscffnRneEysaDple fot aEalCsns.

h dete yde bQG of a tepotyeB tesclyBrffets ftoD syaEBatB bQG, ydns DaCr e Bce yo drgd Dorsycte RoEyeEy, nEscffnRneEysaDple (teBcReB wergdyeDploCeB) ot Dayln nEyetfeteERe.

#eC: WEoECDocs < Gefets yo saDples wdnRd ate EoyspeRfnRallCpatyof ydns wotk otBet r cyfotDeB patyof yde Ui ptoRess loy
i WS OcDr et < i WS tegrnsytCEcDr et ftoD Bayar ase DarEyanEeB r Ci deDnRal Wr sytaRys SetmnRes. Tde i deDnRal Wr sytaRys SetmnRe rns a BrnmsmoE of yde WDetnRaE i deDnRal SoRneyC.
bQG < bnDnyof tepotynEg
GPM < Gelaynne PetReEyage MnffeteERe
= < NEBnRayes fanleB Ui

OWTWWRReBnyeB bar otayotC8L5

WRReBnyeB fot RoDplraERe wnyd NSQ/Nvi 170L5.

Signatories

Tdns BoRcDeEy das r eeE eleRytoEnRallC snglEeB r C yde acydotnzeB snglEayotnes nEBnRayeB r elow. vleRytoEnR snglEnEg das r eeE RattneB ocy nE RoDplraERe wnyd ptoReBctes speRfneB nE L1 i FG Paty11.

Signatories	*Position*	*Accreditation Category*
MnaEnFetEaEBo	SeEnot NEotgaEnRi deDnsy	u elr octEe NEotgaEnRs
		u elr octEe NEotgaEnRs
		u elr octEe NEotgaEnRs
		u elr octEe NEotgaEnRs
OaERCh aEg	SeEnot SeDnnolayne NEsytcDeEy	u elr octEe QtgaEnRs
	i deDnsy	u elr octEe QtgaEnRs
Vatsda x o h nEg	OoE-u eyals TeaD beaBet	u elr octEe NEotgaEnRs
		u elr octEe NEotgaEnRs

Laboratory Duplicate (DUP) Report

Tde qcalnyC RoEytol yetD bar otayotC McplnRaye tefets yo a taEBoDIC seleRyeB nEytalar otayotC splny. bar otayotC BcplnRayes ptomBe nEfotDaymE tegatBnEg DeydoB pteRnsmE aEB saDple deyetogeEenyC. Tde petDnyeB taEges fot yde Gelaynne PetReEy MemtaymE (GPM) of bar otayotC McplnRayes ate speRfneB nE WbS u eydoB Uh NvO/38 aEB ate BepeEBeEy oE yde DagEnycBe of tesclys nE RoDpatnsoE yo yde lemel of tepotynEg: Gescly H 10 ynDes bQG:- Oo bnDnyKGesclyr eyweeE 10 aEB L0 ynDes bQG:- 0% - 50%KGescly> L0 ynDes bQG:- 0% - L0%.

Scr-u ayt n : **WATER**

				Laboratory Duplicate (DUP) Report					
Laboratory sample ID	*Client sample ID*	*Method: Compound*	*CAS Number*	*LOR*	*Unit*	*Original Result*	*Duplicate Result*	*RPD (%)*	*Recovery Limits (%)*
EA005: pS (QC Lot: 2937310)									
v u 1306738-001	I h 18	v W005: px Valce	----	0.01	px ZEny	6.83	6.85	0.3	0% - L0%
v u 1306756-00L	WEoECDocs	v W005: px Valce	----	0.01	px ZEny	5.95	5.95	0.0	0% - L0%
EA015: Total Dissolved | olids (QC Lot: 293V071)									
v u 13067L6-008	WEoECDocs	v W015x: Toyal MnssolneB SolnBs @180°i	----	10	Dg/b	L18	LL0	0.9	0% - L0%
v u 1306738-001	I h 18	v W015x: Toyal MnssolneB SolnBs @180°i	----	10	Dg/b	15600	15400	1.5	0% - L0%
ED037P: Alkalinity by PC Titrator (QC Lot: 2936336)									
v u 13067L6-009	WEoECDocs	v M037-P: Toyal WlkalnEnyCas i ai Q3	----	1	Dg/b	L18	L18	0.0	0% - L0%
v u 1306738-003	I h 40	v M037-P: Toyal WlkalnEnyCas i ai Q3	----	1	Dg/b	L01	198	1.1	0% - L0%
ED041G: | ulfate (Turbidimetric) as | O4 28by DA (QC Lot: 2936451)									
v u 1306738-001	I h 18	v M041I : Sclfaye as SQ4 - Tctr nBnDeytnR	14808-79-8	1	Dg/b	1L80	1300	0.9	0% - L0%
v u 1306756-00L	WEoECDocs	v M041I : Sclfaye as SQ4 - Tctr nBnDeytnR	14808-79-8	1	Dg/b	33	33	0.0	0% - L0%
ED045G: Chloride Discrete analyser (QC Lot: 2936449)									
v u 1306717-001	WEoECDocs	v M045I : i dlotnBe	16887-00-6	1	Dg/b	9860	9950	0.9	0% - L0%
v u 13067L6-001	WEoECDocs	v M045I : i dlotnBe	16887-00-6	1	Dg/b	18	19	0.0	0% - 50%
ED045G: Chloride Discrete analyser (QC Lot: 2936453)									
v u 1306738-001	I h 18	v M045I : i dlotnBe	16887-00-6	1	Dg/b	9710	9880	1.7	0% - L0%
v u 1306756-00L	WEoECDocs	v M045I : i dlotnBe	16887-00-6	1	Dg/b	354	355	0.0	0% - L0%
ED093F: Dissolved Major Cations (QC Lot: 2936450)									
v u 13067L6-001	WEoECDocs	v M093F: i alRncD	7440-70-L	1	Dg/b	3	4	0.0	Oo bnDny
		v M093F: u agEesncD	7439-95-4	1	Dg/b	4	4	0.0	Oo bnDny
		v M093F: SoBncD	7440-L3-5	1	Dg/b	1L	1L	0.0	0% - 50%
		v M093F: PoyassncD	7440-09-7	1	Dg/b	1	1	0.0	Oo bnDny
v u 1306756-00L	WEoECDocs	v M093F: i alRncD	7440-70-L	1	Dg/b	L4	L5	0.0	0% - L0%
		v M093F: u agEesncD	7439-95-4	1	Dg/b	L7	L7	0.0	0% - L0%
		v M093F: SoBncD	7440-L3-5	1	Dg/b	18L	188	L.9	0% - L0%
		v M093F: PoyassncD	7440-09-7	1	Dg/b	8	8	0.0	Oo bnDny
EG020F: Dissolved Metals by ICP8M| (QC Lot: 2936513)									
v u 1306468-098	WEoECDocs	v I 0L0W-F: i aBDncD	7440-43-9	0.0001	Dg/b	H0.0001	H0.0001	0.0	Oo bnDny
		v I 0L0W-F: WtseEnR	7440-38-L	0.001	Dg/b	H0.001	H0.001	0.0	Oo bnDny
		v I 0L0W-F: i oraly	7440-48-4	0.001	Dg/b	H0.001	H0.001	0.0	Oo bnDny
		v I 0L0W-F: i oppet	7440-50-8	0.001	Dg/b	H0.001	0.00L	7L.0	Oo bnDny
		v I 0L0W-F: beaB	7439-9L-1	0.001	Dg/b	H0.001	H0.001	0.0	Oo bnDny
		v I 0L0W-F: u aEgaEese	7439-96-5	0.001	Dg/b	H0.001	H0.001	0.0	Oo bnDny
		v I 0L0W-F: OnRkel	7440-0L-0	0.001	Dg/b	H0.001	H0.001	0.0	Oo bnDny
		v I 0L0W-F: AnER	7440-66-6	0.005	Dg/b	H0.005	H0.005	0.0	Oo bnDny

Scr-u ayt n : **WATER**

Laboratory sample ID	Client sample ID	Method: Compound	CAS Number	Laboratory Duplicate (DUP) Report					
				LOR	Unit	Original Result	Duplicate Result	RPD (%)	Recovery Limits (%)
EG020F: Dissolved Metals by ICP8M| (QC Lot: 2936513) 8continued									
v u 1306468-098	WEoECDocs	v l 0L0W-F: WcDrnErcD	74L9-90-5	0.01	Dg/b	H0.01	H0.01	0.0	Oo brDry
		v l 0L0W-F: SeleErcD	778L-49-L	0.01	Dg/b	H0.01	H0.01	0.0	Oo brDry
		v l 0L0W-F: XotoE	7440-4L-8	0.05	Dg/b	H0.05	H0.05	0.0	Oo brDry
		v l 0L0W-F: NtoE	7439-89-6	0.05	Dg/b	H0.05	H0.05	0.0	Oo brDry
v u 1306685-001	WEoECDocs	v l 0L0W-F: i aBDrcD	7440-43-9	0.0001	Dg/b	H0.0001	H0.0001	0.0	Oo brDry
		v l 0L0W-F: WtseErR	7440-38-L	0.001	Dg/b	0.003	0.003	0.0	Oo brDry
		v l 0L0W-F: i or aly	7440-48-4	0.001	Dg/b	0.006	0.006	0.0	Oo brDry
		v l 0L0W-F: i oppet	7440-50-8	0.001	Dg/b	0.005	0.005	0.0	Oo brDry
		v l 0L0W-F: beaB	7439-9L-1	0.001	Dg/b	H0.001	H0.001	0.0	Oo brDry
		v l 0L0W-F: u aEgaEese	7439-96-5	0.001	Dg/b	0.140	0.146	4.0	0% - L0%
		v l 0L0W-F: OrRkel	7440-0L-0	0.001	Dg/b	0.0L4	0.0L4	0.0	0% - L0%
		v l 0L0W-F: AnER	7440-66-6	0.005	Dg/b	0.111	0.113	L.1	0% - L0%
		v l 0L0W-F: WcDrnErcD	74L9-90-5	0.01	Dg/b	H0.01	H0.01	0.0	Oo brDry
		v l 0L0W-F: SeleErcD	778L-49-L	0.01	Dg/b	0.03	0.03	0.0	Oo brDry
		v l 0L0W-F: XotoE	7440-4L-8	0.05	Dg/b	0.L9	0.3L	8.7	Oo brDry
		v l 0L0W-F: NtoE	7439-89-6	0.05	Dg/b	H0.05	H0.05	0.0	Oo brDry
EG020F: Dissolved Metals by ICP8M| (QC Lot: 2936515)									
v u 1306738-00L	l h 01	v l 0L0W-F: i aBDrcD	7440-43-9	0.0001	Dg/b	0.0001	H0.0001	0.0	Oo brDry
		v l 0L0W-F: WtseErR	7440-38-L	0.001	Dg/b	0.478	0.503	5.0	0% - L0%
		v l 0L0W-F: i or aly	7440-48-4	0.001	Dg/b	0.003	0.003	0.0	Oo brDry
		v l 0L0W-F: i oppet	7440-50-8	0.001	Dg/b	0.00L	0.003	0.0	Oo brDry
		v l 0L0W-F: beaB	7439-9L-1	0.001	Dg/b	H0.001	H0.001	0.0	Oo brDry
		v l 0L0W-F: u aEgaEese	7439-96-5	0.001	Dg/b	0.L66	0.308	14.6	0% - L0%
		v l 0L0W-F: OrRkel	7440-0L-0	0.001	Dg/b	0.056	0.058	3.0	0% - L0%
		v l 0L0W-F: AnER	7440-66-6	0.005	Dg/b	0.039	0.04L	7.6	Oo brDry
		v l 0L0W-F: WcDrnErcD	74L9-90-5	0.01	Dg/b	H0.01	H0.01	0.0	Oo brDry
		v l 0L0W-F: SeleErcD	778L-49-L	0.01	Dg/b	H0.01	H0.01	0.0	Oo brDry
		v l 0L0W-F: XotoE	7440-4L-8	0.05	Dg/b	1.37	1.37	0.0	0% - L0%
		v l 0L0W-F: NtoE	7439-89-6	0.05	Dg/b	L.76	L.88	4.5	0% - L0%
v u 1306756-001	WEoECDocs	v l 0L0W-F: i aBDrcD	7440-43-9	0.0001	Dg/b	H0.0001	H0.0001	0.0	Oo brDry
		v l 0L0W-F: WtseErR	7440-38-L	0.001	Dg/b	0.005	0.005	0.0	Oo brDry
		v l 0L0W-F: i or aly	7440-48-4	0.001	Dg/b	0.001	0.001	0.0	Oo brDry
		v l 0L0W-F: i oppet	7440-50-8	0.001	Dg/b	0.00L	0.00L	0.0	Oo brDry
		v l 0L0W-F: beaB	7439-9L-1	0.001	Dg/b	H0.001	H0.001	0.0	Oo brDry
		v l 0L0W-F: u aEgaEese	7439-96-5	0.001	Dg/b	0.3L6	0.351	7.4	0% - L0%
		v l 0L0W-F: OrRkel	7440-0L-0	0.001	Dg/b	0.003	0.003	0.0	Oo brDry
		v l 0L0W-F: AnER	7440-66-6	0.005	Dg/b	0.007	0.006	0.0	Oo brDry
		v l 0L0W-F: WcDrnErcD	74L9-90-5	0.01	Dg/b	1.66	1.66	0.0	0% - L0%
		v l 0L0W-F: SeleErcD	778L-49-L	0.01	Dg/b	H0.01	H0.01	0.0	Oo brDry
		v l 0L0W-F: XotoE	7440-4L-8	0.05	Dg/b	0.LL	0.LL	0.0	Oo brDry

Scr-u ayt n : **WATER**

Laboratory sample ID	Client sample ID	Method: Compound	CAS Number	Laboratory Duplicate (DUP) Report					
				LOR	Unit	Original Result	Duplicate Result	RPD (%)	Recovery Limits (%)
EG020F: Dissolved Metals by ICP8M| (QC Lot: 2936515) 8continued									
v u 1306756-001	WEoECDocs	v l 0L0W-F: NtoE	7439-89-6	0.05	Dg/b	L0.5	LL.L	8.0	0% - L0%
EK026| F: Total CN by | egmented Flow Analyser (QC Lot: 2936567)									
v u 1306718-001	WEoECDocs	v#0L6SF: Toyal i CaEnBe	57-1L-5	0.004	Dg/b	H0.004	H0.004	0.0	Oo brDry
v u 1306738-010	Mcp L	v#0L6SF: Toyal i CaEnBe	57-1L-5	0.004	Dg/b	0.018	0.017	0.0	Oo brDry
EK040P: Fluoride by PC Titrator (QC Lot: 2936334)									
v u 1306701-00L	WEoECDocs	v#040P: FlcotnBe	16984-48-8	0.1	Dg/b	0.3	0.3	0.0	Oo brDry
v u 1306738-003	I h 40	v#040P: FlcotnBe	16984-48-8	0.1	Dg/b	0.6	0.6	0.0	Oo brDry
EK055G: Ammonia as N by Discrete Analyser (QC Lot: 2936V60)									
v u 1306677-001	WEoECDocs	v#055I : WD DoEna as O	7664-41-7	0.01	Dg/b	1.33	1.39	4.4	0% - L0%
v u 1306716-003	WEoECDocs	v#055I : WD DoEna as O	7664-41-7	0.01	Dg/b	0.08	0.08	0.0	Oo brDry
EK055G: Ammonia as N by Discrete Analyser (QC Lot: 2936V62)									
v u 1306738-005	I h 35	v#055I : WD DoEna as O	7664-41-7	0.01	Dg/b	L.57	L.45	4.6	0% - L0%
EK057G: Nitrite as N by Discrete Analyser (QC Lot: 2936447)									
v u 1306716-001	WEoECDocs	v#057I : Onytnye as O	----	0.01	Dg/b	0.01	0.01	0.0	Oo brDry
v u 1306756-00L	WEoECDocs	v#057I : Onytnye as O	----	0.01	Dg/b	H0.01	H0.01	0.0	Oo brDry
EK071G: Reactive Phosphorus as P by discrete analyser (QC Lot: 2936452)									
v u 1306738-001	I h 18	v#071I : GeaRymne Pdospdotcs as P	14L65-44-L	0.01	Dg/b	H0.01	H0.01	0.0	Oo brDry
v u 1306756-00L	WEoECDocs	v#071I : GeaRymne Pdospdotcs as P	14L65-44-L	0.01	Dg/b	0.0L	0.0L	0.0	Oo brDry
EP074A: Monocyclic Aromatic Sydrocarbons (QC Lot: 2937477)									
v u 1306709-006	WEoECDocs	v P074: XeEzeEe	71-43-L	1	µg/b	H1	H1	0.0	Oo brDry
		v P074: TolceEe	108-88-3	L	µg/b	HL	HL	0.0	Oo brDry
		v P074: v ydCr eEzeEe	100-41-4	L	µg/b	HL	HL	0.0	Oo brDry
		v P074: Deya- & pata-2 CeEe	108-38-3 106-4L-3	L	µg/b	HL	HL	0.0	Oo brDry
		v P074: otydo-2 CeEe	95-47-6	L	µg/b	HL	HL	0.0	Oo brDry
		v P074: SyCteEe	100-4L-5	5	µg/b	H5	H5	0.0	Oo brDry
		v P074: NsoptopCr eEzeEe	98-8L-8	5	µg/b	H5	H5	0.0	Oo brDry
		v P074: E-PtopCr eEzeEe	103-65-1	5	µg/b	H5	H5	0.0	Oo brDry
		v P074: 1.3.5-TtnDeydCr eEzeEe	108-67-8	5	µg/b	H5	H5	0.0	Oo brDry
		v P074: seR-XcyCr eEzeEe	135-98-8	5	µg/b	H5	H5	0.0	Oo brDry
		v P074: 1.L.4-TtnDeydCr eEzeEe	95-63-6	5	µg/b	H5	H5	0.0	Oo brDry
		v P074: yety-XcyCr eEzeEe	98-06-6	5	µg/b	H5	H5	0.0	Oo brDry
		v P074: p-NsoptopCtyolceEe	99-87-6	5	µg/b	H5	H5	0.0	Oo brDry
		v P074: E-XcyCr eEzeEe	104-51-8	5	µg/b	H5	H5	0.0	Oo brDry
v u 1306738-005	I h 35	v P074: XeEzeEe	71-43-L	1	µg/b	4	4	0.0	Oo brDry
		v P074: TolceEe	108-88-3	L	µg/b	HL	HL	0.0	Oo brDry
		v P074: v ydCr eEzeEe	100-41-4	L	µg/b	HL	HL	0.0	Oo brDry
		v P074: Deya- & pata-2 CeEe	108-38-3 106-4L-3	L	µg/b	HL	HL	0.0	Oo brDry

Scr-u ayt n : **WATER**

Laboratory sample ID	Client sample ID	Method: Compound	CAS Number	Laboratory Duplicate (DUP) Report					
				LOR	Unit	Original Result	Duplicate Result	RPD (%)	Recovery Limits (%)
EP074A: Monocyclic Aromatic Sydrocarbons (QC Lot: 2937477) 8continued									
v u 1306738-005	l h 35	v P074: otydo-2 CleEe	95-47-6	L	µg/b	HL	HL	0.0	Oo brDry
		v P074: SyCteEe	100-4L-5	5	µg/b	H5	H5	0.0	Oo brDry
		v P074: N\optopCr eEzeEe	98-8L-8	5	µg/b	H5	H5	0.0	Oo brDry
		v P074: E-PtopCr eEzeEe	103-65-1	5	µg/b	H5	H5	0.0	Oo brDry
		v P074: 1.3.5-TtnDeydCr eEzeEe	108-67-8	5	µg/b	H5	H5	0.0	Oo brDry
		v P074: seR-XcyCr eEzeEe	135-98-8	5	µg/b	H5	H5	0.0	Oo brDry
		v P074: 1.L.4-TtnDeydCr eEzeEe	95-63-6	5	µg/b	H5	H5	0.0	Oo brDry
		v P074: yety-XcyCr eEzeEe	98-06-6	5	µg/b	H5	H5	0.0	Oo brDry
		v P074: p-N\optopCyolceEe	99-87-6	5	µg/b	H5	H5	0.0	Oo brDry
		v P074: E-XcyCr eEzeEe	104-51-8	5	µg/b	H5	H5	0.0	Oo brDry
EP074S: Naphthalene (QC Lot: 2937477)									
v u 1306709-006	WEoECDocs	v P074: OapdydaleEe	91-L0-3	7	µg/b	H7	H7	0.0	Oo brDry
v u 1306738-005	l h 35	v P074: OapdydaleEe	91-L0-3	7	µg/b	H7	H7	0.0	Oo brDry
EP0V0/071: Total Petroleum Sydrocarbons (QC Lot: 29363V6)									
v u 1306717-001	WEoECDocs	v P071: i 15 - i L8 FtaRyroE	----	100	µg/b	H100	H100	0.0	Oo brDry
		v P071: i 10 - i 14 FtaRyroE	----	50	µg/b	H50	H50	0.0	Oo brDry
		v P071: i L9 - i 36 FtaRyroE	----	50	µg/b	H50	H50	0.0	Oo brDry
v u 1306738-001	l h 18	v P071: i 15 - i L8 FtaRyroE	----	100	µg/b	H100	H100	0.0	Oo brDry
		v P071: i 10 - i 14 FtaRyroE	----	50	µg/b	H50	H50	0.0	Oo brDry
		v P071: i L9 - i 36 FtaRyroE	----	50	µg/b	H60	H60	0.0	Oo brDry
EP0V0/071: Total Petroleum Sydrocarbons (QC Lot: 2937476)									
v u 1306709-006	WEoECDocs	v P080: i 6 - i 9 FtaRyroE	----	L0	µg/b	HL0	HL0	0.0	Oo brDry
v u 1306738-005	l h 35	v P080: i 6 - i 9 FtaRyroE	----	L0	µg/b	HL0	HL0	0.0	Oo brDry
EP0V0/071: Total Recoverable Sydrocarbons 8NEPM 2010 Draft (QC Lot: 29363V6)									
v u 1306717-001	WEoECDocs	v P071: >i 10 - i 16 FtaRyroE	----	100	µg/b	H100	H100	0.0	Oo brDry
		v P071: >i 16 - i 34 FtaRyroE	----	100	µg/b	H100	H100	0.0	Oo brDry
		v P071: >i 34 - i 40 FtaRyroE	----	100	µg/b	H100	H100	0.0	Oo brDry
v u 1306738-001	l h 18	v P071: >i 10 - i 16 FtaRyroE	----	100	µg/b	H100	H100	0.0	Oo brDry
		v P071: >i 16 - i 34 FtaRyroE	----	100	µg/b	H140	H140	0.0	Oo brDry
		v P071: >i 34 - i 40 FtaRyroE	----	100	µg/b	H100	H100	0.0	Oo brDry
EP0V0/071: Total Recoverable Sydrocarbons 8NEPM 2010 Draft (QC Lot: 2937476)									
v u 1306709-006	WEoECDocs	v P080: i 6 - i 10 FtaRyroE	----	L0	µg/b	HL0	HL0	0.0	Oo brDry
v u 1306738-005	l h 35	v P080: i 6 - i 10 FtaRyroE	----	L0	µg/b	HL0	HL0	0.0	Oo brDry

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

Tde qcalnyC RoEytol yetD u eydoB / bar otayotC XlaEk tefets yo aE aEalOye ftee Daytn yo wdnRd all teageEys ate aBBeB nE yde saDe molcDes ot ptopotynoEs as cseB nE syaEBatB saDple ptepataynoE. Tde pctpose of ydns Ui pataDeyet ns yo DoEnyot poyeEynal lar otayotC RoEyaDnEaynoE. Tde qcalnyC RoEytol yetD bar otayotC i oEytol SaDple (bi S) tefets yo a RetyfneB tefeteERe Dayetnal, ot a kEowE nEyetfeteERe ftee Daytn, sprkeB wnyd yatgey aEalOyes. Tde pctpose of ydns Ui pataDeyet ns yo DoEnyot DeydoB pteRsnoE aEB aRRctaRCnEBepeEBeEyof saDple Daytn. MCEaDnRGeRonetCbnDns ate r aseB oE syaynsyRal emalcaynoE of ptoResseB bi S.

Scr-u aytn : **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
EA015: Total Dissolved | olids (QCLot: 293V071)								
v W015x : Toyal MnssolneB SolnBs @180°i	----	10	Dg/b	H10	L000 Dg/b	100	98	104
ED037P: Alkalinity by PC Titrator (QCLot: 2936336)								
v M037-P: Toyal WkalnEnyCas i ai Q3	----	1	Dg/b	----	L00 Dg/b	98.4	91	105
ED041G: | ulfate (Turbidimetric) as | O4 28by DA (QCLot: 2936451)								
v M041l : Sclfaye as SQ4 - Tctr nBnDeytnR	14808-79-8	1	Dg/b	H1	L5 Dg/b	111	81	1L5
ED045G: Chloride Discrete analyser (QCLot: 2936449)								
v M045l : i dlotnBe	16887-00-6	1	Dg/b	H1	1000 Dg/b	109	89	117
ED045G: Chloride Discrete analyser (QCLot: 2936453)								
v M045l : i dlotnBe	16887-00-6	1	Dg/b	H1	1000 Dg/b	110	89	117
ED093F: Dissolved Major Cations (QCLot: 2936450)								
v M093F: i alRncD	7440-70-L	1	Dg/b	H1	5 Dg/b	105	83	1L9
v M093F: u agEesncD	7439-95-4	1	Dg/b	H1	5 Dg/b	10L	80	1L4
v M093F: SoBncD	7440-L3-5	1	Dg/b	H1	50 Dg/b	94.7	77	1L5
v M093F: PoyassncD	7440-09-7	1	Dg/b	H1	50 Dg/b	95.L	77	1L3
EG020F: Dissolved Metals by ICP8M| (QCLot: 2936513)								
v I 0L0WF: WcDnEncD	74L9-90-5	0.01	Dg/b	H0.01	0.5 Dg/b	99.4	90	110
v I 0L0WF: WtseEnR	7440-38-L	0.001	Dg/b	H0.001	0.1 Dg/b	99.6	93	109
v I 0L0WF: i aBDncD	7440-43-9	0.0001	Dg/b	H0.0001	0.1 Dg/b	97.L	85	111
v I 0L0WF: i or aly	7440-48-4	0.001	Dg/b	H0.001	0.1 Dg/b	99.4	87	111
v I 0L0WF: i oppet	7440-50-8	0.001	Dg/b	H0.001	0.1 Dg/b	95.4	86	110
v I 0L0WF: beaB	7439-9L-1	0.001	Dg/b	H0.001	0.1 Dg/b	10L	88	11L
v I 0L0WF: u aEgaEese	7439-96-5	0.001	Dg/b	H0.001	0.1 Dg/b	98.4	86	110
v I 0L0WF: OnRkel	7440-0L-0	0.001	Dg/b	H0.001	0.1 Dg/b	97.3	86	11L
v I 0L0WF: SeleEncD	778L-49-L	0.01	Dg/b	H0.01	0.1 Dg/b	97.0	85	111
v I 0L0WF: AnER	7440-66-6	0.005	Dg/b	H0.005	0.1 Dg/b	9L.6	83	113
v I 0L0WF: XotoE	7440-4L-8	0.05	Dg/b	H0.05	0.1 Dg/b	10L	7L	1L6
v I 0L0WF: NtoE	7439-89-6	0.05	Dg/b	H0.05	0.5 Dg/b	98.9	88	11L
EG020F: Dissolved Metals by ICP8M| (QCLot: 2936515)								
v I 0L0WF: WcDnEncD	74L9-90-5	0.01	Dg/b	H0.01	0.5 Dg/b	99.3	90	110
v I 0L0WF: WtseEnR	7440-38-L	0.001	Dg/b	H0.001	0.1 Dg/b	99.7	93	109
v I 0L0WF: i aBDncD	7440-43-9	0.0001	Dg/b	H0.0001	0.1 Dg/b	97.9	85	111
v I 0L0WF: i or aly	7440-48-4	0.001	Dg/b	H0.001	0.1 Dg/b	99.8	87	111
v I 0L0WF: i oppet	7440-50-8	0.001	Dg/b	H0.001	0.1 Dg/b	96.6	86	110
v I 0L0WF: beaB	7439-9L-1	0.001	Dg/b	H0.001	0.1 Dg/b	99.3	88	11L

Scr-u ayt,n : **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 ICP8M| (QCLot: 2936515) 8continued								
v l 0L0W-F: u aEgaEese	7439-96-5	0.001	Dg/b	H0.001	0.1 Dg/b	96.8	86	110
v l 0L0W-F: OnRkel	7440-0L-0	0.001	Dg/b	H0.001	0.1 Dg/b	99.3	86	11L
v l 0L0W-F: SeleEnc D	778L-49-L	0.01	Dg/b	H0.01	0.1 Dg/b	94.1	85	111
v l 0L0W-F: AnER	7440-66-6	0.005	Dg/b	H0.005	0.1 Dg/b	9L.6	83	113
v l 0L0W-F: XotoE	7440-4L-8	0.05	Dg/b	H0.05	0.1 Dg/b	107	7L	1L6
v l 0L0W-F: NtoE	7439-89-6	0.05	Dg/b	H0.05	0.5 Dg/b	99.6	88	11L
EK026| F: Total CN by | egmented Flow Analyser (QCLot: 2936567)								
v#0L6SF: Toyal i CaEnBe	57-1L-5	0.004	Dg/b	H0.004	0.L Dg/b	81.9	75	113
EK040P: Fluoride by PC Titrator (QCLot: 2936334)								
v#040P: FlcotnBe	16984-48-8	0.1	Dg/b	H0.1	5 Dg/b	96.0	78	1L0
EK055G: Ammonia as N by Discrete Analyser (QCLot: 2936V60)								
v#055I : WD DoEna as O	7664-41-7	0.01	Dg/b	H0.01	1.0 Dg/b	104	76	1LL
EK055G: Ammonia as N by Discrete Analyser (QCLot: 2936V62)								
v#055I : WD DoEna as O	7664-41-7	0.01	Dg/b	H0.01	1.0 Dg/b	100	76	1LL
EK057G: Nitrite as N by Discrete Analyser (QCLot: 2936447)								
v#057I : Onytye as O	----	0.01	Dg/b	H0.01	0.5 Dg/b	95.1	84	11L
EK071G: Reactive Phosphorus as P by discrete analyser (QCLot: 2936452)								
v#071I : GeaRyme Pdospdotcs as P	14L65-44-L	0.01	Dg/b	H0.01	0.5 Dg/b	101	84	108
EP074A: Monocyclic Aromatic Sydrocarbons (QCLot: 2937477)								
v P074: XeEzeEe	71-43-L	1	µg/b	H1	L0 µg/b	101	76	1LL
v P074: TolceEe	108-88-3	L	µg/b	HL	L0 µg/b	91.9	79	1L3
v P074: v ydCr eEzeEe	100-41-4	L	µg/b	HL	L0 µg/b	88.4	76	118
v P074: D eya- & pata-2CleEe	108-38-3 106-4L-3	L	µg/b	HL	40 µg/b	87.0	75	1L1
v P074: SyCteEe	100-4L-5	5	µg/b	H5	L0 µg/b	8L.L	7L	118
v P074: otydo-2CleEe	95-47-6	L	µg/b	HL	L0 µg/b	93.7	80	1L0
v P074: NsloptopCr eEzeEe	98-8L-8	5	µg/b	H5	L0 µg/b	97.3	71	119
v P074: E-PtopCr eEzeEe	103-65-1	5	µg/b	H5	L0 µg/b	90.5	69	113
v P074: 1.3.5-TtnD eydCr eEzeEe	108-67-8	5	µg/b	H5	L0 µg/b	84.6	70	114
v P074: seR-XcyCr eEzeEe	135-98-8	5	µg/b	H5	L0 µg/b	91.8	71	115
v P074: 1.L.4-TtnD eydCr eEzeEe	95-63-6	5	µg/b	H5	L0 µg/b	83.8	70	114
v P074: yety-XcyCr eEzeEe	98-06-6	5	µg/b	H5	L0 µg/b	89.7	7L	114
v P074: p-NsloptopCyolceEe	99-87-6	5	µg/b	H5	L0 µg/b	86.7	68	114
v P074: E-XcyCr eEzeEe	104-51-8	5	µg/b	H5	L0 µg/b	85.0	61	115
EP074S: Naphthalene (QCLot: 2937477)								
v P074: OapdydaleEe	91-L0-3	7	µg/b	H7	L0 µg/b	87.L	75	1L1
EP0V0/071: Total Petroleum Sydrocarbons (QCLot: 29363V6)								
v P071: i 10 - i 14 FtaRyroE	----	50	µg/b	H50	3610 µg/b	87.9	46	1L6

Scr-u aytn : **WATER**

Method: Compound	CAS Number	LOR	Unit	Method Blank (MB) Report: Result	Laboratory Control Spike (LCS) Report: Spike Concentration	LCS: Spike Recovery (%)	Recovery Limits (%): Low	Recovery Limits (%): High
EP0V0/071: Total Petroleum Sydrocarbons (QCLot: 29363V6) 8continued								
v P071: i 15 - i L8 FtaRyroE	----	100	µg/b	H100	10340 µg/b	99.4	55	1L5
v P071: i L9 - i 36 FtaRyroE	----	50	µg/b	H50	3790 µg/b	104	55	1L9
EP0V0/071: Total Petroleum Sydrocarbons (QCLot: 2937476)								
v P080: i 6 - i 9 FtaRyroE	----	L0	µg/b	HL0	360 µg/b	100	60	1L6
EP0V0/071: Total Recoverable Sydrocarbons 8NEPM 2010 Draft (QCLot: 29363V6)								
v P071: >i 10 - i 16 FtaRyroE	----	100	µg/b	H100	5070 µg/b	98.L	53	1L9
v P071: >i 16 - i 34 FtaRyroE	----	100	µg/b	H100	11L30 µg/b	106	56	13L
v P071: >i 34 - i 40 FtaRyroE	----	100	µg/b	H100	1010 µg/b	100	51	137
EP0V0/071: Total Recoverable Sydrocarbons 8NEPM 2010 Draft (QCLot: 2937476)								
v P080: i 6 - i 10 FtaRyroE	----	L0	µg/b	HL0	450 µg/b	96.8	56	130

Matrix Spike (MS) Report

Tde qcalnyC RoEytol yetD u aytn Spnke (u S) tefets yo aE nEytalarotayotC splry saDple spnkeB wnyd a tepteseEyaynne sey of yatgey aEalOyes. Tde pctpose of ydns Ui pataDeyet ns yo DoEnyot poyeEyal Daytn effeRys oE aEalOye teRometres. SyayRGeRometCbnDns as pet lar otayotCMaya UcalnyCQr jeRymes (MUQs). NBeal teRometCtaEges syayeB DaCr e wannneB rEyde emeEyof saDple Daytn rEyetfeteERe.

Scr-u aytn : **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: | ulfate (Turbidimetric) as | O4 28by DA (QCLot: 2936451)							
v u 1306738-004	l h L8	v M041l : Sclfaye as SQ4 - Tctr rBrDeytnR	14808-79-8	10 Dg/b	= Ooy MeyetDnEeB	70	130
ED045G: Chloride Discrete analyser (QCLot: 2936449)							
v u 1306717-00L	WEoECDocs	v M045l : i dlotnBe	16887-00-6	400 Dg/b	= Ooy MeyetDnEeB	70	130
ED045G: Chloride Discrete analyser (QCLot: 2936453)							
v u 1306738-004	l h L8	v M045l : i dlotnBe	16887-00-6	400 Dg/b	106	70	130
EG020F: Dissolved Metals by ICP8M| (QCLot: 2936513)							
v u 1306468-098	WEoECDocs	v l 0L0W-F: WtseEnR	7440-38-L	0.L Dg/b	107	89	139
		v l 0L0W-F: i aBDrcD	7440-43-9	0.05 Dg/b	113	75	131
		v l 0L0W-F: i or aly	7440-48-4	0.L Dg/b	113	77	1L9
		v l 0L0W-F: i oppet	7440-50-8	0.L Dg/b	110	71	1L7
		v l 0L0W-F: beaB	7439-9L-1	0.L Dg/b	95.5	71	1L3
		v l 0L0W-F: u aEgaEese	7439-96-5	0.L Dg/b	11L	66	13L
		v l 0L0W-F: OnRkel	7440-0L-0	0.L Dg/b	111	73	1L9
		v l 0L0W-F: ArtER	7440-66-6	0.L Dg/b	107	68	136
EG020F: Dissolved Metals by ICP8M| (QCLot: 2936515)							
v u 1306738-00L	l h 01	v l 0L0W-F: WtseEnR	7440-38-L	0.L Dg/b	101	89	139

Scr-u ayt,n : **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
EG020F: Dissolved Metals by ICP8M| (QCLot: 2936515) 8continued							
v u 1306738-00L	l h 01	v l 0L0W-F: i aBDrcD	7440-43-9	0.05 Dg/b	113	75	131
		v l 0L0W-F: i or aly	7440-48-4	0.L Dg/b	113	77	1L9
		v l 0L0W-F: i oppet	7440-50-8	0.L Dg/b	109	71	1L7
		v l 0L0W-F: beaB	7439-9L-1	0.L Dg/b	114	71	1L3
		v l 0L0W-F: u aEgaEese	7439-96-5	0.L Dg/b	99.L	66	13L
		v l 0L0W-F: OnRkel	7440-0L-0	0.L Dg/b	113	73	1L9
		v l 0L0W-F: ArER	7440-66-6	0.L Dg/b	1L6	68	136
EK026| F: Total CN by | egmented Flow Analyser (QCLot: 2936567)							
v u 1306718-00L	WEoECDocs	v#0L6SF: Toyal i CaEnBe	57-1L-5	0.L Dg/b	= 65.L	70	130
EK040P: Fluoride by PC Titrator (QCLot: 2936334)							
v u 1306699-001	WEoECDocs	v#040P: FlcotnBe	16984-48-8	5.0 Dg/b	10L	70	130
EK055G: Ammonia as N by Discrete Analyser (QCLot: 2936V60)							
v u 1306677-00L	WEoECDocs	v#055I : WD DoEna as O	7664-41-7	1.0 Dg/b	118	70	130
EK055G: Ammonia as N by Discrete Analyser (QCLot: 2936V62)							
v u 1306738-006	l h LL	v#055I : WD DoEna as O	7664-41-7	1.0 Dg/b	96.7	70	130
EK057G: Nitrite as N by Discrete Analyser (QCLot: 2936447)							
v u 1306717-00L	WEoECDocs	v#057I : Onytne as O	----	0.5 Dg/b	100	70	130
EK071G: Reactive Phosphorus as P by discrete analyser (QCLot: 2936452)							
v u 1306738-004	l h L8	v#071I : GeaRyme Pdospdotcs as P	14L65-44-L	0.5 Dg/b	99.4	70	130
EP074A: Monocyclic Aromatic Sydrocarbons (QCLot: 2937477)							
v u 1306738-001	l h 18	v P074: XeEzeEe	71-43-L	L0 µg/b	96.7	64	1L1
		v P074: TolceEe	108-88-3	L0 µg/b	90.4	63	1L5
EP0V0/071: Total Petroleum Sydrocarbons (QCLot: 29363V6)							
v u 1306738-00L	l h 01	v P071: i 10 - i 14 FtaRyroE	----	3610 µg/b	109	40	130
		v P071: i 15 - i L8 FtaRyroE	----	10340 µg/b	115	51	145
		v P071: i L9 - i 36 FtaRyroE	----	3790 µg/b	119	5L	144
EP0V0/071: Total Petroleum Sydrocarbons (QCLot: 2937476)							
v u 1306738-001	l h 18	v P080: i 6 - i 9 FtaRyroE	----	L80 µg/b	71.L	46	1L6
EP0V0/071: Total Recoverable Sydrocarbons 8NEPM 2010 Draft (QCLot: 29363V6)							
v u 1306738-00L	l h 01	v P071: >i 10 - i 16 FtaRyroE	----	5070 µg/b	119	46	14L
		v P071: >i 16 - i 34 FtaRyroE	----	11L30 µg/b	1LL	5L	146
		v P071: >i 34 - i 40 FtaRyroE	----	1010 µg/b	115	49	143
EP0V0/071: Total Recoverable Sydrocarbons 8NEPM 2010 Draft (QCLot: 2937476)							
v u 1306738-001	l h 18	v P080: i 6 - i 10 FtaRyroE	----	330 µg/b	70.4	45	1L7

Matrix Spike (MS) and Matrix Spike Duplicate (MSD) Report

Tde qcalnyC RoEytol yetD u aytn; Spnke (u S) aEB u aytn; Spnke McplnRaye (u SM) tefets yo nEytalar otayotC splny saDples spnkeB wnyd a tepteseEyaynne sey of yatgey aEalOyes. Tde pctpose of ydese Ui pataDeyets ate yo DoEnyot poyeEyral Daytn; effeRys oE aEalOye teRometres. SyaynRGeRometCbnDnys as pet lar otayotCMaya UcalnyCQrjeRynnes (MUQs). NBeal teRometCtaEges syayeB DaCr e wannneB nEyde enneEyof saDple Daytn; nEyetfeteERe.

Scr-u aytn: **WATER**

				Matrix Spike (MS) and Matrix Spike Duplicate (MSD) Report						
				Spike	*Spike Recovery (%)*		*Recovery Limits (%)*		*RPDs (%)*	
Laboratory sample ID	*Client sample ID*	*Method: Compound*	*CAS Number*	*Concentration*	*MS*	*MSD*	*Low*	*High*	*Value*	*Control Limit*
EK040P: Fluoride by PC Titrator (QCLot: 2936334)										
v u 1306699-001	WEoECDocs	v#040P: FlcotnBe	16984-48-8	5.0 Dg/b	10L	----	70	130	----	----
EP0V0/071: Total Petroleum Sydrocarbons (QCLot: 29363V6)										
v u 1306738-00L	l h 01	v P071: i 10 - i 14 FtaRymoE	----	3610 µg/b	109	----	40	130	----	----
		v P071: i 15 - i L8 FtaRymoE	----	10340 µg/b	115	----	51	145	----	----
		v P071: i L9 - i 36 FtaRymoE	----	3790 µg/b	119	----	5L	144	----	----
EP0V0/071: Total Recoverable Sydrocarbons 8NEPM 2010 Draft (QCLot: 29363V6)										
v u 1306738-00L	l h 01	v P071: >i 10 - i 16 FtaRymoE	----	5070 µg/b	119	----	46	14L	----	----
		v P071: >i 16 - i 34 FtaRymoE	----	11L30 µg/b	1LL	----	5L	146	----	----
		v P071: >i 34 - i 40 FtaRymoE	----	1010 µg/b	115	----	49	143	----	----
EK057G: Nitrite as N by Discrete Analyser (QCLot: 2936447)										
v u 1306717-00L	WEoECDocs	v#057l : Onytnye as O	----	0.5 Dg/b	100	----	70	130	----	----
ED045G: Chloride Discrete analyser (QCLot: 2936449)										
v u 1306717-00L	WEoECDocs	v M045l : i dlotnBe	16887-00-6	400 Dg/b	= Ooy MeyetDnEeB	----	70	130	----	----
ED041G: | ulfate (Turbidimetric) as | O4 28by DA (QCLot: 2936451)										
v u 1306738-004	l h L8	v M041l : Sclfaye as SQ4 - TctrnBnDeytnR	14808-79-8	10 Dg/b	= Ooy MeyetDnEeB	----	70	130	----	----
EK071G: Reactive Phosphorus as P by discrete analyser (QCLot: 2936452)										
v u 1306738-004	l h L8	v#071l : GeaRymne Pdospdotcs as P	14L65-44-L	0.5 Dg/b	99.4	----	70	130	----	----
ED045G: Chloride Discrete analyser (QCLot: 2936453)										
v u 1306738-004	l h L8	v M045l : i dlotnBe	16887-00-6	400 Dg/b	106	----	70	130	----	----
EG020F: Dissolved Metals by ICP8M| (QCLot: 2936513)										
v u 1306468-098	WEoECDocs	v l 0L0W-F: WtseEnR	7440-38-L	0.L Dg/b	107	----	89	139	----	----
		v l 0L0W-F: i aBDmcD	7440-43-9	0.05 Dg/b	113	----	75	131	----	----
		v l 0L0W-F: i or aly	7440-48-4	0.L Dg/b	113	----	77	1L9	----	----
		v l 0L0W-F: i oppet	7440-50-8	0.L Dg/b	110	----	71	1L7	----	----
		v l 0L0W-F: beaB	7439-9L-1	0.L Dg/b	95.5	----	71	1L3	----	----
		v l 0L0W-F: u aEgaEese	7439-96-5	0.L Dg/b	11L	----	66	13L	----	----
		v l 0L0W-F: OnRkel	7440-0L-0	0.L Dg/b	111	----	73	1L9	----	----
		v l 0L0W-F: AnER	7440-66-6	0.L Dg/b	107	----	68	136	----	----
EG020F: Dissolved Metals by ICP8M| (QCLot: 2936515)										
v u 1306738-00L	l h 01	v l 0L0W-F: WtseEnR	7440-38-L	0.L Dg/b	101	----	89	139	----	----
		v l 0L0W-F: i aBDmcD	7440-43-9	0.05 Dg/b	113	----	75	131	----	----

Scr-u ayt n : **WATER**

				Matrix Spike (MS) and Matrix Spike Duplicate (MSD) Report						
				Spike	Spike Recovery (%)		Recovery Limits (%)		RPDs (%)	
Laboratory sample ID	*Client sample ID*	*Method: Compound*	*CAS Number*	*Concentration*	*MS*	*MSD*	*Low*	*High*	*Value*	*Control Limit*
EG020F: Dissolved Metals by ICP8M| (QCLot: 2936515) 8continued										
v u 1306738-00L	l h 01	v l 0L0W-F: i or aly	7440-48-4	0.L Dg/b	113	----	77	1L9	----	----
		v l 0L0W-F: i oppet	7440-50-8	0.L Dg/b	109	----	71	1L7	----	----
		v l 0L0W-F: beaB	7439-9L-1	0.L Dg/b	114	----	71	1L3	----	----
		v l 0L0W-F: u aEgaEese	7439-96-5	0.L Dg/b	99.L	----	66	13L	----	----
		v l 0L0W-F: OnRkel	7440-0L-0	0.L Dg/b	113	----	73	1L9	----	----
		v l 0L0W-F: AnER	7440-66-6	0.L Dg/b	1L6	----	68	136	----	----
EK026| F: Total CN by | egmented Flow Analyser (QCLot: 2936567)										
v u 1306718-00L	WEoECDocs	v#0L6SF: Toyal i CaErBe	57-1L-5	0.L Dg/b	= 65.L	----	70	130	----	----
EK055G: Ammonia as N by Discrete Analyser (QCLot: 2936V60)										
v u 1306677-00L	WEoECDocs	v#055l : WDDoEra as O	7664-41-7	1.0 Dg/b	118	----	70	130	----	----
EK055G: Ammonia as N by Discrete Analyser (QCLot: 2936V62)										
v u 1306738-006	l h LL	v#055l : WDDoEra as O	7664-41-7	1.0 Dg/b	96.7	----	70	130	----	----
EP0V0/071: Total Petroleum Sydrocarbons (QCLot: 2937476)										
v u 1306738-001	l h 18	v P080: i 6 - i 9 FtaRyoE	----	L80 µg/b	71.L	----	46	1L6	----	----
EP0V0/071: Total Recoverable Sydrocarbons 8NEPM 2010 Draft (QCLot: 2937476)										
v u 1306738-001	l h 18	v P080: i 6 - i 10 FtaRyoE	----	330 µg/b	70.4	----	45	1L7	----	----
EP074A: Monocyclic Aromatic Sydrocarbons (QCLot: 2937477)										
v u 1306738-001	l h 18	v P074: XeEzeEe	71-43-L	L0 µg/b	96.7	----	64	1L1	----	----
		v P074: TolceEe	108-88-3	L0 µg/b	90.4	----	63	1L5	----	----

Environmental Division

INTERPRETIVE QUALITY CONTROL REPORT

Work Order	: **EM130673|**	Page	: 1 of 10
Client	: ENVIRONMENTAL EARTH SCIENCES	Laboratory	: Environmental Division Melbourne
Contact	: REGIN ORQUIZA	Contact	: Carol Walsh
Address	: P.O.BOX 2253 FOOTSCRAY VIC, AUSTRALIA 3011	Address	: 4 Westall Rd Springvale VIC Australia 3171
E-mail	: rorquiza@eesi.biz	E-mail	: carol.walsh@alsglobal.com
Telephone	: +61 03 96871666	Telephone	: +61-3-8549 9608
Facsimile	: +61 03 96871844	Facsimile	: +61-3-8549 9601
Project	: 210074 Sth Melbourne Gasworks	QC Level	: NEPM 1999 Schedule B(3) and ALS QCS3 requirement
Site	: ----		
C-O-C number	: ----	Date Samples Received	: 25-JUN-2013
Sampler	: ----	Issue Date	: 01-JUL-2013
Order number	: ----		
		No. of samples received	: 10
Quote number	: ME/330/13	No. of samples analysed	: 10

This report supersedes any previous report(s) with this reference. Results apply to the sample(s) as submitted. All pages of this report have been checked and approved for release.

This Interpretive Quality Control Report contains the following information:

- Analysis Holding Time Compliance
- Quality Control Parameter Frequency Compliance
- Brief Method Summaries
- Summary of Outliers

Analysis Holding Time Compliance

The following report summarises extraction / preparation and analysis times and compares with recommended holding times. Dates reported represent first date of extraction or analysis and precludes subsequent dilutions and reruns. Information is also provided re the sample container (preservative) from which the analysis aliquot was taken. Elapsed period to analysis represents number of days from sampling where no extraction / digestion is involved or period from extraction / digestion where this is present. For composite samples, sampling date is assumed to be that of the oldest sample contributing to the composite. Sample date for laboratory produced leachates is assumed as the completion date of the leaching process. Outliers for holding time are based on USEPA SW 846, APHA, AS and NEPM (1999). A listing of breaches is provided in the Summary of Outliers.

Holding times for leachate methods (excluding elutriates) vary according to the analytes being determined on the resulting solution. For non-volatile analytes, the holding time compliance assessment compares the leach date with the shortest analyte holding time for the equivalent soil method. These soil holding times are: Organics (14 days)x Mercury (28 days) ; other metals (180 days). A recorded breach therefore does not guarantee a breach for all non-volatile parameters.

Matrix: **WATER** Evaluation: × & Holding time breach x ✓ & 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
EA005: p+								
Clear Plastic Bottle 8Natural (EA005)								
GW18,	GW01,	**25-JUN-2013**	**----**	----	----	**25-JUN-2013**	25-JUN-2013	✓
GW40,	GW28,							
GW35,	GW22							
EA015: Total Dissolved Solids								
Clear Plastic Bottle 8Natural (EA015+)								
GW18,	GW01,	**25-JUN-2013**	**----**	02-JUL-2013	----	**27-JUN-2013**	02-JUL-2013	✓
GW40,	GW28,							
GW35,	GW22							
ED037P: Alkalinity by PC Titrator								
Clear Plastic Bottle 8Natural (ED037P)								
GW18,	GW01,	**25-JUN-2013**	**----**	09-JUL-2013	----	**26-JUN-2013**	09-JUL-2013	✓
GW40,	GW28,							
GW35,	GW22							
ED041G: Sulfate (Turbidimetric) as SO4 2-by DA								
Clear Plastic Bottle 8Natural (ED041G)								
GW18,	GW01,	**25-JUN-2013**	**----**	23-JUL-2013	----	**26-JUN-2013**	23-JUL-2013	✓
GW40,	GW28,							
GW35,	GW22							
ED045G: Chloride Discrete analyser								
Clear Plastic Bottle 8Natural (ED045G)								
GW18,	GW01,	**25-JUN-2013**	**----**	23-JUL-2013	----	**26-JUN-2013**	23-JUL-2013	✓
GW40,	GW28,							
GW35,	GW22							
ED093F: Dissolved Major Cations								
Clear Plastic Bottle 8Natural (ED093F)								
GW18,	GW01,	**25-JUN-2013**	**----**	02-JUL-2013	----	**27-JUN-2013**	02-JUL-2013	✓
GW40,	GW28,							
GW35,	GW22							

MatriK: **WATER** Evaluation: × & Holding time breach x ✓ & 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 ICP8MS							
Clear Plastic Bottle 8Nitric Acid; Filtered (EG020A8F)							
GW18, GW01, GW40, GW28, GW35, GW22, Dup 2	**258JUN82013**	888	22-DEC-2013	----	**278JUN82013**	22-DEC-2013	✓
EK026SF: Total CN by Segmented Flow Analyser							
White Plastic Bottle8NaO+ (EK026SF)							
GW18, GW35, Dup 2	**258JUN82013**	888	09-JUL-2013	----	**268JUN82013**	09-JUL-2013	✓
White Plastic Bottle8NaO+ 8Pb Acetate (EK026SF)							
GW01, GW40, GW28, GW22	**258JUN82013**	888	09-JUL-2013	----	**268JUN82013**	09-JUL-2013	✓
EK040P: Fluoride by PC Titrator							
Clear Plastic Bottle 8Natural (EK040P)							
GW18, GW01, GW40, GW28, GW35, GW22	**258JUN82013**	888	23-JUL-2013	----	**268JUN82013**	23-JUL-2013	✓
EK055G: Ammonia as N by Discrete Analyser							
Clear Plastic Bottle 8Sulfuric Acid (EK055G)							
GW18, GW01, GW40, GW28, GW35, GW22	**258JUN82013**	888	23-JUL-2013	----	**278JUN82013**	23-JUL-2013	✓
EK057G: Nitrite as N by Discrete Analyser							
Clear Plastic Bottle 8Natural (EK057G)							
GW18, GW01, GW40, GW28, GW35, GW22	**258JUN82013**	888	27-JUN-2013	----	**258JUN82013**	27-JUN-2013	✓
EK071G: Reactive Phosphorus as P by discrete analyser							
Clear Plastic Bottle 8Natural (EK071G)							
GW18, GW01, GW40, GW28, GW35, GW22	**258JUN82013**	888	27-JUN-2013	----	**258JUN82013**	27-JUN-2013	✓
EP0| 0/071: Total Recoverable +ydrocarbons 8NEPM 2010 Draft							
Amber Glass Bottle 8Unpreserved (EP071)							
GW18, GW01, GW40, GW28, GW35, GW22, Rinsate 2, Dup 2	**258JUN82013**	**268JUN82013**	02-JUL-2013	✓	**278JUN82013**	05-AUG-2013	✓

MatriK: **WATER**

Evaluation: × & Holding time breach x ✓ & 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 +ydrocarbons								
Amber VOC Vial 8Sulfuric Acid (EP074)								
GW18,	GW01,	**258JUN82013**	**268JUN82013**	09-JUL-2013	✓	**278JUN82013**	09-JUL-2013	✓
GW40,	GW28,							
GW35,	GW22,							
Rinsate 2,	Trip 2,							
Trip 3,	Dup 2							
EP074+ : Naphthalene								
Amber VOC Vial 8Sulfuric Acid (EP074)								
GW18,	GW01,	**258JUN82013**	**268JUN82013**	09-JUL-2013	✓	**278JUN82013**	09-JUL-2013	✓
GW40,	GW28,							
GW35,	GW22,							
Rinsate 2,	Trip 2,							
Trip 3,	Dup 2							
EP0| 0/071: Total Recoverable +ydrocarbons 8NEPM 2010 Draft								
Amber VOC Vial 8Sulfuric Acid (EP0| 0)								
GW18,	GW01,	**258JUN82013**	**268JUN82013**	09-JUL-2013	✓	**278JUN82013**	09-JUL-2013	✓
GW40,	GW28,							
GW35,	GW22,							
Rinsate 2,	Dup 2							

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(where) processed. Actual rate should be greater than or equal to the eKpected rate. A listing of breaches is provided in the Summary of Outliers.

MatriK: **WATER**

Evaluation: × & Quality Control frequency not within specification x ✓ & 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	15	**13.3**	**10.0**	✓	NEPM 1999 Schedule B(3) and ALS QCS3 requirement
Ammonia as N by Discrete analyser	E=055G	3	26	**11.5**	**10.0**	✓	NEPM 1999 Schedule B(3) and ALS QCS3 requirement
Chloride by Discrete Analyser	ED045G	4	30	**13.3**	**10.0**	✓	NEPM 1999 Schedule B(3) and ALS QCS3 requirement
Dissolved Metals by ICP-MS - Suite A	EG020A-F	4	33	**12.1**	**10.0**	✓	NEPM 1999 Schedule B(3) and ALS QCS3 requirement
Fluoride by PC Titrator	E=040P	2	17	**11.|**	**10.0**	✓	NEPM 1999 Schedule B(3) and ALS QCS3 requirement
Major Cations - Dissolved	ED093F	2	20	**10.0**	**10.0**	✓	NEPM 1999 Schedule B(3) and ALS QCS3 requirement
Nitrite and Nitrate as N (NOK) by Discrete Analyser	E=059G	2	10	**20.0**	**10.0**	✓	NEPM 1999 Schedule B(3) and ALS QCS3 requirement
Nitrite as N by Discrete Analyser	E=057G	2	19	**10.5**	**10.0**	✓	NEPM 1999 Schedule B(3) and ALS QCS3 requirement
pH	EA005	2	20	**10.0**	**10.0**	✓	NEPM 1999 Schedule B(3) and ALS QCS3 requirement
Reactive Phosphorus as P-By Discrete Analyser	E=071G	2	12	**16.7**	**10.0**	✓	NEPM 1999 Schedule B(3) and ALS QCS3 requirement
Sulfate (Turbidimetric) as SO4 2- by Discrete Analyser	ED041G	2	16	**12.5**	**10.0**	✓	NEPM 1999 Schedule B(3) and ALS QCS3 requirement
Total Cyanide by Segmented Flow Analyser	E=026SF	2	16	**12.5**	**10.0**	✓	NEPM 1999 Schedule B(3) and ALS QCS3 requirement
Total Dissolved Solids (High Level)	EA015H	2	20	**10.0**	**10.0**	✓	NEPM 1999 Schedule B(3) and ALS QCS3 requirement
TPH - Semivolatile Fraction	EP071	2	19	**10.5**	**10.0**	✓	NEPM 1999 Schedule B(3) and ALS QCS3 requirement
TPH Volatiles/BTEX	EP080	2	17	**11.|**	**10.0**	✓	NEPM 1999 Schedule B(3) and ALS QCS3 requirement
Volatile Organic Compounds	EP074	2	15	**13.3**	**10.0**	✓	NEPM 1999 Schedule B(3) and ALS QCS3 requirement
Laboratory Control Samples (LCS)							
Alkalinity by PC Titrator	ED037-P	1	15	**6.7**	**5.0**	✓	NEPM 1999 Schedule B(3) and ALS QCS3 requirement
Ammonia as N by Discrete analyser	E=055G	2	26	**7.7**	**5.0**	✓	NEPM 1999 Schedule B(3) and ALS QCS3 requirement
Chloride by Discrete Analyser	ED045G	4	30	**13.3**	**10.0**	✓	NEPM 1999 Schedule B(3) and ALS QCS3 requirement
Dissolved Metals by ICP-MS - Suite A	EG020A-F	2	33	**6.1**	**5.0**	✓	NEPM 1999 Schedule B(3) and ALS QCS3 requirement
Fluoride by PC Titrator	E=040P	1	17	**5.9**	**5.0**	✓	NEPM 1999 Schedule B(3) and ALS QCS3 requirement
Major Cations - Dissolved	ED093F	1	20	**5.0**	**5.0**	✓	NEPM 1999 Schedule B(3) and ALS QCS3 requirement
Nitrite and Nitrate as N (NOK) by Discrete Analyser	E=059G	1	10	**10.0**	**5.0**	✓	NEPM 1999 Schedule B(3) and ALS QCS3 requirement
Nitrite as N by Discrete Analyser	E=057G	1	19	**5.3**	**5.0**	✓	NEPM 1999 Schedule B(3) and ALS QCS3 requirement
Reactive Phosphorus as P-By Discrete Analyser	E=071G	1	12	**| .3**	**5.0**	✓	NEPM 1999 Schedule B(3) and ALS QCS3 requirement
Sulfate (Turbidimetric) as SO4 2- by Discrete Analyser	ED041G	1	16	**6.3**	**5.0**	✓	NEPM 1999 Schedule B(3) and ALS QCS3 requirement
Total Cyanide by Segmented Flow Analyser	E=026SF	1	16	**6.3**	**5.0**	✓	NEPM 1999 Schedule B(3) and ALS QCS3 requirement
Total Dissolved Solids (High Level)	EA015H	1	20	**5.0**	**5.0**	✓	NEPM 1999 Schedule B(3) and ALS QCS3 requirement
TPH - Semivolatile Fraction	EP071	1	19	**5.3**	**5.0**	✓	NEPM 1999 Schedule B(3) and ALS QCS3 requirement
TPH Volatiles/BTEX	EP080	1	17	**5.9**	**5.0**	✓	NEPM 1999 Schedule B(3) and ALS QCS3 requirement
Volatile Organic Compounds	EP074	1	15	**6.7**	**5.0**	✓	NEPM 1999 Schedule B(3) and ALS QCS3 requirement
Method Blanks (MB)							
Ammonia as N by Discrete analyser	E=055G	2	26	**7.7**	**5.0**	✓	NEPM 1999 Schedule B(3) and ALS QCS3 requirement
Chloride by Discrete Analyser	ED045G	2	30	**6.7**	**5.0**	✓	NEPM 1999 Schedule B(3) and ALS QCS3 requirement
Dissolved Metals by ICP-MS - Suite A	EG020A-F	2	33	**6.1**	**5.0**	✓	NEPM 1999 Schedule B(3) and ALS QCS3 requirement

MatriK: **WATER**

Evaluation: × & Quality Control frequency not within specification x ✓ & Quality Control frequency within specification.

Quality Control Sample Type		Count		Rate (%)			Quality Control Specification
Analytical Methods	*Method*	*QC*	*Regular*	***Actual***	***Expected***	*Evaluation*	
Method Blanks (MB) - Continued							
Fluoride by PC Titrator	E=040P	1	17	**5.9**	**5.0**	✓	NEPM 1999 Schedule B(3) and ALS QCS3 requirement
Major Cations - Dissolved	ED093F	1	20	**5.0**	**5.0**	✓	NEPM 1999 Schedule B(3) and ALS QCS3 requirement
Nitrite and Nitrate as N (NOK) by Discrete Analyser	E=059G	1	10	**10.0**	**5.0**	✓	NEPM 1999 Schedule B(3) and ALS QCS3 requirement
Nitrite as N by Discrete Analyser	E=057G	1	19	**5.3**	**5.0**	✓	NEPM 1999 Schedule B(3) and ALS QCS3 requirement
Reactive Phosphorus as P-By Discrete Analyser	E=071G	1	12	**| .3**	**5.0**	✓	NEPM 1999 Schedule B(3) and ALS QCS3 requirement
Sulfate (Turbidimetric) as SO4 2- by Discrete Analyser	ED041G	1	16	**6.3**	**5.0**	✓	NEPM 1999 Schedule B(3) and ALS QCS3 requirement
Total Cyanide by Segmented Flow Analyser	E=026SF	1	16	**6.3**	**5.0**	✓	NEPM 1999 Schedule B(3) and ALS QCS3 requirement
Total Dissolved Solids (High Level)	EA015H	1	20	**5.0**	**5.0**	✓	NEPM 1999 Schedule B(3) and ALS QCS3 requirement
TPH - Semivolatile Fraction	EP071	1	19	**5.3**	**5.0**	✓	NEPM 1999 Schedule B(3) and ALS QCS3 requirement
TPH Volatiles/BTEX	EP080	1	17	**5.9**	**5.0**	✓	NEPM 1999 Schedule B(3) and ALS QCS3 requirement
Volatile Organic Compounds	EP074	1	15	**6.7**	**5.0**	✓	NEPM 1999 Schedule B(3) and ALS QCS3 requirement
MatriK Spikes (MS)							
Ammonia as N by Discrete analyser	E=055G	2	26	**7.7**	**5.0**	✓	ALS QCS3 requirement
Chloride by Discrete Analyser	ED045G	2	30	**6.7**	**5.0**	✓	ALS QCS3 requirement
Dissolved Metals by ICP-MS - Suite A	EG020A-F	2	33	**6.1**	**5.0**	✓	ALS QCS3 requirement
Fluoride by PC Titrator	E=040P	1	17	**5.9**	**5.0**	✓	ALS QCS3 requirement
Nitrite and Nitrate as N (NOK) by Discrete Analyser	E=059G	1	10	**10.0**	**5.0**	✓	ALS QCS3 requirement
Nitrite as N by Discrete Analyser	E=057G	1	19	**5.3**	**5.0**	✓	ALS QCS3 requirement
Reactive Phosphorus as P-By Discrete Analyser	E=071G	1	12	**| .3**	**5.0**	✓	ALS QCS3 requirement
Sulfate (Turbidimetric) as SO4 2- by Discrete Analyser	ED041G	1	16	**6.3**	**5.0**	✓	ALS QCS3 requirement
Total Cyanide by Segmented Flow Analyser	E=026SF	1	16	**6.3**	**5.0**	✓	ALS QCS3 requirement
TPH - Semivolatile Fraction	EP071	1	19	**5.3**	**5.0**	✓	ALS QCS3 requirement
TPH Volatiles/BTEX	EP080	1	17	**5.9**	**5.0**	✓	ALS QCS3 requirement
Volatile Organic Compounds	EP074	1	15	**6.7**	**5.0**	✓	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	EA005	WATER	APHA 21st ed. 4500 H+ B. pH of water samples is determined by ISE either manually or by automated pH meter. This method is compliant with NEPM (1999) Schedule B(3) (AppdK 2)
Total Dissolved Solids (High Level)	EA015H	WATER	In-House, APHA 21st ed., 2540C A gravimetric procedure that determines the amount of `filterable` residue in an aqueous sample. A well-miKed 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 (1999) Schedule B(3) (AppdK 2)
Alkalinity by PC Titrator	ED037-P	WATER	APHA 21st ed., 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 (1999) Schedule B(3) (AppdK 2)
Sulfate (Turbidimetric) as SO4 2- by Discrete Analyser	ED041G	WATER	APHA 21st ed., 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 (1999) Schedule B(3) (AppdK 2)
Chloride by Discrete Analyser	ED045G	WATER	APHA 21st ed., 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	Major Cations is determined based on APHA 21st ed., 3120xUSEPA SW 846 - 6010 The ICPAES technique ionises the 0.45um filtered sample atoms emitting a characteristic spectrum. This spectrum is then compared against matriKmatched standards for quantification. This method is compliant with NEPM (1999) Schedule B(3) (AppdK 2) 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 (1999) Schedule B(3) (AppdK 2) Hardness parameters are calculated based on APHA 21st ed., 2340 B. This method is compliant with NEPM (1999) Schedule B(3) (AppdK 2)
Dissolved Metals by ICP-MS - Suite A	EG020A-F	WATER	(APHA 21st ed., 3125xUSEPA 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.

Analytical Methods	Method	Matrix	Method Descriptions
Total Cyanide by Segmented Flow Analyser	E=026SF	WATER	APHA 4500-CN-O. Sodium hydroKide preserved samples are introduced into an automated segmented flow analyser. CompleK bound cyanide is decomposed in a continuously flowing stream, at a pH of 3.8, by the effect of UV light. A UV-B lamp (312 nm) and a decomposition spiral of borosilicate glass are used to filter out UV light with a wavelength of less than 290 nm thus preventing the conversion of thiocyanate into cyanide. The hydrogen cyanide present at a pH of 3.8 is separated by gas dialysis. The hydrogen cyanide is then determined photometrically, based on the reaction of cyanide with chloramine-T to form cyanogen chloride. This then reacts with 4-pyridine carboKylic acid and 1,3-dimethylbarbituric acid to give a red colour which is measured at 600 nm. This method is compliant with NEPM (1999) Schedule B(3) (AppdK 2)
Fluoride by PC Titrator	E=040P	WATER	APHA 21st ed., 4500 F--C CDTA is added to the sample to provide a uniform ionic strength background, adjust pH, and break up compleKes. Fluoride concentration is determined by either manual or automatic ISE measurement. This method is compliant with NEPM (1999) Schedule B(3) (AppdK 2)
Ammonia as N by Discrete analyser	E=055G	WATER	APHA 21st ed., 4500-NH3 G Ammonia is determined by direct colorimetry by Discrete Analyser. This method is compliant with NEPM (1999) Schedule B(3) (AppdK 2)
Ammonium as N	E=055G-NH4	WATER	Ammonium in the sample is reported as the ionised / unionised fractions by the use of a nomograph and the initial pH and Temperature. Ammonia is determined by direct colorimetry by Discrete Analyser according to APHA 21st ed., 4500-NH3 G. This method is compliant with NEPM (1999) Schedule B(3) (AppdK 2)
Nitrite as N by Discrete Analyser	E=057G	WATER	APHA 21st ed., 4500-NO2- B. Nitrite is determined by direct colourimetry by Discrete Analyser. This method is compliant with NEPM (1999) Schedule B(3) (AppdK 2)
Nitrate as N by Discrete Analyser	E=058G	WATER	APHA 21st ed., 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 (1999) Schedule B(3) (AppdK 2)
Nitrite and Nitrate as N (NOK) by Discrete Analyser	E=059G	WATER	APHA 21st ed., 4500-NO3- F. Combined oKidised Nitrogen (NO2+NO3) is determined by Chemical Reduction and direct colourimetry by Discrete Analyser. This method is compliant with NEPM (1999) Schedule B(3) (AppdK 2)
Reactive Phosphorus as P-By Discrete Analyser	E=071G	WATER	APHA 21st ed., 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 (1999) Schedule B(3) (AppdK 2)
Ionic Balance by PCT DA and Turbi SO4 DA	EN055 - PG	WATER	APHA 21st Ed. 1030F. The Ionic Balance is calculated based on the major Anions and Cations. The major anions include Alkalinity, Chloride and Sulfate which determined by PCT and DA. The Cations are determined by Turbi SO4 by DA. This method is compliant with NEPM (1999) Schedule B(3) (AppdK 2)
TPH - Semivolatile Fraction	EP071	WATER	USEPA SW 846 - 8015A The sample eKtract 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 (1999) Schedule B(3) (AppdK 2)
Volatile Organic Compounds	EP074	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 (1999) Schedule B(3) (AppdK 2)
TPH 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 NEPM (1999) Schedule B(3) (AppdK 2)

Preparation Methods	Method	Matrix	Method Descriptions
Separatory Funnel Extraction of Liquids	ORG14	WATER	USEPA SW 846 - 3510B 100 mL to 1L of sample is transferred to a separatory funnel and serially extracted three times using 60mL DCM for each extract. The resultant extracts are combined, dehydrated and concentrated for analysis. This method is compliant with NEPM (1999) Schedule B(3) (Appdx. 2). ALS default excludes sediment which may be resident in the container.
Volatiles Water Preparation	ORG16-W	WATER	A 5 mL aliquot or 5 mL of a diluted sample is added to a 40 mL VOC vial for sparging.

Summary of Outliers

Outliers : Quality Control Samples

The following report highlights outliers flagged in the Quality Control (QC) Report. Surrogate recovery limits are static and based on USEPA SW 846 or ALS-QWI/EN/38 (in the absence of specific USEPA limits). This report displays QC Outliers (breaches) only.

Duplicates, Method Blanks, Laboratory Control Samples and Matrix Spikes

MatriK: **WATER**

Compound Group Name	Laboratory Sample ID	Client Sample ID	Analyte	CAS Number	Data	Limits	Comment
Laboratory Control Spike (LCS) Recoveries							
ED045G: Chloride Discrete analyser	3491176-042	---	**Chloride**	16887-00-6	1.1 %	89-117%	**Recovery less than lower control limit**
Matrix Spike (MS) Recoveries							
ED041G: Sulfate (Turbidimetric) as SO4 2- by DA	EM1306738-004	GW28	**Sulfate as SO4 8 Turbidimetric**	14808-79-8	Not Determined	----	**MS recovery not determined, background level greater than or equal to 4x spike level.**
ED045G: Chloride Discrete analyser	EM1306717-002	Anonymous	**Chloride**	16887-00-6	Not Determined	----	**MS recovery not determined, background level greater than or equal to 4x spike level.**
E=026SF: Total CN by Segmented Flow Analyser	EM1306718-002	Anonymous	**Total Cyanide**	57-12-5	65.2 %	70-130%	**Recovery less than lower data quality objective**

- **For all matrices, no Method Blank value outliers occur.**
- **For all matrices, no Duplicate outliers occur.**

Regular Sample Surrogates

- **For all regular sample matrices, no surrogate recovery outliers occur.**

Outliers : Analysis Holding Time Compliance

This report displays Holding Time breaches only. Only the respective EKtraction / Preparation and/or Analysis component is/are displayed.

- **No Analysis + olding Time Outliers exist.**

Outliers : Frequency of Quality Control Samples

The following report highlights breaches in the Frequency of Quality Control Samples.

- **No Quality Control Sample Frequency Outliers exist.**

CoC received 25/06/13 15:36 RT

CHAIN OF CUSTODY

ALS Laboratory: please tick →

☐ Sydney: 277 Woodpark Rd, Smithfield NSW 2176 Ph: 02 8784 8555 E:samples.sydney@alsenviro.com
☐ Newcastle: 5 Rosegum Rd, Warabrook NSW 2304 Ph:02 4958 9433 E:samples.newcastle@alsenviro.com
☐ Brisbane: 32 Shand St, Stafford QLD 4053 Ph:07 3243 7222 E:samples.brisbane@alsenviro.com
☐ Townsville: 14-15 Desma Ct, Bohle QLD 4818 Ph:07 4796 0600 E:[illegible]
☐ Melbourne: 2-4 Westall Rd, Springvale VIC 3171 Ph:03 8549 9600 E: samples.melbourne@alsenviro.com
☐ Adelaide: 2-1 Burma Rd, Pooraka SA 5095 Ph: 08 8359 0890 E:adelaide@alsenviro.com
☐ Perth: 10 Hod Way, Malaga WA 6090 Ph: 08 9209 7655 E: samples.perth@alsenviro.com
☐ Launceston: 27 Wellington St, Launceston TAS 7250 Ph: 03 6331 2158 E: launceston@alsenviro.com

CLIENT: ENVIRONMENTAL EARTH SCIENCES	TURNAROUND REQUIREMENTS : (Standard TAT may be longer for some tests e.g., Ultra Trace Organics)		FOR LABORATORY USE ONLY (Circle): Custody Seal Intact? Yes No N/A
OFFICE: 98 MARIBYRNONG RD, FOOTSCRAY, VIC. 3011			Free ice / frozen ice bricks present upon receipt? Yes No N/A
PROJECT: 210074 Sth Melbourne Gaswords	ALS QUOTE NO.: ME/330/13	COC SEQUENCE NUMBER (Circle)	Random Sample Temperature on Receipt: °C
ORDER NUMBER:		CC 1 2 3 4 5 7	Other comment: Ref – 3.6
PROJECT MANAGER: REGIN ORQUIZA	CONTACT PH: 8398 4403	O 1 2 3 4 5 7	
SAMPLER:	SAMPLER MOBILE:	RELINQUISHED BY: S.Leong	RECEIVED BY: ALS Courier
COC emailed to ALS? (YES / NO)	EDD FORMAT (or default):	DATE/TIME: 25/6/13 / 3 pm	DATE/TIME: 25/6/13 3pm
Email Reports to : rorquiza@eesicontracting.com and sleong@eesi.biz		RELINQUISHED BY:	RECEIVED BY: ALS
Email Invoice to : rorquiza@eesicontracting.com		DATE/TIME:	DATE/TIME: 25/6, 1635

COMMENTS/SPECIAL HANDLING/STORAGE OR DISPOSAL:

Environmental Division Melbourne
Work Order
EM1306738

Telephone : +61-3-8549 9600

ALS USE ONLY	SAMPLE DETAILS MATRIX: Solid(S) Water(W)			CONTAINER INFORMATION		ANALYSIS REQUIRED including SUITES (NB. Suite Codes must be listed to attract suite price) Where Metals are required, specify Total (unfiltered bottle required) or Dissolved (field filtered bottle required).												Additional I	
LAB ID	SAMPLE ID	DATE / TIME	MATRIX	TYPE & PRESERVATIVE (refer to codes below)	TOTAL BOTTLES	EES IONIC BALANCE SUITE - includes pH, TDS, Ca, Mg, Na, K, Cl, SO4, Alk, F, NO3, Reactive P, Ammonia	Ammonium (field pH and field temp. must be recorded on the COC)	Dissolved metals - Al, As, Cd, Cu, Fe, Pb, Ni, Zn, Co, Se, B & Mn	Total Cyanide	EP074A - MAH	EP074H - Naphthalene only	TPH (C6-C36) plus TRH (C6-C40)	Silica gel clean up - on SV TPH - TPH (C10-C36) and TRH(C10-C40)					field pH	Field temp	
(1)	GW18	25/06/2013	W		8	X	X	X	X	X	X	X						6.89	18	
(2)	GW01	25/06/2013	W		8	X	X	X	X	X	X	X						6.6	17.4	
(3)	GW40	25/06/2013	W		8	X	X	X	X	X	X	X						5.24	18	
(4)	GW28	25/06/2013	W		8	X	X	X	X	X	X	X						5.67	18.8	
(5)	GW35	25/06/2013	W		8	X	X	X	X	X	X	X						6.92	17.8	
(6)	GW22	25/06/2013	W		8	X	X	X	X	X	X	X						6.3	18.5	
(7)	Rinsate 2	25/06/2013	W		2					X	X	X								
(8)	Trip 2	25/06/2013	W		1					X	X									
(9)	Trip 3	25/06/2013	W		1					X	X									
	Extra cups:																			
(10)	Dup2	25/6/13	W	Ice (ALS)																
(11)	Spl1+2	25/6/13	W	25/6/13																
				TOTAL																

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

CoC received 25/06/13 15:36 RT

CHAIN OF CUSTODY

ALS Laboratory: please tick →

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☐ Newcastle: 5 Rosegum Rd, Warabrook NSW 2304 Ph:02 4968 9433 E:samples.newcastle@alsenviro.com
☐ Brisbane: 32 Shand St, Stafford QLD 4053 Ph:07 3243 7222 E:samples.brisbane@alsenviro.com
☐ Townsville: 14-15 Desma Ct, Bohle QLD 4818 Ph:07 4796 0600 E: townsville.environmental@alsenviro.com
☐ Melbourne: 2-4 Westall Rd, Springvale VIC 3171 Ph:03 8549 9600 E: samples.melbourne@alsenviro.com
☐ Adelaide: 2-1 Burma Rd, Pooraka SA 5095 Ph: 08 8359 0890 E:adelaide@alsenviro.com
☐ Perth: 10 Hod Way, Malaga WA 6090 Ph: 08 9209 7655 E: samples.perth@alsenviro.com
☐ Launceston: 27 Wellington St, Launceston TAS 7250 Ph: 03 6331 2158 E: launceston@alsenviro.com

CLIENT: ENVIRONMENTAL EARTH SCIENCES	TURNAROUND REQUIREMENTS : (Standard TAT may be longer for some tests e.g., Ultra Trace Organics)		FOR LABORATORY USE ONLY (Circle): Custody Seal Intact? Yes No N/A
OFFICE: 98 MARIBYRNONG RD, FOOTSCRAY, VIC. 3011			Free ice / frozen ice bricks present upon receipt? Yes No N/A
PROJECT: 210074 Sth Melbourne Gaswords	ALS QUOTE NO.: ME/330/13	COC SEQUENCE NUMBER (Circle)	Random Sample Temperature on Receipt: °C
ORDER NUMBER:		CC 1 2 3 4 5 7	Other comment: 0.8 – 3.6
PROJECT MANAGER: REGIN ORQUIZA	CONTACT PH: 8398 4403	D 1 2 3 4 5 7	
SAMPLER:	SAMPLER MOBILE:	RELINQUISHED BY: S.Leong	RECEIVED BY: ALS Courier
COC emailed to ALS? (YES / NO)	EDD FORMAT (or default):	DATE/TIME: 25/6/13 / 3 pm	DATE/TIME: 25/6/13 3pm
Email Reports to : rorquiza@eesicontracting.com and sleong@eesi.biz		RELINQUISHED BY:	RECEIVED BY: Patrick
Email Invoice to : rorquiza@eesicontracting.com		DATE/TIME:	DATE/TIME: 25/6, 1635

COMMENTS/SPECIAL HANDLING/STORAGE OR DISPOSAL:

Environmental Division Melbourne
Work Order
EM1306738
Telephone : +61-3-8549 9600

ALS USE ONLY	SAMPLE DETAILS MATRIX: Solid(S) Water(W)			CONTAINER INFORMATION		ANALYSIS REQUIRED including SUITES (NB. Suite Codes must be listed to attract suite price) Where Metals are required, specify Total (unfiltered bottle required) or Dissolved (field filtered bottle required)												Additional I	
LAB ID	SAMPLE ID	DATE / TIME	MATRIX	TYPE & PRESERVATIVE (refer to codes below)	TOTAL BOTTLES	EES IONIC BALANCE SUITE - includes - pH, TDS, Ca, Mg, Na, K, Cl, SO4, Alk, F, NO3, Reactive P, Ammonia	Ammonium (field pH and field temp. must be recorded on the COC)	Dissolved metals - Al, As, Cd, Cu, Fe, Pb, Ni, Zn, Co, Se, B & Mn	Total Cyanide	EP074A - MAH	EP074H - Naphthalene only	TPH (C6-C36) plus TRH (C6-C40)	Silica gel clean up - on SV TPH - TPH (C10-C36) and TRH(C10-C40)					field pH	Field temp	
(1)	GW18	25/06/2013	W		8	X	X	X	X	X	X	X						6.89	18	
(2)	GW01	25/06/2013	W		8	X	X	X	X	X	X	X						6.6	17.4	
(3)	GW40	25/06/2013	W		8	X	X	X	X	X	X	X						5.24	18	
(4)	GW28	25/06/2013	W		8	X	X	X	X	X	X	X						5.67	18.8	
(5)	GW35	25/06/2013	W		8	X	X	X	X	X	X	X						6.92	17.8	
(6)	GW22	25/06/2013	W		8	X	X	X	X	X	X	X						6.3	16.5	
(7)	Rinsate 2	25/06/2013	W		2					X	X	X								
(8)	Trip 2	25/06/2013	W		1					X	X									
(9)	Trip 3	25/06/2013	W		1					X	X									
	Extra cups:																			
(10)	Dup 2	25/6/13	W	Ice (ALS)																
(11)	Rinsate 2	25/6/13	W	25/6/13																
					TOTAL															

SCANNED

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